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# **Informationswissenschaft zwischen virtueller Infrastruktur und materiellen Lebenswelten**

**Information Science between  
Virtual Infrastructure and Material Lifeworlds**

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# Visioning the Future of Information and Library Science: Challenges & Opportunities

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## Abstract

The landscape of society continues to undergo tremendous change. Social challenges are more complex than ever before, often crossing multiple geopolitical boundaries, creating new socio-economic boundaries and involving new relationships and interdependencies among actors. Natural and human-made disasters continue to present multiple challenges linked to information access. Scientific instruments and sensors are producing new types and large volumes of digital data that require curation. Personal, cultural and organizational heritage digital data that allow for new ways of interacting with information and others, and new ways of understanding ourselves and our society continue to increase. These trends present challenges and opportunities for information and library science that place demands on our academic leadership. This paper discusses these challenges and demands.

## 1 Introduction

The nature and state of information and library science research and education continues to evolve and be a topic for discussion and speculation. Recently Michael Buckland wrote about the kind of science information science can be. He suggests that the main goal for information studies and services

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should be to enable “people to become better informed” (2012: 5). Blaise Cronin (2012) sees our discipline as “no longer as introverted or disconnected from the academic mainstream as it used to be” but that our sense of identity remains fragile as scholars from other disciplines join our schools. Andrew Dillon (2012) argues that the iSchool movement ([www.ischools.org](http://www.ischools.org)) reflects a focus on “the study of information beyond agencies” and an increasing emphasis on research productivity. These reflections also come at a time when the membership of one of the largest professional associations in information science, ASIS&T, voted overwhelmingly to change its name from the American Society for Information Science and Technology to Association for Information Science and Technology (ASIS&T), facilitating a more international identity (Sonnenwald 2012).

This paper joins this discussion by noting challenges and opportunities for information and library science. The challenges often cross geo-political and cultural boundaries, but opportunities still tend to primarily emerge within geo-political boundaries. Responding to the challenges, and recognizing opportunities embedded in them, places a variety of demands on academic leadership with respect to innovation, community, strategic planning, finance, engagement, and advocacy.

## **2 Challenges and Opportunities**

There are multiple challenges facing society that also represent opportunities for information and library science. These include complex social problems; natural and human-made disasters; scientific, sensor and cultural digital data; new ways of working; future employment opportunities; and, changes in higher education. This list is not exhaustive and new challenges will continue to emerge that our discipline can help address provided we respond expeditiously.

### **2.1 Complex Social Problems**

The landscape of society is undergoing tremendous change. Social challenges are more complex than ever before, often crossing multiple geo-political

boundaries, creating new socio-economic boundaries and involving new relationships and interdependencies among actors.

Examples include the global recession and its linkages to government defaults and global unrest, as well as the increasing income inequality in the US and other countries. Behind the headlines and pictures are multiple and often surprising relationships and interdependencies among actors worldwide.

Our current models, theories and best practices typically do not take this complexity into account. Will today's best practices and theories (which have often been developed from relative small amounts of geographically situated data) continue to be useful? And if not, can we develop new, robust best practices and theories in sufficient time to make a positive impact, and educate our students regarding these; and can we show them how to develop new best practices and theories on an ongoing basis?

## **2.2 Natural and Human-Made Disasters**

Multiple challenges emerge from natural and human-made disasters. Disasters are universal, occurring in all parts of the world. Between 1970 and 2010 3.3 million people died in natural disasters, and over \$2,300 billion US dollars (in 2008 dollars) in property damages occurred (The International Bank for Reconstruction and Development 2010). Disasters also often have negative impact on health, nutrition, education and mental state of mind. As urban population increases worldwide, the potential for increased damages from disasters increases. Currently 50% of the world population lives in cities, compared to 30% in 1950 (ibid.).

In a recent report by The International Bank for Reconstruction and Development (2010) states that prevention of disasters is often possible and cost effective. Their primary recommendation is for governments to make information more easily accessible.

What roles could information and library science play in this? In addition to assisting in information management after a disaster occurs, are there new roles that information researchers and professionals can and should play in prevention?

### 2.3 Scientific, Sensor & Cultural Digital Data

We also see that new types and very large volumes of digital data have emerged. Just about every scientific instrument and sensor today produces digital data, and the number of new instruments and sensors collecting digital data is increasing. As you may know government funding agencies are increasingly insisting that funded research projects make their data available to other researchers and sometimes the public.

