When we ask questions, we want answers. We want accurate answers, and we want those answers now, at Internet speed. In short, we are in search of certitude for the answers to our questions. For college and university communities, the questions needing answers can be myriad: “Which was Shakespeare’s first play?” “How do I configure Window’s Vista to connect to the campus Virtual Private Network?” “Where is parking for the Friday Art Exhibit?” “Where is the source dataset for the metabolomics simulation in lab paper WP2008-12a?” “What is a good source for the W131 Introduction to Writing required references?” “When did the trustees formally vote on the new purchasing rules?” “How do I hide the online roster for my multi-section course?”

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Certitude may imply absolute infallibility of an answer, but it also recognizes a continuum of reasonable confidence that can be attributed to an answer. Though the word certitude is defined as “total certainty,” the modern quest for certitude encompasses the second part of this definition: “or greater certainty than circumstances warrant.”2 Questions and answers have sought each other for millennia, most often with an information seeker asking a question of someone with presumed greater knowledge. The Internet has enabled instant access to answers, but it has also brought new uncertainties over the accuracy of the answers, over access to contradictory answers, and over persisting difficulties in finding timely answers for some topics. Circumstances dictate when an immediate answer that is “good enough” is more valuable than a precise answer tomorrow.

Colleges and universities—as communities of both knowledge creators and information consumers—value all levels of certitude, with a refined sense for matching a level of confidence to a particular need. Researchers and scholars pursue questions and generate rigorous evidence to advance human knowledge. Staff—in libraries, at IT support desks, and in student enrollment services—provide answers daily to thousands of questions across a range of circumstances. As the second decade of the public Internet reveals a desire for immediate access to greater certitude, CIOs and other campus leaders have an opportunity to rethink how questions find answers that are good enough or quick enough for the context of need.

**The Challenges of Digital Abundance**

Information seekers have gone from a relative drought to sipping from a digital fire hose. Following a common habit of our day, I entered the two words digital and abundance together in Google and received about 543,000 results (just from English-language sites). The 500th entry on the list holds equal promise to the first ten. The list yields authoritative sources from traditional scholarly domains, as well as blogs, self-published items, presentations, and other uses of the terms. It is quite possible that the best insight for the two words may come from a thoughtful blog entry or Wikipedia. It is also possible that some postings and resources may contain questionable accuracy or errant bias.

All trends point to exponential growth in digital abundance. Efforts like Google Scholar, the read-write capabilities of what has been labeled “Web 2.0,”2 the curation of scholarly data, and the mass digitization of historical collections affirm this trend. Although the ease of digital access to this volume of content has raised concerns that a deeper look for accuracy or more thorough insight may be undermined, the immediacy of results often trumps these concerns. Immediate results often meet the level of certitude warranted for a situation. Thus, we see growing abundance in content, information seekers’ greater perceived value for ease of access and speed, and subject-matter experts’ increasing concerns regarding sufficiency of certitude for answers.3

These trends can be understood as three eras that describe successive generations of the use of and expectations for the Internet. The eras are cumulative; each enlarges, rather than replaces, the preceding era.

**Era of Publishing**

The Era of Publishing describes the pre- and early Internet period. The costs of production and dissemination via paper or digital media provided an economic balance to supply and demand. This era had limited capacity, and the costs of production created some value-adding filtering for investments in content. Editors and others provided quality control to sustain the value of a branded distribution channel. The journal Nature, the Encyclopaedia Britannica, CliffsNotes, Rand McNally Atlas, and various books and newsletters are examples. This era was distinguished by a relative scarcity of distribution (only to paying customers), good attention to accuracy, and relative slowness in cycle time from idea to distribution—even if distribution moved from print to online.

