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## Professional Competencies of Electronic Publishing: A Reflection from the Arab World

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### Abstract

The publishing industry has dramatically changed in the last two decades. Turning towards electronic publishing, (EP) has required crucial developments, one of which is to equip specialists with a variety of competencies for performing the technical and managerial tasks of (EP). To date, no study has comprehensively investigated the requisite competencies for these tasks and the sources of learning and qualifying EP professional, especially in Egypt and the Arab World. This paper identifies professional competencies for each task through a proposed matrix. To design this matrix, several related studies have been consulted to collect the defined competencies. Afterwards, a survey has been designed and distributed to explore the application of these competencies in the real EP practices. Finally, a Focus Group has been designed to assign the required competencies for each surveyed task. The results showed that the most practiced tasks are: EP planning, and acquisition. On the other hand, and in order to acquire knowledge and experience, specialists often rely on direct communication with experts and their colleagues at work and also design professional training courses. User support and communication are the most required competencies for (EP) tasks. Further, disciplinary knowledge category represents the highest weighted category among three categories of competencies. The matrix could be applied as a competence-based professional formal education and job training framework, which would help students and trainees meet the fundamental requirements of the labor market.

**Keywords:** electronic publishing; competence-based education; competencies; Skills; Labor market, Arab world.

### 1. Introduction

Over the course of centuries, publishing, which has been commonly known as “an accidental profession”, has suffered from the lack of organized professional development and training framework. Accordingly, knowledge and experiences of this industry have transferred from one generation to another through practice and on-the-job training without any formal education programs. In the 1940s, the Book Publishers Bureau (now called the Association of American Publishers) had sponsored the earliest efforts to offer educational courses in publishing. Afterwards, publishers, associations and publishers

themselves offered many training opportunities (Skinner, Lippincott, Speer, & Walters, 2014). Eventually, Library and Information Science (LIS) educational programs have implicitly embraced the formal education of publishing in their curricula as parts of some courses.

Major changes have been made in the publishing industry since the beginning of the new millennium as a result of that shift from printed format publishing to a more dynamic delivery of information through a variety of electronic and digital formats (Turner, 2014, p. 388). By addressing the new changes and adopting the appropriate strategies to keep up with this shift, publishers are about to redefine the industry (Turner, 2014, p. 400). One of the most crucial aspects of the redefinition is determining the core competencies required to face the challenges of the dynamic information society and the growing technological environment. Therefore, striving to provide clients with satisfaction, publishing employers have recently sought the most qualified electronic publishing (EP) specialists with a variety of competencies, including those technical, managerial, and personal competencies.

In spite of the recent changes in the field, many recognize that publishing education programs often addresses some required new competencies insufficiently, especially the competencies of new technologies used in the production of traditional and recent forms of digital publishing. Nevertheless, (LIS) master's programs can, mostly, fulfil these requirements (Chikonzo, Kusekwa, & Mushowani, 2014, p. 111; Skinner et al., 2014).

In Egyptian universities, publishing education is typically included in the curricula of (LIS) programs. Recently, (EP) has become an independent specialization in a few universities (such as Cairo and Monoufia universities) where "Open Education Programs" of (EP) have been launched. These programs are supposed to be deeply specialized and to be essential suppliers of advanced (EP) competencies.

In addition, in Egyptian universities, (EP) project has been recently launched to build an integrated electronic environment for electronically publishing Egyptian academic journals and facilitating global access to national content. Moreover, many private sector (EP) companies have been recently established in the Arab region, as they found huge potential in the market due to the seamless need for transforming the Arabic content to digital format. This change concurs with the interest of many Arab governments to achieve such digital transformation. Many initiatives for the Arabic content digitization have been announced in Egypt, UAE, and KSA- <https://www.mcit.gov.sa/en/media-center/news/90390>, etc., with huge funds allocated for achieving these goals from the leaders of these countries (Taie & Mohamed, 2009).

Human development is increasingly foreseen among the most transformational forces of the 21st century. Its impact extends into a wide range

of industries, including (EP) that leads to serious concerns about the required competencies of EP professionals.

As such, this study can be immensely advantageous to these developments because the fundamental objective of the study is to identify the (EP) tasks based on surveying job market, in either higher education or private sector. Moreover, the study is meant to explore the required competencies for the professional performance of these tasks.

Before embarking on the details of the requisite competencies, it seems appropriate to present a brief overview of the meaning of competency. In fact, although competence and competency are often used interchangeably, researchers have demonstrated the difference between the two terms. "Competence indicates sufficiency of knowledge and skills that enable someone to act in a wide variety of situations"(Hadi, Hassan, Razzaq, & Mustafa, 2015, p. 1166). On the other hand, according to Program for International Student Assessment (PISA), "a competency is more than just knowledge and skills"; it involves the ability to meet complex demands by drawing on and mobilizing psychosocial resources (including skills and attitudes) in a particular context. For example, the ability to communicate effectively is a competency that may draw on an individual's knowledge of language, practical IT skills, and attitudes towards those with whom he or she is communicating"(DeSeCo, 2005, p. 4). Also, others refer to the following formula: competency = competence (knowledge X skills) + commitment ("Difference between Competence and Competency (Explained with Diagram)," 2016).

## **2. Literature Review**

This section reviews and highlights the most crucial findings of pertinent studies conducted to analyse the current trends in desired qualifications for employment in the (EP) industry, especially in the digital academic library environment. Examining numerous related papers demonstrates that there are two essential perspectives, including the academic perspective versus the professional perspective, as follows:

### **Academic Perspective**

For the most part, many studies over the world have long investigated the knowledge and skills sets required for LIS professionals in the digital academic library environment, including (EP).

To identify the core competencies required for digital librarians, Chio and Rasmussen (2006) conducted a survey asking digital librarians in the United States about their knowledge and skills, and if there is any shortage in their training. The survey highlighted the value of soft skills, communication, and project management skills as well. Further, it has revealed areas for which librarians' education and training had not prepared them adequately, some of which are knowledge of web-related languages and technologies, web design,

XML standards and technologies, and overall understanding of the complex interplay of software (Chio & Rasmussen, 2006, pp. 8-10).

In the same vein, Choi and Rasmussen (2009) collected the job requirements and qualifications from job advertisements for the positions related to digital areas. Their study showed that “current awareness and appropriate technological skills and experience in the digital library environment, knowledge and experience in creation and management of digital information, and metadata are the most required qualifications for digital librarian positions with high emphasis on management skills”(Choi & Rasmussen, 2009, p. 465).

Singh (2013) too identified three major challenges addressed by librarians in the knowledge society in the third millennium, namely Information Explosion, Explosive Growth and Usage of Web Resources, and Information and Communication Technology (ICT) revolution. These challenges, in turn, immensely require new skills falling into the following broad groupings: Understanding Customer Needs, Marketing, Communication, Presentation, and Management.

Also, in South Africa, an exploratory study of job advertisements and semi-structured interviews by Raju (2014) concluded from the previous literature that there are three major skills sets required for LIS professionals in the digital era academic library. The major sets include disciplinary or professional knowledge and skills (including technological knowledge), generic skills and personal competencies. This study indicated that the generic skills, especially ‘communication’, are the highest and most important required ranked skills.

**Focusing on specific aspects of (EP), some studies have conducted to emphasize the requisite competencies for each aspect, especially in the academic society.**

In their survey of the required competencies for Italian Institutional repository managers, Cassella and Morando (2012, p. 408) cogently pointed out that as these repositories have played a crucial role in the transformation of the scholarly communication system, new skills should be developed. These skills comprise, according to its rating, “management and communication skills, technical skills, and expertise with regard to access rights and preservation of digital content.”

