

6-2012

Developing a Technology Integration Residency Model: The Catalyst Project Report

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Recommended Citation

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June 2012

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Executive summary

Consider a common scene in libraries today:

A user – whether a student, a member of the community, or an employee – comes into the library with his mobile device, asking for help. The librarian may or may not have any knowledge of mobile devices, and the library may or may not offer any of its services or resources via mobile devices. Users increasingly expect librarians to be familiar with technology and to be able to implement technology for the benefit of the library users. Yet librarians' ability to effectively do so varies widely. Depending on the technology skills of the librarian and the technology offerings in the library, the user may walk away extremely frustrated or highly satisfied. For some users, the value and relevance of the library may be in question depending on the service they received and the technology provided to them.

This is only one illustration of how libraries across the spectrum are struggling with technology in two major ways. One challenge libraries are facing is keeping up with rapid changes in technology. The other challenge is how to thoughtfully apply technology in the library setting. For libraries to survive, libraries need to integrate the technology that people use every day. Libraries must be able to identify and effectively implement the technologies that will best serve their users.

At the same time, MLIS graduates are coming into a job market drastically affected by a difficult global economy. Graduates come into the market with new ideas, enthusiasm, a contemporary educational experience, and the potential to be a catalyst in transforming libraries. Many of these new graduates will be the leaders in the next generation of library services.

To address these issues, IMLS awarded a planning grant in 2011 to Dr. Sandra Hirsh, professor and director of the School of Library and Information Science at San Jose State University. The vision of the Catalyst project planners is to create a replicable residency model that the library profession can use to develop the knowledge and leadership capacity of new professionals in effecting transformative change. The mission of the Catalyst project planners is, with a subsequent grant, to implement several pilot projects to test that model in the context of emerging technologies. The residency model has the potential to give the new professional the mentoring, coaching, and experience necessary to become a leader and a catalyst in effecting transformative change. Through this planning grant, we are developing a residency model that libraries at a local level can adopt and follow. By embedding individuals in library environments, this model can provide immediate and creative solutions to help libraries implement technology. It has the potential to enable libraries to respond to rapidly shifting priorities, enhance the user experience, and benefit the community.

Our analysis of our research findings have resulted in these conclusions concerning our formative model:

- **The “hospitality” of the host organization is critical for a successful residency.** We identify several characteristics indicative of a suitable host organization. For the purposes of our proposed pilot implementations, and for the sustainability of the model beyond the grant, we believe it will be important to identify organizations that provide a hospitable environment for an emerging technology resident. By hospitable, we mean that the host institution is ready and able to support the development of the resident. We identify several characteristics of a hospitable environment.
- **The host organization must be able to demonstrate commitment to the residency** both in money and time. Our research has found that it is important to have the commitment of the organization's executive, adequate budget support for the resident as well as for the local project, and a viable plan for providing a smooth introduction of the resident to the institution's staff, among other factors.
- **The availability of coaching and mentoring for both the organization's resident support team (which would include a supervisor, champion, and/or project team) and the resident can have a positive effect on the residency program.** Our findings indicate that providing support for the host, as well as the resident, is critical to the effectiveness of the residency.
- **The host organizations for our proposed pilots need to be selectively chosen** for their readiness to develop the professional competency of the resident. The matching of residents to host institutions should be selective rather than competitive. That is, we believe that the pilot projects should be sited at resident-ready hosts that are recruited as implementation grant partners
- **The model needs to be supported by a project-wide infrastructure of coaching, mentoring, networking, and cohort activity.** Part of our task as a project team is to think about and develop this infrastructure so that it can be ready to launch, should we be awarded a follow-up grant to implement the model.
- **An essential part of the model must address onboarding residents so they can be integrated effectively into the organizational culture.** Onboarding is the process by which a new member of an organization acquires the knowledge, skills, and behavior to be effective in the organization. Our research has found that developing the ability to navigate the organizational culture is critical to the success of anyone implementing technology within an organization.
- **Emerging technology is contextual.** What may be considered emerging technology in one library setting may not be in another. In particular, we have found that many libraries consider the **innovative application of technology** as “emerging technology.” While we will provide some definition and examples of emerging technology and innovative applications of technology, we will be open to the project ideas put forth by hosts. We understand that the spirit of the Catalyst project may be met in a variety of contexts and settings.
- **Trend-spotting, among others, is a key competency for residents working with emerging technology, and includes more than just technology.** The key to trend-

spotting is being able to conceptualize “technology in context,” and being able to identify broader trends beyond the profession.

- **Residents will need both appropriate competencies and attitudes.** Residents will need at the outset certain technical, attitudinal, and behavioral skills and abilities. They will also develop additional skills on the job, such as navigating the organization, communicating across departments, translating user needs to technical requirements, and vice versa. It is important for the resident to be curious, flexibly, resilient, and resourceful, as well as personable.

Introduction

In 2011, Dr. Sandra Hirsh, professor and director of the School of Library and Information Science at San José State University, was awarded a one-year planning grant from the Institute of Museum and Library Services (IMLS). The purpose of this planning grant is to explore how a residency program model can support libraries' ongoing efforts to integrate emerging technology by **designing an optimal residency model for recent Master of Library and Information Science (MLIS) graduates - a model focused on improving the end user library experience through the integration of emerging technology.**

During the one-year planning period of this grant project, we are designing a residency model that embeds new MLIS graduates from any library and information science master's degree program into a range of library settings – public, academic, and special. The residency model will provide libraries with support (such as templates, onboarding documentation, and checklists) to aid their efforts to implement new technology. It will also provide practical professional development opportunities for new professionals. Our ultimate goal is to create the model during this planning grant, and to pilot and evaluate that model in subsequent years.

We want to design a residency model that will:

- **Match residents with libraries** to integrate emerging technology into the libraries' operations and services
- **Develop leadership skills and experience in residents** in the area of integrating technology into library services and operations
- **Produce a replicable residency template for libraries** so that individual institutions can establish and support future residency programs across different types of institutions

This white paper outlines our vision and rationale for the model, describes our research methodology and approach, shares our findings, discusses the framework of an optimal residency model, and puts forth areas for further research and the continued development of the model, which will also be the subject of an implementation grant application to IMLS.

Vision and mission

In working with our Partners (see [Research methodology](#) for a list of our industry grant Partners), we have developed the following vision and mission for the Catalyst project:

Vision

The creation of a replicable residency model that the library profession can use to develop the knowledge and leadership capacity of new professionals in effecting transformative change.

Mission

To create several pilots to test that model in the context of emerging technologies.

Rationale

Libraries play an important role in the community, and effective leadership is critical to the very survival of libraries in our communities. The need for leadership development across all library disciplines is well known and of prime concern to national library organizations. The Catalyst project can make a significant contribution to a multi-organizational initiative for library leadership development. It brings to the increasing patchwork of leadership development efforts a residency model that local libraries can adopt. There is not one pathway to leadership development but many pathways that the library community must make. The Catalyst project is unique in providing a model and the tools for local libraries of all types to play a role in developing future leaders for the profession.

Implementing emerging technologies, and building the leadership required to do so, is a profession-wide issue. Through this model, we are attempting to provide a way for libraries to develop and launch residencies at the local level. Organizations can be transformed by teaching new professionals how to navigate an organization in a “live” situation, through the model of residencies.

Brewer (2010), in her studies of residency programs focusing on diversity, described the benefits to the hosting institution, and identified three “administrative rationales” that justify

continued support and characterize a successful program. While the residency programs that Brewer studied focused on recruiting more diverse professionals, these findings can be applied to a broader range of residency models.

- **Residency programs can enhance diversity in many ways.** While, traditionally, they can increase the racial and ethnic diversity of the staff, residencies can also contribute to “career-span diversity” by employing entry-level librarians.
- Career-span diversity links to Brewer’s second characteristic—“organizational effectiveness.” **Collaboration among librarians of different career levels makes the organization more dynamic.** Senior staff has opportunities to mentor, and newer staff brings new ideas and energy for change.
- Brewer identifies the third characteristic as “managing change,” which refers to the staffing flexibility possible through residency programs. Having temporary staff rotating every year or two allows the library the flexibility to experiment with new services. In applying this characteristic to the Catalyst project, **a resident would enable a host organization to respond to changes and trends in emerging technologies in a timely manner.**

Leadership programs like the Snowbird Leadership Institute, the Eureka! Leadership Program, and the Leadership Institute for Academic Librarians already exist. This grant project and the resulting residency model are important and unique for a few reasons:

- The model will enable local settings, and settings outside of the academic realm, to engage in leadership development in the profession; it is not driven from an association level.
- Most leadership development programs are short-term, typically lasting no more than a week. This model focuses on leadership development over the full course of the residency.
- The model is geared toward entry-level librarians just beginning to develop leadership skills. Many existing programs are geared toward established librarians, or those already in leadership or management roles.
- Because the model is focused on implementing emerging technology, by the nature of emerging technology, it is project-based, rather than role-based.

This model differs from previous residency models as well. All previous residency programs have been offered in academic libraries, and primarily as diversity initiatives. Our proposed model aims to build tools, templates, training, and other support structures that could help establish residencies both inside and outside the university library setting, including public libraries and special libraries.

Within any setting, the question may arise, what is the difference between the resident position and a new hire for the organization? To begin with, an emerging technology residency

would be a project-based, limited-term appointment. It has a specific purpose in implementing technology projects – it is not the same as a long-term library role, such as reference services. Having a resident confers prestige on the host organization. Finally, in our proposed model, the funding associated with having a resident provides support for resident travel, as well as coaching and mentoring for the organization.