At Indiana University (IU), this era is illustrated by the creation of the Knowledge Base (http://kb.iu.edu) for all kinds of technical, policy, and support answers. The KB is a publishing operation with editors, highly refined fact-checking processes, curation for cross-linking knowledge to other related topics, and excellent support. It is heavily used across IU’s eight campuses and is paid for by IU, but half of the 17 million page views of its 13,500 documents come from outside of an IU domain. The annual activity-based cost for the KB is about $1 million. IU believes that the KB is a good value for self-service access to accurate answers, since at $.06 per page view, it reduces expensive support phone calls and consultations.4

**Era of Participation**

The Era of Participation expands the Era of Publishing to be much more inclusive in the instant creation of content by anyone. The relatively low-cost economies of production and dissemination via digital
networks combined with the consumerization of the tools to do so have blown open the gates to content creation and distribution. Many traditional publishers, such as newspapers, now allow readers’ comments to directly accompany a published article, and some of these online discussions draw thousands of interesting extensions, counterpoints, and insights to the article. Wikipedia has demonstrated that the Era of Participation can produce a free-access, imperfect encyclopedia just as the Era of Publication produced a for-fee, limited-access, imperfect encyclopedia. The Era of Participation values speed and inclusion. It is distinguished by unlimited distribution, much content that is neither filtered nor fact-checked, and a rapid production cycle that may yield self-correction over time.

Wikibooks (http://wikibooks.org) and the Global Text Project (http://globaltext.org) are examples of the Era of Participation. Each provides free access to community-authored content in the form of books or textbooks. The Global Text Project states its philosophy as “engaging many for the benefit of many more.” Another example is Slashdot (http://slashdot.org); in its Firehose system, readers assist editors in selecting stories by categorizing how “hot” a story is by using a red-to-violet color scheme. Every story is a discussion, with a few to thousands of community comments, depending on the topic. The aptly named blogosphere amplifies near-instant dissemination of personal views among bloggers as a leading exemplar of content creation in the Era of Participation. Thus, participation can rapidly shape even the managed publication of content.

Similarly, alongside its highly refined, fact-checked publication process, the IU KB has added a wiki for tips, techniques, and how-to ideas from anyone in the broader community. WikiKB documents hasten the speed of insight from IU’s local support providers in the schools and administrative units to help the KB more quickly discover new technical insights and update its published documents. WikiKB content does not pass through the KB’s editors, so what is gained in agility and participation must be balanced against the testing, checking, and greater certitude of the KB. Time will tell if the KB community is of sufficient number and motivation for this crowdsourcing approach to knowledge sharing to be effective.

Era of Certitude
The emerging Era of Certitude is the next era, one that builds on both publication and participation but that addresses higher thresholds of certitude through authenticity of source, credibility, and even dialogue for refinement of answers across time and distance. Whereas the first two eras arbitrated the creation and distribution of content, this third era is
about the timely extraction of meaningful answers from content and distribution.

Quality sources and wise guides have always been a path to certitude though the ages. What has changed is the desire and expectation for “anytime, anyplace” access to this path. Kevin Kelly has observed that as distribution and discovery become pervasive and increasingly commoditized services, the Internet becomes a “super-distribution system . . . that copies promiscuously and constantly.” He asserts that value creation does not follow the pervasive copies; rather, inimitable generatives create value that is better than free content. Generatives must be grown, cultivated, and nurtured and cannot be easily imitated. Kelly names eight: immediacy, personalization, interpretation, authenticity, accessibility, embodiment, patronage, and findability. All of these closely align with the deep knowledge competencies of colleges and universities. Librarians, staff at help desks and research centers, and even campus phone operators have long exemplified these eight generatives.

In the Era of Certitude, the arbiter of value creation shifts from content access to intelligent matching of questions with answers that meet an information seeker’s threshold of certitude at the moment and place of need. The era is distinguished by near-immediate access to higher levels of confidence in answers gleaned from the digital fire hose.

**Trending toward Certitude**

For centuries, accomplished scholars and academic librarians have been valued for their deep expertise. The news media, inventors, government agencies, and others have sought out scholars and librarians when they needed specialized insight. Students at prestigious colleges and universities were afforded access to the libraries, services, faculty, and courses at these academic institutions.

The rise of the public Internet heightened concern that less costly substitutes would displace colleges and universities or, at a minimum, greatly shift the role of these institutions in education and research. In some ways, this has happened. Credible, online degree programs offer greater flexibility for some students. Many library resources are increasingly available via public access. Yet to the extent that these trends respond to a growing market that enables broader participation in education and scholarship by society, they are not shifting the core contributions of colleges and universities; instead, they are pioneering paths of value.

