

# A Knowledge Lens: Humans in Action

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**Abstract:** Every member of a social system sees that system in a particular way. This essay outlines a new way of seeing the uniquely human characteristics in these systems, with particular attention to what happens when this view is taken. Termed the Knowledge Lens, this view embraces complexity, sees the potential of innovation through conversation, and understands the barriers limiting the traditionally assumed powers of data, information, and knowledge. This lens is approached within the context of ensuring that graduates of a Knowledge School are equipped with the tools and understanding necessary to facilitate positive change and increase human agency--both in their jobs and their communities. Specific attention is also paid to the role of automation, with the suggestion that automation and information-centric views work only in areas with known and simple answers.

**Keywords:** *knowledge creation, complexity, automation, agency*



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## Introduction

Within every social system, there are various people, relationships, procedures, processes, and products at play in infinite interactions. It is a complex arrangement, and, in efforts to simplify, members of these systems often choose to pay particular attention to certain things. They adopt a lens, and the system—filtered through that lens—can look substantively different from one member to another. It is unlikely, for instance, that the microbiology department of a pharmaceutical company will see their system in the same way that the marketing department does. There are myriad ways to categorize these different perspectives, but Library and Information Science (LIS) provides three lenses that address some fundamental differences. These are the lenses of data, information, and knowledge—though this author is not aware of literature using these contentious terms to outline ways of seeing organizational systems.

This paper is not an attempt to rehash previous outlines that suppose some linear processes from data to knowledge. Indeed, the very suggestion that knowledge emerges out of data carries with it the assumption that knowledge maintains the objectivity assumed in data. This is certainly not the case (Frické, 2009). Instead, each term is outlined by itself as a way of seeing complex organizational systems. When a person is trained to see the data in a system, they act differently than someone trained to see the knowledge in a system. A primary contention of this paper is that data and information lenses are predominant in organizational systems, and this has led to ethical and productivity failures. In order to address these failures, organizational members must adopt a Knowledge Lens to more fully see the system, because seeing only through a data or information lens leads members to attempt the impossible and dangerous task of simplifying complexity. A Knowledge Lens, as defined in this paper, is more aligned with the natural processes of complex human systems.

This shift in how organizational systems are seen is similar to the shift in how libraries are seen (Lankes, 2011), and each shift has a significant impact on process and outcome. It is not that one lens should be used at the expense of the others, but that an appropriate balance is needed to see the true nature of the system.

### The Lenses

The Knowledge Lens is a correction for information and data lenses. An *Information Lens* focuses the system's attention mostly on the codified, external elements that surround human existence, e.g. books, websites, databases, and manuals. This is an important distinction, as *information* is not a catch-all term for processes, things, knowledge, data, and events as Buckland (1997) outlined. Rather, information is a series of codifications that represent all of recorded history. Given that this codification leaves out procedural knowledge, rules of thumb, aptitudes, etc., it is easy to see why a lens that sees only information is inadequate—it simply misses too much of what makes a system adaptive and innovative. And because measurement tools are built for information inputs, these codifications are prioritized. Yet most of humanity cannot be codified. As a result, system members act according to the information measurement rulebook, rather than their own intuition. Viewing organizational systems through a *Data Lens* is even more problematic, because it is actually impossible—though that has yet to stop anyone from trying to use it. A common definition for data is “discrete, objective facts or observations, which are unorganized and unprocessed” (Rowley, 2007, p. 170). One must ask where such data exist? If one came across data, would the human mind's processing of that data turn it into something else? Herein lies the problem. Humans cannot do anything with data, because the very *doing* of anything with data is a form of processing that adds subjectivity.