Regarding Open Access (OA) model, academic librarians should acquire a general understanding of (OA), including (OA) advantages and applicable (OA) policies, and direct the researchers' attention to publishing their articles through (OA) (Chan & Shearer, 2013, p. 10). Furthermore, Chan and Shearer (2013, p. 14) stated, based on the previous studies, that the following generic skills are important in this regard: communication, project management, and technical and negotiation skills.

In terms of how academic librarians realize and act upon support for researchers' publishing, including institutional repositories and (OA), Hansson and Johannesson (2013) concluded that despite having several competencies regarding publication strategies and opportunities, librarians mostly feel insecure in the researchers' approaches, and there is a need to develop proactive attitudes among themselves for researchers' publishing.

Regarding editing, Hsu (2014) identified the essential competences from various literature associated with digital publishing editors, and he highlighted 84 of 527 potential competences as being crucial in this digital era to form "the Draft of Competence Framework of digital publishing editors". After conducting the Delphi Technique Questionnaire, the results yielded a total of 30 "critically essential" competences(Hsu, 2014, p. 20).

In Germany, a study performed into the consequences of technological change for the organizational structures of book publishing companies by Klamet (2016) found out that shifting to digital publishing has required an accurate identification of the managerial and technical skills needed for other activities beyond editing and production, with focus on the decision-making activity concerning choosing between in-house or outsources products and services.

Many studies have been conducted on library publishing, a growing subfield of publishing, focusing on the key fields in which library publishers require several training opportunities. According to Library Publishing Coalition(LPC), Library publishing is defined "as the set of activities led by college and university libraries to support the creation, dissemination, and curation of scholarly, creative, and/or educational works"(LPC, 2017).

In this regard, livonen and Huotari (2007, p. 93) emphasized that publishing as a research activity at university requires the library to be able to deal with other internal actors in scholarly communication in at least the following activities:

1. Engaging in teaching scientific communication;
2. Enhancing the benefits of (OA) publishing as a faster channel for publishing the latest findings;
3. Publishing dissertations, journals, and monographs in hard and digital copies; and training scholars and administrative staff to practice citation techniques.

In their two case studies, from the University of California, Berkeley Huwe and Lefevre (2013) asserted that digital publishing became a core competency among librarians in the current digital environment. Furthermore, the relative ease of digital publishing has widely provided the potential for librarians "to follow the user as they use the Web in creative ways" and to support the parent institutions strategically.

Vandegrift and Bolick (2014) argued that libraries should move into the role of publishing to maintain the heritage of “access for all.” They also implicitly demonstrated the need for acquiring knowledge on (OA) as a business model and connecting and collaborating with partners in the publishing industry.

Skinner et al. (2014) also concluded that library-publishing professionals, especially in the academic libraries, should possess the following variety of core skills to fill the gaps in this area: “technical, soft, traditional and emerging, entry-level, and leadership skill sets”.

**Regarding (EP) education and training, some studies have lately focused on specific skills that should be integrated into the curricula to keep up with the rapidly changing environment and its requirements.**

Maxwell and Fraser (2010) highlighted the educational project created by the graduate students at Simon Fraser University, which identified four essential concepts shaping a modern book publishing approach. These concepts include “the concept of an agile publishing methodology; the centrality of online content management systems; leveraging the web's HTML mark-up as a way of achieving an XML-based workflow; and the radical reconfiguration of promotion and marketing”.

Baruah and Hangsing (2013), in a study attempting to realize the changes required for LIS profession in India, pointed out an increasing gap between the competencies required at the job market and the LIS courses structure. They found that (EP) is the third most incorporated new LIS course, after digital libraries and networking, in response to “The recent spate of government funded digital library projects and consortia based electronic resource subscription”(Baruah & Hangsing, 2013, p. 61). On the other hand, they found ,in general, that more than 50 percent of the respondents in their survey felt that their LIS course did not fulfil their job requirement(Baruah & Hangsing, 2013, p. 70). Regarding (EP) , 85 respondents stated that the (EP) concept is currently required in their respective jobs, and 37 stated that the concept is taught in their respective LIS courses. Additionally, the study found that only 44%of the (EP) job requirements were covered by respondent’s respective LIS courses(Baruah & Hangsing, 2013, pp. 69-70).

Chikonzo et al. (2014, p. 111), in a study that assessed the changing needs of information professionals in Zimbabwe, found that (EP) is one of the major drivers behind changing the roles of those professionals, and they emphasized that LIS curricula should be critically reviewed on a yearly basis to keep pace with the changing needs.

A study on 36 university publishing programs in Croatia and over the world by Selthofer (2015) found that publishing competencies “ (editorial, ICT, business, graphic, marketing, organizational, cultural)” obtained through these programs enable the students to compete in the digital publishing market, and

the majority of the publishing staff have a professional background in publishing business.

Patel (2015, p. 432) enumerated the ICT skills, among the requisite skills required for librarians in the knowledge programs, as follows: “webpage development, database design and management, web publishing, Internet publishing, designing and application of search engines, and networking to gather, share and disseminate knowledge”.

### **From the practitioners' perspective**

Schwartz (1999, p. 107), in a study that discussed to what extent publishers need to re-engineer their processes in the light of the shift into (EP) , pointed out that publishers employing long-serving staff should seriously consider whether the current skills are appropriate for this new shift. Besides, Schwartz emphasized that the modern expected roles immensely depend on “negotiation and project management skills” rather than utilizing the technology.

In the same strain, Daniels (1999) stated that as technology is challenging and has impacts on the products of publishing industry, there are many skills required to implement these changes. Therefore, he suggested six areas of core skills needed for IT functions in the publishing houses, including the following: strategic, technical development, User Support, application development, relationship management, and operations and support (Daniels, 1999, p. 116).

In South Africa, the report of The Media, Advertising, Publishing, Printing and Packaging (MAPPP) SETA, which revealed skills needs and gaps in the publishing and print media sub-sectors, stated that one of typical skills required to fill “a significant gap between attitudes required and those available” stated that one of the typical skills required to fill “a significant gap between the attitudes required and those available” is enhancing the usage of (EP) tools through recruitment of specialists (Hagg, 2006, p. 18).

For traditional publishing employees concerned with the shift to digital publishing, Liao and Pan (2010) explored the professional competencies that those employees must possess. In their study, they found out that the key jobs in the digital publishing industry are “marketing planners, content writers and programmers”. In addition, encrypting digital files is the most required competency, among competence indicators, by digital publishing employees (Liao & Pan, 2010).

Moreover, in 2014, the seventeenth volume of “the journal of electronic publishing” included a special issue addressing “Education and Training for 21st Century Publishers.” The issue featured several contributions from new and ambitious publishers with their perspectives reflecting on experiencing publishing education or training. For example, Keener (2014) discussed many reasons making information and library schools the essential source of knowledge and skills required for publishing practice. Furthermore, Keener recommended that

practitioners should make use of any professional improvement opportunities to master new skills and gain up-to-date knowledge.

Regarding university presses, Alexander (2014) highlighted the skilled professionals currently required for scholarly publishing, such as professional designers mastering tools of designing books for e-delivery, sales and marketing staff aware of the significance of metadata and social media, and acquisitions editors who have the capability of building a network of relationships and awareness of academic disciplines.

