Public libraries and digital competences
A mixed-method analysis of job ads
and professional views

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Completed: 2019

Abstract: Technological advancements and digital tools have radically changed the professional profile of public librarians and yet little has been researched about the practical influence these changes have had on the digital competences that the professionals need in their daily work. The goal of the present paper is to examine which digital competences are required of the modern public librarian. A mixed-method research approach was adopted, based on content analysis of job advertisements retrieved from a Swedish context and semi-structured interviews with five currently employed librarians. A conceptual model was developed to allow a triangulation of results based on such different datasets. Results showed that the concept of digital competences is still defined in diffuse terms, often subjective to individual interpretations and strongly affected by the library’s size and user population. In spite of this, the professionals working in the public library sector clearly demand a minimum standard of digital skills and knowledge in all digital competences to be established. Such standard is needed both to perform daily responsibilities linked to the professional role of the public librarian and to the vital task of catering to the users’ needs.

Keywords: Digital competence, public library, librarian, content analysis, job advertisements, semi-structured interview.
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1 Introduction

“Just like coffee, IT is a perishable good, changing from day to day. It is society that decides what becomes part of our job description”. (Librarian B3)

With technological advancements and digital innovations permeating all parts of today’s society, Cochoy, Hagberg, Petersson, McIntyre and Sörum (2017) have described ours as a digital age, while others have highlighted how “information technology and its convenience has changed human lives” (Shimray, Keerti, & Ramaiah, 2015). Just as for other aspects of society, the role of librarians and, more importantly, the competences they are expected to possess have also undergone remarkable changes during a relatively short span of time, fluctuations that have often been linked to the extraordinary spreading of new technology. While numerous studies have previously looked at the changes in the library as an institution (Broady-Preston & Preston, 2007; Maness, 2006; Mashkoor Abidi, 2015) and others have observed the opinion of the professionals themselves on the subject matter of variations experienced in their role (Anderson, 2007; Huvilla, Holmberg, Kronqvist-Berg, Nivakoski, & Widén, 2013), there remains to be seen how the new pervasive technological and digital implementations that are to be found in a modern library have affected the knowledge and expertise that these professionals need to perform their daily work. In short, there is a need to examine how this new ‘digital age’ has affected the librarians’ digital competence in terms of needs and skills.

On a worldwide scale, the use of information and communications technology (ICT) has been linked to a greater success in achieving the Sustainable Development Goals (International Telecommunication Union, 2018) that represent a target for 2030 as envisaged by the United Nations (2015). The European Commission (2018), with the motto of “Being digitally competent – a task for the 21st century citizen”, issued a call throughout its territories to diagnose the citizens’ digital competence levels, inciting individuals to set learning goals for themselves, either to broaden their own knowledge or to be able to carry out vital tasks such as job hunting or information seeking more efficiently. A formal document, the Digital Competence Framework 2.1, or DigComp 2.1 (Carretero, Vuorikari, & Punie, 2017), has been created, listing the five areas, with eight proficiency levels each, deemed fundamental to navigate efficiently and safely in digital waters.

In 2017, Sweden was ranked in the sixth place amongst the European countries when it came to the percentage of population with basic digital skills. Around 30.8 per cent of individuals aged between 16 and 74 had “at least ‘basic’ skills in all the four Digital Competence domains included in the index: information, communication, content-creation and problem-solving, but no more than three above basic” (European Commission, 2019), results that, amongst other issues, were also strongly affected by variables such as age and educational background (Negreiro, 2015). Within the Swedish school system, younger generations receive formal training during their formative years, an educational
arrangement that allows students to use new technology, to create and to consume digital information (Skolverket 2018). However, for those lacking digital skills, or without access to tablets, computers, smartphones or internet in their homes, help can often be found in the local public libraries, where many patrons come daily to perform a wide array of digital activities and where they know they can get access to both digital technology and guidance from the library’s personnel.

The notion of public library as anchor point to inform and educate users in digital competences is a point clearly stated in the Library Law (Bibliotekslag, SFS 2013:801), given that 7 § Public libraries shall act to increase the knowledge about how information technologies can be used to retrieve information, increase learning and participation in the cultural life. The Swedish State Office itself has highlighted the fact that libraries play a fundamental part to increase the public’s digital competence (Regeringskansliet, 2017) as have professional representatives of the sector, such as Hansson, President of the Swedish Library Association, who stated that working to increase digital participation is a core mission of public libraries, helping users find the information they are looking for independently of the format (Svensk Biblioteksförening, 2018). In The International library manifestos, the Swedish National Commission for UNESCO and the Swedish Library Association (Svenska Unescorådet & Svensk biblioteksförening, 2014) also reiterated that one of the main objectives of today’s public libraries is to stimulate information competence in this digital age, mainly by helping people to master information and communication technologies. Public libraries within the Stockholm region, for example, have been promoting “IT-hosts” and “Digital First Aid” to help with basic digital tasks such as internet usage, creation of e-mail addresses, scanning, copying and downloading e-books (Stockholms stadsbibliotek, 2019a, 2019b). A further example is presented by Gothenburg’s city library, where users can receive information about how to use social media, apps, tablet computers and e-books (Göteborgs stad, 2019a), or where activities specifically created for elderly users aim at enabling seniors to use cloud services, navigate the internet and use their tablets (Göteborgs stad, 2019b). The implementation of this type of new services has inevitably led to changes in the role of the library personnel in general and in the figure of the public librarian specifically. There has been an undeniable shift in the concept of public library, from a wholly-analogue institution to an ever more digital one. These changes have been strongly felt by both the sector’s professionals and by the employment market. Choi and Rasmussen (2009) mention the impact that the deployment of digital technologies and digital libraries has had on core aspects of librarian institutions, with tangible consequences on practices, staff resources, workload and the very structure of the organisations. Terms such as Library 2.0 and Librarian 2.0 gained unprecedented force and established new standards for the public library as an institution (Huvila et al., 2013), but also entailed that completely new sets of tools, repositories and user queries must be handled daily by library staff.
Broady-Preston and Preston (2007) mentioned that the library and information science (LIS) profession is an occupation intrinsically linked to rapid change and to the constant necessity of its professionals to attain changing sets of skills. Huvila et al. (2013) later expanded on this concept of a continuous professional change with less and less clear-cut boundaries, admitting that the libraries’ role has been indistinct since library automation, especially since the libraries themselves show a constantly growing presence online.

Furthermore, not only have libraries been gaining force online, but they have also incorporated increasingly more digital tools and routines in their day-to-day activities within the physical space of the library buildings. Cataloguing systems, which can vary enormously from region to region, are today completely digital in most of the cases, while the library’s content is slowly shifting from being an altogether physical format to being expanded with increasingly digital ones, especially for items such as films and audio files (Kungliga Biblioteket, 2018). Internal and external communication has also shifted from being exclusively physical in format to a gradually more digital support and, on average, a librarian working within a public library will inevitably have to deal with digital tasks such as emailing, digital cataloguing, user registration and overall access to informational databases, internet navigation, online payments and much more. When it comes to the interaction with users, the list of digitally-based activities grows, depending on the library and its patrons. Astounding shifts in the very user-librarian interaction have even been attempted, as solutions have been tested to virtualise the figure of the LIS professional through the use of avatars (Mon, 2012).

All in all, the changes in society and, consequently, in the sector keep blurring the boundaries around the concept of library, changing the ideas users have of what a library should offer and what a librarian should do, just as it happened with the first boom of popular concepts such as those of Library 2.0. This in turn has led to changes in the digital skills and abilities, or competences, a professional librarian should possess, which ultimately also affects how an ‘ideal librarian candidate’ should be in the eyes of the hiring managerial sector.

1.1 Problem statement

Tangible requirements are being issued from local and supraregional institutions when it comes to incorporating digital technologies in public libraries, while patrons rely more and more strongly on the competence and availability of librarians to perform digitally-related tasks or to receive information about digital activities and content. In spite of these facts, up to date little has been researched in the field of digital competences from the public librarians’ own point of view, and even less so specifically using a mixed-method research strategy that would include both the view of the employment market and that of the LIS professionals. While studies of job advertisements have been carried out before, a cohesive vision that includes the professionals’ viewpoint is needed, given that analysing only job announcements provides the
characteristics of an idealized applicant rather than a successful one (Howard, 2010).

Moreover, Olander (2009) stated that when more and more librarians born in the 40s and 50s retire, being replaced by ‘new’ librarians, the recruitment process will entail some difficulties, as the changes happening in the library sector have inevitably affected the professional identity of this workforce. The relatively new and still-adjusting figure of the librarian, combined with the fact that job advertisements used for the recruitment of new professionals of the LIS sector do not always specify the details of digital competences required by the actual daily work in a Swedish public library, make for a lack of recognised professional standards in this specific aspect.

In short, there is, at present, little attention dedicated to the formalisation of the increasing need for varied digital competences required of librarians working within public libraries in Sweden, especially in relation to the formal requirements asked by the sector’s management.

1.2 Aim of the study and research questions

The aim of the present paper is to empirically explore the digital competences required, by the employment sector and by the professional perspective, of librarians working in Swedish public libraries.

The following main research question will guide the present study:

“Which digital competences are required of librarians working within the Swedish public libraries?”

In order to answer this question, two sub questions will be used as guidelines:

1. Which digital competences are required by the job market of librarians working in Swedish public libraries?

2. Which are, in the view of librarians working within Swedish public libraries, the digital competences needed within the setting of their daily work?

The main research questions and its following sub questions will be answered by analysing the empirical data with the help of a conceptual model and of previous studies within the sector.
1.3 Relevance for the LIS sector

The present paper aims at being relevant for the professional sector as well as for the academic community. As Choi and Rasmussen (2009) pointed out, there exists a struggle to better understand the cycle of influence in the equation librarians-digital competences, whose ultimate goal is to find out if changes in the libraries, their content and services are brought about by the employment of increasingly more digital savvy librarians, or if the truth lies in the exact opposite, namely that new types of professionals are hired to cater to the needs of an exponentially more technological library. Furthermore, this paper holds a value for professionals-to-be public librarians, who will be able to closer identify which digital competences and prior experiences are appreciated and used most in the day-to-day reality of Swedish public libraries. The added factor of analysing the views of the two actors involved in the promotion and usage of digital competences in public libraries side by side, namely the managerialist and the professional librarians’, will hopefully produce more closely matched results between what is being asked for, and what is to be expected once in the field, providing a more balanced portrait of which digital competences are really needed in Swedish public libraries. Furthermore, the results of the study could prove beneficial to the academic sector, both by ensuring that the digital competences and needs highlighted by the librarian workforce come to be included in educational programs preparing future professional librarians and as reference for future studies on the topic.

1.4 Structure of the paper

Chapter one has presented an introductory section to provide the necessary background information, the problem statement, the aim of the study and its research questions.

Chapter two presents a literature review of previous research and the conceptual model used for the data analysis. The chapter is articulated into three main areas targeting each of the views of digital competences included in the conceptual model, separately explained in the fourth section of this chapter.

Chapter three is dedicated to the method adopted in the course of this research. A first section deals with the specifics of the collection, categorisation and analysis of the job advertisements while a second section explains the semi-structured interviews. The third section of this chapter provides insights into the limitations associated with this study, whereas the ethical considerations taken into account for the present research are explained in the fourth section of this chapter.

Chapter four presents the results of the analysis, grouped into five different categories that correspond to the five digital competence areas included in the Competence Categories.
Chapter five is dedicated to a discussion of the findings and the conclusions extracted thereof. A second section in this chapter also discusses the used conceptual model, while a final section provides suggestions for future research within this topic.
2 Literature review and conceptual model

The material chosen for the present section’s literature review has been selected with the intention of creating a common ground and understanding of the main concepts and factors deemed as fundamental for the present study. Previous examples of analysis of subjects relating to the research at hand also served to provide a guideline used in the production of the conceptual model upon which the analysis itself is based.

There was the initial need to define a formal understanding of digital competences, both from an academic perspective as well as from a governmental one, included in the first part of this chapter, Abstract view of digital competences: an academic and institutional view. Here are included previous studies that attempt to define what ‘digital competences’ are, how they can be identified and how they relate to the new digital practices of modern libraries. Within this chapter is also the definition of ‘digital competence’ according to official documents issued by the European Union.

The second part of the chapter, Formal view of digital competences: the employment market’s perspective, is dedicated to previous research focusing on the analysis of which digital competences have been formally required by the employment market for professional purposes. Earlier papers included here have examined, often in comprehensive longitudinal studies, the competences, skills and other traits that were formally required in job advertisements.

A third section, Professional view of digital competences: the librarians’ perspective, is dedicated to previous investigations into the question of digital competences used for professional purposes in the opinion of the LIS professionals themselves. Attention is also dedicated to the notion of Library 2.0 and Librarian 2.0.

The last section of this chapter provides the conceptual model developed on the basis of the presented literature and empirical results.

To the author’s knowledge, this is the first time that both daily practices and formal requirements issued in job advertisements are analysed to investigate the presence of digital competences within the Swedish public library context. Previous studies have been conducted internationally either focusing on the formal necessities of the sector, analysing job advertisements to individuate the professional requirements aspiring librarians would have to meet, focusing on the library as newfound forum dedicated to developing users’ digital competences, or concentrating on the daily practices of digital librarians in academic contexts. It must also be noted that the vast majority of previous research papers sieving out digital requirements in job advertisements has focused on specifically academic or research libraries, where larger sets of digital skills were deemed as more often required than in traditional public libraries since “bringing electronic resources to campus and making them
available to user communities require knowledge and expertise for selection; testing; funding; licensing; acquisition; cataloguing; implementation; training; publicity; evaluation; and technical support, including maintenance.” (Croneis & Henderson, 2002, p. 232). This has implied that many of the criteria used in said research papers, such as those relating to the choice of job advertisements and the creation of analysis’ categories, could not be fully applied in the present study.

2.1 Abstract view of digital competences: an academic and institutional perspective

Goodfellow (2011) described digital as the incorporation of new information and communications media into education and its activities, while Guzmán-Simón, García-Jiménez and López-Cobo (2017) defined competence as the ensemble of knowledge, skills and attitudes that lie at the basis of professional and personal development.

Janssen et al. (2013), though, pointed out that trying to narrowly define the concept of digital competence goes far beyond the mere understanding of its separate terms, as it entails theoretical, semantic and lexical choices. This, reminded the researchers, is due to the fact that digital competence is closely linked to many aspects of life such as work, leisure or communication, and needs to be considered as much more than technical skills, to also englobe a critical attitude and confidence towards information and communication media. They also added, however, that “what it means to be digitally competent in practical terms though, is less evident” (Janssen et al., 2013, p. 473). In their view, research and practice failed to provide a uniform and transparent definition of digital competence, which in turn made it extremely hard for teachers, employers and practitioners to achieve more in terms of competence development (Janssen et al., 2013). A further note presented by their work is the importance of choosing the right term for the appropriate discussion forum: while digital literacy and digital competence have often been used interchangeably in the academic field, ‘competence’ has been the preferred term in Scandinavian contexts and is also adopted in the course of this paper, given both its “broader and educational oriented concept (and the reference) to the categorisation of a discipline in a series of intertwined knowledge, skills and attitudes” (Janssen et al., 2013, p. 474).

Krumsvik (2008) also supported the use of ‘digital competence’ rather than ‘computer literacy’, ‘digital literacy’ or ‘media literacy’ to define “the need to handle technology in the digital age” (Krumsvik, 2008, p. 280). On the same tone, Andersdotter, Grenholm, Johansson, Spjut and Sävhammar (2017), in their practical application of digital competences to the creation of a self-evaluating test for professional librarians, defined digital competences as an intuitive and self-explaining term that clearly indicates its connection to digital media, practices, knowledge and approaches.
Given that the bases of the present paper are strongly rooted in the formal conceptualisations of digital competences as outlined by the European Union, the definition offered by the European Commission (2006) is adopted throughout the course of the research at hand: “digital competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication” (p. 7).

Digital competence has been included in the list of Eight Key Competences for Lifelong Learning (European Commission 2006), which further defined it as being rooted on basic skills in ICT, such as the capacity to use computers to “retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the internet (European Commission, 2006, p. 7). A vital point made by the same document is that digital competence is three-tiered in its composition, as it relies on knowledge, skills and attitudes to exist. Knowledge refers in this case to a deep understanding of the role, nature and opportunities of ICTs in daily contexts; skills, refer to the ability to search, collect, process and use information in a consistent and critical way; attitudes denote the reflective, selective and critical outlook on the information available, as well as a lively interest to broaden one’s networks for different purposes (European Commission, 2006).

2.1.1 Digital competences according to the European Union

First published in 2013, the European Digital Competence Framework, or DigComp (Ferrari, Punie, & Brečko, 2013), was described as “a tool to improve citizens’ digital competence . . . and a reference for many digital competence initiatives at both European and Member State levels” (European Commission, 2017). Two update phases followed, namely DigComp 2.0 in 2016 (Vuorikari, Punie, Carretero, & Brande, 2016) and DigComp 2.1 in 2017 (Carretero et al., 2017). The first update introduced new vocabulary and improved descriptors for each competence, while the second further detailed each competence area into proficiency levels and added practical examples of how to apply the presented competences to educational and employment fields.

Analysis of the data gathered in the course of this paper was based on the most recent, updated and complete version of the document (DigComp 2.1). It should be noted that while the integral version of this document was taken into account as guideline for the analysis of the data gathered here, it has been adapted to suit the characteristics of the observed field of public libraries. This was done through the researcher’s own knowledge of the public library sector and with the help of the document issued by Andersdotter et al. (2017), which gives practical examples of digital competences applied to the public librarian’s daily work.

In DigComp 2.1, the five competence areas are Information and data literacy, Communication and collaboration, Digital content creation, Safety and
Problem solving. Within these five areas, different competences are identified and individually described (21 competences in total). Each single competence is successively broken down into eight proficiency levels each, with practical examples of use in everyday contexts. The eight proficiency levels are grouped into four main levels: foundation, intermediate, advanced, highly specialised. The foundation level is characterised by a low complexity of tasks, little user autonomy in performing those tasks and with the main objective of remembering patterns or steps necessary to carry out the tasks. The intermediate level tackles well-defined, routine tasks with straightforward problems, as well as slightly more complex, non-routine problems, in which the user is autonomous and is dedicated to understanding, as much as performing, the tasks at hand. The advanced level includes different tasks and problems of varied nature, the user performing them is able to guide others and adapt to their needs in complex situations, since being cognitively able to apply and evaluate different solutions. The highly specialised level includes users who can resolve complex problems, even ones with different interplaying factors and even with limited solutions at their disposal. Furthermore, users classified within this level are able to contribute to the professional practice, guide other users and propose new ideas and solutions to the field, cognitively creating content.

