Demons, Determinism, and Divining the Future of Information Science
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Let me start by thanking Crystal and ASIS&T for inviting me to give the inaugural President's Lecture. I've prepared about 30-40 minutes of remarks that should leave us plenty of time for questions, disagreements, and conversation.

I'd like to begin by noting that 27 years ago I received the ASIS&T Doctoral Proposal award and was asked to present at the annual conference. Nearly 3 decades later, here I am again presenting formative work focused on complexity and trying to get something written.

Of course, a lot has happened in those 27 years and not just in that my hair fell out and my ties got shorter.

In the intervening years we have seen a dramatic shift in the information field, and the knowledge infrastructure our society is increasingly reliant upon. From the explosion of the internet, to the creation of social media, to the rise of the too big to fail search engine, things changed and, I argue, grown more complex. With the growth of ubiquitous and increasingly mobile networks we saw the true advent of big data and data science. As media turned to streaming, and storage turned to the cloud, we saw a complementary growth in mis and dis information.

And now we are faced with the impact of artificial intelligence. A multi-headed hydra that is already having substantial impacts in fields like education and publishing. What does the world look like when the phone in your pocket allows you not just to take a photo of reality, but edit reality itself to match your perspective? How does society adapt to anyone plausibly introducing doubt by calling evidence "generative AI."

Over the past 27 years our world has grown ever more dependent on information technology, and has shifted from an information on demand world, to one saturated with addicting mechanisms of distraction and misdirection. As we information scientists tested and researched and talked and taught, I would argue that the society became more fractured, more confrontational, and less-not more-informed. And today I would like to talk about how we hold some responsibility in that must make amends.

What I have to tell you is that we must throw out narratives around documenting the information world. We must toss aside a seemingly endless quest for concrete definitions of information and information science. We must actively banish language and approaches that seek to elevate theory over practice-when they are one and the same-and see that it will take a concerted effort from scholar, librarian, and data scientist to save our increasingly isolated and fragmented communities. While many of my examples come from my US perspective, I believe that the grand challenge for all of information science is nothing less than saving lives.

Throughout the nation and now internationally we have solid data that shows increased mortality among the isolated and disaffected. We see that social isolation is equivalent to smoking 15 cigarettes a day. We see a rise of deaths of despair from suicide, drug overdoses, and alcohol related disease.

When economists found decreased life spans in the US population, countering a century long trend, the only common variable they could find among the increased mortality in middle aged people was the lack of a 4-year college degree.

Let me be clear, it wasn't the education that vaccinated people from despair. It was the fact that a 4-year college degree has become an indicator of wealth, family social position, and a sense of agency. As universities like mine made college either unaffordable for the majority of US citizens, or a sure road to debt that put the goal of home ownership and even parenthood out of reach for more and more people. Yet we still put forth a narrative that college degrees are a sign of merit and worth. Never mind that it is impossible to pay for college with a full-time job, or that there are not enough scholarships for all, the lasting myth is that college is achievable by any person of merit. If they work hard enough or think deeply enough, they can overcome a system that increasingly acts as gilded gateway to social mobility.

But I get ahead of myself. ASIS&T is, if nothing else, a place of reasoned discourse. Strong claims require strong support. Let me unpack these ideas.

When I asked Crytal for some guidance on the topic for today, she said "What comes after AI for research, education, and professional work in Information Science?" I appreciate 2 things about this topic:

1. The optimism that there will be anything left after AI achieves superintelligence and enslaves mankind for the manufacture of batteries. However, seeing as we are training the large language models on text from internet sources like Reddit and Facebook, there is a better chance that humans will continue to run the world as our AI overlords make selfies and argue amongst themselves about the eating the cats and the dogs.
2. I also appreciate the open-ended nature of the question. Is it a call to predict the future? Is it a call to action? Is it after AI has become normalized? Is it asking what the next big thing will be?

Here's how I am going to interpret the question: "What ***should*** come after the societal effects of AI are ***shaped*** by the research, education, and professional work in Information Science?" In other words, how do we as information scientists and professionals strive to change society with AI?

This is about taking responsibility for the impact of information on society. ***We*** must be mechanisms of adaptability and innovation that work through our allied professions to make society better.

