

1. *What are the major factors in your discipline that are currently shaping its long term, strategic evolution?*

Digital content is becoming increasingly pervasive. This pervasiveness results in wholesale transformations of industries, especially those related to media, as distribution and consumption undergo continual changes. These phenomena collectively are referred to as *convergence* and results in new competition between firms and technologies and substitutions not previously considered. Google and Apple were once partners and are now fierce competitors; mobile technologies increasingly substitute for fixed telephony; television is increasingly being consumed via mobile devices and computers, radically revising the business models for media production and consumption. Together, these trends strongly affect our profession at each point in the life cycle of information and drives the direction of our professional and academic programs.

At the same time, information is growing at unprecedented rates. In his speech to the G-8 in Yalta in Sept. 2011, entrepreneur Yuri Milner observed (see <http://i.mp/qTKwXT>):

“If you add all information that was generated by the mankind for the last 30,000 years beginning with the first drawings on the walls of the caves until year 2003, equal amount of information was created last year for only two days. It took two days to create equal amount of information to the one that was created by all people that ever lived from the dawn of civilization until 2003. And moreover the same amount of information will be generated in ten years from now only within one hour.”

While such statements must be taken with a grain of salt, the growth of information that needs to be stored, transmitted, organized, managed, preserved, etc. is staggering, a situation that will only become more extreme.

Furthermore, the growth of relatively inexpensive electronic devices such as e-readers, tablets and smart phones has changed the information needs themselves as well as how users consume information. For example, a recent report from the consultancy Performics estimates that mobile devices account for approximately 10% of all searches in early 2011 and have grown 238% from the previous year (compared with a growth rate of 13% for PCs in the same period (see <http://blog.performics.com/search/2011/02/mobile-paid-search-impressions-surge-into-2011-clicks-ctrs-and-cpcs-remain-steady.html>). Libraries have responded to the increased demand for e-books by creating lending programs for these media; a recent survey by *Library Journal* indicates that the number of titles have grown 184% in public libraries and 93% in academic libraries (<http://www.thedigitalshift.com/2011/10/12/dramatic-growth-ljs-second-annual-ebook-survey/>). These trends require librarians that are fluid and adept with current and emerging technologies, as well as conversant with the challenges of digital content acquisition and licensing.

These tablet devices have put enormous strain on wireless networks, as people use them to consume media of all kinds (especially video) at elevated levels. This has had a number of consequences:

- Carriers have moved away from “unlimited” data plans to relatively unpopular “tiered” plans, which increase revenues;
- Carriers and media providers have had to innovate on content delivery networks (CDNs), often using peer-to-peer techniques, to keep up with the demand without excessive capital investments; and
- Carriers have been actively exploring and adopting new techniques and solutions to provide connectivity with these highly mobile devices. WiFi offloading, femtocell technology and dynamic spectrum sharing are all techniques that are being explored to enable users to have a seamless and satisfying media consumption experience.

In addition to being media consumption devices, people are increasingly using these mobile systems as platforms for personal information management. Thus, they manage, store, select and share personal information artifacts such as photos and videos as well as participating in their social networks using a variety of applications. These artifacts may be stored in the “cloud”, which has, by itself, important privacy and security implications.

2. *What is the impact of these factors? Why are they so important? What difference do they make?*

These trends, while not new, have reached a level in some instances where existing techniques and technologies are nearing their limits, or where the limits are on the horizon. Failure to keep pace with the growth of information means limited benefits to society or, worse, create the possibility of opportunistic exploitation of information and access asymmetries. These benefits are not just abstract; for example, a [recent study](#) by Ericsson, Arthur D. Little and Chalmers University (Sweden) found that GDP growth could be attributed to broadband investment. In another example, governments around the world are seeking to provide services to citizens through electronic resources to extend engagement while at the same time reducing costs; in fact, some argue that these technologies have transformed [government into a platform](#). Such a transformation means that access to the resources of government must very broadly based and highly available, implying the need for inexpensive technologies and reliable systems.

Being situated in the middle of the information ecosystem, these trends afford SIS the opportunity to develop transformational techniques and to offer education that should be relevant well into the future. Being at the center of these sets of trends should also afford SIS the opportunity to commercialize techniques and technologies that they develop.

3. *How do these factors affect the future of SIS and your program?*

In general, the school is reasonably well positioned to address many of the fundamental research issues addressed by the future scenario laid out above. Because the information environment is changing so rapidly, it is often not possible for faculty members to respond

quickly enough to emergent problems because of other commitments making demands on their time and the lack of a consistent funding stream that would enable them to build more persistent teams.

4. *How can the School respond most effectively to these factors?*

At the Chicago “New Configurations” workshop, Prof. Richard Arms noted that iSchools in general lack relatively persistent research teams that can be tasked to emergent opportunities in exploratory ways. Such teams would be able to prototype solutions to technical problems in the information field in relatively rapid fashion and provide the foundation for larger research proposals that address those problems in a more systematic fashion.

Building this capability requires a consistent funding stream and cannot be constructed only from PhD students, as they (hopefully) graduate after a few years. While PhD students are clearly part of the picture, such teams must be anchored by research scientists who provide a level of consistency and professionalism that cannot be achieved by students alone. While faculty members provide a great deal of consistency, their attention is often divided among several projects, including instruction, professional service, university service, in addition to research.

5. *Who are the necessary partners that would need to be engaged in order to respond effectively?*

The ability to respond effectively in this environment means that foundations and granting agencies are natural partners. Other partners would include the other research-oriented iSchools.

6. *What would an effective response look like and what difference would it make?*

It is hard to know exactly how an effective response would look. I would expect that a core research staff mostly funded out of “soft money” that would consist of people capable of designing, building and evaluating systems that address the information problems described above. They would necessarily be closely attuned to the emergent problems of the discipline along with full time faculty members

Such a capability would allow iSchools to achieve high visibility on the national and international stages as they would often be early contributors to emergent research discussions. It is quite possible that a positive feedback cycle could emerge where these teams would find it easier to attain funding, further strengthening their capability.