This may seem a mere game of semantics afforded to academics. Yet, a further look reveals essential problems of failing to realize this distinction in data. There are infinite pieces of data surrounding a human at any given point, and humans must choose which data to attend to. They must also choose how that data will be collected and devise systems for its manipulation. These are subjective human decisions about something that used to be data, but is now something else. The problem with a Data Lens as defined here, is that it ignores this transition from objectivity to subjectivity. This assumption of objectivity in something soiled with human subjectivity reduces skepticism of it. If, in fact, it still remains objective, it is the one thing we can still believe in. Data becomes a type of truth. It is no wonder, then, that so much of algorithmic automation is flawed without any real attempts to correct it (O’Neil, 2016), i.e. there is no perceived need to correct it. Consider O’Neil’s (2016) outline of crime algorithms that automatically assign police to certain areas. Algorithms are presumably built on objective data. Yet these policing algorithms are built from a subjective assumption that crime occurs more in poorer areas. More police are then dispatched to that area. As a result of the increased police presence, more people are stopped for petty crimes. These stops reinforce the data-fed algorithm’s assumptions of increased crime, and more police are dispatched to the area. Here, data is assumed to be true, without the benefit of a human understanding of justice. Only a human is embedded with the ability to recognize the injustice of the process and fix the algorithm. Yet, this is not being done, and “without feedback . . . a statistical engine can continue spinning out faulty and damaging analysis while never learning from its mistakes” (O’Neil, 2016, p. 7).

*A Knowledge Lens* is one that reveals and provides room for human potential and need. Central to the Knowledge Lens is the proposition that humans are the only ones who can have knowledge—beliefs, attitudes, and experiences. The term knowledge has a unique place in LIS as the *Journal of New Librarianship*, 4(2019) pp. 417-438 10.21173/newlibs/7/13 419

human element. This was captured in Machlup's (1981) *living knowledge*, where the relevant stock of knowledge in any society was not what is recorded in books, but "what living people know" (p. 167). This human element was a distinguishing feature of Drucker's (1993) knowledge society, in which "knowledge workers own their knowledge and can take it with them wherever they go" (p. 8). McElroy (2000) argued that "all knowledge begins in the minds of individuals" (p. 45) as they sense a tension between what is happening and what should be happening.

There is no doubt that humans are irrational and inconsistent, but they are also more innovative. A *Knowledge Lens* focuses the system's attention on the creativity, imagination, unpredictability, and messiness within it. Humans are also the only ones who can do anything with this knowledge. Termed *knowing*, this doing is "the epistemological dimension of action itself" (Cook & Brown, 1999, p. 387). Harari (2015) noted the new and unique ability of humans after the cognitive revolution to think and transmit ideas about things that do not yet exist, and this led to "rapid innovation of social behaviour" (p. 37). This cognitive revolution—brought about rather by chance—introduced new and expanded ways of thinking and communicating, referenced by Harari (2015) as the *Tree of Knowledge mutation* (p. 21). The beliefs and myths that make up knowledge do not have a tangible reality. Thus, not only is knowledge itself human, but the ability to work with knowledge is human.

### **The Confusion**

In spite of decades of experience working within a *knowledge economy*—in which human intellectual capital replaced land and machinery as the primary drivers of value—systems still find themselves prioritizing the codified expressions of knowledge rather than the humans that produce it. And they likely fail to realize they are doing it. For example, when the McKinsey Global Institute reported in 2013 on the "automation of knowledge work," they confused information with knowledge.

If knowledge is uniquely human, it cannot be automated. Try giving the pharmaceutical employee a second-by-second series of commands—they will not last long in that position. Instead, the McKinsey report looks into the automated manipulation of information. It is information, rather than knowledge, that is referenced in the 100 times “increase in computing power from IBM’s Deep Blue (chess champion in 1997) to Watson (in 2011)” (Manyika et al., 2013, p. 5).

Automation certainly impacts humans, but humans themselves and the knowledge they uniquely hold can never be automated. It is important to note, again, that this is more than an academic exercise to subject students to. In this confusion of knowledge work with information work, the latter becomes the primary focus. This has the effect of taking society backward out of a knowledge economy as attempts are made to codify everything of importance. Humans become invisible cogs in an automated machine, replaced by what they produce and not seen for their greater potential. Humans alone have the imagination, creativity, and agency to anticipate change (Davidson, 2010). The focus on automating *things* in the Information Lens reduces these complex human elements to simplified versions of themselves represented in manuals and white papers. As this happens, the system not only loses its ability to adapt to changes in the external environment, but it also loses what makes it human.

