

DE GRUYTER
SAUR

Judith Mavodza

NAVIGATING AND MANAGING AN ACADEMIC LIBRARY

BEST PRACTICES FROM THE ARABIAN GULF REGION

**CURRENT TOPICS IN LIBRARY
AND INFORMATION PRACTICE**

Judith Mavodza
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Background

The purpose of this book is to alert library and information science (LIS) professionals working in the Arabian Gulf higher education establishments that there is an ever-increasing demand for them to possess skills and trainings that are vastly different from what many of them originally anticipated. The world over, in academic institutions, the fast-changing information environment has altered work patterns and student expectations. The library is admittedly no longer the singular information center of a university. This book is unique in concisely addressing the impact of new and enhanced approaches to library service, encompassing topics such as Information Literacy (IL) skills acquisition, Media Information literacy (MIL), artificial intelligence (AI) in academic libraries, research data management (RDM), and confronting the concept of VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) as mentioned by the Research Planning and Review Committee of the Association of College and Research Libraries (ACRL) (2020) and elsewhere before that.

While the same topics are usually discussed to cover many parts of the world, this book takes a perspective of highlighting how the said changes impact library service in Arabian Gulf academic libraries, i.e., in Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. Traditional library service is still very important but tailoring the librarian's role so that it is blended in all student-centered activities and promoting university scholarly products is needed, and that also raises the visibility of the library in its institution. The image of the academic librarian has therefore continued to evolve into one that includes being an engaged effective educator in the digital networked era, and enabler in curriculum change. This is demonstrated by Arabian Gulf-specific examples or scenarios whenever available. Academic librarians are now collaborative educators who focus on the researcher and the student, meaning that they must understand how learning happens. They are also increasingly collaborating with researchers, journal publishers, and actively involved with repository creation, research data management, handling data and providing digital services.

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Chapter 1

Academic Library Systems, Services, and Products in the Arabian Gulf

1.1 Introduction

The service and support that a library provides to the university community is always a work in progress because of the fast-changing information environment and constantly evolving library patron requirements. There have been suggestions from various researchers to use a market-oriented approach with modern technologies, entailing the prioritization of customer needs and expectations. These needs include, for example, services appropriate to local culture as well as providing service to net generation students and researchers. Librarians supporting net generation students are therefore effective if they understand how learning occurs in this new reality but bear in mind that this is also a diverse user group. This chapter informs the reader about academic library systems, services, and products in the Arabian Gulf countries of Oman, Kuwait, Qatar, Bahrain, United Arab Emirates (UAE), and Saudi Arabia. Inevitably the framework of volatility, uncertainty, complexity, ambiguity (VUCA) and its suitability in understanding regional matters is considered.

1.2 VUCA and Academic Libraries

In modern times, there are so many changes and developments taking place that individuals in their jobs and professions become excessively anxious about the future. Academic librarians wonder if there are ways of future-proofing the profession. VUCA has been used as a principle in many discussions to confront complicated and confusing anxiety-causing fast changes. A former army officer, Bakshi (2017) wrote the book *The Forward-Looking Manager in a VUCA World* from the perspective of using army lessons to successfully manage projects in today's turbulent professional environment, with useful suggestions about proactivity.

Falkenberg (2019) explains that volatility is when people cannot predict the future, because they are dealing with a massive rate of change happening often and fast. Bennett and Lemoine (2014) suggest the impact of natural disaster on prices as an example of a volatile situation. In academic library situations, the volatility of textbook pricing stands out and it is difficult to predict where that

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takes libraries and library service, compounded by volatile library budgets. Falkenberg (2019) refers to uncertainty as the unpredictable nature of what could happen in the future despite having collected a lot of data to show how things went, and what was successful. All people do is try to analyze their behaviour and predict trends. In the academic library, this can mean being unsure what format future textbooks will take, with collection development, resource licensing, pricing, and access implications. Moreover, the most uncertainty to library work has been brought on by advances in technology which are taking new directions, including increasing AI-directed functionalities and applications.

Falkenberg (2019) mentions that complexity happens when it is unpredictable to navigate because changing one thing may affect many other things. Bennett and Lemoine (2014) give the example of complex situations arising from doing business in multiple countries and having to deal with the accompanying regulatory environments and cultural values. In library terms, complexity can be in the form of research questions posed by scholars and researchers, resulting in multiple ramifications for service, librarian expertise, resources, and services available. The footprint of change is also reflected in revisions in the LIS curriculum in library science schools. Another expression of uncertainty is in data stewardship and open access and the role the library plays in supporting those. Falkenberg (2019) ends by confirming that ambiguity is when there is more than one possible meaning to what is happening, thereby causing confusion. Bennett and Lemoine (2014) give the example of ambiguity arising from launching products outside specified core competencies. In the academic library situation where IL skills instruction is a one-shot experience with a class, assessing its effectiveness may be encumbered with a lot of ambiguity. The situation becomes more ambiguous where some are questioning the value of a university degree, e.g., the news article by Field (July 11, 2016) expressing the suggestion to “stop sending so many young people to university”.

But then, in support of facing life beyond VUCA, Jenkins and Eoyang (2020) argue that this concept has lived beyond its time and may not necessarily apply to environments outside the United States. And yet, one only needs to look around for theories and frameworks originating from one part of the world and being applied to completely different environments and circumstances. But at the same time, it is pragmatic to think beyond VUCA.

1.3 Beginnings of University Libraries in the Surroundings of the Arabian Gulf

Over 35 years ago, Ali (1986, 238), in writing about Arabian Gulf universities, mentioned that “until recently there was no concept of a university library system, and libraries within the same university were often operated independently”. Moving on from that era, one can suggest that they still are relatively young when compared to those from other areas and eras, e.g., Alexandria Library in Egypt which, according to *Encyclopaedia Britannica Academic* (2021), was founded in 283 BC. Reference to the Alexandria Library arises from its origins of having been created by Ptolemy I Soter at the instigation of the scholar and orator Demetrius of Phalerum (an exiled governor of Athens) in 297 BC (*Encyclopaedia Britannica Academic*, 2021). The library would house a copy of every book in the world. Though not an academic library, an awareness of the need for a great library, by a scholar, cannot be ignored. But then, even though the contents of the library were of high value, the systems in place, the services provided, and available products were inevitably elementary when compared to the year 2021 onwards.

History mentions that, originally, libraries in the Arab region were needed for the preservation of the Quran, the Muslim Holy Book which stands out as a prototype of the written word in Islam, signifying a major role within its intellectual tradition and educational system. In that context, Mosques that were central to everything in a Muslim society’s daily life also became libraries that stored and preserved all knowledge, i.e., from the Holy Book to books on religion, philosophy, and science, including places like Al Zaytūnah in Tunisia (Arjmand, Mirsafa, and Talebi 2018). The *Encyclopaedia Britannica Academic* (2021) mentions that this is a mosque in Tunis and the seat of an important Muslim university dating back to the eighth century. Gradually, libraries contained encyclopaedias, translations, commentaries, and treatises written by Muslim philosophers, scholars, and scientists. This history is based on the existence and availability of paper.

The *Oxford Companion to the Book* (2010, n.p.) dates the invention of paper to AD 105, “attributed to Cai Lun (d. 121)”, an inventor of Chinese origin. The *Oxford Reference online* (2012, n.p.) reveals that in AD 751, “skilled Chinese paper-makers are captured by the Arabs – beginning the slow westward transmission of the technology of paper”. The same source also affirms the fact that cuneiform, one of the earliest inventions of writing style, was used in Mesopotamia (present-day Iraq) between 3400 and 3300 BC. The *Encyclopaedia Britannica Academic* (2021, n.p.) also mentions that “it has long been known that the earliest writing system in the world was Sumerian script, which in its later stages was known as cuneiform” in Mesopotamia. But then, Hayes (2018), in a papyrus-parchment-paper analysis, provides an account of the development of

writing material from papyrus to parchment, and then paper. Then also, the merging of writing and paper was very gradual, over a long period of time.

With the availability of paper combined by the existence of writing, the Muslim world quickly began to progress in its development of libraries. Some book collections were also located inside the schools or Madrasa throughout the major Islamic cities (Arjmand, Mirsafa, and Talebi 2018). Libraries often employed translators and copyists in large numbers, to render the books into Arabic from Persian, Greek, Roman, and Sanskrit. According to the *Encyclopaedia Britannica Academic* (2021, n.p.), in the Islamic world, “notable libraries were established by the ‘Abbāsīd caliph al-Ma’mūn in Baghdad in the 9th Century and by the Fāṭimid caliph al-Mustaṣṣir in 11th Century Cairo.” From the eleventh century, Islamic states in Africa began to see a rapid development in education where libraries of importance included that of Timbuktu whose many manuscripts were important for over 600 years in the Ghanaian, Malian, and Songhai empires (Library of Congress, Global Gateway 2007). Generally, in the ancient Middle East world, libraries existed in Iran and Iraq, being a feature in royal palaces, in buildings of worship, and in private homes, but similar examples were also present in many different parts of the world. With this brief historical background, one needs to view the gradual progression to where academic libraries in Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE) generally and currently are in the 2020s.

1.4 About Keeping of Books and LIS Training

University libraries are regarded as one of the most important spaces available for student learning. Discussing them is to emphasize their central role in supporting the strategic direction of academic institutions. Initially, libraries were not as accessible as they are today, with some allowing access only to reputable scholars. That practice existed in Islamic libraries and was not different from international practice when one considers practices in the Americas and Europe. During that era, libraries were predominantly storage spaces for clay tablets, coins, papyrus, and eventually print-on-paper books, and librarians kept them secure. As the keeper of books, a librarian had monopoly of the knowledge about how book accessioning and retrieval systems worked. Then also, much later, Ranganathan (1931) suggested a philosophy through the five laws of library science or Ranganathan’s Code to guide library services and methods but targeting print resources. The laws are: 1. books are for use; 2. every reader his [or her] book; 3. every book its reader; 4. save the time of the reader; and 5. the library is a growing organism. The title of a March 16, 1980 *New York Times* article by Karen de Witt called “The

Humble Librarians Are Humble No More: Keepers of Books Struggle for Solvency in Ingenious Ways” confirms a generally held view that all along librarians were recognized as keepers of books, but not much more. But moving on to today’s environment, the IT enabled services and information society processes facilitate the still relevant and applicable implications of Ranganathan’s Code, albeit inclusive of e-resources and information in all formats.

To arrive at Arabian Gulf academic library systems in place now, there is a historical development with international influences. For many years, these countries largely depended on expatriates as academic librarians (Ali 1986). This refers to individuals with the LIS qualifications to support university teaching, learning, and research. In the process, they established all kinds of libraries and information institutions. Furthermore, they contributed to organizing professional and technical workshops and short training sessions aimed at boosting competencies and skills to work in libraries and information institutions. The need for local qualified librarians has been increasing due to a rapid development in all sectors of life in the region, but the creation of library science schools has been sluggish. More comments on this aspect are alluded to in Chapters three and four.

The history of librarian training programs has seen many challenges that include low enrolment that results in the termination of some of the programs. However, that does not diminish the need for well-qualified academic librarians who have the requisite respect for and from faculty. In fact, when the number of skilled librarians increases, there is a possibility to form professional associations that help with communicating and continuous professional development (PD) among members as well as with other similar groups. The reason for desirability of more qualified LIS professionals comes out of the reality of a fast-changing information environment with a demand for completely different skills sets in addition to the traditional librarian ones. Robati and Singh (2013) enumerate several competencies among librarians that include communication and interpersonal-related skills, research-related, information technology-related, information services-related, information organization-related, collection development-related, and management-related ones. More types of required librarian competencies and skills continue to evolve. It is in this context that a closer investigation of library management systems is useful since they depend on librarian competencies and have become central to library activities and services.

A product of library service that stands out is the teaching of information literacy (IL) skills. But then it no longer stands on its own since more literacies have become a part of the way information is discovered, accessed, evaluated, and used. There is digital literacy (DL) and media and information literacy (MIL) skills that help improve the autonomy of individuals of any society. Currently, qualified professionals are expected to possess superior competencies, including MIL and

DL, in service provision and individual lifelong learning. That in fact means librarian workplace competency also refers to the knowledge or variety of skills that they have or exhibit, and an ability to meet complex demands in their work environments. For example, they must also possess “cognitive skills for analysis, synthesis, and evaluation of information” (Pausch and Popp 2004), technical skills which include advanced technical knowledge (beyond typical office application knowledge) (Magnuson 2017), interpersonal skills which encompass language and attitudes that are useful in interacting with library patrons, and more.

Along with that, the ability to communicate effectively is a competence that may draw on an individual’s knowledge of language, practical information technology skills, and attitudes towards the community they are supporting. MIL brings together Information Literacy (IL), Media Literacy (ML), and ICT or Digital Literacy (DL) dimensions. UNESCO (2013, 17) defines it as “a new literacy construct that helps empower people, communities and nations to participate in and contribute to global knowledge societies”. The implication of this definition is that both educators and learners need that competency. Carlsson (2019) points out that “media, and concepts connected to MIL, are often seen with eyes that have been conditioned by analytical categories developed predominantly within the Anglo-American sphere”, therefore can easily be dismissed as foreign to many places.

The United Nations Alliance of Civilizations (UNAOC) (2020), using their online Media and Information Literacy for Teachers resources, suggest the application of metacognitive theory, also mentioned by Pausch and Popp (2004), in MIL education. If one considers the fact that there is, for example, an existing news meter at <https://newsmeter.in/> for checking the veracity of news that is circulating in social media and a WhatsApp Research Awards for Social Science and Misinformation (2018) project launched to try and counter misinformation circulation on the WhatsApp platform, the implication is a high need for MIL. Perez (2018) reports of a multilingual DL library launched by Facebook aimed at educators. Croteau and Hoynes (2013, 306) add that “our adoption of new media technologies is producing significantly negative social consequences”. These examples demonstrate that competencies and skills expected of LIS professionals have evolved and continue that path. This is favorable for curriculum development everywhere including Arabian Gulf countries that are already offering LIS qualifications, and those planning to open LIS schools.

Lewis (2019) uses the Core Competencies for 21st Century CARL Librarians list of 2010 to define academic librarian core competencies as foundational knowledge, interpersonal skills, leadership and management, collections development, information literacy, research and contributions to the profession, and information technology skills. Besides referring to the said competencies of academic librarians, Lewis (2019) also mentions the importance of a clear understanding of

librarianship and professional practice, the library system and the larger institution within which librarians work. Hofer, Townsend, and Brunetti (2012) emphasize the importance of foundational knowledge, i.e., internalizing key facts and theories of a field to sufficiently grasp the concepts of its subjects. The Australian Library and Information Association (ALIA) (2015) has a policy entitled *Foundation Knowledge, Skills and Attributes relevant to Information Professionals working in Archives, Libraries and Records Management*. In it, foundational knowledge covers:

knowledge of the broad context of the information environment . . . the purposes and characteristics of information architecture, organisation and access . . . processes and practices relating to information management . . . information sources, services and products . . . general employability skills . . . and professional development.

The American Library Association (ALA) elaborates further by providing knowledge and competencies statements developed by relevant professional organizations, e.g., core competencies for music librarians, core competencies for law librarians, core competencies for electronic resources librarians, etc. to reflect different LIS specializations. These definitions are in line with the *Media and information literacy: Policy and strategy guidelines* (Grizzle et al. 2014) document created under the auspices of UNESCO.

For any library to function, the librarian must be able to develop the collection, i.e., have a foundational knowledge of basic scholarly publishing, collections management, digital preservation and records management. The knowledge is rooted in information and media competencies for current times. In the research arena, internet use has produced a variety of publishing methods, and an assortment in the quality of what is being published, making awareness of these issues very important. Inevitably, a strong understanding and commitment to critical thinking, lifelong learning, and basic information literacy principles is required. That is facilitated by the librarian being knowledgeable and committed to ongoing research and PD, i.e., staying current. To a large extent, these are rooted in having efficient internet facilities to work with.

In addition to having MIL skills, the discontinuous information environment makes it impossible to ignore the presence and impact of AI, regardless of geographic location. That is because AI has become a new MIL application due to being situated as curator and editor of personalized information, and LIS professionals must update themselves about it. A survey by Cox, Pinfield and Rutter (2019a) revealed the exclusion of libraries from the focus of AI development, ethical concerns, intelligibility of decisions, and data quality. The results also unveil some threat to jobs, confirming the same sentiment as expressed by Johnson (2018). This translates into an evolving curriculum for LIS training, altered work practices,

mandatory continuous PD, and job descriptions that only vaguely match those from a decade ago. This way, Ranganathan's (1931) Fifth law, "the library is a growing organism", is relevant and applicable even today.

There is an expectation that trained librarians are highly skilled at the search, retrieval, and ethical use of information as well as other professional skills. That expectation is based on assuming that LIS professionals receiving qualifications from institutions of higher learning have been transformed into information and media competent manpower. The challenge is not unique to LIS but faced in many disciplines because "a degree does not necessarily indicate your skill proficiency" (Virkus 2019, 157). This is the case despite the existence of technical and vocational education and training (TVET) programs that include LIS. That type of education system recognizes the "importance of broad-based entrepreneurial skills and mindsets to support employability and innovation" (McCallum 2019, 3).

LIS schools could adopt rigorous competency-based learning to help close the gaps between the skills being taught and what employers value, thereby branding themselves as spaces that cultivate industry-ready graduating individuals who can contribute to the attainment of SDGs. The skills required by industry and employers form a basis for higher education producing industry-ready LIS graduates. That makes it clearer to determine whether some MIL proficiencies are genuinely not applicable to some and to their work environments. Awareness of gaps is important. Library associations can also be more influential if empowered to provide credit-rated PD opportunities that minimize the said skills gaps, especially among those who have already graduated.

Having concerned stakeholders valuing and expecting certain professional competencies can open the gates for major updates in the LIS field. Davis (2017) points out that if students are aware that what they are learning are sought-after skills, they are likely to be more interested. It is the motivation or incentive to learn and adopt required skills that is necessary. Education institutions therefore must be more involved with their communities and industry to become aware of competencies needed. Perhaps working within a Triple Helix (Etzkowitz 2008) framework where there is three-way collaboration (Government-Industry-Higher Education) facilitates a realization of the TVET approach or vice versa.

Rodgers and Puterbaugh (2017) explain how Credly and WordPress plugin LearnDash was used in their library as a delivery platform in creating IL digital badges awarded upon completion of specific tasks and trainings created to inculcate skills in participants. Some concerns have been raised over this approach due to lack of recognition of such badges by employers, problems with quality control and standardization in what they are intended to achieve, and possible gamification of the system. Virkus (2019) highlights the perspective that if badges are poorly applied they are bad, but if well-used they lead to peer

learning and authentic assessment, facilitating workforce credentialing. Librarians the world over must also consistently examine the variety of media technologies to understand how media works.

Understanding how the media works is complicated by the murky world of fake news, deepfakes, and alternative reality that is currently prevalent. Undeniably, the current information environment has enabled people in general to be content creators, regardless of quality of their products, and an information explosion (Croteau and Hoynes 2013; Koltay 2011). For that reason, one can conclude that the actions of media consumers continue to determine its future, and Koltay (2011) suggests that educating people contributes to responsible use of it. Information professionals who contribute to these efforts therefore must be equipped with requisite MIL competencies, not only for use in their workplaces in their role as guides, but as information and media technology consumers themselves.

1.5 Library Management Systems

The cloud-based library management systems (LMS) in place in academic libraries as of 2021 include widely used ones such as Sierra ILS, Alma, Aleph, WorldShare Management Services (WMS), SirsiDynix Symphony, Koha, Evergreen, and more. These are for library services management, report production, knowledge discovery, and the capture of student data. Among the desired attributes that determine adoption, purchase, and usage are technical and vendor support for the systems including training and the ability for Arabisation (i.e., modified so that a system designed for use with a Latin script can be made to handle Arabic script) of all its modules, and customization (Khurshid 2003; 2006).

Information on library user groups can be collected from the LMS because it updates records daily. In many world universities, this information has been tied to systems that monitor student attendance and success (e.g., the Learning Outcomes Management component of Blackboard or Sakai, or GradesFirst), enhancing the potential to demonstrate the relationship of library use with student success (ACRL 2015; Soria, Fransen, and Nakerud 2013; Stemmer and Mahan 2016) besides also informing library collection development decisions. But according to the ACRL Research Planning and Review Committee (2020, 271), this approach is gradually losing momentum because the use of those analytics in fact “relates to student privacy, student agency, library ethics, and student trust in libraries as institutions”. The library services platforms enable librarians to broaden the range of activities built into their responsibilities. Currently, universities can benefit from improved management of research data and the research process, thereby reducing knowledge silos. Therefore, libraries must have coherent and efficient

workflows for managing all research resources, which has not been the case previously (Schonfeld 2017). This is not unique to Arabian Gulf countries. In fact, Koopman and Jager (2016, 42) point out that in South Africa, for example, “research data have not traditionally had a home in university libraries or university archives and have instead remained the responsibility of research units and researchers or, in some cases, have been archived in special collections associated with a particular research unit and its specialised focus”.

This is one of the reasons that academic libraries are revising their roles, becoming very closely aligned to the activities of their universities’ offices of research. This way, librarians and other research specialists can also provide scholars and students with support in the use of data and statistics analysis tools such as SPSS, Excel, R programming, STATA, MATLAB, etc. Subsequently, data collection and storage are built into the research procedure, necessitating the data management capability and specialization in librarians. The responsibility to support researchers is tied to the rankings debate which is discussed in Chapter five. The example of the libraries of King Abdullah University of Science & Technology (KAUST) in Saudi Arabia and Khalifa University of Science, Technology and Research (KUSTAR) in the UAE stand out, but they are not the only ones in the Arabian Gulf, as quotable examples of academic libraries evolving to match the needs of high research academic establishments. Their LMS systems are mainstream, but their use is highly dependent on the professionals working on and with them.

LMS packages are continuously updating and upgrading, and others are being taken over because of unprecedented demands and developments towards enhanced workflows. For example, Enis (2019) announced the acquisition of Innovative Solutions by Ex-Libris (the same company that owns Alma). This is the general direction that suppliers of library systems are taking, with some libraries opting to use open source solutions such as Koha that depend on having strong systems teams to tailor the technology for specified capabilities. It is also possible to integrate vendor services acquisitions software with the LMS. It has been found to be practical to use such platforms as Ingram’s Online Acquisitions and Selection Information System (ProQuest OASIS), or GOBI Library Solutions from EBSCO (formerly YBP Library Services), and these are web-based systems for searching, selecting, and ordering print and electronic titles. Using these and other similar competing systems is popular in the Arabian Gulf by academic libraries instead of direct Amazon, Kinokuniya, Barnes & Noble or Magrudy bookstore purchases primarily because books arrive shelf-ready, regardless of language. However, other universities still prefer to purchase direct from the publisher.

What is limited as of 2021 is consortial purchasing of library material in the Arabian Gulf region, whether this is within single countries, or the entire region. This is because the development of university library consortia (e.g., eFada in the UAE) is either a work in progress that demands unwavering commitment from a variety of constituents, or an idea that is discussed but with no concrete steps being taken towards its creation. Al Fadhli (2005) in a research about Kuwaiti libraries, Harrasi and Naeema (2014) about Oman, and Kader (2000) referring to Saudi Arabia and UAE all confirm the absence or brittle provision of national information policies that enhance academic library service. A research in Oman about academic library collaborative ventures by Harrasi and Naeema (2014) points to a lack of a national information policy as one of the reasons that militate against such ventures by these libraries. Such a policy would enable all kinds of libraries to organize meetings with policymakers to demonstrate the contribution libraries and access to information make to national development, and across the UN 2030 Sustainable Development Goals (SDGs). If this is the direction libraries in any region of the world wish to take, the approach can be guided by using a National Information Society template created by UNESCO (2009) Information for All Program.

Woodward and Henderson (2014) revealed that most librarians found the consortial model to work well and were sure that the advantage was in value for money, but publishers were not enthusiastic about it even when they did not suffer any financial disadvantage, while users benefitted by getting access to much more content. Belonging to a consortium enhances the affordability of resources through group negotiations, making it possible to purchase more. For example, when universities all use major expensive databases, some of which cover the same disciplines, subscription and access can potentially be less costly if it is through consortial negotiation and arrangement. This is about coping with Big Deal subscriptions, that are “an arrangement in which a library pays a lump sum for access to all of a publisher’s electronic journals, without individual subscriptions to each one” (*Dictionary of Publishing and Printing* 2006, n.p.).

1.6 Academic Library Services

The *Encyclopaedia Britannica Academic* (2021, n.p.) defines library services to include circulation services, reference services, online information services, inter library loans, IL skills training, copyright, intellectual property rights, and the economics of information, “all with variations in detail from country to country”. Research data services (RDS) support has become an additional solution

that academic libraries provide and is discussed in Chapter three in more detail. Librarians are also aware that providing service and support to the university community and satisfying everyone needs constant reviewing to meet ever-changing library patron expectations. Regional researchers such as AlKindi, Al-Suqri, and Al-Sarmi (2014) in Oman and Klaib (2014) in Jordan have suggested using a market-oriented approach with the use of modern technologies, i.e., prioritizing customer needs and expectations. The suggestions arise out of actual studies that have been performed in their libraries. These needs, in the instance of this book, include services appropriate to local culture as well as the requirements of net generation students.

Librarians supporting net generation students are effective if they understand how learning occurs in this new reality. It has, however, been found that this generation is not unanimous in preferences as “some students are driven by a desire to explore new technologies while others remain sceptical of them” (Guthrie, 2014, 150). This is interestingly confirmed by an internal Zayed University Library and Learning Commons Annual Satisfaction Survey Report (2015) which reveals a preference by most students to use print rather than e-books. The apparent unpredictable and sometimes complicated remote access challenge of reading e-books was cited, although that was also accompanied by comments on their convenience when database connection was successful. Then also, it is important to note that according to Walton and Bunderson (2021), student disciplines and other unexpected factors may also have an impact on the said preference, and more research about this is necessary. For instance, Walton and Bunderson (2021, 89) mention that:

the understanding of patron preferences, will likely become even more critical due to the increasing dependence on remote access necessitated by the COVID-19 pandemic. A good focus for future study would be investigating whether the pandemic has accelerated patron and librarian usage and adoption of ebooks over print books.

