Communications of the Association for Information Systems

Volume 25 Article 37

11-1-2009

AIS, LEO and the Pursuit of Good Work

Richard O. Mason
Southern Methodist University, rmason@smu.edu

Recommended Citation
Mason, Richard O. (2009) "AIS, LEO and the Pursuit of Good Work," *Communications of the Association for Information Systems*: Vol. 25 , Article 37.
DOI: 10.17705/1CAIS.02537
Available at: https://aisel.aisnet.org/cais/vol25/iss1/37

Communications of the Association for Information Systems

CAIS

AIS, LEO and the Pursuit of Good Work

Richard O. Mason

Southern Methodist University

rmason@smu.edu

Abstract:

This paper is the text of a talk at the 15th Americas Conference on Information Systems, San Francisco, California, on 8 August 2009, based on the concept of the "Last Lecture" by recipients of the Association for Information Systems LEO Award.

Volume 25, Article 37, pp. 451-464, November 2009

Communications of the Association for Information Systems

This talk is a reflection on **respect**. That is, about honoring and esteeming the field of information systems.[1]

Our respect is always directed toward some object. There is some thing that we respect. Respect is directed toward, paid to, felt about, or shown for an object. For me today that object is **information systems**.

There are many things about our field that I have respect for and wish to reflect on this afternoon:

- my **colleagues** in information systems
- the **field** itself and what it stands for
- **AIS**, as the leading professional society of IS researchers and educators
- the **history** and traditions of our field, and
- the **work** we do as members of the field

These, of course, are not isolated elements. They are part of a complex network of IS professionals and activities that in their totality, I believe, are deserving of our respect. Respect is reflexive. As the essayist Ralph Waldo Emerson once observed "Men are respectable **only** as they respect."[2] Emerson is reminding us that to a great extent our field of information systems will only be respected by others to the extent that we accord it our respect.

Blake Ives and your program committee, I believe, were seeking respect for our field's history when they proposed that Gordon Davis and I deliver a "last lecture." They were perhaps motivated by Carnegie Mellon Professor Randy Pausch's moving reflection on his childhood delivered about two years ago upon learning that he was dying of pancreatic cancer. Or perhaps they were encouraged by series at several universities where a professor is asked to speak to the question "If this were your last time to address a group of students, what would you say to them?"

Whatever the motivation, it's an honor to be asked to reflect on that question and respond. But, upon thinking about it, I decided to take a slightly different tack. Instead of a "last lecture," I would rather call this the "last scene." After over forty years spent as an academic focusing on information systems and the over fifty years having been associated with computers and information technology, I speak to you today for what may well be what Shakespeare called the "last scene of all." In *As You Like It,* the "last scene" is the final of seven ages of life. For Shakespeare this seventh age is a period of second childishness. Thus, one is allowed to be a little reckless as well as longingly reminiscent.

During the last scene, as the Carpenters expressed it in song, we may look at "Yesterday Once More." And the Carpenters' lyrics go on to say "So much has changed," yet, "All my best memories come back clearly to me." This afternoon I will share and reflect on some of the Carpenters' "Sha-la-la-la's" and "Whoa-oh-oh's" that still shine in my memories of information systems.[3]

I do this, however, with a positive eye to the future and especially to all of you AIS-ers who are in the earlier stages of your careers. What we old timers have lived through during the last forty years or so are fading. A new age of information systems is dawning. For you it is the Shakespearian first scene that is the most important.

This reflection is organized around three interrelated themes:

1. First, I will describe briefly some aspects of the evolution of Information Systems as a branch of knowledge and practice and why it is important that AIS, as an association of academics in the discipline, continue to develop itself as **the** professional society for the field. AIS has a covenantal responsibility for stewarding the discipline's knowledge and its practice. Respect for the field demands it.

1. I am grateful to Blake Ives and Ken Kendall for inviting me to speak at this "last lecture" and to Gordon Davis for also agreeing to participate. These colleagues are especially deserving of my respect.
2. http://thinkexist.com/quotation/men_are_respectable_only_as_they/160995.html.
3. http://www.youtube.com/watch?v=G5NZI8NmBLA.

Communications of the Association for Information Systems

2. Second, I will recount an few episodes from the history of the Lyons's Electronic Office, known as LEO, and comment of why I think it serves as a good reminder of our history and of the values that underlay our field and, hence, why it is an appropriate object of our respect and why it is a suitable historical benchmark for an AIS award that acknowledges those who have contributed to the development of the field.

   Lyons was an unlikely innovator in this field. Before the late 1940s, the firm was primarily noted throughout the UK for its teashops and bakery goods and the cheerful service of its waitresses, who were affectionately called "nippies." Oxford science writer Georgina Ferry, to my way of thinking, captures the spirit of the LEO endeavors very well in her history of the project:

   "The LEO experiment," she observes, "quixotic as it may have been in the context of a large catering company, is worth remembering for much more than being first. It is worth remembering because its architects never forgot what the computer was for: it was a tool for business, and so it was their **responsibility** to make sure it worked for business."[4] (emphasis added) . . . "[I]t was their responsibility to make sure it worked for business." This is the key to their quest for professionalism.![5]

3. Third, I will talk about the importance of coalescing a community of IS academics—teachers, scholars and practitioners—around AIS's central mission. Since 1994 AIS has become "the premier organization for academics specializing in information systems." AIS seeks to accomplish this mission by means of "building community through excellence and commitment."[6] For developing this theme I will draw on ideas of professionalism and in particular on Harvard psychologist Howard Gardner's notion of "Good Work." Gardner and his colleagues describe good work as that which is

   ⇒ "technically Excellent;

   ⇒ personally Engaging; and

   ⇒ carried out in an Ethical manner."[7]

As I see it, the members of AIS aspire to all three of these components of good work. And such good work deserves our respect.

These three themes are interwoven in a personal narrative in which I will recount a few of my own experiences in the field—some of my sha-la-la-las. These reflections describe in part how I came to respect the field of Information Systems and also to respect those who have worked so hard to make it into a full-fledged academic discipline.

