

Clear and Future Value¹

The Value Spectrum enables professionals to **chart their own futures** and the progress of the Information Age.

By Thomas J. Buckholtz, Ph.D.²

How have people characterized their Information Age opportunities and plight? Drowning in a tidal wave of e-mail and information? Deafened by a cacophony of data? Paralyzed coping with a gridlock of disparate hardware and software? Blinded by the gleam of marketing claims?

Now is the time to view the Information Age from 30,000 feet and chart two down-to-earth forward-looking paths; a Roadmap for the Information Age and your own course.

The Information Age evolves through six electronic eras – Technician, Clerk, Librarian, Analyst, Coach, and Executive – as defined by the use of broadly applied electronic technologies.

The Technician Era began in the 1840s with deployment of the telegraph, and has continued with the spread of telephones, radio, television, computers, and computer networks. This era focuses on infrastructure. Today's centers of attention include increasing the speed of computing, enhancing data transmission capacities, and developing the Internet.

The Clerk Era started in the 1890s with the electronic processing of data recorded on punched cards. This era focuses on administering transactions. Recent emphases include enterprise resources planning, supply chain management, and electronic commerce.

The Librarian Era commenced in the 1990s with the development of data warehousing and the World Wide Web, and focuses on information. Developing information from multiple transaction databases, and creating Web search engines and other techniques to find and filter information are the two centers of attention today.

The Analyst, Coach, and Executive Eras have not yet begun. The Analyst Era will focus on creating insight; the Coach era will emphasize improving the proficiency of individuals, groups, and systems; and the Executive Era will concentrate on generating outcomes, most notably making and implementing decisions.

Today, people benefit from mission-specific technologies in each of these three areas. For example, an autopilot provides Executive value to a human airplane pilot. However, this Information Age Roadmap features generic multiple-use technologies, not mission-specific systems.

The Analyst Era will likely dawn soon. Librarian Era information bases are being built. Tools, such as "data mining," spot trends in information. And, society is learning how to convert information trends into Insight.

The chat room provides a precursor to the Coach Era, which depends on sharing and using insight. Today, people share people-generated insight. In time, insight will be created and used electronically. The Executive Era awaits general-purpose electronically based techniques for converting insight and proficiency into outcomes - decisions and implementations of decisions.

¹ *Today's Engineer*, Volume 3, Number 3, IEEE-USA, Washington, D.C., pp. 36-39. The table of contents listing (page 3) includes the following: The Value Spectrum enables professionals to chart their own futures and the progress of the Information Age. Now is the time to chart two paths, a roadmap for the Information Age and your own course through this era.

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These six eras of the Roadmap mirror the six elements that comprise a Value Spectrum, which segments and explains the significance of work. The Spectrum pinpoints how any entity – a person, team, system, or combination thereof – benefits from services performed on its behalf. The six Value elements, their focus, and examples of how a beneficiary may view the corresponding services follow:

- Executive – Outcomes – “Takes strategic action on my behalf.”
- Coach – Proficiency – “Improves my game plan and skills.”
- Analyst – Insight – “Creates useful recommendations.”
- Librarian – Information – “Provides me with useful information.”
- Clerk – Transactions – “Handles routine matters.”
- Technician – Infrastructure – “Keeps supporting systems running.”³

While the Roadmap predicts that electronic aspects of the Information Age evolve bottom-up from Technician toward Executive, much human behavior traverses the Value Spectrum top-down from Executive toward Technician.

Consider the choices for a project manager anticipating a key task in the project. While planning to accomplish the task, the manager searches for someone to whom to delegate the responsibilities of setting goals for that task and achieving the outcomes inherent in the goals. If no person other than the manager has adequate time and skills to provide such Executive value, the leader personally retains the Executive function. The leader seeks coaching to ensure adequate personal and team proficiency to make and implement the decisions that define the task and produce its outcomes. Coaching enhances the leader’s success in selecting appropriate team members, processes, and team-member roles.