Colleges and universities begin with very good brand, reputational, and human assets for the Era of Certitude, since faculty and staff are often at the forefront of insight—from scholarship to IT support. Timely and efficient access to those knowledge sources, however,
remains an unfinished endeavor. What is needed is a new generation of tools and processes to project institutional knowledge to communities of interest (e.g., students, faculty, staff, alumni) at the moment and place of need.

Innovators are already pioneering a new generation of tools for the Era of Certitude. For example, the free and open Stanford Encyclopedia of Philosophy (http://plato.stanford.edu) is an online repository of topical entries related to the domain of philosophy. Each entry is maintained by a group of identified scholars and is reviewed by an editorial board as part of a dynamic and continuous process of publishing, participation, and increased certitude. Authors are identified as well, and peer-review processes ensure rigor and revision.

Google announced plans for its online encyclopedia effort, Knol, in December 2007. The philosophical contrast with Wikipedia—the leading exemplar of the Era of Participation—is telling. According to the plans, Knol will add clear evidence regarding the source of writing in its wiki encyclopedia by providing the real identity—authenticity—of its authors. For example, Knol’s sample entry on “Insomnia” (see figure 1) relies heavily on the implied credibility of the author, a Stanford University School of Medicine researcher, to raise the certitude potential of the freely published information. This example illustrates how the insights of college/university faculty and staff, combined with an institution’s brand, can signal greater certitude. Google is also creating a revenue model to provide contributors who may offer greater certitude with an incentive to participate in the writing of Knol entries.

**The Tools of Certitude**

Colleges and universities have long invested in the staff, tools, and processes for the Era of Publishing. Blogs, wikis, and other modern tools are now enabling the Era of Participation, with many of those generic tools coming from third-party, commercial providers such as TypePad or Blogger. As a result, colleges and universities may not need to provide these software tools; instead, they can connect to or embed the commercial services within institutional systems. The Era of Certitude, however, provides an opportunity to rethink how—and with which tools—questions find timely answers that are good enough or quick enough for the context of need.

**Dimensions for Certitude-Era Tools**

Five dimensions—Reach, Response, Results, Resources, and Rights—can be used to describe the tools for the Era of Certitude.

First, what is the reach of a knowledge source? A walk-up help desk that is staffed with domain experts reaches only to the line of people standing in front of the service counter. Phone, e-mail, and chat services increase the reach to people who can call, find, or navigate to a particular service, but only when the service matches the information seeker’s context of need. For example, phone support may be impractical when the seeker needs an answer while in a meeting or in a foreign country, and e-mail support is unsafe when the seeker is driving.

Second, when will the response to a question arrive? Is it an instant answer,
like an algorithmic search in Google, or is it time-delayed, with a response in minutes, hours, or days? Some questions may require near-immediate answers, whereas answers in a few minutes or hours may be sufficient for others. For many questions, the social expectation for response may correlate with the precision of result needed.

Third, will the results invoke confidence in a high level of certitude for accuracy and sufficiency for the question? Is the form of the result a simple textual or verbal answer, or is it a document or image? Is the source of the answer alone sufficient to invoke confidence in the answer, or are additional details required to credential the source?

Fourth, what resources are required to send the question, receive the question, and convey the result? This dimension goes beyond the existing staffing costs of knowledge sources and addresses the means of knowledge projection to an information seeker. Are the connections between the information seeker and the knowledge source institutional systems, or are they generic commercial services? What devices, accounts, or service contracts does the information seeker need in order to access the tools?

Finally, who has rights to the intellectual property (IP) that is a byproduct of every question, answer, and information seeker’s assessment of sufficiency? Is this IP captured in real time during the interaction, for reuse and value, or does it perish in each encounter?

Table 1 illustrates these five dimensions by showing how a library's expertise might be projected to information seekers via six modes of delivery. Although the tools for the Era of Certitude do not vary on a single continuum, the columns are ordered to illustrate a “human only” to a “machine only” interaction, with blended modes in between. The table also illustrates an approach in which the service and infrastructure may be entirely within the institution, may be blended with commercial services, or may be offered entirely by commercial services.

