

Leadership for the Information Renaissance: Clarity, Challenges, Opportunity

Jay Edwin Gillette

**Professor of Information and Communication Sciences
Center for Information and Communication Sciences
Ball State University**

That is the big challenge before us at the dawn of the twenty-first century: to embark on the unification of our technology with our humanity. . . . Oddly, the new world of information, a serious “culprit” in this mounting polarization and dissonance, may provide some helping in bringing our torn-apart selves back together.

Michael Dertouzos¹

The Renaissance was a time of joy and terror, elation and anxiety, and in our own time where anxiety has thrown joy into its millennial shadow, reacquainting ourselves with our rebirth may renew our joie de vivre.

Kenneth Atchity²

Abstract:

This article discusses a new view of leadership in the context of “the information renaissance.” The article describes and clarifies the current era as a historical period, beyond the information revolution, that most resembles the dynamic and challenges of the European renaissance. Recognizing parallels and characteristics helps leaders understand the era’s serious challenges and develop its historic opportunities.

Using expertise in information networking as its basis—the movement and use of information—individuals need to develop a leadership model based on the role of renaissance man and renaissance woman, and organizations need to add knowledge-value to everything they touch. Despite the era’s paradoxes and risks, leadership approaches like these enable individuals and organizations to succeed and prosper in the information renaissance.

The article is in five main sections: 1. Context of the era—Information Renaissance; 2. Characteristics of the European and Information Renaissances; 3. Information

Renaissance Success for Individuals and Organizations; 4. Information Networking as the key component in a Knowledge Society; 5. Conclusions and Recommendations.

The primary audience for the article is management and knowledge workers with functional, research & development, or technical roles. The article's objective is to assist managers and knowledge workers, in knowledge-driven organizations, to develop realistic career and organizational strategies appropriate for the challenges of the information renaissance era.

1.0 The Context of our Era--Welcome to the Information Renaissance

Renaissance:

1. The great revival of art and letters, under the influence of classical models, which began in Italy in the 14th century and continued during the 15th and 16th; also, the period during which this movement was in progress.
2. Any revival, or period of marked improvement and new life, in art, literature, etc.³

Oxford English Dictionary

“Welcome to the Information Renaissance.” Historical eras might be easier to understand if we had clear signposts like that one, showing where we have arrived.

The “information renaissance” as a term, is based on the hypothesis that historic events work out on a concept of increasing returns. “Increasing returns”, as in the research of the economist Brian Arthur, means that events coalesce around modal points. “One event leads to another” is another way to put it. So after many reinforcing events, the information revolution has led to an extended post-revolutionary period I call “the Information Renaissance.”

My way to characterize the context of our era is that it is “a knowledge society driven by an information economy.” On the remarkable scale it has grown to, this new horizon of social and economic change is rightly seen as a huge challenge, chaotic and not easy to manage. Yet to help us work toward clarity, such an era is not unprecedented in human history.

“Is this the Information Revolution?”

No, at least not anymore. Revolutions are often dramatic, brutish, maybe, and short. We have indeed gone through an information revolution, seen as a parallel to the social and economic change of the industrial revolution. Yet for most of the developed world, this is actually a post-revolutionary era.

To illustrate, in an American metaphor, it is not 1776 anymore. In the American context it's 1803; Thomas Jefferson and the revolutionaries are in the White House. The revolution is over; the revolutions have won and they are in power. Now they're getting ready to send out Lewis and Clark to explore the territory we've already bought but haven't explored.

So it is time to look beyond the perspective of the information revolution. We need to find a new perspective, a new paradigm, to help us make sense of the era we discover before our eyes. We have bought the territory; now we need to explore it and make it known.

The era that most resembles this era in history is the era of the European renaissance. This period is considered to have flourished in Italy from 1400-1600, with its peak almost exactly in the center, about 1500, the time of Leonardo da Vinci and Vittoria Colonna. The renaissance as a movement spread throughout Europe over time. For example, the heyday of the British renaissance is nearly a century later, about 1600, the time of Shakespeare and Elizabeth I. It is not too much to say that the European renaissance has been unfolding and developing regionally and worldwide, still today.

