

Masters of librarian science¹

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1. Introduction

On the afternoon of Wednesday, November 7, 2011, National Public Radio's *All Things Considered* ran a story about the CIA's use of social media in the fight against terrorism [10]. The story was reported by Kimberly Dozier, the intelligence correspondent for the Associated Press. At one point in the story, after Ms. Dozier had described the scope of the CIA's efforts, Robert Siegel asks how many "minds" are looking at all these mountains of data. Dozier responds "We're talking about several hundred staffers. You've got people who are experts at finding information. And many of them have a master's of librarian science".

I cringed when I heard Dozier's mistake about the name of the degree that most of us have. But it also got me thinking about the future of our profession and how that future might be affected by individuals whose degree was a master's of librarian science instead of a master's of library science. What would our profession look like and how would it be valued if it were defined by the skills we possessed instead of the place where we work? Would those professionals be better suited to an environment that is likely to be even more fluid and driven by rapid innovation than the one we know today? In order to define this refined vision of our professional future, I have interviewed several librarians and information professionals who embody this new take on our discipline [8].

While the title of this paper might incline you to think that I am only writing about librarians and librarianship, I want to be clear that my focus is about defining the professionals we need to be active and vital participants in the broadly defined information industries as those industries exist today and will exist in the future.

1.1. Finding a place

In 1982, Peggy Hull was in another of a series of temporary positions. This time she was working as a temporary cataloger at the Burroughs-Wellcome corporate library, at the time the largest pharmaceutical company in Research Triangle Park. As the end of her temporary assignment approached, Peggy began looking for other employment opportunities. The head of the BW library had been getting calls asking for advice from a researcher at a new pharmaceutical firm in the Triangle – Glaxo. She suggested that Peggy give them a call.

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When Peggy called, the Glaxo researcher told her that they were not hiring a librarian but Peggy got him to agree to talk about a temporary, part-time position. When she finally met her contact, she found that the “company” was in rented space and in their only conference room she found a stack of journals on a folding table and a few books in a bookcase. She was hired for six months to organize these collections.

In 1982, Glaxo consisted of about 25 employees, mostly pharmacists, regulatory affairs staff and clinical researchers. They were working to get several drugs that were established in the UK and European markets approved for the US market as well as getting one brand new drug approved by the FDA. Peggy’s first tasks included developing a routing system for the journals, establishing a rough order for the books and going to local medical libraries to photocopy the articles they needed. She found her new users to be extraordinarily grateful for the work she did for them. She quickly determined that Glaxo’s employees could benefit from literature search services, so she took a Dialog class and began searching Medline and other medical databases (on a dialup line with thermal paper rolls). In these pre-Internet days, learning how to search Medline involved attending a 5-day course in Bethesda, which Peggy did. She also continued photocopying articles in the evenings – providing her clients with a complete search and delivery service.

When Glaxo’s new drug was approved and hit the market – Zantac wildly exceeded expectations and Peggy’s contributions to that effort did not go unnoticed. As a result of Peggy’s decision to focus her early energy on solving problems in creative ways and create a “just in time” library experience instead of a “just in case” facility, when she left Glaxo in 1996, its library had a staff of 21 that included 10–12 library professionals, including some who held advanced degrees in chemistry and biology. This facility was delivering tailored scientific, news, and business information on a daily basis electronically to the whole global company.

1.2. Producing products

In 1999, Peter McCracken was working in the libraries of East Carolina University and then the University of Washington. He was experiencing a growing frustration over the difficulty of identifying and accessing the journals contained in the databases to which the libraries subscribed. When he started talking with his brothers about this issue, his youngest brother said, “If you can explain the problem to me in a way that I can understand, then I can build a solution”. Peter’s other brother chimed in “If Mike can build it, I can sell it”.

