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Establishing Connections, Bridging the Gap: Library 4.0 and Its Role in Digital Humanities

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Abstract: This paper will reposition the DLSU Libraries as one of the key players in the academic community to support knowledge building by providing essential services to push forth lifelong learning. Using the SPEC Kit 326, an established tool kit published by the Association of Research Libraries (ARL), the paper will document and identify the existing strategies that are in place to help the Libraries continue to reinvent itself in the era of digital humanities. As library development is often tied to technological developments, the paper will also seek to identify gaps in its services to further help improve user satisfaction and maintain its relevance in the emergent era of library 4.0 and digital humanities.

Key Words: digital humanities; library 4.0; DLSU Libraries

1. INTRODUCTION

Libraries, as stated by the world-renowned father of library science – S.R Ranganathan, is a growing organism. The library of the modern era continues to grow, adapt and evolve despite the changing information technology environments. The fifth law – the library is a growing organism continues to give librarians of the 21st century a blueprint for our future directions that are as relevant now as it was in 1931. (McMenemy, 2010; Noh, 2015)

As the trend moves toward the advent of greater reliance on web-based services, it was also succinctly observed that a direct relationship exists between the web's evolution and the way we enhance our education profiles. From the teacher not just being the knowledge source but also delving further as the leader of collaborative knowledge creation. From the learning process of lectures, essays, assignments, written and oral tests that shift into open learning activities addressing student creativity and social networking. From the student being

passive receptive into gradually making them a co-developer of new ideas and artifacts. Whilst improving the means of delivery of education from e-learning management towards the use of web-driven technologies that eventually use portfolio applications. These technological changes pave the way to make new services available that creates new interaction models for education to arise more efficiently. (Demartini & Benussi, 2017)

1.1 Industry 4.0

These changes in the delivery of education place us, at present, at the beginning of this fourth stage, which is characterized by “cyber-physical systems”. These systems are brought about by the inevitable integration of production, sustainability, and customer-satisfaction that is the basis of intelligent network systems and processes. (Bloem, J, et.al, 2014) As emphasized by Livia (2018), the so-called Industry 4.0 is a culmination of several technological innovations where complex sensors, artificial intelligence, cloud computing, and advanced robotics takes center stage – an era that will focus on the creating intelligent products and services.



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In the context of education, this becomes an opportunity to maximize the Internet as a tool and mode for progress. In return, this creates an increased growth on the use of digital devices such as video cameras, RFID readers and tablets, which, coupled with web services, improve the quality and efficiency of any process or program in operation. Since it is becoming easier to connect machines, and even classrooms and applications to the Internet, the bring-your-own-device (BYOD) movement emerges as it provides students, all with their own devices, to enter into classrooms and connect to institutional networks. (Demartini & Benussi, 2017)

Hence, the fourth industrial revolution converges a number of technologies in the way we do our operations or deliver a service. These technologies include but are not limited to robotics, cloud computing, artificial intelligence, big data, linked data, and 3D printing. (Frederick, 2016)

1.2 Libraries and Digital Humanities

As the Libraries strive to maintain its relevance in the academic community - gradual shifts to its programs and services were made as a response to the changing information landscape. Even discussions of libraries and its connection to digital humanities have grown over the past several years. As defined by Sula (2013),

Digital humanities (DH) focus both on the application of computing technology to humanistic inquiries and on humanistic reflections on the significance of that technology.

Sula's extensive table of "ALA Core Competencies of Librarianship Related to Digital Humanities" (Sula, 2013) later calls upon academic librarians to begin digital humanities work. Meanwhile, another article advocates for librarians to consider becoming "hybrid scholars" with expertise in both digital humanities and library and information science (Zhang, Liu, and Matthews 2015). Likewise, even small-scale academic institutions can undertake digital humanities project given that right partnerships are formed, and the best resources are employed (Hauck, 2017). Further, even the Council on Library and Information Resources (CLIR), an independent, nonprofit organization that works with libraries, cultural institutions, and higher learning communities on developing strategies to improve research, teaching,

and learning environments, commissioned a study about digital humanities centers that explores their operations, services, and sustainability. They were able to identify key indicators of what are the characteristics that make up the programs, space and services that a digital humanities center may undertake (Zorich, 2008).