**Initial Progress**

The first wave of tools for this era is already in place with the rise of commercial Internet search engines. A question seeking an answer at some specific level of certitude is, by definition, a search process. The commercial services, especially Google, have demonstrated that their algorithmic search has remarkable efficacy for finding and prioritizing high-probability results. Many colleges and universities now use the Google Search Appliance within their networks to provide answers that can be accommodated by algorithmic search. For most questions, algorithmic search is good enough and quick enough. It reaches to any network-enabled device (e.g., PC, mobile phone), the response is near instantaneous, the result is often credible, and the resources are mostly advertising subsidized and consumer devices.

But as the need for certitude rises, algorithmic search may not always yield the best answers. For example, I recently needed to know when the IU Information Technology Strategic Plan had been approved. A quick search using IU's Google Search Appliance yielded the plan itself, with a May 1998 cover and many related documents. Yet no combination of search terms yielded the official approval date in the minutes of the IU Trustees. After I navigated to the archive of the IU Trustees within our library, I was able to conclude with confidence that the plan was officially approved on December 4, 1998. But what if I had not known about the library's trustees archive? How might I have found it? I would have needed to ask an expert.

### Table 1. An Example of the Five Dimensions of Tools for Certitude

<table>
<thead>
<tr>
<th>Dimension</th>
<th>In-Person Consultation</th>
<th>E-mail Consultation</th>
<th>Real-Time Textual Chat Consultation</th>
<th>Guided Search Consultation</th>
<th>Voice Question, Text Answer</th>
<th>Algorithmic Search</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rights</td>
<td>Institutional; perishable interactions</td>
<td>Institutional; if captured, managed</td>
<td>Institutional; if captured, managed</td>
<td>Shared</td>
<td>Shared</td>
<td>Commercial</td>
</tr>
<tr>
<td>Resources</td>
<td>Physical space</td>
<td>Existing e-mail</td>
<td>Special messaging systems</td>
<td>Outsourced; process integrated</td>
<td>Outsourced; process integrated</td>
<td>Outsourced and/or licensed in-house</td>
</tr>
<tr>
<td>Results</td>
<td>Authoritative</td>
<td>Authoritative</td>
<td>Authoritative</td>
<td>Authoritative</td>
<td>Authoritative</td>
<td>Varies</td>
</tr>
<tr>
<td>Response</td>
<td>Synchronous; immediate</td>
<td>Asynchronous; minutes to hours</td>
<td>Synchronous; immediate</td>
<td>Synchronous; immediate</td>
<td>Asynchronous; minutes</td>
<td>Immediate</td>
</tr>
<tr>
<td>Reach</td>
<td>Limited; physical location</td>
<td>Anywhere; typing suitable</td>
<td>Anywhere; ongoing typing</td>
<td>Anywhere; ongoing typing</td>
<td>Anywhere; talking suitable</td>
<td>Anywhere; typing suitable</td>
</tr>
<tr>
<td>Mode of Delivery</td>
<td>Library Reference Desk (no technology)</td>
<td>E-mail a Librarian (any e-mail)</td>
<td>Chat with a Librarian (messaging, web browser)</td>
<td>Librarian via ChaCha (web browser)</td>
<td>Librarian via Text ChaCha (mobile phone, SMS)</td>
<td>Google (web browser)</td>
</tr>
</tbody>
</table>

* Assumes librarian as expert and commercial tools for connecting information seeker and knowledge source.
This is not a question of finding new money for guided staffing services and tools; most colleges and universities are already staffing and supporting these activities in many departments.

Paths to New Tools
How will the tools for the Era of Certitude develop on college and university campuses? This is not a question of finding new money for guided staffing services and tools; most colleges and universities are already staffing and supporting these activities in many departments. Librarians at a reference desk, staff at an IT support center, and personnel at other venues are answering questions every day, in-person with walk-in clients, via e-mail, and through online chat tools. Thus, the question of new tools and processes is one of a choice between a continued evolution via experimentation and adaptation at the edge over time (“evolution at the edge”) and a coordinated effort that presumes a possible revolutionary path of a leveraged approach across departments (“revolution via leverage”). In the first choice, rapid experimentation over time may develop new tools and services that can reveal insights regarding how tools fit to departmental processes and service expectations. Alternatively, a leveraged plan across multiple departments may provide information seekers with the benefits of learning a single path to certitude. It may give an institution leverage in maturing tools and processes across a range of knowledge domains. The choice of edge or leverage will likely reflect an institution’s culture.