Peter managed to describe the problem in a way that Mike could understand it and these three brothers and a growing team of friends and colleagues set to work on what would become Serials Solutions. Cornerstones of the company’s success included a commitment to accurate data, an unyielding focus on what works best for the customer (the library), not limiting their technical approach to the state of library automation at the time, keeping services simple and being careful about what they would build and what they would not.

While Serials Solutions is the company that Peter is most recognized for, it is not his only entrepreneurial effort. Building on a long-time passion, he has created ShipIndex.org. ShipIndex.org is a company that focuses on aggregating and providing access to information about maritime vessels. The work that resulted in ShipIndex grew out of an internship at the Maine Maritime Museum in 1994 and coursework at UNC’s School of Information and Library Science. And what is the key to the success of this new venture? According to Peter all he needs to do is change the way that societies view maritime

history. Peter feels that we need to see that “this history matters; that ships, which have transported people, goods, ideas and more for the entire span of human history, is one of the most important areas that we should study”.

But Peter doesn't just use his research and entrepreneurial skills to create information companies and commercial products. He has also used those skills to start a small nonprofit online community calendar to help make the 1600 residents of his village aware of all that is going on in their community.

1.3. Building a system and a community

In 1998 and with less than one week on the job, David Singleton, Georgia's new Resource Sharing Librarian, was asked by the Vice Chancellor for the Department of Technical and Adult Education to write a white paper on the feasibility of a shared automation system for Georgia's public libraries. The reason for this request was that the Governor's office was kicking around the idea of a state-wide library card. While David knew that a paper-based system of cards for every library would work, he believed that a shared automation system would be an essential part of making a state-wide library card a reality.

At the same time, while the entire country was steeling itself to deal with Y2K, David and his colleagues had to deal with the fact that not all of Georgia's public libraries had internet access, and many were still using dial-up. In public library systems across the state, access to the state's 3 year old state-wide collection of databases (GALILEO) could only be obtained from a handful of work-stations in each facility. In essence there was no statewide network. David, who became Acting State Librarian soon after the development of his white paper, began working with the legislature and Georgia's public library systems to build a statewide telecommunications network.

The shared automation system solution was PINES. Conceptualized as a Y2K project, PINES went live in December, 1999 as a shared automation system that was supported by SIRSI. 98 Georgia public libraries rang in the 2000 New Year as PINES members. PINES membership eventually grew to 275 libraries, a union database of 6,000,000 books and almost 2 million users.

One of the primary goals of PINES was to increase access to all of the state's public library resources. Was this a success? In FY07 the system handled 540,000 inter-library loans as compared to only 6000 traditional loans between public library systems in 1999.

As PINES approached the end of its initial 5-year vendor contract, David Singleton, Julie Walker and other Georgia librarians started taking stock of what they had achieved and began to dream about what else they could accomplish. This group conducted a systematic and thorough survey of the existing library automation marketplace and found only a handful of systems that could handle PINES' requirements.

At the same time, David and Julie began asking a very significant question: is the software driving the policy/procedure, or is the policy/procedure driving the software? They concluded it was the former and decided that in Georgia that had to change. They began a series of focus groups with both library staff and users. The groups were basically brainstorming sessions where participants were asked to imagine an automated system that could work magic. These groups described a system that would eventually become Evergreen, an open source system built by the Georgia Public Library Service with the public libraries of Georgia being involved throughout the development process. Today Evergreen is in use in over 1000 libraries world-wide.

And when asked what they did right, David and Julie answer, “We listened, and designed the system based on input from library staff and patrons. This created a sense of ownership and pride in the system as it developed”. David, Julie and the public librarians of Georgia wanted to create the right system for

Georgia, but, in doing so, they also created a system that had the potential for changing how libraries thought about open source in libraries.

1.4. Recognizing patterns

In 1999, Ms. Ashton (not her real name) became the first librarian at a research institute focused on aging at a major Southern research university. Like Peggy, when she walked in the door she found an unorganized stack of books, journals and articles. Her first task was to develop a basic library for the members of the Institute and, more broadly, for researchers outside the Institute who were interested in the Institute's topic. She also had to operate in the context that her library was part of a much larger university library system. So as she built the Institute's library she focused not only on what needed to be housed at the Institute but what could be accessed from the larger context of the University's collections and resources.