It has become necessary to configure libraries as spaces that accommodate a variety of learning needs and styles rather than solely for keeping books. The collaboration, knowledge sharing, and open communication with the rest of the university educators that this entails is fundamental to library service. Some libraries have re-modelled space so that library users can experience collaborative work and exploration in a learning commons. Originally introduced in the 1990s by Donald Beagle, a learning commons was a novel online environment through which students could access a variety of digital services in a physical facility designed to organize workspace and service delivery around an integrated digital environment. Moving on to the 2020s, the learning commons has characteristics determined by universities that have implemented the

concept. Because there are various models of learning commons spaces, what shape they take must be relevant and appropriate for the parent institution. In general, academic libraries have moved from a warehouse model to a networked and collaborative model of library service provision.

1.7 Academic Library Products

Available library products, which intricately subsume the services, include circulation and reference, teaching IL, finding resources for research, purchasing library materials and interlibrary loan, introducing students to library resources, reviewing library resources for new courses and degree programs, linking information to learning management systems such as Blackboard or Moodle or Sakai, and use of citation management software, among others. Literature on the provision of library service and products is growing.

Library products also include publications from the library. Johnson (2018, 1) mentions that “the number of online journals being published in the Arab world in all fields is still small. In the library and information field there are probably even fewer, and, with notable exceptions such as the *‘Cybrarians’ journal*, they remain little known.” Wand (2010, n.p.) explains that “historically, the societies in the Arabian Gulf have a rich oral tradition that previously precluded the need for libraries, archives, or museums. Now, along with improving their education and research efforts, comes the need to address information infrastructures”. But this cannot persist as a reason not to have more LIS publications from and about the Arabian Gulf region.

Another product from the library is access. It is enabled by library interface and functional network platforms. Dragovic (2015), for example, in a New York University Abu Dhabi (NYUAD) study, addresses the need to recognize cultural diversity in library interface development. The result is highly valuable for librarians as they take a step back, think and listen reflectively, and appreciate that serving communities that are not necessarily from one’s own culture or educational background requires learning appropriate lessons for effectiveness. It is also important to address information infrastructure and systems issues because of the ethics and security components, even more so as this is in a global context. However, it would be educative to discover what the same study reveals in universities that have more local student populations than international, as is the case at New York University Abu Dhabi (NYUAD).

The academic library’s doors open to everyone in the parent university community. A study by Thomas (2012) comments on the fact that there is emphasis in the UAE on learning the English language and providing English language instruction

in schools and universities. For that reason, inclusivity is a mantra of any library, but more specially in academic libraries where that can affect the success or failure of a student. Thus, librarians must be culturally sensitive and aware of the implications of their quality and nature of service on the English as a second language (ESL) student. Sometimes there is also merit in providing library service outside the library building too. That means experimenting with the roving librarian service at popular points in the university, such as the cafeteria, the student services areas, and so on. This service demonstrates the availability of library service from several spaces to all students and staff.

Additionally, academic library products and services must also be usable by as many students as possible including those differently abled, e.g., those with vision impairments, dyslexia, dysgraphia and other reading, writing, and mobility disorders. Although there is a dearth of library service literature on this topic in the Arabian Gulf region, attention to the topic is rising. For example, a conference presentation by Elsayed and Bady Bady (2016, n.p.) suggests the existence of obstacles to the application of assistive technology in supporting the visually impaired with information access in Arab countries. Their paper was about “the role of assistive technology in integrating the visually impaired with information access, free circulation and obstacles to its application in the Arab countries”. Meanwhile, Kaba and Ellala (2020) explore the use of educational technology among students with hearing-impairment in the United Arab Emirates, concluding by recommending more studies on the topic. Then also, in their analysis of studies published from 1990 to 2014 in English-written literature on inclusive education of children with developmental disabilities, Alkhateeb, Hadidi, and Alkhateeb (2016, 60) realized that “relatively little IE research has been conducted in Arab countries”. Additionally, Alammary, Al-Haiki, and Al-Muqahwi (2017) researched on the impact of assistive technology on Down syndrome students in Bahrain, reflecting concern and interest in inclusiveness.

Any efforts regarding learning should be geared for ESL students because receiving instruction in a language that is different from their own may put them at an academic disadvantage. This also includes incorporating language, traditions, and customs into student learning experiences (Thomas 2012). Thomas (2012) proceeds to suggest that responsiveness to the academic needs of the students requires a developed understanding of their learning styles and knowledge of how to best complement them. The viewpoint of Thomas (2012) points out certain characteristics of the impact of culture, educational style, and national environment on education.

Closely aligned with inclusivity is emotional intelligence (EI). In research at United Arab Emirates University (UAEU), Ahammed, Abdullah, and Hassane

(2011, 19) found that there is a positive relationship between EI and perceived academic success among Emirati university students. EI is “a form of social intelligence that involves the capability of understanding others’ feeling, recognizing and using it for thinking to influence others” (Arabshahi et al. 2013, 2964). The relevance of this study is that educators must consider EI matters when giving required relevant research support to students. But then, EI is not limited to students only. It includes the librarians’ and educators’ capacity to share the knowledge they have with students and their own colleagues for the enhancement of teaching skills. According to Arabshahi et al. (2013), EI is one of the social intelligence factors that can guide individual thinking and activity in both faculty and students.

In their research among Arabian Gulf students, Rahal and Palfreyman (2009) found the favorite learning style of some students studied, other than auditory, to be visual word and visual picture styles, which are addressed in classic lecturing with graphic support. Additionally, this study revealed learning-by-talking, supplementing lectures and graphics with discussion, and visual-word mode (reading) to be minority pursuits. This research confirms the significance of understanding student educational style and academic background – highlighting the importance of sensitivity to a variety of learning styles by educators to create relevant and effective teaching aids. It also brings out an emphasis on critical thinking rather than information transfer in students and suggests that research with a teaching focus is relevant to academic library situations.

Ali (2011, 84) found that educators need to better understand students’ different learning style preferences and address these in the classroom to meet students’ different learning needs. Additionally, teachers may also encourage students to learn by doing and interacting with others, taking notes, participating in role play, gamification, and working collaboratively and cooperatively with others in groups on specific tasks, using a variety of motivating techniques to not only teach but also help students learn and providing alternative strategies when students fail to grasp certain concepts. The results of the study reveal the importance of student learning style and effectiveness of instruction. Interestingly, according to Rinehart, Sharkey, and Kahl (2015, 451), “little to nothing has been written connecting the learning styles of librarians to the learning styles of students, their impact on library-led teaching and learning initiatives, and implications for organizational culture and professional development”. Cognizance therefore should be taken of student learning styles as well as introspection by the educators, particularly librarians.

The results of a comparative study of learning styles between American University of Sharjah (AUS, United Arab Emirates) and University of Minnesota Duluth (United States) by Zualkernan, Allert, and Qadah (2005, 7) indicate that

there seem to be strong similarities in learning styles of culturally diverse students. The researchers, however, suggest that it is difficult to establish a clear relationship between learning styles and course outcomes across cultures. For library service, this is a realization that learning styles are complex but have many similarities regardless of location and informs how to support students from a variety of cultural backgrounds even when using the same set of resources across different geographical zones.

1.8 Culture and Service Provision

Personal and cultural values are factors that have an impact on satisfaction with services offered. The fact that, in most instances, librarians in the Arabian Gulf are from a variety of backgrounds makes it important to understand how they provide service appropriately. A seemingly mundane matter like providing a video streaming service, e.g., Kanopy, may entail librarian conversations with providers of the service to tailor the acceptability of content. Literature that discusses cultural values, both as it relates to librarians as well as to library patrons, as pertinent to library use exists predominantly relating to non-Middle Eastern academic libraries. Culture includes all behavior that is learned through social interaction with others, such as the use of language, rituals, social organization, traditions, beliefs, and technology. The *Bloomsbury Guide to Human Thought* (1993, n.p.) defines it as “the way of life particular to a given group of people”. It, however, should be pointed out that a focus on national culture does not necessarily account for individual contextual teaching methods which are relevant to educators engaging with students and their effectiveness.

The Hofstede cultural dimensions theory, a framework for cross-cultural communication, is used by Markus and Kitayama (1991, 224) who reveal:

many Asian cultures have distinct conceptions of individuality that insist on the fundamental relatedness of individuals to each other. The emphasis is on attending to others, fitting in, and harmonious interdependence with them.

Applying the same dimensions, one must always remember that interactivity is expressed in rituals and customs. This perspective is reaffirmed by Simadi and Kamali (2004) in their United Arab Emirates University (UAEU) study of the value system of university students. The significance of this for educators is the importance of understanding the existing value system to be able to interact with the student community in a way that makes sense in their culture. A discussion on culture inevitably refers to values. These are an “individual’s mental judgment about things, people, and social events” (Simadi and Kamali 2004, 19).

The UAEU study also revealed that religious values are the main source of judgment among students.

While working in Egypt, Oberembt (1998, 121) found that it is inevitable for libraries to be influenced by the culture of the host nation:

libraries, whatever their broad similarities of mission and of operation, are embedded in different cultures, and those cultures infiltrate into every aspect of library business, affecting everything from the perception of what constitutes proper services to the preference for certain styles of management (and leadership) over others as offering the best means of meeting service goals.

This is confirmed by Wand (2011) in a paper discussing library constituents in developing a U.S.-accredited university in the Middle East, reflecting on their contributions to a successful library program. These findings further highlight the need to be aware of the national culture of the host country to provide effective lessons within its confines. In fact, in their UAEU student value structure study, Simadi and Kamali (2004, 19) found that “religious and cognitive values came first in the structure, while social and economic values came in last”. Similar results are also reflected by Raven (2011) in a case study at the Higher Colleges of Technology (HCT) on contextualization and challenges of Emirating the education sector in the UAE. With this knowledge, it is useful to always make sure that appropriate spaces for students, e.g., prayer rooms, are part of the physical layout of university buildings including the library. This is confirmed by Samori and Abd Rahman (2013) who stress the importance of the prayer room as one of the most crucial facilities in a building for Muslims. More knowledge about student needs also informs on issues such as the impact of social media on cultural identity.

One can easily assume that net generation students are all interested in social networking, are highly competent with using computers, and that they prefer a social networking environment. This is especially so where most university students own at least one smart device for daily internet connectivity and have reliable internet. According to Statista.com (2021), internet penetration rate, i.e., the percentage of the total population of a given country or region that uses the internet, in Saudi Arabia is 89.84% and is projected to be 93.8% in 2025, UAE is 96.98% and is projected to be 97.5% in 2025, Oman is 86.62% and is projected to be 87.13% in 2025, Qatar is 93.09% and is projected to be 94.1% in 2025, Bahrain is 98.1% and is projected to be 99.4% in 2025, and Kuwait is 94.31% and is projected to be 97.06% in 2025. Online access is therefore not a challenge.

While Ranganathan’s (1931, 75) concepts of “every person his or her book” and “every book its reader” are applicable but extended to apply to online spaces, one is left with the question of whether this internet penetration translates into a

preference for using online library resources, or if it is a case of library patrons no longer having a choice. If pursued, investigations into the effectiveness of remote library services that are a result of lockdown conditions where internet penetration is enough as in the Arabian Gulf have a potential to alter the way academic library service is structured. One also questions whether internet availability and massive penetration align with the use of credible information that is relevant, authentic, and valid for academic purposes. Major questions arise when one considers the rise in fake information broadcasts on the web. However, there is merit in undertaking regular user studies of student perceptions and preferences rather than making uninformed assumptions. There are currently no documented studies by Arabian Gulf librarians that reflect this. But then, research by Jewels and Albon (2011) on reconciling culture and digital literacy in the UAE gives contextual insight into the reality of the use of modern technology.

1.9 Language and Library Communication

Language is the basis for most communication and learning, therefore it is relevant to be cognizant of the impact of English language writing and speaking proficiency on perceived usefulness of library service. This point is because in many countries, policymakers believe that English as a medium of instruction is crucial if the higher education bilingual graduates are to participate competitively in the knowledge economy. Even with English as a global language, it is easy to fall into cultural traps that endanger effective communication. Alharbi (2017) confirms English as lingua franca in all Arabian Gulf countries, and in some cases a prerequisite for employment.

Most of scholarly research databases in use are in the English language even in universities that are populated by predominantly ESL students. But then, increasingly, Arabic language databases such as AlManhal, Arabic Collections Online (ACO), AskZad, Kotob Arabia Digital Library, e-Marefa, Sader Legal, Mohamoon, and so on, have been added to collections to reflect scholarship from and about the region. Regardless, the range of available library resources has a bearing on whether students will consult a non-Arabic speaking librarian or a peer when they need assistance.

Ibrahim (2004) concluded from a research at UAEU that language can be a barrier in the effective use of library resources. This is aggravated by the fact that, ordinarily even where there are no language barriers, “students do not necessarily ask librarians for help. Library literature suggests that students have a limited understanding of what librarians can do for them” (Miller and Murillo 2012, 50), and instead depend on friends/ peers, their professors/

instructors, and other alternative sources of information. Moore-Jones (2015, 69) explains that “faculty members bring with them their own cultural assumptions, epistemologies and use of language which at times are in stark contrast to those of the students”, and these need modifications. This extends to librarians too.

1.10 Addressing Library User Satisfaction

The reason for being concerned with systems, services, and products of the library is to gauge user satisfaction. That targets the library user’s academic and personal research needs as a measure of service effectiveness and quality. The reason for highlighting the importance of satisfaction is that “according to research findings service quality of library facilities is one of the most important factors that have a significant influence on students’ overall satisfaction from their universities” (Nadiri and Mayboudi 2010, 1). A study at the New York University (NYU) by Dragovic (2015) made the conclusion that when creating library user interface, it is useful to tailor it for the understandings of the user rather than what first comes to mind from a Westerner’s perspective. The study focused on the relationship between the library’s web interface that enables use of research resources that are mainly digital and user satisfaction. With reliance on the Hofstede scale, cultural sensitivity in library service was confirmed as essential. The reason is to reduce library anxiety, i.e., fear or phobia of the library.

Library anxiety as a concept was researched on by Mellon (1986 and 2015), who explained that this is a fear of the overwhelming and confusing library space, as well as the process of using the library to find materials. It is compounded by the provision of databases that use language incompatible with or too complicated for its users (Ibrahim 2004). Because modern library users may not necessarily physically visit the library, some are prone to experiencing information anxiety, i.e., what they do to obtain information and the feelings they express rather than where the information is obtained, particularly with the use of electronic resources.

The intensity of information anxiety is outlined in the Information Search Process (ISP) model of Kuhlthau which was “developed in the 1980s and refined in the 1990s” (Kuhlthau, Heinström, and Todd 2008, n.p.). The authors point out the ISP model is useful in “designing user centred information services and systems, particularly for students in inquiry projects” because it caters to “feelings, thoughts and actions in an information seeking task with a discreet beginning and end, where considerable construction of knowledge takes place”. Librarians must target the transition from where feelings of uncertainty

are replaced by feelings of satisfaction or dissatisfaction as they move through the ISP. In fact, Naveed (2020, 75) suggests that “there is a need for more investigations examining information anxiety, in a variety of contexts with different populations from multiple geographical areas of the world” with the use of anxiety scales such as Bostick Library Anxiety Scale (LAS) of 1992, or the AQAK new library anxiety scale proposed by Anwar, Al-Qallaf, Al-Kandari, and Al-Ansari in 2012.

Besides having knowledge of how learning happens, academic librarians must be cognizant of the dynamics of information search processes to understand the standpoint of students. Savolainen (2015) mentions that students may be unaware of the existence of relevant information which librarians confront in many instances that involve students using big libraries for the first time upon enrolment into university. But then after finding the information, they also may become overwhelmed with what is unwanted, information overload, and sometimes even face challenges with using information systems. At the same time, McPherson (2015) alludes to low self-efficacy, a lack of self-confidence and inadequate knowledge of the subject matter as hindrances to successful information retrieval. There are high levels of internet connectivity by Arabian Gulf students, but the challenge with inadequate search skills and a lack of experience in the use of advanced and basic information retrieval systems exists. Kommisarov and Murray (2016) add the inability to evaluate resources and deal with information overload, particularly by undergraduates, as a major cause for disappointment with using information resources.

Reporting on the relevance and value of InfoOasis (<http://www.zu.ac.ae/infoasis>), a web-based information literacy tutorial developed and tailored to Arab students, Martin, Birks, and Hunt (2010) discuss reasons for its poor usage outside the classroom. They point out that one of the cultural reasons may be the students’ preference for auditory and visual perceptual styles of instruction. This is even though most students reported that they found it both relevant, usable, and useful to their studies. Dragovic (2015) suggests revisiting the Hofstede cultural dimensions before setting expectations that may not necessarily be suitable for the cultural context. The question of satisfaction and its implications therefore still requires further investigation.

The work of Wong, Shun Han Rebekah, and Webb (2010) about uncovering a meaningful correlation between student academic performance and library material usage at Hong Kong Baptist University demonstrates a positive connection between book and multimedia loans and students’ academic performance for most faculties/schools. This suggests that it is possible for academic libraries to demonstrate empirically that library usage contributes positively to student academic performance and, thereby, to the university’s effectiveness.

This can also be enhanced where the learning outcomes set by the university (e.g., IL) are embedded into the learning management system (e.g., Blackboard, Moodle, Sakai, Desire2Learn), and at the same time monitoring student grades. While customary academic library assessment practices may not be enough for this purpose, the Hong Kong Baptist University (HKBU) Library undertook an experimental project, to establish a mathematical correlation between student library material usage and their cumulative grade point average (GPA). Taking 2007 to 2009 graduates as samples, with 8,701 pairs of data, the HKBU Library was able to demonstrate its positive impact on student learning outcomes.

Reacting to the fact that academic libraries, like other university departments, are being asked to demonstrate their value to the institution, Soria, Fransen, and Nackerud (2013) studied library usage statistics at the University of Minnesota during the Fall 2011 semester for 13 library access points. Analysis of the data suggests first-time, first-year undergraduate students who use the library have a higher GPA for their first semester and higher retention from fall to spring than non-library users. The article discusses the impact that library usage has on the retention and academic success of first-time, first year undergraduate students at this large, public research university. The results demonstrate the relationship between student perception of their performance and staying in university, including library relevance. For purposes of informing appropriate student support efforts, a similar detailed survey can be carried out in any other academic library for the purposes of understanding library use habits and satisfaction also.

The study by Ibrahim (2004) at UAEU on use and user perception of electronic resources at that university is iconic. It reveals that the use of e-resources at UAEU was lower than the librarians had anticipated. The reason might be “a lack of awareness about the e-resources provided by the library or due to ineffective channels of communication in campus” (Ibrahim 2004, 24). The use of English language library resources by ESL students was cited as a major challenge since the reading levels of many were not expert. This situation is a phenomenon of several Arabian Gulf university libraries.

1.11 Conclusion

This chapter provided an outline of academic library systems and services in six Arabian Gulf countries. Library services mentioned include circulation, reference, online information provision, inter-library loans, IL skills training and MIL, copyright awareness, intellectual property rights, research data services, and the economics of information. It is a fact that with these services, some are

more comprehensive than others, and variation is also from university to university, and country to country. The chapter also introduced concepts from Ranganathan's Code which will be mentioned again in other chapters. The population dynamics whereby there are large numbers of expatriate professionals in the population has created the need to point out cultural diversity in academic library service, especially where education models include those from the West. It is incumbent upon the educators to learn how to adapt in an information environment that encourages it.

The chapter incorporates recognition of educational style and personal and cultural values as factors that have an impact on how learning takes place. The mention of educational style implies that librarians must enhance their understanding of learning theory in an educational environment, i.e., the atmosphere in which students are learning. Regardless of the local language and cultural conditions, unpredictable world events, the massively changing modern technology and information environment is sometimes accompanied by previously unanticipated requirements for academic librarians, resulting in the need to adopt progressive approaches to service. They also must pay special attention to both library anxiety and information anxiety since they impact library user satisfaction. In addition to taking the feelings, perceptions, and attitudes of library users into account, academic libraries find themselves in an environment of volatility, uncertainty, complexity, and ambiguity, just like all other areas of life.

Chapter 2

Enhancement of Library Services in Academic Institutions

2.1 Introduction

While all educators are re-thinking about pedagogical frameworks of new teaching and learning approaches, academic librarians find themselves supporting evolving library patron expectations (Jensen and West 2015). Characteristics of frameworks such as the *Big 6*, the *Association of College and Research Libraries* (ACRL) framework, the *SCONUL Seven Pillars of Information Literacy*, and *A New Curriculum for Information Literacy* (ANCIL) are some of the guidelines used in teaching IL. In fact, librarian efforts are exerted to suit ESL students in the Arabian Gulf region who, according to Johnston and Marsh (2014), prefer a visual and interactive learning environment to traditional teaching. A common characteristic of the mentioned IL frameworks is their strategy to target visual learners. Thomas, Raynor, and McKinnon (2013) also express similar conclusions about student learning inclinations in their ZU study. Concomitantly, there is a compelling need for library service to be in sync with new instructional designs to reinforce the effectiveness and relevance of IL messages. The adoption of specific IL frameworks is easier if guided by a National Information Policy.

The library is directly impacted by the information and communication technology revolution. This inevitably affects the services mentioned in Chapter one. Russell and Houlihan (2017) note the need and importance of a national information literacy (IL) framework to guide information transfer activities that satisfy the information needs of the research community and students. There usually is no singular IL framework to follow, and even more so in a world of volatility, uncertainty, complexity, and ambiguity. But then, operating in challenging, confounding, and unsettling times is exactly the reason for suggesting a reference to the national information policy guidelines which are informed by the UNESCO (2009) National Information Society Policy template.

2.2 National Information Policy

The definitions of information policies, where they exist, vary. However, according to UNESCO (2009), following the guidelines by Wesley-Tanaskovic (1985), some of the attributes of a coordinated national information society policy (NIP) are that it:

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- (i) promotes the recognition of copyright law,
- (ii) helps give meaning to a harmonized information environment (including enabling the clamp-down on predatory publishers, and meaningful regulation of fake or alternative information sources),
- (iii) enshrines the systematic development of libraries and information centers,
- (iv) endorses the free flow of information,
- (v) supports the management of the cost of books and other educational materials, and
- (vi) sets boundaries for compliance with the legal deposit laws.

The goals of NIPs may be similar but ways of achieving them vary. Prediction of the long-term future can be extremely difficult, and even more complex in a VUCA environment. For that reason, it is strategic to possess a harmonized information environment that is demonstrated by provisions to fight, manage, and control emergencies such as dangerous computer/ web malware bots, e.g., the trojan betabot, kelihos botnet, ransomware, cyberextortion, and other cyber-attacks, and even internet trolls, usually at national, regional, and international levels.

While the UNESCO (2009) National Information Society Policy template exists to guide the creation of policy, there is merit in developing a plan that is linked to local needs so that IL frameworks can be tailored accordingly. Mchombu and Miti (1992, 24), discussing “some unlearned lessons” about national information policy formulation in Southern Africa, mention the need for a good understanding of an information environment “and how it has developed over time can lead to realistic policy”. And then also, none of the Arabian Gulf countries reflect an obvious national information policy that academic libraries can quote, but this is not unique to the region.

The creation or formulation of an information policy involves all agencies related with information (Wesley-Tanaskovic 1985), e.g., technical and scientific information, libraries, socio-economic issues relating to government, expert consultants, and more. One of the topics to confront from a policy perspective is internet security which gets challenged due to the vigilance and inventiveness of the creators of malicious programs. The existence of this kind of policy also contributes to efforts towards combined protections for safe use. Way back, Fung (1987, 26) mentioned that the national information policy, when created, is where the national library and information service policy derives from to address issues of IT, privacy, information networks, library science services, and information education.

However, each of the Arabian Gulf countries deals with matters of policy according to national requirements. This suggestion comes out of the observation

that there are policies covering specific parts of information-related matters, e.g., all the Arabian Gulf countries have cyber security policies and guidelines. Mchombu and Miti (1992, 24) argue that “no single policy can cover the wide information sector, and that what is needed is a series of co-ordinated policies”. Considering that the cited authors made this conclusion 20 years ago, it appears that policy making is a long and complicated process and Arabian Gulf practices are using a pragmatic approach.

2.3 Intellectual Property Protection

Universities operate in the modern information and technology environment that enables unprecedented knowledge flow and sharing capabilities. That in turn affects many facets that are not necessarily unique to the Arabian Gulf, but a feature of global scholarly communication trends. A few of them include copyright awareness, digital and information literacy. According to the website of the World Intellectual Property Protection (WIPO 2021), the UAE has been a member since 1974, Bahrain since 1995, Qatar since 1976, Saudi Arabia since 1982, Kuwait since 1998, and Oman since 1997. That means Arabian Gulf countries are signatories to the relevant international treaties and conventions.

Intellectual property includes copyrights, patents, trademarks, and trade names. The UAE and Saudi Arabia became signatories to the Berne Convention, starting in 2004, Oman in 1999, Kuwait in 2014, Bahrain in 1996, and Qatar in 2000. This Convention is for the Protection of Literary and Artistic Works. Some are also members of the Rome International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations, which was put into force in Bahrain in 2006, UAE in 2005, and Qatar in 2017. Additionally, the UAE, Oman, Qatar, and Bahrain have observed the WIPO Performance and Phonograms Treaty since 2005. Furthermore, the WIPO Copyright Treaty includes membership by the UAE since 2004, Bahrain, Oman, and Qatar since 2005, besides their own federal laws on copyright. The GCC patent office in Riyadh, Saudi Arabia was set up for acquiring patent protection in all GCC Member States comprising Saudi Arabia, the UAE, Oman, Kuwait, Qatar, and Bahrain. The reason for respecting the notion of intellectual property is that it is a core asset in knowledge economies. It is the type of asset that many people can use at the same time because it essentially is information.

Belonging to WIPO carries the responsibility of adhering to the specifications of the treaties and conventions by the members. But while individual members can choose to interpret and follow these in ways that are convenient and suitable to their environments, sometimes complications arise when dealing with cross-

border matters. Writing from a Lebanese book market perspective, Abou-Zeid (2013) points out that piracy remains a major challenge despite legal frameworks in the Arab world by enumerating how it happens:

- A local publisher translates a title without acquiring its rights.
- A local publisher acquires the rights and declares a print-run of 3,000 copies while printing and selling more (without declaring the reprints for example).
- A local publisher acquires the rights and works all along legally, but once he releases the book, his edition is copied by others and pirate copies are distributed in his market.
- Semi-plagiarism: a local publisher uses 30% of the contents of a foreign book to make another book and claim it has nothing to do with its model.
- Piracy of the imprint: the imprint of a local or a foreign publisher is used on books by another party.