### 2.2 Formal view of digital competences: the employment market’s perspective

Previous studies have investigated the skills, experiences and formal requirements that future librarians working within a new type of library would need: the evolution of the library has been first and foremost characterised by the growing incorporation of new technologies and digital services. It should be noted that the majority of previous research has focused exclusively on job requirements for academic libraries, with very few studies taking into account the public library perspective. Even those which did include the public library perspective, found that the advertisements for the position of public librarians were a definite minority when compared to those advertising posts in academic libraries (Torabi, 2011). This tangible scarcity of previous results focusing only on public libraries has been palliated in the present paper by studying previous research done within the ambit of academic libraries and academic librarians, adapting its perspectives to the aims of the paper at hand, again with the help of personal knowledge of the sector and through the use of the practical work by Andersdotter et al. (2017).

Choi and Rasmussen (2009) analysed job advertisements for academic librarians during an eight-year time span, from 1999 to 2007, looking for changes in the needed qualifications, skills and experience required of the aspiring applicants. In the course of their research, they observed variables such as degree requirements, experience within similar working environment (academic libraries), knowledge within a given subject domain and overall
skills. The results of the study clearly showed that while libraries were, and would continue to be, taking advantage of the skills of their currently employed staff, they also needed to change the way they were recruiting new librarians, in order to hire personnel with “new skills and knowledge profiles” (Choi and Rasmussen, 2009, p. 458). In the course of their research, they remarked upon the fact that the new requirements needed from candidates had mostly to do with having familiarity with current technology, although increasing interest was dedicated to recruiting professionals with “communication skills as well as technological skills” (Choi & Rasmussen, 2009, p. 458).

Howard (2010) had already diagnosed the need to add a further dimension to the studies that focused on the skills needed within the LIS field when it came to digital competences and knowledge. In her paper, she advocated for the necessity of an auscultation with the professionals already working within academic libraries, primarily to better understand the real needs that came into play when staffing libraries which presented an added digital dimension. Once clearly defined, Howard argued, these needs would make indispensable guidelines for better profiling LIS schools and programs. Furthermore, Howard provided a fundamental insight into why a more triangulated research including both the opinion of the professionals as well as an analysis of job ads was needed: when analysing only the managerial side of the dice, by speaking directly with employers or by analysing job advertisements, natural limitations would occur, as the resulting profile would be that of an idealised applicant “reflecting employers’ expectations rather than establishing the skills of the successful applicant” (Howard, 2010, p. 262).

Raju (2014) likewise advocated for the consultation of both the LIS working professionals and their employers, triangulating his findings through the analysis of job advertisements and semi-structured interviews in order to ascertain the key skills and knowledge required of LIS professionals working within academic libraries with digital characteristics. A vital point made by the researcher is that IT-skills were clearly marked as a priority in the job advertisements analysed in the four-year lapse between 2009-2012. Further interesting points to be noted were that personal competences, such as “capacity for continuous learning, flexibility, fostering change and the capacity to work independently” (Raju, 2014, p. 165), but even more importantly generic skills, “such as communication and interpersonal skills, critical thinking, problem solving and teamwork” (Raju, 2014, p. 165) were considered just as important as disciplinary skills. All in all, Raju (2014) pointed out, LIS professionals working within institutions which incorporated digital services and content “need to embrace a blend of discipline-specific knowledge, generic skills and personal competencies” (p. 165).

Orme (2008), in her analysis of job advertisements with the aim of pinpointing the most sought-after skills employers looked for in librarian candidates, made an important point by highlighting the fact that unless specifically advertising a post for a digital librarian, many job advertisements often considered IT-skills,
amongst which digital competences are counted, as one of the categories of *generic skills*, side by side with personal skills or management skills. IT-skills, she noted, were not considered the most relevant category by the recruiting ads analysed in the course of her research: they ranked third place, appearing only 63 times in a total sample of 180 advertisements, after personal skills and management skills.

Nonthacumjane (2011), however, had detected that there existed notable changes in the requirements deemed necessary to absolve the daily tasks of a librarian once projected in the ‘digital age’. In her comprehensive research analysing literature that encompassed the competencies and the skills necessary for LIS professionals working in an increasingly digital environment, she highlighted that “collection development, content management, digital archiving and preservation represent areas of knowledge in which the new generation LIS professionals should be qualified” (Nonthacumjane, 2011, p. 286).

Croneis and Henderson (2002) analysed job announcements for positions of librarians in academic libraries over an eleven-year period and could highlight relevant new trends. Firstly, they could see an increase in the number of announcements specifically looking for an “electronic” or “digital” librarian professional. Secondly, they also detected a broadening in the functional areas involved in the profession (such as public services, technical services, systems, collection development, digital projects or preservation). Thirdly, they had noticed that a further variation in the typology of institutions placing advertisements had also emerged, as did a clear distinction between “electronic” and “digital” positions, specified in the title of the job ad. Ultimately, their analysis led them to conclude that “these changes might be explained, in part, by a combination of factors such as technological advances in information access and delivery, rising user expectations, and libraries’ efforts to meet those demands” (Croneis & Henderson, 2002, p. 234).

As Howard (2010) would expand on later, Thomas and Patel (2008) clearly mentioned the gap between theory and practice when it came to which competences a librarian was supposed to possess. Adding the digitisation of things on top of that, they argued, only aggravated the situation, as demand for digitally competent LIS professionals was on the rise, but no clear definitions of what was expected of such a new type of librarian were formulated. Fundamental points made in their essay had to do with the enormous variation between libraries of different institutions, which led to dissimilar digital expectations and goals amongst staff and management. Thomas and Patel (2008) further expanded the idea by adding that the lack of consensus within the professional sector translated into broadly varying LIS training programmes, which in turn produced professionals-to-be with mismatching skills that only contributed to aggravate the already uneven situation. In their research, Thomas and Patel (2008) had also to deal with the fact that the very nature of those libraries where digital services were offered were tangibly
differing. These inequalities were due to the fact that some of the institutions were exclusively digital and managed by organisations external to the analogue library, while others were embedded within the organisation but managed by a specialised sector of staff, and others yet made no distinction between virtual and physical collections, or between online or over-the-counter services, as they were trying to make sure that “the ‘digital’ aspects of the organisation are integrated seamlessly with the more traditional ‘library’ aspects” (Thomas & Patel, 2008, p. 301). To solve differences in standards when it comes to the competence of professionals working with digital aspects of library environments, the researchers suggested a Competency-Based Training method (CBT). This system would allow both educators, employers and working professionals to “create and refine training standards for specific types of work” (Thomas & Patel, 2008, p. 303), promoting better understanding between the different actors.

Shahbazi and Hedayati (2016) warned about the dangers of ignoring the wishes of the job market, inviting the LIS educational sector to increase their knowledge of the digital requirements asked of today’s librarians and to take advantage of IT-related opportunities in order to avoid them turning into threats for the professional workforce. In their analysis of 109 job advertisements, Shahbazi and Hedayati (2016) identified four categories of sought-after digital competences: Computer basics; Internet searching, Databases and Electronic Services/Resources; Website Designing and Management; Library Software and Computerised cataloguing. Relevant proficiencies were related to basic and advanced searching methods in databases and on the internet, as well as to information-seeking consultation through calls, email, chat or another digital medium. Other competences were linked to digital resources and collection development, managing digital dealers and suppliers, as well as interacting with basic concepts of computers and Windows operating systems. Interestingly, Shahbazi and Hedayati’s study (2016) also highlighted that some of the requirements appearing in the analysed job advertisements were indirectly related to digital competences or to the changes happening in an increasingly technological library and were therefore highly requested. Such requirements were “good communication skills, flexibility, and problem-solving abilities . . . They also need to have discipline, self-management, and time-management in order to succeed” (Shahbazi & Hedayati, 2016, p. 7).

The subtle difference between looking for competences instead of skills when hiring digitally competent librarians had already been observed by Tennant (1998; 1999). He warned library managers of the downsides of requiring specific skills (such as Java programming experience), given that such a strategy would need to entail not only the correct identification of specific skills important at that present moment, but also a high degree of prediction for future important skills, a hard-to-achieve feat in a highly evolving technological reality. He encouraged instead “to choose staff who can evolve as the needs of the organisation change” (Tennant, 1998, p. 102). He listed a
series of personality traits that management should seek in staff working in a digital library. He pointed to the capacity to learn constantly and quickly, flexibility and an innate scepticism, a propensity to take risks and an abiding of public service perspective, an appreciation of what others bring to the effort and an ability to work with them effectively, skills at enabling and fostering change as well as the capacity and desire to work independently (Tennant, 1998). Tennant justified the fact that no specific technological experience was charted in the list of desired traits by guaranteeing that librarians displaying “the traits outlined above will be able to pick up whatever skill or experience is deemed necessary . . . people like that will do well by you no matter what the new millennium holds for libraries – digital or otherwise” (Tennant, 1998, p. 102). In a following paper, (Tennant, 1999) he reiterated the idea that “no one likely will have all of the following skills and experience, nor will most employers require all of them” (Tennant, 1999, p. 39), but ensuring that the newly hired staff possessed the basic traits he listed (Tennant, 1998) would make sure that they would quickly pick up on the new digital competences required by digital libraries, such as managing imaging technologies and optical character recognition, using markup languages or cataloguing and metadata, as well as indexing and database technology, user interface design, programming, web technology and project management (Tennant, 1999).

It is important to note that, in the course of the present paper, personality traits as envisaged by Tennant (1998, 1999) were not taken into consideration during the analysis of either the job advertisements or the semi-structured interviews. Said choice was rooted in the fact that the latest, most updated version of the document delineating digital competences issued by the European Union, namely DigComp 2.1 (Carretero et al., 2017), did not include examples of knowledge skills and attitudes, but focused instead on “examples of use applied to the field of employment and learning due to their policy relevance” (Carretero et al., 2017, p. 10).

2.3 Professional view of digital competences: the librarians’ perspective

Andersdotter et al. (2017) argued that, to successfully carry out the project Digitally First with focus on the User (Kungliga Biblioteket, 2016) which will further develop the role of Swedish public libraries as a support net for users and society in general when it comes to digital literacy, an assessment and development plan of the digital competences of librarians was needed. To support the National Library of Sweden in its work, Andersdotter et al. (2017) developed a self-diagnosis test specifically targeting those digital competences that are most inherent to the work of librarians. The basis for the test has been the European document DigComp 2.0 (Vuorikari et al., 2016). The authors do mention the publication of DigComp 2.1 in their work but recognise that the differences between these two versions of the documents did not influence their findings. Their research was strongly influenced by a previously produced
self-diagnosis test of digital competences for pedagogues developed by Norden, Mannila and Pears (2017). The test developed by Andersdotter et al. (2017) is structured in five blocks, one for each digital competence area, with a total of 24 statements about practical tasks that the user has to evaluate on a 7-steps scale, ranging from 1 – *I would not be able to do it at all* to 7 – *I would be able to do it without problems*. The included statements were selected from both the lowest and the highest proficiency levels, with the choice and relevance of the statements decided by the contributing professionals through a process of test and retest of the original prototype.

The test has been online and freely available from the beginning of 2018. Grenholm (2018) analysed the results from the answers reported between January and April 2018, stretch of time during which over 2000 librarians had answered, 42 per cent of the total Swedish librarian workforce. The test created had the primary goal of establishing the degree of confidence professional librarians felt when it came to digital competences, and therefore focused on more hypothetical aspects of digital competences amongst the librarian workforce than those present in this paper. Therefore, while the results of the analysis might not directly influence the present research, the structure of the self-diagnosis test produced by Andersdotter et al. (2017) was undoubtedly useful when it came to individuate the most relevant examples of practical uses of digital competences within a public library. Furthermore, the 24 statements that compose its questions have been used, in a modified version dedicated to changing the form of the statements, not their substance, as basis for the semi-structured interviews for the present paper.

### 2.3.1 Library 2.0 and Librarian 2.0

The idea of a Library 2.0, as its name suggests, is closely intertwined with the notion of Web 2.0. For the purpose of this essay, the general and basic notion of Web 2.0 as envisaged by Cullen (2008) will be adopted, which considers Web 2.0 as a “collection of various technologies and applications that spans the entire range of social networking” (p. 55).

Broady-Preston (2009) defined Library 2.0 as the result of applying technologies and philosophy of Web 2.0 to a library’s collections and services. Maness (2006) further detailed this notion by specifying that the technologies deployed in a Library 2.0 are “interactive, collaborative and multi-media web-based” (paragraph 7). When it comes to the philosophical ground which an ideal Library 2.0 stood upon, Maness (2006) also mentioned the importance of having a “user-centred virtual community [and a] socially rich, often egalitarian electronic space” (paragraph 7). A further point strongly linking the idea of Library 2.0 to the needs of users was that made by Mashkoor Abidi (2015), who defined it as a library with services that are destined to meet those user needs that are directly “caused by the straight and tangential effects of Web 2.0” (p. 3).
Houghton (as cited in Connor, 2007, p. 6) focused on Library 2.0 as a notion of space, in its virtual as much as in its physical sense, and summed it as being “more interactive, collaborative, and driven by community needs”. Practical examples of her vision were the inclusion of collaborative projects such as photo sites, blogs and gaming nights for the younger users. The point stressed in Houghton’s understanding of Library 2.0 (as cited in Connor, 2007, p. 6) was that its aim was to “get people back into the library by making the library relevant to what they want and need in their daily lives . . . to make the library a destination and not an afterthought”. King, on the other hand (as cited in Connor, 2007) saw Library 2.0 as a focal point for technology. He warned, however, that the library patrons’ welfare came first, implying that the technology deployed there should serve the interests and needs of the users, and not exist for the sake of it alone: “our patrons are using web 2.0 services. They are using cell phones. They are gaming, IM’ing, chatting. They are consuming digital content. And we as libraries need to be there, if we want to meet and greet our patrons” (King, as cited in Connor, 2007, p. 7).

Cullen (2008) reflected upon the notion of Library 2.0’s pros and cons. He warned about the risk of a library so focused on technology to make it “look cool and progressive” (p. 56) that it forgets its main mission, namely that of helping users to learn and develop in an independent manner. But he also encouraged institutions to embrace the changes brought upon by technological advancements and adopt a Web 2.0 ‘mindset’, creating a library that reinvents and pitches itself to the public as an active and updated knowledge-sharing core.

When it comes to understanding the figure of a librarian 2.0, an important point was made of the shift from the role of the professional as knowledge-holder to knowledge-facilitator. Maness (2006) reiterated that the move to a Library 2.0 had turned the librarian to a reference figure for users to find support and guidance in their information-seeking quests and no longer as a dispenser/producer of knowledge, working in collaboration with the users themselves to create resources and content. This shift in role had also been picked up by Anderson (2007), who incited librarians to maintain their role as collectors and preservers of knowledge, but also to expand their part as providers of user-centred services, a task that could prove challenging when considering the issues of legal and privacy nature linked to Web 2.0. Anderson (2007) further incited librarians to take a more active role as developing force to bring about the creation of new technologies dedicated to library and information services.

Huvila et al. (2013) touched upon a sensitive issue when investigating how the professionals themselves saw this new role they had been assigned in a Library 2.0 environment. A fundamental point that emerged from their research were the high expectations associated with the figure of a 2.0 Librarian, as adjectives such as internet competent, interactive, up-to-date, producer and virtual were amongst the most cited. The feeling amongst the interviewed professionals,
Huvila et al. (2013) reported, was that the 2.0 role was not considered challenging by all, but moderately intimidating, insecurities that were mostly linked to the presence and usage of ICTs.

The concept of Library 2.0, while not being the only one linking libraries to the digital sphere, was deemed as the most appropriate and useful to be included in this paper: observing the characteristics on which the concept of Library 2.0 rested and matching them to the characteristics of today’s average library, it is possible to see that what was considered the future of libraries around the 2000s is today a common professional reality, at least in a Swedish context. A modern librarian is supposed to handle social and digital media in order to distribute information in as many formats as possible (Vanwynsbergh, Vanderlinde, Georges, & Verdegem, 2015) and digital tools have proved to be effective ways to empower the professional librarians in their practice, as remarked by Oyieke and Dick (2017), who noted that Web 2.0 tools could “transform knowledge-sharing activities, augment existing authoritative information service, foster interaction with patrons and colleagues and market information products and services” (p. 278) and that an empowered librarian “should use Web 2.0 tools to strengthen their epistemological, ontological, descriptive, exploitative and communicative power to provide effective e-services” (Oyieke & Dick, 2017, p. 278). Lamba (2019) reinforced this idea by observing that “today’s libraries have become increasingly multi-disciplinary, collaborative and networked” (p. 155) and that applying Web 2.0 tools to libraries would “not only connect the users with their community and enhance communication but will also help the librarians to promote their library’s activities, services, and products to target both their actual and potential users” (p. 166). Librarians themselves had changed their mind as to what their professional identity entailed, according to Ghuloum and Buabbas (2016), who found that librarians who saw themselves as being ‘2.0’ gave greater attention and importance to technology rather than factors such as education, learning, personality traits or communication skills. Interestingly, Partridge, Lee and Munro (2010), had previously highlighted that a Librarian 2.0 was “less to do with technology and more about quality transferable skills and interpersonal abilities” (p. 332), in strong contrast to Ghouloum and Buabbas’ (2016) findings.

2.4 Conceptual model

With a starting point in the theoretical and empirical ideas presented above, three main interplaying perspectives appeared as the prominent supporting base for the current research at hand:

- the overall framework for digital competences as envisaged by the academia and by institutions such as the European Council, which makes up the Competence Categories for the purpose of this paper;
- the formal digital competence requirements expressed by the professional sector and found in job advertisements, which in this paper will be called Competence Requirements;

- the digital competence requirements that professionals need in their daily practices, named as Competence Needs in the present research.

The interaction and mutual influence between these three dimensions has led to the development of a conceptual model that will be used to analyse the collected data and support a final discussion of the results. The model, which comprises the Competence Categories, the Competence Requirements and the Competence Needs, is both a guide to analyse the datasets and an embodiment of the data itself, and after having performed the final analysis of the datasets, the conceptual model proposed will be revisited and, if needed, altered to fit more appropriately with the final findings and to serve possible future studies of the same field.