The information renaissance can be an organizing term, to clarify the challenges and opportunities of our era. However, professional historians of the European renaissance warn us against an overdramatic, nineteenth-century use of such terms, to demarcate sharply the beginnings and endings of periods of history, written linearly like chapters in a book.

These professionals suggest our interpretation of history should send us instead toward "a gradual, fluctuating, highly contextualized blending . . . [which] stakes out the heart of this era and emphasizes its main characteristics rather than its becoming and passing."

The phrases are found in the passages below, which I have extracted from a thoughtful and informative discussion of the terms "Renaissance" and "Reformation" by Thomas A. Brady and others in an excellent set of essays, *Handbook of European History, 1400-1600*.⁴ These thoughts have guided my approach to the information renaissance era:

The pivotal role in European history of the two centuries between 1400 and 1600 has sometimes been questioned but rarely denied. Since the middle of the nineteenth century, two terms--"the Renaissance" and "the Reformation"--have commonly been employed to express the historians' sense of this role. [p. xiii]

Today, one speaks of Renaissance and Reformation as movements--the influence of social history--but they are no longer grand categories of periodization.

Nowadays, the place of the old revolutionary shift from medieval to modern has been taken by a gradual, fluctuating, highly contextualized blending of "late medieval" with "early modern," the central phase of which unfolds in the fifteenth

and sixteenth century. . . .A focus on the fifteenth and sixteenth centuries, therefore, stakes out the heart of this era and emphasizes its main characteristics rather than its becoming and passing. [pp. xvi-xvii]

[T]hese centuries--late Middle Ages, Renaissance, Reformation, and early modern era--have become a conceptual bridge between the world of pre-modern Europe and the histories of most other parts of the world.

This role, which the nineteenth-century historians could hardly have suspected, has lent the study of these centuries a remarkable energy in our time. [p. xxi]

The somewhat technical discussion of these terms by professional historians is helpful for us. They let us see how the community of scholars is handling the terms today. As we can see, the terms "renaissance" and "reformation" can be far more general—and more subtle—than was seen as the case in the nineteenth century.

We'll continue to work with these terms for our own time. We will access their conceptual power and add value to the "remarkable energy in our time" for renaissance and reformation studies, appropriate to our knowledge society and its information economy. For our discussion on the renaissance concept in the next section, we will emphasize the "main characteristics rather than its becoming and passing."

2.0 Characteristics of the European and Information Renaissances

Renaissance times are paradoxical times, characterized by encouraging positives and distressing negatives. Renaissance times are paradoxically times of great human progress and great human conflicts.

The positives include major advances, based on information transfer and application. Renaissance times display rapid, extensive discoveries and innovation. Information networking quickly spreads the word.

Yet there are corresponding negatives. Renaissance times characteristically feature the clash of paradigms that generates major social conflict.

Why great conflicts? Because the old paradigms have awakened to the threats of the new ones, and the old fight back, often using the concepts, tools and weapons of the new paradigms.

Therefore if we are blessed and cursed to live in renaissance times, we will encounter—and must be prepared for—the joys of breathtaking human advances, and the tragedies of serious social conflict, worldwide.

Leadership in people and organizations, and finally in societies and the global community, will help us understand, and succeed and prosper in these paradoxical times.

One of the best introductions to the European renaissance for today's professional is Kenneth J. Atchity's *The Renaissance Reader: Firsthand Encounters with the Renaissance*. Atchity edits together writings and information from the historical renaissance, and analyzes a list of its characteristics that continue to have influence to this day. I have followed Atchity's lead and some of his analysis in my approach below.

I have outlined some salient characteristics of the European and information renaissances as places to pursue similarities and differences. I've provided them in the text for readability, and in the table ("Comparisons and Contrasts: Salient Characteristics of the European and Information Renaissances") for summary purposes,

In both cases, these are points of departure for professionals to learn from the eras, and to apply the learning to our careers and organizations as I will discuss in another section.