The chain effect of publications being reproduced without consulting the legal owners is a habit that complicates the approaches that academic institutions take to educate the academe to do the right thing. The librarian is powerless to confront this challenge unless there are institutional champions, some of whom are in management and leadership, so that it is a comprehensive agenda to reorientate the culture of scholarly productivity with integrity. Abdulla (2008) confirms that diversity in implementing international copyright is permitted by the Berne Convention, the Rome Convention, and Internet Treaties, the WIPO Convention Treaty (WCT) and WIPO Performances and Phonograms Treaty (WPPT).

With copyright issues, it is befitting to mention plagiarism. Moten (2014, 169) points out that:

existing literature deals almost exclusively with plagiarism in Western countries, while there is relatively very little research on the issue of plagiarism among students and of academics engaged in such unethical practices in the Muslim world.

This does not mean there is acquiescence. In fact, Al Balushi (2015, n.p.) states that “books and other literary works are protected in the Arab World from the moment the work is created for the entire lifetime of the author plus 25, 50, or 70 years after his or her death, depending on the country.” It is incumbent upon faculty in universities to make sure students are alerted to the importance of ownership of original ideas and innovations, respect for the ownership of individuals’ original work/ creations, and the unfortunate implications of lacking academic integrity (including plagiarism).

When plagiarism occurs, the quality and authenticity of scholarly work is compromised. Then also is the question of “fair use” which requires the involvement of faculty, librarians, and the legal office so that institutional policy

on copyright and academic integrity is clearly spelt out. As in most countries around the world, academic integrity is considered as very important in determining the quality of students and faculty that come out of a university. But then, Al Balushi (2015) says that “no Arab country has a “fair use” exception, and the existing exceptions are limited and mostly do not satisfy the needs of the users of creative works on the internet.” However, good academic conduct or academic integrity helps students learn, and the academe guides them to attain high quality qualifications. Thus, the better the quality of perceived products of a university, the more likely employers are encouraged to provide internship opportunities, hire the graduating students, and the more the reputation of the university is perceived to be superior. The result is a boost to the university’s corporate image.

2.4 Recent Developments: Implications for Universities and Academic Libraries

Change and transformation that has happened in education and the library world is primarily not at the instigation of any single institution. The information and technology environment have remodeled life expectations and experiences in the twenty-first century. This affects all disciplines and continues to happen. There is therefore merit in making sure that the education, training, and professional development programs of all educators are in tune with preparing students for original thinking, creativity, and innovation. The reason that students need critical thinking skills is for them to be “able to make decisions based on data, with its inherent uncertainties and variability” (Holmes, Wieman, and Bonn 2015, 11199) in many different contexts, and a reliance on feedback from decisions made. This is to avoid what is referred to by the sociologist Veblen as “trained incapacity” (as explained by Erin Wais 2005, n.p.) whereby people’s own training or education prevents them from “seeing the world from other perspectives,” inhibiting chances of innovativeness and managing in a world of increasingly unpredictable technological and social developments.

Another major change in scholarship is in how publishing takes place. For example, the concept of Open Access (OA) is a current and evolving issue that researchers and scholars, universities, publishers, grant funders, and other interested parties are trying to contend with. While initially it was de-campaigned by some publishers who viewed it as a threat to their livelihood, its momentum continues, resulting in various models evolving, including being embraced by many major publishers. In health and agricultural sciences, the model was adopted very fast in comparison to other disciplines (Beall 2012). Open science

is the broader concept tying together OA, open data, open-source software, open educational resources (OER), and collaborative research such as citizen science and digital humanities (Woods, Teplitzky, and Vandegrift 2021).

2.5 Open Access (OA)

There are several OA models but in general there is increased universal openness to information (Zhao 2014). Ranganathan's (1931, 1.) "books are for use" and "every person his or her book" concepts could not be more obvious especially that the scope of use is now beyond print media. OA to scholarly material is a method of information sharing, enabling more people to have access to scholarly publications and research results. Researchers are sometimes unsure of the models or implications of using OA, but as more information becomes available, it is developing into an increasingly academically acceptable one. The Babson report by Allen and Seaman (2014, 9) suggests that in the United States (US), "while most academic leaders were somewhat aware of OER, the level of understanding of the details was seriously lacking".

The problem with this reality is that the attitudes of US scholars and educators influence international practices in many ways. As such, when suspicion and inadequate knowledge of the OA model is current, trust for it requires a lot of advocacy work. Currently, there are no obvious or openly available mandatory OA policies for publicly funded research in the Arabian Gulf. However, various studies show that scholars in the region have been responding positively towards OA. To minimize the negative effects of bias or lack of information, the United Nations Educational, Scientific and Cultural Organization (UNESCO 2015) launched a curriculum for library schools and researchers so that the OA concept is learnt about and understood more intensely by librarians as IL educators. Its uptake is still to be studied and assessed, but all the modules of the curriculum document are freely and openly available on the UNESCO Communication and Information section at http://www.unesco.org/new/en/communication-and-information/resources/news-and-in-focus-articles/all-news/news/unescos_open_access_oa_curriculum_is_now_online/.

Sometimes there has been a lack of information on genuinely authentic OA journals to contribute to or find information from. Some academics have identified the low impact factor of OA journals as a major weakness, but this is a discussable topic if one accepts that what is important is to publish outstanding research that attracts wide readership and containing a formidable level of detail. The fact that a journal is OA does not depreciate the quality of contributed research findings that are authentic. Krawczyk and Kulczycki (2021, 102271)

point out that “it would be desirable if an academic discussion places more focus on other possible links between the topic of OA and knowledge validation than predatory publishing.” In any case, the OA model is still evolving so comparison with those that have been active over a long time is flawed since it takes years for impact factor readings to start making a difference. In fact, projects like the Open Access Button, Sci-Hub.org, <http://unpaywall.org/>, Academia.edu, and ResearchGate.net are all an expression of the increasing demand for OA publications that are otherwise difficult to access due to pay walls.

Knowledge and being comfortable with use and contribution to OA matters is also often dependent on discipline. For example, the health sciences are more aware of the model as confirmed by Allen and Seaman (2014), and in agriculture as suggested by Clobridge (2014). Regardless of this, many researchers still question the validity and authenticity of OA published material. This is aggravated by the abundance of lower-quality, non-peer reviewed vanity publishing that is flourishing due to the possibilities enabled by the Internet – referred to by Clobridge (2014, n.p.) as “the wild west of OA publishing” and predatory OA journals that have created a need for more scholarly publishing literacy on the part of scholars (Beall 2012; Zhao 2014). According to Beall (2013, 48), “this skill includes the ability to recognize and avoid publishing scams. There are some simple steps that we all should take to avoid being taken in by predatory publishers and their scams”. Academic libraries try to support researchers, but because of pressure to publish that faculty is under, the dark side of publishing manifests itself this way, and unsuspecting researchers can fall victim.

Scholarly publishing literacy also includes knowledge about journal title/ publication title inclusion in major indexes such as Scopus, Cabell’s Directories, ISI Web of Science, and more. Universities are increasingly leaning towards research, making it necessary for researchers to be on the lookout for such fraudulent and unethical journal titles or publishers. In the library world, a famous champion in bringing out suspicious publishing activities was Jeffrey Beall who for some time maintained and curated a list of possibly unreliable journals and publishers, which survives at <https://scholarlyoa.com/publishers/> and <https://beallist.net/>. Librarians are, however, able to use the ACRL Scholarly Communication Toolkit (2017) to guide researchers about how to evaluate journals, among the several methods of being supportive. They may also refer to the Cabell’s Directories for already evaluated journals that includes both OA and subscription-based ones, and to the Directory of Open Access Journals (DOAJ). Many comments and criticisms have been made about Beall’s methods of listing predatory journals that reflect a bias against OA, though his lists are quoted and referred to relentlessly (Krawczyk and Kulczycki 2021). So, university libraries are suggesting OA journal quality indicators as a more practical way of facing the publishing world. The reason for these

discussions is to be able to handle and cope with the enterprising persistence of predatory publishers when it comes to luring potential victims.

As big publishers, for example Elsevier, John Wiley & Sons, Sage, Springer, and Taylor & Francis, are now offering the OA option to scholars when they are submitting their publications, the concept is becoming better understood. Big funders of research and government agencies such as the National Science Foundation (US), the Research Council UK, the European Commission, the Indian Council of Agricultural Research, UNESCO, the Australian Research Council (ARC), and the National Health and Medical Research Council (NHMRC) have also become supportive of the model (Zhao 2014). As Clobridge (2014, n.p.) puts it, “OA now includes several permutations based on levels of openness . . . Most of the large STM publishers now provide this option in order to comply with OA mandates yet still allow traditional subscription-based or pay-per-access business models to remain in place”. In fact, the Directory of Open Access Journals (DOAJ 2021) website explains transparency and best practice and includes clear guidance on genuine OA authentic publishing requirements.

In their Springer Nature-affiliated research in which they were assessing the open access effect in hybrid journals, Draux, Lucraft, and Walker (2018, 29) concluded that “OA articles were downloaded with much greater frequency than non-OA articles”. Even the rationale for sometimes making authors pay has become clearer, i.e., that the publisher must find a way of sustaining the publication of documents with properly curated content. It is not the same as vanity publishing which encourages non-scholarly articles getting published for a charge. Berger and Cirasella (2015, 132) point out that librarians “help researchers avoid becoming prey and help readers recognize low-quality journals. In addition, we need to counteract the misconceptions and alarmism that stymie the acceptance of OA.” Being a notion that is still being adopted means that for some time impact factors of many OA new journals remain lower than the more established ones. This is a major concern for scholars, especially those in the early stages of their careers who speedily want to be visible by publishing in well-recognized journals. A re-focus by academic evaluators and established scholars can go a long way in encouraging publishing in valid and reputable OA journals.

The Consultative Group on International Agricultural Research (CGIAR), a global partnership that unites organizations engaged in research for a food secure future, UNESCO’s initiatives enhancing OA to scholarly information, and digital libraries are examples of OA success. Advocating OA publishing, Barbour et al. (2006, 339) suggest that “by regaining control of copyright the medical and scientific communities could ensure that publishing is no longer driven by the interests of publishers, but rather by the needs of society”. These editors suggest that when authors use OA to publish, they in fact are taking control of

their work for the benefit of knowledge dissemination. The UNESCO Global Open Access Portal (2021) currently lists two OA journals from Bahrain, one from Kuwait, one from Oman, one from Qatar, five from Saudi Arabia, and 14 from the UAE. That is a total of 24 OA journals from the mentioned Arabian Gulf countries.

With more diverse academic publishing options, fair and ethical use of information questions cannot be ignored. However, there is no guarantee that if information is not available through OA, then when it becomes available it is ethically used and users are automatically free of copyright infringements. The principle applies equally to all kinds of information and the onus is on librarians and educators to help information users become aware of fair use and copyright concepts. In fact, the openly available book *Libraries Driving Access to Knowledge (A2K)*, edited by Jesús Lau, Anna Maria Tammaro and Theo Bothma (2012) as a part of the IFLA Publications Series, elaborates on how libraries assist scholars to contribute towards OA repositories for the benefit of knowledge availability and accessibility. In the context of the OA model, one needs to also make a comment on the topical phenomenon of Massive Online Open Courses (MOOCs).

Mention has been made of unpaywall.org while discussing pay walled publications. Rodriguez (2019, 216) says that this is a 2017 free project by Piwowar et al.:

designed for one-click retrieval of full-text, legally open access (OA) versions of scholarly journal articles. . . . It harvests data from standard sources such as Crossref, DataCite, the Directory of Open Access Journals (DOAJ), and PubMed Central and also from 50,000 publishers and repositories worldwide. Unpaywall does not harvest from ResearchGate, Sci-Hub, or other sources that host legally dubious content.

Then also, Hinchliffe (2020, n.p.) mentions the use of data from [unsub](https://unsub.org) in the unsub tool as a “data analysis service that is helping librarians forecast, explore, and optimize their alternatives to the Big Deal”, and unsub is intended to make research more open. An older browser extension that also purports to achieve similar results is the Open Access Button. After testing the effectiveness of both [unpaywall](https://unpaywall.org) and Open Access button, Kuester (2017, n.p.) concluded that “both of these applications are still rather new, and there are still barriers to open access that need to be crossed. It therefore remains to be experienced whether unsub is a more successful option.”

2.6 Implications of OA Publishing on Library Consortia

There is always the question of whether the character of a library consortium is reading or publishing. Evans (2019) explains that:

library consortia can be characterized as “Read” consortia (not much publishing activity from institutionally affiliated researchers), “Publish” consortia (substantial publishing from institutional researchers) or somewhere on a continuum – and where a consortium or institution falls on the Read/Publish continuum will influence the kinds of deals that publishers are willing to offer them.

Publishers benefit the most from the “Read” consortia because of heavy library Big Deal subscriptions. As such, even when big consortia are formed among Arabian Gulf academic libraries, it may take a while to substantially benefit from discounts where consortial purchasing is concerned until most of universities become research heavy. Revenue for publishers is mostly from the “Read” model, i.e., subscription funding. As there is a general push towards more OA benefits to an increasing number of institutions, one wonders about the implications for the future financial burden of “Publish” consortia. Funding must be availed from grant funders and governments to support the model.

This point leads to the capacity of library consortia to enter transformative agreements with publishers. Hinchliffe (2019, n.p.) explains that “a contract is a transformative agreement if it seeks to shift the contracted payment from a library or group of libraries to a publisher away from subscription-based reading and towards open access publishing” but hastens to also add that “definitions are debatable, debated, and continuously emergent”. The same author emphasizes that these agreements are, without exception, “notoriously complex” (Hinchliffe 2021, n.p.). On January 21, 2021, Brill announced that it had concluded transformative agreements with the Jisc (formerly called Joint Information Systems Committee (JISC)) consortium in the UK and Bibsam consortium in Sweden. In the Arabian Gulf, solitary cases can be mentioned, e.g., the Royal Society of Chemistry agreed on a Read and Publish deal with the King Abdullah University of Science & Technology (KAUST) in Saudi Arabia. The same report elaborates that “corresponding authors at KAUST are now able to publish Open Access in hybrid Royal Society of Chemistry journals, as well as having access to read the full range of scientific content from these titles”. The ESAC (Efficiency and Standards for Article Charges) Transformative Agreement Registry reflects transformative agreements between Qatar and Elsevier, Springer Nature, and Taylor & Francis. However, the future and sustainability of these approaches is yet to emerge. But then, the unsub option is also available.

2.7 Library Service in E-learning and Massive Online Open Courses (MOOCs)

Education transformation now includes MOOCs, OA, and open education. That demands more librarian awareness of entire academic institutions than solely being in the library keeping books and responding to citation management queries. E-learning has been tested during the pandemic lockdown times of 2020–2021 when librarians, as with all other educators, have had no choice but to be more remotely involved with student learning. Massive lockdown has resulted in the adoption of e-learning as a practical solution to challenges with the impossibility of face-to-face classroom teaching and learning. As in many sectors of life, the academic library has experienced its share of overwhelming repercussions of sudden inevitable change. It therefore is educative to discover if MOOCs have been impactful in this context.

MOOCs are being tried in many parts of the education world but rely on the availability of reliable internet connectivity. Initiatives such as edX MOOC by Harvard, MIT, and Berkley; Coursera MOOC by Stanford; Coursesites; Udacity Inc.; Canvas Networks Inc.; Udemy Inc.; and more offer courses in a wide range of subject areas and are major players in the Arabian Gulf region. In a Coursera blog, Belsky (2019) posted news about a partnership between Coursera and the Abu Dhabi School of Government in the UAE aimed at training government employees. The same blog also mentions that Dubai Electricity and Water Authority (DEWA), Etihad Airways, TECOM Group, and Dubai Asset Management have used Coursera to upskill their employees. Besides having increased Arabic language content in some MOOCs, wholly Arabic language MOOCs have increased too. For example, in Saudi Arabia, Rwaq which was founded in 2013, per the website at <https://www.crunchbase.com/organization/rwaq>, is one of the largest MOOC platforms in the Arabian Gulf region, and another Saudi Arabian MOOC, Doroob per the website at <https://doroob.sa/ar/individuals/about/>, was launched in 2019 in partnership with edX. In Kuwait, Dawrat was launched in 2011 per the website at <https://www.dawrat.com/about>, while in Oman, Nadrus, launched in 2015, offers a broad range of subjects per the website at <https://www.nadrus.com/site-map>. Qatar, Saudi Arabia, Bahrain, and the UAE are among the Arabian Gulf countries which use the Edraak MOOC that is originally from Jordan and edX powered (launched in 2013) platform <https://www.edraak.org/en/>. What these MOOCs have in common is that they are tailored for manpower development in the region. Referring to MOOCs in general, Almeida (2013, n.p.) mentions that:

There are remedial MOOCs, professional development MOOCs, and recreational MOOCs. There are niche MOOCs on special topics and MOOCs on classical subjects ranging from poetics to physics. There are foundational MOOCs on the basics of academic writing and iterative MOOCs about pedagogical theory. There are even MOOCs about MOOCs.

Most of these courses are free and place no obligation on the student to complete. While the media generally advertises them as providing democratized world-class education that promotes global sharing, that sounds like a substitution of instructors local to an individual's education environment, unless they are a part of the MOOC producers. Meanwhile, librarians are inclined to care for topics included in MOOCs because they involve more than the local physical library space and go beyond supporting e-learning, but their contribution is not necessarily always sought or included.

Schaffhauser (2021) writes about MOOC enrolment exploding in 2020, specifically mentioning Coursera, EdEx, and Future Learn as the most popularly visited MOOC providers. Since the pandemic is still an ongoing phenomenon in 2021, it is not yet clear how much MOOC activity has plummeted in the Arabian Gulf countries. Even when competition for students sometimes drives the MOOC approach, it remains important to consider its situational appropriateness or suitability. It is also interesting to follow and observe the impact of the 2020–2021 disease pandemic lockdown in terms of acceptance of remote teaching and learning, including synchronous versus asynchronous learning, as well as formulation and use of suitable assessments and certifications.

Even when the librarian's role in this spectrum is minimally applicable, it can include advising on copyrighted material, advocating comprehensive OA activities, capturing MOOC content and data, remotely supporting students, and exercising remotopia (working remotely). It is also a learning opportunity for academic librarians as they interact with communities that create as well as use MOOCs. Because the content of the curriculum used belongs to the faculty, the place of the library depends on how much recognition the librarian receives in developing, running, and supporting these. However, questions remain about the cultural boundary distortions that some MOOCs pose. As such, the mentioned MOOC efforts from Saudi Arabia, the UAE, Kuwait, Bahrain, and Oman make it easier for the target audience to understand the courses offered better.

2.8 Comments

Sometimes the role of academic librarians and scholarly databases has been questioned due to the availability of alternative sources of information that the Web provides. For example, Little (2013, 309) questions the role that academic

librarians have in MOOCs because the latter operate in a “massively open” environment “where content is delivered in short bites and there is often no reading list or assignments beyond quizzes and tests?” There is often a tendency for potential library users to feel that “academic library collections are a series of walled gardens in large part due to license agreements signed with commercial vendors that restrict what can and cannot be done with proprietary resources” (Little 2013, 309), and MOOCs as possessing more accessible information.

Hu, Luo, and Liu (2013) propose that librarians, instead of being concerned with spaces where their service may not necessarily be essential or required, be involved with other activities such as launching institutional repositories (IRs), promoting, encouraging, and supporting the use and preservation of diverse OA resources and materials. Courtney (2013) suggests that such activities are an opportunity for collaboration with faculty, and a teachable moment for OA, publication, and copyright issues. In fact, the OA Agreements and Licenses Taskforce (2013, 14) mentions that:

the players best placed to secure the rights for deposit into repositories are the libraries or library consortia that carry out licensing activities. Libraries (or groups of libraries) routinely negotiate licenses that express the terms of access to content and usage rights for journal articles and have become a major force in the acquisition process of scholarly journals. In the context of these negotiations, libraries and consortia wield significant power and licenses can be an effective apparatus for guaranteeing authors or institutional rights to re-use articles and/or deposit articles into repositories.

As such, librarians become more visible by acquainting themselves and understanding their important role in this picture. Jensen and West (2015) also advise librarians to embark on open educational research. A survey by EDUCAUSE (2013, n.p.) suggests that librarians can be involved with advising on “open access works, Creative Commons–licensed work, public-domain resources, and permissions to use licensed content [that] will provide the richest course content in a MOOC”. These expectations are not unique to academic libraries in the Arabian Gulf region, but to university libraries in general, and academic administrators especially in determining the progress of OA initiatives.

Clobridge (2014, 46) says “while libraries are often given the responsibility of overseeing the repository, the most successful OA policies are those receiving strong support from university leadership and administrators.” Thus, empowered and supported librarians can reveal the existence of new and alternative reliable sources of research information, e.g., via Google Scholar Links, OAIster/ WorldCat, and Public Library of Science (Plos) to complement the library’s aggregated search facilities (such as ProQuest Summon, Ebsco Discovery Service, SirsiDynix BLUEcloud, etc.). Librarians can also provide guidance and support to scholars in creating and/ or updating their social media presence for more visibility.

Aharony (2009, 39) indicates that “librarians of all branches should be exposed to marketing concepts to maintain their central position as information providers despite – and within – the new technologies”. Thus, the involvement and attitude of librarians towards marketing library service is critical to its success. Arasu (2014, n.p.) suggests that “libraries need to brand themselves in more engaging and interactive ways, exposing the vast and diverse expertise residing in librarians”. This may mean training and re-training librarians to equip them with relevant skills, i.e., allocating a budget for professional development (PD) whether it is internal or available from external sources. Internal PD enables the sharing and transfer of context-specific relevant knowledge, or “situated learning” as expressed by Lave and Wenger (1991). As an incentive, perhaps the use of badges may be used, just the way they have been referred to in Chapter one.

It is necessary for librarians to proactively place themselves at an advantageous position through professional associations, workshops, seminars, webinars, and conferences that offer PD opportunities enabling them to become more effective educators and knowledge facilitators. This cannot be emphasized more when reality dictates that volatility, uncertainty, complexity, and ambiguity must be confronted. Rinehart, Sharkey, and Kahl (2015, 463) suggest that PD helps “to improve workplace interpersonal communication, enhance professional development and staff training, and become a more engaged teacher”. The ACRL, for example, is increasingly including teaching skills training as well as advocacy so that library professionals can more deeply understand how the learning process happens and be more confidently embedded in the information literacy efforts as knowledgeable knowledge facilitating experts. These efforts, together with the ACRL Scholarly Communication Toolkit (2017), prepare them for supporting university students in efficiently and effectively acquiring information and digital skills. This includes proficiency in data-related matters because, increasingly, huge amounts of online data are stored and used towards a wide variety of purposes.

2.9 Conclusion

The VUCA phenomenon must be understood from the perspective of professionals who can take charge of their future as much as possible. The unexpected and unpredictable happens any time, causing complexity and ambiguity, but the fact that these topics are discussed must result in forward thinking, forward-planning academic librarians capable of enhancing library services in the universities they serve. Commonalities in what global academic librarians face

is what makes lessons learnt in one part of the world useable in another part, subject to situational modifications. As such, lessons that academic librarians in the Arabian Gulf read or learn about elsewhere are applicable if tailored to suit the region. That is a notion expressed by Abdulla (2008) in confirming the acceptance of diversity in implementing international conventions. So, when e-learning platforms are created, their purpose may be similar across the world, but the content and applications used are useful only if they are relevant to their targeted audiences. The example of edX partnering with Arab Gulf organizations suggests an acceptance of diversity and the need for relativity to the expected users.

The information and communication technology revolution inevitably impacts the services mentioned in Chapter one, but perhaps IL frameworks are needed as guidance in that situation. There usually is no singular IL framework to follow, but they are presumed to work best in the context of national information policy guidelines informed by the UNESCO (2009) National Information Society Policy template.

Chapter 3

Research Data Management and Institutional Repositories

3.1 Introduction

This chapter probes into Research Data Management (RDM) efforts in selected Arabian Gulf university libraries. From examining available literature about the topic using region-specific articles when available, few librarian comments, and the information provided by university library websites, it is possible to get an idea of RDM status in academic libraries. Existing lessons and policy documents are sought, and plans suggested for local solutions, suggesting avenues for progress. Though not a new concept, there are indications that local RDM activities are in their infancy, but knowledge of their importance exists. Taking advantage of the existing awareness to organize tangible RDM efforts can facilitate retrieval and availability of data relevant to the region. This account reveals an intricate range of activities involved in the organization of RDM services.

3.2 A Discussion Whose Time has Come

This discussion covers the RDM efforts in academic libraries of universities that are moving from a predominantly teaching focus, becoming research-intensive. Some are public, and others private, with several of them being satellite campuses of Western-based universities. Western-based institutes sometimes have already-existing RDM arrangements which have highly established digital data collections. However, it is noted that when it comes to research matters, academics identify more with the notion of “academic tribes” (Becher and Trowler 2001; Trowler, Saunders, and Bamber 2012) than with their parent institution. As such, local and regional RDM-related services and advances are pointed out to demonstrate and affirm their contributions to the regional and global research environment, but without positioning the extent of researcher support provided by librarians in the various universities.

As in many other parts of the world, an enhanced emphasis on research among universities, transforming them from teaching-only establishments to a comprehensive agenda, includes research, development, innovation, and entrepreneurship. Previously, research by Abouchedid and Abdelnour (2015) revealed that faculty research productivity in Bahrain, Kuwait, Oman, Qatar, Saudi Arabia,

<https://doi.org/10.1515/9783110740219-003>

and the UAE was very low. What is not mentioned is that the creation of research institutes was and is taking place to champion development in the region. Some of these feature on university websites. For example, a few of the university-affiliated research institutes and centers include King Khalid University Research Institute, Prince Sattam bin Abdulaziz University Research Institute in Saudi Arabia (established in 2010); Qatar Environment and Energy Research Institute (Qeeri) (established in 2011), Hamad Bin Khalifa University research institute (established in 2010), the Social and Economic Survey Research Institute (SESRI, Qatar University Research Institute) (established in 2008); University of Bahrain; the Gulf Nuclear Energy Infrastructure Institute (established in 2011); the Institute of International and Civil Security, the KU Robotics Institute and the Nuclear Energy Research Group, the Khalifa University Centre of Excellence in Biotechnology, and the Visual Signal Analysis and Processing Centre, to name but very few of the many such units in UAE universities; and the DARIS Research Centre at the University of Nizwa (established in 2010). In Kuwait, the Kuwait Institute for Scientific Research (KISR) is affiliated to various organizations including universities. The small sample of research institutes mentioned reflects that they are developing, but their existence is expected to enhance research output from the region.