In addition to being more than a mere academic exercise, this confusion is also more than merely hypothetical. Consider merit-based immigration in national systems. Reports indicate that new plans in America will decide merit based on age, education, and the ability to speak English (Kopan, 2017). Here, national governments confuse the intangible knowledge element of human potential with its codified representations—e.g. educational achievement. A human is so much more than educational achievement, yet governments use this information as a crude proxy for a *good immigrant*. Rather than question these rudimentary codifications, nations treat them as actual representations of

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potential in an immigrant. This becomes a *true* picture of an immigrant. The actual potential this misses—and the humans who are hurt—is hard to quantify, but it is surely staggering. The Knowledge Lens, by shifting one’s focus, calls for fewer parts of a system to be approximated for the sake of efficiency. It reveals the need for the increased time to consider the deeper layers of human activity. The Knowledge Lens attempts to correct for the inadequacies and dangers in information and data lenses. To view social systems through the Knowledge Lens is to understand and appreciate the complexity of human systems, the power of human conversation, and the inherent irrationality of human belief and behavior. It is not a complete rejection of automation and a call to do everything by hand. Human manual processing is equally biased, and certainly inefficient. Instead, the Knowledge Lens is a call to more carefully scrutinize what is codified and automated, seeing where codification should not occur. And where codification does occur, the Knowledge Lens is a call to recognize limitations and consequences, and open that codification back up to the complex and changing realities that created it.

By embracing complexity, utilizing conversation to create what doesn’t yet exist on a foundation of what does exist, and recognizing the human barriers to knowledge work, students who graduate from a Knowledge School will be in a place to question data and information lenses. This will increase system innovation, make room for human agency, and reveal a fuller picture of the individuals who make up the system.

### **A Luddite Call**

One particularly important aspect of the Knowledge Lens, then, is that it asks society to rethink when, where, and with what automation occurs. It begs the questions: What can and should be automated in the quest for increased precision and efficiency? What can and should be left to humans when the information to automate simply does not exist? If knowledge cannot be automated, any

process or area of life that requires knowledge cannot be automated. The following section poses this as a question of which one is given greater control—technical automation or human struggle. And because this paper is not a full rejection of the Information Lens, this section attempts to provide some guidelines for when an Information Lens is appropriate.

As a critique of automation, this is a new Luddite call. Yet rather than push against the displacement of work—though that is equally troubling—this call centers around the issue of agency. Actor-Network Theory (ANT)—a popular means of explaining the intertwining relationships among humans and technology—gives a type of agency to both human and nonhuman actors. It becomes nearly impossible to separate the technical from the social and, thus, “Every human interaction is sociotechnical” (Latour, 1994, p. 806). This was not meant to assert that there is no difference between humans and nonhumans, but to push against assumed clear lines of demarcation between the two (Sayes, 2014). One can see the agency of nonhuman actors as it allows for human society, modifies relationships, and factors into questions of morality and politics (Sayes, 2014). In the Knowledge Lens, the question of agency is very simple: *who or what is given more control in a given situation?* This avoids a complete duality between humans and technology, while still asserting that either can be given more or less control in a given situation. In other words, it does not assert that technology or humans can act completely in isolation. Yet, it does assert that some level of cause and agency can be determined, and this can lead to vastly different outcomes. And the answer to this question helps those seeing through the Knowledge Lens identify where they can put back on their Information Lenses.

### **Who or What is in Control?**

Humans make the decision about when to give up some agency and control. For example, many people are completely comfortable giving more agency to their vehicle to decide when to stop.



