

Information Systems into Wisdom Systems

— published in *The X Journal*, July/August, 1996



Eric Schaffer, Ph.D., CUA, CPE, is Founder and CEO of Human Factors International, Inc. (HFI). He teaches, consults, and speaks on corporate and governmental Web and GUI interface design issues.



John Sorflaten, Ph.D., CUA, CPE, teaches and consults as a Project Director at HFI. With Eric, he initiated a usability curriculum at a local university in his home town of Fairfield, IA.

©1996, Human Factors International, Inc.

What will information systems offer the world in 25 years? The easy answer is “Watch Star Trek.” The hard answer is “Let’s think about how systems grow.”

BIO-BASED PREDICTIONS Those who write about development of biological systems try to account for the causes of new functions. For example, mollusks that normally appear one color when grown in fresh water take on another color and shape when adapting to salt water. When looking from the effect backwards to the cause, biologists can do a good job of explaining why the changes came about. However, when looking from the cause, trying to predict the effects, they often give up. This is because complex systems have “emergent properties,” i.e., a “phase change” arises when combinations of features unpredictably assert dominance over the current features. Nothing new. Welcome to “chaos theory.”

“All Life Is A Stage...” But for *Homo sapiens*, in both the personal and social realm of human endeavor, we have a surprise. We have some “emergent properties” that are predictable in their developmental trajectory. Maturational stages predictable follow the preceding stage. That is, we can reasonably predict the infant to become the exploring but probably thoughtless youngster. We can fully expect the risk-taking adolescent to become the young, probably mating adult. Likewise the middle-aged, conservative parent will become the risk-averse, and perhaps wise, old grandparent.

Other determinants of the stage-driven prediction have less, but countable influence. Socioeconomic status of the parents strongly influence the educational potential of the youth, but do not determine it. Social surroundings influence the criminal potential of the young adult, but do not determine it.

Whence Comes “Maturity?” What does this all have to do with the future of information systems? We suggest that any “system” worth its silicon follows some sequence of developmental stages. While the rate and details of growth may be indeterminate, the sequence must certainly have a predictable pattern. (This assumes the absence of stress-induced system suicide and absence of other nuclear-related pathologies such as MAD—mutual assured destruction.)

National cultures exhibit signs of varying stages of maturity. We see this in their tolerance of innovation and creative risk versus slavish

adherence to the tried and true. For example, music of the '60s and '70s incessantly blares from the "oldies" radio format stations. As though locked in endless memory rehearsals, our own baby boom marketing group faces the debilitation of continuously reliving the past, rather than creating the present. No wonder aggressive corporations lay off older workers. Even worse, it may be of great concern to some parents in the U.S. that their children actually like and listen to music that was recorded and popular 30 years previous.

Old Can Be Beautiful These fears aside, we can imagine an alternative scenario in which a national culture benefits from its maturing work force. The advice and council of the experienced members can save the younger workers the waste of trial and error learning. Corporate cultures can steer through the economic racecourse with seasoned drivers. Their maturity reflects the lessons of having survived many prior race events and the lessons of their cunning techniques.

Cyberpubies Given this human orientation to prediction, we ask what "maturational stage" characterizes the current status of information systems on the world-wide level. We suggest that it may be in the 14- to 18-year old stage. We predict that the future looks good, as it would for any adolescent with a reasonable upbringing and a clean record. However, for the world, it wasn't always that way.

Just as the pubescent male may exercise his new-found muscular strength by dominating his weaker colleagues, we suggest that the technological advances of the "industrial age" became the proximate cause of WWI and WWII. While these wars could have been avoided if the social skills of nations had been stronger, a period of global conflicts has reasonable predictability by analogy to human growth stages. In teens we find a maturational lag in which physical prowess usually pre-

cedes or outstrips ethical development. Every teenage society has some whose impulses make them bullies. Bullies can precipitate gangs. Gangs adopt external aggression in the absence of internal, ethical controls.

Cyberpreppies The "information society" or the "global village" of television and computer connectivity represents coming of age, but with limits. Just as the adolescent gains intellectual competence and logical thought at about 16-18 years, but yet lacks wisdom, our industrial cultures have "wired up" enough to become at least "smart," if not yet wise. Just as some corporations like to hire young blood for their aggressiveness and willingness to take direction without much investigation of the ethical issues, likewise, we suggest that our current post-industrial cultures have used information dissemination in a devil-may-care manner.

Cyberwizzies However, even this youthful mode of conduct ultimately grows into ethical outcomes, based on growth of "wisdom." The young adult seeks consistency and tries to eliminate logical contradictions. This can shape moral expectations. The same occurs in our information systems. For example, everyone watches CNN to learn what really is going on. It's a global nervous system. Thus, Saddam Hussein's invasion of Kuwait could no longer remain a private affair where might makes right. It became a test case where world nations for the first time ever agreed almost unanimously on a definition of conduct unbecoming a modern nation state. This consensus became an "emergent property" of the information age and it arose solely from the new interconnectedness of global television. The global network gave rise to a more mature functioning of the constituent governments. Social approbation replaced the law of the bully. Global ethics emerged from the developing "nervous system" of the world. The internet may recapitulate this process in its own manner.