Like David and Julie, Ashton also found herself creating systems and tools that increased access to the materials that her colleagues needed. Also like the Georgia team, she listened to and involved her colleagues in her work. For example, she paid attention to the requests that she was receiving. While she responded to individual requests for information and service, she listened for whether or not these requests were unique. When she found that a question or need recurred, she developed a resource to address the challenge in a more efficient manner. For example, she was often asked questions about whether a particular journal was available in the Institute's library or on-campus. To address this recurring need, she built a database of journal information related to the interests of the Institute's staff. Another example was how she responded to requests for a list of researchers who were working on campus in the area of aging. This was surprisingly challenging, given that the field is spread out over various disciplines and subject areas, so the faculty focused on aging were located in departments as varied and as far flung as social work, business and information science. The result was that they often didn't know each other. In response, she created a directory/database of faculty and researchers, including their research interests as well as their positions and connections throughout the university. She turned this directory into an online database so that anyone could use it to search for other faculty members with similar interests. This meant that a researcher could discover someone from a completely different department who shared either their research interests or could support the work of the Institute. It also helped create a system that supported interaction among this diverse group of researchers. This became a popular resource and was valuable when it came time to develop collaborative projects and research proposals across disciplines.

Since the Institute's staff was small, Ms. Ashton was able to develop direct and personal relationships with her users. This gave her colleagues a chance to learn more about her and the skills that she possessed. As a result, as the needs of the Institute changed, her role also changed. For example, she became responsible for managing the Institute's website. What started as a few webpages developed into a 1500-page site that not only provided information about the Institute but pushed the Institute's information, publications, and research out to a wider audience. In addition to the website, she also became responsible for managing the Institute's publications and defined its social media strategy. Like Peggy, who attended a DIALOG class to learn online searching, Ashton pursued an aggressive self-directed learning program to develop the competencies that she needed in order to meet the needs of her employer.

When she left the Institute a few months ago to take a position in the private sector, she not only left behind a solid, functioning special library. She left behind a group of individuals who had a new awareness of what a librarian could do for them. She left behind an organization that was better positioned to leverage its information assets to achieve its mission.

2. A common core

All of these individuals share several traits that are not only important today but will become increasingly important to the information professions of 2050.

2.1. *Entrepreneurial stance*

All of these individuals identified a problem and focused on creating solutions to it instead of just accepting the status quo. They set about creating new products, new systems, and new services that overcame these problems and improved the efficiency, effectiveness and/or the quality of life for their communities.

In their book *Engines of Innovation*, Thorp and Goldstein [11] define an entrepreneur as someone who increases the use of underutilized resources. The essential nature of libraries has historically been institutions that collect resources and information, but the purpose of this entrepreneurial approach to gathering is not just to collect, but to increase access and use.

At Glaxo, when Peggy begins offering online searching, she is seeking to maximize the efficiency and effectiveness of Glaxo's most precious resource – its staff.

At the University of Washington, Peter wants to generate use of the library's electronic journals. He wants not only to help scholars and students find the information they need, but to increase the library's return on its investment in these materials.

In Georgia, David and Julie identify needs in their state that no existing system can meet. They decide along with the Georgia public library community to build a system to answer those needs. The result is not only a system that meets the needs of its users but a community that understands, respects and cooperates with each other.

For each of these information professionals, problems are not just something to be endured – they are something to be overcome. The solutions they create result in higher utilization of some asset their institutions or communities already hold.

2.2. *Customer/community focus*

Each of these individuals was committed to a specific user group or community and committed themselves to helping these communities achieve their goals through more effective use of information resources and services. In some cases they created the resources and systems needed by their communities to achieve these goals. In all cases, they were pro-active and anticipatory in identifying community needs and crafting responses to them.