### 2.4.1 Competence Categories

They refer here to the theoretical, descriptive categorisation of digital competences as provided by the European Union in the document *DigComp 2.1* (Carretero et al., 2017). The document contains a detailed list of the five digital competence areas and of the 21 digital competences displayed across eight proficiency profiles. For the purpose of this paper, a condensed summary of the salient points found across the eight proficiency levels of each digital competence was used to categorise the data obtained from both the job advertisements and the semi-structured interviews. While the document issued by the European Union offers some practical examples of situations in which the user must be able to deploy a certain digital competence, both in a professional and private environment, not all eight proficiency levels were accompanied by illustrations of this kind. The Competence Categories are, first and foremost, idealised, conceptual descriptions of the 21 different competences deemed relevant for any 21st century citizen to possess. The Competence Categories influence both the Competence Requirements and the Competence Needs. A brief description of each Competence Category as described in *DigComp 2.1* is included in Table 1.

#### Table 1

**Descriptions of Competence Categories**

<table>
<thead>
<tr>
<th>Competence Area</th>
<th>Competence Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Information and data literacy</td>
<td>1.1</td>
<td>Browsing, searching, filtering data, information and digital content</td>
</tr>
<tr>
<td>Section</td>
<td>Topic</td>
<td>Subtopic</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>1.2</td>
<td>Evaluating data, information and digital content</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Managing data, information and digital content</td>
<td></td>
</tr>
<tr>
<td>2: Communication and collaboration</td>
<td>2.1</td>
<td>Interacting through digital technologies</td>
</tr>
<tr>
<td></td>
<td>2.2</td>
<td>Sharing through digital technologies</td>
</tr>
<tr>
<td></td>
<td>2.3</td>
<td>Engaging in citizenship through digital technologies</td>
</tr>
<tr>
<td></td>
<td>2.4</td>
<td>Collaborating through digital technologies</td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>Netiquette</td>
</tr>
<tr>
<td></td>
<td>2.6</td>
<td>Managing digital identity</td>
</tr>
<tr>
<td>3: Digital content creation</td>
<td>3.1</td>
<td>Developing digital content</td>
</tr>
<tr>
<td></td>
<td>3.2</td>
<td>Integrating and re-elaborating digital content</td>
</tr>
<tr>
<td></td>
<td>3.3</td>
<td>Copyright and licenses</td>
</tr>
<tr>
<td></td>
<td>3.4</td>
<td>Programming</td>
</tr>
<tr>
<td>4: Safety</td>
<td>4.1</td>
<td>Protecting devices</td>
</tr>
<tr>
<td></td>
<td>4.2</td>
<td>Protecting personal data and privacy</td>
</tr>
<tr>
<td></td>
<td>4.3</td>
<td>Protecting health and well-being</td>
</tr>
<tr>
<td></td>
<td>4.4</td>
<td>Protecting the environment</td>
</tr>
<tr>
<td>5: Problem solving</td>
<td>5.1</td>
<td>Solving technical problems</td>
</tr>
<tr>
<td></td>
<td>5.2</td>
<td>Identifying needs and technological responses</td>
</tr>
<tr>
<td></td>
<td>5.3</td>
<td>Creatively using digital technologies</td>
</tr>
</tbody>
</table>
The complete description of the individual categories, together with examples from the collected data are presented in Appendix A.

### 2.4.2 Competence Needs

In the course of this paper, the competence needs are considered to be the digital competences that librarians themselves express as necessary to perform their daily work. They will be obtained by matching relevant elements in the discourse of the interviewed librarians with the items present within the Competence Categories. Digital competences, as seen in the Literature review section presented earlier, have been playing an increasingly important role in the public library sector. LIS professionals have needed to adapt to a constantly evolving working environment, having to offer increasingly complex and technologically challenging services to their users. Consequently, their own skills and professional competence have needed to evolve, as seen by the fulfilment of concepts such as those of Library 2.0, once a futuristic vision, today a common reality for many institutions. The Competence Needs both influence, and are influenced by, the Competence Requirements.

### 2.4.3 Competence Requirements

In the case of the present paper, competence requirements will be considered those phrases and formulas that constitute formal requirements of digital competences as presented in the analysed job advertisements. These are understood as being activities and skills closely dependent from the 21 digital competences presented as the Competence Categories. Inevitably, as library users require help with increasingly advanced digital and technological questions that forced a change in the figure of the librarian, market forces have long since been including digital competences amongst the required and sought-after skills when advertising for LIS professional positions. This dimension of competence has consequently been included as a key viewpoint in the conceptual model. The Competence Requirements are also an influencing dimension on, as much as they are influenced by, the Competence Needs.

### 2.4.4 Mutual influence

The three main viewpoints of the model which guides the present analysis are tightly connected in a mutually influencing representation. Thus, the Competence Categories represent a supra-level that affects both the Competence Needs and the Competence Requirements. Given the importance that digital competences play in the ambit of Swedish public libraries as a result of the national digitisation strategy *Digitally First with Focus on the*
User (Kungliga Biblioteket, 2016), changes in the Competence Categories will also imply alterations in the types of digital competences needed by the professionals in their daily practice (Competence Needs) and on the formal requirements issued by the employment market (Competence Requirements).

While some of the digital competences might be formally decided beforehand by the managerial sector of public libraries and presented as must-haves to the professionals to perform daily task routines, there must exist a dialogue between the LIS experts working in the library and their administrative team. Said dialogue would help the library management to identify possible gaps in digital and technological knowledge amongst the employees, leading in turn to pinpointed activities or events aiming to expand the existing competences.

As a general note, it is important to highlight that all three concepts presented above, Competence Categories, Competence Needs and Competence Requirements are originally multidimensional in their original state, as they include other variables aside from the strict applications of digital competences. The initial document issued by the European Union describing the single digital competences, for example (Ferrari, Punie, & Brečko, 2013), included not only the necessary capacities needed to perform practical tasks involving digital competences, but also “knowledge, skills and attitudes applicable to each competence” (Carretero et al., 2017, p. 10). Although considered an interesting additional dimension to the data analysis, and although included by previous research in the study of job advertisements for LIS positions, the focus of this paper will rest exclusively on the practical knowledge linked to each digital competence, forgoing behavioural requirements as they were considered to be “incontrollable variables…resistant to comparative analysis” (Harper, 2012, p. 31), and especially so when triangulating data from very different datasets such as those deployed in the present paper (job advertisements and semi-structured interviews).

3 Method

The study’s aim and research questions will be met through the following methodological construction in three stages. Firstly, to obtain relevant datasets from job announcements advertising for librarian posts in public libraries. Secondly, to obtain relevant data through semi-structured interviews with librarians already employed in public libraries. Lastly, to analyse both sets of data, with the help of the conceptual model, attempting to pinpoint the main digital competences required by public librarians in their daily practice.

The present section illustrates the chosen mixed-method research strategy to collect and analyse the data used in this study, which relies on a combination of content analysis of job advertisements and semi-structured interviews with staff currently employed in Swedish public libraries. Said research strategy has been selected to add depth and validity to the results through triangulation, as Bryman (2016) suggested that even if very different in nature, two datasets can
be used complementarily, as results from one can be cross-checked and corroborated by the results of the other.

Choemprayong and Wildemuth (2017) defined methodological triangulation, chosen for the course of this paper, as the act of combining data obtained through different methods, a research strategy that, like other approaches of triangulation, serves the purpose of clarifying the meaning of the research using multiple perspectives. On the same topic, Fidel (2008) further expanded the strengths of a mixed-method research based on methodological triangulation by saying that it allows researchers to “address issues more widely and more completely than one method could, which in turn amplifies the richness and complexity of the research findings” (p. 266) and that it promotes more flexibility in the research process, which in turn might lead to insights the researcher might have overlooked if using only a single method (Fidel, 2008).

Harper (2012), after reviewing countless research methodologies dedicated to the collection and analysis of job advertisements within the LIS sector, noted that most studies of job adverts did not use any complementary methods, but that semi-structured interviews could provide an extra dimension to the results as well as ensuring the credibility of the study by drawing on multiple data sources. Moreover, as Harper (2012) highlighted, relying solely on the analysis of job advertisements might not offer a complete picture of the job’s true nature “as it is perceived and experienced by LIS professionals” (Harper, 2012, p. 45), remarking on the need for investigating wider ranges of perceptions and experiences.

Raju (2014) also presented the benefits of triangulating the results of content analysis performed on job advertisements using semi-structured interviews with purposely selected library professionals to gain a wider perspective, and a more accurate picture, of the key skills and knowledge base that professionals of the LIS sector require.

It is important to highlight that although a first analysis of the two datasets was carried out considering each section separately to allow the researcher to get an overall grasp of the content, a final analytical stage took into consideration both datasets simultaneously, using each individual Competence Category as guideline to find relevant connections within the advertisements’ dataset and in the content of the semi-structured interviews.

The obtained datasets from both the job advertisements collection and the semi-structured interview were originally in Swedish and have been translated by the author herself. There exist risks and limitations in such decision, given that “language differences generate additional challenges that might hinder the transfer of meaning and might result in loss of meaning and thus loss of validity” (Nes, Abma, Jonsson, & Deeg, 2010, p. 314). However, to prevent the loss or addition of meaning during the translations, great care has been taken to
follow the suggestions made by Fersch (2013) when dealing with data in another language than that of the research paper, avoiding adding linguistical implications and denotations to the original content dictated by the researcher’s own language. The type of data collected presented an advantage point in itself, as it lacked metaphorical references or figurative connotations and referred to professional topics that could be easily and objectively translated between languages.

3.1 Job advertisements

To gain insight in the Competence Requirements issued by the employment’s market, a content analysis of job advertisements was performed. Details on how the sampling, the data categorisation and analysis have been carried out is presented in the following sections.

3.1.1 Sampling

A total of 64 job advertisements were analysed in the course of this research. The forum chosen for the selection of samples was the Swedish Public Employment Service’s own website and job portal, Platsbanken. This sampling frame was selected given its historical importance as the major, publicly funded, job advertisement forum within Swedish territories, as well as due to the specific Swedish law that requires new employment positions to be advertised on the Public Employment Service’s site, in most cases (Lag om offentlig upphandling, SFS 2016:1145).

The selection process was carried out following purposive sampling, as Bryman (2016) envisaged it. This was done so that the selected cases to be included would be strategically chosen, in order for them to be relevant to the research questions formulated in the present paper. The approach of the sampling was criterion-based, where the criteria for the sampling were all established at the outset of the data collection, and remained the same throughout the process, making it an a priori sampling approach. All the job advertisements to be included in the analysis had to adhere to the following criteria:

- the job advertisements had to be present and active at the day of selection on the Swedish Public Employment Service’s website;
- they had to advertise a post based within Swedish territories;
- the post advertised was to be for a Librarian position in a public library;
- the announced position could be either a permanent or temporary placement;
- the required educational background had to be pertinent to the subject of Library and Information Science.

Other professional profiles such as *Library Assistant*, *School Librarian* or *Archivist* were not considered, as they might bring other variables into play in aspects such as the required professional background or the educational profile. If the same position was advertised twice, and if it maintained the same characteristics, it would only be considered as a single entity for the purpose of the analysis. Harper (2012) found that the majority of the studies focusing on analysing job advertisements for the LIS sector worked on samples of between 1 and 199 elements. In the present research, the final sampling size was attained at 64 when, according to the principle of theoretical saturation (Glaser & Strauss, 1967), no additional data would be found even if continuing examining samples from the sample frame. The length of the sampling period in itself was not judged relevant, given that this study was not aiming to be a longitudinal comparison of active job advertisements against historical ones. Regular visits to the website *Platsbanken* were made, however, in order to collect data over a final period of three months, between January and March 2019.

### 3.1.2 Data categorisation and analysis

Quantitative and qualitative methods were used to analyse the data, as Ocholla and Shongwe (2013) and Raju (2014) had done in their own, similar studies. Content analysis, “a systematic technique of segmenting data into describable linguistic units” (Harper, 2012), has been the method of choice in several studies that focused on the analysis of job advertisements, such as in the case of Shahbhazi (2016), Croneis and Henderson (2002), Heimer (2002) or Orme (2008). In the case of the present research, the freedom granted by qualitative content analysis was needed specifically to enable the categorisation of data from the job advertisements according to categories that corresponded to the digital competences present in *DigComp 2.1*. Even though researchers such as Krippendorff (2004) reject the distinction between quantitative and qualitative content analysis, putting forward the argument that “all reading of texts is qualitative, even when certain characteristics of a text are later converted into numbers” (p. 15), the characteristics inherent to the data analysis at hand showed clear common traits with what Krippendorff (2004) defined as *content analysis with a qualitative approach*, due to the fact that it presented characteristics that the author labelled as pertaining to the ‘interpretive’ analysis class (Krippendorff, 2004).

The analysis adopted in this paper followed an inductive approach, as presented by Elo and Kyngnäs (2008), who highlighted that in this type of method the data moves from specific to general, and that categories are derived from the data. Bryman (2016) expanded on a similar notion, pointing out that a qualitative, inductive approach to content analysis entailed the observational methods typical of quantitative content analysis, with the freedom to
extrapolate the categories necessary for analysis from the dataset itself, providing a contextual environment to identify the relevance of the items found. Harper (2012) further supported content analysis of job advertisements due to the naturalistic and organic nature of the data involved, as well as for being a method that could bring upon long-term changes in the LIS professional sector thanks to its measurable and easily comparable set of analysed data. The description of qualitative content analysis offered by Zhang and Wildemuth (2017) further supports the application of this method for the present research paper, as rather than focusing on the occurrence frequency of concepts or items, qualitative analysis of content observes the bigger picture, by paying attention to the full range of possible meanings of a given phenomenon. Amongst the drawbacks of this method, however, Harper (2012) warns about the ambiguity of job adverts’ very nature, which makes for a complex and challenging analytical and coding process. The same author also highlighted that “job adverts may be written to reflect a desired future state, rather than a current reality” (Harper, 2012 p. 31).

The analysis rested on the notions illustrated in the conceptual model, as the items found in both the job advertisements’ dataset (Competence Requirements) and within the semi-structured interviews (Competence Needs) were matched against the digital competences featured in the macro-category englobing them all (Competence Categories). The coding was carried out manually, through a process of reading and extracting key content from the job advertisements. The job advertisements were numbered individually, the excerpt of text in which requirements, activities, skills or knowledge useful to the advertised position were made explicit was extracted and included in the analysis table. The content of the excerpts was later analysed, and the various elements classified as pertaining to one, or several, digital competence areas. The different items found were first grouped under five categories, each corresponding to a digital competence area, and were further detailed according to the single digital competences they were linked to (with a total of 21 possibilities). Categorisation of the items found within the job advertisements was based on the interpretation and application of the digital competences fitted within the Competence Categories to the descriptions of tasks to be performed, skills or experiences needed made explicit in the advertisements. Items could be labelled as pertaining to multiple areas of Competence Categories. Following these criteria, for example, a position demanding someone who “can work with the Arena web interface, has good command of In-design, Photoshop and can use social media for marketing purposes” [excerpts and references originating from the datasets are translated from Swedish to English] has been categorised as requiring the following competences:

1.1 Browsing, searching, filtering data, information and digital content

1.2 Evaluating data, information and digital content
1.3 Managing data, information and digital content

2.1 Interacting through digital technologies

2.2 Sharing through digital technologies

2.3 Engaging in citizenship through digital technologies

2.4 Collaborating through digital technologies

2.5 Netiquette

2.6 Managing digital identity

3.1 Developing digital content

3.2 Integrating and re-elaborating digital content

3.3 Copyright and licenses

3.4 Programming

4.1 Protecting devices

4.2 Protecting personal data and privacy

5.1 Solving technical problems

5.2 Identifying needs and technological responses

5.3 Creatively using digital technologies

These were not necessarily the only digital competences deemed relevant within the frame of the exemplified positions, but they were the only ones that could be explicitly linked to the activities and tasks to be performed included in the advertisements and were therefore the only ones considered and categorised. Phrases and elements linked to personality traits or personal skills, such as ‘you should show interest for new technologies’ or ‘you have a passion for IT-solutions’ were not included in the analysis, as they do not refer to tangible digital competences but to general, holistic personality and character traits that, although interesting to analyse, were not the focus of the present paper. No categorisation of the proficiency levels assigned to each item was done, as it would have been possible to do so only if presented with further details about the single specific tasks included in the advertisements by the different libraries.

Examples of which items from the job advertisements were matched against which digital competence can be found as Appendix A, which also includes examples from the formal descriptions of digital competences (Competence Categories) as well as examples from the items found within the semi-
structured interviews (Competence Needs). The complete table used for analysis can be found as Appendix D.

3.2 Semi-structured interviews

To collect the data necessary for the understanding of the Competence Needs, interviews with LIS professionals were scheduled and performed. The criteria used for the sampling and the execution of the interviews, as well as for the categorisation and analysis of the data are reported in the following sections.

3.2.1 Sampling

Bryman (2016) described critical case sampling as the ideal method to achieve logical inferences about the studied phenomenon, as Patton (1990) had also previously stated, as “critical cases are those that can make a point quite dramatically or are, for some reason, particularly important in the scheme of things” (Patton, 1990 p. 174). The sampling frame for the semi-structured interviews were the public libraries within the area of Malmö. Out of the thirteen public libraries available, and through the choice of using critical case sampling, two were selected for the interviews, both being ‘area libraries’ (områdesbibliotek). Due to the limited size of one of the libraries, and to safeguard anonymity of the interviewees, ‘Library A’ and ‘Library B’ will be used throughout this paper instead of the actual names of the institutions. The two chosen libraries were selected due to their representativeness of two opposite poles of public libraries in size, user population and socio-geographical placement. The five professionals selected for the interviews were chosen to offer as wide a sample selection as possible, and ultimately included librarians with ages varying between 28 and 63, with different positions within their respective institutions – one children’s librarian; two librarians with focus on digital technologies and two adult librarians. This was done in order to avoid possible pitfalls of biased results produced by homogeneity in the sample selection.

3.2.2 The interviews

The interviews were performed within the libraries where the individual professionals worked and lasted an average of 30 minutes each. An interview guide was adopted to lead the consultations.