Thus, human developmental stages can guide our understanding of the unfoldment of information history. We suggest that predictions for the next 25 years can anticipate the same trajectory of growth and maturation. In the next 25-year period, we suggest our world culture will grow from being 18 years old to young adulthood. Some young adults do pretty well. And some fail, at first. But after time, the vast majority of young adults predictably get it together. Let's take a look at one picture of our global information future.

A SYSTEMS APPROACH TO PREDICTION In writing for developers and fellow analysts, we recognize the need for a systematic review of possibilities. Imagine how you would program a two dimensional array of an exhaustive list of values. You'd identify the number of columns and rows required to classify the data items. Then, for each column, the program would fill in the rows. We have opportunities for a similar matrix that covers the range of life experience. This matrix is drawn from an age-old discipline for characterizing human fortune and challenge. One of us (Bob) has studied the system of Vedic astrology as a hobby for several years. Since over 50% of the mature U.S. population reads astrology columns in newspapers, we can't go too astray in adopting this scaffold for building an entertaining picture of the future.

All Possibilities The "matrix" used in Vedic astrology is simple. It says that life has three stages of evolution: outer values, inner values, and the integration of the two. These will be our "columns" in the array. Vedic astrology identifies four realms of discourse:

- personal tendencies ("Dharma" for our '60s readers)
- resources (people and stuff that gives us a head start in life)

- hopes/desires (the directional predispositions we have)
- awareness (who we are and our definition of fulfillment)

The matrix of three columns and four rows gives us 12 cells. In astrological jargon, these are the 12 "houses" you've heard about. Let's take them one by one in answering the question "What is the future of information technology?" This "hororary chart" was cast at 12:40 PM on March 3, 1996 at a longitude of 91 degrees 57 minutes and 45 seconds west. The latitude was 41 degrees, 0 minutes, and 31 seconds north. (Yup, you can check the results!)

OUTER VALUES (THE FIRST COLUMN)

First House (Dharma) In the future computer technology is applied much more appropriately than now. It no longer competes with human labor and brain power for jobs, but instead serves them, complements them, and gives them leverage. Technological advantages have been decentralized. They serve popular interests making life easier and more efficient for all. The technology is taken for granted and is much less noticeable than now. This latter point has an analogy with the history of automobile technology. Whereas early drivers had to know about spark and choke settings, and risked breaking an arm while cranking an engine, today we don't need much knowledge at all about how a car works. We just turn the ignition key. We take the car for granted and pay no heed to its technology. Requirements for an "interface" to our automobile technology almost vanish. Likewise for our computers.

Second House (Resources) The family unit is strong again, served by having more time together and easy audiovisual communications when apart. The family lives a healthier, more advanced stage of development based on individual desire for this.

Family togetherness is not based on habits of social restrictions and pressures as was the case historically. The sense of family is extended to encompass the world. A sense of family and equity among nations begins to be firmly established.

The local production and preparation of food becomes more intimately integrated with family and community life. Computer network sharing and the spread of efficient production techniques and health information plays a major role in this trend.

Third House (Hopes/Desires) Computers play a vital but less distracting, less obvious role than they do now. Computers are a relatively transparent part of our social nervous system, more subservient, much easier to use, powerfully important, but less noticeable, more like telephones. We notice each other more than we notice the technology we use to process information and communicate it to each other. This occurs in spite of advances in artificial intelligence we can hardly imagine now. Computers become the communication center for the masses.

Fourth House (Awareness) “Smart” functionality of all kinds simplifies and supports our needs, and supplies our comforts. Computers are ubiquitous servants, just like the computer in your car’s electronic ignition uses a computer letting you ignore tune-ups for at least a hundred thousand miles. We have much more leisure time at home. Travel needs are vastly reduced on every front, both business and pleasure, local and long distance. Basic needs like energy and shelter derive from much more locally self-sufficient economic systems. This reduces freight costs and increases global production enormously per unit of energy expended. Travel and freight costs become cost effective in a global, ecological sense, i.e., in the service of long-term quality of life for the total population.

INNER VALUES (THE SECOND COLUMN)

Fifth House (Dharma) We have much more time to raise children, contribute personal guidance to them or others, and express individual creativity. Business investment is better informed and supported with accurate, up-to-date information and analysis. Sharing of creative output for the guidance, entertainment, and inspiration of others is global in scope.

Sixth House (Resources) Global games and competitions are profuse and intense. Other games are cerebral in nature, like chess, but they do not displace physical sports. On the contrary, physical sports information and entertainment is more accessible to everyone, along with an expanded world arena for these events in terms of who will want to compete with whom.

Business opportunities increase enormously. But the higher the degree of success, the more one must have a true winning edge to maintain it. Fame will be less a matter of good fortune, more a matter of the cream floating to the top.

Disputes and debates on every topic will be many, often heated and intense. Competition for massive public attention will be far fiercer and more difficult than now, while smaller audiences will be commonplace. Relative ease and wealth in life will be much more readily accessible to all, however.