This phrasing, of course, calls into question who exactly is the "we." Over my 30 years in information science that "we" has received a lot of attention. I am always reminded of Chaim Zins' work in the early 2000s on developing definitions of information where he found more definitions of information than the information scientists he asked. In my very informal attempt to replicate Zins' results I asked 7 of my colleagues when I was at Syracuse. I got 9 answers, the best one being "I don't know. I don't care. Get out of my classroom."

I think about all the times I called out for intellectual signatures over mottos in the faculties I was honored to be on. I have seen the regular fights and endless retreats in the iSchool movement seeking simple definitions of information science or informatics, or information studies that could work equally well for the parents of potential undergrads, tech giant hiring managers, and senior scholars alike.

I have come to see the problem of defining the information field very differently. The definition of information science is not one thing.

Ultimately what holds us together as a discipline is not a common definition of information. It is not even the common questions we ask. It is the community of people that continually recommit to a conversation. A conversation about the nature and application of technology, data, and humanity in addressing the pressing issues of society. The talk of interdisciplinary or multidisciplinary or transdisciplinary is based on out-of-date concepts of rigid universal classification. We use these terms to seek clarity and in doing so ignore the power of complexity and even of ambiguity.

When I say that "we" hold some responsibility for the current state of affairs, that includes librarians, data scientists, iSchools, iSchool alumni, my fellow scholars, data scientists, analysist, records managers, and archivists. The "we," that includes me, is responsible for every article that demonstrated a correlation between interface and the spread of disinformation that didn't have specific policy recommendations included. The "we" that is responsible for scrubbing data from Twitter/X for sentiment analysis and didn't highlight that the platform supports antisemites and hate groups. The "we" -hell, the me-that is responsible for documenting radical attacks on librarians without showing up to school boards and city councils to back those same librarians.

And so now put before us is a new disruption in the knowledge infrastructure: artificial intelligence. To be precise, the disruption in the general discourse is about generative AI and generative AI with direct public access. Throughout information science, in lab and library, in classroom and board room, in offices and cubicles, we have taken up the AI-what…issue? Challenge? Problem? Yes, all of these and more.

And we are right to do so. It is a good thing that we transform data science degrees into AI degrees, just as data science was a transformation of information management. It is a good thing that librarians see opportunity in AI for augmenting their work instead of dreading it will replace them. AI has already accelerated the work of programmers and information managers, designers, and analysts. Large language models have brought simple analysis of qualitative data into the hands of front-line information workers. We can now live the truism of data making stories real, and stories making data matter.

But in this move from datafication to general applications I see the real opportunity for information science. To argue and advocate for the embedding of social context, ethics, and values into these systems. What's more, we have the opportunity to throw away simplistic concepts of determinism and direct causality when we do it.

Cutting edge AI systems are built on induction and randomness. We populate our neural networks and train our models with non-deterministic mathematics and the use of initial random weighting to produce viable and human-like response. We as a field must embrace this non-deterministic approach across our work.

In the published abstract for this lecture, I promised you demons. A demon in science is a conceptual device used to illustrate a theory or pose a question for interrogation. Perhaps one of the most famous is Laplace's Demon. This demon was a creature that could know every action occurring across the universe in an instant and thus perfectly predict the future and divine the past. Laplace used this construct as the basis of what would come to be known as determinism-a logical, causal, clockwork universe.

Laplace's demon still lives. We see the demon in positivism and even the multivariate regression analysis with clearly defined dependent and independent variables. If we were to envision Laplace's demon reaching into the world and pulling out information science, what would it hold in its hands? Would it be JASIS&T authors and iSchool faculty? Would it scoop up librarians? Would its hands be large enough to hold information architects, data wranglers, UX designers, systems analysts, and archivists?

What shape would it have? In Laplace's world it would be an orderly construct with rigid edges and a hard boundary. Information would be like a fluid being channeled into code and services and then into the waiting brains of the user. To examine such a discipline, one could sample and generalize. One could change the course of information through the application of a switch or clever interface. In this demon's world we don't have people we have users – a construct that sucks the intricacies and idiosyncrasies of humanity from a person and defines it as a function that consumes and directs.