If the available Coach value appears inadequate for the leader’s needs, the leader tries to obtain specific insight – Analyst value. “Please provide me prioritized recommendations for the task’s outcomes. Then, I will choose one.” If the team is unlikely to provide adequate Analyst value, the leader digs deeper for Librarian value by asking for information with which personally to develop the needed recommendations.

If the information proves inadequate, the leader asks for transactions data and attempts to synthesize information. If the transactions prove inadequate, the leader requests an increase in Technician value – for example, an Infrastructure upgrade to data gathering systems and technologies.

Higher value behavior generates risks to the extent weaknesses lower in the Spectrum undermine it. For example, successful proficiency-enhancing coaching depends on appropriate recommendations and other insight. Recommendations produce risk to the extent weakness exists in the underlying information on which they are based. And, information suffers to the extent underlying transactions data has flaws.

Thus, the Information Age’s now one-and-a-half-centuries old bottom-up evolution through the electronic eras represents a-walk-before-run scenario. While some people claim the Information Age is burgeoning rapidly, others can legitimately point to evolutionary slowness. Currently, the Information Age scenario still requires much “low on the Value Spectrum” experimentation and work. Many people would relish today reliable Coach and Analyst general-purpose systems. But society still works to resolve important infrastructure, transactions, and information issues such as, respectively, capabilities for systems to communicate with each other, the consistency and accuracy of data, and the trustworthiness of supposed knowledge.

Value Spectrum Opportunities

The Value Spectrum addresses some of the workplace’s, and life’s, key opportunities:

- “Am I doing the most appropriate work?”
- “What support and learning should I seek to succeed with my work?”
- “How can I best market my work?”

³ Six-item table: Copyright (c) 1995-2000 Thomas J. Buckholtz

Specifically, the Value Spectrum describes how services performed by one entity add value for a beneficiary regarding a specific goal or activity the beneficiary endeavors to accomplish. Either entity, the provider or the beneficiary, can be a person, group, product, service, system, or combination. Sometimes, the provider and beneficiary are the same entity.

For example, you personally invest in the stock market and⁴ run a one- or few-person business. Examples of the six types of value you need to run your business include:

- Outcomes – Decisions to buy and sell stocks.
- Proficiency – Coaching provided by investment advisors.
- Insight – Analyses from newsletters for investors.
- Information – News about world events.
- Transactions – Processing buy and sell orders.
- Infrastructure – Telecommunications and computing systems.

Your decision to buy a stock constitutes Executive value for the business. Your buy and sell decisions, along with your expenditures securing the other five supporting types of value, determine the financial success of the business. To the extent you are not an impulse trader, you value Coach, Analyst, and other services that enhance your effectiveness at making buy and sell decisions. Like the project manager described earlier, you may prefer to rely on apt Coach and Analyst services, rather than perform your own Librarian research and develop your own conclusions.

The Value Spectrum points out some key features of the personal investment marketplace. For example, many people do not have time or other resources adequate to secure services sufficient to support picking stocks. Like the project manager confronting that key task, these people have the option of delegating the Executive function, in this case by investing through a mutual fund.

The Spectrum also points out a disparity that, along with the Internet, created the opportunity for online discount brokerages. Traditionally, investors who make their own decisions rely on brokers for Coach, Analyst, Librarian, and Clerk services. Such investors typically crave coaching and insight, but pay only for Clerk-value execution of buy and sell orders. Traditionally, brokerages bundle the cost of the higher Value services into transactions fees. Discount brokers to provide Clerk services priced as Clerk-only services.

As a provider of services, your tests for “doing the right work” include:

- **External perspective:** “Do the beneficiaries of my work find it situated sufficiently high on their Value Spectra?”
- **Internal perspective:** “From my point of view, are my intended Outcomes sufficiently supported throughout my work’s Value Spectrum that no inappropriate weaknesses jeopardize my achieving them?”

To the extent you anticipate inappropriate weaknesses, you discover potential opportunities to take advantage of additional resources or training. You enhance the marketing of your own work and capabilities to the extent you legitimately position those accomplishments and talents high on the Value Spectrum in other people’s perspectives.