This residency model seeks to meet the current critical need of implementing emerging technologies in library settings by focusing the residencies around emerging technology projects. Why focus on emerging technology? Through our research, interviews, and discussions, we are convinced that the issue of implementing emerging technology is one that affects all library settings and is a huge need within libraries. The implementation of emerging technology provides a focus point for our pilot residencies and for the model.

Beyond the scope of the grant, we anticipate that the templates and approaches developed by this model can potentially have broader impact in onboarding new professionals in any library setting.

The project aims to partner with host institutions to implement several pilots to test the model in the context of implementing emerging technologies. In implementing and learning from several pilots, we have the opportunity to make long-lasting change in the profession.

Research methodology

Our research and needs assessment methodology aims to address the questions raised in our initial feasibility study (see [Appendix A](#)), and to gather additional information to inform the creation of an effective, replicable, and sustainable residency model. Our research utilizes a combination of data collection approaches, including interviews, focus groups, and literature reviews. Our intent has been to learn from a variety of sources, integrate that information into the optimal model design, and get iterative feedback.

As part of this research, we developed four research “pathways”, as outlined below. Each pathway required different approaches, questions, and considerations. Each has also drawn on key informants with different areas of expertise. Our key informants are drawn from professionals from the field (see [Appendix B](#) for a complete list of identified key informants to date), and from our professional association Partners and their representatives:

- **Association of College and Research Libraries** (Mary Ellen Davis, Executive Director)
- **Public Library Association** (Barb Macikas, Executive Director)
- **Urban Libraries Council** (Susan Benton, President and CEO)
- **OCLC**, one of the largest non-academic library research organizations in the world (George Needham, OCLC Vice President for Global and Regional Councils)

The four research pathways we have identified and the approach we have taken are as follows:

1. What do we mean by the integration of emerging technology?

- Key questions:
 - How are libraries currently integrating emerging technology into their operations?
 - What do we mean when we talk about emerging technology?
 - Does the definition of “emerging technology” change in different settings?
- Key informants and resources: Our grant partners; emerging technology librarians; students; residents; host institutions; non-industry participants; literature review.
- How are we gathering this information? Via key informant interviews, literature reviews, and focus groups (including the Library 2.011 Conference in November 2011, ACRL focus groups in January 2012, and PLA focus groups in March 2012), and our Partners.

2. What are the hallmarks of effective residency programs?

- Key questions:
 - How are successful residency programs currently structured?
 - How are residents recruited and selected?
 - How are they matched with host institutions?
 - What preparation do they receive?
 - What are they expected to do?
 - What evaluation activities occur in order to assess the success of the residency programs?
 - What outcomes have they achieved?
 - How are libraries able to fund residencies?
 - How do residency programs support leadership and mentoring?
 - What roles do leadership and mentoring play in emerging technology residencies?
 - Are there residency settings that are more conducive to implementing emerging technologies?
 - How are residencies sustained beyond the life of a grant?
- Key informants and resources: Institutions who have hosted residency programs; residents; students; literature review.
- How have we gathered this information? Literature reviews and gathering of current best practices; selected interviews with key informants; focus groups with ACRL Residency group at ALA Midwinter, January 2012.

3. What are the essential qualities of a residency cohort program?

- Key questions:
 - How would elements of a cohort program fit into our frameworks?
 - How does having mentoring connections at another institution help residents and hosts?
 - What is the role of a cohort model in a successful residency?
- Key informants and resources: Institutions who have hosted residency programs with a cohort model; students; literature review.
- How have we gathered this information? Working with grant partners and other partners to identify key informants, and conducting interviews; literature review and gathering of current best practices; and our Partners.

4. What are the unique characteristics of emerging technology residency programs?

- Key questions:
 - What resources do libraries need in order to take advantage of emerging technologies to improve their services and operations?
 - What would replicable frameworks look like across different institutions: urban vs. rural, public vs. other settings, etc.?
 - Are there residency settings that are more conducive to implementing emerging technologies?
- Key informants and resources: Institutions who have hosted residency programs; students; residents; emerging technology librarians; key informants outside of the information industry; and our Partners.
- How have we gathered this information? Working with grant and other partners to identify key informants, and conducting interviews with those key informants; literature review and gathering of current best practices; review of emerging technology job descriptions; focus groups.

For each of the research pathways, the grant team has taken our synthesized results to focus groups (such as at the ALA Midwinter Conference and the ACRL Residency group) to gather feedback from the field. We then synthesize that information for the project team and grant Partners, and continue to “vet” our latest thinking with current practitioners and key informants. A key part of our exploration is to learn from current and former residents and library leaders who have hosted residents. We are also continuing to garner input from librarians who are grappling with integrating technology today in a variety of settings.

To date, we have conducted research, interviews and focus groups:

- Literature searches in each research “path,” conducted from October 2011 through February 2012 (see References in [Appendix D](#) for specific sources);
- Two focus groups, [one emphasizing emerging technology](#) and [one emphasizing residency programs](#), conducted via the Library 2.011 Virtual Conference in November 2011;
- Two focus groups on emerging technology and residencies, conducted at the ALA Midwinter Conference in January 2012 in Dallas, Texas;
- Two focus groups on emerging technology and residencies, conducted at the PLA Conference in March 2012 in Philadelphia, Pennsylvania;
- 21 one-on-one interviews conducted via phone and in-person (See a list of key informants and interviews in References in [Appendix D](#).); and
- Feedback and input from our Partners at a two-day face-to-face meeting in San Jose, California, in February 2012.

Findings

Results from the literature reviews, interviews, and focus groups have provided a strong foundation for an initial residency model. We outline the findings around structure, resident competencies, host characteristics, coaching and mentoring, the cohort model, leadership skills, products from a residency, funding and sustainability, and outcomes and evaluation.

What is a residency program?

Residency programs in library and information science date back to the mid-1980s and have traditionally been based in academic and research libraries. In fact, we have found no evidence to date of a public library residency, except one that is being piloted in 2012 at the Los Angeles Public Library.

Typical residency programs have some similarities to paid internships in that both are aimed at providing experiential learning. However, while internships are aimed at current students, have short duration, and may be unpaid, residency programs place recent MLIS graduates into library settings, typically last anywhere from one to three years, and are paid positions. Historically, residency programs grew out of a need to foster ethnic diversity in academic libraries.

Residencies provide new graduates the opportunity to gain valuable professional experience that will aid them in landing permanent positions in the profession. Residency programs also embed individuals in library environments, where they can share and implement ideas regarding how to meet the needs of the diverse populations served by libraries. Residency programs provide opportunities for mutual learning for residents and host institutions.

Structure

This section addresses the overall format and characteristics of residencies: length of residency, number of residents, salary, and other overarching, defining features of residencies. In our research, we've looked at elements from both library and non-library residencies.

In most residencies:

- Residents are in place from one to two years – usually two years, in order to give a variety of experience and build continuity.
- Residents typically are paid on a salaried rather than an hourly basis, and often receive partial or full benefits that regular employees receive.
- Residents typically rotate work in different departments, functions and/or projects – though this is not always the case. Residencies can be generalized or specialized, where generalized residencies are usually rotational, and specialized residencies may focus on a particular long-term project. In our interviews, we've found that emerging technology implementations are typically project-based, and so a specialized model may work best for the grant model.
- Hosts typically provide a positive learning environment and opportunities for professional development, including support to attend workshops and conferences.
- Residents are assigned work that both represent their areas of interest and the interests of the library. The work is often determined mutually by the resident and the host institution.
- Residents and hosts conduct routine updates or evaluations.
- Often times, residents are required to provide some sort of “deliverable” at the end of the residency, usually a “capstone” project.

Why focus on emerging technology?

As described above, one of the drivers for this planning grant emerges out of the fact that library settings of all kinds are struggling with the adoption of emerging technologies to serve their users. Another important driver is that library and information science programs are already preparing student with key skills in emerging technologies.

Our findings indicate that the meaning of “emerging technology” varies by industry; what may be considered emerging technology for libraries may no longer be considered as such in another industry (Erdman & Kim, 2011). Often, what makes technology “emerging” for libraries is the adoption of technology from another sector or industry. This “cross-industry” application – **the adoption of technologies from other industries into library settings** – is a characteristic of emerging technology in library settings.

Another definition of emerging technology focuses on **adoption rates and performance**. The Horizon Report, produced by the New Media Consortium (NMC), provides an annual look at emerging technologies for libraries and museums. The report evaluates emerging technology

through the lens of time to widespread adoption. It characterizes emerging technologies as those on the “adoption horizon,” which ranges from immediate adoption to five years. From the 2012 Horizon Report, the following are identified as emerging technologies in the next one to five years:

- Mobile apps
- Tablet computing
- Game-based learning
- Learning analytics
- Gesture-based computing
- Internet of things

Cervone (2010) similarly defines emerging technologies as those “on the cusp of adoption,” with an adoption rate of 30 percent or less. Erdman and Kim (2011) confirm this adoption aspect of emerging technologies and also acknowledge that adoption rates are tied to performance. While emerging technologies are considered to be low performing, they have surpassed the experimental prototype phase – the “bleeding edge” - and are starting to show a rapid increase in performance. (See Figure 1 below)

A point of ongoing discussion is around the relative nature of the definition of “emerging technology” between library settings, as confirmed by several interviews and literature searches. In other words, **implementation of an “emerging technology” for one library setting may be something that has been in use in another library setting for years.** To use a simplified example, a library might regard itself as implementing emerging technology by starting a library blog, when many libraries have been utilizing blogs for many years. However, Cervone (2010) is careful to distinguish between **innovative practices** and the implementation of emerging technologies. While starting a blog may be an example of an innovative practice in a particular setting, it is not the implementation of emerging technology in the strictest sense of the term. Since an emerging technology by definition has not yet been widely adopted, it is difficult to deem a mass commercialized technology as emerging. However, considering the Horizon Report's adoption time frame of five years to one or less, it's true that one library might have picked up an emerging technology very early on, while another may implement the technology much later, just prior to its mainstream adoption.