2.1 Distinguishing Characteristics of the European Renaissance

- Book Publishing Technologies, especially movable type
- Exploration and Discovery
- Fragmentation and Nationalism
- Idealism
- Naturalism and Secularism
- Scientific Method
- Humanism, self interpretation
- Individualism
- *Homo faber* ("Man the maker")

2.2 Distinguishing Characteristics of the Information Renaissance

- Information and Communication Technologies (ICT)
- Exploration, Discovery and Travel
- Universal versus Tribal
- Information Economy
- Knowledge Society
- Collaboration
- Globalism, diversity evaluation
- Community
- *Homo sapiens* [Linnaeus, 1758] ("Human the knower")

These categories are in some cases directly parallel, especially the impact of information and communication technologies—in the earlier renaissance the printed book; in the information renaissance, the networked computer.

Always a good question, which comes first, information or trade? Which follows which, trade routes or information flows?

In the earlier renaissance, I hypothesize that trade came first in large terms, and information followed. Today, I hypothesize information comes first in large terms, and trade follows. While these concepts are mutually reinforcing, what is vital to recognize today is the speed of the information-trade-information cycles. These are the sources of the so-called “flat earth” concept popularized by Thomas Friedman, itself a recapitulation in contemporary terms of some of the views of Marshall McLuhan’s concept “global village.”

For this discussion, I will emphasize a key difference: The European renaissance developed an innovative view of humans as species *homo faber*, which was summarized as “man the maker.” After the long centuries of dominance of medieval religious thinking that defined the human as a spiritual creature between the angels and the animals, the humanistic view of man the maker, the maker of himself, his society, and his world, was a radical advance that has literally informed today’s dominant view of humankind.

In our renaissance I will emphasize a new view of humans, essentially “modern” from the nomenclature of Linnaeus in 1758, who named our species differently, as *homo sapiens*, which I’ll translate loosely as “human the knower,” or human who knows. In this perspective, the key to understanding the human species is its special gift for knowledge, and for processing knowledge via the catalyst of information.

Many species make things, and virtually all species process information from their environments in astoundingly various ways, yet it is the human species, in these ways of renaissance activity, that has elevated the use of knowledge to the highest levels ever seen on a global basis.

Table 1

Comparisons and Contrasts: Salient Characteristics
of the European and Information Renaissances

European Renaissance Characteristics	Information Renaissance Characteristics
<ul style="list-style-type: none"> • Book Publishing Technologies, especially movable type 	<ul style="list-style-type: none"> • Information and Communication Technologies (ICT)
<ul style="list-style-type: none"> • Exploration and Discovery 	<ul style="list-style-type: none"> • Exploration, Discovery and Travel
<ul style="list-style-type: none"> • Fragmentation and Nationalism 	<ul style="list-style-type: none"> • Universal versus Tribal
<ul style="list-style-type: none"> • Idealism, Neo-Platonism 	<ul style="list-style-type: none"> • Information Economy
<ul style="list-style-type: none"> • Naturalism and Secularism 	<ul style="list-style-type: none"> • Knowledge Society
<ul style="list-style-type: none"> • Scientific Method, Search for System 	<ul style="list-style-type: none"> • Collaboration, Search for Synthesis
<ul style="list-style-type: none"> • Humanism, self interpretation 	<ul style="list-style-type: none"> • Globalism, diversity evaluation
<ul style="list-style-type: none"> • Individualism 	<ul style="list-style-type: none"> • Community
<ul style="list-style-type: none"> • <i>Homo faber</i> (“Man the maker”) 	<ul style="list-style-type: none"> • <i>Homo sapiens</i> [Linnaeus, 1758] (“Human the knower”)

3.0 Information Renaissance Success for Individuals and Organizations

Like those who succeeded in the earlier era, those who will succeed and prosper in the information renaissance need to become renaissance men and renaissance women.

You might think this is an old idea, but in fact the term “renaissance” was applied the era of early modern Europe only in the nineteenth century.⁵ “Renaissance man” as a concept entered the English language about the same time. Oddly enough, the construct “renaissance woman” only entered American dictionaries in the 1970s.

We labor under the requirements of the industrial economy. The industrial economy model is essentially a linear assembly line—in which managers analyze a product or

service, often in minute detail, and then engineers and managers design an industrial process to produce it.