I begin with a little personal history.

I developed an intense interest in the use of computers to solve business problems during the Fall of 1953. I was enrolled in an accounting principles course at Oregon State. About mid-quarter we were assigned a huge practice set to be completed by the following Monday. The packet contained what, for me at least, was a staggering array of documents: purchases orders, sales transactions, cash receipts, invoices, bills, statements, employee hours, ledgers, journal entries, etc. I had little time to devote to it because as a member of the football team I was leaving on Friday morning for an away game and would not return until Sunday. I lugged the packet back to the fraternity house and went right to the treasurer's office in search of the little ten-key, hand cranked Victor adding machine, that being the only mechanized numerical support we had in the house. I quickly encountered a problem. The treasurer planned to use the machine soon and told me in no uncertain terms that he would not let it go. So, I trudged back to my room to begin to labor piece by piece through all of these scraps of simulated business information, trying to figure out where they went in a morass of journals, registers, and t-accounts, all the time keeping track by doing the sums with pencil and paper.

Sometime in the middle of my muddle I set back in my chair and shouted out loud: "**There has got to be a better way!"**

Then, I remembered having seen an article in *Time* magazine about "giant brains." I thereby resolved to learn more about them. In the meantime, somehow—memory fails me here—I actually did complete the practice set.

4. Ferry, Georgina (2003), *A Computer Called LEO,* London: Fourth Estate, p. 199.
5. In addition to Ferry's book see also Bird, Peter J. (1994), *LEO: The First Business Computer,* London: Hasler Publishing Limited.
6. www.aisnet.org.
7. Gardner, Howard, Mihaly Csikszentmihalyi, and William Damon (2002), *Good Work: When Excellence and Ethics Meet,* New York: Perseus Publishing.

What I do remember is that the *Time* article featured the ideas of a Prudential Insurance company actuary and mathematician named Edmund C. Berkeley. During WW II Berkeley had worked with Howard Aiken at Harvard on the MARK I, among the first computers. The *Time* article pointed me to Berkeley's 1949 book: *Giant Brains, or Machines That Think*.[8] This is likely the first book on computers intended for the general public. Berkeley's technological vision seemed to be just what I was looking for. In this book, Berkeley described the design for a computer he called *Simon*—not named for Herbert Simon but for *Simple Simon,* as in the Mother Goose fairy tales. It was the "simple" part that appealed to me. Simon was a small, mechanical "brain" that could perform basic logical processes and calculations, such as addition and subtraction, and keep track of multiple items of information. (I was unaware of Babbage's Analytical Engine or Alan Turing's Machine at the time. I later learned that their concepts shared some commonalities.) I thought to myself, that perhaps with a little help, Simon could have done my accounting practice set for me.

At the time I was studying finance and economics. The book set a new direction for me. I vowed to look into this new thing called *computers* and how they might be used to solve business problems.

Just a few years ago, as I was researching the history of LEO, I learned that Edmund Berkeley was one of the leading thinkers interviewed by a two-person task force sent to the US by Lyons's during May and June of 1947. The two managers visited ten institutions in America that were believed at the time to be on the leading edge of computing. They met with Herman Goldstine, Eckert and Mauchly, Howard Aiken, and also with researchers at IBM, NCR, Burroughs, RCA, the Moore School at the U. of Pennsylvania, and the US Army Proving Grounds at Aberdeen. While they gained considerable knowledge and insight from all of their interviews, the visit to Prudential provided them with the strongest evidence that a concern for applying computers to business applications was **not** on the front burner in America. The late David Caminer, who became Lyons's leading programmer and systems analyst, later wrote that Berkeley believed in 1947 that "Prudential was the only commercial concern in the US actively interested in the application of electronic machinery in its offices."

That statement may have been a little self-serving, but I don't think it is too far off the mark. That was then. Over the last sixty years or so, a lot has changed. Organizational IS, as we know it today, is a massive enterprise both within the US and globally.

The Lyons people returned to London convinced that IF they wanted a computer system to facilitate their needs for business organization processing, they would have to develop it themselves. So they did! What is important in this distinction is not just the design of the computer. Yes, to oversimplify, scientific computer applications generally need more centralized computing power, whereas business applications generally require more input and output capacity. The key difference really lies in the intent and the **CONTEXT** in which the technology was applied.

In 1947, the idea of Information Systems as we now know it was, I suspect, bubbling somewhere below the surface in a variety of organizations. But, it had not yet been formulated as a social or economic or business need. Lyons was forging new ground here. Their innovative development strategy, which was rather innovative at the time, was to begin with the organizational context. As Gordon Davis helped us understand years ago, it was essential to first identify the full extent of the total organization's information needs, then to perform a systems analysis to refine and specify those needs, next to use the results of the analysis to determine what the optimal information flows should be, and then, as a final step, to apply the most appropriate combination of people and technology available to implement the optimal information flows. If that required innovation of a new technology, **so be it!**

Today, this pioneering approach of Lyons is considered to be classic information systems philosophy, but then it was quite visionary.

Lyons's Systems Research Department was headed by a powerful man with a colorful, and typically British, name: John Richardson Mainwaring Simmons. Upon reviewing the report from the trip to America and understanding fully the need for a true office-based computer, Simmons proposed to the Lyons's board in November 1947 that the company design and manufacture its own electronic office. Simmons was a British "wrangler," having graduated from Oxford in 1923 with highest honors in mathematics. He started at Lyons as a statistician and management trainee. Early on he conceived of the need for and established a full-fledged systems research organization dedicated to better managing the firm. He undertook this leading edge initiative, bear in mind, in the 1920s. Simmons eventually became the maestro of technology who spearheaded the first and subsequent LEO projects.

8. Berkeley, Edmund C. (1949), *Giant brains or machines that think,* New York: John Wiley & Sons; London: Chapman & Hall.

In 1947 Lyons's business was exploding, due to pent-up demand and post-World War II recovery. Simmons and his associates saw very clearly that the company would never be able to handle the anticipated increases in the pace, volume, and complexity of their business transactions if they relied only on the existing systems and technology. They faced what sociologist Jim Beniger later called a "crisis of control."