Thompson (2014) too encouraged practitioners to enrol in the graduate (EP) programs in order to pursue the latest trends in this field and to acquire hands- on experience related to the day-to-day publishing business.

Regarding the Arabic literature, striving for surveying the Arab literature on (EP) competencies, we consulted the most comprehensive Arabic bibliography in LIS (Abdelhadi, 2003, 2007, 2017). After searching, we had found some research related to (EP) topics such as (EP) projects in the universities (EP) systems, and OA. Yet, no studies on the present topic were found. This result, therefore, indicates that the topic of (EP) competencies, especially in the Arab world, has never been paid attention by either academics or practitioners. This is due to the fact that (EP) in the Arab world is still an emerging industry in the academic society and private sector as well.

In summary, Table 1 shows the main topics investigated in the related literature and the most important list of the competencies extracted from these studies:



**Table 1. Related Work On (EP) Competencies**

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perspective	Main research topics	Concluded competencies	references
Academic perspective	- knowledge and skills for LIS professionals in the digital academic library	- Creation and curation of digital information (Web-related languages and technologies, Web design, XML standards and technologies, metadata, etc.). - Management. - Customer needs. - Marketing. - Presentation. - Disciplinary Knowledge. - Personal skills.	Chio and Rasmussen (2006), Choi and Rasmussen (2009), Singh (2013), Raju (2014)
	- knowledge and skills for Library publishing professionals	- Scholarly communication. - Digital publishing. - Open access. - Leadership.	(LPC, 2017), Huwe and Lefevre (2013), Vandegrift and Bolick (2014), Skinner et al. (2014).
	- knowledge and skills for professionals in specific aspects of (EP)	- Management. - Communication. - Preservation of digital content. - Access rights. - Technical and Negotiation skills. - Open access. - Project management. - Decision-making - Institutional repositories management. - Digital publishing production and editing.	Cassella and Morando (2012), Chan and Shearer (2013), Hansson and Johannesson (2013), Hsu (2014), Klamet (2016)
	- knowledge and skills integrated in curricula	- Agile publishing. - Online content management. - Webpage development. - Promotion and marketing. - Editing. - Business. - Graphic. - Organization. - Web publishing. - Networking - Culture. - ICT. - Database design and management - Designing and application of search engines	Maxwell and Fraser (2010), Selthofer (2015), Patel (2015)
practitioner's perspective	- Required Knowledge and skills for the shift into (EP) .	- Negotiation and project management. - Strategy. - Technical Development. - User Support. - Application Development. - Relationship Management. - Operations and Support. - Usage of (EP) tools. Sales &Marketing. - content writing - Programming. - Encrypting digital files.	Schwartz (1999), Daniels (1999), Liao and Pan (2010),
	- Education and Training for 21st Century Publishers	- Design. E-delivering. - Metadata. - awareness of academic disciplines. - publishing business. - Communication	Alexander (2014), Thompson (2014)

### **3. Methodology:**

This part will explore the implemented methodology including research questions, tools, approaches, data collection, and results analysis against the backdrop of the literature review “which concluded” that more exploratory studies are needed to discover the required competencies for professionally performing the EP tasks. The focus of this study is on the competencies and qualification required for EP professional practitioners. Therefore, this study addresses three research questions as follows:

1. What are the (EP) required tasks to be implemented by professional Practitioners while performing their jobs?
2. What are the educational and qualification sources for EP practitioners, so they can professionally perform the required tasks indicated in question (1)?
3. What are the professional competencies required for fulfilling the (EP) required tasks?

To investigate these questions, the study adopted quantitative and qualitative approaches using two tools. First, a questionnaire has been implemented to identify the (EP) required tasks and the sources of qualification. This tool is commonly used for surveying features and patterns explored in related studies such as (Chio & Rasmussen, 2006; Raju, 2014; Skinner, Lippincott, Speer, & Walters, 2014). In order to obtain the largest amount of data as much as possible, the questionnaire included a number of open-ended questions related to tasks identification as well as multiple-choice questions regarding sources and level of qualification acquired from each source. The questionnaire was distributed to a purposively selected sample of 32 participants, including well-known professional specialists working for (EP) companies and academic institutions in the Arab World. The list of the selected sample includes 12 specialists from 4 major EP companies in the Arab world representing (Hendawii (3), Digital Investment Co. (3), Knowledge (3), and Obeikan (3) as well as other 20 specialists working on (EP) projects in some Egyptian universities including (Suez Canal (5), Banha (5), Minya (5), and Assiut University (5). All participants were selected based on being graduates from Library and Information Technology and / or Sciences departments. Yet, the level of experience and period of practicing the EP tasks were not prerequisites for selecting the investigated sample. The questionnaire was distributed and collected from June to August 2017.

Afterwards, based on the analysis of the surveyed (EP) tasks as well as the appropriate competencies gathered through the literature review, A matrix of (EP) competencies has been constructed, which has finally included the weight of each competency required for each task. The vertical dimension of the matrix comprises the competencies, which were grouped into three categories: Disciplinary Knowledge, Generic Competencies, and Personal Skills. The horizontal dimension comprises the tasks which were grouped into two categories: Managerial and Technical tasks .

To fill out the matrix, the second tool was utilized by gathering a focus group of six (EP) experts. The objective was to assign the required competencies for each surveyed task. Experts were gathered in two sessions. The first session was held to allow each expert to fill out a copy of the prepared matrix from his/her perspective using a predefined three point scale for each task (0 = Not Required, 1 = to Some Extent, 2 = Required). The results of this session show the required level of importance for each competency by calculating the weights given to each task and the level of importance of task. A second session was held to meticulously discuss the results of the first session and consciously construct the matrix .

Each cell of the matrix (See Appendix A) represents the average scores identified by the Focus Group members. Moreover, cells are highlighted according to their scores (Red = Not Required, Yellow = To Some extent, Green

= Required) which eventually led to the total relative weights of the competencies required for (EP) tasks and the total degrees of the (EP) tasks as well. (Note: decimals were transformed to be integers)

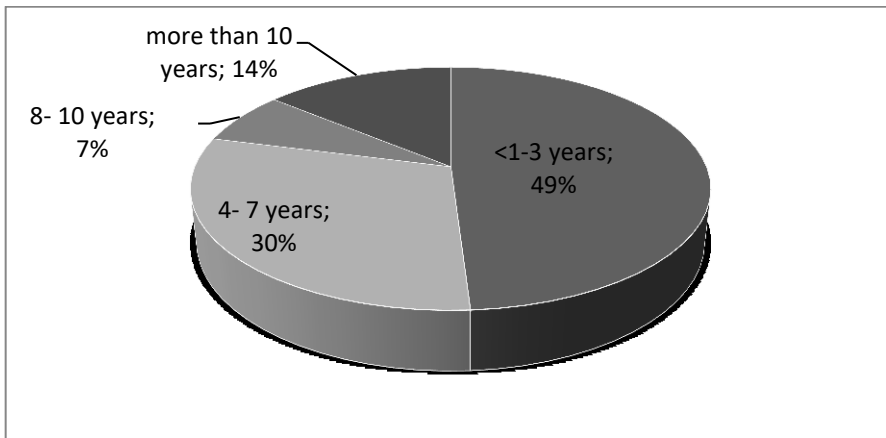
As such, whereas surveying the previous literature had provided the (EP) potential competencies, the questionnaire had gathered the possible (EP) tasks, and then the Focus Group yielded an assemblage of both the competencies and the tasks through the matrix.