The interview guide implemented for the present research opened with a list of statements that described practical examples of digital competences in use within the context of a library. The statements used were the same as those adopted as questions in the self-diagnostic test for professional librarians created by Andersdotter et al. (2017). However, while in the case of Andersdotter et al. (2017) the statements were meant to receive a graded answer (such as 1 - I would not be able to do it at all to 7 - I would be able to do it without problems), in the case of the paper at hand, the interviewees were
asked to acknowledge any of the tasks included on the list that they might perform as part of their daily work or might have performed in the course of the previous year. This questionnaire was placed at the beginning of the interview for several reasons: first and foremost, it would give the interviewees practical examples of what was meant by digital competences in the course of the interview, so as to create a common ground of understanding on which further questions could be posed. Secondly, the answers to the questionnaire gave a clear picture of the practical activities linked to digital competences that the librarians had to perform. In itself, however, the questionnaire on practical examples of digital competences would not offer an exhaustive understanding of the digital competences needed by professionals in their daily work, as some situations that might indirectly require the deployment of digital competences might be specifically linked to the individual library the interviewee worked for, or might have more to do with staff-related activities, aspect which the questionnaire did not really focus on. Furthermore, the statements from the questionnaire sampled activities linked to different proficiency levels of digital categories, which might entail difficulties for the interviewed professionals to apply the examples to their daily practice. Luo and Wildemuth (2017) reminded of the importance of ranking the interview questions in order to obtain the desired results. Even though of a much freer nature than structured interviews, even semi-structured interviews must present a general structure to keep the researcher on track. Bryman (2016) also prompted the liberty which semi-structured interviews allow, describing them as a context of data collection which grants the interviewer a broad range of movement, as the interview is led by a pre-composed interview guide destined to cover the major points of interests, but where the questions order, or content, can be changed during the course of the interview. The author also highlighted the more generalised nature of the questions used in semi-structured interviews, which helps lead the interviewees to add further details that might prove invaluable to the researcher and which could not be foreseen a priori. Bryman (2016) also suggested that the method of recording interviews for later transcription, instead of taking notes during the actual interview, allows the researcher to pay closer attention to the formulated content during the interview itself, allowing time and thought for follow-up questions if needed. All these points proved to be vital in the sampling of interviews for the present paper, as the freedom to pose follow-up questions to the professionals offered special insights in matters that would not have otherwise surfaced, given that they were linked specifically with the individual librarian’s experience, or to the single library where they worked.

The interviews were recorded to be later transcribed in a summarised version and analysed. The recorded audio files were transcribed in their concentrated form, omitting sounds, gestures or phrase fillers as they were not deemed relevant for the analysis at hand. The interview guide in its entirety can be found as Appendix B.
3.2.3 Data categorisation and analysis

Data analysis was carried out with the guidance of the conceptual model derived from the literature presented above. For the sake of consistency, a constant comparative method as proposed by Charmaz (2014) and applied to the existing coding categories was used when analysing the content of semi-structured interviews. Although mostly applied to Grounded Theory, this method proved to be functional for the present research also, as it allowed a simultaneous categorisation and analysis of the content into the pre-existing coding blocks that make up the Competence Categories, combined with a constant cross-check with items previously analysed and categorised under the same label. The process allowed the researcher to refine the analysis as it went along, sometimes by categorizing objects more accurately as new insights into the content were offered by successive items.

Both in the case of the job advertisements and in the semi-structured interviews, the coding system was tested on a sample of the data first, inaccuracies revised and improvements to the consistency of coding scheme applied. A first test of the created analysis system was run on the dataset of the job advertisements, during which clear groupings of specific activities emerged as reoccurring in many elements. The classification system connecting the Competence Categories to the individual Competence Requirements was then revised to ensure uniformity, through the consistent assignation of the same set of digital competences to the same items found within the job advertisements, such as social media, digital tools, web page maintenance, IT-tutoring, IT-skills or digital storytelling.

3.3 Limitations associated with the study

A first ostensible limitation is derived from the different ranges of the datasets, as the sampled job advertisements to be analysed were collected nationwide, while the semi-structured interviews were concentrated in the area of the city of Malmö alone. The number of items to be analysed might represent a further limitation, as a total of 64 job advertisements were analysed, but only five interviews were performed.

The topic of part of the analysis could also provide hazards to representativeness. As highlighted by Harper (2012), analysing job advertisements might entail risks associated with the heterogeneity of content formulations, meaning that the performed study analyses the advertisers’ ‘language and writing skills’ rather than the key content they intended to convey.

A further limitation associated with language is produced by the necessity of the researcher to translate the collected data from Swedish to English. The translations presented in the paper aimed at accurately reporting the content analysed, rather than focusing on issues of form. Therefore, care should be
taken no to lay excessive emphasis on the adopted wording choices, but on their substance instead.

### 3.4 Ethical considerations

No specific ethical considerations were taken into account when analysing the job advertisements published by the different libraries, given that the material published on the Swedish Public Employment Service’s website is considered to be covered by the Public Access to Information and Secrecy Act (Offentlighets- och sekretesslag, SFS: 2009:400) and is therefore available to all, if within a limited period of time. In the interest of complying with a general ethical conduct, however, names of the employers have been omitted.

When it came to the semi-structured interviews, however, no data of a personal nature has been collected and measures have been taken to pseudonymise as much as possible the interviewees through the use of codes for both the sampled libraries (*Library A* and *Library B*), as well as for the librarians themselves (*A1, A2, B1, B2, B3*). The informants have been made aware of the fact that they were being recorded and that the conversations would be transcribed for analytical purposes. Each participant was informed about the general topic of the research and was made to read and sign a consent form (Appendix C).
4 Results and analysis

The empirical data reported and analysed in this chapter refers to the combination of both the job advertisements and the content from the semi-structured interviews. As previously noted earlier in the paper, no specific ethical considerations were linked to the collection and analysis of the advertisements that would require a high degree of anonymisation. For the sake of clarity during the analytical and organisational process, however, they were individually numbered (1-64) and collected in the chart included as Appendix D. The content of the interviews, on the other hand, has been coded to pseudonymise the interviewees, as noted earlier in the paper.

While differing tangibly in both form and content, the data obtained through the content analysis of job advertisements and through the semi-structured interviews has been reported here and analysed simultaneously. This choice has been dictated by the wish to triangulate findings through the complementary nature that the two datasets present, something that has been made possible by using the conceptual model presented earlier in this paper as middle ground between the otherwise independent results. Referring to the macro-level of Competence Categories, the content of both the job advertisements (Competence Requirements) and the semi-structured interviews (Competence Needs) could be analysed according to a common scale.

General details about the libraries in which the interviewed professionals work are displayed below, followed by overall facts that emerged during the analysis of the job advertisements and were deemed relevant for the complete analytical process. Detailed scrutiny of the data has been grouped and displayed in this section according to the digital competence area they referred to (Competence Areas 1-5) for easier examination.

Library A

Library A opened in 2016 and is situated in an increasingly expanding area. The average annual income for this area lies above 270,000 kronor, over 66 per cent of the residents between the age of 20 and 64 have a higher educational degree and the employment rate of the area is of 75.3 per cent (Stadskontoret, Malmö Stad, 2019). At the moment of the interview, the library had permanently employed three librarians, two of which agreed to being interviewed, and has an average of 20 staffed opening hours. One computer is permanently available to users during opening hours, as well as one copying/scanning machine, one self-check-out machine and free Wi-Fi. The library had an average of 70 visitors per day.

Librarian A1 is the IT-ambassador of Library A and focuses on adults. Librarian A2 is a children’s librarian. Both have worked in Library A since its opening in 2016.
**Library B**

Library B opened in 1970 and is situated in a densely populated area. The average annual income for this area is of 99,120 kronor, with an employment rate of 41.7 per cent and where 23.7 per cent of the population between 20 and 64 has a higher educational degree (Stadskontoret, Malmö Stad, 2019). The library has 10 permanently appointed librarians, an average of 41 staffed opening hours and around 750 visitors per day. A total of 13 computers, one copying/scanning machine, four scanners and one self-check-out machine are available, as well as free Wi-Fi.

Librarian B1 focuses on adults and has worked in Library B since 2014. Librarian B2, focusing on accessible media, retires at the end of 2019 and has worked in Library B for the previous 30 years. Librarian B3 is the IT-ambassador of Library B, focuses on adults and has worked there since 2015.

**Job advertisements**

Out of a total of 64 analysed job advertisements, 36 per cent of them (23) presented no specification related to digital competences. Within these 23, 15 of them were announcements for permanent positions and 8 were temporary. Of the 41 positions that did specify the need for digital competences, 75 per cent of them were offering permanent positions (31).

A 26 per cent of the total (17 positions) required competences or experience within specific programs such as InDesign, Photoshop or Arena and they were also the ones that clearly included terms such as *digital competence, digital knowledge* or *IT-skills*. Of the total, only 6 per cent (4 positions) included a reference to technological or digital specification in the ad title, such as *digital development* or *new technologies*.

A total of 6 job advertisements focused on children and young readers, out of which only 3 explicitly required any digital competences.

It can also be noticed that, when activities connected with digital competences were mentioned in the advertisements, and according to the classification system adopted in this analysis, all the competence areas were generally activated (areas 1 to 5), with very few advertisements involving only selected competence areas (7 advertisements out of 64).

Job advertisements that explicitly required ‘good IT-skills’, ‘IT-competence’, ‘digital competence’ or equivalent expressions were also considered as demanding *all* the skills and expertise, at least in their most basic level, included in the five competence areas. A few examples of the job advertisements’ classification numbers were included beside their description in the course of the analysis for reference purposes.
4.1 Competence area 1: information and data literacy

This specific competence category is characterised by the ability to browse, search, filter, evaluate and manage data and digital content. The competences included in this area could be found in 36 out of the 64 analysed job advertisements.

The activities related to the digital competences of this group asked for broadly ranging requirements. Some were linked to researching information within the library’s catalogues (job ads 6, 33, 34) with formulations such as:

you will be part of the library’s ongoing work which entails, amongst other things, extensive database searches. (Ad 34)

Others focused on helping users in their information-seeking queries (22, 28, 32, 37, 39), expressed in terms such as:

(the job) entails tutoring tasks in information searches. (Ad 28)

Within this category was also included the responsibility area for keeping updated on, and selecting, new digital materials for the library’s collection (5, 17, 33, 64):

you will be responsible for the acquisition of adult, nonfictional items, both in physical and digital formats. (Ad 64)

Furthermore, included was also the supervision of work tasks related to Media Literacy, MIK in its Swedish abbreviation (32, 42, 54, 64), with formulations such as:

we require that you have knowledge and interest in media and information literacy/digital competence. (Ad 42)

The same went for tutoring users and personnel in IT-related questions (5, 17, 64), as for example in the case of:

you will be working with IT-tutoring and other related tasks. (Ad 17)

The semi-structured interviews highlighted similar priorities, as all the participating librarians clearly mentioned helping the users access the library’s resources and information databases as their top priority, independently of the format of the resources. The results of the questionnaire presented to the interviewees during the meetings endorsed this. Five out of five librarians ticked the boxes referring to this first competence, as all concurred in using search engines to find certain types of information such as photos, videos and maps (digital competence 1.1). Four out of five critically evaluated digital content to establish its truthfulness (1.2) and all of them saved and organised
digital content to retrieve it later on (1.3). Only one out of five librarians said they had had to explain the meaning of filter bubble in the course of their previous year, which refers to the digital competence 1.2, ‘evaluating data, information and digital content’.

This particular area of media literacy (1.2), and its absence from everyday situations in the libraries analysed, was picked up by many of the interviewed librarians. Interviewee A1 referred to this type of question as being:

more philosophical and reflective, not happening in smaller libraries. (A1)

Interviewee B3 added that, even though he had participated in workshops and courses on the topic, he had never had to tackle the issue with users coming to the library and he saw it as something that would happen in research or university libraries rather than public ones. Library B had discussed the possibility of organizing activities and workshops to guide users in information evaluation, given that:

many of our users do not seem to possess the knowledge to determine the reliability of an information source. (B3)

However, as the same interviewee pointed out, the idea had been abandoned due first and foremost to the specifics of the user population of the library, but also due to the fact that most of the queries performed at library B had to do with authorities and governmental institutions such as banks or migration offices, deemed as reliable by both the professionals and the users. Librarian A2 also mentioned the topic of information evaluation, as she wished for more relevant activities that had to do with information assessment to be organised at the library, since she imagined that:

many would want to have such knowledge, both users and librarians. (A2)

Librarian B1 also noted that there were courses available on information evaluation to which the employees participated in turns, sharing the acquired knowledge with the others, even though this was more for internal and professional use. Librarian B2 further highlighted that there had been a surge in the need to apply information evaluation in her daily work, due to the incrementation in the number of programs . . . possibilities for critical thinking, how webpages are built and such. (B2)

and that information browsing and searching was a vital part of her daily work. This idea that information browsing, source evaluation and information filtering had become an intrinsic part of the modern librarian’s duties was made clear by several of the interviewees. Professional A1, for example, mentioned that in his view, ‘digital competence’ meant being able to work with, sieve
through and use synergistically the information and formats available online, something intrinsically linked to the nature of a librarian’s job.

A similar notion, on the importance of being able to find the right answer rather than knowing the answer to a specific query was picked up by several of the librarians since, as A1 said, finding information was a fundamental quality of any librarian and as interviewee B1 continued that while not all librarians needed to know how to perform all chores connected to the librarian work, they were expected to know where to find the relevant information about them.

All in all, the digital competences included in this first competence area (Information and data literacy) were deemed as most relevant for a LIS professional, given that they entailed expertise in activities such as searching for information and organizing results or digital items (competences 1.1 and 1.3). There appears to be a remarkable difference between which digital competences are needed in the librarians’ interaction with users and which are required when working independently, as competence 1.2 was deemed as all too theoretical to be interesting for users of a public library, but was described as stimulating, relevant and increasingly needed for professional use. In spite of previous attempts at organizing information evaluation activities amongst one of the library’s patrons, the specifics of the user population had deterred such initiative. Activities and workshops destined to expand this particular competence for internal use were organised, with the professionals participating in turns and spreading the acquired knowledge to the rest of the organisation.

4.2 Competence area 2: communication and collaboration

The second competence area focuses on interacting, sharing and collaborating through digital technologies, as well as engaging in citizenship with the help of digital tools, managing digital identities, knowing and using the appropriate netiquette.

Out of 64 analysed job advertisements, 34 included digital competences related to this area. They were generally linked to activities involving the representation of the library on diverse digital channels and forums (job ads 1, 3, 14, 50, 61), with recurring interest in social media, such as in the following case:

you have good IT-skills and knowledge about digital channels such as the Web and social media. (Ad 14)

Some of the libraries asked specifically for candidates with previous experience or knowledge of web page maintenance (11, 22, 37, 39, 59, work task also associated with the third competence area of digital content creation (3.1, 3.2), as in the following case:
you have solid IT-competences, good knowledge and understanding of the technologies behind web platforms, apps and more. (Ad 59)

From the questionnaires collected during the semi-structured interviews it also transpired that this second area included competences of extremely varying nature. This meant that, for instance, all the interviewed librarians agreed on having found and participated in forums and groups on the internet for specific interest areas (digital competence 2.1), and all of them had also used digital tools to work with others (2.4). Only three librarians, however, had shared personally produced digital content online (2.2) and as few as two had had to reflect on concepts such as ‘freedom of speech’ or on the limitations of the internet, with just as few having to manage and delete their digital footprints (2.6). None of the contacted professionals had had to face situations of ‘digital hatred’ either towards themselves or others on the library’s social media spaces or other online forums used in their professional daily routine (2.5).

The digital competences included in this area were met with differing opinions during the semi-structured interviews. There was a general conviction that the channels for communicating and collaborating with other libraries and professionals had changed remarkably over a short period of time, such as in the case of interviewee A2 who, having started her career as a librarian six years before, had noticed how administrative tasks such as statistics had previously needed to be in physical format, while

now we create Excel files, or different types of documents on the computer. (A2)

Further differences she had noticed had to do with the exchange of information amongst colleagues, which had taken an increasingly digital form, with

several shared documents such as GoogleDocs, Sharepoint or other forum where we collect information. We have more digital meeting points. (A2)

Librarian B2, who had started working thirty years previously and had therefore experienced the digitisation of the library almost in its entirety, also testified on the vast differences that had sprung up in the last years when it came to be interacting amongst colleagues and users. Librarian B3, even though having incorporated himself just a few years previously to the workforce, had also recognised tangible changes in the way the personnel communicated and interacted, with the arrival of more cloud services such as the newly adopted Sharepoint. Librarian B1 agreed on the swift changes that had happened in the communication and collaboration department, as she argued that the new digital tools were, at present, of a much more improved quality, so much so, she argued, that their knowledge of them was still quite superficial when compared to the possibilities such tools offered.

When it came to be interacting with users, the librarians had noted other changes that had more to do with the digital vehiculation of information.
Library A, for example, had abandoned paper leaflets entirely and had gone over to digital screens to promote local events, calendar activities and general information. Library B had recently incorporated several more scanners, computers and other devices that allowed users to share digital content. Both libraries had active Instagram accounts, library B having also a Facebook profile, that were kept updated and monitored by the library personnel. However, as librarian B3 pointed out, being able to share the responsibility for the promotion of the library on social medias depended on already having a personal account on said medias, since the professional profile and the private one had to be linked. In the case of library B, this had meant that only a reduced number of librarians could participate, in the opinion of Librarian B3, due to some of the colleagues’ lack of an active social media account.

When it came to communication and interaction, all the librarians agreed on the fact that most of their reality was digital for a total that they estimated as coming up to 60 or 70 per cent of their day. Both librarian B1 and B3 expressed surprise and preoccupation after carrying out a mental appraisal of their share of digital load in a workday, but detailed thereafter that it had to do with the fact that everything, from the tools to help users, to the channels of communication with colleagues, to the promotional aspect of the library on social media and other websites was essentially digital, the only ‘physical’ part of their day being the interaction with users within the physical walls of the library.

When analysing in detail some of the questionnaire phrases, interesting observations were made by the interviewees, especially with regards to the confrontation with digital hatred (2.5) and the managing and erasing of digital footprints (2.6). Librarian B1 declared herself puzzled at the thought of needing to erase one’s digital footprints since:

there should be no need for it, we work in the public sector…it might be different as a private person. (B1)

Both librarians B1 and B3 argued that while digital hatred was easy to come by in the social media sphere of public libraries, it was nothing they had ever encountered in the context of their specific workplace.