This crisis was being experienced on both sides of the pond. Ron Daniel, a McKinsey consultant of that era, later observed that:

"In each company the origin of the problem lay in the gap between a static information system and a changing organization structure. This difficulty is not new or uncommon. There was hardly a major company in the United States whose plan of organization has not been changed and re-changed since World War II."[9] Crucially, these changes created new demands for information and thereby led to a demand for computer-based information systems. Lyons was on the verge of suffering such an information crisis, but Simmons and his associates fully realized it and intended to do something about it.

In the background of Daniel's observation lies what might be called the "iron law" of information systems. Simply stated: *Information flow is essential to the functioning of organizations.* The law implies, that without information serving as the glue, there is no organization. Hence, improvements in organizational performance require improvements in information flow. More effective information flow is a necessary, though not sufficient, condition.

My understanding of this "law' has led me to propose a general mission for the discipline of IS:

To secure morally justified improvements in organizational performance by managing the flow of data, information, and knowledge provided by, among other things, information and communications technologies.

I will return to this mission statement later, especially the "morally justified" phrase, when I share some of my thoughts about the role of AIS in promoting IS as a profession. For now I simply want to observe that the managerial leadership at Lyons tacitly assumed something like this mission statement. Most, importantly, they acted on it.

Thursday, November 29, 1951, is a significant date in the history of our field. That evening at the Cadby Hall Facility of the J. Lyons & Co. operations in West London, the LEO team conducted what, by all accounts, was the first routine office job run on a stored-program computer. That computer, of course, was LEO—the Lyons Electronic Office. Remarkably, within just four years after the trip to America, a proposal was made to the board, the board gave the go-ahead, and a group of remarkable employees had conceptualized, designed, manufactured, installed, programmed and operated this new system for the primary purpose of better managing their business.

Development of a new business oriented computer—hardware—was clearly a major contribution to our field. But the people at Lyons did something more important than that. They planted some vital seeds for instituting a new branch of practice and knowledge about the technology and how it should be applied. In my view, they pioneered what today we now call the field of "Information Systems."

I came to the area a few years later, having **never** heard about LEO. I started my career in computers in June 1956, when, after graduating from Oregon State, I joined the Burroughs Corporation. After some initial on-the-job training, I became a computer specialist and then a bank automation specialist. It was a crazy but exhilarating time. Things were happening so fast. None of us really knew what we were doing. I came to work everyday thinking that today was the day that my managers would discover that I didn't know anything, was in over my head, and needed to be replaced. Somehow I held on. Over a period of about eight years I had an opportunity to visit hundreds of different organizations, consider their information needs, and, of course, try to show them how the Burroughs's solution compared with IBM's, RCA's, NCR's or Control Data's. All of this was really exciting stuff but ultimately, for me, not fully satisfying. I became more interested in the "Why's" than the "How's," more interested in philosophizing than in "Moving Iron."

So, in 1964 I decided that, in order to make any sense of what I was experiencing, I needed to get a broader and more detached perspective. That's when I decided to go to Berkeley to pursue a Ph.D. with C. West Churchman, nominally in Operations Research but with as much exposure to information systems as I could find. (And with West being a philosopher, I received a good exposure to philosophy and ethics as well.)

9. D. Ronald Daniel (1961), "Management Information Crisis," *Harvard Business Review* (September–October 1961), pp. 111–121.

Communications of the Association for Information Systems

Although the Burroughs experience was crucial, my first actual direct encounter with a stored program computer came during the Winter Quarter of 1956 while I was still a student at OSU. Being interested in computers I ask for and was granted permission to audit a graduate course in the statistical design of experiments, a course for which I had none of the required prerequisites, but it was the only course I could find on campus that offered an opportunity to learn computer programming. Oregon State, as a major land grant institution, had a substantial agriculture research program. Dr. Lyle Calvin, a noted agricultural statistician from North Carolina State, allowed me to participate in his advanced course as long as I satisfied several conditions: don't miss a class, do all the homework assignments, and sit for all of the exams. (I think he thought these requirements would be enough to scare me off, but I stayed.)

In those days a distinction was made between plug-board, externally wired computers and the new internally stored program computers. The only stored program computer in the state of Oregon at the time was an IBM 650 located in the Service Bureau in Portland. For a class assignment, we wrote small statistical programs—mine had something to do with matrix manipulations, as I recall. We programmed them in what was essentially machine language. One Saturday morning we drove from Corvallis to Portland. There we stood in line to use a keypunch machine to punch up our deck of program and data cards, and then we stood in another line to enter our deck into a card reader for processing by the 650 computer.

After all my program and data cards had been entered into the 650 I learned quickly, to my dismay, that **my program did not work!** Moreover, I had absolutely no idea why. In fact none of my classmates programs worked. The 650 punched out comment cards, which we then took to another machine (a 407 accounting machine) for printing. We all then took our printouts and tried to make sense of them, to find out where our mistakes were, and to try to make corrections. It turns out that none of us were able to get our programs to work that first day. (Such a scene is probably incomprehensible to all but the very oldest reading this!) So, it was a gloomy and, naturally rainy, ride back to Corvallis late that afternoon.

A week's perusal of the printout, another trip to Portland, more keypunching of correction cards, another false run, more corrections, and finally my program was the third in our class to run successfully. I think I decided that day that programming was not my strong suit and that I had better focus on philosophizing about how computers could be used. The noted mythologist Joseph Campbell had it right when he said: "Computers are like Old Testament gods; lots of rules and no mercy."[10]

In too many ways to enumerate the technology has changed during the last fifty-plus years. Meanwhile, the then fledging discipline of information systems has had to change and mature with it. Reflect for a moment on what we called an electronic computer in early 1956. The 650 used a magnetic drum memory that contained just 2000 signed, ten-digit words. It consisted of a CPU that was 5 ft. by 3 ft. and 6 ft. tall and weighed about a ton; this was attached to a power unit that was the same size that weighed about a ton and a half; attached to these units was a card reader/punch for input and output. It was slightly smaller than the other units and weighed about two-thirds of a ton. At IBM's Portland Service Bureau this three-plus ton unit was housed in a glassed-in corner room facing Broadway Street. I estimate the raised floor room was about 30 ft. by 30 ft. Passersby could see the blinking lights (and hopefully ignore the frustrated faces).