#### **4. Findings**

This section encompasses the study findings and analysis as well. More specifically, findings are logically made up of the problem, research questions covering the survey analysis and the Focus Group results .

The first part of the findings analysis includes the EP practitioners responses to the survey questions, the purpose of which is to identify the various tasks of (EP) and the learning sources of these tasks. The ultimate goal is to assign appropriate competencies for each task through the matrix of (EP) competencies proposed in this study .

#### **Period of (EP) experience**



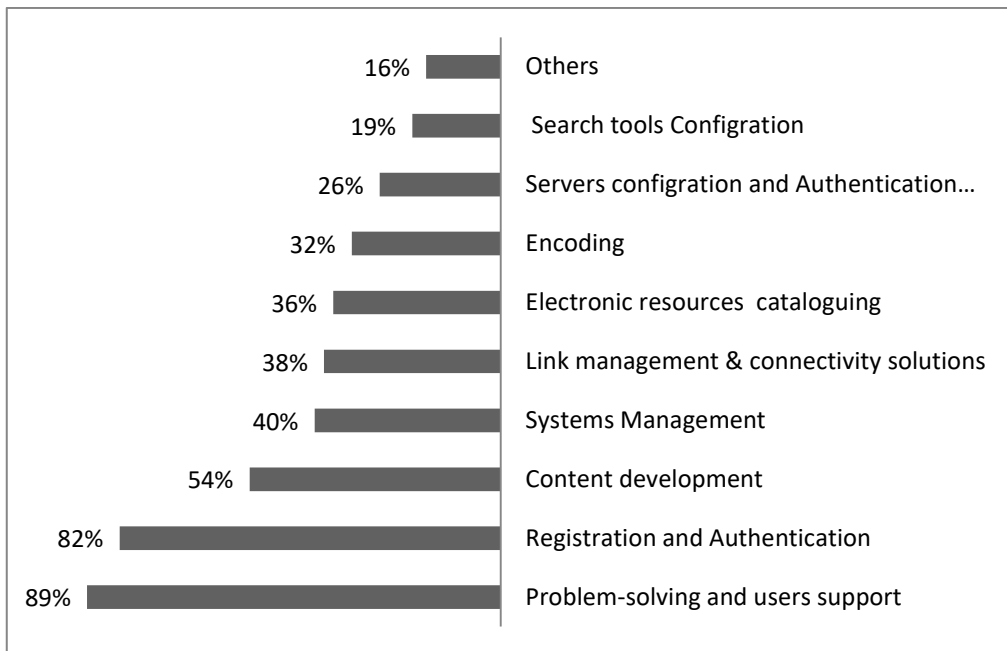
**Fig. 1. Period of (EP) experience**

As illustrated in Figure 1, approximately half of the respondents spent less than (1-3 years) of experience practicing their current job in (EP) and 30% spent (4-7 years), meaning that EP, especially in the academic environment, is still an emerging industry in the Arab world, in general and in Egypt in particular. However, the majority of the specialists are still beginners or paraprofessionals, only 21% have experience of (8-10 years) or more, most of whom had worked for

### **Main Categories of (EP) Tasks**

In this study, depending on the literature review and reconnaissance of the status quo of the Arab world as well, all (EP) tasks were grouped and classified into two main categories: Technical and Managerial tasks. The Technical category includes the tasks related to electronic resources, technical processing, production, retrievability, and preservation. However, the Managerial category includes the tasks related to information resources selection, planning, and marketing. The survey shows that 67% of the respondents are implementing the technical tasks. At the same time, 64% of them are performing managerial tasks. (Note that one response might apply to both categories )

### **Technical Tasks**

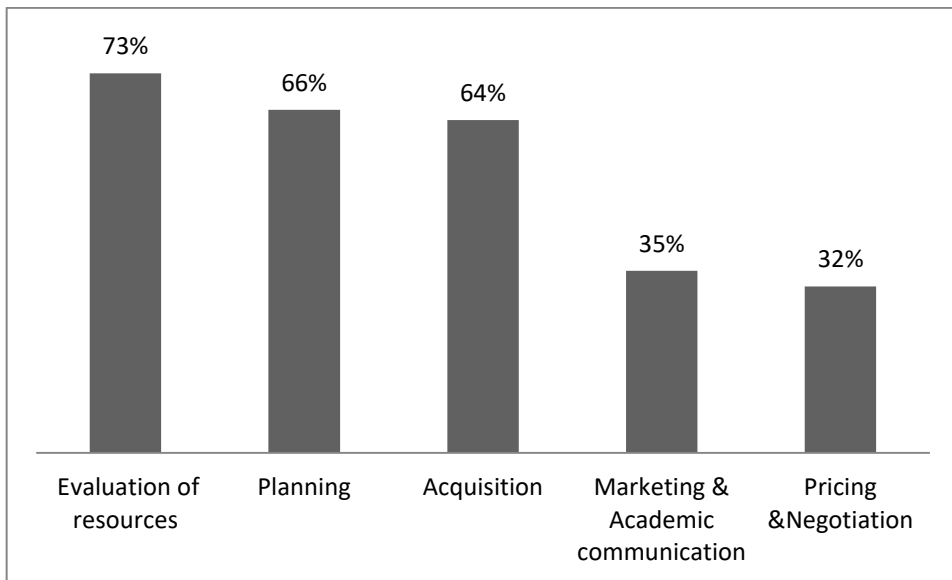


**Fig. 2 Technical tasks**

Figure (2) illustrates nine Technical Tasks performed by (EP) survey respondents. The most frequently reported Technical Tasks are problem solving and users' support (89%) registration, and authentication (82%). Accordingly, it is clear that the Technical Tasks directly related to the end user appear as a fundamental part of the EP professional's major duties. Similarly, core work required for (EP), content development (54%) and electronic systems management (40%) are the next frequent stated tasks. Nevertheless, computer

and programming specialists can play a largely prominent role in this work. Obviously, other mentioned tasks make up little fractions, which are immensely due to inadequate qualification for practicing these tasks in either education or workplace, and the increased dependence on computer science specialists as well. Cataloguing of electronic resources (36%) was excluded from that interpretation which traditional cataloguing specialists mostly perform. Others (16%) include (Cloud Infrastructure Management, Networking, Archiving, and Backup Storage(