Evolution at the Edge
Colleges and universities constitute many varied sources of expertise. Staff members at library reference desks answer an amazing variety of questions every day. Staff at student health centers, research centers, and IT support centers all answer questions with high degrees of certitude. Many of these sources of expertise and service are already deploying various synchronous or asynchronous knowledge-projection tools to span distance and reach information seekers. Some commercial tools—including Docutek VRL plus, QuestionPoint, and Tutor.com—are gaining favor with libraries.

Like many other large institutions, IU already has many examples of service and tool evolution. For instance, the IU-Bloomington library has developed the “Ask a Librarian” service: information seekers can e-mail a question to the library, and library staff will often be able to provide an answer in less than twenty-four hours—and sometimes within a much shorter timeframe. The library has also deployed a real-time textual chat module so that information seekers can invoke a chat session with a librarian. These tools seek to project librarian expertise to the moment and place of need when greater certitude may be required—certitude beyond algorithmic search.

Similar knowledge-projection tool development and deployment services have also evolved, using different tools, at the IU-Indianapolis campus library, the IT Support Center, the Kinsey Center, and many other departmental units. Each has deployed a different mix of tools and processes. Unfortunately, this evolutionary approach to innovating the tools of certitude creates duplicative software costs for each department, limits knowledge sharing for service improvement, and most important, forces information seekers to direct their questions to the right service front door to even be able to
What if members of a college or university community—faculty, staff, students, alumni—could point their browser to a single URL for access to algorithmic search plus access to expertise and guidance if greater certitude is required?

find the disparate software tools that connect to the experts.

These tools also vary in their ability to capture the insights and knowledge of each service interaction. With the exception of the IT department’s KB, most of these departments have not been able to fund and sustain an online, self-service knowledge base of answers. Thus, they find themselves facing recurring costs to answer recurring questions, and they struggle to provide a consistent quality of answers from various staff. By offering the ability to span distances and curate emergent knowledge for recurring questions, the tools for the Era of Certitude may provide help.

Revolution via Leverage
Alternatively, what if members of a college or university community—faculty, staff, students, alumni—could point their browser to a single URL for access to algorithmic search plus access to expertise and guidance if greater certitude is required? They would not need to know multiple service front doors but would be able to reach a variety of experts, for greater levels of certitude, through one URL.

Although this is intuitively appealing, the question arises as to how queries would get routed to the right source of institutional expertise. Could the answers be harvested and systematically refined to create a self-improving knowledge base for a domain of expertise? Which college or university experts would answer which questions? What about scholarly communities of disciplinary knowledge—for example, physicists seeking answers from other physicists? How would this integrate with good-enough algorithmic search? In short, is there a common platform of tools for the Era of Certitude that can fit the knowledge-projection needs of many departments?

An Example
IU has embarked on a multi-year research, development, and services strategic alliance with a startup company, ChaCha, to build a next-generation service for search and greater certitude across a range of the university’s knowledge sources. ChaCha’s public search service had already built a model using paid guides to help information seekers find answers via real-time chat. The IU project seeks to use the ChaCha platform—an outsourced service with no fee—to connect IU experts to the IU community for guided search as part of a leveraged path.

The alliance explicitly recognizes differing levels of certitude based on the type of search and answer required. The Search Pyramid (see figure 2) illustrates that the bulk of search remains very well served by machine-based, algorithmic search results. At the top of the pyramid, a smaller proportion of search may benefit from human guides for greater expertise or even for delegation when circumstances preclude the use of a web browser or synchronous server encounters (e.g., if the information seeker is driving or has no time to wait for an answer). In the middle, some questions benefit from a tier of human-certified answers—“Web Gems”—that appear first on a page, before simple algorithmic search results. At the top of the pyramid, a smaller proportion of search may benefit from human guides for greater expertise or even for delegation when circumstances preclude the use of a web browser or synchronous server encounters (e.g., if the information seeker is driving or has no time to wait for an answer).