By today's standards the lights did not blink very fast. The 650 could add and subtract in the then "remarkable" time of 1.63 milliseconds. Multiplication took 12.96 milliseconds. Division required 16.90 milliseconds. (The original LEO used mercury delay tubes and was slightly faster than the 650 at a 1.3 milliseconds add/subtract time.) In scientific notation, the 650's add time speed may be expressed as 1.63 times 10^{-3} seconds. In comparison today's petaflop machines execute instructions at 10^{-15} seconds. That's about one trillion times faster. And the new technology is smaller and lighter and far more agile.

What is significant about today's information systems, however, is not their speed, size, or mass. It is their range and expanse. For the last forty years or so, we have been moving up a Maslow type **hierarchy** of information needs.[11] LEO and the early systems I worked on—the one's upon which all early ISer's cut their teeth—were intended to meet an organization's **physiological** needs—accounting, payroll, order entry, and the like.

10. http://thinkexist.com/quotation/computers_are_like_old_testament_gods-lots_of/152696.html.
11. Originally proposed in 1943, in Maslow's hierarchy, human needs have a predetermined order of importance. Most fundamental are **physiological needs** (e.g., breathing, food, water, sex, etc.). These are followed by **Safety, Love/belonging, Esteem,** and **Self-actualization.** Self-actualization was described by Maslow as "the desire for self-fulfillment, namely the tendency for him [the individual] to become actualized in what he is potentially. This tendency might be phrased as the desire to become more and more what one is, to become everything that one is capable of becoming." It seems to me that information systems since its inception has been on a path to its own self-actualization. See Maslow, Abraham H. (1943), "A Theory of Human Motivation," *Psychological Review* 50, pp. 370–396, p. 370.

Today most of our systems have moved up the hierarchy to encompass **social** and **self-actualization** needs. In my day the organizational systems were routine, tightly coupled and structured, centrally commanded. There really was a "main frame." Today's systems focus on urgency, ubiquity, interactivity and connectivity, and on being mobile and untethered. They tend to share information **horizontally** via network-enabled services rather than vertically. They accommodate collective intelligence and give users more control over their own data. Globally accessible Web pages, Wiki's, blogs, Twitters and tweets, MySpace, Facebook, Friendster: these are among the high social needs applications that drive today's information systems technology and its use. They also shape and support a different kind of organization.

In the 1950s, computer based simulation was at best a twinkle in some programmer's eye. Today millions of people work and play in virtual worlds. Computer simulation has transformed the practices of designers, engineers, economists and planners, scientists and members of almost every other discipline. So much so that Sherry Turkle, with echoes to Freud, can speak of its "Discontents," the new sources of human anxiety and misery that accompany it.[12] Immersed in simulation and virtual worlds, Turkle observes, we become vulnerable in new ways. We have a feeling that something important (and real?) is slipping away and become uncomfortable about it.

I mention these notable changes in processing capacity and capability because although technological improvement is not, as I stated earlier, the essence of Information Systems, it has been a major driving force shaping our field. Each improvement in the cost to performance ratio of information and communication technologies and every change in the scope of its feasible breadth of application—every move up the hierarchy of information needs—has expanded the range of things that can be done to change and, hopefully, to improve the functioning of organizations.

Herein lies the ground for moral responsibility. Innovation opens up more options. Information systems professionals definitely shape the nature of these options, and they often decide on or at least recommend which options will be adopted. Most of these options are very good; some are just so-so; but, at least a few may be bad, indeed very bad. To anticipate a point I will come to later, this process of shaping technological capability, adds to the moral responsibilities of those of us who practice, research, and teach about information systems.

I left U.C. Berkeley in the Fall of 1968 for UCLA where a small group of us started one of the first IS programs. There was no academic branch called *information systems* in those early days, no real agreement on what we did or who we were. Most people both outside and within academia confused us with computer science. We—and the "we" I am referring to includes many in the audience, those who have received the LEO award and many, many others—were at best a ragtag, disparate but dedicated group of pretty venturesome people who believed that innovations in the flow of information were going to change the way organizations of all types were managed. We also believed that there was a viable body of knowledge and practice developing that warranted genuine academic and professional treatment.

Many of us were frequently called before our colleagues and academic administrators to explain and to defend our field, to describe what it was and make an existential argument as to why it even existed. At UCLA we prepared a list, as I recall, of over 200 books and articles, gleaned from a wide variety of sources, that we argued established a corpus of knowledge for the field. Nevertheless, none of us had a formal degree in the field. We all had degrees in something other than IS—accounting or management science being the most prevalent. (Ph.D.s in IS were not granted until around 1970.)

The program that a handful of us started at UCLA was at first part of the accounting area and initially called *Accounting Information Systems.* From these humble beginnings, we continued to struggle for a separate identity. No matter how hard we tried, it was difficult to convince most of our colleagues that there was enough rigor and content in what we did to put us on an academic par with, say, finance, economics, marketing, or operations research. Indeed some of these fields at the time were still fighting to establish their own bona fides. So, why give us any credit?

One incident will perhaps shed light on the struggle. Our small band wanted seriously to distinguish ourselves from accounting, but we also needed an academic home. That's when the indefatigable and always politically astute Eph McLean rose to the occasion. Eph proposed that we change the area's name to *Accounting AND Information Systems,* which was then shorted by replacing the "and" with an **ampersand**. University policy required that the proposed name change be submitted for a vote before the entire business school faculty.