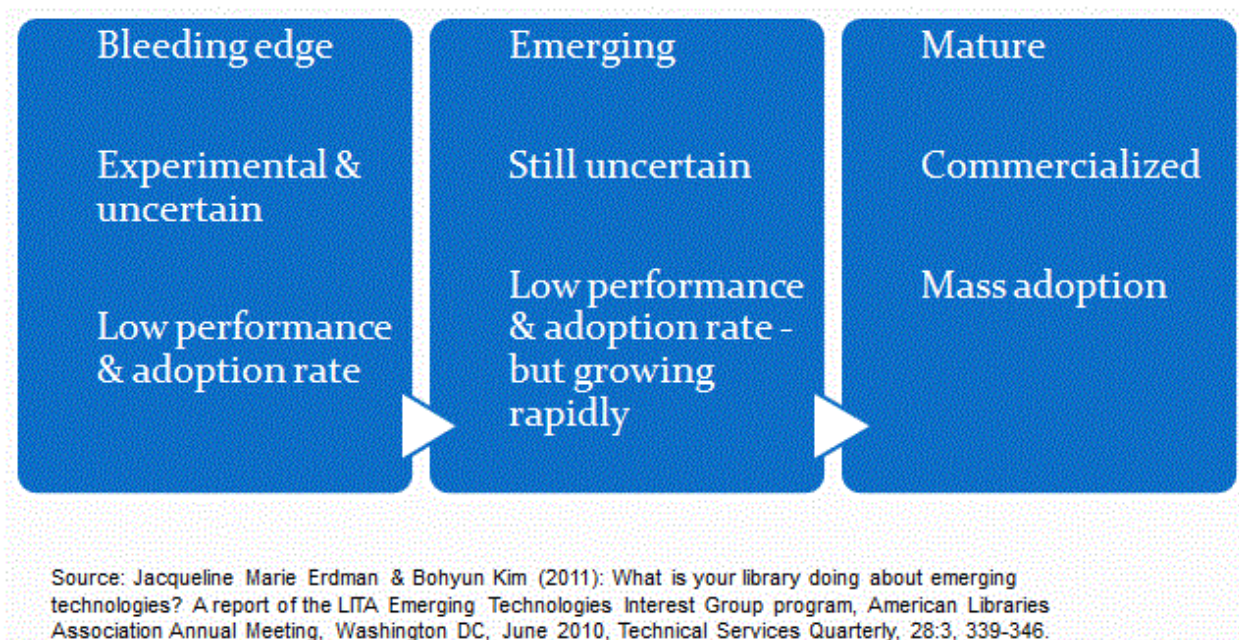


Figure 1: Erdman & Kim (2011) view of adoption in terms of performance and adoption rate.

Additional aspects of emerging technology come from our focus groups and interviews:

- An example of implementing emerging technology in a library setting may be a new way of **combining existing technologies**. In other words, each piece of a technology implementation might not be emerging, but the combination and application of those technologies can be an emerging technology.
- It's important to be aware of technology gaps and the need for the infrastructure to support the technology (broadband vs. dial-up access, rural vs. urban communities). As one participant stated, "we still have patrons using cassettes and VHS, and (who are) without email." (Library 2.011 focus group, November 2011)

In creating a definition of "emerging technologies" for the purposes of this residency model, we will need to take into consideration both the "formal" definitions of emerging technology, as well as the applied/working definition being put into practice. As one interviewee put it, emerging technology in practice is technology that has the potential to radically change the patterns of use for end users, or radically reshape the way libraries do business. "If it's emerging, I'm going to have to gain a radically different set of skills sets in order to implement it." (G. Evans, personal communication, January 12, 2012). This definition may apply to any technology being implemented in a library setting, whether or not that technology is truly "emerging" as defined formally. **The defining criteria for selecting an emerging technology implementation residency will need to be flexible.** We do believe, however, that putting forth a definition of emerging technology will be important in communicating with potential hosts and residents about the model, and in making the best matches of hosts and residents.

In light of a model focused on implementing emerging technologies, here are some considerations:

- **An emerging technology residency model will likely follow a specialized residency structure.** While in traditional generalist residency models residents rotate through multiple departments, in an emerging technology residency there will be projects that require more continuity and more time commitment. Residency structures should be flexible enough to respond to the particular project needs of the host institution.
- **Both residents and host institutions should have the understanding that there is some inherent risk in implementing emerging technologies due to the very nature of emerging technologies.** As we've seen in looking at definitions, "low performance" is a characteristic of emerging technologies – which means they don't always work. However, by positioning emerging technology implementations as "proof of concepts," outside of the production environment, risk can be mitigated in a safe and supportive environment.
- **Hosts should take a tiered approach to implementing emerging technology when appropriate: proof of concept, pilot, and full implementation.** For example, if a technology application is untested, establish a "proof of concept" to determine whether a concept is valid or not. A "proof of concept" may turn into a pilot if it is successful. A "pilot" implies implementing the technology with a smaller audience or application, with the intent to grow larger. The idea of "piloting" emerging technologies can ease the adoption and full implementation of that technology.
- **Technical challenges and concerns** that may need to be addressed specifically in emerging technology residencies include **security and privacy issues; staffing, funding, and reallocation of resources to adopt new technologies and solutions; diversifying devices, interoperability and standards issues; and digital preservation.** While directly addressing these challenges is out of scope for our project, these are important considerations for host institutions.

Competencies and characteristics of successful residents

Emerging technology residents will require a unique blend of both competencies and characteristics. ALA's [Core Competencies for Librarianship](#) document defines competencies as "the basic knowledge to be possessed by all persons graduating from an ALA-accredited master's program in library and information studies." While specific technical knowledge will be important for an emerging technology resident, we have identified several other competencies and characteristics of a successful resident.

Expected Resident Competencies

- Project management
- Technical competence
- Trend-spotting in a broad sense
- Prior workplace experience

Expected Resident Characteristics

- Strategic thinking
- User-centricity
- Flexibility and adaptability
- A keen interest in exploring and implementing emerging technologies and innovative services

Project management skills are emerging as a critical set of skills for effective residents. Residents are often leading technology implementation projects during their time at the institution. Project management skills include the ability to:

- Evaluate the needs of all stakeholders, including users, staff, and technical staff.
- Communicate and work with and across teams and departments.
- Build relationships and partnerships; successful residents are able to set up working relationships across a variety of personalities and technical experience in the organization.
- Negotiate and build enthusiasm and consensus around an issue.
- Understand the practical “building blocks” of a project, including tasks and sub-tasks.

For hosts, a project management approach ensures sustainability of emerging technology projects within the institution. After the resident concludes the residency, the host institutions sometimes realize that they cannot sustain the project. While implementing emerging technologies has an experimental feeling by its very nature, at some point, the “pilot” needs to become part of the host institution’s portfolio.

Because residencies are limited-term engagements, an important part of the residency is to plan for passing the projects on to permanent staff who will ultimately manage the projects. Part of the resident role may be in helping to facilitate the identification of the best person or team to take on the maintenance of the projects. If the resident takes a project management approach (rather than a maintenance approach), ideas can potentially be implemented more quickly and passed into production.

Additional key competencies for residents include:

- **Technical competence** – It is critical that residents possess a level of technical competence. However, this doesn't mean that successful residents need to be programmers. As one interviewee phrased it, all librarians should be "computer literate if not computer eloquent". (G. Needham, personal communication, October 24, 2011). Technical competence may include understanding and assessing what skills level is needed to work to implement a solution. Technical competence also means that the resident has the ability to interpret needs into functional requirements. While this may not mean writing requirements documentation, it is important for the resident to have an ability to understand how end-user needs can be translated into technical solutions, and vice versa. Additionally, residents need to take a "systems" approach by understanding how technology systems work and interact with each other. They need an understanding of how the parts interact to create a system.
- **"Trend-spotting" and the ability to track, synthesize, and transfer ideas** – Residents need to have an awareness of major trends and current events – both those inside the library field and those beyond --that may impact their organization, the library profession, and the end user. Trend-spotting in this sense doesn't only mean tracking technology trends; it means tracking and understanding the larger community and societal trends, of which technology is a part. Specifically, this means residents should have the ability to:
 - Scan regularly for new ideas both within and beyond the library field, and understand how ideas from outside of the library field might be applied within the library world.
 - Synthesize ideas into applicable concepts in library settings.
 - Act as trainers and mentors to other staff in disseminating technical trends and determining future technological offerings. Residents are often conduits for new information "from the outside." Residents also ideally have the ability to "bring the organization along" – to help the organization understand emerging technologies in the context of user service.
- **Prior workplace experience** – Ideally, residents have a sense of how the workplace works, in order to understand how to function effectively in an organization.

In addition to competencies, it is important to also look at characteristics, which capture abilities, attitudes, and traits outside of a "knowledge base." Characteristics of successful residents include:

- **Strategic thinking** – Residents need to have the ability and skill to understand the mission and goals of an organization, and to understand how technology can ultimately benefit the end users. They need to be able to see the "big picture."
- **User-centricity** – Residents should have the ability to empathize with the user experience in terms of interacting with new technologies; this is sometimes called "technological empathy." They need to be creative – have the ability to make analogies to convey ideas and concepts. They also need to be patient, friendly, and approachable.