There is, however, a challenge compiling accurate statistics to reflect regional gradually escalating scholarly output figures. The reason is that the representation of non-English language scholarly works are barely represented in the big indexing services. For example, according to SciVal (2021) early in the year, statistics (originating from Scopus), between 2010 and 2015, scholarly output from the UAE was 458; five from Saudi Arabia; two from Qatar; seven from Kuwait; six from Oman; and one from Bahrain. Total numbers of scholarly productivity may be lower than what comes from Europe and the rest of the Western World, but the figures reflected are erroneous just by looking at them. A very similar pattern is reflected for 2015 to 2020. It is important to note that the figures reflected convey the message that what is not in Scopus is not included, and that with no English language abstracts, no matter how scholarly an article, a journal, a book may have been, it would be excluded. But the situation is gradually changing,

Regardless of the language-related shortcoming of some indexing services, resources and support must be in place to enable researchers to be seriously engaged. Supporting elements of the research cycle that include research data services (RDS) or RDM is thus a major library activity. But then, it is not entirely the availability of and access to research resources and data that determines the success of research, innovation, and entrepreneurship. Other factors are at play too, for example, teaching workload matters. According to Kelsky (2018), top-ranked research universities have a standard 2–2 load (meaning an individual

teaches two courses each semester of the academic year) in the humanities and most social sciences (and a 1–2 or 1–1 or 1–0 in STEM fields). The expression of teaching workload formulas varies but impacts balance between teaching and research productivity.

3.3 Research Data in Academic Libraries

The proliferation of huge amounts of data and information that academic scholars and researchers are confronted with drives the need for RDM services. Their development in various regions of the world have national implications and are based on universities identifying the existing need for them, developing plans of action, considering existing tools and service models that may be reused. Recording the long history of American RDM efforts starting from 1950s, Rice and Southall (2016, 10) point out that it “would be a mistake to think all these developments have been smooth and of the same kind”. In comparison, most RDM projects in libraries of Arabian Gulf universities are in their infancy but have the potential advantage of benefitting from the experiences and examples of established services both inside and outside their countries.

In academic research environments, librarians are sometimes expected to make research data as accessible and visible as possible. Where this is within the boundaries of their professional control, they make them retrievable by creating metadata schemes and taxonomies as well as designing standard retrieval methods. Ackers (2013) points out that in university environments, academic librarians are likely to encounter Small Data, therefore should focus on developing approaches to the documentation, organization, preservation, and dissemination of small datasets that have no permanent home outside of the labs and offices in which they were born. They must also increasingly include data literacy in their instructional programs. The Small Data sets are the result of research activities. While highly valuable, the data are also diverse and heterogeneous in nature (Wang et al. 2016) and can be huge in a university setup where active research is going on. The data are useful for mining by other researchers per their needs, but that requires proper infrastructure and a policy framework. Librarians thus support by curating the data to make them more valuable and available for other future uses. Researchers usually store their data locally on their computer disks or in the cloud (Elsayed and Saleh 2018; Tenopir, Birch, and Allard 2012). Librarians get involved in attempts to systematically archive that data, meaning that they arrange, describe, document, and preserve the data to enhance and make them easily retrievable, and in the process facilitating new research. But then, there is frequently a data organization challenge due to the lack of subject-specific

and interdisciplinary standards (Petersen et al. 2020; Wang et al. 2016) and costly nature of the high-performing computer servers required to process such data (Wang et al. 2016). Nonetheless, it is their role to curate and preserve the datasets, thus helping researchers understand their meta-descriptions.

Promoting and supporting the use of common standards (e.g., ISO/IEC JTC 1/SC 32 – Data management and interchange – specifically the ISO/IEC 11179 (Martin-Rodilla and Gonzalez-Perez 2019) family of standards) is to address the specification and standardization of metadata schemas and tools (e.g., research instruments such as questionnaires and/or scales, for implementing the research strategy) among researchers. This is how it is possible for researchers to relate to the research data life cycle, data analysis, tools, and statistics (Chiware and Mathe 2015). In other words, data librarians do their best to maintain knowledge bases about data. They also champion the establishment of uniform data citation standards. Library search does not yield much information about RDM activities in Arabian Gulf countries, but the availability of PD opportunities such as the free October 2020–February 2021 online *Research Data Management* course offered by the Research Data Management Librarian Academy (RDMLA) or the *Research Data Management and Sharing* Coursera course are too advantageous to miss.

The topic of library initiatives organizing research data attracts attention in many parts of the world and has been discussed widely. Consensus is that when large networks and repositories are created, they provide support for effective data management and access. HathiTrust (2017) is an example of such a co-operative network effort of more than 100 university libraries. It is administered by Michigan and Indiana universities and is a collaborative repository of digital content from research libraries. It is “committed to the long-term curation and availability of the cultural record” (Hathi Trust 2017, n.p.). A smart policy framework is necessary because personal research data is being used in new ways, giving rise to many information sharing issues. Policymakers must therefore create proper guidelines for an information sharing environment and researcher privacy. The use of an information policy is thus suggested. Guidelines must also define the extent and nature of use that can be considered fair dealing. Salo (2010), Rice and Southall (2016), and Wang et al. (2016) suggest that this work could be done by data scientists rather than librarians. This reality means that libraries planning to organize data should either train their personnel or hire already trained ones to fulfil the university’s data management requirements. They are needed in providing researchers with advice on levels of control relating to their research data. Funding for existing and continued maintenance of data repositories is a far-reaching investment.

There is also a special challenge in libraries concerning the use of the various Content Management System (CMS) platform options whose control of the

underlying technology is not necessarily controlled by librarians, therefore including the RDM option is not always an original component. The University of Exeter, for example, uses SWORD and Globus plug-ins to bridge the gap between DSpace and Big Data capture (Taylor 2013). A similar arrangement is described in a study by Jurik et al. (2015) who, in the context of the Danish State and University Library, refer to integrating Hadoop applications or Map Reduce with traditional repository systems such as Fedora. Furthermore, Motta et al. (2016) suggest an integrated system for the management and analysis of grey literature contents and metadata. Attention is required towards the effectiveness of query processing strategies in Big Data applications, such as Hadoop, that are intended to facilitate its adequate exploitation.

Formal training is still necessary because it empowers the librarians. Additionally, working in a knowledge and information-driven economy, it is necessary to equip librarians with the skills that enable them to function effectively. Nazim Ali (1986) referred to two library science schools. Thereafter, ur Rehman (2008; 2012) stated that Saudi Arabia, Kuwait, Oman, and Qatar offered formal degree programs for the education of LIS professionals, with Saudi Arabia having six LIS programs located in four universities. Qatar University has an undergraduate program, and a University College London master's program is on offer in partnership with Qatar Foundation, while Sultan Qaboos University in Oman has both undergraduate and graduate degree programs. Kuwait University offers a graduate degree program in LIS and an undergraduate minor in Information Studies and the Public Authority of Applied Education and Training (PAEET) in Kuwait also offers an undergraduate LIS degree. Kafel, Creamer, and Martin (2014) note the increasing interest in library science training programs to include data management in the curriculum, furnishing trainee librarians with data management, data mining, machine learning, and deep learning capabilities, equipping them with data stewardship skills.

3.4 Research Data Types and Formats

There is a tendency for different universities and institutes to define research data according to how it matters to them. Cox and Verbaan (2018) list an array of definitions from universities and research organizations, but what they have in common is that it is all data in varying formats and types. Data types include results from experiments or laboratories, generated from test models (climate, mathematical or economic models), social media data such as tweets, logs of web server traffic, derivations or compilations (text and data mining, databases, 3D models), collections of peer reviewed datasets published (chemical structures,

gene sequence databanks, statistical datasets), and datasets from national censuses (for demographic, occupational, and housing information to answer fundamental questions in social economic history), and more.

Research data formats include raw data files, artefacts, documents (PDF, Microsoft Word, Text), notebooks, questionnaires and transcripts, specimen, samples, photographs, and more. According to Essayed and Saleh (2018, 2), “research data includes every piece of data acquired and generated during the research process, and may comprise, among others, text, spreadsheets, questionnaires, photographs, films, test responses, slides, laboratory notes, statistics, observations, results of experiments, measurements, samples, algorithms, scripts, and workflows”. Like Big Data, research data is characterized by its huge volume, its variety and the velocity with which it is being created, its veracity, i.e., reliability, and the value attributed to as well as resulting from it. RDM is important in facilitating the making of informed data-reliant decisions. The role of university libraries as enablers of research is central to data capture, management, and access by researchers, and this is not always a smooth activity, as literature reveals.

3.5 Research Data Repositories

There are data repository directories, e.g., Re3Data which is a database of data repositories; Fairsharing.org, a catalog of databases and related resources; DataCite, a database of datasets and repositories; the European Union Open Data Portal which is a catalog of open datasets; Data Citation Index (DCI) which is a database of datasets; and Google Dataset Search. Beyond the directories are general data repositories, e.g., Dryad Digital Repository, Figshare, Harvard Dataverse, Open Science Framework, Zenodo, and Mendeley Data. The advantages and strengths of using one or the other, or several at the same time, are determined by institutional requirements and preferences. Additionally, subject specific repositories are also the choice of many disciplinary scholars and researchers, e.g., in biology and life sciences, chemistry, computer science, earth and environmental science, geoscience, health sciences, humanities, physics, astrophysics and astronomy, and social sciences.

Among these registries, there is evidence that research data from or about Arabian Gulf countries exists in several repositories. An example is that country name searches (by no means an exhaustive search term) for “United Arab Emirates” in March 2021 in ZENODO revealed 23 datasets, “Saudi Arabia” 31 datasets, Kuwait two datasets, Oman 13 datasets, Qatar 24 datasets, and Bahrain one dataset. The same country name search in PANGAEA revealed 14 datasets for the UAE, 242 for Saudi Arabia, 10 for Kuwait, 13 for Qatar, 799 for Oman, and 51 for

Bahrain. In DRYAD the same country name search gave 9 datasets for the UAE, 14 for Saudi Arabia, two for Kuwait, five for Qatar, 21 for Oman, and six for Bahrain. Preferences of researchers, especially in terms of their research areas of specialization in any country, and the accompanying conditions for uploading, contribute to decisions on where they upload their data most frequently. However, the Mendeley Research Data platform which reflects data of various types (including physical object, images, tabular data, and more) shows 3,277 datasets containing the name United Arab Emirates, 5,112 Saudi Arabia, 3,037 Kuwait, 966 Qatar, 6,705 Oman, and 539 Bahrain. It is considering this growing array of data possibilities that the article *So you want to be a data scientist?* by Catherine de Lange (2013) becomes useful in explaining the increasing demand for the position of Data Librarian, investment in RDM projects, including the hiring of copyright and data experts.

3.6 The Context of Research Data Management

The management of research data is increasingly recognized from the perspectives of different professions because of “the deluge of data arising from new types of science, a crisis in confidence in research integrity in certain fields and the general movement for open data” (Cox and Verbaan 2018, 5). Research data is relevant to all subject areas and contributes to the bigger Big Data landscape used in and for policymaking. Though this is not a new proposition, it is true that university libraries, regardless of geographical location, have a special role to play in supporting academic researchers with some of the data-related tools they need to pursue their disciplinary activities. Saxena (2017, 237) makes the comment that open public data (OPD) in the “GCC countries is in its nascent stage and little academic interest has been shown in this area.” Likewise, RDM activities in university libraries are in their infancy, but knowledge about their importance exists.

Flores et al. (2015) propose that a needs assessment exercise and policy development must be put in place before confirming RDM projects. Bryant, Lavoie, and Malpas (2018, 18) suggest that the motives for organizing a RDM service are:

compliance with mandates or policies that establish formal requirements for documenting research data management plans or for demonstrating progress toward open science goals; evolving scholarly norms that influence disciplinary perspectives on what constitutes good scientific practice, including expectations of reproducibility and transparency in documenting protocols, methods, and data sources; institutional strategies that are aided by more rigorous and systematic attention to monitoring research productivity and performance and improving (or maintaining) institutional reputation in data-intensive

research areas; direct or derived demand from researchers with unmet (or imperfectly satisfied) data management needs; for example, evidence that university researchers are turning to external services to meet data storage, management, or sharing needs that could be met by the university.

Once RDM programs are in place, advocacy programs, awareness campaigns, training sessions and advisory services, data repository development, helpdesk services, and data management plans (DMP) must be organized. It is notable that a RDM skills course is now integrated in the curricula of many library schools and available through professional development resources, including those run through the Research Data Management Librarian Academy that subsequently posts the training and publications files on GitHub (<https://rdmla.github.io/>) that librarians are engaging with; or the Elsevier Researcher Academy webinars, and so on. The attributes of those courses cater to the “research data scientist” or “institutional intelligence officer” or “data librarian” type positions mentioned above that require computational and statistical expertise.

3.7 Questions About RDM Efforts

A Google search for “data librarian” jobs in libraries in the Arabian Gulf does not yield results. However, there are a few instances of “research data scientist” or “institutional intelligence officer” positions advertised, unrelated to libraries. A job advertisement of the position of “data librarian” happens very rarely. But then, the fact that activities or terms of this nature are not reflected on university websites does not conclusively suggest that they are not happening. One needs to comment on possible reasons for delayed adoption of the efforts, and how libraries are involved. In so doing, the following questions arise:

- a) Are academic libraries taking leadership in coordinating RDM efforts in their universities?
- b) Does an enabling environment for those efforts exist?
- c) What are the possible explanations for delays or impediments in RDM activities?

3.8 Commenting on RDM at Universities

Efforts specific to university libraries are at varying stages, mostly being works in progress. For example, in March 2021, a web search for “Data Librarian” or “Data Services Librarian” or “Data Management Librarian” did not yield a result. That implies that it is not a frequently advertised library job position. However, there

are indications that in some libraries, positions exist of Systems and Digital Librarians, Digitization Technicians, and Research and Data Management Librarians. That means data services are a phenomenon in libraries and repositories. These repositories contain some research data, while others' efforts are developing. Characteristically, there are thesis repositories, but with a limited number of formalized RDM projects. The results of a United Nations e-Government survey (2020) indicates the Arabian Gulf countries as having high data publishing capabilities after they all participated in data gathering for that survey, suggesting an inherent enabling environment for data harnessing that supports academic research. Thus, for the sake of propping up the region's scholarly research environment, librarians must support researchers in finding information, including providing guidance on where this data is readily accessible.

One must bear in mind that the strides being made by universities exist in a context where language, research scope, and resources (human and infrastructural) sometimes lead to the undervaluation of academic research output as indicated in the above-quoted SciVal figures. That limits the ability of regional scholars to contribute to international science since their effort is not recorded. It is becoming evident that regional research output in the Arabic language is increasingly becoming available through databases such as Al Manhal, Bani-pal, Dar AlMandumah, E-Marefa, and Kotob Arabia, to name a few. But then, if the research data emanating from the works housed in those databases were harnessed for access, they could contribute to global research, adding to the pool of original research pursued in Arabic language. Abalkhail (2018) highlights the challenge of translating qualitative data from Arabic to English for purposes of writing articles in English. This challenge is suggestive of the need for capturing research data in the original language.

A proposal by Larabi Marie-Sainte et al. (2019) suggests a New Arabic Dataset (NADA) for text categorization purposes. Resulting from infrastructural deficiencies, an additional stumbling block for scholars and researchers in low/middle-income countries (LMICs) is expressed by Bezuidenhout and Chakauya (2018, 39) to be the fact that "low-resourced environments shape data sharing activities but are rarely examined within Open Data discourse", meaning that they too suffer exclusion. Nonetheless, libraries are counted among the essential support entities available to all scholars.

Regardless of where RDM activities take place, libraries lower barriers that researchers sometimes face by making institutional scholarly works and research data available. Depending on the available infrastructure, librarians can integrate data catalogs with regular library retrieval services such as Koha, Alma, World-Share Management Services (WMS), and Sierra among others, making the search for data hassle-free. But then, involvement of the requisite data specialists is an

evolving effort. The required skills include creating common meta-description schemas and common citation practices so that data sets have persistent identifiers and can be crosslinked between publications and datasets. Awareness about the impact of datasets is also necessary for the data creators. For that reason, librarians must guide them on bibliometrics (for example, impact factor, h-index) and altmetrics. That is facilitated with the use of tools such as Mendeley, Scopus author management, ORCID identifier, and DMP Tool (Chiware and Mathe 2015; Johnson 2018). Data librarians are also essential to higher education research projects because they provide advice on conditions under which data can be re-used. It is important for them to guide researchers on discipline specific best practices in data creation and intellectual property rights. They also offer RDM support, including DMPs for grant applications, intellectual property rights advice, and the integration of data management into the curriculum.

The responsibilities mentioned above demonstrate that the work of librarians keeps evolving due to continuously changing demands and expectations of the academe. The ACRL (2019, n.p.) summarizes those responsibilities to include:

helping researchers to deposit data in institutional and disciplinary repositories, assisting with data management plans, and consulting with research teams. Librarians also serve the research community by creating workshops, webinars, and tutorials. . . . develop a robust understanding of tools and support mechanisms available on campus. . . collaboration with campus computing or statistical support services. . . providing background information as well as advanced information about RDM. . . through, newsletters, or webpages is also important. . . have an RDM presence online . . . provide information related to creating data management plans, data documentation, metadata standards, storage and preservation.

A similar description is provided by the Association of European Research Libraries (2018), suggesting the recognition of data management librarians. Sharing experiences in the context of South Africa, Chiware and Mathe (2015) concur with both the Association of European Research Libraries and ACRL on the need to employ data librarians in research-heavy data-reliant environments. It is the responsibility of the data librarian to connect with useful RDM procedures. The foregoing account affirms the importance of data librarian skills to scholarly research as it takes center stage in all higher education.

Reference to increased use of research data is due to its exponential growth. But then many libraries must create Data Librarian posts, and this is not unique to Arabian Gulf academic libraries. The development of professional staff skills for data librarianship has become essential so that the library can actively participate in institutional research data policy development, including resource plans, and adopt open data policies where appropriate in the research data life cycle. On a wider scale, it is important to partner with researchers, research groups, data

archives and data centers to foster an interoperable infrastructure for data access, discovery, and data sharing. This is where the international data repositories, e.g., Dataverse, Zenodo, Dryad, become useful. Other RDM options that can be investigated too include the Comprehensive Knowledge Archive Network (CKAN) which is a large Open-Source data portal platform, DSpace, and more as listed by Lewis (2014), depending on the functions required and defined by the university.

It appears that university libraries need champions and advocacy especially when they do not yet possess data repositories or immediate plans for RDM services. Currently, the requisite data experts are rare, causing delays in initiating any RDM plans. It is worth noting that there is value in learning from university libraries with established RDM services regardless of their status, to accurately articulate the advantages of having systems in place, the types of data and objects for inclusion, intellectual property (IP), and licensing implications (Cox, Pinfield, and Rutter 2019a). Harnessing knowledge about awareness, access, and use of these resources is key for the benefit of researchers. Unsolicited comments about RDM from librarians working in the Arabian Gulf reflect them admitting that the researchers they support produce research data from their projects but organizing the same data for re-use, possibly by other scholars, could be enhanced. They are generally aware that for RDM programs to be initiated, certain infrastructure must be in place and various constituents involved as these are major initiatives. Examples of required participants include research offices, faculty evaluation processes, the library, information technology, legal counsel for intellectual property advice, and more.

It is also understood that file storage strategies are necessary because storage formats are liable to fail, and file formats eventually become obsolete, therefore storage strategies help to minimize the risk of loss or destruction of data. Some conversations have suggested national repositories to centrally formalize RDM processes. One can make the comment that this arrangement would enable the harvesting, management, and centralized regularized access to research data. Talib et al. (2015), at the realization of a huge demand for a unified database for social science research in the region, advocate that all social science researchers upload their work to the Dataverse Network (coined with the name Bayanatona). Dataverse is “an open-source web application to share, preserve, cite, explore, and analyze research data” (Dataverse Project 2020). But then, the effort requires champions who maintain continuity and vibrancy. Yoon and Schultz (2017) suggest improving aspects of library RDM webpages to include service development and thoroughness of information offered.

From a broader perspective, RDM activities in the Arabian Gulf countries of Saudi Arabia, Qatar, Bahrain, Kuwait, Oman, and the UAE reflect tendencies found in many other universities across the globe. A few have existing institutional

repositories (IRs), but not necessarily active RDM/ RDS arrangements. The same holds for the role of librarians as expressed in a research data services study (RDS) by Cox et al. (2019, 1432) which confirms “a picture of the spread of RDS, especially advisory ones. However, future ambitions do not seem to have seen much evolution. There is limited evidence of organisational change and skills shortages remain”. In an ACRL White Paper, Tenopir, Birch, and Allard (2012) found that a quarter to a third of all academic libraries in the United States and Canada were planning to offer some research data services within the next two years. But another investigation by Tenopir et al. (2014) revealed not much difference two years later. Chigwada, Chiparasha, and Kasiroori (2017, 9) make similar observations from their study focusing on Zimbabwe, where they conclude that RDM is “a relatively new concept in Zimbabwe’s research institutions as compared to other institutions in the developed countries”.

Similarly, a research by Chiware and Becker (2018, 1), covering Southern Africa (Botswana, Lesotho, Malawi, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe), concludes that there is “need to advocate for awareness of research data management within institutions with academic and research libraries taking a leading role in spearheading data management and providing training and the technical support needed to store and retrieve research output and data sets”. This too is the conclusion from a study of RDM practices in Australia by Krahe et al. (2019). Additionally, Tenopir et al. (2019, 36) found in a follow-up investigation of the USA and Canadian studies that the “provision of RDS is not yet widespread among academic librarians, although there is a group for which these services are integral to their jobs and another group who offer some of the services occasionally”. Regardless, the perspective of Zhou (2018) on RDM/ RDS is that services in the United States, Britain, Australia, and some universities in China such as Peking University, Fudan University, Wuhan University, and Xiamen University have become more developed than elsewhere.

There are no studies about the GCC that are equivalent to the USA/Canada cases by Tenopir, or those from Southern Africa, but the findings of the said studies perhaps explain why the progress of RDM services do not happen fast or have not taken shape. In fact, efforts at Western-based universities, or non-federal ones, or private ones tend to be more advanced than those at public ones. Examples include that New York University Abu Dhabi has a Social Sciences and Data Librarian position; Khalifa University of Science, Technology and Research (KUSTAR) has well-established RDM guidance supported by the library team; the University of Wollongong Dubai has a service that one can request through the library. RDM services are, however, in place in other regional libraries, e.g., in the Kingdom of Saudi Arabia at King Abdullah University of Science and Technology (KAUST), in Qatar at the Carnegie Mellon University

Doha, and at University College London Doha, and so on. Omani and Kuwaiti library websites generally have no mention of data services, but that does not rule out that RDM efforts may be in existence in other forms.

3.9 Concerning Policy for RDM Efforts

According to the *UNESCO science report: Towards 2030* report by Zou'bi et al. (2015), it is important to put in place a data policy framework for academic libraries, as well as data protection legislation. This defines the plan detailing what data to collect, documentation and metadata, ethics and legal compliance, selection and preservation procedures, storage and backup, data sharing provisions, and what resources are used, as well as allocation of responsibilities (Cox and Verbaan 2018). In the event of RDM being outsourced, or where there is an independent data publishing model, it is necessary to set clear parameters for doing so. The independent data publishing model involves using spaces where research data from various departments, localities, and units are integrated to make full use of international research data resources, developing a series of data sets and products, building an intelligent and networked RDM and sharing service system (Xu 2019).

There must also be user training and professional development opportunities relevant for librarians with limited data management knowledge or experience, as well as the raising of awareness about research data availability and access, its advantages, and ethical use in and by university researchers. This reduces negativity and suspicion while assuring the researcher community of the range of support capabilities the libraries offer. There is merit in libraries becoming members of professionally supportive organizations, e.g., Research Data Alliance (RDA). The use of data handling tools also helps, e.g., DMPTool, for creating data management plans that meet institutional and funder requirement, the Spatial Data Access Tool (SDAT), and the UN StaTact toolkit for data governance and data utilization for policymaking purposes.

To enhance research data benefits, there is a need to address data literacy skills among academic librarians and potential data consumers. This ranges from the ability to recognize the existence and need for data to applying recognized ways of citing them. Elsayed and Saleh (2018) highlight the fact that when potential beneficiaries of research data do not possess data analysis capabilities to derive meaningful information from the data, this creates a gap. When there is no meaning derived from existing research data, it stands to reason that there may also be reluctance or inability to store it in retrievable spaces, because of not appreciating the point of doing so. Thus, the lack of clarity about the advantages of

data sharing demands researcher guidance on RDM. A study on RDM and sharing among researchers in Egypt, Jordan, and Saudi Arabia by Elsayed and Saleh (2018, 2) reveals that “97% of researchers were responsible for their research data, and 64.4% of researchers shared their data”. Among those unwilling to share, their inhibition was confirmed as being due to concerns about confidentiality and data misuse. This is not unique to the academics in the Arabian Gulf countries. Rather, it is a concern shared by internet users worldwide, and inclusive of researchers and academics, and is consistent with an earlier research by Tenopir, Birch and Allard (2012).

A 2017 multi-country survey by the European Conference of Information Literacy (ECIL), intended for assessing RDM appreciation among university researchers that was sent to several regional participants, attracted comments expressing doubts, confusion, and suspicions about the need for RDM, as well as the mandate and expertise of their librarians. Another point raised by Elsayed and Saleh (2018) is that when university libraries are introducing research data plans in a multilingual environment, sometimes researchers need more clarification about and familiarization with meanings of terms, e.g., research data, data management plan, data documentation, data repository, digital archive, etc. Thus, the addition of Arabic language on platforms for research is a practical solution.

Other challenges in RDM efforts include compromised reliability of some research data, e.g., when original data sets are not stored, remaining with only the aggregated results from one data gathering exercise to the next, it becomes complicated to have longitudinal studies of patterns. Furthermore, coding may not always be consistent over prolonged periods of time, resulting in many inconsistencies. When there are spelling mistakes, name variants, and specific language preferences, data collection and use requires unified effort as poor and loosely connected data representation happens easily. If there are no data capture and storage plans, with absence of qualified staff to create and manage the data management projects, accompanied by difficulty in creating RDM specialist job positions, lack of clarity about data capture, ownership, and sharing implications, e.g., data life cycle, copyright, fair use, intellectual property, the challenges continue to be a hinderance.