12. Turkle, Sherry (2009), *Simulation and Its Discontents* Cambridge, MA: The MIT Press.

Communications of the Association for Information Systems

What a time bomb that was! In what some of us latter called the *Great Ampersand Battle,* this proposal became a kind of emotional Rorschach test. Faculty members reacted to it by expressing their irritation about this unknown upstart troupe called *information systems.* Most of the faculty seized on this opportunity to complain about numerous other things that had nothing to do with IS. Many were simply baffled. Nevertheless, a highly charged discussion continued for twenty or thirty minutes. Finally, the room was silenced when an economist who happened to be sitting next to a marketing professor—with whom on most school issues he violently disagreed—turned and asked in a voice much louder than he intended, "What the fxxx is an ampersand?"

We did not know about LEO in those days, but, if we had, it would have served as a very informative case study from which to teach IS. It begins with a lesson in leadership. While there were many important leaders and contrib.-utors to the project, including our own Frank Land, the key maestro was the aforementioned John Simmons. Simmons imbued the company with a systems philosophy. Before any other steps were taken, every project begun had to be subjected to a thorough systems analysis, which was used to establish the best possible flow of crucial information to all relevant parties. All proposed changes were based on a "from beginning to end" understanding of what the Lyons people described as "the network of relational **contracts** within and around the firm"—a concept they called "organizational architecture." The notion of a "contract" is interesting because it connotes a **mutual responsibility.** A contract implies that both provider and user have moral obligations to one another. Only after this organizational pre-work was completed and optimal information flows determined, was the most appropriate technology identified and applied.

A lead force in implementing Simmons's vision was David Caminer, a systems and programming guru who passed away on June 19, 2008, at the age of 92. Caminer was among those who continued to insist that Lyons's analysts must always take a whole-systems view of their problems, pay meticulous attention to detail, and be dedicated to professionalism in their work as a code of honor. That is, Caminer, as did Simmons, demanded that the enterprise be respected.[13]

The LEO team focused on the fundamental physiology of their business, on what today we would call *mission critical applications.* The pioneering application was a daily cost accounting program that calculated values for the production and distribution of each of Lyons's numerous products—breads, cakes, pies, ice cream, teas, etc. This information drove numerous day-to-day business decisions. This application was followed soon there after by payroll in 1953[14]. (This may have been the first payroll application in the world. The GE Univac I payroll, often cited as the first in the US and generally considered to be the launching of commercial applications in America, was run about a year later in 1954). Third, came "teashop distribution" which was used to schedule and manage the flow of products distributed to its 180 shops. This was followed by bakery sales invoicing, and, finally, tea blending, which kept track of inventory and costs of a vast variety of mixes of teas. (Frank Land wrote the program.) All of these applications were developed and implemented according to the strict professional philosophy of the Lyons's Systems Research Office.

It's a long leap from the LEO team of the early 1950s to AIS in 2009. However, a common tread of professionalism runs through the decades.

As a member of the field, I believe that our personal moral situation changes at that time when we become "information systems professionals." In our role as ISers, we do not take a formal oath, such as Barack Obama did on January 20, 2009, nor as doctors, lawyers, accountants, or ministers do. Nevertheless, I would argue that we do assume additional moral responsibilities when we become members of this field. We should insure that the power inherent in the knowledge we **possess,** and that we **profess**, and that guides our **practice** is not used for untoward purposes. We must treat this knowledge and our colleagues with respect.

The very word *profession* comes from the Latin *profiteri*, which means "to declare aloud," to "testify on behalf of," to "stand for," or "to avow." Being a professional requires accepting publicly a special way of life, one that promises that the members of the profession can be trusted to act in ways other than just their own personal interests. My colleague, the medical ethicist William F. May, argues that a professional's covenant derives from three fundamental characteristics. In his view a professional:

13. Martin Campbell-Kelly (2008), "David Caminer: Systems designer behind LEO, the world's first business computer," *The Independent* London, 26 June 2008. Caminer died on June 19, 2008.
14. Actually, Derek Hemy, Caminer's first hire as a programmer, programmed a complete application for payroll in November 1948, but it was decided to postpone work on it until input source issues could be ironed out and a modular approach applied to the code. Bird, Op. Cit. pp. 55–56.

1. Professes **something**, a body of knowledge and experience. This we do in our teaching, writing, consulting, advising, and related activities. This Bill May calls the **intellectual** mark. It calls for a virtue of **practical wisdom**.

2. Professes on **behalf** of someone or institution or organization. What we do affects someone for either good or bad. Churchman called this beneficiary the system's client. Bill May refers to this as the profession's **moral** mark and notes that it requires the virtue of **fidelity**.

3. Professes in the setting of colleagues. This is the **association** mark—AIS in our field—and it requires the virtue of **public spiritedness**.[15]

In the late 1960s there was no association for IS people to join and with whom to share their knowledge and experience. First, members of the field put on conferences like ICIS. Finally in 1994 AIS was formed. Information Systems now has a viable association mark, thanks to the continuing efforts of many of you in this room.

From the very beginning IS people went to work developing the field's intellectual mark. *The MIS Quarterly* became the first academic journal specifically dedicated to IS research and knowledge building. The *Quarterly* has been followed by a host of others. As a result a fairly substantial body of knowledge and experience has accrued.

The IS body of knowledge is grounded in at least three things: theory, data, and historical trajectory. The York University website, "Theories Used in IS Research," lists at last count some 82 theories that have been applied to IS problems. (I initially thought this was too many. Then I realized that professions like medicine, law, and engineering likely draw on this many or more.) In the data category many of these theories have been subjected to empirical tests in an IS environment. And, with the occurring of key benchmark events, such as LEO, IS has recorded a history that helps put the field's knowledge and its evolution in perspective, running back at least as far as Charles Babbage and Leibnitz and moving forward to the current-day social networking and virtual world applications.

I believe that the association mark and the intellectual mark, though always in need of improvement, are relatively under control and that we continue to make good progress on those fronts. What about our moral mark?

Bill May observes: "professionals wield knowledge not simply to exploit others or to indulge in self-display, but to serve others in their needs. Teachers who wield knowledge simply to dazzle, to show off, or to jangle the verger's keys of learning without opening the door to their students, malpractice, as surely as dentists who exploit their patients' ignorance to sell them expensive procedures."[16] Almost all writers who comment on professionalism use the word *altruistic* to describe the required relationship between a professional and his or her clients. Altruism may be too strong a notion to use in the context of information systems but it does point us in the right direction. It requires an explicit focus on the "other" as the object of concern. At the very least IS professionals should avoid doing any anticipatable harm to others.