Measurements and Gauges

While composed of six distinctly named Value Elements, the Value Spectrum is continuous. For example, a sophisticated Clerk provides low-level Librarian services for finding and filtering Information. As noted above, the evolution of the Information Age’s electronic eras has reached this point. By helping a client assess the trustworthiness of information for use in a particular context, a sophisticated Librarian provides low-level Analyst services. The extent Analyst-Value recommendations contain game plans for implementing recommendations, a beneficiary of those recommendations receives Coach value.

Each Value Element has two associated words. For example, the third element has Analyst and Insight. The first word is, strictly speaking, used as an adjective – Analyst Value. The second word, in this instance Insight, is a noun.

⁴ thereby [word dropped during production].

Coincidentally, society uses the six first words as nouns for job titles or work descriptions. Exploiting this coincidence proves useful in some circumstances, but inappropriate in others.

Every job carries responsibilities for outcomes. A person who records routine data and has a job title of Clerk has responsibility for the quality of recording that data and maybe even for the quality of the data itself. Within the context of those duties, recording data is an Executive function and requires appropriate Coach-through-Technician support.

The Roadmap highlights the progress up the Value Spectrum of the use of generic, widely applicable technologies, such as the information resources of the World Wide Web. Society can gauge progress within each electronic era. Table 1 suggests measures for Technician, Clerk, and Librarian Era progress.

Extensively discussed gauges lag Information Age advancement. Table 1 refers to the two most discussed “Laws” – Moore’s and Metcalfe’s. The former tracks over many years and predicts the increasing density of components on microcomputer chips and, as a corollary, the increasing speed of microprocessors. The latter asserts that the value of a telephone or computer network scales proportionately to the square of the number of entities connected.

Industry watchers track other indicators, such as the highest storage density for data on disks and the maximal standardized transactions processed per second for “online transaction processing systems.” Opportunities exist for more gauges and for broader media coverage and public discussion of progress. Indeed, the Age is named for information, not technology.

While the bottom half of the Value Spectrum emphasizes tangibles, the top half features creativity. Measurements for the former tend to be concrete and, when financial, cost-oriented. Gauges for the latter emphasize competitive advantage and net value. Such differences lead some people to call for new methods for estimating corporate value.

Using the Roadmap to Shape Decisions

You can use the Roadmap to anticipate and shape future Information Age developments. For example, to provide Insight toward an information technology “make or buy” decision, combine estimates of your enterprise’s needs for timely enhanced competitive advantage with estimates for relevant Roadmap progress. If you require technology before generic systems will fulfill your needs, consider developing a mission-specific system or having one built for you. Alternatively, if the development of generic systems has proceeded adequately, you will probably want to buy “off the shelf.”

The Roadmap provides technology developers, professional services companies, and other suppliers with vital pointers to opportunities to develop new products and services. Suppliers should also consider the extent to which customers will buy “bleeding edge,” leading edge, or mainstream products and services.

The Value Spectrum provides important insight into future of work and services.

- **Work.** Can you predict the evolution of work? Clerk work is being mechanized. While after more than a century of electronic automation much manual transactions processing remains, today automation increasingly obsoletes human Clerk work in significant segments of society. In those sectors, the new competence threshold becomes Analyst creativity backed by Librarian knowledge and abilities to find additional information.
- **Services.** Can you identify the emerging markets for services? Look toward the upper four Value Elements. Minimizing time-to-market and focusing on core competencies compel enterprises to outsource traditional functions. These enterprises pay others to provide Executive value services for those functions. The same emphases cause leaders to seek coaching and analyses from outside service providers. Pride in self-sufficiency yields to the effectiveness of hiring trustworthy Coach and Analyst services. The move to Analyst and higher-value work produces needs for Librarian services, especially information that is comprehensive, concise, timely, and trustworthy.
- **Staff Functions.** Which staff functions have staying power? Many chief financial officers and senior attorneys provide trusted Coach services to CEOs. Even in an era in which enterprises crave competitive advantage

through people and technology, many senior human resources officials and chief information officers have yet to capture opportunities to provide Coach and Analyst services to business unit leaders and, thereby, earn true roles on corporate leadership teams. Sub-Analyst staff functions that fail to seize their opportunities risk the prospects of outsourcing or fading further into the background.