On the whole, Communication and collaboration in digital environments (Competence area 2) proved to be an intrinsic part of the librarians’ professional workload, both when it came to interact with colleagues, managing administrative tasks, help users in their queries or market the library’s activity, with up to 70 per cent of the day being ‘digital’. The job advertisements required mostly expertise in managing social media accounts and upkeep of web pages, something highlighted by the interviewed professionals as well. Participation in the shared responsibility for the upkeep of social media content, however, was linked to the single professional’s presence on said social media, as private accounts were needed to be able to
manage the library’s joint social media account. A second, equally important factor was the needed digital knowledge to manage internal communication through digital tools such as email, cloud services, shared documents or virtual meeting forums, tools that were constantly improved and expanded. Some of the competences included in this area puzzled the interviewed professionals, since they either appeared to contradict a principle of transparency linked to the figure of the public librarian or they had never been encountered in the specific public library’s digital environment (2.5 Netiquette and 2.6 Managing digital identity).

4.3 Competence area 3: digital content creation

Within this competence category are included the abilities to develop, integrate and re-elaborate digital content, understanding the foundations and applications of copyright and licenses as well as being able to create relatively simple programming codes.

A total of 35 job advertisements out of 64 mentioned activities and requirements that would deploy the digital competences of this area. The highlighted activities focused on aspects such as producing material for the library’s website or keeping it updated (job ads 3, 22, 37, 50), with formulations such as:

you are responsible for (the library’s) social medias and for updating the local webpage. (Ad 3)

Purchasing new items for the library’s digital collection (5, 17, 33, 64) was also included, as in the example of:

you will work with planning and purchasing of new medias, both physical and e-medias. (Ad 5)

Creative work targeting children through the use of digital storytelling (13, 18, 19) was also required, as in the following example:

through the use of different aesthetical expressions such as text, images and digital tools, you will create the right conditions to develop the children’s creativity, fantasy and curiosity. (Ad 18)

A further aspect included in this competence area was the promotion of the library and its activities through the production of marketing material, such as flyers, posters, presentations, digital material, often with the help of specific programs such as InDesign (14, 36, 57). Other job advertisements asked for prior knowledge and proficiency in using digital tools such as Arena (10, 36), CSL-Saga (36), BOOK-IT (10, 29, 32, 59) or a combination of them.

The questionnaires included as part of the semi-structured interviews showed that some of the digital competences included in this area were standardly used
in everyday work by all the librarians, as was the case with determining which type of material they could use freely on the library’s webpage or for a poster (digital competence 3.3). Other competences were not as broadly used: only three out of five interviewees had at some point had to choose an appropriate program or app to create digital content (competence 3.1), just as few had redacted or expanded digital material created by others to adapt it to their needs (competence 3.2), while two out of five had had to choose a suitable creative commons license for material they had themselves produced (digital competence 3.3) and only one out of five had needed to produce a step-by-step guide to explain how to use the Legimus program (digital competence 3.4).

Partial answers to why certain competences were more widespread than others came from the content of the interviews. In the smaller library A, all the three permanently employed librarians had to rely on their own capacities to produce marketing material (A1), displayed on the screens within the library, and shared responsibility for producing all digital material (A2). The larger library B, on the other hand, had a different standpoint in the matter. All librarians working there had to know about, and be able to work effectively with, certain specific areas, such as the Legimus program, dedicated to facilitating content to users with reading difficulties, but did not necessarily have to possess knowledge on other specific digital competence areas. This was linked to different reasons, as interviewee B1 explained that any library visitor should be met by a librarian able to tackle questions that may be of a sensitive nature for users, such as in the case of Legimus, without having to be referred to another professional, or to be asked to come back a second time due to the unavailability of the person in charge of the program. Interviewee B3 built further upon this fact by saying that knowledge of the Legimus program had previously rested in the hands of few colleagues, but due to the high request of the service, the library had had to expand this particular digital competence to more employees in order to respond to the users’ demand. Not all librarians, however, needed to be proficient in all digital competences linked to the production of digital content, as in library B there was a subdivision of labour that library A could not afford. This meant that, as librarian B1 pointed out, if a professional did not have it amongst his or her duties to produce content or update a webpage, they did not need to know how to perform such activities. She further thought that not everybody should know how to create or re-elaborate digital content, but everyone should know where to find the final products.

When it came to the creative use of digital tools, especially with focus on digital storytelling and in the appeal to younger audiences, children librarian A2 confirmed that there had been numerous changes that had required the expansion of her digital competences. While focus had previously lied on communicative skills as the most important quality for a children’s librarian and even if, as she pointed out,
normally, a children’s librarian job does not usually involve such things, (A2)

nowadays a lot of her work involved digital tools as well, such as e-books and digital mediation. When it came to the users’ needs in the competence area of digital content creation, the interviewed librarians from library B had all noticed tangible changes in the requests for tutoring and support they faced daily. Librarian B3 highlighted the need for more assistance and knowledge amongst the professionals, as an increasing number of users manifested the necessity to scan, edit pictures, create and alter digital documents, especially since the wave of refugees, many more have needed this type of help, and we are located in an area where the digital competence is quite low. (B3)

All in all, this third area of Digital Content Creation was widely represented in the job advertisements. The four competences englobed in it were mostly activated when hiring libraries required expertise in producing new material for the library’s website or to keep it updated, thus developing, integrating and re-elaborating digital content with the help of competences 3.1, 3.2 and 3.4. When choosing to integrate a picture or image in the digital content, competence 3.3 was also needed, to find out which copyright or licensing agreement was applicable there. This last competence was also needed when including new items in the library’s digital collection, a further recurring request found in the job ads. Expertise in the use of specific programs to either produce marketing material or to carry out administrative tasks was also required, but different libraries used different programs. The interviewed professionals actively used their knowledge of copyright and licences, but other digital competences, such as editing existing content or producing new one, were not as broadly required. This was greatly influenced by the size of the library. While smaller libraries with few employees had to rely on the fact that every librarian knew how to perform a wider array of digital tasks, larger libraries could share the digital workload and specialisations amongst themselves, with some colleagues holding more expertise than others. The needs of the user population were also a key influencing force: a library such as B, placed in an area where the average user had low digital competence, puts stronger pressure on its employees to master digital competences in order to assist its patrons.

**4.4 Competence area 4: safety**

The fourth area included in the competence categories tackles issues of safety, both those related to technological devices and those dealing with privacy and personal data, health, well-being and the environment.

A total of 33 out of 64 job announcements encompassed this competence area. Responsibility of social media accounts for the library were counted as involving safety-related issues, and were thus included (job advertisements 1, 10, 21, 35, 61), with formulations similar to:
you have good knowledge and experience in working with social medias, digital tools and the Web. (Ad 1)

Positions with responsibility areas dealing with accessible media (tillsändliga medier) were also included as they entailed working with well-being and health-promoting activities (19, 23, 55, 64), as in the following case:

experience of working with accessible media for children is required. (Ad 19)

The results of the questionnaires, however, portrayed a different picture, since this specific competence area was still apparently underrepresented amongst the daily activities the librarians had to perform. None of the interviewed professionals had circled the phrase ‘having to deal with protecting digital equipment from unwanted access via internet’ (digital competence 4.1) nor the one with ‘identifying webpages and email addresses that could be used for fraudulent purposes or other types of unwanted activities’ (competence 4.2). Only one of the professionals had previously used safety measures to communicate via internet without revealing their identity through encryption (competence 4.2) and only two out of five interviewees had limited their digital presence so it would not impede their workflow (competence 4.3). However, when it came to protect the environment through the use of digital equipment, all five librarians agreed that they had either used virtual meetings (instead of face-to-face conferences) or had reduced physical printing jobs (competence 4.4). Said competence (4.4) was not explicitly found within the job advertisements analysis but was however counted as required whenever broad expressions such as ‘IT-skills’, ‘digital competence’ or ‘IT-competence’ were asked for in the advertisements. Reiterating this, in the course of the personal interviews, librarian A1 had clarified that in the context of Library A they had completely eliminated printed fliers and pamphlets for marketing purposes, opting for digital presentations on the screens within the library building.

Four out of the five professionals agreed that some of the activities included within this area of digital competence dealing with the safety of devices were far too advanced to be allocated to the single librarian’s responsibility (A1, B1, B2, B3), and that they should be tackled at higher, centralised levels, such as by the City Library’s IT department, in charge of maintenance of the IT-environment of the area libraries in the Malmö district. Librarian B1 added that the single librarian could not be expected to act alone in matters of safety, partially due to knowledge gaps, but also partially due to the librarian’s role as public employee. Specific tasks such as communicating without revealing one’s identity puzzled some of the interviewees (B1, B3), as they saw no fit reason that a public figure as that of the librarian would require such a skill:

We should be open about who we are while communicating with our environment, for example when we email. (B3)
The example of digital competence 4.3 also met with some perplexity from the same two librarians, as ‘limiting my digital presence so it does not impede my workflow’ made the interviewees think that the professional that needed such a strategy was probably carrying out other activities not related to work (B3) and that it should be something to ponder about, since it deals with one’s work environment . . . and some people are stressed to be constantly online, present on social media and answer the visitors’ questions. (B1)

Subdivision of labour came into play even for this competence area, as librarian B2, responsible for the upkeep and monitorisation of the accessible media in her library, further highlighted that she came into contact with such questions (relating to the specific competence area 4) more often than other colleagues at her library who did not share her responsibilities.

This competence area in its entirety was counted as active whenever the advertisement asked for ‘IT-skills’, ‘IT-competence’ or ‘digital competence’, which was counted as requiring all competences, if only at their most basic level. Responsibility for the library’s social media account, relating to digital competence 4.2, was also present in the ads, as was previous experience with accessible media, counted as activating digital competence 4.3 (protecting health and well-being). Protecting the environment, 4.4, was not explicitly included in the advertisements, but it did prove to be a widely present area in the professionals’ daily work. There was a general feeling that some aspects of the area of Safety were far too complicated to be amongst the responsibilities of public librarians and should be managed centrally at a municipality level. The size of the library and the division of labour, once again, affected the individual range of knowledge and expertise, with some professionals dealing more specifically with issues relating to this competence area rather than others.

4.5 Competence area 5: problem solving

This particularly broad competence area involved solving technical problems, identifying needs, technological response and digital competence gaps and creatively using digital technologies. The notion of ‘creatively using digital technologies’ mentioned in this area differs from the digital competence 3.1, ‘developing digital content’ not only in the fact that it focuses on the technological vehicles rather than on the end product, but also because it supposes the creative use of digital technologies, tools and products as a response to specific needs or to overcome abstract problems.

Competence area 5 was represented in 33 out of 64 job advertisements, with tasks such as responsibility of the library’s media and digital environment (5, 11, 22, 33), as reported in the following example:
since the municipality works in PC and Android environments, familiarity with Mac and iOS operative systems is considered an advantage. (Ad 11)

Other tasks involved tutoring patrons in the use of digital technologies or helping them access the library’s digital resources (5, 17, 28, 32) and development and maintenance of the accessible media tools and content (19, 23, 55), as in the following case:

we are currently looking for a reading-inspirer responsible for working with target groups requiring accessible media. (Ad 23)

Creative use of technology in the promotion of children’s and adults’ digital reading habits (28) was also included:

broad competence in handling digital tools is required: it can for example entail . . . activities both on the web and within the library building promoting reading. (Ad 28)

Answers from the questionnaires handed out to the professionals showed that some of the activities linked to these digital competences were more commonly performed than others, with five out of five librarians having found ‘solutions to technical problems by searching the Internet’ (digital competence 5.4), having had to ‘troubleshoot a malfunctioning computer’ (competence 5.1) or to ‘adapt and adjust a program’s performance and functionality through its settings’ (competence 5.3). Digital competence 5.3, represented in the questionnaire by the phrase ‘activate the built-in speech synthesis function in an iPhone’ had only been performed by one of the five librarians.

In the course of the interviews, however, several other fundamental topics linked to the competence area of Problem Solving surfaced in multiple occasions. One of them was the subdivision of responsibility when it came to oversee and solve technical problems. All the librarians presented a similar pattern of preferred ‘action course’ when encountering digital issues that they were not able to resolve autonomously, as they all agreed that each library had standard protocols one could follow when in difficulty, routines that had recently been homogenised for all libraries in the Malmö area. If not already in possession of the answer to a specific technical question, query or matter, librarians A2, B1 and B2 would ask their local IT-ambassador for help. When faced with the same problem, librarians A1 and B3, IT-ambassadors in their respective libraries, recurred to different strategies that ranged from ‘googling’ the answer, to contacting the right extension of support in charge of the city libraries’ digital landscape. For software and hardware issues of the computers used for the library’s internal work, they had a specific IT-assistance, while for the computers available to the public, as well as for digital catalogue issues, they contacted directly their original provider, Malmö’s City Library. Technological hiccups with copiers, printers and scanners were handled directly with the machines’ providers. When it came to tutoring users in
technological and digital issues they could not resolve, both librarians A2 and B3 usually suggested them to go to the City Library’s Learning Centre (Lärcentrum), a department specifically dealing with digital and technological topics placed in the central library.

A further important point emerging from the interviews, classified as pertaining to the digital competence 5.4 dedicated to ‘identifying needs and technological responses’ was that users were, once more, a great influence in deciding which digital competences were needed within the setting of each library. Librarian B2 pointed out that

> just like coffee, IT is a perishable good, changing from day to day. It is society that decides what becomes part of our job description. (B2)

In her opinion, if a large number of users posed similar technological and digital questions to the library staff, it was the library’s duty to incorporate amongst its knowledge arsenal the right digital competence to help patrons solve those issues. Librarian B3 pushed the matter further, not only acknowledging that librarians had to possess the necessary digital competences to solve user issues, but that it was the librarian’s duty to expand the users’ own digital competences via different methods such as individual tutoring, courses and workshops that targeted the topics most relevant for the public of the library.

Librarian A1 had noticed a growing interest in loaning e-books and streaming movies from the library’s affiliated services, which had meant that the staff had had to expand their knowledge of programs, licenses and apps that supported the different formats each user needed.

Library A had also previously held digital and technological tutoring events targeting specifically the local elder population (SeniorNet), an activity that had been discontinued due to the low affluence of participants, to Librarian A2’s great displeasure as

> it was needed. After it had been withdrawn, we noticed a great demand amongst the elderly. (A2)

She had noticed a resistance amid the users to ask the library’s personnel questions relating to digital competences. In her opinion, this misgiving was due to the fact that few users knew that librarians could also help in those matters. Library B faced the opposite problem, as library patrons came in daily and in great numbers to ask questions that were mainly digital and technical, something that was experienced as putting great pressure on the professionals working there. To achieve more balance, and to be able to ‘help users help themselves’, in the opinion of librarian B3, it was fundamental that all colleagues working within a library possessed similar levels of digital competences. It was also necessary to establish a range of digital issues that the library staff was entitled to help users with, as both librarians A1 and B3
pointed out. Library staff often faced user queries that had little to do with librarian matters (B3), and which, for several reasons ranging from privacy issues to resource management, staff was asked by the management to turn down. However, as highlighted by librarian A1, each library had its own policy as regarding to where the boundaries were drawn.

‘Identifying digital competence gaps’, competence 5.4 in the list provided by the EU, is a subject that was picked up by all interviewed librarians, as it represented a very actual topic of discussion amongst professionals in the Malmö area. Librarian B3 mentioned that:

with the right competence to do our job, we can help our users better and it would not need to be very advanced digital competences either. (B3)

This was especially important in his opinion, given that digital competences were considered a fundamental part of the librarian’s work.

All five interviewed librarians agreed on the present lack of a common benchmark when it came to which digital competences a standard professional working in a public library should possess. Librarian A1 had learned from previous experiences that the difference amongst the digital competences of different professionals was so remarkable at times that there reigned great confusion as to which duties one was supposed to perform, and that colleagues had no clear picture of what kind of technological and digital support an IT-librarian could offer. He also added that while some of the most basic digital and technical problems could be solved by searching for answers on the internet, many colleagues still chose to ask directly for help rather than trying to solve the problem autonomously. Confidence in solving digital competence issues also came, he conceded, with years of experience in the workforce, as one learned to pose the right queries online, or acquired specific ‘tips and tricks’ to overcome certain difficulties.

Librarian A2 had also noticed the great differences in digital competences amongst professionals, an imbalance, she thought, that could have causes such as the age of the person in question, or the person’s workplace. A larger library could adopt a subdivision of digital and technological labour, while a smaller library had to rely on all its employees to work comfortably with digital issues of varied nature and difficulty. Other variables that she estimated had an influence on the issue were the individual educational patterns, as the more ‘digital’ the person’s educational background, the easier it became to employ digital competences in the daily work, and the years left to retirement as she felt that

if one does not have many years left to work, having to learn new things, new systems, might feel like an obstacle. (A2)

Librarian B1 argued that, as a rule, professionals were not obliged to know how to solve digital and technological issues, but they were expected to know
where to look to find either an answer or help in moving the question along. Librarian B2, remarking on the differences in digital skills amongst the workforce, also observed the importance of knowing where to look for the right answers to solve a problem, rather than knowing all the answers to begin with, solving digital problems as they arise and asking for help when unsure about the necessary steps to take. She highlighted the role that personal motivation played in the individual development of digital competences, as she argued that previous generations of librarians as those born in the 1950s were still insecure when it came to digital and technological routines.

Librarian B3 pointed to the importance of talking amongst colleagues about recurring issues and difficulties that had to do with digital competences, in order to lift these questions to the IT-council based in the City Library so that courses and workshops could be organised to divulge new knowledge amongst the professionals. Although, as librarian B3 highlighted, some colleagues repeatedly preferred to ask for help in recurring questions rather than acquire the needed competences. Just like the other four interviewed librarians, B3 also found it imperative that a common level of digital competence be established and that this be expanded over time, as it would entail a more balanced sharing of labour amongst colleagues. Librarian B2 also agreed on this aspect, as she stated that with digital competences playing an increasingly larger role, there was a need to expand the general knowledge of the professionals working in public libraries.

When it came to incorporating new professionals in the workforce, both librarians A2 and B1 agreed that the job advertisements published by their libraries tended to specify some degree of needed digital competences, but librarian B1 and B3, however, did remark on the fact that there was an unspoken understanding that all professionals working in the public libraries of the Malmö area had to be able to perform a minimum level of digital activities independently, focusing especially on being able to communicate with the digital tools provided by the city management and being able to use the digital channels adopted by the Human Resources department, to report events such as sick leaves, vacations or extra shifts. In their own experience, librarians A1, A2 and B3, who had started working in the course of the previous eight years, did remember being asked for some level of digital competence (A2 and B3) or specific IT-skills (A1) at the moment of hiring. Librarian A1 had been hired specifically to focus on IT-related issues, while A2 had been required to possess previous experience in working with the library system Sierra.