It is important to note that AIS has promulgated a strong Code of Research Conduct.[17] (Although personally I believe that "Respect for the rights of research subjects" should be **obligatory** and not merely desirable and, hence, should be in Category One. Ask yourself how many IS research projects require IRB approval at your institution. If the answer is one (or more), than respect of human subjects is mandatory). Robert Davison, Malcolm Munro, and Detmar Straub are to be congratulated for their fine work in this regard. Davison, Cynthia Beath, and Roger Clarke have recently developed a Privacy Policy Statement for the Association.

All of these efforts are necessary and laudable but, in my view, they are not quite enough. They are essentially inward looking. They do not cover the full spectrum of practice in which AIS professionals engage and its range of external impacts.

It is important to recognize that the acts taken in organizations by people trained in information systems may have far-reaching moral consequences. I learned this lesson the hard way.

One of the first courses we developed at UCLA focused on the systems approach and systems theory applied to information systems. In one of my lectures I talked about how a system's performance was often governed by its weakest component, the "weakest link in the chain," and commented on how unscrupulous users could take advantage of this flaw for their own nefarious purposes. After class a particularly alert and eager and quite charming

15. May, William F. (2001), *Beleaguered Rulers: The Public Obligation of the Professional*, Louisville: Westminster John Knox Press.
16. May, Op. Cit., p. 7–11.
17. http://home.aisnet.org/displaycommon.cfm?an=1&subarticlenbr=15.

student came up to me and asked a few questions about how to find the weak spot in a system. He also asked me for a copy of my notes.

A few years later, in November 1978, this student's name was blazon in the national headlines. Stanley Mark Rifkin had pulled off what *Time* called "The Ultimate Heist."[18] Security Pacific Bank had been taken for $10.2 million. The money had been converted to diamonds and Stanley was gone. It was called a computer fraud, but it was really a systems scam. Stanley had been an adviser to a company that consulted with Security Pacific Bank. Under that cover he had gained access to the Bank's secure wire transfer room called *Operations Unit One on level D,* which was accessible only by an unmarked elevator. Once in the room he noted that each day a new clearance code was written on a blackboard on the front wall. He simply memorized the code and went back to his three-bedroom apartment in the San Fernando Valley. There he phoned the wire transfer room and, identifying himself as "Mike Hansen," he quoted the day's secret code. Given clearance, he requested that the money be transferred to an account at the Irving Trust Company in New York on behalf of the Wozchold Handels Bank of Zurich. Bingo! The transfer was completed. Rifkin flew to Geneva, accessed the funds and used them, as he had prearranged, to buy diamonds, which he then smuggled back into the US for sale. Stanley Rifkin had found the weak link.

I am not naïve enough to think that there was much the UCLA MBA program or California State University at Northridge, where he did his undergraduate work, could have done to dissuade Rifkin from following this criminal path. But we could have tried. Rifkin had used the knowledge he had acquired at our schools and the power that knowledge conferred, to commit illegal and unethical acts. He did not respect it. I believe that Information Systems people have a responsibility to do what we can to insure that the knowledge we dispense is not used in this way but rather is used for morally justifiable purposes.

A footnote: Stanley was apprehended at a friend's house in San Diego and charged. While out on bail, he attempted a similar scheme at Union Bank but was exposed by a government informant. He pleaded guilty to wire fraud and on March 26, 1979, he was sentenced to eight years in federal prison and fined $10,000. Patricia Ferguson, his accomplice, was convicted of three counts of conspiracy.

Security Pacific, in turns out, did not do so badly. The bank recovered $12,000 in cash from sales Stanley had made, another $2 million from the other banks involved, and about forty packets of diamonds. The diamonds were valued at $13 million. So, in the end, the bank stood to clear about $5 million from having been heisted. But, it had learned a valuable and initially stressful lesson about security. As a consequence this bank and many others tightened their security procedures. Security Pacific, of course, did not hold UCLA responsible. Nevertheless, the episode was not forgotten by several Security Pacific executives, including Carl Hartnack, Chairman; Harry Grossman, head of Operations Research, and Duane Peterson, Vice President and CIO.

The ACM Code of Ethics and Professional Conduct does a better job of addressing cases like this, in my opinion. Under the heading "1.1 General Moral Imperatives, Contribute to society and human well-being," the ACM code requires that "When designing or implementing systems, computing professionals must attempt to ensure that the products of their efforts will be used in socially responsible ways, will meet social needs, and will avoid harmful effects to health and welfare." [19]Shouldn't IS professionals also live by this or a similar standard?

Fortunately, Information Systems has had remarkably few scandals. But there are a few black marks in our history. Edwin Black, in *IBM and the Holocaust,* reports on the devastating uses to which information systems can be put. According to documents he obtained, during the 1930s, systems representatives at IBM helped design punched card systems for the Nazis to use in tracking down Jews in Europe and improving the efficiency of the "Final Solution."[20] Are such applications respectful of the field?

Consider another Los Angeles-based scandal: *Equity Funding Corporation of America*. It has recently been called the *Enron* of the 1970s, and its lessons are still taught in auditing classes. Near the end of the financial year in 1964 Equity Funding was experiencing operational problems with its mainframe. The head of information systems at Equity Funding concluded that his unit would not be able to get the company's annual report out on time, and he gave the president, Stanley Goldblum, the bad news. To his surprise, Goldblum reassured him there was "no problem"; all he had to do was report a bottom line of about $10 million in profits and change all the other figures to show that result. After agonizing over this directive and with some trepidation the Head of IS complied. His rationale at the

18. _____ 1978, "The Ultimate Heist," *Time,* Monday, 20 Nov 1978 http://www.time.com/time/magazine/article/0,9171,948323,00.html. See also "Stanley Mark Rifkin," World of Computer Science Biography, http://www.bookrags.com/biography/stanley-mark-rifkin-wcs/.
19. ACM Code of Ethics and Professional Conduct, http://www/acm.org/about/code-of-ethics.
20. Black, Edwin (2002), *IBM and the Holocaust:The Strategoc Alliance Between Nazi Germany and America's Most Powerful Corporation*, New York: Crown Publishing Group.

time was that this was just a temporary fix, and it would be corrected as soon as the mainframe was up and running again and the **real** numbers could be produced.