For Peggy, the community was her colleagues at Glaxo, but she just does not wait for them to bring requests for articles to her. As Peggy sat in that conference room “arranging” Glaxo's handful of journals, she listened for the questions and challenges that were being discussed. She would then conduct literature searches to find articles that might help move Glaxo's research and regulatory agendas forward, drop print-outs of these search results by her colleague's offices and ask if they wanted her to obtain the articles for them. In many cases, they requested copies.

For Peter, the community was initially the students and faculty at the University of Washington, but his solution solved problems not only for that institution but for research institutions world-wide. The same can be said for David and Julie in Georgia. A local solution has global impact. In 2011, Equinox, a company that supports Evergreen implementation signed 21 contracts representing 117 libraries and 415 facilities [3].

In the case of Evergreen, however, the efforts of these two Georgia librarians not only resulted in a resource that their constituency could use. PINES and Evergreen both resulted in a healthier, more resilient community. In essence, the product of PINES and Evergreen was not just the system – it was the community itself.

2.3. Information in context

In every case, this group of professionals has a correct orientation towards information. Information is an asset that is meant to be used – not just collected or preserved. They were passionate in their belief that the availability of recorded knowledge and story improves the quality of life of their constituencies.

While she was hired to arrange a collection of journals, Peggy went on to create both a document delivery service and an online search service for her employer. From the outset, she focused on identifying and delivering the information needed by her “market” in the most efficient and effective way possible.

In the case of Peter McCracken, his entrepreneurial orientation became a commitment to convince the world of the value of maritime information.

For David and Julie, their orientation is not about guarding their state’s public library resources – it is about creating both systems and a culture that is committed to maximizing the sharing of those resources.

For Ashton, finding ways to share information with diverse audiences was the key to helping a specialized group of individuals become better connected and have better tools for collaboration.

2.4. Technology as a means to an end

Each of these individuals took advantage of emerging technologies to create their products and services, but in all cases technology was not an end in itself. The technology that was most effective in achieving their goals was applied to the community challenges that each of them identified. The goal was using technology to address user needs.

On-line database searching was not something that was available at Glaxo when Peggy showed up. She introduced it not because it was the new, new thing. She took her DIALOG course to be able to ensure that her scientists had the latest, most accurate information available and that they obtained this with the least amount of time and energy on their part.

Peter says that one of the keys to Serials Solutions’ success was that it was not limited to current library technology. He was able to draw on some of the cutting edge technology that was being used and created by the dotcoms that his brothers and their friends were working for. Again, it was not just access to cutting edge technology – it was using this technology to solve the information challenges faced by Peter’s users.

At the research Institute, Ms. Ashton explores strategies for maximizing the impact of the Institute’s website not only to share information about the Institute but to give its findings a wider audience. She also begins developing a social media strategy for use within the Institute as these technologies become available. Again, her goal was not to create a Facebook page, but to determine whether this social communications technology can help her achieve the mission and goals of her employer.

2.5. Collaboration

There is an image of the lone entrepreneur, the inventor in the attic or garage who invents in isolation. Each of the individuals featured in this paper realized that an essential key to success was finding the right team to implement their ideas.

The two outstanding examples of this are Serials Solutions and PINES/Evergreen. Without Peter's brothers and their friends it is an open question whether or not Serials Solutions would have ever seen the light of day. As has already been discussed, from its outset PINES/Evergreen was a collaborative effort between the Georgia State Library and the state's public libraries. But collaboration also occurred between its funding sources, the team of developers who worked on the code, and that community of libraries as well.

2.6. Ongoing, self-directed learning and the spirit of inquiry

Any entrepreneurial effort is at its heart a self-directed learning activity. As Peggy, Peter, Julie, David and Ms. Ashton moved from having the idea of building a library service for Glaxo, creating Serials Solutions, developing PINES/Evergreen or defining a social media strategy for the research Institute to their realization, I suspect that each of them could make a long list of the things they learned along the way. Undoubtedly, some of these would be things they set out to learn, but I suspect that many of what they would now view as the key takeaways from their efforts were complete and total surprises.