The Value Spectrum also provides key insight into human resources opportunities.

- **Team Building.** Does your team have adequate skills throughout the Spectrum? When you determine an inadequacy, you pinpoint a need to add or train people.
- **Hiring.** Will your hiring criteria meet your true needs? People tend to write job descriptions that emphasize Clerk-Value skills, such as programming in a specific language. Perhaps your project and enterprise actually need Analyst skills now and Coach skills soon. Analyst skills can promote the development of more capable, flexible software with less programming effort. Interpersonal Coach skills may be needed now to ensure adequate teamwork; soon to ensure the software is marketed, sold, and used effectively; and later to ensure the enterprise sustains its growth.
- **Learning.** How can you create great learning opportunities? The Value Spectrum provides a method for pinpointing needs for people and teams to learn. Ask your clients, boss, peers, and subordinates to what extent you need to be more successful in taking strategic action on their behalf, improving their game plans and skills, creating useful recommendations, and so forth. Ask yourself the same questions. Also, consider the situations to which and people to whom you want to contribute in the future. Use your newfound insight create or select learning opportunities that meet your immediate or future mission-specific needs.
- **Succession planning.** Whom will a project manager suggest as her successor when she transfers to another assignment in the middle of the project? Her recommended candidate pool will likely include those project participants who have provided Executive value for her project leadership role. If that pool proves inadequate, Coach-value and perhaps analyst-Value contributors will be added. Similarly, effective organizational succession planning identifies and develops Executive- and Coach-skilled people.
- **Career development.** How can you best position yourself for advancement? Enhance, demonstrate, and market your high-value skills with respect to the roles you want to have. Also, take into account two pieces of wisdom: Premature or overly broad marketing may threaten some of your colleagues. A weakness in lower-value skills may prove to be a hindrance.

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⁵ [The following material appeared in the author's draft but not the published article.]

Moving Forward – You and the Information Age

You have the following six choices for using this article.

- Recycle the paper or avoid downloading the electronic version – Technician Value.
- File the paper or bookmark the online link – Clerk Value.
- Review the article occasionally – Librarian Value.
- Determine how you can apply the article – Analyst Value.
- Deploy techniques from the article to help yourself and your colleagues – Coach Value.
- Achieve, thereby, something you find worthwhile – Executive Value.

The closer to Executive Value you choose, the more opportunities you will have to thrive – throughout your endeavors and in the Information Age.

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Table 1: Monitoring Progress of the First Three Eras

The following aspects and measurements typify the ones society can use to monitor the progress of each of the first three electronic eras of the Information Age. As appropriate, you can chart over time the progress aggregated worldwide, amassed by a single enterprise, or determined by the single most advanced system yet produced.

Technician Era

- Communication – bandwidth
- Sharing – nodes per network (“Metcalfe’s Law”)
- Computing – operations per time (for single microprocessors, a derivative of “Moore’s Law”)
- Storage – total data; bits per volume, area, or volume-time
- Reliability – typical time between failures

Clerk Era

- Transaction Rate – completions per time
- Transactions – total records, records per database
- Intrinsic Data Qualities – completeness, timeliness, accuracy, consistency, degree of detail
- Extrinsic Data Qualities – convenience, knowledge of sources, security

Librarian Era

- Collecting Information – amount of information
- Finding and Filtering Information – useful pointers conveyed
- Intrinsic Information Qualities – completeness, timeliness, accuracy, consistency, degree of detail
- Extrinsic Information Qualities – convenience, knowledge of sources, security
- Interpreting Information (in the contexts in which it was created and previous used) – value generated
- Estimating the Trustworthiness of Information (in the context in which it will be used) – value generated

⁶ Subsequently, Beyond Insight Corporation, providing business and executive coaching.