1.3 Library 4.0

The age where technology and humanity will inevitably merge. Such discussions that explore the convergence of libraries and digital humanities, has made some researchers suggest developmental directions for the future of libraries. One plausible area to explore is the library model researched and suggested by Noh (2015) about Library 4.0 - the next generation digital library. Banking on this library model, the researcher characterized a library 4.0 containing the following concepts: *intelligent library*, *massive data library*, *augmented reality library*, *context-aware library*, *cutting-edge recognition library* and has *infinite creative space*. These core concepts identified will be used to determine the current position of the DLSU Libraries as it maneuvers its way as a future library shaped by future technologies.

1.4 The SPEC Kit 326: Digital Humanities Assessment

In addition to the library 4.0 model, an established tool kit published by the Association of Research Libraries (ARL), SPEC Kits, was used in this study. Created by librarians for librarians, each issue of SPEC kits provides results of thorough and systematic surveys and undertakings conducted on the different topics affecting libraries and librarians of today not just to ARL member libraries but to the library communities around the globe. With the aim of providing a snapshot of the experiences of digital scholarship centers and its role in digital humanities, SPEC Kit 326 primarily focuses on the result of the survey conducted on 2011 among 126 ARL member libraries about their digital scholarship centers and the challenges of managing them (Bryson, Posner, St. Pierre, & Varner, 2011). Aside from their experiences and challenges encountered, the paper also provided recommendations on how these centers can be improved. With this idea in mind, the researchers made use of the survey questions provided in this kit to assess the DLSU Libraries' role as one of the key players in the



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university's thrust in knowledge building and lifelong learning.

2. METHODOLOGY

This paper employed the descriptive analysis approach to determine the role of DLSU Libraries in the digital humanities time as well as in the knowledge building of the academic community towards industry 4.0 and how it has repositioned itself in the midst of digitally enhanced environments. The paper made use of the SPEC Kit 326: Digital Humanities instrument developed by a team of librarians to member libraries of the Association of Research Libraries (Bryson, Posner, St. Pierre, & Varner, 2011). Selected key areas in the kit were used to assess the DLSU Libraries' services that support the humanities. The key areas focus on various aspects of digital scholarship centers and libraries such as services and support, service users, project workspace, sustainability and partnerships.

To provide additional compelling information on the role of libraries in digital humanities, a documentation and checking of the DLSU libraries' existing services, activities, and programs was also conducted vis-a-vis checklist of digital humanities centers' activities in the study commissioned by the Council on Library and Information Resources (CLIR) (Zorich, 2008) as well as the library 4.0 model proposed by Noh (2015).

3. RESULTS AND DISCUSSION

The DLSU Libraries provides ad-hoc services that support digital humanities projects. Although it has not yet formed a separate space for a digital scholarship center, it does support multiple disciplines including the humanities in its other services. Using the SPEC Kit: 326, the following areas were checked: services and support, service users, project workspace, sustainability and partnerships.

3.1 Services and support

In the area of services and support, the Libraries has been working on its project development and support arm through digital project management as it facilitate interdepartmental and institutional collaboration to beef up its plans for an institutional repository that will house all the

scholarly outputs of the University. Technology and design are seen through the digitization projects that the Archives and Special Collections are currently undertaking. The discovery interface, in addition, lets users to mine all the holdings of the libraries and be able to harness its capability to link the bibliographic data to the learning management module used by the University. Bibliographic management software is also a staple in the information literacy sessions and 3D rendering platforms will soon be made available as they gear up our Makerspace. Hence, evidently supporting research needs of the academic community. Preservation and education transpire as the libraries engage in digital asset preservation and access by making available online selected collections. In addition, the support in DH initiatives is made possible through maximizing the role of the librarian. As seen on Table 1, the librarians play an important role in delivering any digital humanities endeavors of the institution through execution of certain skills and expertise contribution.

Table 1. Expertise contribution of the librarian

Strategizing on:	<i>Creation of tools for use in digital humanities; marketing / outreach</i>
Instruction on:	<i>Tools or techniques used in digital humanities research;</i>
Services related to:	<i>Scanning; selection of resources for digitization or some other inclusion in a digital humanities project; application of specialized metadata or ontologies</i>
Assistance with:	<i>Identifying potential partners and resources for digital humanities project</i>
Consultation on:	<i>Preservation management; accessibility</i>
Education about:	<i>Open access issues; ethical issues</i>

And because of this, the Libraries encourage, facilitate and promote interdisciplinary projects such as librarians working with faculty members and staff members in other departments to organize symposia or events focusing on interdisciplinary themes. Librarians organize activities to educate cross-disciplinary audiences about scholarly communication, publishing techniques and open access issues.