While the central designers may have a view of the whole, the assembly-line paradigm encourages the fractioning of the entire process into smaller component parts. In the end the process breaks down the entire product or service into the smallest, and it may be, the “dumbest” of the processes it can.

The approach of the industrial model is intelligence in the central office, with effectively dumb terminals at the nodes. Yet today such a model is dangerously outmoded. It is both inflexible and insulting when it comes to a human workforce. We need to leap back before the industrial model to find a more human and beneficial one.

In a sense, today we need to do as the leaders of the European renaissance did. They leaped over the intervening medieval era (the renaissance mentality called it “the dark ages”), back to the classical era, making its knowledge “reborn” (the French term renaissance means “rebirth”) to grow into applications appropriate for their present day.

We need to have “a renaissance of the renaissance,” so that the smothering era of industrial thinking is leapt over to recover and rebirth new ideas from the older era. The ideas with the richest promise for individuals is the goal—dismissed by the specialization ideology of the industrial era—of becoming a renaissance man or renaissance woman.

3.1 Succeed as a Person—Become a Renaissance Man or Renaissance Woman

According to the Merriam-Webster's Dictionary, 10th edition, the phrase "Renaissance Man" was noted as part of American English in 1906. They define the concept as "a person who has wide interests and is expert in several areas." A more recent term seems to be emerging, “polymath”—a person of great or varied learning.

There are many examples in history of such people. Indeed a good undergraduate education on the classic liberal arts model works to build such a person at a young age. The idea is that the graduate will continue a lifelong learning enterprise along the same lines. Yet professional specialization and the constant demands of overworked managers clearly obstruct the means to that end.

It was the European renaissance that forwarded the concept of this multidimensional person. One of the most famous theoretical works to do so was *The Book of the Courtier* by Baldesar Castiglione. My hypothesis is that the demands of their renaissance age required them to develop the type. As exemplars I will note in passing two who are a joy for professionals to study and learn from: Leonardo da Vinci, and Vittoria Colonna

Leonardo da Vinci (1452-1519) was and is the archetypal "Renaissance Man." Yes, he was enormously talented. Yet he had one lifetime; but so do we. Leonardo lived 67 years. He worked to the end. He was still productive when he died, even though he

could no longer paint or sculpt, because of arthritis in his hands. He was doing city planning at the end. He also designed and developed gala celebrations for the King of France, his host, who gave him a small chateau to live in, near the king's own large one.

Vittoria Colonna (1492-1547) was the daughter of a ruling family of diplomats and leaders, and she received an extensive education for anyone, let alone a woman of the era. Her family's insistence and her own interest in higher education is a splendid example of raising a renaissance woman today. She wrote extensively and inspired many friendships and corresponding relationships—the information networking of the day. Michelangelo and Baldesar Castiglione were part of her network of renaissance men and woman. She was open to new ideas, including religious ones of the new Protestantism. She was involved in the cultural and political movements of her time.

How do we translate the European renaissance person ideal into a practical application to the information renaissance?

By way of conclusion, I put it this way: be a “T-person” – a person whose structure of personality and attributes resembles the structure of the letter “T.” Be both broadly comprehensive (the T-crossbar), deeply competent (the T-base), as one complete person.

In essence, the information renaissance person has and displays *breadth* and *depth*:

- *Breadth* of comprehension (the goal of liberal arts education)
- *Depth* of competence (the goal of professional education)

These foundational personal and educational attributes lead to professional behaviors we value in the professional world, *adaptability* and *utility*. *Breadth* informs adaptability; *depth* informs utility:

- *Adaptability* to succeed in rapid change (adapt to environment)
- *Utility* to prosper by adding value (find a need and fill it)

These attributes and behaviors lead to professional and personal success in the information renaissance. This is a challenging formulation. I like to say, only partly humorously, “all you need to be a success and prosper in the information renaissance is to be Leonardo da Vinci, or Vittoria Colonna.” A tall order. And thus a modern requirements specification—the necessary changes being made—for information renaissance leadership.