### Managerial Tasks

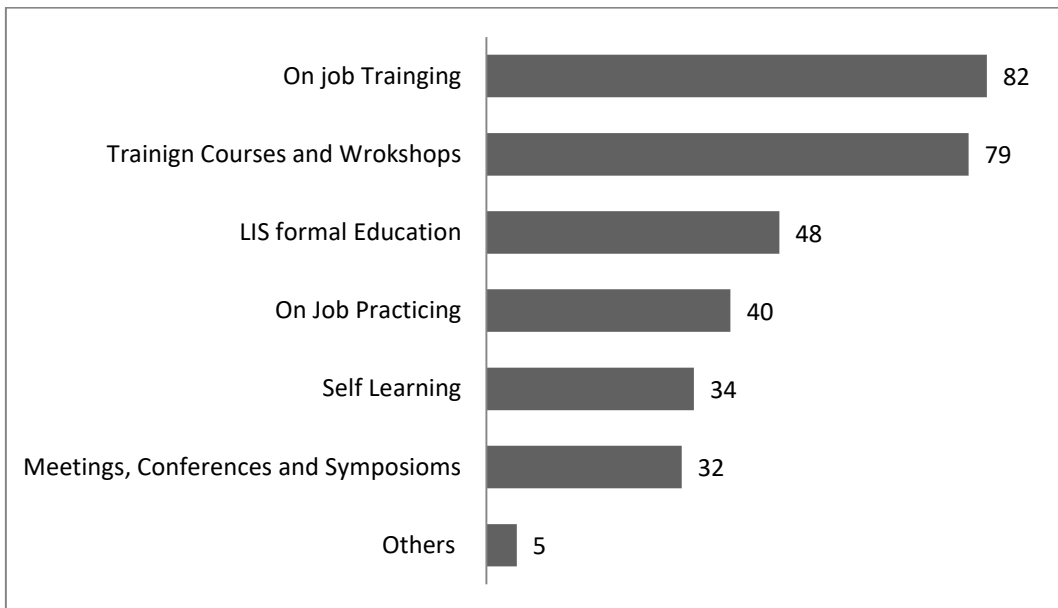


**Fig. 3 Managerial tasks**

With regard to other detailed tasks, Figure (3) illustrates the duties related to Managerial Tasks. Evaluation of information resources (73%), planning (66%), and acquisition (64%) are identified as the most frequently reported tasks. Notably, these tasks represent a part of the most important knowledge and skills generally in the librarianship specialization thought to be the major parts of several librarianship curriculums, such as acquisition, databases, and digital libraries. It is interesting to note that marketing and academic communication tasks represent only (35%) even though they are largely crucial tasks. That can be attributed to the fact that most of the (EP) products developed by the investigated selected sample are mainly directed to the academic communities, with which specialists should communicate to distinguish their needs and to discover their level of satisfaction for enhancing their products. Pricing and

Professional Competencies of Electronic Publishing: A Reflection from the Arab World \ Dr. Mona Farouk  
negotiation could also be considered a fundamental task performed by professionals although these tasks record a lower percentage (32%)

### Learning Channels of (EP)

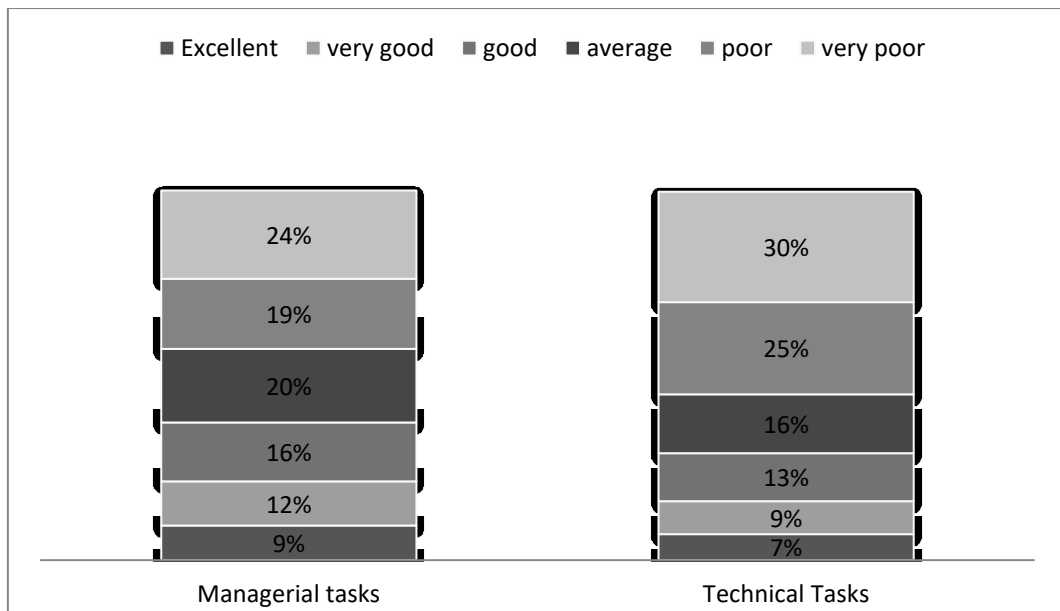


**Fig. 4 Learning Sources of (EP)**

What makes EP specialists qualified for their jobs? Surprisingly, LIS formal education programs, including publishing curriculums in particular and other related curriculums (48%) in general, do not appear as the most effective learning channels for qualifying (LIS) graduates for the labor market. However, there are two other more effective learning channels. As demonstrated in Figure 4 on job training, including direct interaction with colleagues and seeking advising from expertise, has been reported as the most frequent source of knowledge and skills (82 %). This type of on job training and advising is also acquired from employers, consultants, customers, vendors, and all other involved parties in (EP) industry. Training courses and workshops have also been identified as the second learning and qualification channel, because 79% of the respondents reported them as important learning and qualifications channels. Another reason for the ineffective role of LIS program in qualifying graduates to work in EP industry is the lack of capable and competent faculty members who are capable of teaching EP required knowledge and skills as reported by the respondents. Finally, other sources of learning, such as learning by chance from different discussion groups and informal observation from real world, were identified as learning channels that contributed (3%)

In spite of the ineffective role of LIS formal education compared to on job training, some LIS curriculums, such as digital libraries, reference and publishing, have been reported as important source of knowledge and skills in building human capacity for this career. Several learning channels have also been reported as a vital source of gaining knowledge and skills in EP industry, including on job practicing (40%), self-learning (34%), and attending events (32%). Other sources include on job practice, such as direct instructions and using manuals and trial and error. Many open self-learning sources have also become available for joining online training courses, attending webinars, and reading related books and articles. This also includes attending events such as internal meetings with managers and colleagues, external appointments with clients and partners and participating in conferences and symposiums. Now, the most two frequent EP sources of learning and qualification are more available through private sector than formal librarianship education. Given the fact that EP is a relatively recent industry in the Arab region in general and Egypt in particular, it is much more recent in the academic environment since the first comprehensive electronic academic publishing project in Egypt was launched in 2011 to convert 300 Egyptian universities' academic journals from being printed to e-journals (Mohamed & Hassan, 2015.)

### The role of LIS programs in Qualifying



**Fig. 5 LIS departement role in qulaifing for EP industry**

Participants were requested to determine to what extent LIS departments had participated in qualifying them to work in the EP industry. Figure 5 shows the