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3.2 Service users

With an average 2,635 entrants on a daily basis since 2016, the DLSU Libraries caters to all bonafide students, faculty, and staff of the academic community. They also extend their service to researchers not affiliated with the institution following the prescribed guidelines of visiting users.

Most of the services available are made available through various channels e.g. library website, help desk announcements, orientations, social media posts and newsette articles.

3.3 Project Workspace

Library liaisons for DH projects meet in the spaces within the library. The existing six (6) library committees use an abundant number of meeting rooms (2), seminar room (2) and discussion rooms (48) in planning their various library programs and activities. They also make use of the Makerspace, established in 2017, in fabricating some of the exhibition materials as well as other program collaterals.

3.4 Sustainability

Currently, digital humanities resources are digitized, particularly, those under the special collections – manuscripts and transcriptions of oral histories. However, there were also instances that a resource may not warrant preservation. Hence, the library is also working on criteria's and defining circumstances that will merit preservation of the digital resource. There is also an ongoing discussion and coordination regarding the establishment of an institutional repository capable of preserving certain outputs and file types while ensuring that materials are created in sustainable formats to ensure long-term access.

3.4 Partnerships

The Libraries has established partners both inside and outside the institution. For instance, they are in collaboration with The Museum for curation of distinguished special collections and its exhibition whether physically mounted or online. It is also worthwhile to note that most partnerships have arisen around specific projects using specific resources. They also collaborate with the university's Information Technology Services to move forward with their local repository and has been actively working with the U.S. Embassy in the Philippines'

Public Affairs Section, through the American Corner in hosting digital storytelling workshops and various civic engagement activities.

In addition, patterned on the study commissioned by the Council on Library and Information Resources (CLIR) in Zorich (2008), the goals of DH driven centers are to further humanities scholarship, create new forms of knowledge, and explore technology's impact on humanities-based disciplines. To achieve this, a number of programs are in place to support DH work at the Libraries. Earlier mentioned by Zorich (2008), a digital humanities center is undertaking some or all of the activities as mentioned on Table 2.

Table 2. List of DH and DLSU Libraries Activities

<i>DH Center Activities</i>	<i>DLSU Libraries Activities / Programs</i>
1. Builds digital collections as scholarly or teaching resources	<i>Digitization projects (thesis and special collections)</i>
2. Creates tools for authoring, building digital collections, analyzing collections, data or research processes, managing the research process	<i>Research and publishing workshops; Mendeley trainings</i>
3. Uses digital collections and analytical tools to generate new intellectual products	<i>LibGuides; Information literacy (IL) modules</i>
4. Offers digital humanities training (in the form of workshops, courses, academic degree programs, fellowships, and internships)	<i>Digital storytelling; Civil Society Certification workshop; Massive Open Online Courses (MOOC)</i>
5. Offers lectures, programs, conferences or seminars on digital humanities topics for general or academic audiences	<i>Lunch n' Learn; Diplomatic (Ambassadors) dialogue series; Human library; F. Sionil Jose dialogue series</i>

Table 2. List of DH and DLSU Libraries Activities

6. Has its own academic appointment and staffing	<i>Creation of adhoc committees to support DH-inclined projects</i>
7. Provides collegial support for and collaboration with members of other academic departments at the home institution	<i>Research and publishing workshops; Social engagement projects</i>
8. Conducts research in humanities and humanities computing (digital scholarship)	<i>User preference studies</i>
9. Creates a zone of experimentation and innovation for humanists	<i>The Makerspace Digital creation labs* e-classroom*</i>
10. Serves as an information portal for a particular humanities discipline	<i>Oral history collections</i>
11. Serves as a repository for humanities-based digital collections, and	<i>Institutional repository*</i>
12. Provides technology solutions to humanities departments	<i>Embedding library resources into learning management systems</i>

**work in progress*

From this list of DH initiatives, all of the activities are currently being undertaken by the DLSU Libraries which varies in scope, progress and technological innovations. These programs, activities and services are available all throughout the academic year. Most of the sessions and trainings are handled by a librarian while others are led by various Committee teams to ensure their success, implementation and sustainability. Other ongoing projects that will further improve DH initiatives were focused on providing spaces that respond to different learning needs and styles of the academic community, more specifically, the establishment of

digital creation labs and e-classrooms that is envisioned to provide a wide range of software for video/audio editing, graphic design, statistical tools, visualization, etc.

Further, as seen on Table 3, in the library 4.0 model suggested by Noh (2015), the DLSU Libraries is currently performing as an intelligent library, massive data library, and context-aware library with a provision of a creative space but has not yet delved deeper into implementing the augmented reality and cutting-edge recognition library aspect. A feat that is still being studied by the facilities development team.