3.10 RDM, Institutional Repositories (IRs), and Open Access (OA)

Several factors impact research data use. Lack of access to it, for example, is mentioned by Scaramozzino, Ramírez, and McGaughey (2012) as a major challenge particularly if there are no OA options. This can be a result of data repository

restrictions (as is sometimes applicable with private funder specifications, concerns about researcher anonymity, and where there are anomalies to do with legal or ethical matters), not knowing of data existence, connectivity and technical infrastructure issues (Bezuidenhout and Chakauya 2018), the state of the prevailing research culture, and sometimes the unavailability of organized relevant data sets. OA means that the results and data from research are made openly available. The implication is that there must be openness during the research process (Cox and Verbaan 2018; Elsayed and Saleh 2018), thus enabling readers to not only use journal articles and books but also be able to re-use or re-analyze the data they see (sometimes resulting in conclusions that differ from those of the originator of the data). That is the essence of academic tribal/ disciplinary dialogue.

For RDM, continuous close collaboration between the library and university leadership, research support units, researchers, and funders (including the applicable government offices) is essential to facilitate decision-making, e.g., the benefits of RDM efforts, funding, deciding which data management platforms to use, and organizing clear privacy policies and notices. Collaboration is practical for shaping decisions on basic plans, the life cycle of data for the long-term, and regularly assessing the RDM policy and practice. Because no single university can have all the data required by researchers, there is need to have interoperability and enhanced access among repositories, with appropriate permissions and limitations embedded. That is based on the OA concept that librarians and researchers must familiarize themselves with.

For visibility, data management spaces can be registered in the Registry of OA Repositories, and in OpenDOAR. OPENDOAR lists three repositories in the UAE, 11 in Saudi Arabia, one in Qatar, and one in Kuwait. In fact, there is increasingly a tendency for repositories to be ranked according to visibility and impact, e.g., by Institutional Repositories by Google Scholar (webometrics). The Repository Analytics & Metrics Portal (RAMP) is an example of a tool to evaluate the accuracy of repository analytics. Besides these mentioned impact measures, a library must regularly review the performance of its own RDM service through surveys, interviewing researchers, studying periodic data downloads and other relevant parameters or benchmarks it aspires to accomplish. The Registry of Open Access Repositories (ROAR), OpenAIRE, and the Confederation of Open Access Repositories (COAR) are platforms that reflect visibility and impact.

Established international research institutes, whether they are affiliated to universities or not, are increasingly making their research data available via OA because most of them are sponsored by public funds, and therefore are expected to allow the public to view and use them. The European OpenAIRE2020 project is an example of one such initiative. However, Sajjad Ahmed and Al-Baridi (2012, 79) note that “open access and IR developments are at the early stages in the

Arabian Gulf region”. It is also not clear if an OA policy for publicly funded research in Arabian Gulf countries is under consideration. This affirms the point about lack of policies being an existing shortcoming as mentioned in the earlier study by Elsayed and Saleh (2018) concerning research data in Arab universities. The same point is also made by Marlina and Purwandari (2019, 972) who found that “due to the absence of national or institutional policies, data is generally managed by researchers with limited access”. However, the OpenAIRE website mentions that its project evolved to help implement and monitor open scholarship and improve the discoverability and reusability of research publications and data. There are also disciplinary repositories, e.g., Inter-University Consortium for Political and Social Research (ICPSR), incorporating OpenICPSR, DRYAD, PANGAEA (Data Publisher for Earth and Environmental Science), ONEMercury (geosciences and biology data), NIH Data Sharing Repositories (listing medical and biomedical data repositories), VADS (Visual Arts Data Service), British Library Sound Archive, and GIS datasets.

Because the regional academic libraries are predominantly staffed by librarians whose training is as varied as their countries of origin, they must depend on the universities’ visions and goals in line with those of the countries’ Higher Education and Scientific Research ministries. This affirms the importance of national policy on RDM. Examples of data management beyond universities include the efforts of the Association of European Research Libraries (LIBER) as elaborated on by Tenopir et. al. (2017), and those of China as explained by Xu (2019). Elsayed and Saleh (2018, 293) suggest that:

The transition towards a culture of data management and sharing among researchers at Arab universities should start with training in data management and sharing practices; encouraging funded research projects to deposit research data in the funding agencies’ repositories at least; providing infrastructures, including repositories, policies, guidelines and best practices, and tools supporting backup and accessibility; and finally, rewarding data sharing within and beyond universities.

Likewise, with RDM matters, librarians must have or acquire expertise and objectively understand the options they are proposing or introducing to their patrons.

Useful suggestions arise from the MBRSG (2015) with a direct impact upon and empowering university libraries in addressing the need for RDM services, and at the same time explaining delays experienced. These include the setting up of openly available databases to house research that is conducted by and for government institutions; engendering transparency in research methods to minimize discrepancies in statistical data present in social science research; unification in accepted research standards, terminologies, and methods among researchers in government and academia to ensure that research standards are maintained;

availability of government support in research; connecting research KPIs to the number of research outputs from publicly funded universities; and to incentivize academic researchers.

Once a university starts being research-heavy, the results show and rankings agencies, e.g., Times Higher Education World University Rankings (THE), the QS World University Rankings, and the Academic Ranking of World Universities (ARWU), reflect that. The ranking agencies are, in fact, examples of instances where existing data is used to provide visible results. Kelsky (2018) confirms that research-heavy universities attract researchers depending on the research emphasis demonstrated. This incentivizes academics to join successful and visible universities.

3.11 Research Data Services (RDS) and Big Data

Research Data Services involve support and solutions for organizing, describing, preserving, and sharing research data. Data in universities is available from library books, magazines, databases, transactions such as book borrowing records, and training materials. Other sources of information are research records and records of courses taken by individual students. When there are big sets of data such as information about students, faculty, and staff who are key elements in the production of useful data, a modern large university views this as a Big Data picture. That is because the information can be used towards the accumulation of useable knowledge assets and resources, such as in tracking student library usage patterns and other university-centered web resources to monitor their academic performance.

More Big Data information includes everything about the university itself, such as course information, repositories, research subjects, and curricula. The transactions that take place in the context of all these elements create meaning. When using Big Data sets, data-driven science is likely to have errors where unsound statistical manipulation and conclusions/ deductions exist. That arises from the fact that the availability of Big Data sets encourages passive data collection as opposed to experimentation and testing. Inevitably, the concerns that come to the fore include information governance, access and dissemination, avoiding privacy pitfalls, security, accuracy, usage, storage and preservation, i.e., issues that are central to Big Data environments. Then also to be highlighted is the point raised by a UNESCO (2012, 8) policy brief mentioning that when it comes to data, “claims to objectivity and accuracy are misleading; bigger data are not always better data; not all data are equivalent; just because it is accessible doesn’t make it ethical; limited access to big data creates new digital divides”.

Academic librarians therefore need the acumen for handling those specific data sets that are relevant to and meant to be viewed and managed by the library.

From a practical perspective, librarians make data sets as accessible and visible as possible, reflecting a concept by Ranganathan (1931) suggesting “every book its reader”. Decisions therefore should be made about what to save and in which format. That leads to data archiving. Researchers usually store their data locally on their computer disks or in the cloud. Librarians get involved in attempts to systematically archive that data. That refers to arranging, describing, documenting, and preserving the data to enhance it and make it easily retrievable. This is very important in facilitating new research. But then, there is frequently a data organization challenge due to the absence of data standards and costly nature of the high-performing computer servers required to process such data (Wang et al. 2016).

Initiatives of libraries to organize research data happen in many parts of the world. When large networks and repositories are created, they provide support for effective data management and access. The HathiTrust stands out as an example of such a co-operative network, powered by smart policy. But then, per Salo (2010):

significant mismatches exist between research data and library digital warehouses, as well as the processes and procedures librarians typically use to fill those warehouses. Repurposing warehouses and staff for research data is therefore neither straightforward nor simple; in some cases, it may even prove impossible.

The same point is repeated by Wang et al. (2016) who suggest that this work could be done by data scientists rather than librarians. This reality means that libraries that get involved should either hire trained personnel or get existing ones trained to fulfil the university’s data management requirements. Whether the researchers will be able to opt out or control their research data should also be specified clearly. The funding issue for continued maintenance of the data repository is also a major concern.

Attention is required towards the effectiveness of query processing strategies in Big Data applications, such as Hadoop, that are intended to facilitate its adequate exploitation. But then, Salo (2010) expresses concern about the lack, or shortage, of library personnel expertise, in creating and managing the data capture and control of the platforms. However, Kafel, Creamer, and Martin (2014) note the increasing interest in library science training programs to include data management in the curriculum as useful development furnishing trainee librarians with data management, data mining, machine learning, and deep learning capabilities. This equips librarians with skills to become effective research data stewards.

Many academic libraries have shifted from being solely lenders of books to information and knowledge hubs. As such, their role has become very collaborative. Because many GCC academic libraries are predominantly staffed by librarians whose training is as varied as their countries of origin, they depend on the universities' direction through visions and goals that are in line with that of the country's Ministry of Education. That is to avoid having these educators being what is referred to by Bradley (1997) as unconsciously incompetent. That is a state of genuinely trying to offer services only according to how they have been trained but being unaware of their lack of knowledge or expertise on how to appropriately communicate in the host culture (Diallo 2014). Faculty members have sometimes been found to be unaware of culturally competent pedagogical strategies on how to respond in culturally sensitive ways, and thus they lack the ability to successfully communicate and work with learners from other cultures (Diallo 2014; Gopal 2011; Moore-Jones 2015; Paige and Goode 2009). Competency in this instance also includes the social aspects as that is important to culture.

Faculty teaching in major programs at universities can collaborate by ensuring that their students are comfortable using technology used to retrieve research within their academic disciplines, e.g. starting with encouraging the use of short virtual library tutorials. Although print books continue to be in use, there is also the possibility of more dependence on digital textbooks as a ripple effect of the increasing cost of textbooks and current mobile device use in academic communities. Librarian input becomes relevant in guidance on the ethical use of such resources and using the devices as learning tools. Student technology projects that demonstrate the acquisition of library-driven information literacy skills and qualities can be shared with administrators, faculty colleagues, trustees, alumni, and classmates.

With the use of technology accessing library resources comes the need to be prepared for the various ways that new technologies such as mobile devices are adaptable to what is on offer. For example, some tutorials contain video clips made with the use of Camtasia, Adobe Connect, and flash player and may present challenges when library patrons use mobile devices; giving instruction on how to print from a mobile device; and some commercial library database apps sometimes play-up if one is not familiar with how they work. In this environment, the library must operate with usability and standardization issues for its services.

The library markets its services successfully by having the capability to efficiently handle effective information flow, OA, security, privacy and data protection, copyright and fair use, academic integrity, and sometimes Big Data.

3.12 Librarians Supporting Researcher Skills

The book *Metaliteracy: Reinventing Information Literacy to Empower Learners* by Mackey and Jacobson (2014) elaborates on the new guidelines available to academic librarians to cope in the new information environment. Included in the book is the suggestion for librarians to investigate how students and scholars obtain and share information using emerging technologies in the context of their research and education. Another way that academic libraries enhance their service is to be advisers in publishing matters. This ranges from what may seem straightforward to ethics matters in publishing, including even advising researchers on proper procedure, e.g., on intimate academic partnerships, “academic nepotism”, and “inappropriate authorship” (Rivera 2018, 1) because this matters to research evaluation. Academic librarians serve to point towards proper procedure.

Occasionally researchers get overwhelmed with internet information. Sometimes even organizing completed research projects has progressively proved to be a challenge due to instances of identical names, and several other reasons that feature with use of the Web. In that respect, solutions are arising from various directions, but librarians suggest platforms that give tangible solutions. An example is the move towards a possible reliance on the Open Researcher and Contributor ID (ORCID) that librarians are advising researchers to use. Some research university libraries in the GCC have already made strides in enabling this practice. It provides a persistent digital identifier that distinguishes one individual from every other researcher as well as through integration in key research workflows like manuscript and grant submission. However, Beall (2015) alerts researchers to the worrisome ability of predatory publishers to tamper with ORCID IDs so that they appear academically legitimate, thereby luring some.

According to a Nature Publishing Group (2012, n.p.) news brief, the ORCID project is “supported by funds and input from member institutions, publishers (including Nature Publishing Group) and scientific societies”. This is a way to enhance researcher visibility, academic reputation, and discoverability but with disambiguation well controlled. Another way is through Elsevier and Thomson Reuters indexing whereby a researcher can create a ResearcherID. It associates easily with an ORCID, allowing interoperability. PLOS has made the Article Level Metrics (ALM) app available for use by repositories and journal publishers. Additionally, Google Scholar’s Publish or Perish complements ORCID and ResearcherID. All three possibilities, Publish or Perish, ResearcherID, and ORCID, are openly available at no cost to a researcher. This is an example of the existence of maximizing the use of big internet cloud interoperable file systems rather than secluded data warehouses. Article metrics, author metrics, and journal metrics are the focus. Increasingly, content creators are using altmetrics (altmetrics.org)

and altmetrics.com) which captures many social networking platforms and records mentions that may not necessarily appear with the use traditional tools. Therefore Bepress, for example, has now partnered with Altmetrics.com which is also partnered with Elsevier.

There is often the assumption that all librarians have the skills for aggregating, cataloguing, preserving, managing and curating information, as well as teaching digital literacy because the data is more varied than traditionally, and is complex in structure. While big universities have varieties of specialists in the library who have those skills, oftentimes, the success comes from the collaborative efforts of various units of the university, e.g., teaching faculty, computer center or computer services department, information technology department, the library systems unit, etc., and administrators to make sense of the organization of knowledge. Collaborative approaches in information and digital literacy projects are what Bothwell (2017) as well as by Seargent and Tagg (2016) confirm as effective.

For effectiveness, a library leader needs to be an enabler. Examples of important sources of suggestions are the books *Library Innovation Toolkit: Ideas, strategies, and programs*, edited by Molaro and White (2015), and *Managing Creativity: The innovative research library*, by Ronald C. Jantz (2016) for ACRL, that are rich with ideas. Sometimes, there are challenges in choice of library leadership as expressed by Huber (2011) who mentions that it is necessary for them to promote learning and utilize the talents of their staff, eliminate job monotony, and increase staff retention. In fact, research over a six-year period on transformational leadership and stakeholder management in library change by Sucozhañay et al. (2014, 76) concludes that “library managers should act as transformational leaders creating sustainable and trustful relationships not only with the library staff but also with other stakeholders to reach this goal”. Having able library leaders helps consolidate the librarian skills needed to support student and faculty research efforts and effectively offer RDS.

3.13 Conclusion

Regional university libraries are in their infancy regarding RDM efforts, but progress is slowly happening. In some universities, strides have been made to acknowledge and harness resources for research data to be made available to researchers. They reflect awareness though not necessarily full utilization of the RDM potential. What needs developing is systematic access to data resources that includes datasets from and about the Arabian Gulf region beyond national census data. Literature indicates that RDM concerns are shared regardless of where, geographically, the efforts are being made. Where local RDM projects exist,

the libraries must take leadership in running and coordinating efforts in their universities.

There are suggestions of healthy enabling policy and infrastructural environment for RDM efforts. What needs to be organized are openly available procedures to follow for successful RDM efforts that are locally appropriate and practical. The fact that the World Wide Web is available to most parts of the world puts all researchers and innovators in the position of being able to share as well as use research data sets in multi and interdisciplinary dialogues. Therefore, it stands to reason that university libraries must play their part in data capture and management and encourage data literacy. This chapter concludes that the fast transformation of academic libraries, whose use of resources are global in nature and access, means that librarians need to be prepared to provide the requisite expertise to support users. Regular repository self-study is also a necessary activity. Lessons obtained from experiences of other university libraries, e.g., those from Western-based institutes, together with local ones such as KUSTAR, KAUST, and international ones, can be put in place for local practical solutions that promote additional RDM services.

Chapter 4

The Potential Impact of AI on Libraries: Competencies and Skills

4.1 Introduction

As information and data have taken on new forms, researchers and libraries alike are adapting their skills and services to reflect changes in how information and research are created and conducted, disseminated, and preserved – throughout shifting social and philosophical paradigms as well as in response to emerging technologies including artificial AI. This impacts workplace competency and skills of LIS professionals.

Librarian workplace competency refers to the knowledge or variety of skills that they have or exhibit, and an ability to meet complex demands in their work environments. The skills mentioned in Chapter one are foundational for librarians who must also execute their responsibilities in the AI age. But then, it is also important to appreciate the state of incertitude among academic library employees about AI use in libraries. Lund et al. (2020, 875) suggest that a Diffusion of Innovations framework “may be successfully employed in a study of library employee perspectives/attitudes” to understand the process of diffusion of emerging technologies among them. They explain that:

Diffusion refers to the adoption of individuals and groups of an innovation (some new technology, idea, or another innovation). The process of diffusion of innovations is described by Rogers as “An information-seeking and information-processing activity,” where individuals use information about an innovation to determine whether or not they will adopt (use) this innovation. (Lund et al. 2020, 867)

Library roles, competencies, and values are being altered because of competing information and data resources, meaning that they must continuously revise what they offer. Additionally, the influence of the Fourth Industrial Revolution is sometimes making librarians view AI as a threat to library relevance. In fact, for continued relevance of LIS professionals, more diversified competencies and skills are important to confront exciting but sometimes volatile, unpredictable, ambiguous, and complex responsibilities.

4.2 Defining AI

Using AI has been defined in terms of the programming of computers to do things, which, if done by humans, would be said to require intelligence. According to the *Techopedia* (2019, n.p.), AI is “an area of computer science that emphasizes the creation of intelligent machines that work and react like humans”. Most AI work involves Machine Learning (ML), and ML is the application of, not the same as, AI. While in ML, computers can handle new situations via analysis, self-training, observation, and experience, AI relies on huge amounts of data and information that enable it to make connections and draw conclusions. This implies that accurate AI-based predictions must depend on accurate data, which Knight (2021) expresses worry about in an article discussing the fact that the foundations of AI are riddled with errors. The ALA (2021, n.p.) mentions that:

Artificial intelligence seeks to create “intelligent” machines that work and react more like humans. AI developments rely on deep learning, machine learnings, and natural language processing that help computers accomplish specific tasks by processing large amounts of training data to help the system recognize patterns, input data to drive predictions, and feedback data for improving accuracy over time.

An example is in Digital Humanities where large or dense cultural datasets are used to process and interpret the past while attempting to predict the future. In fact, powerful algorithms are changing our perception of reality while catering to our instincts, needs, and wants. Meanwhile, Hervieux and Wheatley (2021, 1) point out that “librarians do not agree on a definition of artificial intelligence which is in keeping with this emerging field.”

Even as it becomes evident that AI contains advanced IL skills as compared to humans (given its reliance on ML) when one considers the proliferation of fake data, fake information, and fake news, it remains important to critically evaluate information sources and is also more complicated to evaluate AI information providers and decision makers (Johnson 2018). This is a niche for information professionals to actively contribute, whatever form that takes. While the research by Alagumalai and Natarajan (2020) does not mention AI, they conclude that Internet of Things (IoT) in libraries impacts collection management, information literacy programs, effective utilization of online learning portals, accessing of library resources, and more. And then also, IoT is the interconnection of uniquely identifiable embedded computing devices which work more smartly with the use of AI.

While mainstream tech players use their own proprietary AI software (and heavily guard it as intellectual property), libraries, especially academic ones, still predominantly contain resources needed for AI development through high

quality digitized resources, OA, and linked data. In fact, Hervieux and Wheatley (2021, 7) point out that “the use of AI in technological applications has been long standing in librarianship, regardless of whether or not the librarians are aware”. Some libraries are, however, moving towards software-based approaches, and technological environment development such as makerspaces, context-aware technology, digitalization of contents, big data, cloud computing, and augmented reality. In the words of Noh (2015, 786), these are features of Library 4.0 which is characterized by “intelligence-based, massive data, augmented reality, context aware, cutting-edge displays, and infinite creative space”. Increasingly, academic librarians are using capabilities to remotely provide service, with the result that library visits by students are becoming more unpredictable.

4.3 Remotopia

Remotopia is the phenomenon of working remotely, fast-tracked by the Covid-19 pandemic whereby work responsibilities are fulfilled away from regular workspaces, which has become a *modus operandi* for most organizations, inclusive of universities, except those organizations that cannot be practically managed without physical presence, e.g., hospitals. Cognizant (2020), an American multinational technology company, introduced the term remotopia drawn from the Latin root *remotus* (removed or far apart) and Greek word *topos* (place). Remotopia is augmented by AI assisted workspaces, and the practicality of completing job functions remotely seems to be in favor of the working habits of digital nomads. Humphries (2020) points out that work is now everywhere and anywhere, while Sarkar-Basu (2019, n.p.) mentions the prevalence of digital nomads, i.e., “professionals who can work from anywhere”. This also means that virtual access to library resources and e-databases must be made easier and always possible regardless of type of electronic communication device. If in Ranganathan’s code, the word “book” can be substituted with e-resource, then a combination of “books are for use”, “every reader his [or her] book”, and “every book its reader” is realized.

Humphries (2020) explains that this is enabled by networks and platforms to connect, create and accomplish, self-isolate, and still stay connected with the entire world. This blends with the changing nature of work that has been impacted by AI capabilities. Library service, especially IL sessions and consultations from off-campus, have been made possible by AI powered platforms that also provide AI meeting analytics such as Zoom, WebEx, Microsoft Teams, GoogleMeet, and more. Zoom has AI-powered transcripts as announced at the 2019 Zoomtopia Conference in San Jose, California; a similar application of AI is also in WebEx where AI-driven collaboration is the norm; GoogleMeet mentions an AI-based

noise cancellation feature; while Microsoft Teams has developed an AI software named AffectiveSpotlight that can read who is enjoying the meeting or conference the most (though this feature is encumbered with ethical dilemmas surrounding AI emotion recognition). Academic librarians have therefore been able to continue providing reference service. This is where internet penetration in the Arabian Gulf mentioned in Chapter one has been very reliable and useful for enabling continued library service.

4.4 Use of AI in Academic Libraries

Libraries in general operate in circumstances where they have ceased to be the center of information. The values they have traditionally cherished, e.g., free and equal access, ethical information use, are no longer necessarily at the heart of every information provider in the Fourth Industrial Revolution. This is characterized by systems that use AI and AI-based technologies, revealing a requirement for new and revised competencies and skills. That also drives new perspectives in training and professional development (PD) of library and information professionals. Miller (2020, 62) alludes to the fact that:

the impact of big data, machine learning, and artificial intelligence on libraries falls into three buckets: assisting users (both machine and human); making collections accessible; and preserving data sets and the products of research.

Classification, indexing, cataloguing, information retrieval reference services, and IL instruction are examples of responsibilities that libraries have always mastered but could be enhanced if they take advantage of the capabilities of AI.

An implication from AI in libraries is suggested through the results of a survey by Wood and Evans (2018) which reveals respondents indicating that collection development and acquisitions are likely to be affected. The research does not explain how, but reflects that librarians know that there is some impact. Cox, Pinfield, and Rutter (2019a) point out that AI capability facilitates the identification of problems with metadata, thereby allowing the review of how material was indexed, thus ensuring that it is discoverable. Meanwhile, Miller (2020, 63) points out that “vendors are already incorporating artificial intelligence and machine learning into their platforms, services, and products. Librarians must become informed customers and users of those platforms, services, and products”. Hervieux and Wheatley (2021, 1) conclude that “academic librarians require more training with regard to artificial intelligence and its potential applications in libraries”.

It is noted that the librarian skill of searching for reference service, for example, has fed into the implementation of library chatbots, following the influence of voice-assistive technology virtual assistants Siri, “Google Assistant, Amazon’s Alexa and Microsoft’s Cortana” (Hervieux and Wheatley 2021, 3). Cox, Pinfield, and Rutter (2019a and 2019b) suggest that AI implies faster searches and enables librarians to learn more about searcher behavior. Perhaps when library patrons are searching, search engines with AI technologies can be pre-programmed to ignore content that is less relevant in the results, thereby revealing only what is pertinent, thus guiding user search and retrieval capabilities. Lund et al. (2020, 875) suggest that “perhaps, given their positive inclination, librarians could even take the lead in designing and integrating practical uses of AI technology into library systems and services and educating patrons, much as they may have done in the early days of the internet”. But then, while more similar uses of AI can be put in place, many libraries cannot afford a budget for it. This is a missed opportunity where librarians can step up and make their voices and potentialities be known (Johnson 2018). All the same, necessary changes must take place in the education and continuous professional development of information professionals because of an environment characterized by disruptions that keep arising, e.g., AI. That may breed more professionals with a good command for skills required now and capable of anticipating those of the future, perhaps slowly reducing the cost of developing library AI solutions.

Wade (2020) mentions that in the library, “AI and machine learning can be powerful tools”. If bots can be trained to efficiently help users do basic searches for books or repository material, especially multilingually as and when required, this is where “concept extraction” (Desul et al. 2019; Young 2019) plays a big role. Concept extraction is a process of automatic extraction of key concepts from a given set of documents. Young (2019) discusses the example of the University of Oklahoma’s plan to have an AI-powered tool search across the full-text of all papers submitted by its faculty, with the expectation to identify instances where scholars in different disciplines might be working on similar ideas and may collaborate. Despite the evolving possibilities, it is noticeable from literature that AI use in libraries is still developing. Tella (2020, 13) mentions that now “there are autonomous shelf reading robots, as well as telepresence, chatbots and humanoid robots for reference services and maintenance of circulation records in the library”. For example, the *Smithsonian Magazine* (2016) reports of an Indonesian robot, the Autonomous Robotic Shelf Scanning system (AuRoSS), which keeps track of books by scanning their RFID tags to detect when they are misfiled, i.e., shelf-reading. It is therefore not unthinkable to consider collection weeding, resulting from shelf-reading results, as a candidate for

AI use in the library even though it may take a long time for librarians to eventually let a machine decide what to keep and what to discard/ suppress from view.

Smith (2021) quotes the Hawaii State Library System's reliance on an AI-based technology for tracking library occupancy based on the use of sensors that detect massive datasets identifying human beings. Its audio component notifies library staff when occupancy is too high. However, with its use, the library administrators acknowledge that they make sure to continue respecting the privacy of library patrons by avoiding sending their information to a central database. This concern is raised by Cox, Pinfield, and Rutter (2019a) because AI amasses huge amounts of data, but additional complications may arise where there are various legal jurisdictions involved. Kim (2019) also lists uses of AI-powered robots in libraries including the ability to greet library visitors and answering directional questions. Kim (2019) quotes the example of Libby the robot which was deployed for this purpose at the library of the University of Pretoria in South Africa. Kim (2019) proceeds to mention the ability to identify and re-shelve misfiled books into correct places; reference services where a bot can answer simple queries; providing a basic readers' advisory service and pointing a user to the location of a book on a smartphone or a computer; a reading assistant where library reading services to children exist, e.g., Luka the robot that reads aloud picture books put in front of it at the University of Wisconsin-Madison, U.S.A.