- **Flexibility and adaptability** – Residents need to be “self-starters”; in other words, they need to have the ability to self-direct as well as have a keen interest in a variety of areas, as well as to solve one’s own problems. This can require courage, perseverance and tenacity when faced with opposition, and working to understand opposing views and what is required to turn them around (Abels, et al, 2003). Specifically, residents need to have the ability to:
 - Accept critical feedback, navigate setbacks and obstacles
 - Evaluate multiple approaches and conceptualize the best solution
 - Embrace change
 - Be confident and comfortable with new technologies
 - Be “risk tolerant” (possessing a confidence in and comfort with experimentation)
 - Learn new technologies easily
 - Demonstrate an emotional maturity and get along and work with a variety of personalities
- **A keen interest in exploring and implementing emerging technologies and innovative services** – Finally, residents need to demonstrate a keen interest and passion for new technologies.

We understand that this extensive list of competencies and characteristics is a “wish list.” We don’t expect that residents will meet all of these requirements, and we recognize that some of these skills will be addressed during the residency. The intention is not to position the resident as the “white knight” who will save the library – this sets both the resident and the host up for failure. Our goal is to identify the full list of competencies and characteristics, and to continue to discover the truly key ones as we finalize and pilot the model.

Leadership

When you’re dealing with emerging technologies, there is no book that says “this is how it’s going to be”. You’re writing the book.

- R. Hulser, personal communication, December 8, 2011

The nature of implementing emerging technology in libraries implies that there is a certain amount of “unknown” territory. The experimental nature of implementing emerging technology means that, even if the project is something the resident has done before, the project is still going to be different and unique – due to changing technology, different settings, or different applications of the technology.

- **Residency programs should provide opportunities to lead.** In some residency settings, one of the roles of development is to put residents in charge of things, and provide support and mentoring. For residents, this means that they are often leading the project, and often dealing with a variety of unknowns. The benefit of putting residents in project leadership roles not only helps the host organization get things done; it also prepares the resident for leadership roles further on in his or her career

- **It will be important to look for leadership qualities in resident candidates.** This can be difficult sometimes if a resident has no prior work experience. However, in the interview/matching process, discussing leadership examples with potential resident candidates can help uncover examples of leadership in volunteer positions or in other experiences.
- For direct managers of residents, focus on end results and parameters, and **be willing to turn the approach over to the resident.** In one setting, the manager outlines the goals of the project and the necessary elements, and lets the resident outline the plan to get there. (R. Hulser, personal communication, December 8, 2011).

Characteristics of successful host institutions

In addition to successful resident characteristics, we need to consider the desirable characteristics of host institutions for enabling a successful residency and host experience. The characteristics of the host institution equally determine the ultimate success of the residency, and so require equal attention.

Expected Host Characteristics

- A culture that values and demonstrates learning and flexibility
- A certain level of risk tolerance
- Ability to facilitate communication between the resident and the organization
- Providing purposeful exposure to different departments to gain insight on how the library builds support for projects and for library services
- Providing a structured experience
- Established experience with mentoring in the organization

We have found the following characteristics to be important for host institutions, especially in relation to implementing emerging technologies:

- **Demonstrate a track record of valuing learning and flexibility, balanced with a structured experience and mentorship.** For the first year of the residency, host organizations may provide specific projects and more structure in the work experience, depending on the project. As the resident gains experience and knowledge of the organization and its users, the resident may be given more autonomy in identifying projects for implementation.
- **Ensure a certain amount of risk tolerance.** Host institutions need to have a clear understanding that residents are not penalized for taking risks and trying different things. A common characteristic of emerging technology implementations is an atmosphere of experimentation. Implicit in this atmosphere is the recognition that some projects will not come to fruition. A host organization needs to understand that some projects may not succeed, and need to be prepared to re-challenge the resident. Often,

a failure on one project can be an invaluable learning experience both for the resident and for the host institution, and the next project can be a success.

- **Facilitate effective communication between the resident and the host organization.** Communication is a key factor in helping a resident effectively navigate the organization, and for the organization to fully gain the benefits of a residency. Often times, the immediate supervisor orients the resident to the organizational culture, and helps the resident navigate the various departments, potential stumbling blocks, and politics of the organization. This helps the resident develop the political and social savvy necessary in working successfully in an organization.
- **Provide purposeful and conscientious exposure to different departments** in the organization. This doesn't mean having a formal rotational model, but rather giving the resident insight and exposure to how the library interacts with IT, human resources, finance, and other departments to build support for projects and for library services.

Coaching and mentoring in residencies

A recurring characteristic of successful residency models is the explicit focus on coaching and mentoring for residents. Mentoring and coaching are similar, in that they are often one-on-one experiences. In **mentoring**, typically advice and guidance is given by a more experienced person to a less experienced person. **Coaching** is a form of personal, one-on-one training.

As Perez and Gruwell (2011) phrase it, "internal support strategies" can include **orientation** to the host institution, **socialization** inside and outside of the department, along with **mentoring** and **regular supervision**. Especially for recent graduates, regular supervision, mentoring and evaluation provide a transition from the assessment-focused world of academia into the working world. All of these components help provide the support for a successful residency program for both the resident and the host institution.

While many residency models formally assign a **staff member or librarian** to a resident for mentoring and coaching, there are many different modes of support. Residents may receive coaching and mentoring from different staff members as they rotate through different departments and projects. In some settings, one of the mentors to new residents may be a **former resident** (typically someone who was hired as staff after the end of the residency). Since that person knows the residency experience there, she is able to establish a rapport with the incoming residents. In other settings, residents are in a **shared office environment** with other senior librarians, resulting in informal interaction that provides another venue for support and knowledge transfer.

Another aspect of mentoring is focusing on networking. In the Purdue fellowship model (Perez and Gruwell, 2011), networking is a part of the mentorship model, providing a broader base of people who can potentially mentor the resident. Mentors might include program directors, or specialty resource mentors who can provide subject matter expertise.

Finally, mentors can include members inside the host institution, as well as graduate program faculty or other stakeholders in the residency program.

A critical element of this new residency model for integrating emerging technologies in libraries is to **ensure that both residents and host supervisors get the coaching and mentoring they need to be successful.**

- **Formal and informal mentoring and coaching support and opportunities should be built into a residency program model.** The literature outlines the benefits of both formal and informal mentoring, since each provide a unique type of support for the resident, and opportunities for staff at host institutions to build their experience in mentoring and coaching. Most importantly, coaching and mentoring should be made available to both the residents and to the host institutions.
- As residents near the end of their term, **host institutions should coach residents in finding a position**, either in the host institution or elsewhere. Host institution mentors can be advocates for the hiring of a resident after the end of the residency. They can also coach residents in finding a job when the residency position ends. Host institutions need to prepare for this part of the residency, and also be prepared to have the resident be hired at another organization.

Cohort model

A cohort, simply stated in this context, is **a group of people sharing the same experience.** In this respect, resident cohorts can be a group of residents in a single host institution, or it can be a group of individual residents from a variety of host institutions. Similarly, a group of host institutions could be a cohort. **An effective residency model will include cohorts both within a single host institution and among residents at different institutions.** Cohorts within an institution can share experiences within the context of that institution. Cohorts in different institutions can compare and share experiences in their various settings, and potentially leverage knowledge and practices from other settings.

Cohorts provide **mutual support** and **opportunities to share and compare experiences.** At their best, they can also be **technical resources for residents.** In one example, one resident working on a technology project thought a database would provide the best solution; however, she did not have deep expertise in database implementation. Luckily, one of her cohorts was very experienced in databases, and was able to provide her an approach for successfully proposing different solutions. (K. Dunn, personal communication, October 7, 2011).

In this way, cohorts also provide a setting for **cross-training and mutual learning.** In another example, a host institution cohort was learning **project planning from a teaming approach.** Because the residents' time at the site overlapped only minimally, they developed a diary to pass on project dates and notes. They developed their own written training modules as well. (R. Hulser, personal communication, December 8, 2011).

Another aspect of cohort coordination within an institution is establishing overlapping cohorts. Many residency settings have indicated the value of having more seasoned residents mentor newer residents. At Bowling Green State University, more experienced interns are required to mentor newer interns, particularly in the areas of organizational culture, work practices, and

problem solving within the organization. (G. Evans, personal communication, January 12, 2012). This type of “tacit” information is often most effectively shared among cohort members.

Cohort meetings can also provide a forum for feedback, debriefing, learning, and “collaborating with criticism”. In one setting, weekly group meetings are used as a forum for residents to discuss what went well and what didn’t go well during the previous week. Residents need to be prepared to receive feedback from their cohorts. (K. Dunn, personal communication, October 7, 2011).

Results and products from a successful residency

Not all residency programs currently require an “end product.” Some do require a “capstone” project, which may be a presentation to the host institution internally. Through our research, we conclude that a “product” from the residency can potentially benefit the host institution, the resident, and the profession as a whole, through the sharing of experiences and best practices. A presentation from the resident to the host institution internally, for example, can build presentation skills for the resident, and promotes the transfer of knowledge within the host institution. Some kind of external-facing product, such as a paper published, or a presentation at a conference, can help broaden the learning from a residency to the larger profession. The product might be in the form of a conference presentation, a published article, a blog, or another vehicle where the process and the result of the project are shared with the broader community, benefitting potential and current residents, as well as potential and current host institutions.

Funding and sustainability

One of frequent concerns that arose in interviews and focus group discussions was around the ongoing funding and sustainability of any residency program. Public library settings have not traditionally had residency programs, and so finding funding for a resident position may be more challenging.