But when the actual numbers arrived, they were very different. In fact, they showed a several million dollars loss rather than a $10 million profit. Nevertheless, Goldblum demanded that the fraudulent numbers remained unchanged. They were published. In response, the company's stock price actually increased, and this set into motion a dangerous precedent. Having averted one catastrophe by subterfuge, the Equity's executives learned how easy it was to falsify the data and get away with it (at least for a while). What else could they do to drive the share price up? How about manufacturing false insurance policies? Sure! They fabricated some policies, and the company looked even better to investors. They then used the resulting inflated stock to purchase insurance companies that had real policies that really were profitable. As a result, things continued to look up. Moreover, they still hadn't been caught. Subsequently, someone came up with the idea of making still more money by selling fictitious policies to other insurance companies via the reinsurance system. These other insurance companies paid real cash for Equity Funding's phony policies. With all of this apparent growth, the company's stock became a darling on Wall Street. The fraud continued for over nine years.

On January 1, 1973, shares in Equity Funding were trading at about $37. Burnham & Co. (unaware that the earnings were counterfeit) rated it a "Buy," citing the fact that it was selling at nearly ten times earnings. Then, in March 1973, a disgruntled employee went to a security analyst who finally blew the whistle. At that time it was estimated that more than half of Equity Funding's policies (at least 64,000) were fake. Moreover, at least $25 million in counterfeit bonds had been issued. Over $2 billion in assets were still unaccounted for. On March 28, 1973, when the fraud was exposed, the SEC stopped trading in Equity Funding shares. The price then was below $14. (This was short of Bernie Maydoff and Frank DiPascali, but significant all the same.[21])

After the fraud was disclosed, investigators discovered that Equity had built a separate, special computer room that was used to create the phony policies. Another secret office was devoted to fabricating documents: application forms, medical records, and background papers needed to appease auditors. A computer programmer who was assigned to work on the scheme recalled later, "I was kind of wondering what to do about it. I was told that this was a short-lived financing [deal] to acquire [two other insurance companies.]" So, at first, he complied. **And then he capitulated**! Eventually this programmer created some clever actuarial based software for fabricating plausible policies. His program periodically "killed off" phantom policyholders so that mortality and persistency ratios and the demographics appeared to be normal. Each time a phantom policyholder was arbitrarily "killed off," the reinsurer was required to pay the beneficiary on the policy. But since in most cases these beneficiaries were phonies and did not exist, Equity Funding just took the cash and pocketed it.

How was a massive fraud like this sustained for so long? Because, as *The New York Times* reported, "Those closest to (the scam) were believed to have cleverly concealed their tracks through intimidation, subterfuge, threats of violence and the use of doctored computer tapes."[22] True professionals would not have yielded to these threats.

When the fraud was made public, a federal grand jury returned an indictment of 105 counts against twenty-one persons, including officers and directors. Eighteen high-level employees pleaded guilty. Three more stood trial and were convicted. Stanley Goldblum, the corporate Chairman and the key instigator, received an eight-year prison sentence and a substantial fine.[23]

Auditors who study this case focus on the question: "Why didn't someone detect this fraud earlier?" As information systems professionals, however, we must ask an even more fundamental question: "How was the fraud created and maintained in the first place?" That is, "Who is to blame?" "How can it be prevented?" To answer these questions we must look more carefully at the moral responsibilities of IS personnel.

We do have a few role models to draw on.

21. Bernie Maydoff and Frank DiPascali set up a phantom computer-based trading platform on the 17th floor of Manhattan's Lipstick Building, Maydoff's headquarters. If a visitor sought to confirm the company was trading globally in real time, a sham was set in motion. One employee was instructed to enter trades on a computer screen for the visitor to witness while another employee was surreptitiously sent to a computer in another room where he pretended to be the European counterparty to these trades. DiPascali periodically conducted drills to make sure his employees knew how to pull this deception off. Henriques, Diana B. (2009), "Madoff Aide Holds Key to Intrique," *The New York Times,* 13 August 2009. And, Henning, Peter J. (2009), What Madoff's Chief Fraud Officer Has to Offer," *The New York Times,* 14 August 2009.
22. Seidler, Lee J., Frederick Andrews, and Marc J. Epstein, 1977, *The Equity Funding Papers: The Anatomy of a Fraud*, Santa Barbara: John Wiley & Sons. p. 25.
23. Seidler, Lee J., Frederick Andrews, and Marc J. Epstein, Op. Cit.

In the early 1980s President Ronald Reagan proposed the missile-defense program known as the Strategic Defense Initiative, SDI, or "Star Wars." David Parnas, a highly respected Canadian computer scientist who studied at Carnegie Mellon, was appointed to serve on an SDI advisory panel, called the "Panel on Computing in Support of Battle Management." In June 1985, however, in a much publicized move, Parnas suddenly resigned. The reason he gave was not that he disagreed with the mission and morality of SDI (although he might have harbored some reservations). Rather, he raised the crucial question of **professional competence**. Given the state of the art, in Parnas's considered opinion, it was not possible to write error-free software of the scope and magnitude required. Therefore, the resulting operational programs could not be **trusted** to prevent a nuclear attack. In fact, if these inevitably flawed programs were activated, they might actually produce harm, even catastrophic harm. He concluded that Star Wars inevitably would be unreliable and may well constitute a menace to humanity. Parnas publicized his position in a series of essays in the *American Scientist.*[24]

For David Parnas, the Star Wars program would not result in a "morally justified improvement in organizational performance." Consequently, he made the professional decision not to participate. To the contrary, Stanley Rifkin, the pre-World War II IBM executives, Bernie Maydoff and Frank DiPascali, and the twenty-one officers and directors at Equity Funding viewed information systems as a tool they could use to achieve their own greedy and morally perverted goals. As professionals they failed to realize Bill May's moral mark.