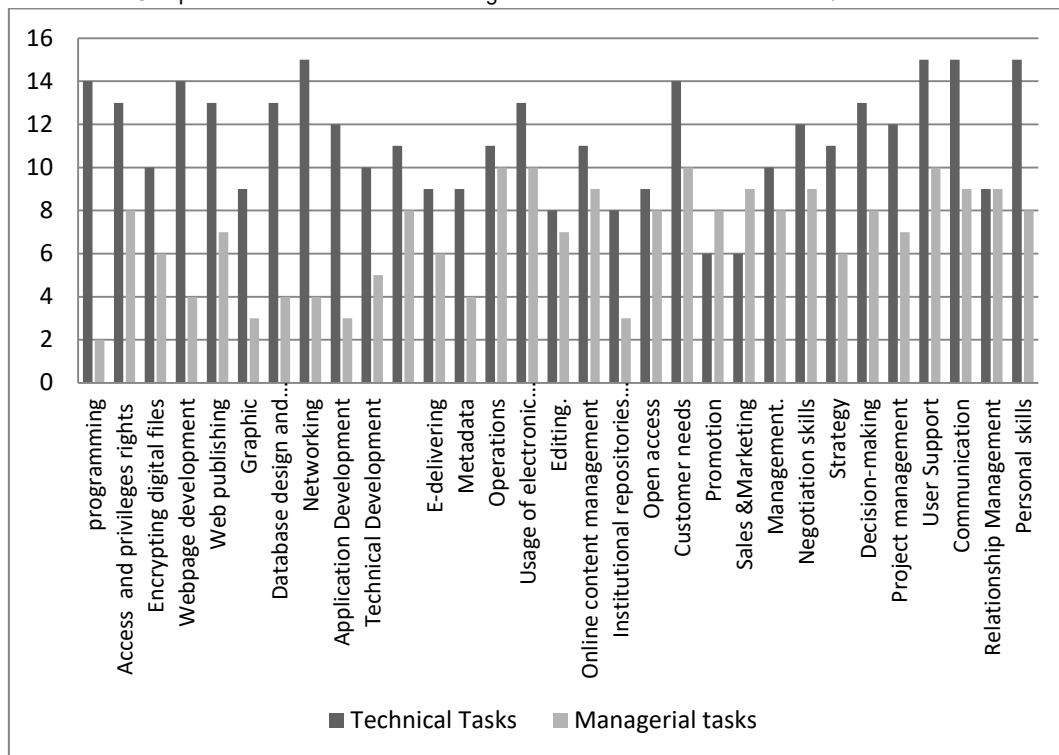
distribution of their responses. Unfortunately, there is a high general trend from the participants toward the insufficient LIS departments' role to support their preparedness for the required EP industry knowledge and skills. In general, LIS programs have qualified their graduates for performing the managerial tasks relatively higher than qualifying them to perform the Technical Tasks; 71% of the respondents indicated that Technical Tasks qualification is ranged from average to very poor, while 63% indicated that the Managerial Tasks ranged between average and very poor. As such, there is a necessity to reconsider LIS educational curriculum supporting (EP) to bridge the serious gaps in qualifying students for the EP labor market.

### **Proposed Matrix for (EP) Competencies**

**In order to explore the required competencies for EP tasks, participants were directed to report these competencies. The following table and figures indicate the results of the reported competencies and Appendix A shows the matrix elements.**

Table 2 and Figure 6 show the total relative score reported for both Technical and Managerial tasks. It is clear that Technical Tasks are in general more important than Managerial Tasks, with an average of 11.3 compared to 6.8 for the Managerial Tasks. It is surprising that competencies such as user support, communication, project management, and customer needs analysis were indicated as more important for Technical purposes than Managerial ones although they are mainly managerial. Two experts interpreted this result by emphasizing the importance of such competencies to achieve and follow-up on the required tasks. The Table, moreover, shows that the most important required competencies for performing the Technical Tasks include personal skills, communication, user support, networking, customer needs analysis, web developing, and programming. Regarding the Managerial Tasks, the most significant competencies are user support, customer needs analysis, usage of (EP) tools, operations, customer relation management, communication, and negotiation skills. In this context, one expert emphasized the need for Technical competencies, such as usage of (EP) tool, to perform some management tasks accurately, like acquisition and evaluation.

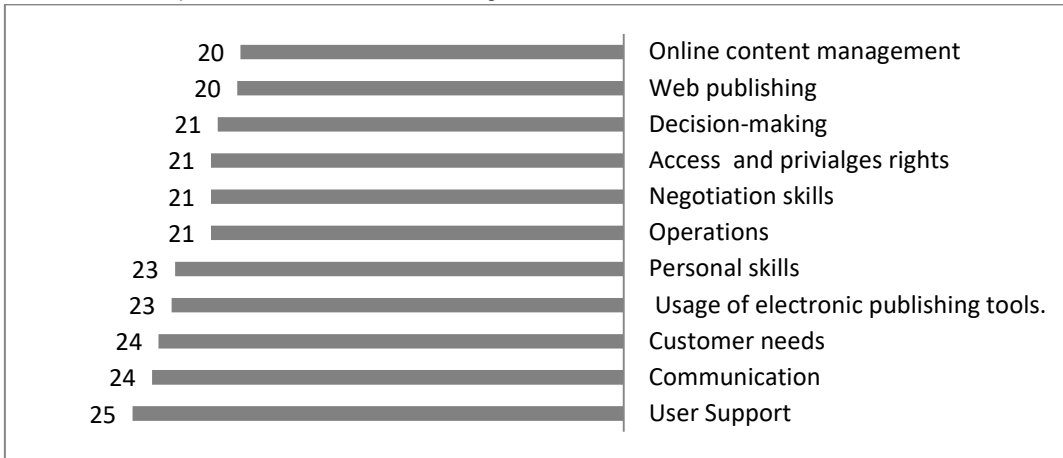




**Fig. 6 The level of importance of Technical and managerial Tasks**

As illustrated in Figure 7, participants have reported eleven competencies as the highly required competencies for the EP industry. These competencies emphasize and significantly focus on providing end user support. User support, communication, and customer needs analysis were identified as the three most prominent competencies for the (EP) tasks. In addition, six competencies including (customer needs analysis, usage of (EP) tools, operations, access and privileges rights, web publishing, and online content management) categorized under disciplinary knowledge category are highlighted among the top required competencies. In other words, this category has a crucial impact on qualifying (EP) specialists. Further, personal skills were reported as very significant among the top five required competencies due to their influence on the effective performance for both Technical and Managerial tasks .

In order to create a well conceptualized, less complex, and easy to manage matrix, personal skills details were removed from its category. It is a general attitude that often includes enthusiasm and initiative, leadership, capacity to work independently, ability to work under pressure, ability to respond to others' needs, adaptability and flexibility, capacity for continuous learning, fostering change, and reflective thinking(Raju, 2014 )