There is a real need to manage these digital data so that multiple actors can effectively find, and correctly understand and analyze digital data both now and in the future, and to ensure that the privacy and security of individuals and groups are protected. As you may know this is often referred to as data science, data analytics and data curation. Our discipline is well suited to contribute to research and education in data curation.

Similar to the growth in scientific and sensor network data, we see increasing growth in personal, cultural and organizational heritage digital data that allow for new ways of interacting with information and others, and new ways of understanding ourselves and our society.

Examples include urban explorers (e.g., [www.urbanexplorers.net](http://www.urbanexplorers.net)) who are digitally documenting and sharing stories about today's physical landscape, e.g., abandoned factories. Quantified Self ([www.quantifiedself.com](http://www.quantifiedself.com)) is a collaboration of individuals and tool developers who are interested in self-knowledge through self-tracking. The diary of Samuel Pepys ([www.pepys-diary.com](http://www.pepys-diary.com)) – diary from 340+ years ago is published daily as a blog. People actively comment on this blog, adding relevant historical information and critiquing Sam's actions.

In addition companies are increasingly viewing their own history as a commodity and as a mechanism to increase goodwill. You may be familiar with the Coca-Cola digital archive on the web. Information and library science students at the University College Dublin worked with Aer Lingus last year to create prototypes of an interactive digital hybrid archive. Aer Lingus views the digital archive as a mechanism to fulfill their historic responsibility with respect to Ireland and its aviation history, to reclaim memories and promote Irish culture, increase sales, and enhance employees' pride.

## 2.4 New Ways of Working

Information and library science students may need to work differently in the future. For example, my colleague, Greg Welch, is working to develop ‘physical-virtual avatars’ (e.g. Welch 2012). These are physical manifestations of remote individuals. A unique aspect of this technology is that the facial expressions on the avatar are those of the human being controlling the avatar. The goal is for cameras to capture the facial expressions of an individual and project them onto the face of a remote avatar in real time.

One could imagine a future scenario in which towns that no longer can afford to hire librarians to work on site could pool resources and set up a central location in which a small number of librarians provided support to multiple geographically-distributed libraries, or even provided support in large disaster areas, both nationally and internationally.

In addition avatars might also be used in higher education when a student cannot travel to a classroom due to illness or other commitments. So in the future this, or similar, technology may impact how our students work and how we teach. We should prepare students today for these types of changes that are on the horizon.

## 2.5 Future Employment

With these challenges and opportunities, what are students’ employment prospects? Data from the Bureau of Labor Statistics, U.S. Department of Labor (2012) predict a 7% increase in jobs for archivists and librarians in the U.S., which is a slower than average. Jacquelyn Smith at Forbes (2012) labeled the master’s degree in information and library science “the worst master’s degree for jobs right now.” However there is a 22% job growth, which is faster than average, predicted for web content developers and other information technology based jobs, such as informatics nurse specialists (Bureau of Labor Statistics 2012). The median salary levels are also higher for web developers and informatics nurse specialists. Should we not consider such data when designing our educational programs?

## 2.6 Changes in Higher Education

The larger landscape of higher education also continues to change. New types of competition within higher education and alternatives to higher education continue to emerge. For example, individuals may soon be able to take massively open online courses (MOOCs), supersized free online courses, and receive credit towards a university degree (Young 2012). Kahn Academy ([www.kahnacademy.org](http://www.kahnacademy.org)) and others already offer free online courses. Educational start-up companies have been receiving large amounts of venture capital; over \$400 million was invested in educational start-up companies in 2011 (DeSantis 2012). In countries where higher education is, and will continue to be, fully funded by through public sources, such developments may have little or no impact on universities. However such countries are decreasing in number.

There is also increasing competition for international students who are typically charged higher tuition fees than home, or local, students. For example, as some European countries back away from fully funding higher education, European universities are developing strategies to attract students from outside Europe, including the U.S. and Asia. Examples of strategies include offering cost-competitive accredited degrees, specialized summer programs, partnering with international student recruiting firms, and partnering with international universities and governments. Because many programs in information and library science at universities are relatively small compared to programs in other disciplines, it may be crucial that our programs proactively participate in such strategies in order to remain viable on our campuses.

## 3 Academic Leadership

Navigating the challenges discussed above and other challenges that exist and will emerge in the near future, and recognizing the opportunities that are embedded in those challenges places a variety of demands on academic leadership in information and library science. The importance of academic leadership should not be under-estimated. Research on the sustainability of academic programs identifies leadership as a key factor in decisions regarding closure of academic programs (Haycock 2010; Eckel 2002).