Table 3. Library 4.0 and DLSU Libraries

<i>Library 4.0 Characteristics</i>	<i>DLSU Libraries</i>
1. Intelligent library	<i>Springshare, SaaS platform for libraries</i>
2. Massive data library	<i>Cloud computing e.g. integrated management of library resources, remote access to resources and services</i>
3. Context aware library	<i>Wayfinder, book status information, MyLibrary features</i>
4. Augmented reality	
5. Cutting edge recognition capability	
6. Infinite creative space	<i>Makerspace</i>

4. CONCLUSIONS

In summary, this paper has provided an opportunity to document the current undertakings made by the DLSU Libraries in response to the proposed library 4.0 model and digital humanities endeavors. It manages to recognize how the library was able to continually adapt to certain models and landscapes brought about by the Industry 4.0. In



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addition, it was also able to identify the gaps that can be further explored such as inclusion of augmented reality in its services and cutting-edge recognition e.g. Google Glass, HUD, Flexible Display.

In lieu of this, it is worthwhile to note that librarians, as the stewards of libraries, play a crucial role in shaping the future directions of libraries. As an enabler for the strategic management of the institutions' key result areas, they are called upon to position and maintain the libraries relevance in the academic community. Hence, collaborative relationships and harmonious partnerships with the faculty and stakeholders need to deepen in order to advance the institution to an active and sustained digital humanities work.

Overall, the DLSU Libraries' programs and services are constantly evolving just as stated by S.R Ranganathan's law on librarianship – *the library is a growing organism*. With all the programs, activities and services presented, it was therefore concluded that the libraries have a strong lead in pursuing digital humanities work, several of them involving broad collaboration. Hence, the authors would assess that these initiatives – even though some on its initial stage, while others recurring regularly, are on the right track for innovation and growth.

5. REFERENCES

- Bryson, T., Posner, M., St. Pierre, A., & Varner, S. (2011). *SPEC Kit 326: Digital Humanities*. <https://doi.org/https://doi.org/10.29242/spec.326>
- Demartini, C., & Benussi, L. (2017). Do Web 4.0 and Industry 4.0 Imply Education X.0? *IT Professional*, 19(3), 4–7. <https://doi.org/10.1109/MITP.2017.47>
- DLSU Libraries. (2017). Brief history of the libraries. Retrieved from <https://www.dlsu.edu.ph/library/about>
- Frederick, D. E. (2016). Libraries, data and the fourth industrial revolution. *Library Hi Tech News*, 33(5), 9–12. <https://doi.org/10.1108/LHTN-05-2016-0025>
- Hauck, J. (2017). From service to synergy: Embedding librarians in a digital humanities project. *College & Undergraduate Libraries*, 24(2–4), 434–451. <https://doi.org/10.1080/10691316.2017.1341357>
- Livia, F. (2018). Automated supply chain formation - a theoretical framework. *Informatica Economică*, 22(4). <https://doi.org/10.12948/issn14531305/22.4.2018.04>
- McMenemy, D. (2010). Ranganathan's relevance in the 21st century. *Library Review*, 56(2), 97–101. <https://doi.org/10.1108/00242530710730268>
- Noh, Y. (2015). Imagining Library 4.0: Creating a Model for Future Libraries. *The Journal of Academic Librarianship*, 41(6), 786–797. <https://doi.org/10.1016/j.acalib.2015.08.020>
- Radziwill, N. (2018). *Let's Get Digital: The many ways the fourth industrial revolution is reshaping the way we think about quality*. Retrieved from <https://arxiv.org/ftp/arxiv/papers/1810/1810.07829.pdf>
- Sula, C. A. (2013). Digital Humanities and Libraries: A Conceptual Model. *Journal of Library Administration*, 53(1), 10–26. <https://doi.org/10.1080/01930826.2013.756680>
- Zhang, Y., Liu, S., & Mathews, E. (2015). Convergence of digital humanities and digital libraries. *Library Management*, 36, 362–377. Retrieved from <https://0-www.emeraldinsight.com.lib1000.dlsu.edu.ph/doi/pdfplus/10.1108/LM-09-2014-0116>
- Zorich, D. M. (2008). *A survey of digital humanities center in the United States*. Washington, D.C.: Council on Library and Information Resources A Survey of Digital Humanities Centers in the United States. Retrieved from <http://www.clir.org/pubs/abstract/pub143abst.html>