Members of the LEO team, were they in the audience today, I am sure would have **applauded** David Parnas's actions. Professional competence, truth in information, attention to detail, a cautious attitude that kept the Lyons people from trying to reach beyond their grasp: these were key guiding values of the LEO personnel.

I believe that they would also have been **appalled** by the way Rifkin and the others defiled the knowledge that they—and so many other IS academics who have followed in their footsteps—had worked so hard to produce and to vouchsafe. And so, I might add, would the nineteen IS academics who have received the LEO Award thus far.

A common theme running through the nineteen's LEO careers is that they care deeply about the field and accord it respect. They treat it as an honorable profession. There is a key point here: information systems are morally malleable. They can be used for either good or evil. It is incumbent on IS professionals to shape these systems so that they achieve the good or at least avoid the bad.

Earlier I referred to Gardner's definition of "Good Work" as being work that is technically excellent, personally engaging, and carried out in an ethical manner. He and his associates go on to observe that there are three other conditions that characterize good work:

1. A strong sense of moral commitment to **larger purposes** that one brings to the job and its related activities,
2. A **professional ethic** exemplified by one's efforts to provide training and education to new members, and
3. A linage of worthy **role models** from the past with whom one identifies in working toward the future.[25]

The original LEO team met these requirements, the LEO award winners have lived and promoted them during their careers, as, of course, have many, many more, including those in this room.

Hugh Heclo, a professor of public affairs at George Mason, calls the kind of respect for a profession that good work advances ***respect-in-depth***.[26] It is the respect that engages a person's sense of obligation to an institution, such as AIS, and to a community consisting of both **living** and **dead** people who themselves embody the essence of the profession and its practices. Heclo cites as an example of respect-in-depth the Baseball Hall of Fame acceptance speech delivered by the great Chicago Cubs' second baseman, Ryne Dee Sandberg, when he was inducted on July 31, 2005. "Ryno" spoke consistently of respect for the game (I count twenty-one citations in about 2700 words). He chides those self-aggrandizing players who, in his opinion, lacked true respect for the game of baseball.

Listen to what he has to say. And, as you listen, think about Information Systems and AIS whenever he refers to the game of baseball or the baseball field:

---

24. Parnas believes that it is permissible, in fact in some cases desirable, for ethical people to work on projects they think have unethical aspects. In this way they might be able to have some influence on keeping things ethical. Moreover, they have an obligation (whistle-blower's) to inform themselves and the public of the risks and benefits of these untoward projects. See Parnas, David Lorge (1985), "Software Aspects of Strategic Defense Systems," *American Scientist,* October 1985, pp. 432–440. And, Parnas, David L. (1985), "Software Aspects of Strategic Defense Systems," *Comm. ACM*, Vol. 28, No. 12, Dec. 1985, pp. 1326–1335.
25. Gardner, Howard; Mihaly Csikszentmihalyi, and William Damon (2002), *Good Work: When Excellence and Ethics Meet,* New York: Perseus Publishing.
26. Heclo, Hugh (2008), *On Thinking Institutionally,* Boulder, CO: Paradigm Publishers.

"I was in awe every time I walked on to the field. That's respect.

I was taught you never, ever disrespect your opponent or your team mates or your organization or your manager and never, ever your uniform.

Make a great play, act like you've done it before, get a big hit, look for the third base coach and get ready to run the bases, hit a home run, put your head down, drop the bat, run around the bases, because the name on the front is a lot more important than the name on the back. That's respect. . . .

When did it become okay for someone to hit home runs and forget how to play the rest of the game? . . .

These guys sitting up here [in the Baseball Hall of Fame] did not pave the way for the rest of us so that players could swing for the fences every time up and forget how to move a runner over to third, it's disrespectful to them, to you, and to the game of baseball that we all played growing up. Respect.

A lot of people say this honor validates my career, but I didn't work hard for validation. I didn't play the game right because I saw a reward at the end of the tunnel. I played it right because that's what you're supposed to do, play it right and with respect. . . .

If this validates anything, it's that the guys who taught me the game, [here Sandberg mentions his coaches and teammates. I would mention my mentors and colleagues and LEO Awardees]; they did what they were supposed to do and I did what I was supposed to do."[27]

Sandberg is a model of a professional and of good work. He is technically excellent, totally engaged and committed, and steeped in the ethics of respect for his profession and for his fellow players. I believe he can serve as a role model for AIS and the field of information systems as well.

This was Ryno's "last lecture," his "last scene," his "yesterday once more" and he ended it simply with:

"Thank You, and Go Cubs."

I end mine with:

"Thank you, and Go AIS."

27. Sandberg, R. (2005), Ryne Sandberg's Hall-of-Fame Induction Speech, 31 July 2005, http://www.cubsnet.com/node/536.

ABOUT THE AUTHOR

Richard O. Mason is Carr P. Collins Distinguished Professor Emeritus, Edwin L. Cox School of Business, Southern Methodist University, Dallas, Texas. He served as Director, The Maguire Center for Ethics and Public Responsibility at SMU from 1998 to 2005. Previously he was Professor of Management and Management Information Systems at the University of Arizona; Professor and Chairman Department of Management and Policy Sciences and Associate Dean for Research and Faculty at the University of Southern California; and Associate Professor and Assistant Dean at UCLA. He received a Ph.D. in Business Administration at University of California Berkeley and a B.S. from Oregon State University, where he also lettered three years in football. Mason's main fields of interest are ethics, information systems, and management. The author of numerous academic articles and books, he received the LEO Award in 2001 from the Association for Information Systems for lifelong contributions to the information systems field. In 1992 he was made a Foreign Fellow of the Russian Academy of Natural Sciences in the Informatics and Cybernetics section.

Communications of the Association for Information Systems

ISSN: 1529-3181