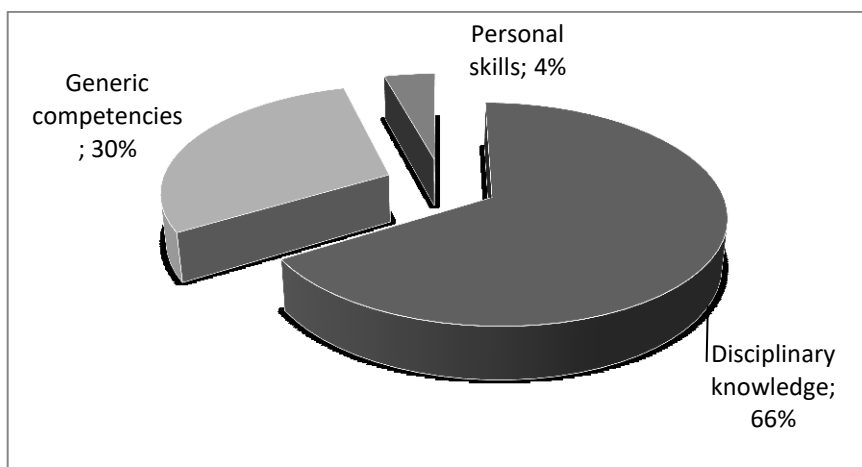


**Fig. 7 Top competencies required for (EP) tasks.**

**Table 2 Total relative weight of competencies required for electronic publishing**

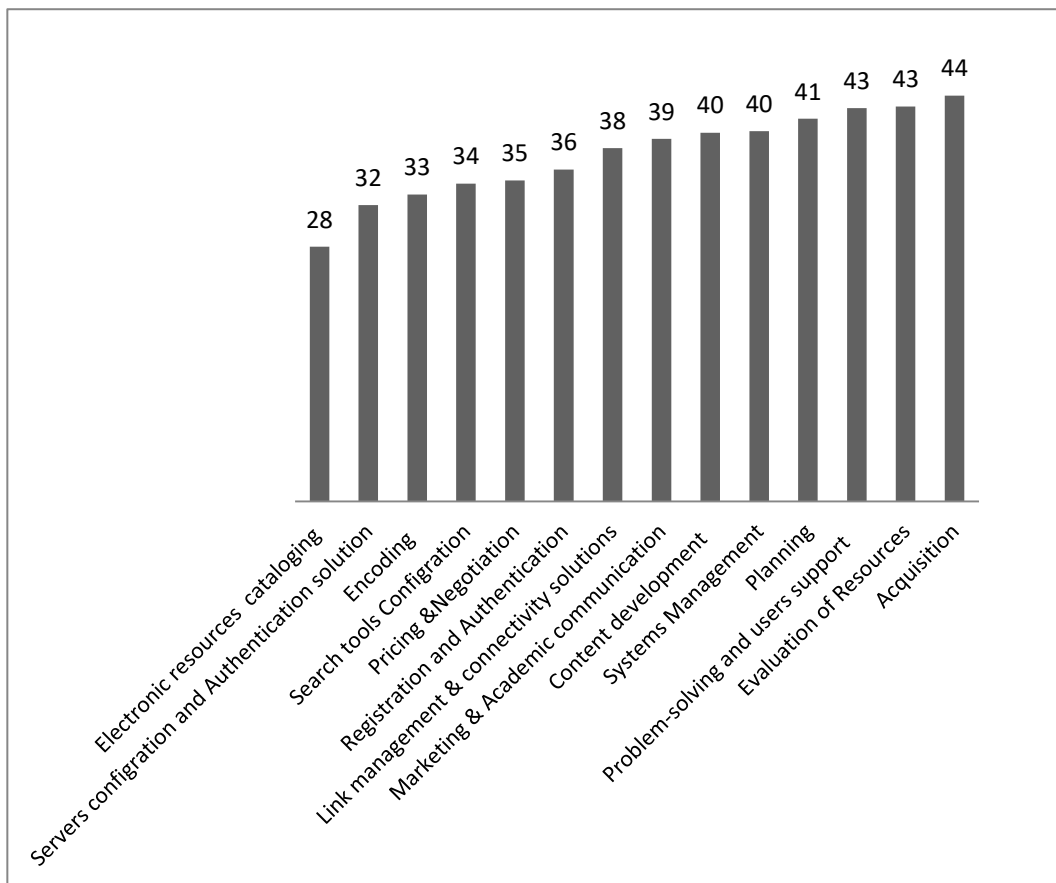
Competency	Total Relative Weight	
	Technical Tasks	Managerial tasks
programming	14	2
Access and privileges rights	13	8
Encrypting digital files	10	6
Webpage development	14	4
Web publishing	13	7
Graphic	9	3
Database design and management	13	4
Networking	15	4
Application Development	12	3
Technical Development	10	5
Creation and Curation of digital information	11	8
E-delivering	9	6
Metadata	9	4
Operations	11	10
Usage of electronic publishing tools.	13	10
Editing.	8	7
Online content management	11	9
Institutional repositories management	8	3
Open access	9	8
Customer needs	14	10

Competency	Total Relative Weight	
	Technical Tasks	Managerial tasks
Promotion	6	8
Sales &Marketing	6	9
Management.	10	8
Negotiation skills	12	9
Strategy	11	6
Decision-making	13	8
Project management	12	7
User Support	15	10
Communication	15	9
Relationship Management	9	9
Personal skills	15	8
Average	11.3	6.8



**Fig. 8 Relative weights of the three categories of (EP) competencies.**

According to Figure 8, the disciplinary knowledge category represents 66% of the total relative weight of competencies and the other two categories. Some may explain this result by the fact that knowledge category is more detailed and Technical Task oriented than the other two categories in the matrix. Moreover, no one can deny the prominence of this category in qualifying human resources, not only in (EP) but also in all other fields of work. Most of the experts involved in the Focus Group discussion immensely asserted this fact. Regarding generic competencies (30%) and personal skills (4%), the Focus Group experts stated that these two categories could be considered complementary and supportive.



**.Fig. 9 Total scores of (EP) tasks**

Figure 9 shows the total score reported for each task. This score represents the sum of the scores reported by the Focus Group members for each task. The vertical dimension of the matrix comprises the competencies, which were grouped into three categories: disciplinary knowledge, generic competencies, and personal skills. The horizontal dimension comprises the tasks, which were grouped into two categories: Managerial and Technical tasks. The total score for each competency and task were also reported. It is clear that the Focus Group members identified acquisition as the most important task followed by evaluation, problem solving and users support, respectively. These high scores are made up mostly of generic competencies, each of which has a score of two in these tasks (See Appendix A). Personal skills are a common denominator among the highest tasks in addition to some disciplinary knowledge competencies. On the contrary, the task of electronic resources cataloguing is the least. This is because most competencies required for this task get a score of

one, but few competencies including metadata, usage of (EP) tools, and customer needs get a score of two. Notably, all of these competencies fall into the disciplinary knowledge category. To interpret this finding, one expert revealed the reality that the more sophisticated the task is, the more competencies are required, and vice versa.

## **5. Discussion**

The focus on determining the competencies required for the tasks of (EP) has received little attention in prior research. Hence, the main tension underlying this study was to assign the requisite competencies for each task of the surveyed (EP) tasks through an initial matrix .

The Survey findings reveal several features related to both the (EP) tasks and the specialists in Egypt and Arab world as follows:

Specialists working in this field tend to be young, and they are recent graduates; half of them have <1-3 years of experience. This finding is in line with the literature that points to the fact that electronic areas typically attract the young generation of the library profession(Chio & Rasmussen, 2006). In addition, most of the EP tasks are relatively recent and still do not require experience(Choi & Rasmussen, 2009 ) .

Major categories of (EP) tasks in which the specialists are involved include Managerial Tasks (64%) and Technical Tasks (67%). This is an indication that both categories have approximately the same importance, and specialists are assigned to perform both of them; the specialist can perform the tasks related to both categories at the same time. Findings from the literature reiterate convergence of both categories either generally in digital library area (Chio & Rasmussen, 2006) or specifically in (EP) (Liao & Pan, 2010.)

Although Liao and Pan (2010) see that the key tasks in the digital publishing industry are marketing planning, content writing, and programming. The present study reveals that the most practiced tasks are related to providing direct technical support for users, such as problem-solving and users support (89%), registration and authentication (82%). Other important tasks include evaluation of resources (73%), planning (66%), and acquisition (64%). As such, Liao and Pan were more general in their conclusion, while the current study is more specific; the time interval between the two studies can interpret these differences. Notwithstanding, both studies agreed that planning and content development are crucial to (EP)

With regard to learning sources and the role of (LIS) departments in qualifying students to practice (EP) tasks, the findings show that the (LIS) departments in Egypt and the Arab world play a limited role in this area, and the specialists often rely on experts and their colleagues at work (82%) as well as the training courses (79%). This increasing gap between the requirements of the (EP) job market and the LIS curriculum and courses structure were discussed in

some related studies such as (Hagg, 2006; Baruah & Hangsing, 2013; Keener, 2014.)