I argue that we must exorcise this demon of assumed rationality. In its place an information demon that pulls back from the ether not some solid set of building blocks built on the shoulders of giants, but an unruly and glorious mess. Information science would have

millions of threads linking back to politics and publishers and computer science and humanities and profit and welfare. That seeming disorder is actually a complex adaptive system. A system not of users and systems, but of agents all struggling for a sense of stability achieving, in the end, at the edge of chaos, an infrastructure where people come to make meaning in their lives.

Embracing complexity is the only way we can truly understand questions like AI's impact…understand and through that understanding, act.

For example, corrosive AI is the hypothesis that AI will undermine trust in public institutions and will do so quickly. We see corrosive AI in the use of AI generated fake voice ads and in claims that rally sizes are a product of generative AI. The solutions to counter this corrosive effect have technical aspects, certainly, but also call for a new form of information literacy. An information literacy that is not about generating skepticism and methods of interrogating information sources, but instead coping with a world where ALL information is seen as suspect. The ultimate solution, however, is not a new AI detector, digital watermarking, or massive re-education on AI tools. It is instead in fighting social isolation. The bottom line is that people simply are losing trust in each other.

The tools that we in information science claim to study, to create, to critique have all too often turned to a monetization model based on confrontation over connection. Social media is increasingly an oxymoron, because one does not build strong social systems on dopamine hits and enraging people to stay engaged on a platform to generate more ad views. Please understand that this is not some global call against markets and profit – rather it is a re-statement of a simple truth: well-functioning markets require stable societies. Destabilizing the underlying social connection is the act of self-destruction.

In his latest book, *The Upswing: How America Came Together a Century Ago and How We Can Do It Again*, Robert Putnam tracks social cohesion in the US from the 1800s until today. He makes a convincing argument that the social isolation Putnam first examined in his earlier book *Bowling Alone,* is not a unique creation of modern times, but rather a cyclical phenomenon. He shows how social isolation and disconnection was at a peak during the Gilded Age but swung to a more connected society at its height in the 1960s. He talks about this cycle as a I/We curve where members of a society focus on themselves and their wellbeing (I) versus where a community comes together around common goals (We). Putnam is quick to acknowledge that such a swing is not fully inclusive of minoritized population or women, but even there, limited progress in freedoms and inclusion were made.

Putnam points to the mid and late 60s as the beginning of a swing back from the We-socially connected- to today's I-socially disconnected- culture. A culture that on the surface focuses on influencers and selfies, but underneath creates policies that concentrate wealth and erode social safety nets.

While Putnam doesn't address higher education per se, the data here matches as well. In his book, *After the Ivory Tower Falls*, Will Bunch describes the shift of higher education from before World War II until today. Bunch recounts the US Government trying to figure out how to reintegrate returning veterans into the workforce. They were trying to avoid the protests and marches on the capital by World War I veterans who found themselves in the Great Depression with no jobs waiting upon returning home.

Part of the solution was the GI Bill that paid for soldiers to get college degrees. Before World War II higher education was exclusive and privileged. It cloaked its exclusionary practices as a meritocracy. After World War II and the lifting of financial barriers veterans of all backgrounds and socio-economic status (but alas not of all races) entered college. Yet the narrative of meritocracy remained. One got through their classes, earned their degrees, went on to graduate school because they were smart and the farther they went the more exceptional they were assumed to be.

Another goal of the GI Bill was to support liberal arts education. The idea was to fight fascism and authoritarianism through education. And, many would say, it worked. It worked so well that as more and more youth went to college more and more people realized that their government did not always live up to its own ideals. The expansion of the war in Vietnam was a breaking point – right along with Putnam's shift from a "We" society, to an "I." society.

State governments started to see higher education as less social building and more as job preparation in the 1960s. Graduates were benefiting from public investment; they could now pick up part of the cost. Public colleges that were once free, now shifted to tuition to support their operations. Universities grew with public investment in both education and research, and now the colleges could continue to fuel growth first with partial tuition and then through public backed personal debt in the form of college loans. The end result is that higher education in the United States since the 1960s has increasingly become inaccessible.

