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# Lead Users: A Predictive Framework for Designing Library Services and Spaces

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## Introduction

The purpose of this paper is to describe the mix of qualitative and quantitative methods applied at the Georgia Institute of Technology Library as part of the Library Next project. Library Next refers to a transformative reimagining of library services, spaces, infrastructure, technology, and operations now in process at Georgia Tech. This paper will focus on the user research and service and space design process developed by brightspot strategy and coordinated by both brightspot and Georgia Tech Library during 2013–2014.<sup>1</sup> In particular, the paper describes how we applied Eric von Hippel’s “lead user” approach to identify opportunities for future innovation in designing new library services.

## Designing for a Changing Context

As we began the Library Next project, we identified the larger trends that were driving change at Georgia Tech Libraries and how we would respond. We called these the future service directions and they set the context for the project. We began by recognizing that the majority of library visits and information are online and that more information is created and shared digitally. So, we decided to think about the library as primarily online, with physical space complementing it. Conversely, we then also determined that, by moving physical collections off-site to the Library Services Center, making online resources, tools, and services more visible will be even more critical to the library’s operations—the more digital things become, the more place matters.

These shifts then led us to define the broad service directions that informed the service and space program design process. First, the library sought to be involved earlier and longer in the research process and connect people to the “whole universe of information,” beyond what is available at Georgia

Tech. Second, the library saw the need to get outside their building to “push” services out to advanced users (e.g., grads, faculty) while continuing to “pull” users (e.g., undergrads) into the library. Third, the library recognized that it would be critical to do more community engagement and outreach to make everyone aware of research, teaching, and learning activities happening on campus through exhibitions and events. Fourth, helping users acquire, curate, analyze, visualize, store, and manage is essential. Fifth, the library sought to incorporate more technology-rich spaces and tools, e.g., visualization labs, maker spaces, multimedia studios, prototyping tools, retrocomputing, and audio and video recording studios. Finally, in doing all this, the library wanted to help users help themselves, e.g., self-checkout, self-serve hold shelf, and improved quick search online.

From this direction, we developed a vision statement for the libraries that we used to guide our interactions with users, what spaces to provide, what services to offer, and how to deliver them. The library’s vision is to: “define the technological research library of the 21st century, enabling people to explore the past and design the future, by bringing together inspirational spaces, curated content, expert guidance, and scholarly communities.”

## Our Hypothesis: Work with Lead Users to Predict the Future

Libraries of all types and sizes are asking the same question: “How can we anticipate shifts in user needs and preferences?” There are many ways to answer this question: institutions can look at quantitative trends, consult with outside experts, look beyond their industry, talk to users and staff, or perhaps consult a crystal ball. Because we see that within

academic libraries—anticipating future needs are of particular significance as many of the mid-century library facilities on college campuses reach the end of their useful lives—we decided a rigorous approach to engaging specific users and staff would be the best approach. Concurrent with this trend are often precipitous declines in print collection circulation, coupled with increased demand for new user spaces and services. At Georgia Tech, an opportunity arose to manage the legacy print collection for the long-term via a unique public-private partnership with Emory University Libraries, resulting in a singular opportunity to transform the aging library facilities around user spaces and services, and less around underutilized print collections.

### **Eric von Hippel and “Lead User” Theory**

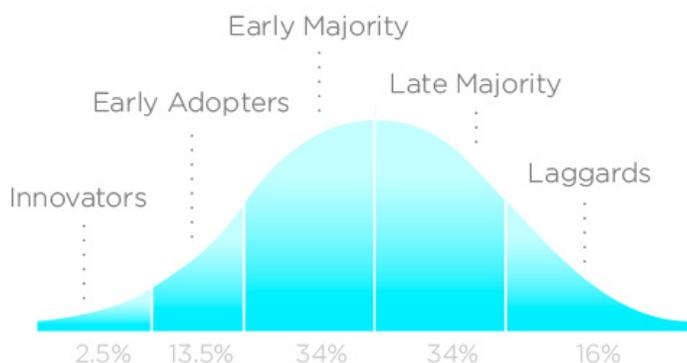
In trying to answer the “what’s the future” question, we based our design method upon the work of Eric von Hippel, an economist at MIT and author of *Democratizing Innovation*. Von Hippel is perhaps most well known for coining the phrase “lead user” and defining the methodology by which firms are able to identify opportunities for transformational innovation in product design. In *Democratizing Innovation*, von Hippel notes that upwards of 40% of users make some effort to modify, improve upon, or “hack” their product.<sup>2</sup> His research also suggests that lead users are often prepared to “freely reveal” their innovations, thereby contributing to the growth of the information commons. This “free reveal” behavior is particularly evident in the open source software community. Early evidence of von Hippel’s examination of lead user behavior includes an interesting case study in Australian libraries. In 2000, von Hippel, Morrison, and Roberts conducted a study of OPAC adoption and integration in Australian libraries. This was at a pivotal point during the overall adoption lifecycle for library OPACs. Most library systems offered by vendors