All in all, the analysed data showed that the most commonly sought-after digital competences in the job advertisements were linked to the responsibility for the library’s media and digital environment which required solving technical problems (5.1), tutoring patrons in their use of digital tools and library resources by identifying their needs and the technological responses to solve their queries and identifying digital competence gaps (5.2, 5.4), as well as developing and maintaining the accessible media tools and content and using
technology to promote children’s and adults’ reading habits by creatively using digital technology (5.3). The interviewed professionals had common problem-solving patterns when facing digital problems (5.1), following a set-up that was the same for all the libraries in the municipality and which entailed different level of local support in the form of IT-ambassadors, all the way to a centralised problem management department in the City Library. Digital competence 5.4, identifying digital competence gaps, was the most present and recurring topic in the semi-structured interviews. It was the area most influenced by the library users who, through their queries to the library personnel, determined which digital competences needed to be acquired by librarians. Gaining the necessary competences to help users was deemed a must for a public librarian. Depending on the library, however, the number of queries relating to digital competences varied enormously. Professionals therefore wished that a common ground for which digital competences are needed to be possessed by all librarians be established, partially to make the labour subdivision more equal, partially to solve confusion amongst colleagues as to who holds responsibility for which tasks and also to level the differences in knowledge that, according to the professionals themselves, are caused by variables such as age, background education, years left to retirement or personal motivation.
5 Discussion and conclusions

This section provides a discussion based on the data presented previously, as well as attempting to draw some conclusions relating to the major topics that surfaced during the analytical process.

5.1 Changes in the libraries’ role

The gathered information showed that libraries and librarians have felt the impact of the arrival of new technologies as Choi and Rasmussen had described (2009) and that professional librarians have needed to constantly adapt their knowledge and skills to the rapid changes happening in their environment, as highlighted by Broady-Preston and Preston (2007). The interviewed professionals had all experienced tangible changes in the technologies used in their workplace, both those for specialised practices and those at the users’ disposal. New digital and technological tools had translated into a need to keep up and expand the professionals’ knowledge on how to use said tools. The necessity to update the professionals' skills, through the enhancement of competences both at individual level as much as within the educational sector, has been described by Shahbazi and Hedayati (2016) as a must, in order to avoid turning the technological advancements into threats to the profession itself. Courses, workshops and information-sharing opportunities were currently organised by both the city of Malmö and by the libraries themselves to promote professional competence expansion. Following the guidelines of the national strategy Digitally first with focus on the User (Kungliga Biblioteket, 2016), to further develop the role of public libraries as support points for users when dealing with issues of digital literacy, a region-wide plan was also afoot at the moment when the interviews with the professionals were carried out. This was to map the present level of digital competences amongst the libraries’ personnel, something the professionals believed would lead to even more targeted competence-developing events.

Furthermore, it clearly surfaced that libraries did function as anchor points to help, inform and educate users when it came to digital competences, as was envisaged by the Swedish Library Law (Bibliotekslag, SFS 2013:801), the Swedish State Office (Regeringskansliet, 2017), the Swedish National Commission for UNESCO and the Swedish Library Association (Svenska Unescorådet & Svensk biblioteksförening, 2014). This entailed that, in order to help users, the public librarians themselves needed to attain a basic understanding and confidence in using digital competences. Data analysis however showed that the single libraries could have widely differing volumes of user queries relating to digital competences. Factors that the professionals believed fuelled this unevenness were the library’s placement – with some areas showing higher general digital competence than others – and the knowledge amongst users, or lack thereof, that librarians could help with such queries. The analysed job advertisements further highlighted the widespread
understanding of the library as resource centre to help users with their digital competences. Helping users with their information queries and helping them access the library’s digital resources was expressed as a fundamental part of the librarian’s work tasks and was clearly stated in the announcements.

5.2 Formalizing the needed digital competences

The problems predicted by Olander (2009) as regarding the difficulties of the recruiting process of new librarians with innovative competences did turn out to be partially justified, as the interviewed professionals agreed on the fact that there was little formalisation in the set of skills that a standard librarian was expected to possess. Although libraries had common routines for some aspects of their daily work, and all the libraries within the Malmö-area shared the same digital tools for communication and cataloguing, the librarians agreed that the basic level of expected digital competences was still ‘unspoken’, which made it hard to set a common ground for all professionals and, consequently, could make the recruiting process of the right competences amongst new personnel a challenge. The analysis of job advertisements showed similar results, as different libraries required different expertise levels, and some of the recruiting institutions did not include any reference to digital competences at all. This finding can be linked to the previous notion of an ‘unspoken’ expected level of digital competence amongst the workforce, rather than to the less likely explanation that the 23 institutions that advertised a position without specifying any essential digital competences did indeed not require any.

A further difficulty in the recruitment process could still be the obstacle expressed by Janssen et al. (2013), that the very notion of ‘digital competence’ is broad and diffuse. Proof of this was also mirrored in the words of the interviewed professionals who had differing views of the tasks, areas of responsibility and knowledge levels that being digitally competent entailed. The same could be said for the job advertisements included in the analysis. The types of needed expertise were many and englobed performative responsibilities of very different nature. Even when mentioned in either the job advertisements or during the interviews, the digital competences that appeared were normally not specified as to which proficiency level they pertained, in spite of the fact that the official document provided by the European Union, DigComp 2.1 (Carretero et al., 2017) provides detailed descriptions of eight proficiency levels that include a broad spectrum of abilities. Ranging from basic knowledge on how to print a document, all the way to complicated tasks such as web page designing or photoshopping, at present there exists no clear digital competence ‘base’ for the average public librarian. Furthermore, as pointed out by one of the interviewees, the concept is highly subjected to its historical perspective, as the notion of ‘basic digital competence’ for today’s library surely differs from that of ten years ago and will probably also have shifted ten years from now.
An additional factor that was highlighted by the data analysis was the overlapping of digital competences required to perform any given task. To carry out a single task found in either the job advertisements or in the descriptions provided by the interviews often meant activating several digital competences at the same time and with varying degrees of proficiency. This entails a supplementary difficulty when trying to pinpoint the needed digital competences required of the average librarian.

Choi and Rasmussen (2009) had highlighted that the requirements found in job advertisements were mostly associated with ensuring that the hired personnel were familiar with, and comfortable using, current technology rather than specific technological skills. The analysis of job announcements performed in the present paper showed that this was partially true even in the current Swedish employment market. There were 17 ads that explicitly required previous experience and familiarity with actual programs linked to either programming, cataloguing or administrative duties, but most of the announcements analysed included general requirements or broad definitions, such as ‘IT-skills’, ‘digital competence’, or previous experience with social media management. They also described mostly areas of work and range of duties rather than needed expertise with programs or technology. On a similar path, Orme (2008) had remarked that IT-skills, amongst which digital competences are found, were often considered as being generic skills, not considered as the most important category to be included in a job advertisement unless specifically looking for a digital librarian. This was not entirely applicable in the case of the data analysed in this paper, as even though there were two ads announcing a position specifically dealing with technologies and digital communication, when it came to digital competences they presented similar requirements as other announcements associated to the post of general public librarian. The results from the interviews with the professionals agreed with this finding. All concorded on the fact that general, basic knowledge of technology was a must in today’s librarian’s daily work and even when hired specifically to deal with the library’s IT environment, the needed digital competences had been observed as averaging within intermediate-high levels.

Croneis and Henderson (2002) had noted an increase in the number of job ads specifically asking for ‘electronic’ or ‘digital’ positions over an eleven-year period. Analysing the dataset used for the present paper, this could appear to have receded, but after triangulating the results from the job advertisements analysis with the content of the semi-structured interviews it seemed clear that the demand for more digitally competent librarians had not diminished, it had only been assimilated in the more general job description. Nonthacumjane (2011) had already ventured this development, asserting that some basic skills linked to digital competence, such as those needed for the development and management of collections and content or digital archiving were to become a natural and expected part of a new generation of library and information professionals.
On the same note, Croneis and Henderson (2002) had also suggested that an expansion in the functional areas involved in the librarian’s profession would happen, due to external factors such as advancements in technological and informational tools as well as user demands. The job announcements analysed here confirmed it. The spectrum of activities considered to be part of the daily workload of the librarians varied greatly between libraries, but the majority of them included several activities of varying nature activating different digital competences. The interviews added further support to Croneis and Henderson’s theory (2002), as all the interviewed professionals agreed on the importance of meeting the users’ expectations, demands and needs. Some of the librarians explored the question even further by adding that the library’s duty was to expand its staff’s digital competences with the users’ specific needs as the starting point. Other factors pushing for change were highlighted in the interviews, such as the adoption of increasingly more digital tools and technological items, both for professional use and for the benefit of the users.

From the analysed material it was also possible to observe that, when tasks needing digital competences were included in the job advertisements, they often activated all competences at once. This had several implications, as it made it harder to separate and assign each competence to specific tasks to be performed in a library, meaning it would be harder to generate a set of ‘basic needed skills’ common to all librarians. It also meant that the boundaries between proficiency levels were difficult to establish, as the advertisements included some activities requiring basic levels of a given digital competence at the same time as they were requesting expertise in a task activating a second digital competence’s highest proficiency level. The found ambiguity in specifying exact skills, choosing instead to highlight broader groups of competences found justification in the analysis that Tennant (1998; 1999) had previously carried out, admonishing employers from basing their recruiting processes on narrow predictive assessments of the needs of future libraries.

5.3 Highlighting the needed digital competences

Results further showed that some specific digital competences were deemed more relevant and necessary than others, both by the working professionals and in the job advertisements. The first competence area, dealing with Information and data literacy, emphasised the central role held by users, as librarians had to be able to satisfy their queries and help them along their information searches, but it also highlighted the permeating nature that an activity such as browsing and searching for information (1.1) had on all the other tasks involved in the librarian’s daily workload. Many of the interviewees associated this particular information-seeking capacity to the very nature of a librarian, be that a digital or analogue one. While evaluation of information (1.2), data and digital content was not as clearly stated in the job advertisements, it was a relevant part of the specialists’ day. This specific competence was mostly needed for professional use rather than in discussions or informative sessions with the users. The capacity to manage data and information in digital format (1.3) was also vastly
employed by all librarians, appearing also in the job advertisements, mostly in the form of administrative chores.

Competence area 2 was fundamental for the daily activities of librarians and englobed some digital skills that were very active both in the job advertisements and in the professionals’ day, such as those linked with tasks of social media management, web page upkeep and internal communication. Interacting through digital technology (2.1), as well as sharing and collaborating through digital technologies, (2.2, 2.4) were deemed fundamental in the modern library’s daily development. The tools to communicate, either with colleagues, with management or with the patrons, had become mostly digital, which had meant that familiarity with the institution’s virtual communication channels was considered an essential quality. Oyieke and Dick (2017) had already remarked on the empowerment digital tools and communication channels had brought to LIS professionals in what Lamba (2019) defined as an “increasingly multi-disciplinary, collaborative” network, and although the professionals themselves agreed on this factor, the job advertisements presented a more diffuse image. Some of the announcements clearly demanded previous experience with communication platforms typically linked with public libraries, while others were vaguer about the matter, or did not include it at all. The wide reach of digital communication tools had meant that most of the librarians’ day was entirely digital in format, a clear indicator that this second competence area was not something that a modern professional could ignore. Activities such as managing the library’s social media accounts automatically implied the use of other digital competences, such as Netiquette (2.5) and Managing digital identity (2.6) that were not detected as strongly by the professionals and were not as clearly stated in the job advertisements. This could be linked to the fact that, although using them daily, professionals did not recognise the digital competences lying behind certain activities as such, taking them to be a natural part of the tasks. The identified mindset of the professionals indicated a strong connection to the analysis of the concept of Library 2.0 presented earlier in the paper by Cullen (2008), Broady-Preston (2009) or Maness (2006), which now pervades the everyday reality of a library heavily based on technology, digital interactivity and collaboration. As Vanwynsberghe et al. (2015) pointed out, it lies in the interests of the modern librarian to be able to distribute information in as many formats as possible, meaning that confident handling and managing of social and digital media needs to be fully integrated in the professional expertise.

Within Competence Area 3, issues of copyright and licensing of material (3.3) were included in the tasks performed daily, but they were deemed especially important when joined with the production, editing and updating of digital content for the library’s webpage and social media channels (3.1, 3.2). When needed, the latter types of tasks were clearly stated in the job advertisements, which could be adduced to the fact that they might be considered as lying above what a public librarian is commonly expected to perform. The interviews further strengthened this idea, as it was remarked by some of the professionals
that knowledge within such areas of expertise was expected only of librarians who had those specific tasks amongst their duties, as was also the case with Accessible Media.

Competence area 4, tackling safety, was not as clearly included in the advertisements, a situation that was mirrored by the interviews with the professionals as they did not deem it to be a relevant part of the librarian’s work, but something to be managed at higher and centralised levels, with the exception of competence 4.4, relating to the protection of the environment, generally recognised by the interviewees as present in their working mindset. As was the case for competence area 3, however, many of the daily routines performed by public librarians did entail some level of activation of the digital competences relating to safety. Protecting devices (4.1) and protecting personal data and privacy (4.2) were an important part of managing a social media account, a web page or an equipment available within the physical space of the library, since they ranged from basic features such as being conscious about the digital service provider’s ‘privacy policy’ all the way to block unwanted access to library computers with a password. Given that the interviewed librarians shared responsibility for such activities, it seems to be the case that these digital competences were used unwittingly, as had already been suggested earlier on in the discussion. Furthermore, the librarian in charge of accessible media was also activating digital competence 4.3, dedicated to the protection of health and well-being, an area of expertise that was not shared amongst the entire personnel and which therefore, as with other tasks assigned to certain staff members and not others, affected the individual’s digital competence arsenal.

Competence area 5, dedicated to problem solving, was touched upon both by the job advertisements and by the interviewed professionals at great lengths. It was also the most debated area amongst the interviewees, as it was directly affected by the ongoing structural and competence changes promoted by the new national library strategies. Solving technical problems (5.1), identifying needs and technological responses (5.2) and creatively using digital technologies (5.3) were the most requested areas of expertise, both in the job advertisements and in the professional day-to-day. The interviewees, however, offered a more nuanced image of the practical translations of these competences, reminding once more of the importance of balancing both the employment market’s view with that of the active LIS specialists to obtain a reliable understanding of the professional situation, as promoted by Shahbazi and Hedayati (2016). While personnel were encouraged to solve technical and digital problems autonomously in the first place, more complicated issues were moved along to either the local IT-ambassador or to a higher, centralised department. There was no clear definition, however, for what constituted a ‘complicated’ issue amongst the professionals, which meant that some of the colleagues willingly relied on a colleague’s help as a first solution and on repeated occasions, which created imbalance in the workload amongst librarians employed in the same location. This fact meant that digital
competence 5.4, dedicated to identifying digital competence gaps, was deemed as equally important to that of solving technical problems, since it would provide a common ground for what is meant with ‘basic digital competences’ that each and every professional is supposed to possess, independently of their personal preferences, previous educational background, age or years left in the workforce before retirement. The importance of individual preferences in the development of digital competences had been already analysed by Tennant (1998) and later by Shahbazi and Hedayati (2016), who suggested that the library management recruiting librarians should also look for specific personality traits that would ensure a willingness to adapt, evolve, learn new skills and be able to work independently. Although, as Tennant (1998) justly stated, no one single library employee could possess all the needed skills and experience, and no employer could ask for a single professional to possess them all, there is at present a patent wish amongst the active librarians to establish a shared, common and basic level of digital competences.

5.4 Other factors influencing the needed digital competences

The analysed data showed that other factors affected the level of digital competences required of professionals. The size of the library was one of them, as to smaller libraries corresponded a levelled distribution of tasks and responsibilities which implied that all librarians had to have similar digital competences, even if on varying proficiency levels, while larger libraries could rely on a more compartmentalised distribution of knowledge. Once more, the inability of some of the librarians to perform certain digital and technological tasks augmented the inequalities in the individuals’ workload, as well as creating breeding ground for future problems that would arise if those digitally more competent colleagues were to move to a different library, or if unavailable when needed.

The library’s placement and, most importantly, its user population, also proved to play an important role in establishing which digital competences were mostly needed by librarians. While Library A is geographically situated in an area where over 66 per cent of the population aged 20 to 64 have a higher educational degree, Library B is located in an area where only 23.7 per cent of the inhabitants within the same age range had higher educational degrees. Just as age, the educational background has also been observed to affect the level of digital competence and inclusion (Negreiro, 2015). This, combined with the size of the library, meant that professionals within Library A were met by barely any user queries that involved digital competences, while Library B’s professionals highlighted that a large share of their users came specifically to receive help in such matters. Library A’s user population seemed mostly interested in obtaining assistance on topics such as accessing the digital catalogue or downloading e-books, as well as with IT-related issues, in the case of the elder patrons (SeniorNet). As cited in the interview with professional A2,
said needs were so reduced that even the main activity dealing with assisting senior citizens with IT-questions had been discontinued in their library. Library B, on the other hand, is much larger in size and in user population, meaning that the LIS professionals working there encountered daily a large number of user queries that tackled technological or digital issues. Furthermore, the topics of such queries were very broad in nature and ranged from accessible media, to loaning digital material, to assisting the users in their contact with different authorities’ digital environments, paying bills, emailing or receiving help to set up a new mobile phone.

These facts translated into work routines in which the needed digital competences were subjected to varying degrees of stability. Library B, with the constant input brought by the users’ queries, dealt with digital competences that were tightly connected with the users’ own changing needs, a variable that rested outside the control of the library’s own management and organisational setting. Library A, on the contrary, presented a structural form in which outside-input, in the form of users’ requests, was relatively limited. Therefore, Library A’s professionals seemed less subject to prompt variations in the types and proficiency levels of their digital competences than Library B’s professionals.