Will Bunch in his book argues that a great deal of today's political polarization can be attributed to the shift in how merit allowing you to achieve a college degree was replaced with financial wealth, yet the merit narrative remained. Now people who could not afford to get into college because they lacked the means were also seen as lacking merit. The difference between blue collars and white collars became a literal matter of degrees, and so the growing information economy left many behind.

As we see new technological opportunities and disruptions the information academy continually reacts with new degrees and new tuition schemes. As the population of 18 year olds dwindle, we have turned to graduate education. Increasing the number of graduate students and international graduate students is a common funding model. The benefits are a stronger, more diverse, and more educated workforce, but the costs are an increasingly disaffected communities that see only more barriers and less agency. We have created a

vicious circle: those who can't get a job in the information industry because they can't afford an undergraduate education, now need graduate degrees, often established to increase school budgets, that are even farther out of reach.

A lack of accessible and quality education is splintering our information economy. When Boeing moved the majority of their manufacturing to South Carolina it was hailed within the state as an influx of good well-paying manufacturing jobs. What Boeing found though was a manufacturing workforce unprepared for the high-tech requirements of computer aided manufacturing. They turned to the high schools with STEM programs and internships and found that too many high schoolers had basic literacy issues. They finally settled on a strategy to get kids to reading level by grade 3. The solution to greater profit and productivity lay in strengthening basic literacy and public education. This is a solution that is emblematic of a complex approach.

Why do we have iSchools that prepare school librarians and AI programmers? It is easy to see it only as a legacy of the information field, but in this complex reality it is in connecting the essential information professionals to change society. Librarianship and Information Science are neither separate fields nor do they need to move to some homogeneous new field. They are identities of people locked in a complex and changing dance to make the world better.

Which brings me back to how do we make it better? How does AI fit in- or push against- positive social change? AI, or more precisely generative AI using large language models, is being built and spearheaded by the same companies that both built the information world we live in today and benefited from the social effects of that growth. They are in an arms race where products are being pushed to the public in a form that makes a beta test look polished. This is no longer a case of users testing and refining information applications. This is human beings reacting to tools that already have profound effects and implications for them. For teachers who used reading and summarization as a path to critical thinking; for scholarly communications based on human peer review that simply cannot scale to accommodate the onslaught of AI produced works; and artists that now must compete against a new productivity equation created by work that wouldn't exist without their un-reimbursed labor.

It is no wonder that we are seeing an increase in deaths of despair. Is it any wonder that isolated communities in rural towns and urban neighborhoods, without access to affordable broadband or decent healthcare, have become hotbeds of extreme views, isolationism, hopelessness? Is it any wonder that politicians increasingly use rhetoric of division and grievance? It may be easy to cast these off as political opportunism, but the support it garners is based on real unmet needs. Is it any wonder that to overcome the pain of being isolated and unheard is to turn to drugs and alcoholism which gives them both relief and something they feel they can control?

The solution isn't to vote for one party or another, it must start with us – the information science community – that professes the power of information to liberate and educate.

The other day I was talking to Rebekah Cummings. She is an academic librarian in a humanities research center. She is the past president of the Utah Library Association, and a former public librarian. She is also currently running for Lieutenant Governor of Utah. She is running on a platform that includes fighting against book bans and the censorship of information in the schools of the state. She is running to put into action what she was taught in her library and information science graduate program. She is running because she believed us when we said that a civil society encourages the sharing and debate of ideas, especially those we disagree with.

When I asked her what lessons I could take from her campaign into the classroom, she said we needed more teachers and more librarians running for office. They, she said, have a unique view of the power of government and information to change lives, Librarians have the skills and everyday experience of ethically connecting people to information and that was sorely needed in the state houses. I agree and would broaden that to include the full range of allied information professions.

And so, I come back to where I began – the future of information science after AI must be a dedication to saving lives. Our discipline, or as I think of it, our community, has the ideas, ideals, and idealists to make a change. Seeing us as our information demon did – a connected network of action and ideas- we can bring about change. Who is better positioned in this time. The discussions of AI beyond our self-imposed walls, are not about Markov Models and deep learning. They're about who will be left behind and how can we as a society benefit. That is our real expertise, and we need to speak up.

Many years ago, at a Virtual Refence Desk Conference I charged the assembled audience to be brave, be bold, and be right. I now task us all as well.