Many librarians still lack the requisite knowledge to speculate how and what impact AI will have on their work. Reading news about accidents happening with autonomous vehicles (self-driving cars) whose functionality is AI-based causes more anxiety, even when they are aware that robotic vehicles are already in use especially in dangerous situations. But then, change in libraries has always happened whether from inside the profession or because of inevitable universal developments. The aphorism ascribed to the Greek philosopher Heraclitus of Ephesus (535–475 BCE) that “change is the only constant in life” could not be more real. For that reason, one can expect that some advances already taking place in other sectors will take on a library-related face too. For example, Phetteplace (2018) quotes a presentation called “*Deep Learning for Libraries*” by Di Monte and Patil (2017) which explained the application of deep learning techniques to solve a library's space assessment project at the University of Rochester's River Campus Libraries.

The suggestions from Hammais, Ketamo, and Koivisto (2017) mention chatbots used as virtual assistants that act in the role of “AI-assisted book recommenders” providing library users with suggestions of reading material. According to Johnson (2018), increased implementation of AI puts many jobs at risk, therefore it is necessary to re-educate a workforce to compete for a small number of highly

specialized jobs. Cox, Pinfield, and Rutter (2019a, 430) summarize the role for libraries that can arise from AI as being:

Around providing and acquiring content, procuring tools to explore content and data, and stewarding derived outputs; . . . monitoring quality of material in the collection . . . support users to navigate a new information landscape, evaluate content and manage their digital privacy . . . helping to design the whole infrastructure based on their understanding of user needs, and to protect users' privacy and interests with their data.

Unfortunately, developments in the LIS field have not kept up with the pace of forces causing its evolution. Involvement of librarians in AI remains a struggle because those involved with AI tool acquisition and infrastructure building may not necessarily associate their activities with libraries – unless there is a system in place that makes it mandatory for them to do so, e.g., grant funding, or if formally ingrained in institutional structures. This calls for LIS professionals themselves in general to rise to the challenge. The reality of a volatile, uncertain, complex, and ambiguous (VUCA) environment demands this.

4.5 Use of Bots in Arabian Gulf Academic Libraries

In a research article, Nawaz and Saldeen (2020) conclude that:

Most of the libraries in Europe have become pioneers in adopting new technology to enhance their services, but the Middle East and North African libraries are slow in adopting it. The library patrons are most familiar with these developments and expect library professionals to cater them through those channels. Therefore, the librarians are required to recognize and understand the technological changes and utilize them to provide opportunities to the contemporary and potential user communities.

The same authors admit that libraries in “Bahrain are still not quite ready for chatbots due to various factors like budgetary issues, limited number of students and academic programs, expertise and patrons' preparedness” (Nawaz and Saldeen 2020, 448).

After AlHagbani and Khan (2016) discussed the challenges accompanying the technology for Arabic language creation of conversational chatbots, there has been activity in Saudi Arabia where the chatbot “Nabiha” was demonstrated by Al-Ghadhban and Al-Twairish (2020, 452). They “developed “Nabiha,” a chatbot that can support conversation with information technology (IT) students at King Saud University using the Saudi Arabic dialect”. This innovativeness is suggestive of a clear path for academic library applications. In Muscat (Oman), Debnath and Agarwal (2020) made a conference presentation about chatbots in educational institutes and advocated for their use in library reference services. The existence of

this presentation suggests that the use of AI in academic libraries was yet to be adopted. Meanwhile, a Hamdan Bin Mohammed Smart University (HBMSU) in Dubai news update of July 22, 2019 announced the launching of a library chatbot that “has placed HBMSU’s library as the first university library in the UAE to adopt (AI) technologies to provide services and help accelerate transformation from traditional to smart library management.” It is likely that other university libraries may wish to try using this mechanism when they have a budget for it, especially for peak times or when the library is closed.

There must be a proven or existing connection between the way AI tools are used and the consistency with which their viable performance is perceived for libraries to adopt their use. This is one of the reasons that uptake of bots and AI in academic libraries does not yet seem to be a priority. The fact that the Coronavirus Information Service of the Qatar Ministry of Public Health uses chatbot service to give citizens and residents in Qatar answers to the most common questions about Coronavirus, and that the UAE Road and Transport Authority’s (RTA) launched an AI Virtual Assistant to help customers with Salik (an electronic road toll collection system) services suggests that the technology is available but put in place when deemed crucial. By implication, filtering of these technologies to academic libraries requires time. In any case, “for AI to succeed, it first must be able to fail” (Ciocca, Horowitz, and Kahn 2021), so investment in uncertain functionality is put in place only when carefully studied and exhaustively analyzed situations demand that, with alternative solutions already in place. Additionally, technological and manpower cost factors cannot be underestimated.

4.6 Competencies and Skills; Education and Training for AI

Marmion (1998) mentioned the challenge of preparing library employees to use computer technology effectively as an expression of concern for librarians playing catch-up to an overwhelming technological disruption. Now, more than 20 years later, a similar pattern continues to happen with AI, albeit at a much more rapid pace. A 2019 OCLC research paper on *Responsible Operations: Data Science, Machine Learning, and AI in Libraries* recommends workforce development, but mentions that “it can be difficult to assess which training options are most likely to develop desired skills” (Padilla 2019, 18), hence suggesting evidence-based trainings.

A survey by Cox, Pinfield and Rutter (2019a) focusing on the increasing impact and use of AI revealed the exclusion of libraries from the focus of AI development, ethical concerns, intelligibility of decisions and data quality. The results also unveil some threat to jobs, confirming the same sentiment as expressed by

Johnson (2018) who adds that while libraries will certainly be changed by the AI revolution – and in ways we cannot imagine – it seems unlikely that they will cease to exist altogether. However, it is undeniable that in the current era the role of the library must include AI tool acquisition and infrastructure building, aiding user navigation (Wade 2020; Kim 2019) and data literacy. Academic libraries should educate themselves about how autonomous machines can advantageously perform in a VUCA world where knowledge silos must no longer be an issue.

An ExLibris (2019) whitepaper shows that nearly 80 percent of research librarians are exploring the use of AI and machine learning, but only about five percent are currently leveraging the technology. Various reasons that include budgetary constraints, expertise limitations, and job obsolescence fears exist. Wood and Evans (2018, n.p.) attribute the minimal interest to “an overwhelming sense of complacency among librarians in regard to the transformative/disruptive effects of this technology”. This explanation is disputable. Padilla (2019, 19), for example, recommends that libraries must “pilot and/or support the development of evidence-based data science, machine-learning, and/or AI training options that are grounded in library use cases”. The study by Lund et al. (2020, 877) reveals that “academic librarians responding to the survey were highly receptive toward the potential of integrating artificial intelligence into the operations of the library and demonstrated that they are generally early adopters of new information and communications technologies”. This implies a call on library and information professionals to become more involved in research that keeps their professional livelihood alive. This discussion arises again in Chapter six in speculating where the qualifications and profession of academic librarianship are heading to.

Regardless of the hurdles, Noh (2015, 792) mentions the possible transition of AI to “an intelligent library where not only inference and research are available, but the system will analyse information by itself and discuss findings with users like a colleague”. Some of these suggestions are speculative, but one of the recommendations by Padilla (2019, 18) is to “initiate evidence-based evaluations of existing data science, machine learning, and AI training opportunities within and outside of the library community”. This approach would be an acknowledgment that LIS is not the only profession in need of these skills. Wood and Evans (2018) concur with this view and acknowledge that the capability for machine learning, natural language processing, and massive computing power are the three aspects of AI that will impact the profession of librarianship in a manner like how law and medicine are being affected. This also means a lot of trust must be invested in the efficiency of AI tools, large amounts of data, and information. More importantly, librarians need to not only develop data analysis skills, but also

problem-solving abilities to work proficiently and determine the future of their expertise.

Increasingly, some libraries (e.g., from among the few mentioned by the ExLibris whitepaper of 2019), through noticing that users have questions at all hours and at times no one is available to answer, have put chatbots into use. Using ML techniques, they are dependent on already existing information converted for their comprehension. Examples of such information include what is derived from logs of chat service use, directional questions on a library website, alerts when books are due, frequently asked queries, and simple questions. That way, the system knows the questions that users ask real librarians, and what the answers are. A challenge one can expect is in instances when the bot does not understand the question, or gives weird answers, or when it simply does not give a correct answer as indicated by Young (2019) from testing the bot at the University of Oklahoma library. But then, Hammis, Ketamo, and Koivisto (2017) can testify to the benefits of using experiences learned from continued trials to achieve desired efficiencies in the bot.

Existing cases of AI assistant robots in libraries are generally aimed at enhancing the user experience by helping library patrons to quickly find library books, and in responding to simple questions. This is mentioned by Springer Nature (2019), ExLibris (2019), Pinfield, Cox, and Rutter (2017), and Young (2019) among others. As confirmed by Hammis, Ketamo, and Koivisto (2017), it takes use and practice to discover and rectify errors and possible weaknesses. Examples of chatbot use in place in a wide range of libraries keep increasing in many parts of the world. Some are even opting for anthropomorphism (Wade 2020) in robots as a desirable characteristic to encourage its use because humans “are susceptible to projecting motives, emotions, and other human traits onto robots” (Kim 2019, 1).

4.7 Discussion

In speculating about and investigating the potential impact of AI on libraries, it is important to acknowledge that there are no sufficient resources to inculcate required competencies globally, comprehensively, and uniformly in LIS professionals the world over, whether they are still in training or in the form of professional development (PD). That is because of the inequitable distribution of resources and opportunities that is characteristic of the world. Concomitantly, qualified professionals, wherever they operate from, are expected to possess superior competencies in service provision and individual lifelong learning.

A library of the Fourth Industrial Revolution Age provides enhanced access to library resources and other external information than the previous ones and

offers more information networking. Libraries need to work closely with an array of vendors to create services and AI systems that suitably work towards the interests of library users. The suggestion to use AI-assisted book recommenders is based on library user reading preferences (Hammais et al. 2017). But inevitably, everyone wants to know who has access to the data about library users and their information search and use habits when the librarian is a robot. That is because one cannot avoid questioning what happens when algorithms increasingly play a big role in tracking habits of library patrons (Henry 2019). Raine and Anderson (2017) and Johnson (2018) view the availability of open-source AI software to be a viable option that can be used with no corporate bias, and data ownership is more certain. Sparkes (2021) reports on a European Union plan to regulate AI with possible repercussions for companies that break proposed rules on mass surveillance and discrimination. A similar initiative is taking place in the United States (Piper 2021). While political moves are behind these initiatives, these reports suggest a realization that regulatory checks must be put in place with AI use.

Even when some librarians may lack an understanding of the meaning of AI or its application in libraries, they are all the same encountering the phenomenon. This is consistent with the SCONUL report by Pinfield, Cox, and Rutter (2017) which concludes that the AI trend is not well-understood in libraries, and the study by Wood and Evans (2018) that reflect librarian awareness but not real knowledge of a transformative effect that AI can have in libraries. The example of AI that powers the bot mentioned by Young (2019), where an already established and reliable commercial vendor was contracted while the library's job was to train the chatbot, is practical. That is because if AI tools are left to be created by corporate giants with minimal librarian input, decisions made from the data and algorithms used can be skewed or biased. Cox, Pinfield, and Rutter (2019a, 421) ask:

How are AI systems to be accountable and transparent if their operation cannot be understood? There is gathering evidence of the biased assumptions built into many algorithms, e.g., created through choice of training data.

Expressing a view previously articulated by Rainie and Anderson (2017) explaining a tendency to reinforce inequalities if the starting point is a place of inequality in using algorithms to decide what is a likely outcome for a person/system, Lankes (2019, n.p.) warns of the tendency to end up with a “class of people who can use algorithms and a class used by algorithms.” This also means that librarians must develop and possess competencies and skills to participate in these discussions and decisions that chart the direction of the information profession, i.e., be involved with future-proofing the profession. The fact that bias and skewedness are features to be cognizant of also highlights ethics in the use of AI. To quote the opinion of Naughton (2021, n.p.):

The thing is that current machine-learning systems have ethical issues the way rats have fleas. Their intrinsic flaws include bias, unfairness, gender and ethnic discrimination, huge environmental footprints, theoretical flakiness and a crippled epistemology that equates volume of data with improved understanding. These limitations, however, have not prevented tech companies from adopting the technology wholesale . . .

Padilla (2019, 8) quotes *A Unified Framework of Five Principles for AI in Society* created by Floridi and Cowls (2019, 9) as a recommended reference for “libraries that seek to evaluate the extent to which existing ethical commitments account for the positive and negative effects of algorithmic methods”. The framework promotes beneficence, nonmaleficence, autonomy, justice, and explicability. Meanwhile, the American Library Association (ALA) (2021, n.p.) code of ethics states that the LIS profession has “a special obligation to ensure the free flow of information and ideas to present and future generations”. But then, in the context of the Association of Research Libraries, Kennedy (2019, 8) points out that with AI:

now is the time for research libraries to collectively understand and address a host of ethical questions for research institutions, public policy, and more specifically for research library leaders in institutional and public policy, so that research libraries will continue to serve as trusted advisers to our users, and as responsible collectors, disseminators, and preservers of knowledge.

The statement complements the view expressed by Johnson (2019) that big tech companies are developing ethics guidelines, driving the need for LIS professionals to do likewise while enhancing their competencies.

Besides using game-based learning platforms such as (to name a few) Kahoot, Quizizz, Poll Everywhere, Quizlet, Schoology, or MindTickle, that bring learner engagement during IL class sessions while being fun, it certainly is becoming increasingly important to use virtual reality technologies such as Aurasma for real-world visual learning experiences targeted at keeping students engaged. Additionally, if AI capabilities can be used for optimized library searches and information organization, it would produce more accurate subject-specific results and citations. Library reference assistance is already being provided by bots (and telepresence robots), but service promotion and functions like book delivery (particularly in some Arabian Gulf library spaces designated according to gender), inventory, and shelf-reading are candidates for that too, as exemplified by AuRoSS. The ALA Center for the Future of Libraries (2019, n.p.) suggests “collaborative robots (or CoBots), described by the National Science Foundation as “help on wheels” and primarily focused on gofer activities, like couriers and messengers that can operate in programmable environments”.

There are some advantages to using AI, including the ability to expeditiously complete complex or stressful work that humans may have challenges

doing successfully, and in the process possibly discover the unexplored. Ranganathan (1931, 337), in suggesting to “save the time of the reader” could have never said it better, even though the concept of fast technology applications in libraries was non-existent during his time. It is an expectation that there are fewer chances of errors (dependent on the information input and used). But then, even when AI still relies on human programming, the human touch is absent (Rainie and Anderson 2017), and Lund et al. (2020) express a concern revealed in their research about possible replacement of some human job roles. Chances of malfunctioning are also real. Additionally, AI can be misused and manipulated – a repeat of the mentioned ethics question. Johnson (2019, 16) in fact cautions against “technological cataclysm” that can happen if AI is left to chart the way forward. This is one of the reasons libraries can be the place where researchers find or are guided towards Big Data sources that are used in AI. Rainie and Anderson (2017) believe in the need for a rainbow coalition that develops rules to avoid allowing inbuilt bias and groupthink to attain the outcomes. It therefore is practical for LIS professionals to be invested in and adopt advanced technologies and skills for Big Data analysis.

4.8 Summary of Concerns with Use of AI

The use of algorithms that rely on data can create safety and security concerns (Wade 2020). Kim (2019, 3) asks “will a robot be able to handle unforeseen consequences?” Thus, with the example of the autonomous car, one questions the allocation of responsibility in the event of an accident, particularly where human beings and/ or property are damaged as a result. Concerns have also been raised about the not-yet-perfected ability of AI to reign in fake news, and then also the growing concern with how it is being used to create deepfakes or synthetic media. Patterson (2019, n.p.) explains that “deepfakes are videos and images that have been digitally manipulated to depict people saying and doing things that never happened. Most deepfakes use artificial intelligence to alter video and to generate authentic-sounding audio. These clips are often produced to fool viewers and are optimized to spread rapidly on social media.” The academic library therefore has the added responsibility to alert library users to their existence, even when tools to detect them are still not yet in use.

Another concern is about the bot’s degree of autonomy and technical sophistication, i.e., the “human-on-the-loop” (where humans are in control, providing oversight) and a “human-in-the-loop” (where there is human interaction) system (Kim 2019). Use of AI must therefore be because of what libraries determine and can provide oversight with, rather than be led by it. An additional concern is

about how to program morality into the use of AI technology in the sense that “if machine learning techniques drive today’s artificial intelligence (AI) technology to the degree that AI systems can partly or fully automate human decision-making, to what use should we put those?” (Kim 2019, 3). Another school of thought asks how creepy it would be if AI started teaching workers to be more human (O’Connor 2021, n.p.).

Another concern arises with creating anthropomorphic robots because of the possibility of them creating unanticipated danger or harm to the robot user. That can arise from the point raised by Wade (2020, n.p.) that “because machine learning software is made to develop new neural networks, the algorithms can develop biases not initially observed”. Another concern revolves around the fact that “it is not a new phenomenon that companies try to make more profit by deceiving or manipulating consumers through exploiting the human-robot relationship for profit” (Kim 2019, 6), i.e., dishonest practices.

4.9 Conclusion

For many reasons, librarians seem to be continuing with work as usual, with concerns that do not reflect the urgency of getting acquainted with AI matters. But then, for advances to happen it is necessary to refocus and realize the need for doing so. Some of the useful changes include altering the library space (through space assessment procedures, maybe with AI-powered utilities as suggested by Phetteplace (2018)) to become an intelligent unit which can analyze information and present findings to users. This can be partially supported through library and information science training that equips graduating professionals with AI competency skills and requires major institutional investment in AI-related innovations. But then, perhaps, delay in joining the trend may result in benefiting from the existence of more sophisticated approaches developed elsewhere. At the same time, continuous professional development opportunities for librarians have become more urgent than ever before – repeating a statement in the evolution of appropriate LIS expertise as expressed by Marmion (1998) a long time ago.

In addition, because AI relies on huge amounts of data, perhaps the time has also come to approach information and data use from other perspectives than library-linked and consider a more elaborate multidisciplinary approach to information, access, use, and information ethics. Topics that include data literacy and AI must be handled throughout with every possible chance. The potential impact of AI on competencies and skills of LIS professionals is irrepressible, therefore more aggressive emphasis on multidisciplinary and interdisciplinary approaches to training, re-training, and continuous professional development is required.

Models of e-resource subscriptions could be tried whereby faculty-selected collection development is used to purchase specifically what is required in supporting the curriculum and research. At the same time AI functionality can be used to determine e-resources for suppression from public view due to inappropriateness, or irrelevancy, and out-datedness.

Chapter 5

Emergency Preparedness and Management

5.1 Introduction

The *Encyclopaedia Britannica* (2021) defines an emergency as an unforeseen combination of circumstances or the resulting state that calls for immediate action, while a disaster is a sudden calamitous event bringing great damage, loss, or destruction. These definitions lend the discussion to mentioning disasters and emergencies interchangeably, although it is likely that it is disasters that cause emergency situations. Their occurrence often causes hardship and usually requires help.

In the context of libraries in general, reference to an emergency is ordinarily understood to mean serious, unexpected, and often dangerous situations requiring immediate action including when there is a flood, fire hazard, vermin, patron matters such as disorderly conduct or sudden illness, and other such scenarios. Additionally, the new information environment that relies on internet connectivity also carries web-related potential risks, e.g., computer virus attacks, spyware threats, phishing, hackers, and predators that need avoidance and mitigation. In 2020, the term took on an additional meaning with the onset of the Covid-19 world pandemic. It confirmed that besides risks that directly impact the library are some that happen on a world-wide scale, and the library is affected as a ripple effect. Other such examples include those caused by nuclear power generation, offshore oil and gas drilling, and other natural disasters including seismic activity. Meshkati and Tabibzadeh (2016) caution about possibility of a major oil spill or radiation contamination in the Arabian Gulf region. El-Kholei (2019) mentions that the frequent natural disasters in the Arab region are floods, earthquakes, severe weather events, dust storms, and droughts. This means preparedness and management at every level cannot be over emphasized, and that ensures service, thus upholding Ranganathan's Code.

5.2 Types and Causes of Emergencies

Emergencies are not unique only to certain parts of the world. It is their types that sometimes vary, e.g., while in the Arabian Gulf, one can worry about dust storms that are not necessarily applicable in non-desert environments. Also, through the ages, some disasters are caused by natural disasters while others are a result of human decisions and action. As an example, Sandys (2011) reveals that

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the Library of the Serapeum in the Alexandria of Ancient Egypt was razed to the ground in 392 AD by Pope Theophilus, the 23rd Pope of Alexandria and Patriarch of the See of St. Mark. This followed attacks and counterattacks between pagans and Christians, i.e., a time of conflict between the Christians and the pagan establishment in Alexandria, each of which was supported by a segment of the people of Alexandria. There are more examples of human decisions that result in disasters affecting libraries, even up to today (Rachman 2020). Some have been deliberate, as in the Serapeum example, but others accidental. Reckless behavior such as smoking inside a library can cause a fire hazard, while bringing in food can cause direct damage to collections and at the same time also encourage vermin (e.g., rats, cockroaches, flies) encroachment, in addition to mold and mildew.

Additionally, emergencies can be triggered by individuals who are not necessarily using the library. For example, the April 18–19, 2021 wildfire in Cape Town, South Africa that quickly spread from Table Mountain to many parts of the city destroyed rare collections of African books and archives in the library of the University of Cape Town. Following that disaster, Jordan (April 20, 2021) reported that the “Cape Town fire-starter suspect appears in court”, meaning that the cause of the fire was arson. The perpetrator may not necessarily have thought of possible consequences of their behavior, and librarians in turn will have made a mistake if they assume the commonality of common sense. Other hazards include collection vandalism and theft. The *Dictionary of Philology* (2002, n.p.) uses an Aristotelian definition of common sense to mean “the faculty that integrates the data of the five senses into unified apprehensions of objects.” For a variety of reasons, it cannot be assumed that everyone using the library effectively uses this. Hence, contingency plans are created for cater to many eventualities in addition to regularly engaging in “user education to encourage good practices that will safeguard [the] library collection” (Rachman 2020, 72).

On the other hand, natural disasters can come in the most unexpected ways. For example, the 2004 Indian Ocean earthquake caused tsunamis resulting in untold widespread damage to Indonesia, Malaysia, Maldives, Thailand, and Sri Lanka. This type of emergency is so widespread that one cannot focus only on educational establishments, and yet eventually they can also not be ignored. The UNDP Arab Cities Resilience Report (2018) mentions that the State of Kuwait is located to the south-west of the Zagros belt which can produce strong earthquakes with magnitudes of up to 7.5.; that the Sultanate of Oman forms the south-eastern area of the Arabian plate, which is surrounded by relatively high active tectonic zones; that the UAE has a low to moderate seismic hazard potential; that Bahrain and Qatar are in a zone with low seismic hazard

potential; and that the Harrat Al-Shaqah part of Saudi Arabia experienced volcanic activity and small to moderate size earthquakes in 2009. The same report describes the potential hazard that floods can cause to all the Arabian Gulf countries in addition to seismic activity. The fact that there is potential hazard, regardless of how remote the chances, is reason enough to create a plan.

5.3 Emergency Preparedness: Broad Perspective

Emergencies are phenomena of concern to every nation. The Hyogo Framework of Action (HFA) is an example of a “global blueprint for disaster risk reduction efforts” (UNISDR 2021, n.p.). It was a result of plans to “reduce disaster losses by 2015 – in lives, and in the social, economic, and environmental assets of communities and countries” (UNISDR 2021, n.p.). While the UNISDR (United Nations International Strategy for Disaster Reduction, now known as UNDRR) report mentions that coverage in the Arab region included 22 countries, among those where HFA focal points were designated are Bahrain, Oman, Qatar, and United Arab Emirates; and national platforms or committees for Disaster Risk Reduction (DRR) had been established in Bahrain, Qatar, and United Arab Emirates. The report also mentions a consistent increase in the number of Arab States reporting progress for the HFA: five in 2009, nine in 2011, 13 in 2013, and 15 in 2015.

According to the website of the United Nations Office for Disaster Risk Reduction – Regional Office for Arab States (UNDRR ROAS), the mission of their office is to provide support to countries and agencies of countries in the Arab region. These regional disaster risk reduction (DRR) offices “promote the integration of risk reduction in regional and national policies and plans” (UNDRR 2021, n.p.). According to the UNDRR (2021) website, the focal points in Arabian Gulf countries are: Kuwait Fire Service Directorate, Oman Ministry of Environment and Climate Affairs, Qatar Ministry of Interior, Saudi Arabia civil defense – civilian protection – emergency planning, UAE National Emergency and Crisis Management Authority, and their own offices in Bahrain. These in fact now operate within the Sendai Framework for Disaster Risk Reduction 2015–2030 which was adopted in Sendai, Japan, in 2015 after the HFA. The target of the Sendai Framework is “(i) understanding disaster risk; (ii) strengthening disaster risk governance to manage disaster risk; (iii) investing in disaster reduction for resilience and; (iv) enhancing disaster preparedness for effective response, and to “Build Back Better” in recovery, rehabilitation and reconstruction” (UNDRR 2015, n.p.). A Seventh Session of the Global Platform for Disaster Risk Reduction is scheduled for May 2022. Meshkati and Tabibzadeh (2016, 227) propose the creation of a multinational “generic integrated system-oriented model” approach to

disaster management in the Arabian Gulf using Western models which are already in existence.

International or global frameworks are usually non-binding but created to try and use a similar understanding of the topic at hand. As such, the UNISDR and UNDRR serve to guide individual nations in their efforts to find and use practical emergency preparedness and management guidelines that are locally applicable but based on universally applicable principles. Global frameworks are useful, but the time comes when their national relevancy is addressed. That is where nations study what disasters are likely to hit them and must come up with requisite plans.