Academic leadership for information and library science is multi-faceted. The facets are inter-connected in multiple ways, and the execution of each facet influences not only how we perceive that facet but also how we perceive other facets. In no particular order the primary facets are: innovation, community, strategic planning, finance, engagement and advocacy.

### **3.1 Innovation**

An academic leader in our field should facilitate innovation in research, in teaching and learning, and in ways of working within a school. This is needed to sustain and increase our relevance to stakeholders and increase our effectiveness. There is an old saying: necessity is the mother of invention. So when we face challenges, we can also view them as opportunities to be innovative. A first step is to see connections among seemingly disparate things.

For example given the high cost of higher education and competition in higher education, would programs that allow students to receive a combination bachelor's and master's degree reducing the number of years it takes to get a bachelor's and master's degree be feasible in information and library science since most of our master programs do not require a bachelor's degree in our field? What new types of careers are emerging, and can we enhance our current educational programs and/or develop new programs to meet these needs in collaboration with other disciplines in a timely manner? Should we be more nimble in designing curricula?

### **3.2 Community**

Academic leadership has a central responsibility in creating and maintaining a community in which we value and help one another. There's a community within our schools that includes students, alumni, faculty, adjuncts and staff, a community within our university, and communities in our discipline that influence what we do, how we do it, and how we feel about doing it. Examples of community activities within a school that leadership should attend to include: mentoring faculty and staff, resolving conflicts, and listening to and acting on feedback from students, alumni and other experts. Constructive criticism should always be welcomed because we cannot fix what we don't know is broken, and such criticism provides the opportunity to engage critics in making improvements. For example I recruited several mature under-



graduate students to be peer mentors after they complained about the behavior of younger first-year students.

### **3.3 Strategic Planning**

Strategic planning includes working with relevant stakeholders to form a school's mission, vision and values, and from these to develop goals, and plans to achieve the goals. This is followed by implementation and dynamic revision of the plan as needed.

I recently developed a strategic plan for the School of Information and Library Studies at the University College Dublin. Although the university had not requested a strategic plan from the school, when talking with academic and administration staff both within the school and within the larger university and with other stakeholders, it was clear many were wondering about the future directions in the school. A strategic plan is a good tool to articulate future directions, and generate consensus and support for those directions.

To begin formulating a strategic plan I collected information to better understand the perspectives of relevant constituencies and relevant contexts. This included talking with people within a school, including faculty, staff, students, boards and alumni; talking with people within the university, including other deans and the provost; reading university documents. It also included talking with practitioners and academics within our discipline, and outside our discipline.

Based on this understanding I drafted an initial plan. Components of the initial plan included a discussion of the current landscape and future challenges and opportunities; vision, mission, goals and values for the school; a description of and rationale for future actions, resource allocation and contingency actions. As I drafted an initial plan I sought feedback on it. Having face-to-face conversations one-on-one and in small groups to get individuals' reactions was very useful, and I revised the initial plan accordingly.

Next I distributed the draft plan to all academic faculty and staff within the school, and put it on the agenda for discussion at a school meeting that all faculty and staff attend. The discussion lasted about 10 minutes after which all present approved the plan.

Following this I presented the plan to members of the university administration who allocate financial resources and faculty and staff positions

across the university. Their feedback was positive, and they accepted the plan with no changes, promising resources to the school to support the plan.

Subsequently the university required schools to develop strategic plans within a limited timeframe. Having a plan already created was useful in satisfying this requirement.

### **3.4 Finance**

This facet focuses on financial planning and management. This includes activities such as fund raising, budget negotiation, budget creation and budget management. Many of these activities require a short-term, e.g., one year, perspective as well as a longer term, e.g., a three-year perspective. Goals of financial planning and management include be able to provide matching financial support for grants that faculty and staff obtain; funding student scholarships and new student learning opportunities; having funds to facilitate personal career growth; and financially contributing to the university.

### **3.5 Engagement**

Through engagement we support others. In the past we might have called this facet ‘service’. However, I prefer the term, engagement, because we often learn new knowledge and skills through engagement. There is reciprocity in engagement, with all participants benefitting. Engagement can occur within a school and university, and with different types of local, state, national and international organizations, including for-profit and non-profit organizations. An academic leader can facilitate engagement by seeing connections between individuals’ expertise and interests, and the needs of others, and when needed, working with both parties to facilitate their collaboration. For example, sometimes I have drawn on my experience in business and academia and worked as a translator between faculty and business managers and directors; helping each to better understand the other person’s context, including constraints and opportunities in each context.