We must be brave in times when as we celebrate the thriving undergraduate program or the new graduate certificate, we also staunchly defend the school librarian who has been doxed, labeled a pedophile, and physically threatened. We must be willing to step away from false cloaks of objectivity and embrace that with the privilege of academic appointment comes an obligation to take what we learn and turn it into action.

We must be bold and think differently about the informal caste system we have in place. As we crow about our exclusive acceptance rates in journals and conferences, we must not then become exclusionary in the opportunities we extend to communities. Let us work together with librarians and data scientists and CIOs to craft new academic programs where instead of charging a premium, we slash the cost of access to higher education. Who will be the first to partner with an urban library to offer inner city youth and the new immigrant a degree in information science? A degree that includes internships and promises of work in the high tech world?

But we must also be right. Let our outreach to the isolated be based on good science and true participatory research. In a complex world we look increasingly to design methodologies to develop holistic solutions. But just as a user-based design methodology can easily be perverted by selecting which users you pay attention to, so must we understand that in order to achieve participatory design, and participatory research, we must cede control and ownership to the communities we study. Right now, we promise no harm and confidentiality in our human subjects applications. We must add the obligatory benefit to those who participate.

If we want our universities to survive the current attacks that call for dismantling intellectual freedom protections, that call for elimination of mechanisms that ensure a rich set of voices and ides in the classroom, that call for corporate business practices in a public good institution; if we want our universities and colleges to survive, we must once again become the tutors and conscience of the society. We must join the mission of discovery to a mission of explanation and risk mitigation. Our ivory towers of increasing exclusion must become both watch towers and beacons toward a more humane world.

I will end with a story. Last week I flew into Springfield Illinois. I was asked by the public library director to come and speak at their staff development day. I got out of the airport and called an Uber to take me into downtown. I was picked up in a truck, and my driver asked me what brought me into town.

It was not a question I gave much weight to. I was tired from the flight, and new duties as interim associate dean. I had just come off two days of nailing down the spring course schedule, 6 hours of back-to-back teaching, drafting a new job ad, and a mountain of email. In other words, my mind was not really about informing an Uber driver.

Still, to be polite I said “I’m here to talk to the library.”

“About what” my driver asked.

“How libraries can take on social isolation.” It has become a standard line, so I didn’t really think to give it any nuance.

“Aw, that’s really important,” she said. “This is my whole world right here,” she said indicating the inside of the truck. “I’m currently practicing solitude…today would have been my 30th wedding anniversary, but I got divorced last year.”

Now the trip from the Springfield Airport to downtown is about 11 minutes long. In that time I learned my driver had divorced a man she met when she was 16….he was her first and only boyfriend. I learned she had four kids, and that she had stayed in the marriage until the youngest graduated high school. I learned that she lost all of her friends in the divorce, and that dating had changed a lot since the 80s. That people were less trustworthy, and that

she hoped the man she was seeing now would cut it off with his two other girlfriends. And now her world was a gig job mediated by a use-based algorithm embedded into an app.

In 11 minutes, I learned that this woman was isolated, and in pain, and was reaching out to anyone who sat in her car- in her world.

She needed a place to connect and to be valued. As I told the staff of the Lincoln Library the next day, she needed them. She needed librarians to create places not just to escape, but to be part of a community. And those librarians? They needed me to tell them that is OK, and that is just as legitimate library work as cataloging or story time. And me? I needed a set of colleagues to understand that working with that library was an act of engaged inquiry and that that library had value. Value not as a place to conduct real research or find subjects, but as a place with institutional value that has and continues to shape the information field. And my colleagues? They need the data scientist and the CIO to provide them insight into the cutting edge and the front line; alumni that increase the reputation of the school, and hopefully help raise funds to make it more accessible.

So, what ***should*** come after the societal effects of AI are ***shaped*** by the research, education, and professional work in information science? A proactive information science community that can demonstrate the use of information and technology to increase social cohesion. A community with mutual respect for those who seek to understand the positive power information has in the lab, the library, the app, and the institution. A community that saves lives and seeks to benefit the Uber driver and the legislator. A community that doesn't simply study and document a society reeling from ever faster waves of disruption but is a trusted partner in making society better.

Thank you.

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Words (and mistakes) are mine

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