possessed a rudimentary functionality, but users (in this case, systems librarians) were increasingly seeking more features in order to improve the OPAC experience for their end users. Of the 102 libraries that responded to the study, the researchers found that a quarter (26%) made some adjustments above and beyond those built into off-the-shelf systems by vendors. Furthermore, those lead user improvements were generally viewed favorably by the vendors themselves, with 70% of the improvements made by lead users considered of medium or greater significance to firm managers.<sup>3</sup>

Another case study also illustrates the power and impact of lead user innovations on the marketplace. The CamelBak is a commonly used lightweight hydration device that allows runners, cyclists and other athletes to stay hydrated without stopping, slowing down, or awkwardly tilting their head to drink while in motion. This now-ubiquitous device was first developed by a lead user, Michael Edison, who also happened to be both a paramedic and a distance cyclist. Edison could not find a product that met his unique needs in the marketplace, so he developed a prototype of the CamelBak from surgical tubing and an IV bag sewn into his shirt.<sup>4</sup>

### **Method**

Our method for the Library Next user research project consisted of applying the lead user approach described by Eric von Hippel and further informed by the work of Everett Rogers. Rogers is a sociologist from Iowa State and coined the phrase “early adopter” in his seminal work titled *Diffusion of Innovations*.<sup>5</sup> We applied his “curve of adoption” as a way to segment our user community for the purpose of future space and service design. We defined our lead user population based on Rogers’ curve, and our goal was to identify and engage those innovators and early adopters (the first 15% of the curve).

**Figure 1: Everett Rogers Technology Adoption Lifecycle**

### INNOVATION ADOPTION LIFECYCLE

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In summary, our methodology consisted of identifying lead users, deeply understanding their research, and teaching and learning lived experiences with an eye towards workarounds as well as identifying unmet needs. We also conducted campus surveys and hours of observation, and then worked with the design team to cocreate program spaces and services to anticipate where their research, teaching and learning is headed at Georgia Tech.

#### Identifying Lead Users

Von Hippel recommends a stepwise approach to identifying lead users in any market.<sup>6</sup> First, consider a major trend that is impacting library operations. For example, this could be an increasing need for collaborative spaces with access to power and data. Next, brainstorm the possible lead users within that market who may be deeply familiar with that trend of increased collaboration. This could be a group of “regular” library users from an honors undergraduate design-oriented course requiring teamwork. The two key factors to keep in mind in identifying lead users within your library communities are:

- identifying individuals or groups with needs that are at the leading edge of the trend, and
- identifying individuals or groups who possess a high incentive or motivation and resources or abilities to develop solutions for their needs.

#### Lead Users: External and Internal

The Georgia Tech Library manages three highly-engaged advisory boards (undergraduate, graduate, faculty) who provide direct student and faculty

input to the library’s senior administration including the dean. Areas of input include consulting on the library’s digital programs, services, collections, renovations, and marketing efforts. The popular commons renovations in the Georgia Tech Library over the past 15 years (Library West Commons, Library East Commons, and 2 West Commons), as well as a number of the library’s web services, were influenced by participation from Board members. These Board members provide a natural source for lead users and were relied upon for insight and guidance throughout the user research process. Also important to this approach are identifying *internal* lead users, particularly for those institutions who find it challenging to maintain dedicated advisory boards or identify other means of engaging external lead users. These internal lead users are defined by Schweisfurth as employees who also happen to be heavy users of the company’s products or services.<sup>7</sup> These internal lead users are different than other employees in the firm because they exhibit many of the same characteristics as external lead users (awareness of the leading edge of trends, solution-oriented affect, and motivated to develop workarounds). So it is entirely possible, and even likely, that your lead users have already devised innovative workarounds to solve their needs. How can librarians and library administrators leverage this innovation?