5.4 Emergency Preparedness and Management Plans: Libraries

Emergencies happen in many forms and ways. The steps for preparedness and management include mitigation, preparedness, response, and recovery (Davis 2020; McIlwaine 2006). Admittedly, “any type of contingency planning for libraries is important because we are building more and more evidence that preparedness is possible, even if prevention is not” (Nelson Decker et al. 2015, 70). Lessons learned from previous experiences are also priceless. For example, using lessons from Typhoon Haiyan in the Philippines, Superio, Alayon, and Oliveros (2019, 51) mention that “a disaster management plan is essential because it can guide library personnel on what to do in a critical time”. McIlwaine (2006) suggests the need to identify potential sources of disasters when preparing a disaster management plan.

No library desires to encounter disasters, and that is exactly the reason plans to try and avoid them are put in place. For example, the ACRL (2019, n.p.) highlights “(1) precautions to protect patrons and staff against acts of violence; (2) safeguarding collection materials from theft/vandalism; (3) internet protection; and (4) procedural safeguards and response plans for natural and man-made disasters.” The *Handbook of Disaster Management and Contingency Planning in Modern Libraries* (Decker 2016) represents contributions on this topic from various angles but is centred in the United States. However, lessons from it can easily be applied elsewhere too. Its chapters collectively acknowledge the need for service continuity in any library setting and introduces plans for coordinating emergency responses, steps to take, the creation and revision of disaster plans, and the role of new technologies in enhancing both the library’s and the community’s recovery. Current new technology largely relies on AI-based systems, e.g., crowdAI which can assist in improving disaster relief efforts and emergency preparedness

with greater accuracy and on a much larger scale than human workers because they use customized vision AI. Awareness about this possibility is of value to library and archive emergency preparedness teams. Similarly, Xie, Liu, Fu, and Liang (2019) propose an IoT-based intelligent evacuation protocol in libraries safety management based on information fed into a system enabling it to have accident prediction capability, detect a library's layout, and map evacuation routes.

In general, an emergency plan must have systems for reporting a disaster quickly. Explaining steps involved where computers are involved, Davis (2020) says that mitigation focuses on maintaining and updating the physical library and computer systems and resolving possible hazards in a timely manner. As in a typical library which is likely to have patrons in it, preparedness includes identifying evacuation routes, maintaining first aid and emergency kits for hazard situations, e.g., earthquakes, and compiling and keeping current lists of contacts for staff, emergency personnel, recovery personnel, and media and communications. Davis (2020) includes the formation of consortial relationships as a way of allowing library service during and after a disaster and identifying temporary locations for library collections. Then again, some plans may sometimes be more practical for university libraries in some parts of the world than in others. Having mentioned the potential for seismic activity in the Arabian Gulf means that any library emergency plan must include the points just mentioned. However, the suggestion that preparing computer systems for disaster is relevant to all computer-based library systems, as is the case with those in the Arabian Gulf academic libraries. The plan includes establishing off-site servers, and for staff to be trained in emergency management to clarify procedures, and individual responsibilities, to reduce collection damage and recovery time and increase cost savings.

The suggestion by Davis (2020) includes response plans that detail staff protocols during and immediately after emergencies and disasters. They could include detailed steps on what to announce over intercom systems and how to approach patrons to alert them of the disaster, who and when to call for emergency personnel, where to shelter during a tornado or earthquake, and what supplies to take to shelters or emergency meeting spots. Without omitting to include disaster response to computer viruses, Davis (2020) adds that this includes identifying threats and threatened computers, quarantining, cleaning, and preventing recurrences.

Academic library disaster plans should also consider when and how to create and update social media posts with accurate disaster updates rather than leaving patrons inundated with fake information, as was the case with the Covid-19 pandemic concerning the disease, possible treatments, and confusion surrounding

vaccines and vaccination, from the start to the end of 2020, but more extreme during the first half of the year. Disaster recovery details how to effectively and quickly resume or continue to provide library services. Recovery plans should designate recovery teams and describe how to activate them to salvage priority collections and services (Rachman 2020). Recovery should again leverage social media to inform patrons of service changes and expansions.

By their nature, disasters and emergencies cause confusion, and that is the reason that social media platforms can easily aggravate already dire situations if left to run wild with no provision for posting accurate information as widely as possible. Systems therefore must be in place for responding to notification of a disaster. Where there is a pre-existing plan, those responsible for assessing the situation and damage take charge. That is how rescue and recovery of library collections can be activated, including calling for outside assistance. Some disasters are localized, e.g., leakage in a bathroom can be resolved through quick action by those responsible for building maintenance and upkeep, while others are more critical. Therefore, there is always a need to assess the damage and respond according to the nature and size of the emergency. But then, in the modern networked world, there must be provisions for dealing with the implications of the online connectivity that most individuals have. Web-based systems themselves require monitoring against tampering if one considers that it is not impossible to create a deepfake sounding or expressing an emergency alert warning of imminent crisis.

After successfully controlling and managing an emergency, resumption of services is the next logical move. This must always be accompanied by revising existing disaster response plans. The unanticipated arrival of the Covid-19 world pandemic demonstrates a requirement to have the previous plans revised. In fact, the situation lends itself to re-imagine how disaster management plans are created. The RAMP study by Buchanan and Murray (1988) has been widely used primarily as a planning manual. But then its coverage tends to be limited to fire-and-water-related disasters involving books, manuscripts, and photographs. Modern emergencies have evolved to include more varieties of the unexpected. This is the reason Cox (2020) expresses an opinion that the situation is “changed, changed utterly” in academic libraries where virtual access has increasingly become the norm, implying emergency concerns are now inclusive of digital collections, access, and connectivity. McIlwaine (2006), under the auspices of IFLA, produced an *IFLA Disaster Preparedness and Planning Manual*. This served to make disaster plan creation more directed in IFLA-affiliated libraries and archival institutions. The concern of the IFLA Preservation and Conservation Core Activity (PAC) was about perpetual access of all forms of library and archive materials. This manual acknowledges the RAMP

study by Buchanan, indicating its relevance, but also lacks more preparedness for internet-related emergencies.

Plans must cater to small-scale, large-scale, and wide-area type disasters. This is because if one considers the damage that can be caused from damage to computers and data, for example, the implications include the direct impact on every aspect of life, and insurance companies must be involved in reparations and recovery (among many other constituents).

5.5 Existing Emergency Preparedness and Management Plans: Relevance to Arabian Gulf

Despite the importance of disaster preparedness and management plans, studies from different countries show that they are not common among academic libraries. While several studies on disaster management and security control have been conducted in the developed world, there is scant evidence of such research in the Arabian Gulf academic libraries. But from a research survey about Middle Eastern libraries of various types, including academic ones, Mostafa (2014) confirmed an absence of disaster management plans in those libraries. Superio, Alayon, and Oliveros (2019) confirm their absence in Philippine academic libraries too. The situation in Arabian Gulf countries appears like the situation where Morgan and Smith (1997) found that most academic libraries in South Africa did not have a disaster management plan. The same result was confirmed by Ngulube and Magazi (2006) after conducting a similar study about academic and public libraries in South Africa, begging the question of how the University of Cape Town must have reacted and been generally prepared for the eventuality of the completely unanticipated April 18–19, 2021 fire disaster incident. Ayoung, Boatbil, and Baada (2016) confirm a similar status in polytechnic libraries in Ghana. They assert that polytechnic libraries in Ghana are inadequately prepared to prevent or survive any form of disaster. In confirming these shortcomings, the authors refer to absence of fundamental and essential necessities like smoke detectors, fire alarms, emergency assembly points, or emergency drills.

Humphrey, Sharpe, and Stiles (2020) list several academic library disaster preparedness and management resources from the United States. Examples include the American Institute for Conservation, while the Foundation for Advancement in Conservation maintains a website of resources that includes the “Risk Evaluation and Planning Program” worksheets and checklists; the American Library Association (ALA) Library Disaster Preparedness and Response hosts a library guide (Lib-Guide) on library disaster preparedness and response links to government, and

non-profit organizations' resources, as well as a bibliography of recommended books for planning, responding, and recovering. There are also many LibGuides on disasters and/or emergency management with sections on management, preparedness, and response to specific disasters, such as the 2010 BP Gulf Oil disaster or and the 2014 chemical spill in West Virginia.

The UK Chartered Institute of Library and Information Professionals (CILIP) seems to have a fragmented collection of disaster management plans. But then, the degrees of inadequacy in preparedness varies. The shortages of resources mentioned by Ayoung, Boatbil, and Baada (2016) do not reflect the types of resources lacking in Arabian Gulf countries. For example, in a study on critical cybersecurity threats in Bahrain, Al-Alawi, Al-Bassam, and Mehrotra (2020, 225) list challenges inhibiting cyber disaster preparedness resulting in increased cyber-crime to be: “weak protection/authentication, ignorance of encryption, insufficient knowledge and awareness of security standards, delays in updates and security patches, ineffective backup plans, overconfidence in traditional and old practices, and IT administrators being mixed with security professionals.” Shires and Hakmeh (2020) confirm that GCC countries (specifically discussing Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE) are keen on digital technology innovation, leaving them vulnerable to cyber threats. They point out that “the landscape of cyberthreats has expanded from issues like denial of service, malware and digital sabotage to include online influence operations, highlighting vulnerabilities in social as well as technological information systems” (Shires and Hakmeh 2020, 2). This is another situation where libraries are not necessarily the primary target but can be impacted, and therefore need to have plans in place to respond if such occurs.

Some emergencies and disasters are unique to libraries, while others are more general but with an impact on library operations. Either way, the library must be alert. On checking the library websites of academic libraries in the Arabian Gulf region, there are no obvious emergency preparedness and management plans on their websites. This does not mean that they do not have them in place. The general practice is to have university emergency preparedness plans that incorporate the library spaces since academic libraries are units inside universities. However, some international library-related organizations have explicit information. For example, the American Library Association (ALA, 2021, n.p.) website reflects information on pandemic preparedness, “including library-specific policy suggestions and more universal resources on pandemic education, prevention, and preparation”, disaster preparedness, emergency preparedness, disaster safety and security in libraries, and violence prevention in the public library including understanding warning signs transmitted via verbal and non-verbal behaviors. To mirror the ALA practice, ALA-affiliated

libraries have created plans relevant to their local situations. In the region at hand, there is a Special Libraries Association/ Arabian Gulf Chapter (SLA/AGC) whose website does not refer to the topic of emergency preparedness and management.

Relating to academic libraries in Arabian Gulf countries, perhaps one may search more widely to see if the topic is covered by the Arab Federation for Libraries and Information (AFLI) in a manner comparable to what the ALA does. Headquartered in Tunisia, it is the largest professional body representing the interests of library and information services in the Middle East and North Africa (MENA) region. However, in 2021, the AFLI website needed updating as the information was scanty. Some individual Arabian Gulf countries have library associations. Examples are the Library and Information Association of Kuwait, Bahrain Library and Information Association (BLIA), the Library and Information Association in Qatar (LIA-Q), and Omani Library Association. However, their activities are not robust enough to undertake emergency management-related responsibilities as that goes beyond their mandate that focuses on professional development efforts and activities for association members.

While some of the existing plans are a product of the kinds of collections a library holds, it is an expectation that all libraries are valuable and therefore need to have mechanisms to limit damage and disruptions. The Library of Congress has a risk management plan, a model disaster recovery plan, a disaster preparedness plan, a response, and recovery plan including how to respond to water emergencies and recovering water damaged material as well as continuity of operations. This approach is in line with the octopus analogy used by Sagarin (2012, 18) to explain how systems can work best in emergency situations through “multiple semi-independent agents that can solve problems as they arise”. But then all these plans rely on national emergency management offices and bodies. That is even more applicable to academic libraries since they operate as units within universities. They and their professional associations can have emergency awareness plans and documentation in place, but when disaster strikes, they generally cannot operate individually.

5.6 Impact of the Covid-19 Pandemic

The Covid-19 pandemic was a typical health emergency that affected the entire world, causing untold upheaval in all aspects of life. Academic libraries were impacted in previously unexpected ways, leading to reactive plans rather than proactive ones in most instances. Typically, library physical spaces were closed and “library staff worked from home and there was a sense of over burden

because of 24/7 connectivity and without any formal working policy addressing the new working routines” (Rafiq, Batool, Ali, and Ullah 2021, 1). Sometimes, experiencing a disaster results in the realization that an emergency preparedness and management plan is needed. Included in new and updated emergency plans will invariably be social distancing standards during and after the Covid-19 pandemic. An example is a study by Bakhsh and Makki (2020) that discusses “splitting teams at a hospital pharmaceutical care services during Covid-19 pandemic: A tertiary hospital experience in Saudi Arabia” as a way of coping during the emergency. But that implies a need for forward planning in anticipation of disasters rather than being reactive.

5.7 Indicators of Unpreparedness

Instances that demonstrate unpreparedness can be reflected as basically as by the existence of unprotected electrical cables and network cables. Besides being a danger to people tripping over them, denial of service due to either vandalism or unplugging of the cables from the sockets can easily happen. Insufficiently housed of network backup servers and server rooms including other networking devices, especially when they lack efficient ventilation, absence of emergency preparedness and management policies, training programs, and disaster management plans are recipes for disaster.

A study by Murphy and Lichtveld (2018, 126) examining the influence of professional emergency management coordinators driving preparedness and resilience on university campuses reveals that despite institutions of higher learning in the USA “being core stakeholders in assuring disaster resilience, gaps exist in preparedness practice.” With this result is the implication that when Covid-19 struck in 2019, there was unpreparedness. Lack of preparedness incapacitates libraries where they should have preparedness and mitigation plans against disaster. Usually this happens out of complacency when there has never been a disaster. When the Covid-19 pandemic struck, many were found to have either outdated plans, or none. Some had been concentrating on internet attacks, neglecting to create plans that cover all other possible emergencies.

Fifteen years before the 2019 disease pandemic, Waugh (2004, 11) mentioned that “the “all-hazards” approach must be continued”. By this is meant “adaptable plans that provide the basis for dealing with a variety of hazards and disasters” (Waugh 2004, 12). Meanwhile, Aloyo (2006, 11–12) suggests that “local emergency response is always first line of defence” and proceeds to state that “emergency preparedness, just like politics, is all local”. In a research covering

MENA on the role of the academe in disasters and crises management, Momani (2017, 150) found that in universities, “there is a limited interest to introduce crises and disasters management as an academic option within Arab States universities and research centres.” The research was intended to “raise awareness in academia of the importance of scientific research in the field of crisis management to prevent or reduce future losses of organisations and assist them to return to normal life after a crisis” (Momani 2017, 150). In a research asking the question “are Arab cities prepared to face disaster risks? Challenges and opportunities” that covered the MENA region, El-Kholei (2019, 479) concluded that:

Arab cities must invest in early warning systems; prepare risk assessments and vulnerability maps. They have to secure funds for social services and infrastructures. Arab cities must prepare and implement land use plans to minimize risks and enforce the use of building codes for safer human settlements.

This research featured the follow-up by various MENA countries of the UNSDR campaign for national safety.

5.8 Concluding Comments

After confirming the need for disaster preparedness and management plans, one is still left asking what practices are in place, whether they are applied when needed, and if not, a consideration of the obstacles preventing their application. El-Kholei (2019) paints a picture of areas of irregularities that require attention if international frameworks are to work. The most recent emergency has been the worldwide Covid-19 health pandemic that is leaving a historical mark in life. Then there are also internet-related potential hazards among many other types. From an emergency preparedness and management perspective in Arabian Gulf countries, the suggestions for readiness and need for up-to-date plans are the same as in most academic libraries.

That is to suggest adding pandemic-preparedness resources on the library websites for patrons; including guidelines for reacting to emergencies; creating teams allocating responsibilities for facing the challenge; having clear communication and reporting structures; providing for rehearsals before a disaster happens; enhancing the robustness of online research resources; enhancing training to prepare librarians for the new library service character; and where there is no emergency preparedness and management plan, organizing it in consultation with various university stakeholders, starting from within the library, i.e. starting “local” per the suggestion by Aloyo (2006).

The point made by Aloyo (2006) also implies that the mentioned global frameworks only work if tailored for local requirements, meaning that major investment in making relevant emergency preparedness and management solutions are a necessity. Thus, international guidelines, national guidelines, and institutional guidelines are useful in creating academic library emergency preparedness and management plans to avoid being caught up as victims of the VUCA reality.

Chapter 6

Speculating on the Future Role of Academic Libraries

6.1 Introduction

This chapter focuses on predicting, anticipating, speculating, or cautioning about future possibilities for academic libraries, using past experiences and lessons learned to imagine what awaits them within their universities. Gilmour and Sapp (2002) cite the seminal works of F.W. Lancaster speculating about “paperless information systems”. Prior to Lancaster was J.C.R. Licklider’s *Libraries of the Future 1945–1965*, published in 1965 by MIT Press. The discussion was speculating on the possible impact of computer technology on libraries. These authors have been proved correct when one considers the digital transformation that has happened to librarianship. However, the extent of the impact is possibly one that was not anticipated by the speculations. Now the environment is encumbered with high volatility, uncertainty, complexity, and ambiguity (VUCA). According to Bakshi (2017, 8) “in armed forces, it is called “maintenance of tempo” in the face of odds”, and similarly, the world is experiencing unprecedented and unanticipated odds in all sectors of life. Universities, and inevitably their libraries, are engulfed in that flow.

Literature has concentrated on the changes that are taking place around librarians, but there is less focus on how librarians feel about that, and how to respond. Cox, Pinfield, and Rutter (2019b, 486) point out that in the literature, “little empirical research has evaluated the academic library profession’s stance toward its future and the assumptions on which this attitude is based.” The study by Lund et al. (2020) mentioned in Chapter four therefore stands out for investigating the process of diffusion of emerging technologies among academic librarians. The human side of librarians is brought to the fore by this perspective.

6.2 The Profession of Academic Librarianship

It is true that in any university, librarians can be essential members of the educating process since they are working with and are like the rest of their course teaching colleagues (Kuh and Gonyea 2003). They in fact work best as collaborating team members. That means their university colleagues must recognize

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them as such. However, colleagues in the academe sometimes express or reflect uninformed perceptions about librarian qualifications and role. One way of gradually rectifying this anomaly is to raise awareness that the Master's in Library and Information Science (MLIS) or equivalent is the terminal degree for academic librarians (ACRL 2015). But then, that sometimes leaves academic librarians suffering from professional image challenges and exposed to being regarded as general service individuals who should fill the role of research assistants and keepers of books, therefore occasionally perceived as not academic faculty enough. Ridley (2018, 3) poses the question of “whether an additional qualification (the PhD) is now also necessary for those in academic librarianship”. This profession has been evolving and advocating the Ph.D. for academic librarians is an important step toward achieving the needed status relative to academic departments. Such a requirement would resolve the ambiguity concerning their status as they are very often the only faculty on most campuses without a doctoral degree. In fact, Tzanakou (2014, n.p.) points at one of the advantages of attaining a doctoral qualification as societal recognition, also mentioning that “doctoral education has become of paramount significance in a world where knowledge is the new ‘fuel’, the ultimate economic renewable to economic growth leading to a knowledge-based economy.”

Interestingly, librarians surveyed in the study by Ridley (2018, 7) reflected an ambivalence that is reflective of general “consensus from librarians (both those who hold a doctorate and those who do not) that, while the PhD might be important to the individual, it should not be a requirement of the position”. Consequently, it remains a question of self-actualization in many cases to embark on post-master's qualifications and undertake active academic /professional research projects, and that helps in getting over the recognition hurdle. This indicates a complicated profession with a potential to be fractured by change. But then, if the analogy of the octopus used in Chapter five is anything to go by, different levels and degrees of regeneration, metamorphoses, and having to blend-in are experiences that academic libraries have seen ever since their formative years, therefore they will prevail, albeit in changed ways.

Concerning how librarians are sometimes perceived, Cox, Pinfield, and Rutter (2019b, 486) have mentioned that “library leaders have often been criticized for lack of vision”. This statement is two-sided. First, it may very well be that leadership in the university brushes aside library leaders due to their perceived lack of remarkably advanced academic qualifications. But on the other hand, some library leaders may in fact be inadequately prepared for their jobs. Martin (2015, 348) points out that “more studies need to be done in library leadership to determine if academic library leaders possess the needed skills to guide libraries to a new frontier”. Additionally, Cox, Pinfield, and Rutter (2019b, 486)

highlight the point that “how a profession conceives its future will affect its ability to offer leadership.” A study by Sucozhañay et. al. (2014, 72) proved that there is merit in training library managers to become change agents since those studied in their investigation were found to lack that quality. Having mentioned library leaders, it is also necessary to comment on the library collections and services since they form parts of the academic library picture that must continuously move into the future.

6.3 Library Collections

Cox (2020) highlighted the diminished value of print collections as fallout from the Covid-19 pandemic. As in many parts of the world, in all the Arabian Gulf countries the print collections were closed off as university communities started working from off-campus. But as Cox (2020) points out, requests for the print materials were minimal. This has raised the question of whether interest in them will re-emerge post pandemic. This is happening at a time when debates about e-books versus print books have been circulating, with non-conclusive opinions being expressed depending on the discipline of the information seeker, their internet connectivity and electrical power capabilities, and in some cases their age (this is mentioned while acknowledging the lack of uniformity in preference mentioned in Chapter one that is expressed by the net generation).

With print books locked behind closed doors, librarians were receiving student requests for chapters of print books that library staff would, on a highly limited scale and frequency, scan and send PDF versions of to the student. That is because respect for copyright was highly emphasized, even more than ever before. The context has seen a move towards use of the library’s e-resources, and more OA in addition to Open Education Resources (OERs) with support and guidance from the libraries. Collaborating with libraries, educators posted more essential reading materials in the Learning Management Systems for students to continue with their assignments. Additionally, the academic world for a few months in 2020 witnessed more OA availability of scholarly articles from major publishing houses, e.g., Sage, Emerald, to name a few. Access to Covid-19 resources has continued to be open too. Concurring with Cox (2020), this means that “although copyright issues will need to be resolved, additional mass digitization efforts should be undertaken, leveraging collaborative storage agreements currently dedicated to the preservation of print content, to make library print collections more accessible.”

OER resources are featured on the websites of some Arabian Gulf libraries. Tlili et al. (2020) report that Saudi Arabia, Qatar, and Bahrain are developing

OER repositories, and are MOOC providers; and that Bahrain, Kuwait, Oman, Qatar, and Saudi Arabia are launching OER regulations; with Oman and Saudi Arabia hosting OER workshops and trainings. Regardless of the fast changes taking place in the information world, in their study, Cachia et al. (2020, 55) confirm that “beyond the technical aspect and the development of content, adoption of open education in the Middle East region is influenced by cultural aspects, which needs to be taken into consideration. As an emerging sub-culture, open education has the potential to transform and change some cultural barriers related to both power distance and collectivist cultures.” This is reminiscent of the point made in Chapter one that culture influences the way that educational concepts introduced are articulated.

The OER Global Report (2017, 50) revealed that there are existing OER policies in Bahrain and Oman, “while Kuwait, Saudi Arabia, and Qatar were still developing”. Then, in 2017, the government of Saudi Arabia Ministry of Education established the SHMS – Saudi OER Network. This National Center for E-learning is an independent center to manage all the e-learning initiatives in the country, with contributions from a vast array of Saudi universities and higher education establishments. The National OER Program was established to help teachers to find free sources to use and support the learning process (SHMS 2020). And then also, according to the OER Commons (2021), there is an Arab League Educational, Cultural and Scientific Organization (ALECSO) OER hub aimed at promoting the use, development, and sharing of OERs in the 22 countries of the Arab region (meaning that all the Arabian Gulf countries are involved). ALECSO also has a cooperative agreement with the *Rwaq* e-learning platform mentioned in Chapter two. This space includes resources from the world over in addition to those from the Arab region. In this spirit, OER initiatives in the Arabian Gulf countries appear to be created as part of regional collaborative efforts.

Cox (2020, n.p.) points out that:

we will spend more time and money developing our electronic collections. That will be a challenge with diminishing budgets. Libraries will need to develop new strategies for negotiating better deals with publishers and lobby for greater access to streaming media and e-books, which are more plentiful and cheaply accessible to individuals than they are to libraries. New access models will also need to be developed.

Negotiating better deals in the Arabian Gulf countries is a major challenge because that is effectively managed at consortial level, and the latter are still a work in progress. This is not to portray the library consortium as an answer to all academic library matters. Writing about issues faced within the OhioLink, one of the largest academic libraries consortia in the United States, Evans and

Schonfield (2020, 13) point out that siloed library systems have “not kept pace with the needs of individual libraries nor their efforts to collaborate in a consortial context”. This reflects disconnect between consortial needs and what library systems are doing. Regardless, Cox (2020) gives the example of an impending cancellation by the University of North Carolina and State University of New York system libraries of their Elsevier contracts in favor of title-by-title to significantly save money. Similar moves can eventually happen in the Arabian Gulf countries too.

With collection development and access, librarians also make decisions on what to remove from the collection depending on the collection and weeding policy. Hallam, Reel, and Heisserer-Miller (2021, 6) suggest that collection development policy is intended “to articulate goals and guidelines that align with an academic institution’s mission, collaboratively creating the collection’s purpose and identifying policy sections, and recognizing that the policy must be malleable so it can respond to changing needs”. The existence of changing needs implies that weeding must take place to keep the collection relevant. While this process was originally done with print collections to manage storage costs and physical workloads in addition to maintaining relevancy, current library holdings contain huge e-collections that can age out. This is where considerations must be made to de-clutter the digital content of online databases. Then again, the Big Deal arrangements come as packages, therefore the use of AI could be in studying usage patterns, then suppressing what is not being used, thereby libraries can come to assess what is relevant, and if the subscription is worth the investment.

6.4 Library Services

Increasingly, libraries in Arabian Gulf universities are seeing self-checkout, curb side pickup, scan and deliver, and materials delivery. That means there is less face-to-face interaction with library users unless the self-check machines are not operational. This means that librarians must be more seamlessly embedded in curricula through evolving functions. If universities are moving to more online education services as an after-effect of the lockdown, then librarians must collaborate with faculty to seamlessly offer services. This may be where MOOCs, if created, could develop with librarian input too. A scenario planning perspective can also be considered. It is not a novel idea because it has featured in library literature, but its face or mention is not obviously addressed in regional academic libraries.