They give up control here, and the car decides that the speed of the cars in front of them necessitate braking. Assuming that it does not lead to worker disempowerment, many are also comfortable giving more agency to robotics to build that car to ensure far greater consistency. Let's face it: People would likely feel safer driving a manufactured car versus a hand-made car<sup>1</sup>. This author is also completely comfortable giving the reins over to a super-automated espresso machine in the morning. It is easier to give up control in these examples, because they are all examples of what Snowden & Boone (2007) called *simple domains*. These are problems or domains that have clear cause-and-effect patterns and obvious answers that everyone agrees on. The problem of stopping to avoid a collision is a simple mathematical equation with a known and agreed-upon result—apply the brakes. The machine welding for a car and coffee brewing processes are also similarly agreed-upon with known results. Yet, we have arguably more examples of areas where technology's agency or control should be reduced. These are the complex domains—problems with no existing patterns, areas where solutions emerge after the fact, and where best practices are necessarily irrelevant.

Consider anxiety. It is estimated that over 30% of American adults have experienced an anxiety disorder at some point in their lives (NIMH, 2017). There is no simple, obvious, or quick solution to treating anxiety. Among the more prevalent approaches is cognitive behavior therapy and mindfulness—which takes work. It requires a tremendous amount of human effort. Yet, Americans are increasingly turning over agency and control to technology to treat their anxiety. They play video games, watch TV, and download meditation apps—all as they hand over the hard, unpredictable and

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<sup>1</sup> This is not to justify efficiency movements that turn human work into bad codified copies of it. Frederick Taylor's *Scientific Management* argued that it was the "duty" and "pleasure" of management to "develop laws to replace rule of thumb" and to teach the "quickest ways of working" (Taylor, 2006/1911, p. 53). Scientific Management led to terrible working conditions and worker rebellion, and much of this is still at the heart of automation.

complex work of therapy to technology. Technology is given the control as individuals release themselves of the responsibility that comes with agency, and anxiety is increasing (APA, 2018). What about the process of being informed? What does it mean? How does one do it? How do you know when you are informed? There are several paths to this end, and it emerges out of complex interactions with various information sources and tools. It is often serendipitous (Erdelez, 1999) and follows a nonlinear path (Bates, 1989). This is a complex process that humans must take greater control of. The vast majority of what we know comes from passive awareness rather than active searching to seek answers (Bates, 2002/2003). When someone assumes this responsibility for themselves, they also assume a lot of work. They need to identify relevant and trustworthy sources, evaluate authorship and content, observe bias, and manage an incredible amount of information. And this will lead to better decision-making. Instead, people hand over control of what they know to technology. Algorithms determine the news they get—equations that tend to encircle us with information that makes us feel good rather than informed, and is clearly not able to identify fake news (Vincent, 2018). The reality is that fake news is not that difficult to spot—if you try.

### **The Knowledge Lens Explained**

Up to this point, complexity has been outlined, along with ways to see—or avoid—that complexity. The Knowledge Lens allows people to more fully see and utilize complexity in complex domains. Of course, this lens is not necessary in simple domains. Awareness of the domains outlined in the previous section free us up to spend more time with problems that actually need it, rather than overthinking simple tasks. The Knowledge Lens also helps people detect problems when agency is misplaced—particularly when technology is given more agency than is appropriate. It focuses attention back on the human elements—the knowledge elements—that are integral to all social systems. Freeburg (2018a) outlined the use of many of these elements in LIS curriculum. This section *Journal of New Librarianship*, 4(2019) pp. 417-438 10.21173/newlibs/7/13 425

expands on Freeburg's (2018a) work by focusing it within the context of a new thought movement—the Knowledge School.

Modeled after a typical camera lens, the Knowledge Lens is made up of several elements pieced together. Each element controls for aberrations in the image of social systems. It allows individuals to see the human elements within these systems. They can then identify actions to improve what they see, i.e. they engage in knowing. This knowing is not innately *good*, however. In other words, someone can see complexity and still act in terrible ways. In the same way that humans confronted with complexity can imagine better ways to welcome refugees and help those in poverty, they can also imagine ways to build walls and withhold social safety nets. So the Knowledge Lens is given additional direction based on a careful consideration of what *is* good and ethical.