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Figure 2. Search Pyramid: Relative Proportions of Certitude Needs and Search Types

<table>
<thead>
<tr>
<th>Human guides provide interaction, expertise, and guidance; synchronous or time-delayed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potentially Higher Certitude</td>
</tr>
<tr>
<td>Guided</td>
</tr>
<tr>
<td>Recommended (Web Gems)</td>
</tr>
<tr>
<td>Algorithmic</td>
</tr>
</tbody>
</table>

Potentially Lower Certitude

An example IU has embarked on a multi-year research, development, and services strategic alliance with a startup company, ChaCha, to build a next-generation service for search and greater certitude across a range of the university’s knowledge sources. ChaCha’s public search service had already built a model using paid guides to help information seekers find answers via real-time chat. The IU project seeks to use the ChaCha platform—an outsourced service with no fee—to connect IU experts to the IU community for guided search as part of a leveraged path.

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In just a few months, the IU staff have generated thousands of these Web Gems for the IU community. The guides and user feedback are constantly refining these Web Gems to ensure their continued relevance. For the IU libraries, this is an alternative, subsidized path to developing and maintaining a knowledge base of recommended and vetted answers. When an information seeker’s need for certitude cannot be satisfied by the algorithmic results or by the Web Gems, the seeker can click on Search with Guide. A chat window appears alongside the initial search results, and the information seeker can then have an interactive conversation with an IU staff guide (see figure 4). The guide uses tools in the ChaCha platform to push results to the information seeker’s screen; further dialogue can refine the search until the seeker’s desired level of certitude has been reached.

This approach represents a revolutionary rethinking of paths to certitude and tools for the campus community. As a pioneering effort, it has required extensive rethinking of library and central IT partnerships, service provision, advertising policy, in/outsourcing, and a variety of technical integration matters. The project provides the IU staff members who serve as guides with a common platform—leveraged across many consulting services and departments—to reach more of the IU community while still doing their same day job. The shift to real-time answers via chat has been both a technical challenge and a staff learning experience, though the response time for a chat answer is actually similar to that for a walk-in service encounter.

The next stage of the IU-ChaCha alliance will assess how IU guides can use ChaCha’s voice service to assist the IU community. With the voice service, an information seeker dials a phone number from a mobile phone, speaks a short question, and then receives an answer via text message (see figure 5). ChaCha is testing this blended mode in the first half of 2008. For many searches, a short-time-delayed answer still meets the requisite level of certitude.

**Institutional Paths to Certitude**

As the Era of Certitude evolves, information seekers in college and university
communities will continue to look for, and find, improved tools and services for greater certitude. This trend is in motion now, and as noted, many knowledge sources and service providers are implementing tools to span distance and enable real-time responses. Some providers will choose vended systems that enable chat, logging, and modest knowledge-management capabilities. Others will look to open source or homegrown tools, and still others may choose to work out legal agreements with third-party service providers. Blended models of institutional and commercial platforms seem ripe with promise.

This is an ideal leadership opportunity for CIOs and other campus service providers: now is the perfect time to think holistically about how to best develop services for the Era of Certitude, since these tools and processes are essentially part of the campus cyberinfrastructure. Much of the cost for tools and staff for the Era of Certitude is already being spent in various departmental budgets. The issue is whether these fragmented efforts can be focused for maximal value to the institution’s stakeholders. In addition, this leadership opportunity raises a number of questions about service provision and institutional boundaries.