#### Data Gathering Techniques

We employed a variety of qualitative- and quantitative-based data gathering techniques to deeply understand the lived experiences of Georgia Tech’s lead users and also better recognize the

tectonic shifts occurring across the landscape of higher education. User engagement methods for collecting data from lead users included, but were not limited to, the following:

- Individual Interviews
- Journey or Experience Maps
- Shadowing
- Journaling
- “Headlines” Activity

We held 25 interviews with individual faculty members and postdocs, and 13 interviews with graduate students from 23 Schools and all six of Georgia Tech’s Colleges.<sup>8</sup> Each interview lasted approximately 30 minutes and was aimed to better appreciate the “pain points” and subsequent workarounds by faculty and graduate students who operate at the forefront of their respective fields. It is important to note that the interviewers did not explicitly ask any library-related questions until

later in the interview, and in some instances, not at all. This was intended to understand the faculty and student lives in a more holistic way, without focusing too intently upon the library. In many instances, opportunities for the library to solve a lead user need emerged, as is further discussed below in the results section.

Another technique applied during the project involved Journey Mapping. This technique involved primarily internal lead users from the library and a few associated non-library units. Participants were asked to develop maps of how users accomplish relevant and significant tasks related to teaching, research and learning. For example, if a faculty member decided to “flip” their course, what steps would be required from inception to execution? What types of affordances would be needed: expertise, software, hardware, furniture?

**Figure 2: Shadowing, Journaling Synthesizing**



	I looked for how self-determinat Google Scholar and was able to network. (I can't overstate how I wanted to read the complete art from GT were at. I took that opp not sure I would have spoken w I did.
Tuesday	
Wednesday	I'm still working on the literature be so overwhelming. To resolve formulating the story that I want own or by bouncing things off of Because I'm learning so much it teaching someone. Several time me what I'm doing. In those mor ask questions about it so I end u
Thursday	
Friday	For me personally, I enjoy worki member. We can work on our or suits me just fine for this.
Follow-up questions	How do you focus your reading Are shared collaborative spaces



Georgia Tech Library and brightspot strategy

## Results

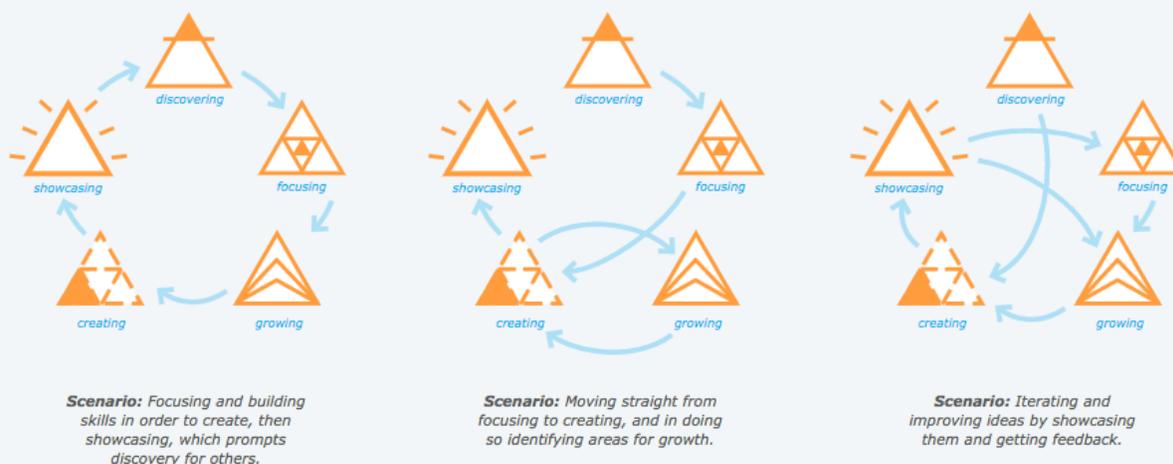
Based on the data gathered we developed a user experience model that addresses the “lived experience” of the faculty and graduate lead users at Georgia Tech. This user experience model describes five “moments,” which can be thought of as goals that users are trying to achieve within their research, teaching, and learning experiences:

- Discovering: Finding the right information, content, people, and tools
- Focusing: Filtering information and identifying what is next
- Growing: Mastering new skills and building relationships
- Creating: Expressing and applying ideas
- Showcasing: Testing and sharing with the community

**Figure 3: Moments**

## moments

Since research, teaching, and learning are blurring, we thought about how people work in terms of *projects*. Within a project, moments generally occur in a cycle though there are certainly loops that occur within. Below are examples of how users might move amongst moments, and the following pages present “experience maps” as examples of how moments might play out in projects.



### Georgia Tech Library and brightspot strategy

The following describes five notable instances when a lead user’s workaround represented one of the five “moments” and, ultimately, developed into a new service or space in the library.<sup>9</sup>

#### **Discover: Digital Media and Scholarship Commons<sup>10</sup>**

We found that even at the undergraduate level, lead users are attempting to discover new modes of visualizing and communicating their work. In this instance, the lead user was a member of the library’s student advisory board and a chemical engineering major seeking to visualize chemical engineering data. There exist many visualization spaces on campus but they are typically housed in secure departmental labs, so we designed a suite of spaces and services available to everyone in order to support digital scholarship, whether through visualization, high performance computing, or even retro-technologies.