3.2 Succeed as an Organization—Add Knowledge Value to everything you touch

“Add knowledge-value to everything you touch.” This is my paraphrase of a profound concept from Japanese theorist Taichi Sakaiya *The Knowledge-value Revolution, or, A*

History of the Future. Sakaiya is well-known as a public policy analyst and business and cultural theorist in Japan, yet hardly known by many in this field.

In my view, this book, which had its roots in the confident and expansive Japanese society of the 1980s, is one of the most important contributions to understanding the information economy. It lives up to its ambitious subtitle.

Sakaiya's knowledge-value future—our present history—is summarized in his work this way:

Knowledge-Value Permeates Everything

The concept *knowledge-value* means both “the price of wisdom” and “the value created by wisdom.” A more strict definition might be, “the worth or price a society gives to that which the society acknowledges to be creative wisdom.”

...

The truly large-scale production of knowledge-value will take the form of concrete goods and services in which it embedded, or to which can be added, and its distribution will be either synonymous with or conducted in concert with those goods and services. What I mean is that the design, the brand image, the high technology, or a product's capacity for generating specific functions will possess more and more weight in the pricing of goods and services. . . . a pricing structure will emerge in which the knowledge-value portion—the design, technology, and image of a product—will be hypervalued.⁶

Sakaiya's example of such a premium for its knowledge value is the Hermès necktie [pp.59-60]. My example, a little better known, is the value premium for high end Mercedes-Benz vehicles. They are not essentially better than their competitors, yet like the Hermès tie, they command higher prices because they are products carrying “that which the society acknowledges to be creative wisdom.”

Put simply, an organization should incorporate knowledge-value in all its products and activities. Add knowledge-value in whatever it is you do. In my work, I push for knowledge-value as a premium in the 3-Ds (design, development, deployment) of information and communications system architecture. You can focus a similar strategy incorporating a knowledge-value premium in your work and your organization's production as well.

4.0 In a Knowledge-Value Society, Information Networking is the Key Component

There are many kinds of knowledge. The study of knowledge and its characteristics is in fact an entire philosophic field called “epistemology” which I define as “how we know what we know.” Here are some examples—rational, psychological, spiritual, emotional, intuitive, instinctive forms of knowledge.

I have written elsewhere on this topic, which is the heart of knowledge management. My taxonomy analyzes knowledge in a scale, all ways of knowing. Of all these forms of knowledge, *information* is the key component, “the door that swings both ways” between the world of phenomena represented as data, and the realm of understanding guided by wisdom.⁷

The great and encouraging excitement of an information renaissance, is that imagination and inspiration are drivers for the exchange of value, in the larger economics of value-- not just monetary value, but also the attention we give in an “attention economy” exchange.

4.1 Creative Power you can Access—Information is a Set of Ideas You Use

If information is based on ideas—news that you use, there are two key parts to that thought. First, it’s the obvious place to focus—on the “news.” That is the “outside” part of the thought. The data come from the outside. Yet what turns data into information is that you bring inside the “outside” news-to-you. You bring the data into your own head, your own mind or consciousness.

That is what makes it “information” for you. Recall that the prefix “in” from Latin means “in,” the same as English. “Form” means form, or shape. So when you are informed, ideas or data take form or shape in your mind.

Information really “happens” when it happens to you or to other people. Information has power in so far as it changes minds. When ideas take shape, and people act on them, information changes people, organizations, and history.

4.2 Information Networks: The Key to the Information Renaissance

Information networking is the key to the information renaissance. By this we mean information networks first, of any kind. Information moves, by any means necessary. You are in a network of information networks.

Second, more than that, you are in social networks that really work fundamentally as information networks. Your social networks really work by communicating information to each other.

Let’s look at information networking more closely:

Information is the message. That is information content. Communication is the medium. That is information movement. You can have information that doesn’t move, but conceptually speaking, that doesn’t make sense. Information wants to move, from a sender to a receiver. In a pinch, people will talk to themselves.

Today, information and communication technologies are being called ICT as an acronym. This is the standard usage of the International Telecommunications Union—the main global regulatory organization, based in Geneva. The acronym “ICT” is replacing the older, more limited acronym “IT” that came from the computer industry, which meant “information technology” essentially computers and peripheral devices like printers, storage devices and later data networking wiring together with wireless radio transmission.