Salaries

Generally speaking, salaries for residents are in line with entry-level professional salaries. In the course of our research to date, we’ve discovered that typical resident annual salaries range from \$35,000 to \$44,000. Only in one instance was an hourly salary associated with a resident position. Residents often are eligible for salary increases if the residency extends longer than a year. In many instances, residents also are offered full benefits, as well as some kind of professional development funding. Some resident positions receive a stipend of up to \$2000 for professional travel, which typically is used to attend conferences. Benefits may include relocation allowance, annual leave, tuition reduction, health and dental insurance, and retirement options.

Other associated costs

While salary is often considered the primary cost for a resident, benefits and other costs come into play as well. Scherrer (2010) found that the Academic Resident Librarian Program of the University of Illinois at Chicago (UIC) costs the university approximately \$14,000 per resident for

recruiting and training, in addition to the cost of their salaries. “In-kind” costs of internal mentors, supervision, the decision-making process to pursue a resident and a project, planning, coaching, and collateral staff time it takes to support a resident all will need to be considered.

Funding for residency positions, and funding sources

Through interviews and literature reviews, we’ve generally found that **sustained residency programs become a budget line-item for the library or the institution**. In SPEC Kit 188, Brewer (1992) reports that four of eleven libraries surveyed fund their residency programs entirely from existing library operating budgets. Five programs were funded in part by their existing operating budget and in part from the parent institution. Clearly, **funding of a residency program needs to be thought of from a long-term, sustainable perspective**. While grants or other short-term sources of funding can get an emerging technology residency started, building a residency into the host institution budget will ensure that funding – and the benefits and continuity of a strong resident position – remains secure.

Funding to launch a residency may come from a variety of sources. One residency program in our research was funded by a special endowed library fund, and another was funded through a private foundation. Other funding sources may be general funds, grants, or gifts. In 2011, the Los Angeles Public Library received a planning grant to create one of the first librarian residency programs in a public library. The funding for the pilot of this program was secured via a private funder. The Catalyst project team is working with the Los Angeles Public Library grant team to share findings and best practices.

While funding is a key component of a sustainable program, sustainability also means that the resident program continues to provide benefits to residents and to host institutions over time, and that there is continuity in the resident experience. To ensure sustainability, we put forth the following:

- **Building support from the head of the host institution, and across the institution, will be critical for success and for sustainability.** Some residency programs have been running for over 40 years. Perez and Gruwell (2011) note that programs that have continued through organizational changes are remarkable in that they enjoy the broad support of the organization. The most effective residency programs demonstrate that they **target organizational priorities**, and **add value to the organization**.
- As residents complete their program, **the knowledge and results brought by those residents need to be expressly transferred to those who are going to stay**. This is a component of the “project management” focus of many residency programs. Sustainable residency programs will address this as part of their process.
- **The structure and process of the residency should be as lightweight and customized an experience as possible.** Especially for residencies focusing on emerging technologies, it will be important to keep the structure as agile as possible so that the resident can more easily bring the benefit of her experience to the host institution, and the host institution can leverage the latest thinking and practices in this area.

Outcomes and evaluation

Brewer and Winston (2001) surveyed 22 academic and/or research libraries with residency programs to identify key evaluation factors and the components of an evaluation model. The evaluation factors identified as important by 90% or more respondents were (1) **the quality of the applicant pool**, (2) **whether or not the resident completed the program**, and (3) **subsequent placement of the resident** in an academic library. Factors in the 80% range of importance were (1) **the work performance of residents**, (2) **the participation of department heads in developing resident work assignments**, (3) **the involvement of former residents in refining the program**, and (4) **diversity-related factors**. The diversity factors were: diversity of the applicant pool, a change in minority representation at the library, and the extent to which the program supports the library's diversity plan. Approximately two-thirds of the respondents surveyed described their library's program as focused on recruiting minority residents.

In terms of desired frequency and type of evaluation, participants recommended conducting **formal evaluations (documented in writing) annually or biennially**, at an interval corresponding to the length of the program. Respondents also stressed the importance of more **frequent, informal feedback gathering from residents, supervisors, and others involved**.

Another evaluation factor indicating success has been the desire to duplicate the residency program. In one interview, the host institution indicated that other departments expressed interest in the model, looking to replicate it in other areas of the institution. (L. Moeckel, personal communication, December 6, 2011).

Many of these evaluation factors are from the perspective of the host. Developing the evaluation parameters for an emerging technology residency model may draw on several factors. Evaluation criteria for the success of the resident may be:

- New skills and competencies developed
- Leadership development
- Employability (did the resident secure employment?)
- Program satisfaction

For host institutions, it's likely a residency model would continue to use the evaluation factors of **quality of the applicant pool to the program, program completion, and subsequent placement of the resident** in a library setting. Some additional evaluation criteria may include:

- Improvement in staff relations or organizational productivity
- Improved quality of library services

A more difficult measure specific to emerging technology residencies might be thought of as "measuring success in the face of failure." By their nature, some emerging technology projects will not come to fruition. Failure of a particular project does not necessarily mean that the

resident did not carry out his or her duties well. The challenge is, how do we measure success of a resident in the face of a project failure?

Key takeaways

We find that the following takeaways are critical in creating a sustainable residency model focused on implementing emerging technologies:

- **The “hospitality” of the host organization is critical for a successful residency.** We identify several characteristics indicative of a suitable host organization. For the purposes of our proposed pilot implementations, and for the sustainability of the model beyond the grant, we believe it will be important to identify organizations that provide a hospitable environment for an emerging technology resident. By hospitable, we mean that the host institution is ready and able to support the development of the resident. We identify several characteristics of a hospitable environment.
- **The host organization must be able to demonstrate commitment to the residency** both in money and time. Our research has found that it is important to have the commitment of the organization's executive, adequate budget support for the resident as well as for the local project, and a viable plan for providing a smooth introduction of the resident to the institution's staff, among other factors.
- **The availability of coaching and mentoring for both the organization's resident support team (which would include a supervisor, champion, and/or project team) and the resident can have a positive effect on the residency program.** Our findings indicate that providing support for the host, as well as the resident, is critical to the effectiveness of the residency.
- **The host organizations for our proposed pilots need to be selectively chosen** for their readiness to develop the professional competency of the resident. The matching of residents to host institutions should be selective rather than competitive. That is, we believe that the pilot projects should be sited at resident-ready hosts that are recruited as implementation grant partners
- **The model needs to be supported by a project-wide infrastructure of coaching, mentoring, networking, and cohort activity.** Part of our task as a project team is to think about and develop this infrastructure so that it can be ready to launch, should we be awarded a follow-up grant to implement the model.
- **An essential part of the model must address onboarding residents so they can be integrated effectively into the organizational culture.** Onboarding is the process by which a new member of an organization acquires the knowledge, skills, and behavior to be effective in the organization. Our research has found that developing the ability to navigate the organizational culture is critical to the success of anyone implementing technology within an organization.
- **Emerging technology is contextual.** What may be considered emerging technology in one library setting may not be in another. In particular, we have found that many libraries consider the **innovative application of technology** as “emerging technology.” While we will provide some definition and examples of emerging technology and innovative applications of technology, we will be open to the project ideas put forth by

hosts. We understand that the spirit of the Catalyst project may be met in a variety of contexts and settings.

- **Trend-spotting, among others, is a key competency for residents working with emerging technology, and includes more than just technology.** The key to trend-spotting is being able to conceptualize “technology in context,” and being able to identify broader trends beyond the profession.
- **Residents will need both appropriate competencies and attitudes.** Residents will need at the outset certain technical, attitudinal, and behavioral skills and abilities. They will also develop additional skills on the job, such as navigating the organization, communicating across departments, translating user needs to technical requirements, and vice versa. It is important for the resident to be curious, flexibly, resilient, and resourceful, as well as personable.

The model

Our vision is to create a replicable residency model that the library profession can use to develop the knowledge and leadership capacity of new professionals in effecting transformative change. Our mission is to create several pilots to test that model in the context of emerging technologies. As we develop that replicable model, and as we focus on an implementation process for several pilots of that model, areas that we have identified to address include:

Residency experience (host & resident)			
Project administration <ul style="list-style-type: none">• Structure• Funding sources & models• Templates & materials• Sustainability	Identification & selection <ul style="list-style-type: none">• Competencies & characteristics of hosts & residents• Selection process• Matching	Support <ul style="list-style-type: none">• Coaching• Mentoring• Training• Cohort coordination	Measurement & evaluation <ul style="list-style-type: none">• Measures• Products• Evaluation• Replication

We now turn to defining some of these elements. Presented in this white paper is the initial design of a model structure. As we continue our research and our work with our grant Partners, we will continue to develop further details to include in a fully-developed residency model.

Project administration

Project administration is defined in terms of the implementation of this model in a subsequent grant, as well as the administration of this residency model beyond the support of an implementation grant. We recognize that the grant implementation team will need to perform a variety of activities. Some of those activities include:

- **The establishment of a network of mentors.** Mentors in the network may include residency administrators, emerging technology librarians, technical experts, and other leaders in the profession. Creating a national network of mentors can help draw broad and deep expertise into the support of both the residents and the host organizations.
- **The identification and establishment of mentoring and cohort training topics for hosts and residents.** More on these training topics is discussed below.

- **An application process and residency structure that provides clear expectations of both the host institutions and the residents.**
- **A selection and pairing process for hosts and residents.**
- **The administration of the pilot residencies, with a view to the development and ongoing refinement of a replicable model for adoption by individual libraries across the country**
- **Reporting and accountability to IMLS**, including project tracking and troubleshooting host and resident issues
- **Evaluation** of the pilot project and the model

Additionally, the grant team recognizes that, within this planning grant and in a subsequent implementation grant, we would need to consider the ongoing administration of this model. (See [Model implementation process: next steps](#) for more discussion.)