In the following sections, the Knowledge Lens is outlined in terms of its impact on students. Each student graduating from a Knowledge School will be embedded in some type of social system, and—equipped with the Knowledge Lens—they will see the human parts of these systems. This is good for the system as a whole, as well as each member.

### **Embracing Complexity**

The first element of the Knowledge Lens helps students see the complexity and imprecision in human systems, controlling for the tendency of information- and data-centric lenses to collapse this complexity into easily processed codifications. Human organizations are complex systems (von Bertalanffy, 1968; Stacey, 1996; McElroy, 2000). The world around a system is constantly changing, and it must remain open and adaptive to these changes in order to survive (von Bertalanffy, 1968). This adaptation comes out of locally derived rules, as agents within the system interact and change their behavior based on the behavior of other agents (Stacey, 1996, p. 10). This adaptation is responsible for a system's complexity. So it is essential that agents are allowed to develop these rules.

Information and data lenses look for existing solutions that can be mapped onto this complexity, e.g. best practices. As previously noted, in simpler areas of the organization, with clear causes and effects and agreed-upon answers, such a simplified approach is appropriate (Snowden, 2002). Yet, because human systems are generally complex, this is rarely a satisfactory approach. In most cases, the very movement and shifting of the system makes it impossible to determine clear cause and effect relationships or predict what will happen. Here, “right answers can’t be ferreted out” (Snowden & Boone, 2007, n.p.). This is the realm of knowledge—the non-static, fluctuating, human elements of a system. Utilizing an information or data lens within such complex domains will send systems into what Stacey (1996) called a *vicious cycle*. Here, in a system’s attempt to design for predictable success, they search for “savior recipes” (Stacey, 1996, p. 3). This is repeated over and over again as they convince themselves that they just haven’t found the *right* recipe yet. This stalls innovation and could lead to system death.

This can be seen in most any organization with the explicit or implicit acceptance of the theory of shareholder value or primacy. Shareholder value is an information-centric approach, using information about stock processes to provide a “clear and simple measure of performance for everyday decision-making in the organization” (Denning, 2016, para. 10). The problem is that organizational life and success is much more complex than this. Even Jack Welch called this approach “the dumbest idea in the world” as “shareholder value is a result, not a strategy . . . your main constituencies are your employees, your customers and your products” (Denning, 2017, para. 4). This focus on shareholder value has led to a tightening of hierarchical structures, increased wealth inequality, “aberrant worker policies,” a “discouraged workforce,” (Denning, 2017, para. 40-41), and a destruction of “the productive capacity and dynamism of the entire economy” (Denning, 2014, para. 4).  
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37). This is yet another reason to shift the view back on the human and away from the outputs of the human, and another argument for the adoption of the Knowledge Lens.

The Knowledge Lens taps into the already existing complexity and networks within the system to develop answers in an emergent way. This returns agency to members within the system, recognizing their autonomy and personhood. Here again, instead of trying to simplify the complexity, the Knowledge Lens turns it up. This is done by utilizing Stacey's (1996) control parameters for these complex systems—information flow, diversity, and richness of connectivity. These parameters act like faucets, allowing more or less information, diversity, and connectivity. Turning the faucet down decreases complexity. And while this reduction makes management more comfortable and work more automated, it also results in Denning's (2017; 2014) list of problems. Most organizations need these parameters turned up, and Knowledge School graduates will do it—though with a clear sense of how much is too much. These graduates will recognize and know how to provide room for people to express their unique knowledge in welcoming spaces. This full expression of human agency is essential to success in social systems, and it also happens to be more ethical. Seeing where possibilities for such expression of agency exist—and where data or information lenses inhibit it—students can take corrective action.

### **Creation through Conversation**

The second element helps students see the ability, desire, and need of humans to create solutions together through conversation. Although knowledge creation begins in the minds of individuals (McElroy, 2000), it is refined in groups: "Each member brings his or her 'knowledge claims' to the table, and together they are scrutinized, discussed, modified and refined" (p. 46). This element helps students see where existing solutions are inadequate, and how humans can come together to create and refine new solutions. This controls for the tendency of information and data-centric lenses

to assume that the answer to a group's problem already exists in codified form, and all that is needed is the transfer of that answer from one group to another.