As such, it appeared that both users and professionals might struggle to pinpoint the needed competences of the modern librarian. As previously mentioned, some of the librarians received barely any queries relating to digital competences while others were overwhelmed by them. Furthermore, the content of said questions, even if relating to digital competences, was not always of a type that could, or should, be answered by a public librarian, as they could entail privacy issues conflicts or simply exceed the area of responsibility of a public librarian. This, combined with the fact that different libraries offer different types of digital assistance and services to the users, as had been already observed by Thomas and Patel (2008), as well as with a lack of resources that determined the amount of attention a library could dedicate to develop the single user’s digital competences, also caused professionals to be struggling with pinpointing their own range of duties and needed skills. The vision feared by Cullen (2008) of a library so focused on technology that it forgets its users did not find anchorage in the analysed data, as all the professionals highlighted on several occasions the importance of tailoring the library and its services to the needs of the patrons. There were, however, some digital competences and technological topics that the professionals considered all too advanced and philosophical in nature to be tackled at a public library level, such as in the case of topics like ‘filterbubble’, the limitations of the internet or freedom of speech. The library staff’s choice to eliminate these topics from the library’s agenda, however, had also been based on the interests shown by the specific library’s user population, a fact that, in itself, reiterated once more the attention posed by institutions to tailor the digital competences on offer in the library to the users’ needs.
5.5 Revision of the conceptual model

The analysis of the semi-structured interviews and of the job advertisements pointed to the existence of two main factors that influence the digital competences needed by today’s professionals. Librarians have to be able to use the tools, services and communication channels that are included and provided by their library’s formal setting, which may be the same for the whole municipality, as in the case of the libraries located within the Malmö area, or individually chosen by the single institution, as shown in the job advertisements. At the same time, and depending on their specific workplace, LIS professionals also have to respond to varying volumes of user queries that might be related to digital competences, which imply the activation of completely different digital competences than those normally used within the formal setting of the library’s administrative work.

Ultimately, the data analysed shed some further light on the paradigm explored by Choi and Rasmussen (2009) on the cycle of influence between librarians and digital competences. In their study, they attempted to find out if the changes in the library as an institution, as well as in the content and services they offer were caused by the employment of increasingly more digitally competent librarians, or if the opposite was true, namely that it was the increasingly technological library that demanded more expertise amongst its professionals. Both analyses proved to be complementally correct in the case of the material analysed in the course of this paper, but they also added a further dimension to the equation, namely the role played by the library’s users in promoting the expansion of the staff’s digital competences, the Competence Needs.

The interviews revealed that the role played by the digital necessities of library patrons, User Competence Needs in this paper, is of a greater importance than what might at first appear from the analysis of the job advertisements. In the examination of the recruiting ads, requirements for the prospective staff did include to be able to guide users in the access of the library’s digital resources and tutor them in IT-related queries. The interviews, however, also made clear references to the reverse action course, namely, that professionals had to identify the changing digital competence needs of the user population and translate them into competence-developing course of actions for the LIS specialists, in forms such as those of workshops or courses for the staff.

When having to specify which of the digital competences included in the Competence Categories are included in the User Competence Needs, one needs to look at the individual libraries since, as observed in the results of the present paper, each institution presented a specific typology of users, which meant that the professionals working within a certain geographical area had needed to promote and master some digital competences rather than others. However, as stated earlier in the paper, not all user queries fell within the areas of responsibility of a public librarian, due to either privacy issues, resource
availability or knowledge base. Therefore, to ensure objectivity in the meeting and tutoring of the patrons coming to one and the same library with similar queries relating to digital competences, it is imperative that centralised, formal directives and instructions are issued, either by the single library’s managerial department or by its supra-local administrative bodies. This entails that the Competence Needs should be constituted by a general basis of all digital competences included in the Competence Categories combined with the User Competence Needs, meaning that specific attention is dedicated to those digital competences that are required by the local user population, which are *filtered and concentrated* by the formal requirements of the sector, namely by the Competence Requirements.

The result is a changing selection of digital competences adjusted to the specific needs of the individual libraries, evolving over time in a constant dialogue between the users and the library staff. There still exists a need to ensure that all professionals working within the same library are able to manage the needed basic digital competences that will allow them to keep adding building blocks to their knowledge. The Competence Requirements, aside from formally establishing which User Competence Needs can be catered to by the library, also exist for the purpose of making explicit the required basic level of digital competences that all personnel need to attain.

To make sure that the equation between Competence Needs, User Competence Needs and Competence Requirements is balanced, a continuous dialogue between the library staff and the library management should be maintained. This is partially due to the fact that it is ultimately the professional librarians who have most direct contact with the library’s users and are therefore able to ‘feel the pulse’ of the changes in the digital competences associated with the users’ queries. Systematic updates, alerting of relevant changes in User Competence Needs’ trends, should be an integral part of the dialogue between LIS professionals and library management. Equally relevant, however, is the formal role played by the latter in keeping up to date with national policy requirements that might influence the very scope of the librarian’s role, thus affecting the types and proficiency levels of the basic digital competences’ set.

This thesis has shown that while digital competence as a concept might be difficult to pinpoint within the LIS profession, there exist recurring digital skills on which public librarians must rely to perform their duties. These competences are dictated both by each individual library’s digital environment and by the competence needs of the library’s users. Therefore, library management and educational institutions should consider including these basic digital competences amongst their requirements when hiring or preparing professionals-to-be.
5.6 Future research

Given the importance of the Users Competence Needs in pinpointing the needed digital competences for the professional librarians, it would prove rewarding to include this fourth variable in the triangulation of findings of future researches. This could help to further narrow down which digital competences are truly needed by the professionals in their daily practice, and to see how often these appear in job advertisements.

A further interesting factor to add to future analysis would be to include an observation not only of digital competences in themselves, but also to incorporate personality skills and character traits that are deemed useful when associated to digital competence needs, much as previous research examples have done. Such observations could help find out if the technological and digital changes experienced by public libraries have also had an effect on the personality and character traits of professionals.

After having observed that many professionals were activating their knowledge of digital competences in what appeared to be an unwitting manner, an objective observation of the public librarians’ daily routine could also shed further light on the digital skills and proficiency levels they are actively deploying in the course of their workday.
Summary

Technological and digital changes have greatly affected the shape and structure of Swedish public libraries. They have also modified the role of public librarians, who need to stay tuned to the relevant advancements to provide useful services to their local user population.

Public Swedish libraries have fully embraced the characteristics that were once strictly linked with concepts such as Library 2.0, and are at present entirely involved in a nation-wide digitisation movement that has affected both the role of the library and of the librarian, now a knowledge-facilitator rather than a knowledge-holder even in matters of digital competences. This shift in the figure of the public LIS expert has led to some confusion, amongst users and professionals alike, as to where the boundaries of their professional activities lie. Librarians are to be informational anchor points and educational resources in a general scheme to promote the users’ digital competences, which has led to a surge in the need to expand the professionals’ own digital competences.

The present study attempted to find out which digital competences were most needed by professionals working within Swedish public libraries today. This was done by using a conceptual model to guide the triangulated analysis of Competence Categories, Competence Requirements and Competence Needs. Competence Categories includes the formal, theoretical requirements issued by the European Union, formalised in the form of the document DigComp 2.1. Competence Requirements are the digital competences deemed as necessary by the employment sector, which have been synthetised by analysing the job advertisements published on the national Public Employment Service’s own website, Platsbanken. Lastly, the Competence Needs are those digital competences that professionals themselves needed to employ in their daily practice, which were extracted by the semi-structured interviews with five professional librarians employed within the area of the city of Malmö.

Results showed that, at present, there is little formalisation within the sector as to which competences are deemed as relevant and necessary to perform the librarians’ daily work routine. Professionals have therefore expressed a strong desire for a general, basic level of digital competence amongst all librarians working within public libraries, as the unevenness of skills might intensify internal frictions amongst colleagues. Ensuring that all new staff possesses at least the basic proficiency levels of digital competences in all five competence areas would greatly empower all the active professionals and would also ensure that better assistance to users would be available in all public libraries.

There surfaced tangible differences amongst the required digital competences amongst different libraries within the country, which could be explained by variables such as the location of the library, its size and its user population. While smaller libraries appeared to be in disadvantage at first glance, when it came to digital competences they might display a more balanced subdivision of
labour than larger institutions. This is linked to the fact that having fewer staff members meant that they all had to be able to manage the library’s digital environment, while in larger libraries the differences in digital skills seemed more pronounced in the opinion of the professionals working there. A further, fundamental factor affecting the typology and necessary level of digital competences of the librarians proved to be the users’ own digital competence, which varied greatly depending on the placement of the library.

This factor led to the conclusion that the combination of several processes could clarify the needed digital competences required by professionals in public libraries.

A basic knowledge of the five digital competence areas needs to be formalised in the requirements expressed in the job advertisements when hiring new professionals. Said knowledge also needs to be ensured, at least in its most basic proficiency level, when expanding the competences of the professionals already employed in the sector. This would lead to a more even distribution of labour within the workforce, as today’s professional librarians in Sweden move in a mostly digital work routine.

Moreover, special focus should be dedicated to enhancing three main areas that are of special relevance within the library field, namely, Competence Areas one, two and five (Information and data literacy, Communication and Collaboration and Problem solving), as they are considered by the professionals themselves to be the very basis on which the modern librarian figure rests. A higher proficiency level within these three fields would also imply that the professional encountering problems relating to the other areas of digital competences would be better prepared to find solutions in a more independent and autonomous manner.

The digital competence needs of the local user population should be acknowledged in a systematic manner, in order for them to be formally included amongst the digital competences needed by the local staff, or to be equally formally excluded from the responsibility areas of the librarians working within the same institution. This would ensure that working professionals would receive official support from the local managerial sector when dealing with the users’ queries under several aspects. Primarily, they would be able to pinpoint the digital competence areas they would need to reinforce, to be able to meet the users’ needs in the most efficient manner. Secondly, they would be able to clearly identify the limits of their professional duty, redirecting users to other institutions or instances when the queries exceed their area of responsibility. Thirdly, and on a more long-term structural plan, they would be able to organise user-oriented workshops and activities dedicated to empowering patrons in the digital competence areas they need the most, hopefully leading to a user population that is, as envisaged by national and international development plans, truly digitally competent.


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Appendix A

Examples from the Conceptual Model’s three dimensions

Competence area 1: Information and data literacy.

This competence area included tasks such as browsing, searching, filtering, evaluating and managing data, information and digital content.

1.1 Browsing, searching and filtering data, information and digital content

Competence Categories’ description: users can carry out tasks such as identifying, explaining and illustrate his or her information needs; carry out increasingly specific searches in digital environments to find data, information and content; find out, explain and describe how to access and navigate between the found data, information and content; identify, explain and propose simple personal search strategies. Example: using a search engine to find information in different formats such as pictures, videos or maps.

Example from Competence Requirements: “part of your job will be to guide users in using our search tools” (Sample 28).

Example from Competence Needs: “we have to help our users access the resources we offer…such as e-books, audio-books, the library catalogue” (A1)

1.2 Evaluating data, information and digital content

Competence Categories’ description: users can detect, analyse, compare and interpret the credibility and reliability of data sources and of data itself in digital environments; they can create solutions to solve complex problems relating to the analysis and evaluation of data and data sources. Example: critically assess digital content and determine its veracity.

Example from Competence Requirements: “you will help users by offering qualified information searches…in databases, magazines or other services provided by us” (Sample 34).

Example from Competence Needs: “we need to be able to assimilate the information and interfaces available online” (A1)

1.3 Managing data, information and digital content
Competence Categories’ description: users can identify how to organise, store and retrieve data in a routine way in increasingly structured digital environments, manipulating it when needed be, in order to make it easily retrieved; they can adapt the management and storage of information, creating solutions to complex problems relating to managing, storing and retrieving data in digital environments. Example: organise and store digital data for later use.

Example from Competence Requirements: “readiness in using Mac and iOS operating systems will be to your advantage” (Sample 11).

Example from Competence Needs: “when I think ‘digital’ I think of very simple things such as print or saving documents” (A2).

**Competence area 2: Communication and collaboration.**

This area of competence focuses on interacting, sharing, engaging and collaborating through digital technologies, as well as knowledge of netiquette and on how to manage one’s digital identity.

**2.1 Interacting through digital technologies**

Competence Categories’ description: users can select increasingly complex and varying digital technologies to interact, identifying communication means and routines; they can also adapt said digital technologies and communication means to suit a given context in order to create the most appropriate interaction; users can also create solutions to complex problems relating to interacting through digital technologies. Example: find relevant forum/groups on the internet for a specific area of interest.

Example from Competence Requirements: “an important part of your job will be to develop the library’s e-services by supervising our communication through Arena” (Sample 10).

Example from Competence Needs: “we have several more digital meeting points” (A2).

**2.2 Sharing through digital technologies**

Competence Categories’ description: users can select increasingly complex and varying digital technologies to share data; they can manipulate said technologies to share information and data, being able to explain and show how to act as an intermediary for sharing content in digital environments, as well as applying and illustrating how to use increasingly more appropriate referencing and attribution practices. Example: share self-produced content through the internet.
Example from Competence Requirements: “you can use social media for marketing purposes” (Sample 10).

Example from Competence Needs: “we plan and write documents, print posters, webpages, social media content” (B3).

2.3 Engaging in citizenship through digital technologies

Competence Categories’ description: users can identify, select, indicate and discuss appropriate digital technologies and digital services in order to participate to society as a citizen, proposing increasingly appropriate solutions to complex problems relating to engaging in citizenship through digital technologies. Example: reflect on the liberty of expression and its limitations on the internet.

Example from Competence Requirements: “you will be part of different networks who work strategically and practically to promote digital inclusion and media literacy” (Sample 64).

Example from Competence Needs: “we have abandoned printed marketing completely within the library building, we don’t have any posters, only screens” (A1).

2.4 Collaborating through digital technologies

Competence Categories’ description: users can choose increasingly sophisticated digital tools and technologies for collaborative processes; they can also select the most appropriate digital tools to co-construct and co-create data, resources and information. Example: use digital tools to work with others physically located elsewhere.

Example from Competence Requirements: “an important part of your job will be to develop the library’s e-services by supervising our communication through Arena” (Sample 10).

Example from Competence Needs: “we have several more digital meeting points” (A2).

2.5 Netiquette

Competence Categories’ description: users can differentiate, clarify, discuss, apply and adapt behavioural norms and know-how while using digital technologies or interacting in digital environments; they can also choose, express, discuss and apply different communication modes and strategies, adapting them to their audience if needed; users are able to differentiate, describe and apply cultural and generational diversity aspects that need to be considered
in digital environments. Example: tackle hate content on the internet, directed either at me or at others.

Example from Competence Requirements: “you will be responsible for promoting the library’s presence on social media” (Sample 35).

Example from Competence Needs: “we need to develop a webpage, or social media content, if you have that responsibility area” (B3).

2.6 Managing digital identity

Competence Categories’ description: users can identify, discriminate display and use a variety of digital identities; they can describe, explain, discuss and apply appropriate ways to protect these digital identities; they can recognise, manipulate and use data they produced in digital environments. Example: manage and erase digital footprints originated on the internet.

Example from Competence Requirements: “you will produce editorial material for the culture and library department on the web, social medias and other forums” (Sample 10).

Example from Competence Needs: “we need to be able to…send emails, use social media” (B1).

Competence area 3: Digital content creation.

Within the domain of this digital competence are included developing, integrating and re-elaborating digital content, as well as knowledge of copyright, licensing and programming.

3.1 Developing digital content

Competence Categories’ description: users can identify, indicate and apply ways to create and edit digital content in different formats, expressing themselves through the creations of digital means, adapting these expressions to the pertinent audience by using the appropriate digital means and formats. Example: choose an appropriate program or app to create digital content such as pictures, videos or audio files.

Example from Competence Requirements: “you will need to create a positive ground for the development of the children’s creativity, imagination and curiosity by using different aesthetical expression such as text, images and digital tools” (Sample 18).

Example from Competence Needs: “one should be able to use certain programs such as InDesign” (A2).
3.2 Integrating and re-elaborating digital content

Competence Categories’ description: users can select, explain and discuss increasingly complex ways to modify, refine, improve and integrate new items and information to create original ones, assessing the most appropriate ways to do so. Example: develop or edit what others have created to fit it to individual needs.

Example from Competence Requirements: “you will be responsible for updating the library’s local website” (Sample 3).

Example from Competence Needs: “we need to develop a webpage, or social media content, if you have that responsibility area” (B3).

3.3 Copyright and licences

Competence Categories’ description: users can identify, indicate, discuss, choose and apply different rules of copyright and licenses that apply to data, digital information and content. Example: assess which content is free to use on posters within the library or on the library’s website.

Example from Competence Requirements: “you will work together with purchasing and planning of media, both physical and digital” (Sample 5).

Example from Competence Needs: “e-books tend to be a little problematic, depending on what platform the user chooses, different accounts need to be created” (A1).

3.4 Programming

Competence Categories’ description: users can list, determine and operate instructions for a computing system to solve problems and perform specific tasks. Example: create a step-by-step guide to illustrate how to read an audiobook in a specific app.

Example from Competence Requirements: “we would like you to have a documented knowledge of supervision tasks for the library system Book-IT…and a deep understanding of the technologies underlying web platforms, apps and more” (Sample 59).

Example from Competence Needs: “I have worked with our webpage before, where we update our information” (A1).

Competence area 4: Safety.

Here are nested the capacities of protecting devices, personal data, privacy, health and well-being and the environment.
4.1 Protecting devices

Competence Categories’ description: users can identify, organise, choose and apply the most appropriate protection for devices and digital content; they are also able to discriminate risks and threats in digital environments, choosing the most appropriate security measures and have due regard to reliability and privacy issues. Example: protect digital equipment from unlawful use on the internet.

Example from Competence Requirements: “you will be in charge of the Book-IT system management...as well as working with the library’s public IT-environment and NetLoan” (Sample 59).

Example from Competence Needs: “we are now expected to use Sharepoint, Microsoft’s service, where we shall share documents amongst colleagues” (B3).

4.2 Protecting personal data and privacy

Competence Categories’ description: users can select, discuss, choose and apply different ways to protect their personal data and privacy in digital environments, especially when sharing data with others, while having consideration for the safety of others; they are also able to evaluate and explain privacy policy statements, assessing their appropriateness. Example: communicate with someone through the internet without revealing my identity (by using encryption programs, for example).

Example from Competence Requirements: “you will be in charge of the Book-IT system management...as well as working with the library’s public IT-environment and NetLoan” (Sample 59).

Example from Competence Needs: “we are now expected to use Sharepoint, Microsoft’s service, where we shall share documents amongst colleagues” (B3).