Question #1: How should colleges and universities acquire the tools and services for the Era of Certitude? Should the tools and services be built, licensed, or acquired commercially? Should institutions allow advertisements on search results pages in order to subsidize the costs of the tools and services? If so, what terms are advisable? Colleges and universities could choose to develop all of the tools and processes for the Era of Certitude by themselves with their own investments. Another model is to engage commercial providers. Advertising subsidy models pervade much of the Internet, from free access to the Washington Post to sports sites. Some institutions have already accepted promotional placement advertisements in their sports facilities or other communications, so allowing sponsored ads on search results is just an extension of this policy. For other institutions, a choice to use a subsidized model with clearly identified ads appearing alongside the college or university logo may be a large step. Regardless, the cost is there—whether it comes directly from the academic treasury to build or buy the tools or indirectly from giving up some space on search results pages. These are complex questions requiring extensive engagement of the institution’s senior leaders, legal team, and all involved.

Question #2: How should colleges and universities manage and maintain their intellectual
Rethinking Guided Search

Indiana University and ChaCha announced a strategic alliance on August 2, 2007, as a set of research, development, and service initiatives. IU envisioned using the ChaCha platform as an outsourced service provider for human-guided search. ChaCha saw an opportunity to refine its general guided-search platform for use by specific communities. The IU arrangement, which deploys an IU-branded search service for the IU community, gives access to IU guides. The service integrates with IU’s Accounts/Authentication system when identity confirmation is needed. For example, if a librarian guide provides a link to subscription content that is limited to faculty and students, the login can ensure that all limits and contracts are honored.

The alliance has caused the university to work through many policy matters, including the use of advertisements on search results pages, appropriate privacy provisions, and revenue-sharing arrangements. Search engines monetize search via advertisements, and this alliance gives the university a no-cost general platform for guided search while also generating revenue.

The partnership between the 187-year-old university and the startup company has been challenging and has required working across a dozen university departments on multiple campuses. Strong executive commitment by the IU CIO, campus librarians, and the ChaCha co-founders—both IU alumni—has been essential to solving problems and respecting each other’s needs. The integrated, pilot service went live in December 2007 and was promoted to the IU community in February 2008. The alliance features research projects in the School of Informatics and student internships as part of the whole in pioneering guided search.

Note: For more information on this alliance, see the podcasts and presentations at <http://www.indiana.edu/~ovpit/chacha>. The podcasts include the announcement of the alliance and a December 2007 progress report with IU’s deans of libraries.

(property in the content of curated knowledge (e.g., “Web Gems”)? As librarians and other staff answer questions and develop recommended answers, or “Web Gems,” how can an institution ensure its long-term rights to that knowledge if the service is provided by a third party? These are the early days for the tools of certitude, but each interaction engages Kevin Kelly’s generatives of value. Institutions should ensure that insourced or outsourced arrangements reasonably protect intellectual property rights for the college or university while leveraging the replicable value of that IP to trade for services.

Question #3: How will governance decisions shape a platform of tools and services for the Certitude Era and also their long-term efficacy? Effective governance requires clarity regarding who has input rights when a decision is needed and who has decision rights when a choice is required. This type of effort across functional, academic, administrative, and technical parts of the institution will require clear leadership and commitment from all involved. Shifts to leveraged platforms require gaining trust, giving up control, and ensuring quality service delivery. Since such shifts may represent a cultural discontinuity,
leadership is essential in pressing through the many obstacles and objections that reinforce the status quo.

**Conclusion**
The Internet has proven remarkable as a distribution system for the Era of Publishing and as an equalizer for the Era of Participation. Today, the volume of information, judgment, opinion, and error necessitates the Era of Certitude. Colleges and universities can proactively lead in this era by projecting existing expertise and helpful guides via common platforms to students, faculty, staff, and alumni—or to the world, if desired. These are the early days for the tools of certitude and for understanding their role as part of cyber-infrastructure. The connectedness of our global society will further hasten the rapid evolution of knowledge and information, and the tools and services that connect information seekers to answers—to accurate answers with greater certainty than circumstances warrant—will grow more valuable over time. In these early days, CIOs and other campus leaders have an opportunity to steer, align, and leverage institutional investments in platforms that can provide answers that are good enough and quick enough—that is, in the tools and services for the Era of Certitude.

**Notes**
4. Based on IU’s activity-based costing metrics, the 2007 Support Center cost of a help-desk phone call was $10.70 and the cost of a walk-in consultation was $17.78: <http://www.indiana.edu/~uitsfin/report_on_cost_and_quality_of_services.html>.