The newer acronym ICT gives a broader sense of telephones, television, video cameras, multimedia and other devices, while including computers and music players and the transmission media short range or long.

The main point, however, is that all these devices are ways to communicate information, so we will focus on information and communication, not on technologies. Think of the technologies as tools and enablers for us to better manage our information and communicate together more effectively.

The table “The Practice of Information Networking” outlines the concept of information networking in two levels of analysis. The Primary Category of Information Networking [read down] consists of the main ways we deal with information, whether through humans or information and communication technologies:

- Access
- Filtering
- Storage
- Retrieval
- Using

That is, we first access, then filter, then store, then retrieve, and finally use information, almost always in that order. Sometimes this happens rapidly. Sometimes we pull out and use information we’ve had in storage for years.

The Second Level Analysis of Information Networking consists of the Primary Categories further analyzed. Read across, left to right, then the next row, top to bottom, and so on. These categories and their placement can be argued and in fact rearranged for a fruitful exercise in how information moves and is used. Most of traditional information and communication sciences and in particular technologies sort out in this analysis.

Table 2

The Practice of Information Networking:
How we Move and Use Information

Primary Category of Information Networking [read down]	<i>Second Level Analysis of Information Networking—the Primary Categories further analyzed</i> [read across, left to right, then next row, top to bottom]			
<i>Access</i>	<i>Input</i>	<i>Processing</i>	<i>Movement</i>	<i>Output</i>
<i>Filtering</i>	<i>Display</i>	<i>Selection</i>	<i>Classification</i>	<i>Prioritization</i>
<i>Storage</i>	<i>Organization</i>	<i>Placement</i>	<i>Securing</i>	<i>Indexing</i>
<i>Retrieval</i>	<i>Searching</i>	<i>Finding</i>	<i>Bringing Forth</i>	<i>Queuing</i>
<i>Using</i>	<i>Applying</i>	<i>Deploying</i>	<i>Distributing</i>	<i>Presenting</i>

Copyright © 2006 by Jay Edwin Gillette

The table is here to provide professionals a way to conceptualize where they and their organizations can add value. In this analysis I name as an “information value-chain.” If information networking is the key to the information renaissance, then the analysis can provide a map for us to find our way.

To conclude, the next section outlines conclusions and recommendations for information renaissance professionals.

5.0 Conclusions and Recommendations: Succeed and Prosper in the Information Renaissance

Have confidence; lead with confidence; succeed and prosper in the information renaissance. Just as the European renaissance opened a new world of understanding and opportunity, the information renaissance unfolds before us as a world of opportunity and knowledge that extends and deepens human experience.

In my view, this renaissance, built on centuries of further experience and the lessons of the industrial worldview, has the power to extend and brighten the achievements of the earlier rebirth.

In summary, here are key conclusions and recommendations:

- Have confidence in the future. Humans have seen and done this before. Lead with confidence from clarity of context. That is the purpose of seeing this era through the reflection of the earlier one. It is said in strategy theory that “morale is itself a strategic advantage.” Let us access this strategic advantage.
- Succeed: Renaissance times call for renaissance men and renaissance women—a challenge we can meet. Renaissance men and women work in more than one area; they take ideas in from many people. Here is a compelling implication: today’s leaders need to study the ideas and history of the European renaissance as renaissance leaders studied the ideas and history of the classics.
- Prosper: This is a world of knowledge-value: seek knowledge; add value; add knowledge value to everything you touch. Build and lead organizations that add knowledge value to everything they touch—and in this we’re already on the way.
- Use information networking to leverage the knowledge that we have and can discover. Information is based on ideas—news you use, or to reinforce your position. Entertainment is essentially information—based on the power of ideas. Information networking is the key to the information renaissance.

The issue is clear: humans already have these skills. We already have these knowledge areas. What we want to do is increase our awareness of them. We need to deepen our knowledge about them. We want to sharpen our skills.

Sharpen our skills. This reminds us of the classic formulation of Stephen Covey, his “Sharpen the saw” habit in the *Seven Habits of Highly Effective People*. For every information and communication technology and organizational management professional, this is the information renaissance imperative.