4.3 Protecting health and well-being

Competence Categories’ description: users are able to differentiate, explain, discriminate and apply the most appropriate ways to avoid health-risks and threats to psychological and physical well-being while using digital technologies; they are also able to adapt and vary the use of digital technology to promote social well-being and inclusion, guiding others when required. Example: limit my digital presence to avoid it becoming a disruption in my overall workflow.

Example from Competence Requirements: “part of your work is linked to audiobooks (DAISY) and the download service Legimus” (Sample 61).

Example from Competence Needs: “everyone is expected to know how to work with Legimus” (B1).

4.4 Protecting the environment
Competence Categories’ description: users can recognise and discuss environmental impacts of digital technologies and of their use; they are also able to discuss and choose appropriate ways to protect the environment from the impact of digital technologies and their use. Example: use digital equipment to reduce the impact on the environment (by video-meeting, or by reducing print jobs, for example).

Example from Competence Requirements: “traditional librarian tasks will also occur, such as…media planning and web. You have good IT-skills” (Sample 37).

Example from Competence Needs: “we have abandoned printed marketing completely within the library building, we don’t have any posters, only screens” (A1).

### Competence area 5: Problem solving.

This final competence includes solving technical problems, identifying needs and technological responses, creatively using digital technologies and identifying digital competence gaps.

#### 5.1 Solving technical problems

Competence Categories’ description: users can identify, assess and appraise technical problems when operating devices and using digital environments; they can also resolve those problems by choosing the most appropriate solutions. Example: start troubleshooting a computer to solve minor issues.

Example from Competence Requirements: “experience as branch manager, independent writing and web-publication through different media is also a merit” (Sample 36).

Example from Competence Needs: “I have worked with our webpage before, where we update our information” (A1).

#### 5.2 Identifying needs and technological responses

Competence Categories’ description: users can identify, explain and assess their digital needs, recognising, selecting and applying digital tools and possible technological responses to solve those needs, adjusting and customising digital environments to personal needs when needed. Example: activate the speech-synthesis function on an iPhone.

Example from Competence Requirements: “we are looking for a reading-inspirer who will be responsible for reaching out to user groups in need of special media formats” (Sample 23).
Example from Competence Needs: “I have held a course on Internet usage, where we explained how the Internet works, important things to think about and so on.” (B3).

5.3 Creatively using digital technologies

Competence Categories’ description: users can identify, select, differentiate and apply increasingly complex digital tools and technologies that can be used to create knowledge and to innovate processes and products; they can also engage individually and collectively to resolve conceptual problems and problem situations in digital environments. Example: adapt and adjust the functionality of a program through its settings.

Example from Competence Requirements: “Experienced of creative processes through the use of both analogue and digital media required” (Sample 19).

Example from Competence Needs: “one should be able to use certain programs such as InDesign” (A2).

5.4 Identifying digital competence gaps

Competence Categories’ description: users can recognise, explain, discuss and demonstrate where their digital competences need to be improved or updated; they can also identify and choose the appropriate forums to seek opportunities for self-developments or to keep up-to-date with the digital evolution. Example: find solutions to technical problems by browsing the internet.

Example from Competence Requirements: “a day’s work at the library entails helping users with questions on media, on the library’s web, PC-management, copying and printing” (Sample 22).

Example from Competence Needs: “if many people are asking the same question, maybe we need to acquire that competence ourselves, to be able to help them.” (B2).
Appendix B

Interview guide

Interview code: _____________ Daily number of visitors: _____________

1. Läs påståenden (självständigt dokument) och bocka av situationerna som uppstår under en vanlig arbetsdag, eller som uppstått någon gång under det senaste året.

2. Pratas det om digitala kompetenser på din arbetsplats? I så fall, i vilka sammanhang (möten med ledning, bland kollegor, facklitteratur)?

3. Hur mycket av din arbetsvardag är “digitalt”, uppskattningsvis? Kan du ge exempel på vilka arbetsuppgifter det rör sig om?

4. Hur ofta möter du användare/besökare med ärende som har med digitala kompetenser att göra?

5. Hur ser du på digitala kompetenser som en del av folkbibliotekariernas arbete?

6. Finns det någon policy på din arbetsplats för vad som ska göras om man stöter på ett problem som har med digitala kompetenser att göra? (Anmäla det till ledning, kontakta en kollega, ring ett supportnummer...)

7. Anser du att vissa aktiviteter som nämns i dokumentet “hör inte hemma” i ett folkbibliotekaries arbete? I så fall, vilka?

8. Har du lagt märke till förändringar på dina 1. arbetsuppgifter och 2. arbetsplats vad gäller användning av digitala medier, tjänster eller teknik sedan du började arbeta där? Kan du ge några exempel?

9. Vill du tillägga någonting?
Läs påståenden och bocka för de situationer nedan som uppstår under en vanlig arbetsdag, eller som uppstått någon gång under det senaste året.

☐ Använda sökmotorer för att hitta en viss typ av information - exempelvis bilder, video eller kartor

☐ Förklara vad som menas med uttrycket "filterbubbla"

☐ Kritiskt granska digitalt innehåll och avgöra dess sanningsgrad

☐ Spara och organisera digitalt innehåll så att jag senare kan hitta det

☐ Hitta relevanta forum/grupper på Internet för ett specifikt intresseområde

☐ Dela med mig av egenproducerat innehåll via Internet

☐ Reflektera kring yttrandefrihetens omfång och avgränsningar på Internet

☐ Använda digitala verktyg för att arbeta tillsammans med andra på distans

☐ Bemöta näthat gentemot mig själv eller andra

☐ Hantera och radera de digitala fotspår jag lämnar efter mig på Internet

☐ Välja ett lämpligt program/app för att skapa digitalt innehåll (t.ex. bilder, videor, ljudfiler)

☐ Bygga vidare på eller redigera vad andra har gjort för att få det som jag vill ha det
☐ Välja en lämplig creative commons-licens för material som jag producerat

☐ Avgöra vilket digitalt material som jag får använda fritt på exempelvis en affisch eller på bibliotekets hemsida

☐ Produera en pedagogisk steg-för-steg-beskrivning för hur man läser talböcker i Legimus

☐ Skydda digital utrustning från oönskad åtkomst via Internet

☐ Identifiera webbsidor och e-post som kan användas för bedrägeri eller annan typ av oönskad aktivitet

☐ Kommunicera med någon via Internet utan att avslöja min egen identitet (t.ex. med hjälp av kryptering)

☐ Begränsa min digitala närvaro så att den inte blir för distraherande för mitt övriga arbete

☐ Använda digital utrustning för att minska miljöpåverkan (t.ex. digitala möten, färre utskrifter)

☐ Påbörja en felsökning av en dator som krånglar

☐ Aktivera den inbyggda talsyntesen i en Iphone

☐ Anpassa och justera ett programs beteende och funktionalitet via dess inställningar

☐ Hitta lösningar till tekniska problem genom att söka på Internet
Samtycke till insamling och behandling av uppgifter om dig

Som en del av masteruppsatsen inom Biblioteks- och informationsvetenskap, Digitala bibliotek och informationstjänster vid Högskolan i Borås utför jag en studie med syftet att samla in väsentlig information om folkbibliotekariernas användning av digitala kompetenser i vardagen.

Jag som utför studien skulle vilja att du lämnar vissa uppgifter om dig själv, närmare bestämt röstinspelning och svar på frågeformulär gällande digitala kompetenser under din arbetsdag.

Uppgifterna kommer att användas för att utvärdera och få en bild av sambandet mellan formellt och informellt nödvändiga digitala kompetenser.

Högskolan i Borås är personuppgiftsansvarig för behandlingen, som sker med stöd av artikel 6.1 (a) i dataskyddsförordningen (samtycke).

Uppgifterna kommer att användas av mig samt vara tillgängliga för lärarna på den aktuella kursen och centrala administratörer vid högskolan. Uppgifterna kan dock vara att betrakta som allmänna handlingar som kan komma att lämnas ut i det fall någon begär det i enlighet med offentlighetsprincipen.

Uppgifterna kommer att lagras inom EU/EES eller tredje land som EU-kommissionen beslutat har en skyddsnivå som är adekvat, dvs. tillräckligt hög enligt dataskyddsförordningen. Uppgifterna kommer att raderas när de inte längre är nödvändiga.

Resultatet av studien kommer att sammanställas i aidentifierad form och presenteras så att inga uppgifter kan spåras till dig.


Jag samtycker till att uppgifter om mig samlas in och behandlas enligt ovan.

_____________________________
Underskrift

_____________________________
Namnförtydligande

_____________________________
Ort och datum
# Appendix D

## Job ads analysis table

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<tr>
<th>Advertisement number</th>
<th>Terms of employment</th>
<th>Excerpt</th>
<th>Digital Competences</th>
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<tbody>
<tr>
<td>1</td>
<td>Permanent position</td>
<td>Du har god kunskap samt erfarenhet av arbete med sociala medier, digitala verktyg och webb.</td>
<td>1.1 1.2 1.3 2.1 2.2 2.3 2.4 2.5 2.6 3.1 3.2 3.3 3.4 4.1 4.2</td>
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<td>Du ansvarar för sociala medier samt för att uppdatera den lokala webbsidan Vi förutsätter att du har goda IT- kunskaper.</td>
<td>1.1 1.2 1.3 2.1 2.2 2.3 2.4 2.5 2.6 3.1 3.2 3.3 3.4 4.1 4.2 4.3 4.4 5.1 5.2 5.3 5.4</td>
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<td>kommer du att arbeta med . . viss it-handledning. Ni arbetar med inköp och medieplanering av såväl fysiska medier som e-medier Det är en fördel om du har administrativa kunskaper inom Book-IT</td>
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<td>Permanent position</td>
<td>Enhetens huvudsakliga uppdrag är att eftersöka, förvärva och katalogisera utländsk litteratur enligt KB:s förvärvsprotokoll samt att på olika sätt stödja forskning i KB:s samlingar, såväl tryckta som digitala</td>
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<td>Permanent position (focus communication)</td>
<td>En viktig del i arbetet är att utveckla bibliotekets e-tjänster genom att ansvara för vår kommunikation via Arena samt att, tillsammans med kultursamordnaren, producera redaktionellt material för kultur- och biblioteksavdelningen på webb och i sociala medier m.m. Kan arbeta i webgränssnittet Arena, behärskar In-design, Photoshop och kan använda de sociala medierna i marknadsföringssyfte. Har goda kunskaper i biblioteksdatasystemet Book-it.</td>
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<td>Temporary position (focus new technologies)</td>
<td>Då kommunen arbetar i PC och Androidmiljö är det en fördel om du dessutom är välbekant med Mac och iOS som operativsystem. Utveckla bibliotekets dialog via webb och sociala medier.</td>
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<td>Permanent position (focus on coordination)</td>
<td>Du bör ha god kännedom och intresse för IT-relaterade frågor.</td>
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<td>Permanent position (focus child and young)</td>
<td>Vi har för närvarande en projektanställd mediepedagog som arbetar med det digitala berättandet och du kommer också att vara en del i detta arbete.</td>
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<th>Du har goda IT-kunskaper och kännedom om digitala kanaler som webb och sociala medier. Har du kunskaper i InDesign är det meriterande.</th>
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<td>kommer du att arbeta med viss it handledning med mera. inköp och medieplanering av såväl fysiska medier som e-medier.</td>
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<td>Genom olika estetiska uttryck, såsom exempelvis text, bild och digitala verktyg, skapar du försättningar för att barns kreativitet, fantasi och nyfikenhet utvecklas (digitalt berättande)</td>
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<td>Erfarenhet av arbete med tillgängliga medier för barn. Erfarenhet av skapande uttrycksformer analoga och digitala (digitalt berättande).</td>
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<th>Du har goda kunskaper i digitala och sociala medier.</th>
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<td>22</td>
<td>Temporary position</td>
<td>En arbetsdag på biblioteket består av att hjälpa besökare med frågor kring medier, bibliotekets webb, datorhantering, kopiering och utskrifter. För att lyckas i arbetet krävs goda kunskaper i svenska och engelska samt goda IT-kunskaper.</td>
<td>1.1 1.2 1.3 2.1 2.2 2.3 2.4 2.5 2.6 3.1 3.2 3.3 3.4 4.1 4.2 4.3 4.4 5.1 5.2 5.3 5.4</td>
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<td>23</td>
<td>Permanent position</td>
<td>Vi söker nu en läsinspiratör med ansvar för uppsökande arbete gentemot målgrupper med behov av tillgängliga medieformat.</td>
<td>4.3 5.2</td>
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<td>24</td>
<td>Permanent position</td>
<td>Du förstår och har kunskaper om: grundläggande historik om sällsynta böcker, kartor, tryck, fotografier, efemärt material, arkivhandlingar, handskrifter, originalkonstverk, audiovisuellt samt digitalt material.</td>
<td>1.1 1.3 3.1 3.2 3.3 5.1 5.2 5.3</td>
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<td>26</td>
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<td>27</td>
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<td>28</td>
<td>Permanent position</td>
<td>bred kompetens inom digitala verktyg och specialmedia: det kan innebära till exempel handledning i söktjänster, läsframjande arbete på webben och i biblioteksrummet. Det är meriterande om du har erfarenhet av arbete med specialmedia och utveckling av digitala tjänster.</td>
<td>1.1 1.2 1.3 2.1 2.2 2.3 2.4 2.6 3.1 3.2 3.3 4.1 4.2 4.3 5.1 5.2 5.3 5.4</td>
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<td>29</td>
<td>Permanent position</td>
<td>Vi söker dig som har digital kompetens. Det är meriterande om du har erfarenhet av BOOK-IT.</td>
<td>1.1 1.2 1.3 2.1 2.2 2.3 2.4 2.5 2.6 3.1 3.2 3.3 3.4 4.1 4.2 4.3 4.4 5.1 5.2 5.3 5.4</td>
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<td>31</td>
<td>Permanent position</td>
<td>Du har dokumenterad god IT-kompetens. Förtrogenhet med biblioteksdatasystemet Book-it är meriterande.</td>
<td>1.1 1.2 1.3 2.1 2.2 2.3</td>
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<td>Permanent position</td>
<td>Tjänsten kräver god digital kompetens och goda kunskaper i handledning och undervisning i informationsfärdighet. Kunskaper i biblioteksdatasystemen BOOK-IT/WeLib Erfarenhet av sociala medier och digitala verktyg</td>
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<td>32</td>
<td>Permanent position</td>
<td>Du kommer till exempel att arbeta med katalogisering i Libris och inköp av olika medieformat. Vi vill att du är intresserad av utveckling av digitala tjänster samt är trygg i det egna användandet av dessa.</td>
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<td>33</td>
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<td>Det är meriterande om du är väl förtrogen med digitala verktyg</td>
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<td>34</td>
<td>Permanent position</td>
<td>med att genomföra kvalificerad informationssökning och presentera vetenskapliga resurser som kunskapsstöd, databaser, tidskrifter eller annan service och tjänster som erbjuds från oss Du kommer att delta i bibliotekens löpande arbete vilket bl.a. innebär en . . . större del databassökningar</td>
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<td>35</td>
<td>Temporary position</td>
<td>Du kommer också att ansvara för bibliotekets närvaro i sociala medier.</td>
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<td>36</td>
<td>Permanent position</td>
<td>I ansvarsområdet ingår uppdrag att kommunicera ut bibliotekens aktiviteter i olika kanaler där fokus ligger på de digitala områdena Erfarenhet av t.ex. arbete som filialföreståndare, eget skrivande och webbpublicering i olika kanaler är meriterande. Arbetar du obehindrat i BOOK-IT 10.0, biblioteksplattformar så som Arena eller CSL Saga och har erfarenhet av InDesign är det också ett stort plus.</td>
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<td>37</td>
<td>Sedvanliga bibliotekarieuppgifter som till exempel informationstjänst, medieplanering och webb är också en del av ditt uppdrag. Du bör ha goda språk- och it-kunskaper</td>
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<td>39</td>
<td>Sedvanliga bibliotekarieuppgifter som till exempel informationstjänst, medieplanering och webb ingår också Du bör ha goda språk- och it-kunskaper</td>
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<td>41</td>
<td>Permanent position</td>
<td>Du har erfarenhet av att arbeta med olika digitala redskap och sociala medier</td>
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<td>42</td>
<td>Permanent position</td>
<td>Vi vill att du har kunskap i och intresse för medie- och informationskunnighet/digital kompetens</td>
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<td>43</td>
<td>Permanent position</td>
<td>Meriterande: Erfarenhet av biblioteksdatasystemet book-it.</td>
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<td>Permanent position</td>
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<td>50</td>
<td>Permanent position</td>
<td>Arbete med sociala medier och webb ingår</td>
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<td>51</td>
<td>Permanent position</td>
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<tr>
<td>52</td>
<td>Temporary position (focus IT-technologier)</td>
<td>I rollen som IT-bibliotekarie med systemansvar för Bibliotek Mark ingår att administrera vårt bibliotekssystem Book-IT. Du sköter självständigt arbetet runt detta, har kontakt med leverantören och har ansvar för att informera och utbilda övrig personal i systemet.</td>
<td>1.1 1.2 1.3 2.1 2.2 2.3 2.4 2.5 2.6 3.1 3.2 3.3</td>
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<tr>
<th>Temporary position</th>
<th>Vi vill att du har både kunskap i och intresse för . . informationskunnighet/digital kompetens. Du är väl bevandrad inom IT-frågor och sociala medier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent position</td>
<td>Meriterande är erfarenhet av: digitala tjänster ur ett användarperspektiv, arbete med digitala processer, tillgänglighet och tillgängliga medier, biblioteksdatasystemet Mikromarc</td>
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<td>60</td>
<td>fungerar i webbplattformar, appar med mer ses det som meriterande för tjänsten.</td>
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<td>61</td>
<td>Du marknadsför aktivt bibliotekets service i olika kanaler och forum. arbete med talböcker (DAISY) och nedladdningstjänsten Legimus samt ansvar för sociala medier Vi förutsätter att du har goda IT-kunskaper</td>
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<td>62</td>
<td>delat systemansvar för biblioteksdatasystemet ansvar för vår statistik. övergång till att bli ett Librisbibliotek och att implementera Dewey. Vi söker en bibliotekarie med hög teknisk kunnighet och en bred digital kompetens Du kan analysera numerisk och verbal data och andra informationskällor</td>
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<td>Permanent position</td>
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<td>64</td>
<td>Permanent position (responsibility for digital participation and media)</td>
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