#### **Focusing: Consultation Zone/Research Navigators<sup>11</sup>**

It is now commonly known that stores such as CVS and Walgreens offer basic medical services such as

flu shots. However, it was not that long ago that the entire business model for this industry rested in the pharmacy and drugs delivered to the customer within their stores. This is a useful exemplar of a sector that has radically transformed in relatively short order to be involved “earlier and longer” in providing healthcare for their customers. In speaking with doctoral lead users and early career faculty, we also detected an opportunity to be involved “earlier and longer” by more proactively supporting faculty research grants, and also helping doctoral students to focus on emerging trends for possible dissertation topics. This level of proactive service requires making active, stronger connections with campus research support units such as the Office of Sponsored Programs. We also designed a space for librarians to meet with faculty in a semi-public setting. This type of visible and proactive service and space makes the work of librarians, formerly conducted almost entirely in private offices, far more public within a new, highly anticipated (and utilized) library facility.

#### **Growing: Teaching Studio<sup>12</sup>**

We interviewed a public policy professor who is one of those innovators from Everett Rogers’

Curve of Adoption (she is part of the 2.5%), and is among many Georgia Tech faculty seeking to “flip” their instruction. This faculty member engages in problem-based learning and through both interviews and observation, we were able to gain a rich understanding of her workarounds as well as the challenges of trying out new teaching and technologies “on the fly.” So we created a place for her to grow and develop her experimental teaching methods before going “on stage” in the classroom.

### **Creating: Innovation and Ideation Studio<sup>13</sup>**

“Design Thinking” has become a common buzzword across all disciplines—no longer relegated to just schools of architecture. We detected a trend among lead faculty users that they were integrating design thinking principles into their curriculum. In addition, inspired by the winners of the student innovation award at Georgia Tech (called the “Inventure Prize”), we designed an Innovation and Ideation Studio with the modeling materials, spaces, and affordances to support design thinking across the disciplines. The Innovation and Ideation Studio is a place that allows students the capacity to create. In interviewing the undergraduate winners of Georgia Tech’s prestigious and competitive innovation contest we learned about furniture, layout, services and materials to help Georgia Tech students create their next invention, idea, or innovation.

### **Showcasing: Scholar’s Event Network<sup>14</sup>**

We interviewed one of the most popular and engaging professors at Georgia Tech. This teacher connects literature and engineering in his classes. For example, one of his classes recently built a replica of Henry David Thoreau’s house at Walden after reading the text and using only the tools available to Thoreau in 1854. We found that he often struggles to locate a suitable space on campus to display the work and also have his students present about their process in a public forum. So we designed a space with a large enough volume to accommodate this kind of creativity and also included an integrated network of presentation spaces.

### **Conclusion**

The method described will only get you so far. Putting it into practice relies on a particular mindset of agile prototyping and a skillset of developing a deep empathy and compassion for the lead users—both of which are often espoused by champions of

“design thinking.” The prototyping mindset is one that recognizes failure through trial and error as the critical path to success. So, rather than want to have perfect information about a problem and the perfect solution, you must try a thing out, measure success, and adapt as you learn. The empathy skill-set relies on having the right mix of social-emotional skills and is critical to creating that two-way conversation with your lead users: understanding their motivations, behaviors, expectations, and limitations to such an extent that you can see and experience the world—or a space or service or technology—through their eyes.

Equipped with empathy and a willingness to try things in the face of risk and uncertainty not only enables you to engage lead users to predict the future; it makes your work more productive and fulfilling as well. Practicing this, you can better understand the people you are trying to help. You can more consistently help them. You can tell better stories about who you have helped and how so that you can have an even greater impact. And, by applying a leaner, more agile mindset you can change the conversation about your work and its results from asking people to support an unproven aspiration to enlisting them in scaling up your success.

After that, what is next? Getting the mainstream to adopt what lead users are already doing. Fortunately, in addition to shaping how we think about innovation in terms of segmenting adopters along a curve, Everett Rogers also identified the five core criteria people generally consider when deciding whether or not to adopt a new idea: observability, trial-ability, complexity, compatibility, and relative advantage.<sup>15</sup> Libraries can use these five criteria as a checklist of sorts for their new initiatives. Librarians can be sure they: find ways for people to try out what they are proposing, see others doing it, make their idea easy to understand, communicate how it relates to what is happening today, and make a compelling case for how it is better than the status quo.

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### **Notes**

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