The key thought is that these are not mysterious new areas of human knowledge and work. Instead, these are areas we already have worked in for a long time. We must train, educate and discipline in these areas. We need to improve these areas. Yet as I have argued, we need to look at these areas in a new way. We need to rebirth what we need to know now. We are already participants in today’s information renaissance.

Acknowledgements:

As information networking in depth and the information renaissance in breadth requires teams to comprehend them, I would like to acknowledge the critical and helpful input I have received from my colleagues and graduate students at my home institution, the Center for Information and Communication Sciences, at Ball State University, and from the hospitable scholarly community of Harris Manchester College, University of Oxford, where I had the privilege to serve as a Visiting Fellow.

Selected recommended books and articles on an information economy or information renaissance approach:

- Kenneth J. Atchity. ed. (1996.) *The Renaissance Reader: Firsthand Encounters with the Renaissance*. New York: HarperCollins Publishers.
- Taichi Sakaiya. (1991.) *The Knowledge-value Revolution, or, A History of the Future*. New York and Tokyo: Kodansha International.
- Peter F. Drucker. (1999.) “Beyond the Information Revolution.” *The Atlantic Monthly* (October 1999).
- Carl Shapiro and Hal R. Varian. (1998.) *Information Rules: A Strategic Guide to the Network Economy*. Cambridge, MA: Harvard Business School Press.
- Michael Gelb. (2000.) *How to Think Like Leonardo da Vinci: Seven Steps to Genius Every Day*. New York: Dell Publishing.
- Debora L. Spar. (2001.) *Ruling the Waves: Cycles of Discovery, Chaos, and Wealth from the Compass to the Internet*. New York: Harcourt Inc.
- Ben Shneiderman. (2002.) *Leonardo’s Laptop: Human Needs and the New Computing Technologies*. Cambridge, MA and London: The MIT Press.

References:

¹ Michael L. Dertouzos. (1997.) *What Will Be: How the New World of Information Will Change our Lives*. New York: HarperCollins Publishers, pp. 314, 315.

² Kenneth J. Atchity. ed. (1996.) *The Renaissance Reader: Firsthand Encounters with the Renaissance*. New York: HarperCollins Publishers, p. xxiv.

³ Oxford University Press. (1971.) *The Compact Edition of the Oxford English Dictionary [OED]*. Oxford: Oxford University Press, v. 2, p. 2488, s.v. in “R” volume, pp. 439-440.

⁴ Thomas A. Brady and others. (1996.) *Handbook of European History, 1400-1600* (Grand Rapids, Michigan: William B. Eerdmans Publishing Co.

⁵ Generally ascribed through popularization in Jacob Burckhardt’s *Civilization of the Renaissance in Italy* (1860), as noted, for example, in *Renaissance Culture: A New Sense of Order*, Julian Mates and Eugene Cantelupe, eds. (1966.) New York: George Braziller, p. 19. The *Oxford English Dictionary*, however, locates the word’s first uses in English in this sense already in 1845 and again in 1854. (See Oxford University Press. (1971.) *The Compact Edition of the Oxford English Dictionary*. Oxford: Oxford University Press, v. 2, p. 2488, s.v. in “R” volume, p. 439.) The same source indicates it was Matthew Arnold in 1869 who “ventured to give to the foreign word *Renaissance* an English form”—“Renescence,” which the British use to the present (s.v., in “R” volume, p. 440.)

⁶ Taichi Sakaiya. (1991.) *The Knowledge-value Revolution, or, A History of the Future*. New York and Tokyo: Kodansha International, pp. 235-237.

⁷ Among other publications, see “Better Knowledge and Accelerated Development: Knowledge Structures, Tools and Techniques to Build Collaborative Community.” *Annual Review of Communications*. Vol. 57. Chicago: International Engineering Consortium. 2004. Also see “A Practical Framework for Understanding Knowledge Management.” Chapter 1 in *Knowledge Management Strategies and Technologies*, edited by Richard F. Bellaver and John M. Lusa. Boston and London: Artech House. 2001.