Structure

Length and structure of residency

A residency length of two years seems to be optimal, and a minimum length for an effective model. However, in the pilot implementations and the final model design, a prescribed length of two years may not be strict requirement.

While flexibility is a key component of an emerging technology residency, residents also need some structure and focus at the beginning of the residency, in order to establish a framework in which to understand the organization and to build early accomplishments. We suggest a more structured first year, with pre-determined projects and a more structured work plan, followed by a more flexible and self-directed second year, with the option of the resident putting forth and pursuing his or her own project ideas, and further developing leadership skills.

Funding sources

Organizations often have to think and budget creatively in order to initiate a new position or initiative. As mentioned earlier, a sustained residency usually becomes a budget line item. However, in launching a residency program, an organization might consider some alternative or additional funding. Sources for funding might include:

- Professional association contribution
- Private funding
- Industry funding (library or non-library)
- Foundation funding
- Third-party funding
- Public library foundations

In addition to the salary of a resident, the model and the host institutions will need to consider the “in-kind” costs of mentors, supervision, the decision-making process in securing a resident and developing a project, planning, coaching, and the collateral staff time it takes to support a

resident. There may be additional out-of-pocket costs related to the project as well. It will be important for the project administrators and the host applicants to have a clear understanding of these additional commitments and costs.

Funding models: some options

One of the goals of this planning grant is to submit a subsequent grant application to IMLS to pilot the Catalyst residency model. If successful, we have started to consider different ways that these grant monies can best be used. Described below are three different approaches we are currently considering.

1) Pay for full resident salary: Providing full funding, or even a majority of the funding, for resident salaries and benefits through grant monies would require a significant sum, and would fund only a few residencies. In that scenario, we believe it would be important to be very selective in the choice of host institutions. While our goal is for the model to work in any type of setting where the host characteristics are present, the pilot projects should engage hosts that strongly show those desirable characteristics to insure an optimum experience for the resident.

Grant money is helpful in order to implement and test new ideas. However, grant monies cannot be relied upon for sustainable programs.

2) Pay for partial resident salaries in a cost-share with the host institution: Another option may be to use grant monies to provide some kind of **cost-share with the host institution in hosting a resident**. A cost-sharing model – having the host institution dedicate funding and resources to the residency – will be critical to both the success and the sustainability of the residency. In this option, the grant funding might be regarded as “venture capital” – the opportunity to invest money for developing long-term benefit. In this option, the resident salary would be tied to the librarian salary at the host institution. In a pilot implementation using grant funding, the grant may pay two-thirds, and the host would pay the balance of the salary and benefits.

3) Pay for sustainability of the pilots and model, with host institutions fully paying for resident salaries: A third option would not involve using grant funds to subsidize the salary of a resident position at all; **the host institutions would provide the full salary**. In this option, the grant funding would go toward ensuring the sustainability of the pilots, as well as the long-term sustainability of the model. Grant funds in this option would be used to:

- Further create and develop the infrastructure of the model;
- Fund travel, development, training, and curriculum development; bring the cohort together; and support writing, publishing, and content development costs; and/or
- Hire a person to help with administration of the pilots and of the model materials.

As in all scenarios, the first criteria for selection would be the ability of the host institution to meet and demonstrate the host criteria. In this particular scenario, hosts would further be selected based on their ability to fund the resident. The majority of the grant funding, then,

would be put toward the development of the long-term sustainable model, not toward conducting the pilots. The advantages of this approach are that:

- The focus of the grant money is on refining the model and further ensuring replicability and sustainability
- The matching process of hosts to residents becomes less onerous; hosts will be “pre-selected” by the project team
- Because pilot hosts are pre-selected, we may not need to put forth a strict definition of emerging technology because host institutions would identify what the key strategic technology needs are in relation to their particular institution
- We would have the ability to potentially conduct a larger number of pilots
- In catalyzing several pilots, rather than just a handful, we have the opportunity to make long-lasting change by learning from several implementations
- If the hosts provide the residency funding, we can apply for more matching funds to develop the model

In our view, the third option can develop a more sustainable model, and makes the best use of IMLS grant funds. The challenge will be the identification and commitment of host organizations. Our task as the project team will be to work closely with our Partners to identify and recruit potential host organizations.

Identification and selection of residents and hosts

As we have interviewed key informants in residencies and emerging technology, we’ve started to identify a resident and host matching process that would facilitate more effective matches. We’re developing a two-part process:

- An application process for both host institutions and residents that puts forth a set of criteria, developed from the characteristics and best practices identified in this grant project, for applicants to meet, and which would be reviewed by the project implementation team; and
- An interview process with potential hosts and residents to further identify and confirm appropriate residency matches.

Shared qualities of the resident and host candidates that will need to be explicit in the application process:

- Demonstration of an innovative perspective.
- Willingness to accept failure of an emerging technology project
- Acceptance of a “good enough” perspective – being willing to be iterative, to not wait for perfection of a service or product, but to attain the outcomes desired
- Striking a balance of structure and latitude between the resident and the host. We have heard from residents that those who had little or no structure wished for a little more structure; those that were over-structured often felt underutilized.

Residents

Residents will ideally meet several criteria:

- “Early-career” status – having graduated within the last three years
- Demonstration of a user-centric perspective.
- Instructional experience and/or courses taken in instruction
- A willingness to be coached in all aspects, and especially regarding organizational barriers, including the organizational culture
- Self-directed
- Demonstrated ability to understand how end-user needs can be translated into technical solutions
- Project management. While residents should have a practical and applied understanding of project management (creating a schedule, understanding and assigning tasks and sub-tasks, etc.), project management could be a part of pre-residency training or the residency curriculum.
- Technical competence
- “Trend-spotting” and the ability to track, synthesize, and transfer ideas Trend-spotting, as described earlier, is NOT limited to technology – the resident must be cognizant of wider trends, community trends, industry trends, and how technology can help address those trends.
- Strategic thinking
- User-centricity
- Flexibility and adaptability
- A keen interest in exploring and implementing emerging technologies and innovative services

This set of criteria for residents is a baseline; hosts may add additional criteria, depending upon the projects and setting of the residency.

Again, we realize that few resident candidates can be expected to meet all of the criteria. The essential competencies for residents will continue to be discovered in the evolution of this model, and as the pilot residencies are completed.

Hosts

To be considered for a Catalyst resident, host institutions will need to demonstrate that they can facilitate and support the residency and the project. The bullets below describe the characteristics and approach of an ideal host.

- **Demonstration of an organizational culture of experimentation and innovation.** Emerging technology may mean adopting and supporting the mindset of being in “perpetual beta” – an ongoing sense of flexibility and experimentation, as well as a perspective of “good enough” solutions.

- **Commitment to establishing buy-in from the organization and the staff.** This not only includes the immediate staff who will be working with a resident. It's important to have the support of the top authorities within the host institution in order to successfully implement emerging technology solutions.
- **Plan to train staff, librarians and users to engage with the new technology.** Set aside time and resources to train all constituents, and to make the connection as to why the technology is being implemented.
- In considering projects for a residency program, **host institutions should have an “intake” process for ideas for evaluation and prioritization.** Often emerging technology projects are selected on an ad-hoc basis, and without consideration of the technical feasibility of the project. Host institutions could develop a framework in order to help the project proposer to start to frame their project in more technical terms. In the formulation of our project implementation, the grant implementation team may have a role in working with the host institutions to determine appropriate projects for the residency.
- **The existence of an active and current technology plan and strategic plan.** The host would need to demonstrate that it has a technology plan, and an understanding of how the residency fits into the implementation of that technology plan. The host should be able to articulate the importance of the residency and how it fits into the organizational vision and strategic agenda, and how it relates to specific organizational goals. The host should understand end-user needs and experience that the implementation of emerging technologies could address.
- **Identified emerging technology projects for the resident.** While the resident would be a partner in identifying projects, particularly in the second year of the residency, the host organization should have one or more projects identified at the start of the residency. The host should have some well-developed ideas, identified in the evaluation process for host applicants, about technology projects that address user needs or desirable user experiences. Some of the experiences residents should gain are needs assessment, conceptual design, and project design and development.
- **A commitment of time, supervision, and financial resources.** The extent and type of financial commitment will depend upon the ultimate model of the pilot implementation. However, there are several ways in which a host organization may demonstrate commitment.
 - **Identified supervision of the resident,** which includes an assigned mentor in the organization, as well as:
 - **A communication plan.** The host organization should be able to demonstrate that it has the ability and plan to connect the resident with key people and departments within the organization to facilitate an effective residency.
 - **Professional development.** This may take several forms:
 - Supporting the resident in participating in organizational activities. The University of Tennessee's Diversity Library

Residency Program, studied by Dewey and Keally (2008), provides opportunities for leadership by allowing residents to serve on the Libraries' Diversity Committee. The committee actively engages in outreach to the community and to student groups, and assisted with the development of the Libraries' Diversity Plan.

- Supporting and/or funding conference attendance (dependent upon the funding model)
- Supporting formal and informal training opportunities
- **Financial resources:** The host organization will demonstrate a commitment of funding for the resident in either fully funding the resident, or participating in a cost-sharing program. The host organization may also commit funds for purchasing resources in conjunction with an emerging technology implementation.
- **A clear outline of where the resident fits in the organization.** To whom does the resident report? How does the resident, and the department in which the resident works, relate to other departments and stakeholders in the organization?
- **An initial idea of the products of the residency, and how that might benefit the host organization, the end users, and the profession.** The resident may be required to present internally to the organization or at a conference, or may be required to produce an article or paper for publication, among other possibilities.
- **Previous experience in mentoring.** This experience does not need to have been in the context of working with interns, residents, or other student workers. However, the host organization needs to be able to describe mentoring relationships and outcomes within the organization.