Another essential ingredient to the success of these efforts is that they were driven by individuals who embody the spirit of inquiry. They were genuinely curious about the problems and challenges facing their constituencies and were motivated to actively seek solutions to these problems.

2.7. Implications for librarian education

During the 1970s and early 1980s, Lester Asheim, a Kenan professor at what was then the UNC School of Library Science, taught a course entitled "Agencies of mass communication". One of the texts in that class was Marshall McLuhan's *Understanding Media* [7]. A central tenet of that text was that a new medium does not extinguish an older medium, it transforms it. The same can be said for our profession. The need for professionals to staff the libraries that are housed in universities, corporations and communities will continue. However, the information ecology and industry of today and tomorrow is also transforming the roles that our profession can play – and indeed must play – if it is to occupy a place of significance in the lives of our communities, businesses and institutions of learning.

These new professionals will also require professional schools that identify, recruit, educate and sustain them throughout their careers.

2.8. Identifying the entrepreneurial spirit

As part of their student recruitment and admissions efforts, professional schools need to seek out and identify candidates who not only meet rigorous academic standards but who have those traits that are found in budding entrepreneurs. Whether or not this can become part of the admissions process, these schools should provide opportunities for students to assess their predisposition for start-up activities and whether or not these are positions and activities that would be satisfying to them.

Peter McCracken credits a marketing course taught by Dr. Evelyn Daniel as being instrumental in helping him think about the opportunities that became Serials Solutions and ShipIndex.

Both David Singleton and Julie Walker "ran" stores growing up. David would "borrow" candy and snacks from his father's grocery store and sell them to his cousins. Julie ran an impromptu lemonade stand in the parking lot outside her family's restaurant. I doubt that either of these stories surfaced as part of their admissions process or even during their time at UNC but both indicate an entrepreneurial stance that would become cornerstones of their professional careers.

Another example of how students with the skills needed for the information professions in 2050 could slip through a professional education program unnoticed occurred during a recent visit to UNC's School of Information and Library Sciences. I was a guest speaker at the School's Popular Materials class. Before I began my presentation, I wanted to gauge the needs and interests of the students in the class. During this "needs assessment", one student said that she very much admired NoveList but that she wanted me to know that she was going to "take" my business. This is exactly the drive and determination that the information professions need not only in the future but now. Did the faculty at UNC know that they had yet another budding young entrepreneur in their student body? I suspect not.

If we are going to ensure that the information professions continue to be active and vital participants in the imagination economy, we cannot afford for students like the one mentioned above to pass through our programs unnoticed and undeveloped.

2.9. Exploring technology

An early version of ShipIndex was a series of webpages that Peter hosted on the internet. These were the first pages on maritime history to be posted on the web. Peter learned how to develop these pages as part of his coursework at SILS.

Professional schools must continue to provide experiences for students not only to develop their technical skills but to become adept at assessing these technologies and their potential for improving a community's information infrastructure and systems.

I'm not advocating that our schools graduate web designers or developers, but graduates need to be fluent not only in current technologies but emerging ones as well. They should be skilled at technology assessment, especially in how it contributes to solving information challenges.

In essence, we need a process for educating emerging information professionals about technology similar to the approaches discussed by Richardson [9] in his article on the teaching of reference. Through an analysis of reference textbooks, Richardson concludes that over time, three different approaches to teaching reference have been in vogue. The first one, the structuralist focused on teaching the formats of reference sources. The second, the procedural emphasized the analysis and classification of the reference question and then mapping the question to the best resource for addressing it. The third approach, which Richardson calls the "psychologicalist", focuses on understanding the interpersonal interactions between librarians and users that result in successful reference service. Richardson concludes his article by arguing that only when all three are blended into developing reference professionals "will the field have reference librarians trained, educated and capable of rendering high quality reference service".