In Levy's (2001) book about Google, he recounted an interview with Larry Page about the future of a brain implant for Google searching: "When you think about something and don't really know much about it, you will automatically get information . . . if you think about a fact, it will just tell you the answer" (p. 67). One problem with this approach is that it assumes an answer already exists for every problem. This is certainly not the case; instead, organizational systems need to create the solutions that do not yet exist. And the agents within these systems who are impacted by these solutions should be the ones who create them.

This taps into a deeper problem that LIS professionals have been pushing against—the arrogance in assuming that the library has all the answers. This arrogance takes the library out of the creation business. Instead, the library is a place where answers can be created, and librarians facilitate this creation (Lankes, 2011). Consider approaches to information literacy. Typically, this involves teaching individuals how to find information in standard ways that the LIS field has deemed appropriate. Yet, the information produced in the formats considered authoritative—e.g. scholarly research—represent a mere fraction of the total information available. Consider a family of four operating on a single minimum wage salary. How do they find out how to cope? They could use peer-reviewed research, but this is likely designed and written by people with no direct personal experience with poverty. A more promising approach is to support them as they get together with other families in a similar situation. Here, supported by information services, they can move beyond what already exists to create the solutions that work best for them. One well-studied model for this is Communities of Practice (CoPs)—“groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their understanding and knowledge of this area by interacting on an ongoing basis” *Journal of New Librarianship*, 4(2019) pp. 417-438 10.21173/newlibs/7/13 429

(Wenger, McDermott, & Snyder, 2002, p. 4). Freeburg (2017) found designed CoPs to be a successful means of information literacy instruction. Freeburg (2018b) also outlined the use of CoPs for classroom systems, showing the broad reach of this tool to engage the Knowledge Lens elements.

This goes beyond the provision of existing information as it shows students opportunities to facilitate—rather than direct or impose—knowledge creation. Consider what would happen, for instance, if those in the profession stopped asking people what their information needs are. Instead, they asked them “What is going on here?” The former assumes that the answers to someone’s problem is in an existing artifact or piece of information that can be retrieved; the latter assumes that answers will likely need to be created. This changes how students view expertise and authority and, as a result, changes how they judge the quality of ideas. There can be no universal standards for authoritative or *good* information, because what works to empower people and help them succeed cannot be realized without the input of the people to be empowered, thus making *good* a contextual and shifting label. Following Habermas, conversation is the only means by which we uncover what is true and what is right: “Authority and tradition have lost their status as the ultimate sources of legitimacy” (Wellmer, 2014, p. 710).

The implication of this for behavior—or knowing—for graduates of a Knowledge School is that humans need to continually create the solutions for most of the problems they face. And they need rich connections with other humans to do it. This is a process of engaging in the knowing of one another, rather than merely the information products of one another. It is engagement with the actionable and ill-formed thoughts and ideas—and experiment with potential solutions—without waiting for an analysis of meeting minutes. It requires engaging in the messy process rather than merely the outputs of that process.

## Barriers

The third element helps students see the barriers humans have to both information and knowledge creation. Students can identify where the provision of information is unsuccessful as individuals lack awareness of this information. They can identify where awareness of this information does not translate to knowledge—and this knowledge does not translate to knowing. They can then study these barriers to help organizational and community systems open themselves up to more possibilities. Information and data-centric lenses stop at information access and provision. The Knowledge Lens shows the glaring chasms between people and information.