Support for hosts and residents

Cohort coordination

Since resident cohorts would likely be spread over multiple host organizations, the establishment and coordination of a virtual cohort would be vital. This optimal model would establish both a cohort of residents, and a cohort of host organizations, to provide support for both groups. There will be occasional "super-cohort" meetings of both the residents and the hosts, either at a central conference such as ALA Annual, or virtually.

Another aspect of cohort coordination, especially in developing a sustainable model, will be establishing overlapping cohorts. In the implementation of the pilots, we may not be able to establish overlapping cohorts. In the long-term administration of the model, however, there may be advantage in creating a way to have more seasoned residents mentor newer residents participating in the model.

Finally, cohort meetings should provide a peer-to-peer forum to learn about different approaches. Cohort meetings would be used, among other things, as a way to learn about and discuss project approaches from peers. The meetings can also be used as a forum to learn

about methodological approaches to projects and the steps necessary prior to implementation: objectives, goals, user needs, etc.

While it would be essential to integrate virtual meeting options for the cohort, it would also be important to bring the cohort together face-to-face at key points during the residency.

Training

As outlined previously, one focus of the support for hosts & residents is established training topics and opportunities for hosts and residents. For residents, training topics over the two years of the residency might include:

First year:

- The mentoring relationship
- Emerging technologies
- Project management
- Needs assessment
- Planning and evaluation
- "Making the case"
- Meeting planning and group facilitation
- Budget development

Second year:

- Presentation skills
- Job hunting
- Writing effective resumes
- "Leading from any position"

For host institutions, mentoring topics over the two years might include:

First year:

- The mentoring relationship
- Emerging technologies
- Early-career librarians and needs for development
- Professional involvement for residents

Second year:

- Assessing resident skills and abilities
- Assessing the success of the residency
- Transitioning your resident

It's anticipated that this training would be delivered virtually, though training topics could be integrated into face-to-face meetings.

Mentoring

Mentoring relationships may be in a "matrix" format, particularly for residents. Residents ideally would have a mentor within the host organization, as well as a "third-party" mentor outside of the organization (in the mentor network established by the project implementation team). It would be important for the mentor network to have the ability to identify and connect with technical mentors or expertise.

Additionally, the project administration team should be explicit about the process of dealing with a poor mentor/mentee match. Both hosts and residents need to be aware that some mentor/mentee matches simply don't work well, and that mentors and mentees can be re-matched.

Coaching (residents and hosts)

Coaching for residents and hosts should have formal, established elements and themes. The mentor team would be formally and significantly involved in providing elements of the coaching for hosts and for residents.

For residents, coaching areas might include:

- Support in further pursuing the job market. The resident should be coached on applying for jobs, resume development, preparing for interviews, and other elements of the job process. In many residency settings, the immediate supervisor of the resident takes on this role. However, additional support may be available outside of the residency setting.
- Coaching on interpersonal relationships, project management, and other skills.

For hosts, coaching areas might include:

- "Setting the table" – establishing the role of the resident and the residency within the organization. This coaching area may be one of the most important, as it can provide a way for hosts to begin talking about and position a residency program within their organizations.
 - What is the difference between the resident position vs. a new hire for the organization?
 - The residency is a project-based, term appointment
 - The residency typically has a specific purpose – implementing specific projects
 - Having a resident confers prestige on the institution
 - The funding associated with having a resident provides support for resident travel, as well as coaching and mentoring for the organization
- Project administration
- Assessing residents

- Working with early-career librarians
- Transitioning residents
- Resolving issues in the residency/host relationship

Measurement/assessment/evaluation

We anticipate various beneficial outcomes from this project. Different stakeholders may realize different benefits and outcomes by the end of the creation and implementation of the model. We have identified that there are four clear stakeholders/beneficiaries from this Catalyst Residency Model:

- The profession as a whole will benefit from having a replicable residency model that can be used in a variety of library settings, and will provide them with the tools, structure, and case studies to ensure their success.
- Residents will benefit from gaining professional experience, building a professional network and leadership training.
- Host institutions (academic, public, and special libraries) will benefit by getting strategic technology projects implemented, getting the tools, templates, training they need to successfully run a residency program, and professional recognition for cultivating future leaders for the profession.
- Mentors/coaches will contribute by facilitating the sharing of knowledge and best practices, and ensuring success of the both the residents and the host supervisors.

These potential outcomes all may be points of measurement as well.

Measures

Longer-term measures of the success of residencies and this model might include:

- Placement/hiring of residents – whether within the host organization or in another setting. This kind of reporting likely would need to be tracked for several years post-residency.
- How many libraries adopted the model, became aware of the model, or expressed interest in the model?
- Citations, communications, and other industry recognition of the model

Under a three-year implementation grant, another option may be to conduct a survey at the beginning of the first year to gauge interest in the model, and take a subsequent survey at the end of the third year to determine how interest has grown.

Products

Products will be required of the residents, and may be required of the host institutions. The completion of these products will be an important part of measuring the success of the residency. They also provide a way for the resident to “give back” to the profession. Possible products may include:

- **Papers** published for wide access, and communicated to audiences interested in residency models and audiences interested in technology in library settings
- **Presentations** given within the host organization or at a conference.
- **Templates or checklists** – particularly in the pilot implementations, residents or host institutions may produce and share templates or checklists specific to emerging technologies residencies, and share those with the profession as a whole.

These are suggestions. We want to provide latitude for the resourcefulness and creativity of hosts and residents for sharing the experience of the residency.

Evaluation

A component of the evaluation should entail interviewing the residents and host stakeholders on a periodic basis. In the pilot grant implementation, project administrators will be in an ongoing relationship with the residents and hosts, checking in at least quarterly, and perhaps monthly.

As discussed in our findings, we did not find evaluation factors from the resident perspective. Potential evaluation measures might include:

- New skills and competencies developed
- Leadership development
- Employability (did the resident secure employment?)
- Program satisfaction

Additionally, the issue of evaluating an emerging technology residency outside of the specific success or failure of a particular project implementation will need to be considered.

Model implementation process: next steps

Some of the elements that will need to be addressed in the next part of the planning process:

- **Developing and settling on a definition of “emerging technology” as a part of the criteria for host institutions.** As part of the application process, host institutions would need to describe how their project concept meets the criteria of an emerging technology project, as defined by the residency model.
- **Clearly describe the roles of resident, host, and mentor.**
- **Refining and codifying a set of criteria for evaluating both resident and host institution candidates.** We will need criteria and an application process that can measure both “hard” skills and characteristics, and “soft” skills and qualities.
- **Creating a clear set of expectations for both host institutions and residents.**
- **Creating an “intake” process for project ideas for evaluation and prioritization.** In the project implementation, the grant implementation team may have a role in either creating an intake process for hosts, or working with the host institutions to determine appropriate projects for the residency.

- **Creating templates to help residents and host institutions to create or refine specific aspects of their programs.** For example, this grant project and model may provide:
 - A “Day 1,” chronological checklist for hosts to track their duties and tasks in supporting residents
 - A framework for structuring an effective mentoring component of a residency
 - Suggestions or templates for “deliverables” of a residency program
 - Criteria for evaluating residents and host institutions, and creating good matches
 - A sample job description for the residency position
 - Talking points for hosts for the residency position
- **Collecting and/or creating training resources for residents.** Since training is going to be a key part of the job of an emerging technology resident, the resident needs to have access to material supporting this role.
- **Providing ideas for potential host institutions for finding funding for a resident position, and for justifying that position.** In any institution, and especially in public libraries, considerations such as union agreements, staff cuts, and other challenges can prohibit the implementation of an emerging technology resident. While solving these challenges is well outside of the scope of this grant project, we may be able to provide some suggestions for approaching these challenges.
- Adapting or creating ways to **track and measure progress and effectiveness** of the residency programs.
- **Identifying the team and structure of mentors, coaches and advisors** for the implementation of the residencies. Mentors will be at the host institution; coaches for both residents and supervisors will be external to the institution; and advisors will help hosts and residents conceptualize and assess project ideas. The coaches and advisors will be a part of a national team.

What would it cost? Where does the residency administration ultimately live?

As we’ve seen, annual salaries for residents range anywhere from \$35,000 to \$44,000, aside from the costs of benefits, recruiting, development, and administrative funds. Part of our work through the remainder of this grant will be to explore the factors and alternatives around optimum model costs, and models for cost sharing with the host organizations. For the implementation of pilot residencies, cost is dependent upon the model structure, whether that means grant funding provides full salary funding, partial salary funding, or support funding. We also understand that we will need to account for regional differences in salaries; entry-level salaries will vary between, for example New York and South Carolina.

As mentioned previously, in our model, the resident salary would be tied to the entry librarian salary at the host institution. No matter what salary the host ultimately funds, the host ideally would also have a project and resources budget.

In order to be sustainable, the model needs to have a life beyond a planning or implementation grant. The materials coming out of the project need to be hosted somewhere, updated,

marketed, and monitored in an ongoing fashion. The cohort, mentor, and training pieces need to be maintained. The question becomes, where will be the home of the model?

Some possibilities are that the model could live in a university placement office, a particular MLIS program, or with a library foundation with an investment in leadership. It may be that the program would live with an organization like the Public Library Association (PLA) or the Library Leadership & Management Association (LLAMA) within ALA. With the right support, this could be a branded, prestigious program that fits in with an organization's plan of service. Something to consider would be, what revenue streams could be created out of it for the home organization?

The answers to these questions are not clear or easy. As we continue our work, we will continue to explore the possibilities.