Similarly, only when we have in place programs that help students understand various information technologies, how these technologies map to solutions for the problems facing user communities and the interactions necessary get these technologies adopted and used will we have the information professionals needed for 2050.

2.10. Information needs assessment

Our profession has a long-standing tradition of evaluating information resources. We know how to compare and contrast various encyclopedias, databases and websites. How good are we at evaluating a community's or an organization's information needs? How good are we at being able to create and prescribe information solutions that help communities achieve their goals?

Ashton recalls several courses at SILS (Human Information Interactions and Information Systems Analysis and Design) that helped shape her ability to analyze user needs and develop information systems in response.

The profession of the future will need individuals who are equipped to fulfill this role for the communities they serve.

3. Collaboration

The April 30, 2012 issue of *The New Yorker* contained an interesting article on Stanford University [1]. One of the many interesting topics covered in the article was Stanford's Institute of Design, an interdisciplinary program that brings students and faculty from a variety of disciplines together to work on a project or problem. This format is something that should be explored as a vehicle for developing the entrepreneurial skills, information needs assessment techniques, and technology awareness of tomorrow's information professionals.

Such a program would provide an environment in which future librarians would learn how to articulate a problem so that engineers could craft a solution and marketers could promote it.

3.1. *Leveraging the present into the future*

In 2050, the information professions will have to be more entrepreneurial, community-focused and collaborative. They will be involved in the creation of new systems, new content and new products for accessing and using information. The result will be a new definition for these professions and for librarians.

As David Singleton notes, quoting John Schaar in a talk where David is celebrating the tenth anniversary of PINES, "The future is not the result of choices among alternative paths offered by the present, but a place that is created – created first in mind and will, created next in activity. The future is not some place we are going to, but one we are creating. The paths to it are not found but made, and the activity of making them changes both the maker and the destination".

The information professionals of today will be involved in shaping that not too distant future of 2050. If they are like the professionals that are described in this paper, then they will shape not only the future and themselves, but our profession and the world it occupies as well.

A glimpse of the context in which these future professionals will operate is available to us today. In "The great tech war of 2012", Manjoo [5] says that the four companies that have come to define the information and entertainment landscape of 2012 are going to war and the outcome of that war is likely to determine the shape of the future imagination economy. The companies featured in Manjoo's article are Amazon, Apple, Google and Facebook. While Manjoo paints a detail-rich landscape in which powerful, talented and well-resourced Goliaths are at each other's throats, even he could not imagine some of the twists and turns that have occurred since the publication of his article. For example, Facebook has gone public. Apple and the Big Six publishers have been sued by the US Justice Department and the EU [2]. Microsoft, not to be outdone in the tablet market, has "partnered" with Barnes and Noble to continue development of the Nook, a chief rival of Amazon's Kindle and Apple's iPad according to Auletta. Apple is also responding by creating a mini iPad designed to compete against Amazon's Kindle and Google's new Nexus 7 tablet [6].

If the information professions and the world which these professions envision are not to be collateral damage in this conflict; we will need to focus on three key things.

First of all, we must carefully and clearly define the nature of our work and how that work adds value to the communities we serve.

Secondly, we need to understand the nature of the people we need to do this work and how we equip and support them in adding value to their communities.

Finally, we need to understand the nature of the education ecology needed to educate and prepare all of us for what in 2050 will surely be not the information industry but the imagination economy.

Today, the *American Heritage Dictionary* [4] defines librarian as “a person who is a specialist in library work”.

In 2050, if we succeed at the three tasks mentioned above, whether we consult the *American Heritage Dictionary* (edition to be determined), the *OED* or the 2050 equivalent of *dictionary.com*, the working definition of information professionals will be “A professional who leverages a community’s information assets to achieve community goals”.

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