6.5 Scenario Planning

The need for planning for all eventualities is reason enough to consider “scenario planning” (Cox, Pinfield, and Rutter 2019b). According to Ringland (2011, n.p.), “scenario planning uses possible future outcomes (scenarios) to improve the quality of decision making (planning).” This means librarians must develop sharp forward planning skills. The term is not new, having emerged in the United States in the 1960s (O’Connor and Au 2009) and later discussed by Harries (2003, 797) in a paper providing a “framework for the evaluation of scenario planning and other strategic decision-making methods or techniques”. The same subject of strategic decision-making still holds, regardless of organization or geographic location. Given the fact that one of the most viewed among academic librarian responsibilities is IL instruction and guidance as mentioned in Chapter one, it is necessary to discuss how scenario-based planning can be applied. Scenario planning can prepare libraries to be adaptable and blossom despite high volatility, uncertainty, complexity, and ambiguity situations. It has previously not been a forte of academic libraries to focus on structural uncertainties such as climate change, virus outbreaks, rapid technological innovation, or political instability, when they have never experienced such, but the interconnected world of today demands that. So, the question is how ready they are to operate in fulfillment of their responsibilities with forward planning undertones.

The way that most academic libraries operate is impacted by the expectations that accrediting organizations have of universities and institutions of higher learning. Many of them focus on IL skills as essential to all learners. Subsequently, universities and libraries continuously revise their curricula to cater to IL outcomes as specified at accreditation. As a result, IL becomes increasingly embedded inside existing courses and, that way, teaching librarians to operate in fulfillment of the specified requirement. In most cases, an IL session is a one-shot instruction opportunity that must yield maximum benefit to students. But how to achieve that is not always standard or obvious, and librarians together with course instructors must think outside the box. The lessons they target are dependent on curriculum and course requirements.

As an example, a librarian can interact with students when they reach a stage of literature search and resource evaluation, at general education level where their inquiry-based learning skills are either established or reinforced. When most of the students use English as a Second Language (ESL), a writing assignment supports enhancement of the English language. How it works is that students are expected to use the university library to find English language scholarly resources, and use them accurately, also avoiding plagiarism. In fact,

for some of them, that is their most fundamental stage of encountering those expectations as part of an assignment. Looking for the resources can sometimes trigger library anxiety. As far as a librarian is concerned, two scenarios arise from creating the assignment with the course instructor. The first one is concerned with how to give instruction on copyright as a concept, knowing that it can be applied in different ways in different cultures, in different circumstances. The second one relates to how to demonstrate accuracy or inaccuracy of information. When this instruction must be online as opposed to the traditional face-to-face encounters with students, a librarian must also be able to re-configure the intended messages to minimize student confusion. But the implication is that forward thinking in lesson preparation must always be the norm if the 2020–2021 lockdown conditions are a lesson to go by.

The librarian can assist in contributing towards the use of a plagiarism check platform that the university uses or prefers to use. Its use is to educate students to avoid plagiarism rather than punitively catch them out. So, the existing online activity can be a written short essay for which the students use a scholarly article that covers a topic of their interest by trying to understand it better, from a library database. They summarize, paraphrase, and use quotes to demonstrate an ability to use the three ways of using an article. Additionally, the students compile an annotated bibliography of three more articles indicating their relevance to the topic originally described in the short essay, accuracy of the articles, and quality of the sources cited. Again, one keeps in mind the guidance that ESL students require in the process. One of the main reasons for this assignment is that IL is one of the main survival skills of the twenty-first century, therefore every student gets an opportunity to grasp the concepts, but in a manner that does not shout “library!” The assignment also receives credit as a part of the ongoing course. Thus, the librarian is a collaborator and contributor who reinforces instruction in the context of the assignment about locating and accessing information, its ethical use, and how to evaluate the sources used.

To effectively achieve that, with the regular course instructor, it is important to clearly define the assignment, create the space for uploading the assignment, specifying when students can upload, and that they are able to retrieve their submissions twice and correct instances of plagiarism. Therefore, uploading for the first time is not the final attempt. Individual chat sessions using Zoom, WebEx, or Google Meet are available to discuss the meaning of plagiarism reports. There is an online session for the entire group after the individual meetings are completed to allow clarification and discussions on queries that have been noted as points of confusion to the entire group. With each stage are assessments of the effectiveness of messages communicated to students through monitoring their performance and feedback.

IL is one of the main learning outcomes of today's students in addition to critical thinking and quantitative reasoning, digital and technological literacy, global awareness, and bilingual citizenship (English and Arabic). This makes IL concepts an integral part of the skills that students must acquire. So, the essay that students produce is written in English by ESL students as an English writing exercise, besides being for plagiarism awareness, and is assessed by both the librarian and the regular instructor of the class. The idea used is in line with an article by Buchanan, Webb, Houk, and Tingelstad (2015) who discuss curriculum mapping as a process for evaluating the various components of a curriculum for cohesiveness, proper sequencing, and goal achievement. This approach is used in addressing situations where librarians serving university communities to a large extent do not have ownership of the curriculum as academic programs do, like most Arabian Gulf academic librarian cases.

Topics that interest students can range from the subjects of cryptocurrency, eLearning, and speedy automobiles to outsourcing parenthood. This idea is in line with research by Foord (2020) who confirms the same point previously made by Buchanan, Webb, Houk, and Tingelstad (2015) concerning aligning the IL assignments to the curriculum, using topics that students have individual interest in, to enhance participants' IL skills. These authors also suggest the use of rubrics to measure IL in students. The reason is that with collaborative opportunities between librarians and instructors, end goals must be as identical as possible.

The rubric is a scoring tool for the qualitative rating of students' work, offering us the facility to inform students of their achievements broadly as well as in different areas of their work and overall. That way, the rubric works as an analytical tool for assessing student work and provides feedback. The rubric reveals to the instructor, the librarian, and the student what is required for successful completion of the assignment and can also be used as an assessment tool for feedback. To make sure the students stay engaged with the educators while completing the assignment, it is encouraged to maintain open communication lines. However, some students are introvert and need encouragement, usually through social media such as WhatsApp. But then, students tend to like individual WhatsApp or other social media communication chat and can be accommodated only during specified times, i.e., educators must make sure to set practical boundaries. For example, a midnight emergency chat request stays unattended. These steps make it less scary to use plagiarism platforms since students realize that they are encouraged to check their uploaded work before final submissions.

To evaluate the effectiveness of the assignment, when it is done, students receive a short online survey to express their sentiments about the lessons gained, and how useful they found the plagiarism detection platform. Over

several semesters, the feedback patterns reveal important lessons for both the librarian and the course instructor. A rubric is another scoring tool for the qualitative rating of students' work, offering a facility to inform students of their achievement in writing the essay, how well they used the articles, and overall presentation of the assignment. That way, the rubric works as an analytical tool for assessing student work and provides feedback. Because the rubric reveals to the instructor, the librarian, and the student what is required for successful completion of the assignment, it also works as an assessment tool for feedback. The process mentioned in this instance can be repeated with different assignments at different stages in the student's academic life. When students are in the academic major/ chosen course of study, they have experienced an orientation to the ways of the library, and it is practical for the librarian to spend more time working with faculty to set goals and design assignments that incorporate IL in effective ways. Class visits can still take place (face-to-face and virtual), and individual consultations with librarians become more prevalent. Cox (2020, n.p.) points out that:

If courses remain online, deeper integration of both library resources and personnel into course management systems is essential to ensure students gain information literacy skills. Librarians can help faculty members develop course content, co-teach, provide research consultations, hold virtual office hours online and assist in the identification and linking of course content.

Then also, the existence of free content generators such as Zyro that provide text for websites, Quillbot (<https://quillbot.com/>), Spin Writer (<https://www.spinrewriter.com/>), Spinbot (<https://spinbot.com/>) or WordAI (<https://wordai.com/>), to name a few, that can rewrite text and make it difficult to detect plagiarism are raising the need among academic librarians and teaching faculty to revise their approach to the creation of writing tasks and plagiarism checking. This is an example of complexity caused by technology in the education of university students. Chances of students using the mentioned resources are high because they are available, convenient, and convincing. The age-old use of viva and oral presentation where a student provides visible evidence of having understood the assignment at hand may also be used whenever possible.

6.6 Library Trends

Taking an Americentric approach, the Association of College and Research Libraries (ACRL) performs biannual top trends and environmental scans. The Marshall Breeding in American Libraries Magazine (<https://americanlibraries>

magazine.org/authors/marshall-breeding/) is another platform that does similar work. The IFLA Trend Report (2019, 3) is:

the result of the dialogue between the library field and experts from a range of disciplines. By crossing experience and perspectives, it provides an opportunity to explore and discuss the emerging trends that are shaping the world in which libraries work. It is not a static report, but a dynamic and evolving set of online resources for library and information professionals.

But then there is no IFLA data covering Arabian Gulf countries. Several other works in the Western world are also regularly available, but their equivalent in Arabian Gulf countries needs to be produced so that one can compare between world trends and regional ones. Such reports are undertaken by people in the library and information world, especially those who live and practice in the regions being studied.

To advantageously position themselves for future success, libraries and librarians must break down traditional barriers, both internally between library units and externally with other players on campus. For example, previously, librarians needed to increase their visibility within the university community through teaching, publishing, and service. Efforts towards this change have been expedited by the onslaught of the Covid-19 pandemic, to which Cox (2020, n.p.) “predicts the significant ways academic libraries will shift in terms of collections, services, spaces and operations as a result of the pandemic”. The pandemic was a strikingly impactful demonstration of structural uncertainty causing academic libraries to find ways of coping, worldwide. There has admittedly been a major shift towards provision of remote library services. But then, one must still always bear in mind that other unanticipated events can also take place. Being reactive, as was the case when the Covid-19 disease pandemic occurred, helped libraries cope, but to truly flourish, educational administrators must be aware of what academic librarianship is about. How that happens is initiated by the library. Ohler and Pitts (2021, 41) suggest that as librarians we must “reconcile our own identity in the new landscape. We need to ground ourselves in a new way of operating: embracing iterative development techniques while deliberately combining collections strategy, digital initiatives, and outreach efforts to support open scholarship.”

Libraries need coherent and efficient workflows for managing all research resources, which has not been the case previously (Schonfeld 2017). For example, Koopman and Jager (2016, 47) point out that “an ad-hoc situation with varying success in the preservation of research data had been the status quo.” This is not peculiar to any single place and is one of the reasons that academic libraries are revising their roles, becoming very closely aligned to the activities

of their universities' offices of research. The trend is gradually becoming visible in Arabian Gulf academic libraries. For example, OPENDOAR (2021) lists one repository in Kuwait, one in Qatar, 11 in Saudi Arabia, and three in UAE, meaning that there are librarians involved with data services, institutional repositories, and OA. Among these, one IR in Saudi Arabia has policies registered in ROAR-MAP, and one in the UAE.

Veaner wanted to answer the question: "What types of skills, abilities, and attitudes will the academic librarian need in 1985 to 1995?" Asking the same question in 2021 about contemporary library practice reveals a massively revised response. Libraries are now working with a wide spectrum of expectations and learning styles that is mostly impacted by a fast-changing information and technology environment. Ohler and Pitts (2021, 41) advise to "infuse agile development structures learned from industry to adapt iteratively and swiftly to changes and evolving needs of our communities". Thus, regardless of which aspect of academic librarianship one is considering, a more business-oriented approach seems to be the new normal. That also leads to return on investment (ROI) considerations.

6.7 Business-Oriented Approach

If a university takes on a business-oriented approach, there must be systems in place used to justify expenditure on almost everything. This is tied to performance and resource assessment, monitoring, and measurement. That is because of the need to regularly check if systems used are efficient and effective. To achieve that, measuring the return on investment (ROI), i.e., cost efficiency, of libraries is necessary. For example, comparing how much library journal articles cost versus how much an individual researcher must pay if they are accessing it outside library subscription. A study in measuring the ROI of academic libraries in Arab countries by Elsayed and Saleh (2015, 219) "found that the return on investment was negative (-0.99)". Such studies need to be repeated on a regular basis, but to benefit from them there must be good management plans, as well as concrete and measurable outcomes. In fact, library leaders must identify the skills and competencies that they need in the VUCA environment of today and to know that investments made in resource and services acquisition, personnel management, and development have been well spent and are delivering the needed ROI.

Besides ROI measures, the use of Key Performance Indicators (KPIs) makes sense in evaluating the success of initiatives put in place by the library. Previous chapters discussed library systems and services, RDM, and the potential of AI in academic libraries. One needs to speculate on how those topics interlink

to reflect libraries' performance and their capacity to provide positive ROI results and successfully meet the KPIs, so that they are viewed as assuming the expected roles.

6.8 Performance Assessment

It is important to be clear about what any university sees as competency-based capabilities that are measurable and need to be managed to be in tandem with the said change and development. The measures used are expressed as key performance indicators (KPIs) and benchmarks. The difference between KPIs and benchmarks can sometimes be unclear. While benchmarks are goals to aim for, KPIs are specific measurements used to gauge performance for purposes of improvement. As such KPIs can be used as tools for attaining certain benchmarks. The use of benchmarking helps identify steps that need to be taken as critical success factors (CSFs). Defining KPIs helps choose which ones to put into practice as that allows a study of innovation and creativity structures. The varying nature of the Arabian Gulf universities inevitably results in different targeted performance outcomes. As each of the universities evolves, they can control the reliability of KPIs used for targeting learning or focusing on undesirable gaps by administrators for the benefit of improving on areas that require curriculum and academic performance improvement.

Performance of libraries in modern environments has been measured with various approaches, ranging from using statistics to impact assessment. However, the weakness of many of these evaluation efforts is that they “have been mainly focused on measuring the quantity of services, to the detriment of an emphasis on the processes occurring within libraries, including how libraries might address challenges within their environments” (Chen, 2007, 6). For example, in a UAE public library context, Abu Eid and Jirjees (2015) suggest the use of ISO standard 16439: 2014 (methods and procedures for assessing the impact of libraries).

While there is a desire by libraries to use the International Standards Organization (ISO), National Information Standards Organization (NISO), Association standards (library and other standards), ACRL, Accreditation/audit/institutional standards, as well as regional and professional accreditation, the trend is towards evidence-based choices such as ISO 16439: 2014, ISO 9001: 2015, and professional associations. One of the reasons for this change is the evolving role of the library, making librarians favor accreditation for international recognition of qualifications (ur Rehman 2012). However, as in the application of any standards, situational suitability is always debatable even when using guidelines from

already established bodies like ALA, ALIA, and CILIP. But then, given the globalized nature of academia, it is helpful to at least have some KPIs to aim for compliance with some discipline or professional standards. Zahran Al Hijji and Cox (2012) confirm the use of surveys, reports, KPIs, statistics, and interviews, in addition to appraisal forms which are used for staff evaluation in Omani libraries. The evaluations are accompanied by internal and international accreditation. This is not unique practice and is practiced in Arabian Gulf countries in different combinations. Universities are interested in being accredited, and in boosting their KPIs, injecting more resources into the areas that will increase them, enhancing the quality of their work, visibility, and rankings. Arabian Gulf universities belong to the Arab Network for Quality Assurance in Higher Education (ANQAHE).

6.9 The Problem with Performance Measurement and Rankings

Employee performance measures are very useful and expected at every stage so that an organization has a way of focusing on what needs attention, improvement, or change of direction. However, one of the challenges that exist is that when there is a failure to perform as expected, the feedback can be negative. It works well to treat instances of mistake correction as a part learning to avoid causing employees to withdraw from volunteering or sharing ideas. Additionally, the effective use of measures such as Baldrige or Six Sigma requires employees to be trained in the stipulated methods. But then, this may result in a tendency for the employees not getting time or needing to think of new ideas for the institution, resulting in a lack of innovation.

Another challenge is a lack of proper understanding of what KPIs really are, and, subsequently also, missing appreciation of the said measures. Inclusion of additional measurement sources of data, e.g., surveys and interviews as indicated by Zahran Al Hijji and Cox (2012), are thus essential. The assumption in using them is that training happens among those who are to implement them, but there is no guarantee of clear articulation. The implication is a longer learning curve for the implementer, and drawbacks resulting from unmet KPIs. Ioannidis et al. (2007, 30) pointed out the weaknesses of rankings in use, and this is reinforced in more recent research by Marginson (2014), essentially reflecting more of a business orientation to managing universities sometimes to the disadvantage of the education process. That can be because of an exclusive over-emphasis on only achieving the performance improvement tools-stipulated targets.

Furthermore, when it comes to the overall performance of a university, one of the challenges of the current ranking system has been identified in the construct validity. According to Marginson (2014, 47.), “there is little discussion and debate about what the different rankings measure and how, and related questions of data coverage and validity; the kind of discussion that distinguishes between good and bad rankings on scientific grounds”. For example, the ARWU ranking places high importance on an institution’s ability to attract awardees of Nobel prizes, and includes non-review material from *Nature* and *Science*. While this is a characteristic that the creators of the ranking determine, there seems to be the exclusion of universities with no Nobel Academy laureates.

Measurement validity is another unclear concept because what is being measured needs to be relative to specific environments and age of the institutions. For example, THE accords high importance to international faculty and students as well as faculty-to-student ratio. The measure is practical where institutions are well-funded either by their governments or by industry. This reveals a varying focus between the two ranking systems. QS is another popular system. Like THE, it uses data from the Scopus indexing database. Both QS and THE incorporate sub-rankings from life sciences, natural sciences, IT and engineering, the social sciences, and the arts and humanities, but ARWU does not cater for arts and humanities in a comprehensive manner. Additionally, the challenge with universities that do not offer STEM degrees is that their metrics are not comprehensively included in the THE, therefore can barely meet its specifications. That is in addition to the rankings’ minimal inclusion of non-English language publications even where there are potentially qualifying titles. It is interesting to note that it is the media that hugely propels the rankings topic, especially influencing students in their choice of what university to enroll in. When the image of a university sits well with students, grant makers, and funders if highly ranked, its status is hyped mostly in the media.

The major challenge is the media tendency to report without clearly explaining or elaborating what the rankings framework means. However, the conveyed messages have the effect of placing universities in competition for attracting high caliber faculty, higher student enrolment and retention, and making them focus on institutional image. It is practical for the MENA region to develop competitive rankings of their own as they maintain high quality scholarly productivity. The development of Times Higher Education MENA University Ranking is an example of progress in that direction. A related activity at the Emirates Centre for Strategic Studies and Research was a lecture on International Rankings of Arab Universities in May 2015, and more similar deliberations are desirable. The introduction of the QS Arab rankings system is a most fitting development. The examples of

the Arabic library database Al Manhal that organizes citations and uses a performance index called the Manhal index (2016) and the potential of the E-Marefa (2016) database to do the same demonstrate that it is possible that such players in the region can incrementally operate as collaborators or competitors with Scopus, but for Arab language scholarly work.

In the words of Marginson (2014, 47), it appears that:

After a decade of university rankings it is apparent that self-regulation by the rankings industry will not distinguish good rankings from bad on grounds of validity of data and methodologies or foster a common culture of improvement based on scientific principles.

It is the reality that the academe is being driven by the rankings inertia, now and for the foreseeable future. However, one expects that research universities are evaluating the various rankings so that they be included in determining what scholarship is, what needs to be ranked, what impact the research has had on national development, and how it should be done according to various criteria that include the age of a university, its teaching focus, and more factors that can only originate from universities and locally relevant organizations.

6.10 What Happens in Times of Difficulty?

All libraries must revamp emergency and disaster plans and include creation of pandemic policy. They must be organized to be proactive. For instance, if there are no written criteria for closing the library in an emergency, or a disaster, or pandemic situation, the Covid-19 pandemic situation has brought home the fact that it is time to create them. Policies must allow discretion depending on the type of disaster or crisis. For example, a current policy must include, among other provisions, social distancing and cleaning if the library remains open, as well as criteria for program suspension, communication channels, work from home expectations, and public service contingency. Braun (2020, n.p.) mentions that “being proactive can take more time than being reactive, but it will enable you to build services that support a community’s changing needs. If you start by examining your vision, it’s more likely you’ll be equipped to provide quality services during periods of crisis.” The ALA has open guides that are useful when writing a policy and a plan.

6.11 The Way Forward

The Covid-19 pandemic may turn out to be an opportunity for forward planning in a VUCA context. Even where totally unexpected circumstances beyond the control of libraries happen, Braun (2020, n.p.) suggests using VUCA Prime as a “natural jumping-off point for forward-thinking response during uncertain times. It can be a way to move from reactive to proactive practices in our libraries”. For example, planning for more OA advocacy. The extended stay at home made most major publishers and their imprints provide more OA information. Articles behind paywalls were temporarily removed at the height of the Covid-19 crisis, and this demonstrated the need for planning more and better OA initiatives as critical for information equality. In the process, libraries help uncover marginalized voices, thus supporting steps towards equalizing academia.

It is likely that with time, incarnations of the profession of librarians may end up distinctly different from who they originally were. But that cannot come as a surprise considering that the old age library was a storeroom of books, and the librarian was regarded as the keeper of books. Through change, the academic librarian has become an educator who engages and supports scholarly and professional research, facilitates access, and provides many more services than solely keeping books. The responsibilities extend to advising on academic publishing and being involved in publishing as scholars themselves. Even more expertise is required in advising faculty about eBook and video streaming licensing since classes have transitioned to online for the most part. Braun (2020, n.p.) acknowledges the view that the outlook must be about “VUCA (volatility, uncertainty, complexity, ambiguity) and VUCA Prime (vision, understanding, clarity, agility)”.

The use of openly available resources that is now possible has opened more possibilities in the scholarly publishing world. Librarians are well-placed to research, understand, and be the bridge between new models of publishing and researchers. Cox (2020) suggests that “this is the moment to advocate for open research and open data in federal grants and to educate faculty members about how to retain their publication rights.” There was a tradition of not trusting OA, but the medical sciences have been doing it for a long time. This is the time for libraries to understand the nuances of open publishing and the use of open educational resources, and properly guide scholars and researchers. Cox, Pinfield, and Rutter (2019a) point out that at the moment it is not clear what would happen if publishing was superseded by online filters that produce results through AI algorithmically directed journal peer-review process. Viewing this from a VUCA lens, this presents uncertainty and complexity. In the words of Contrada and Good-Schiff (2021), educators should be “reaching

higher, together”, a sentiment also expressed by Cox (2020). Additionally, it is the libraries that “can use tools like ORCID to connect preferred gateways like ArXiv with institutional repositories to develop a comprehensive research platform for researchers” (Cox 2020).

As in the rest of the world, Arabian Gulf countries have become more dependent on internet connectivity, meaning that more awareness of the nature of online information is of paramount importance. The explosion of fake news and alternative truths requires the IL responsibility of librarians to be more comprehensive to include digital and media literacy. But then, at the back of many academic librarians’ thought process is the question of professional survival. Concern is about whether soon, rather than relying on librarians or library instruction, students may start directing questions of access or searching to IT personnel or outsource this to database providers. But in terms of trends, digital migration is a phenomenon that has come to stay.

This reverts to the previously asked question about what librarians think and feel about the fast changes that have been happening and continue unabated. Additionally, library managers must take ownership of the volatility, uncertainty, complexity, and ambiguity (VUCA) environment, but at the same time not demoralize people as they realize that there is no other choice. This is achievable through focusing on being inclusive, proactive, creative, and ready to quickly respond to new opportunities and challenges without delayed planning.

6.12 Service Innovations

The following are examples and suggestions of innovations that can take place (where they are not yet operational) in Arabian Gulf university libraries, and it is conceivable to mirror some of them as appropriate in other university departments, making the library one of the pacesetters of innovation and/ or creativity:

- Deliberately and systematically maximizing the benefits of occupational specialties found among current and future library employees, and in the process establish practical and realistic employee career paths to attract more candidates into the profession.
- Involvement with collaborative activities to make a wider impact, e.g., working with university departments to educate students about “fake news” as demonstrated by the University of Michigan’s program titled “Fake News, Lies, and Propaganda: How to Sort Fact from Fiction” (Bothwell 2017) created for use starting in 2017. A product of the library and College of Literature, Science, and the Arts, it is intended to “teach students how to find

trusted sources of statistics and consider how their opinions, and the opinions of others, can affect the interpretation of news”. This is an example of collaborative IL education and guidance.

- Methodically archiving research data from institutional scholars so that research from the Arabian Gulf area receives more attention for its value.
- Creating institutional repositories, where there are none, to keep track of scholar productivity and enhance visibility of both the individuals and the universities, particularly with the adoption of digital object identifiers (DOIs).
- Making sure that information on standards for e-publishing are clear to the academe, creating new library services, e.g., explaining the relevance identifiers on works created, such as ISBN and DOI.
- Creating programs that champion, guide, and explain matters relating to the OA initiative, both as a publishing space for researchers and a source of academic information.
- Joint publishing with the university press where that is applicable and possible, or becoming a part of publishing consortia, e.g., Lever Press (2016) that is supported by a consortium of participating liberal arts college libraries with the aim of helping shape the new scholarly publishing paradigm. Alternatively, Simboli (2019) comments in the post by Evans (2019) suggesting having a “coordinated initiative by all libraries to contract the space of journal publishing, instead of all this focus on APCs”. This may be a way for universities to take back control of journal metrics.
- Having a copyright advisory and data management office or contributing towards its creation where it is not already in place,
- Involvement in the university rankings debate, e.g., being actively engaged in providing feedback to the NISO (2016) Alternative Assessment Metrics (Altmetrics) Initiative.
- Participating in the creation of research output policies if it is not in place, or their support if in place.
- Considering re-modelling library spaces for patron interactivity.
- Creating library outposts especially for reference services, and making sure that remote access to databases and other relevant research resources is stress-free.
- Providing technology assistance to all library patrons including faculty.
- Making available spaces with assistive technology.
- Re-strategizing about emergency preparedness plans and disaster management solutions.

Notwithstanding, there should be evidence that suggested approaches, regardless of whether they are technical, academic, or administrative, meet certain needs of the institutional constituents so that they do not end up achieving results that are opposite to the desirable.

6.13 Further Research

Besides monitoring top trends in academic libraries and speculating about possibilities, suggestions of some academic library-related research areas that can be pursued with Arabian Gulf countries in focus include evidence-based topics on:

- The impact on library service of a combination of societal culture, university culture, internet culture, and MIL.
- Academic library manpower development and PD for curricula in the Arabian Gulf, taking libraries to new frontiers.
- The impact of remotopia, including accompanying advantages and challenges, on the academe.
- Advances in using assistive technology in academic libraries.
- The impact on library service of a possible mix of online and face-to-face teaching post-pandemic.
- Applications of AI in libraries.
- Applications of concepts such as VUCA, scenario planning, consortial engagements and purchasing of licensed databases, OA, and OER.
- The effect of total reliance on internet connectivity, web meeting fatigue, FOMO (fear of missing out) tendencies, fake news, deepfakes and shallow-fakes, and other problematic results of using digital technologies on effectiveness of library efforts in serving university students in the Arabian Gulf.
- In-depth articulation of emergency planning and disaster management.

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