In an attempt to fill a crucial part of this gap, the proposed matrix was constructed to shed light on the competencies required for each task to be taken into account in LIS courses or the (EP) job market as well. according to the competencies indicators shown by the matrix, user support and communication are the most required for (EP) tasks, yet different competencies were concluded by other studies in this regard such as "encrypting digital files" (Liao & Pan, 2010), "usage of (EP) tools" (Hagg, 2006) , and "negotiation and project management skills" (Schwartz, 1999 .)

Moreover, even though the disciplinary knowledge category represents the highest weighted category in this study, which coincides with the results of some other studies such as (Maxwell & Fraser, 2010; Patel, 2015; Selthofer, 2015), several other studies consider the generic competencies as the highest ranked category (Cassella & Morando, 2012; Chan & Shearer, 2013; Raju, 2014). Nevertheless, in the present study, the generic competencies represent the most dominant components of the highest surveyed tasks, including acquisition, evaluation and problem-solving and users support.

## **6. Conclusions**

In this subsection, in the light of the findings and the literature review, the study implications, its limitations, and further potential research are highlighted .

### **Implications for LIS education**

Considering the proposed matrix, LIS departments can upgrade and update their programs and curriculum to serve the needs of the EP market; the three categories of competencies should be embedded in the curriculum related to (EP) to enable graduates to practice the Technical and Managerial tasks. In addition, there is a need to give extra attention to the generic competencies, especially communication, and personal skills as well, because both of them are highly sought by the (EP) job market. Moreover, Interdisciplinary Academic Programs can be developed to gather both (EP) and other fields such as management, computer science, or copyright. The purpose is to enhance the competencies required for performing both Technical and Managerial tasks.

### **Implications for (EP) Employers**

The proposed matrix should be taken into consideration by the (EP) employers in either employing new specialists or evaluating the current specialists. The horizontal dimension of the matrix can be extended to include each task and its competencies, whereas the vertical dimension can include the specialists' names; each specialist will be graded in each task. As a result, the employers can diagnose both strengths and weakness in their workforce.

Accordingly, they will be able to plan for training and professional development and hire and dismiss workers

### **Limitations and future research**

One of the most serious limitations in this study was the limited sample due to the limited number of professional specialists working in (EP) in Egypt and Arab world, especially in universities; there are only 4-7 specialists at most in some universities, whereas other universities lack specialists. Further, there are also a limited number of reputable (EP) companies legible to be surveyed as specialized in EP. The Focus Group also suffered from the lack of experts in the field. Consequently, the current study can be considered a precursor to another envisaged wider study in the future. Besides, explorative research may build on the proposed matrix, and it can also provide this matrix with more tasks and competencies. Furthermore, field studies may use the matrix to survey the empirical competencies available in the (EP) job market in order to check the strengths and gaps in workforce involved in this field in either the Arab world or other parts of the world. Finally, we hope this study will motivate others to conduct deeper research on this highly interesting topic.

### **Acknowledgement**

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Appendix (A) Proposed Matrix of (EP) Competencies (Technical Tasks)

Category	Task	Problem-solving and users support	Registration and authentication	Content development	Systems Management	Technical Tasks						Weight
						Link management & connectivity solutions	Electronic cataloging	Encoding	Servers configuration and authentication	Search tools	Configuration	
Disciplinary knowledge	programming	2	2	1	2	2	0	2	2	2	1	14
	Access and privileges rights	1	2	1	2	1	1	1	2	2	2	13
	Encrypting digital files	0	1	1	1	1	1	2	2	2	1	10
	Webpage development	1	2	2	2	2	2	2	2	2	1	14
	Web publishing	1	1	2	2	1	2	2	2	2	2	13
	Graphic	0	1	2	2	1	1	1	1	1	1	9
	Database design and management	2	1	2	2	2	2	2	2	2	1	13
	Networking	2	2	1	2	2	2	2	2	2	1	15
	Application Development	2	2	1	2	2	1	2	2	1	0	12
	Technical Development	2	2	0	1	1	1	1	1	1	1	10
	Creation and curation of digital information	1	2	2	2	1	1	1	1	1	1	11
	E-delivering	1	2	1	1	1	1	0	1	1	1	9
	Metadata	1	0	2	2	0	1	2	2	0	1	9
	Operations	1	1	1	1	2	1	2	1	2	1	11
	Usage of electronic publishing tools.	2	1	1	2	2	1	2	1	1	2	13
Editing.	1	1	2	1	1	0	1	1	0	1	8	
Online content management	2	0	2	2	1	1	1	2	0	2	11	
Institutional repositories management	1	1	1	1	1	1	1	1	0	1	8	
Open access	2	1	1	1	1	1	1	1	0	1	9	
Customer needs	2	2	2	2	2	2	2	0	1	2	14	
Promotion	2	1	1	1	1	0	0	0	0	1	6	
Sales &Marketing	2	1	2	1	0	0	0	0	0	0	6	
Management.	1	2	1	1	1	1	1	1	1	1	10	
Negotiation skills	2	1	2	1	1	1	1	1	2	1	12	
Strategy	2	1	2	1	2	1	1	1	2	1	11	
Decision-making	2	1	2	1	1	1	1	1	2	2	13	
Project management	2	1	2	2	2	1	1	1	1	1	12	
User Support	2	2	1	2	2	2	2	1	2	2	15	
Communication	2	2	1	2	2	2	1	1	2	2	15	
Relationship Management	1	1	0	2	2	2	2	1	0	1	9	
Personal skills	Personal skills	2	2	2	2	1	1	1	2	2	2	15
	Total degree	43	36	40	40	38	28	33	32	34		

Appendix (A) Proposed Matrix of (EP) Competencies (Managerial Tasks)

Category	Task Competency	Managerial Tasks					Evaluation of Resources	Weight
		Pricing & Negotiation	Marketing & Academic communication	Acquisition	Planning			
Disciplinary knowledge	programming	0	0	1	1	0	2	
	Access and privileges rights	1	2	1	2	2	8	
	Encrypting digital files	1	1	1	1	2	6	
	Webpage development	0	1	1	1	1	4	
	Web publishing	1	1	2	1	2	7	
	Graphic	0	0	1	1	1	3	
	Database design and management	1	1	1	0	1	4	
	Networking	0	1	1	1	1	4	
	Application Development	0	0	1	1	1	3	
	Technical Development	1	1	1	1	1	5	
	Creation and curation of digital information	1	1	2	2	2	8	
	E-delivering	2	1	1	1	1	6	
	Metadata	1	0	1	1	1	4	
	Operations	2	2	2	2	2	10	
	Usage of electronic publishing tools.	2	2	2	2	2	10	
	Editing.	1	1	1	2	2	7	
	Online content management	2	2	2	1	2	9	
	Institutional repositories management	0	1	1	0	1	3	
	Open access	1	2	2	1	2	8	
	Customer needs	2	2	2	2	2	10	
Promotion	2	1	2	2	1	8		
Sales & Marketing Management.	1	2	2	2	2	9		
Management.	1	2	2	1	2	8		
Negotiation skills	2	2	2	2	1	9		
Strategy	1	1	1	2	1	6		
Decision-making	1	2	1	2	2	8		
Project management	1	2	1	2	1	7		
User Support	2	2	2	2	2	10		
Communication	2	2	2	2	1	9		
Relationship Management	2	2	1	2	2	9		
Personal skills	1	2	2	2	1	8		
Total degree		35	39	44	41	43		