For further discovery: implementation phase and beyond

In this white paper, we have explored and developed a residency model for technology integration in library settings. We have also encountered further questions that may be answered through an implementation grant, and in the practice of implementing pilot projects via that grant.

- What are the differences in structure between one- and two-year residency programs? How might that inform our model structure and funding, including cohort, mentoring, and training?
- What are the **minimal** competencies required of a resident or a host?
- How do we measure soft skills?
- How do we effectively match organizations with residents? What makes a good match of resident and host institution? Are there matching practices in other settings – such as medical residency – that we could leverage for this model?
- How do host institutions build visibility and support for their residency programs, both inside and outside of the organization?
- How do resident salaries vary by setting? (Urban vs. rural, academic vs. other settings) What is a reasonable salary to propose for the implementation of this model that can provide a competitive wage in today's job market? We will need to specify what it actually costs to install and sustain a successful residency at a library - not just the cost of paying for a resident, but the cost of supporting the host and resident in meaningful ways that produce results.
- What are the types of “products” and deliverables that come out of residency programs, especially from residents? Are there deliverables that a host institution would produce? What are the benefits to both the host institutions and the residents of those deliverables?
- What evaluation factors should be considered from the perspective of the resident? How does the resident evaluate the success or effectiveness of a residency experience?
- Measurement will need to be based on something outside of the success or failure of a particular emerging technology project. One interviewee characterized the challenge of measuring the success of implementing emerging technology projects as “the patient died, but the operation was a success.” (G. Evans, personal communication, January 12, 2012). The challenge is, how do we measure success of a resident in the face of a project failure?
- How do we identify and establish a home for the model? Where will the checklists, templates, and materials be housed? How will they be updated?
- How does this model tie back into LIS curriculum?

Final thoughts

This white paper brings together the information we've discovered to date on emerging technology, best practices in residency models, and some detail on an emerging technology residency model. From this point, we will develop a pilot model description and implementation grant proposal that we will submit in September 2012. We are now looking for host libraries that are willing to work with us on the pilot implementations, including funding a two-year residency.

For further information

We welcome your feedback on the information outlined in this white paper. For ongoing information on this project, please visit the Catalyst Project site at <http://slisweb.sjsu.edu/catalyst>. On the site, you can find links to our focus group presentations, and further information on the project.

If you are interested, please also take a moment to register to indicate your interest in the project. If you go to <http://slisweb.sjsu.edu/catalyst/catalystsignup.htm>, you can submit your email to indicate your interest in being a host site or a resident, in participating in a focus group, or in updates on the project.

Appendix A: Initial investigation findings

In preparation for the planning grant proposal to IMLS in 2010, our team conducted a three-pronged feasibility investigation in Fall of 2010 to assess the need for the type of residency program we envisioned, and to identify the scope of our planning activities.

- The first aspect of our investigation was an exploration of existing residency program models via literature review.
- The second aspect involved telephone interviews with library leaders and experts in library residency programs. Our intent was to gather input from the library community as we explored our project concept and potential planning grant activities.
- The third aspect involved reaching out to librarians whose jobs focus on emerging technology integration, again via one-on-one interviews.

We garnered input from former residents, residency program coordinators, technology experts, and library leaders regarding the challenges they face in designing effective residency programs, as well as how they identify and overcome obstacles when implementing new technology in organizations. We identified the following areas of inquiry, which guided how we structured our research methodology, and continue to drive and inform the development of our program design:

- **Technology Integration.** How are libraries currently integrating emerging technology into their operations? What types of technology are being integrated and how is it being integrated? What types of technology are being considered for implementation? Who is responsible for identifying opportunities and managing implementation? What can we learn from these individuals?
- **Residency Programs.** How are residency programs currently structured? How are residents recruited and selected? How are they matched with host institutions? What preparation do they receive? What are they expected to do? What evaluation activities occur in order to assess the success of the residency programs? What outcomes have they achieved? How are libraries able to fund residencies?
- **Resources.** What resources do libraries need in order to take advantage of emerging technologies to improve their services and operations? What resources do they need in order to host and, more importantly, sustain a residency program?

Our preliminary feasibility investigation provided a basis for our exploration of the four research pathways, and pointed to a number of questions we are exploring in this grant.

Appendix B: Key informants

Our **key informants and technical advisors** to date include:

- Cindy Gruwell, Associate Professor, St. Cloud State University in Minnesota, a former academic library resident, and author of *The New Graduate Experience: Post-MLS Residency Programs and Early Career Librarianship* and *Diversity in Libraries: Academic Residency Programs*
- Meredith Farkas, Head of Instructional Initiatives at Norwich University in Vermont, author of *Social Software in Libraries: Building Collaboration, Communication and Community Online* (Information Today, 2007), author of the monthly column "Technology in Practice" in *American Libraries*, and recipient of the 2009 LITA/Library Hi Tech award for Outstanding Communication in Library and Information Technology
- Nancy Howe, Deputy Director for Support Services, Santa Clara County Library, California, who is responsible for integrating technology into her institution's public services
- Lisa Moeckel, Associate Dean for Undergraduate Education, Syracuse University Library, which offers a library-funded residency program focused on diversity issues
- Cindy Mediavilla
- Luis Herrera, City Librarian, San Francisco Public Library
- Rachel Bridgewater, Electronic Resources Librarian at Reed College (Oregon)
- Holly Hinman, Directory, InfoPeople Project
- Jane Light, City Librarian, San Jose Public Library
- Vailey Oehlke, Director, Multnomah County Library
- Suzanne E. Thorin, University Librarian and Library Dean, Syracuse University
- Susan Hildreth, Director, IMLS
- Richard P. Hulser, Chief Librarian, Research Library, Natural History Museum of Los Angeles County
- Paul A. Sims, Library Services Manager, Mountain View Public Library
- Michael Stephens, Assistant Professor, SJSU School of Library & Information Science
- Lizabeth A. Wilson, Dean of University Libraries, University of Washington
- Dr. Scott Walter, University of Illinois and SJSU Lecturer
- Dr. Kathel Dunn, Associate Fellowship Coordinator, National Library of Medicine, National Institute of Health

We have selected our key informants and technical advisors based upon their knowledge and experience in the areas of emerging technology in library settings and residency models. We continue to identify additional key informants as we progress in our research.

In addition, members of the International Advisory Council for the San Jose School of Library and Information Science are available as needed. The council includes several individuals who are past-presidents of national professional associations, as well as industry leaders like Stephen Abram, Vice President for Strategic Partnerships and Markets for Gale Cengage.

Appendix C: Project team

Dr. Sandra Hirsh

Project Director

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Sandra Hirsh is Professor and Director of the School of Library and Information Science at San José State University. Prior to joining the School as Director, she worked in the Silicon Valley for more than a decade at major technology companies: Hewlett Packard and Microsoft. As an industry user experience researcher, leader, and manager, she contributed to R&D research projects and influenced the user experience of web, mobile, and TV consumer products resulting in 5 U.S. patents. She was previously an assistant professor at the University of Arizona, and has taught courses for San José State University and the University of Washington.

Dr. Hirsh's research focuses on information-seeking behavior and understanding the information needs of a broad spectrum of users in the United States and around the world; this work has been published in peer-reviewed journals and has appeared in international conference proceedings. Her leadership roles include serving on LIS committees for the American Society for Information Science & Technology (ASIST) and the American Library Association (ALA), as well as locally on Palo Alto's Library Advisory Commission. Her library experience ranges from academic, public, to special libraries.

Ruth Metz

Project Coordinator

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Ruth Metz's library career as a management practitioner and consultant spans academic, public, state libraries, and multi-type library cooperatives in Michigan, Colorado, California, and Oregon. She is a full-time national library consultant specializing in strategic planning and organizational and leadership development. She is the author of the *Coaching in the Library: a Management Strategy for Achieving Excellence*, (ALA, 2002, 2010). Ruth works with individuals and organizations to improve effectiveness. Her work involves one-on-one and team coaching. It also involves practical research and design of new models of service, staffing, and organizational structure.

Scott Brown

Project Research Coordinator

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Scott Brown is owner of Social Information Group, an independent information practice focused on the effective use of social networking tools for sharing and finding information. He has been involved in corporate, academic and public libraries for over 20 years. Most recently, he was a Senior Information Specialist with Digital Libraries & Research, the library and information organization at Sun Microsystems. Scott is a regular speaker nationally on many areas of information work. He also provides coaching for information professionals.

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Laura Serrano is a SLIS student following the Web Programming and Information Architecture career path. During undergrad she completed a one-year internship at the American Library Association, where she worked in both the Public Information Office and in Conference Services. Previously, she worked in publishing as an editorial researcher. She plans to graduate in December of 2012.

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Sheila Gurtu is Project Assistant for the SJSU SLIS Circle of Learning Program and has worked as a credentialed school librarian in K-6 and junior high schools in San Jose.

Resources

Lisa Valdez

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Lisa Valdez supports SLIS faculty in their grant development efforts by researching grant opportunities, developing grant applications, and coordinating grant logistics. She also develops outreach material for the School, including the School's annual review and the School's Facebook page.

Jane Fisher

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Jane Fisher received her MLS in library and information studies at the University of California at Berkeley in 1969. Prior to joining the faculty at San José State University in 2006, Ms. Fisher was a school librarian and cataloger in the Oakland, California, Unified Schools District; a continuing education manager at UC Berkeley Extension, where, among other responsibilities, she inaugurated a comprehensive program of courses, conferences, and institutes in library and information studies; director of an NSF-funded science curriculum development project at the SETI Institute, Mountain View, California; library consultant for the School of Library and Information Science at San José State University; and literacy programs manager for an educational curriculum development and production company.

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