Consider how often an individual is confronted with information that fails to make any impact on what they know—let alone what they do. Such a thought exercise is no problem for those in higher education. The Knowledge Lens shows that having access to—and being confronted with—information does not assume that an individual becomes more knowledgeable as a result. One's existing beliefs can easily block information from influencing what they know in any meaningful way. Caplan (2001) suggested that individuals are rationally irrational, such that they have certain bliss beliefs they *like* holding. Individuals hold onto them—in spite of having very little information to support them—because there is very little cost associated with being wrong. For instance, people can firmly believe that most immigrants to the U.S. are criminals taking advantage of a loose immigration policy. Information that shows that native born Americans are actually *more* likely to commit a crime than immigrants may not enter the knowledge structure of these individuals because they are not, themselves, immigrants. Being wrong will not cost them anything, and they enjoy maintaining that belief. And even if they didn't enjoy the belief, Batson (1975) suggests that public commitment to initial beliefs will cause individuals to double down on them in the face of disconfirming information. Either way, information does not enter the mind as knowledge. A Knowledge School recognizes that, if

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information is to hold any power in social systems, it must be accompanied by a greater understanding of the beliefs in the systems where this information is provided.

Yet, a changed mind can be similarly ineffective if it does not lead to changed behavior. This is why the goal of the Knowledge Lens is *knowing*, rather than just knowledge. If one has the knowledge that crime rates actually decrease in areas of increased immigration, yet does not then advocate for changes in immigration policy, what good is that? What's the point? Many people have the knowledge that smoking is dangerous, but they continue smoking. What good is knowledge about the dangers of smoking if it doesn't lead to cessation of the behavior? The Knowledge Lens reveals a mission—not only to help people integrate and think about information—but to help people engage in actions and make positive decisions based on this knowledge. This requires, for instance, an analysis of the three elements in the Theory of Planned Behavior (Ajzen, 1985)—beliefs about the behavior, social norms, and perceived self-efficacy. These are the variables that influence one's intention to do something and is the best predictor we have for how someone will actually behave.

The implication of this for behavior—or knowing—for graduates of a Knowledge School is that several barriers must be overcome if information is to have its intended impact on behavior. Understanding and accounting for these barriers, the information professional can have more meaningful impact on a system. For example, rather than merely rebuild an organization's databases, they work to build up its potential for action to create positive change.

### **Moving Forward**

It is important that students graduating from a Knowledge School understand and can make use of the Knowledge Lens. Knowledge work is no longer a separate category of work set aside for a privileged few. Instead, *all* individuals within any social system should be encouraged to engage in knowledge work. This includes the generation of ideas about manufacturing processes, new uses for

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community spaces, and any other area that intersects with a student's passion. This is not limited to a job or career.

The Knowledge Lens is not a call to end efforts to increase society's ability to find information, or to stop all efforts at automation. It is also not a call to throw out information. Instead, it is a call to be careful about what is codified and what is automated. It is a reminder to consider how much agency we are willing to give up in the capitalistic quest for efficiency. It is a reminder that neither data, nor the outcomes of data manipulation, are objective. It is a reminder that the knowledge an individual has means nothing without the ability and freedom to express it. It does not do away with data or information; rather, it gives increased meaning to both as they are framed in the context of human action and decision-making.

With the Knowledge Lens, students more fully understand and embrace the complexity of human work without reducing it to manageable pieces and digitized forecasts. With the Knowledge Lens, students tap into the innovative potential of humans rather than remain limited to what already exists. With the Knowledge Lens, students move beyond storage of— and access to— information, adding an analysis of how information is integrated into the human mind through reflection and translated into action by human agents with purpose. With the Knowledge Lens, students can identify misplaced agency in nonhuman actors. This increases innovation, makes room for human agency, and reveals a fuller picture of individuals within a system.

And all of this should be done with a clear sense of how it helps people improve their lives and the lives of those around them. This happens in both organizations and communities. A shift toward an embrace of complexity is good for employees as they are allowed to use rules of thumb and tacit knowledge without the forced and sterile codification of their creative energies. A shift to social knowledge creation helps ensure that groups have the capacity and resources to solve local problems.

A shift in understanding barriers to knowledge and knowing puts information professionals in a better position to actually impact people and empower them to make better decisions. It is a fulfillment of Patrick Wilson's goal, one that "explicitly recognizes the primacy of the need to bring knowledge to the point of use" (Wilson, 1977, p. 120).

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