### **3.6 Advocacy**

Advocacy for individuals in our schools, our school as a unit, our university and our discipline is increasingly important, and something that we as a dis-

cipline have not historically done very well. Academic leaders should work to bring out the best in others, and then communicate their accomplishments widely and as effectively as possible.

ASIS&T ([www.asist.org](http://www.asist.org)), the iSchools ([www.ischools.org](http://www.ischools.org)) and other organizations are increasingly recognizing the importance of advocacy and are grappling with how to most effectively advocate for our discipline. Our discipline is not always represented in funding agencies, and this might be improved when academic leadership and organizations in our discipline work together to advocate for our discipline.

### **3.7 Accomplishing Facets**

It is important that academic leadership is flexible, transparent and collaborative in order to seize opportunities and overcome challenges across facets. Flexibility allows our schools to respond more quickly to challenges and opportunities. Transparency assists in persuading faculty, staff and other stakeholders to support changes. Collaboration also assists in garnishing support but also helps to provide necessary resources. All three, i.e., flexibility, transparency and collaboration, can improve decision-making and the implementation of decisions.

An example of how flexibility, transparency and collaboration was used in addressing challenges across multiple facets can be found in the collaborative capstone project that has replaced our school's master thesis requirement. Previously our school required each master's student to complete an individual thesis. Students complained about this requirement. Rumor had it that at most one student each year actually found doing a thesis a positive learning experience. Faculty were overwhelmed with the extra work that supervising 5 to 10 theses each year entailed, and the government and university had set stringent requirements on hiring faculty due to budget deficits at the national and university level. Furthermore students wanted additional opportunities to work with organizations, and organizations, both non-profit and for-profit, had a number of projects they could no longer afford to initiate.

To address these challenges I pursued the collaborative capstone project concept as a replacement for the master's thesis. Today, instead of working individually on a thesis, students participate in small group projects, each group having 4–6 students. Each is a use-inspired (Stokes 1997) project that

focuses on a real world problem of interest to people within and outside academia. The projects target both application and knowledge generation, and are typically conducted in collaboration with organizations outside the school. Each capstone team is required to present their project to a panel of experts who are not faculty and produce a written project report. They also assess other members of the group, and their assessment is taken into account when assigning grades to students.

This past year students conducted projects with the Library Association Ireland, Aer Lingus, Dublin City Public Library, UCD Library and the SAKAI online learning community. These projects allowed students to integrate knowledge learned in multiple courses, refine project management and collaboration skills, produce a significant piece of work to showcase to employers, and network with professionals. Students have reported:

- *I learned more than I would have doing a thesis.*
- *Working within the group on the project [was] an interesting and enriching experience ... the final report is far richer from having input from the perspective and skills of a variety of individuals.*
- *I have learned from this project the importance of having an eye on the bigger picture, and having an awareness from the start that all the individual parts must make up a comprehensive report.*
- *The geographic spread of the members ... presented a challenge. However, the problem of distance was overcome through virtual group meetings.*

Students benefit from and enjoy this type of integrated, collaborative and engaged learning opportunity. Faculty benefit from the resulting reduction in their teaching load. The school and university benefit from the cost savings realized through the project approach, and more importantly from the positive impressions our students make with external stakeholders. Organizations benefit from interacting with and learning from students, with a minimal investment of their staff time. The collaborative capstone projects have been a win-win-win solution, positively addressing challenges in all facets of academic leadership.

## 4 Conclusion

Ronald Reagan, U.S. President (1981–1989), described the value of our discipline:

By advancing the gathering, storage, and transfer of information, you've touched the lives of virtually every citizen and led the way to wider opportunity for all of us. That's because our scholarship, domestic prosperity, and competitive stance in the world marketplace depend as never before on our considerable information technologies and on how we use them. Your vital role in our increasingly efficient and wide diffusion of knowledge has been a tribute to you and a real blessing for our Nation. (Reagan 1987)

This description continues to be valid. I often refer to our discipline as an infra-structure discipline, impacting people's lives, facilitating science, business, government and other organizations, and sustaining societies. We have many connections to other disciplines, and social network theory tells us that it is better to have many connections rather than just a few. Our discipline intellectually sits between many disciplines, and can interact with and contribute to these disciplines. However, to thrive we must be diligent, continually recognizing and effectively responding to challenges.

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