Seventh House (Hopes/Desires) The users of information technology, the public, are the mates, the partners of computer technology, and the big winners. Useful knowledge of all kinds make even today’s technology pale by comparison, not in terms of quantity, but in quality and in the ease of locating the appropriate information. More importantly still, in spite of amazing advances in artificial intelligence, humans are less naive, less awed

by computer capabilities and much more confident in the power of their own intelligence and creativity. People tend to inform themselves with the external technologies and make decisions with their own context-rich inner understanding. Their partnership with the computer is itself more intelligently managed and well-informed. This also applies to trade relationships, consumer feedback and ratings, etc. There are increased opportunities for bargains and fair deals.

Practical, sophisticated services to aid in the formation and support of viable partnerships of all kinds will abound.

Eighth House (Awareness) More time for philosophical and spiritual interests is reflected in access to deeper understanding of the more abstract and hidden laws in nature and life. Insights are shared, discussed, and deepened. Techniques for evolving greater clarity, coherence, and integration of perspective bloom into popular awareness.

INTEGRATION OF INNER AND OUTER VALUES (THE THIRD COLUMN)

Ninth House (Dharma) Guidance from mentors of every imaginable kind become more readily available for those who seek it. People still need discrimination to select advice wisely, but the tools to aid this are more effective and widely available. Information technology reduces the need for subsistence-level labor to a point that material issues no longer remain the ultimate source of genuine human aspiration and fulfillment.

With increasing sincerity, people seek guidance toward whatever brings true fulfillment to the human spirit.

Tenth House (Resources) The path to these invaluable contributions of information technology is not free of substantial obstacles and delays.

Fierce competition among infotech vendors, inability to resolve smoothly the difficult trade-offs between industry standards and progress, etc. present serious problems en route to subsequent fulfillment. Anger, frustration, and feuding in the industry is certainly not invisible now, but worsens noticeably around December, 1997. In the year running from mid-2005 to mid-2006 there is a major advance in information technology that has a deep and global impact.

This, however, shakes out and cleans up problems in the long run. Remarkable progress in the right direction manifests just a few short years into the 21st century. Afterwards, progress is steadily and rapidly upward toward greater industrial coherence. Still, we find some natural turbulence and technological growing pains of various kinds.

Eleventh House (Hopes/Desires) Gains from world connectivity and processing power are great and pleasing, even beautiful and luxurious. But we find these gains also colored with passionate reactions from some traditional power centers. Already, it is difficult for autocratic powers to control access to information. It is fast becoming totally impossible. "Power to the people" will come from information technology and not Marxism. This will impact not only on governments, but industrial powers as well.

The world population awakens to realize that energy is intrinsically already distributed and available without significant cost, just as nature has known all along. Our infrastructures become fundamentally transformed over time to reflect this realization. People refuse to pay others to deliver their energy to them as they would today refuse to pay for air to breathe. This has extremely powerful economic implications because our current financial institutions depend heavily on income from financing the centralized distribution of energy.

Efficient, localized distribution of energy already available in the environment plus an extremely “smart” infotech nervous system for world society has ultimate implications. We have incredible freedom and ease of living. We have a simplified realization of individual and collective desires.

Twelfth House (Awareness) A more enlightened global community spends its attention in more truly gainful pursuits. It finds time for the pursuit of happiness beyond the realm of material toys. This is where a more mature, grownup human community will be ultimately headed over the next 20 years, vastly aided by information technology.

CONCLUSION In the future, we experience consolidation of inner and outer values in an “age of wisdom” in contrast to conflicts between inner and outer in the “age of information.” This is made clear by discussion of Claude Shannon’s definition of “information.”

Bitter Information Shannon describes information as the number of bits required to reduce uncertainty to zero. That is, the greater the information required for a given event, the greater the initial uncertainty. The game of 20 questions implies that you have get 20 yes/no opportunities to discover the intended item. Two to the power of 20 is represents much uncertainty! If only 2 yes/no opportunities were needed, then the question had far less uncertainty and presumably far less associated “angst” or anxiety.

Thus, the age of information is equivalent to the age of uncertainty and angst. We need the web because we have so many questions. In contrast, wisdom is the inverse of information. Wisdom utilizes an intuitive understanding of how things should be, and thus effortlessly cuts through the Gordian knot of information glut.

The Wisdom Conjecture But where does wisdom come from? The developmental trajectory we see in life suggests that wisdom is an emergent property that comes with later “maturity.” We find wisdom in those whose judgment is not clouded by impulse or personal, selfish bias. In such persons, wisdom brings the innate, empathic sense of how things should be for a fulfilling life. A wise person councils the listener in a manner solely to draw out the full potential of that conversational partner.

Let’s draw upon this humanistic analogy which allows prediction of the developmental stage of wisdom. We suggest that “wisdom systems” of the future support the growth of each individual’s own prescient abilities that make him or her special in our world. Whereas today we must adapt our personal lives to the molds established by rigidly defined channels of information technology, in the future the information systems will adapt to us. They will provide ubiquitous support for meeting our basic needs, leaving us with quality time. And in our work, we can develop those highest of human traits such as friendliness, compassion, and inner happiness.