Integrating Concepts for the Information Age:
Communication, Information, Mediation,
and Institutions

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Developing integrated theories, curricula, or academic programs for the Information Age is a formidable challenge because the fundamental issues of concern are broader than any single discipline, the marketplace moves faster than the academic community, the 'new' media/technology are new in some ways and not-so-new in others, and the most readily observed linkages are sometimes the least significant theoretically. Overcoming these barriers requires: (1) linking relevant disciplines and subdisciplines; (2) deciding which of the many manifestations of the Information Age are truly significant, of lasting importance, and worthy of our study; (3) selecting an appropriate level of analysis for theoretical, curricular, and programmatic undertakings; and (4) identifying concepts that form the basis for a meaningful integrating framework. Four such concepts are presented: communication, information, mediation, and institutions. Each is defined and discussed, and the implications and applications of the framework are explored.

Developing integrated theories, curricula, or academic programs for what is variously referred to as the Information Age, the Communication Revolution, or the Information Society is a formidable challenge for several reasons:
1. **The fundamental issues of concern are broader than any single discipline.** Most theories and curricula are circumscribed within a single discipline, yet the problems and prospects of the Information Age often transcend disciplinary boundaries. Issues of infrastructure, distribution, value, management, and regulation for instance, extend beyond the boundaries of communication and information studies to psychology, political science, sociology, engineering, computer science, economics, management, and perhaps other fields.

2. **The marketplace moves faster than the academic community.** Forces in the Information Age marketplace are advancing more rapidly than most academics are intellectually, programmatically, and sometimes personally prepared to move. The marketplace has created new labels, new technologies, and new concepts of communication and information. These terms and the underlying concepts are driven by production, marketing, regulatory, and technological considerations, and are not tied to nor necessarily guided by theoretical or substantive considerations of the type with which normally direct academic decision making.

3. **The “new” media/technology are new in some ways and not-so-new in others.** What the general public and marketing moguls mean by “new media” can be quite different from what thoughtful students and scholars want to mean by the phrase. Is a portable CD a new technology? Or FAX? Or on-line databases? Or cellular phones. One’s answer depends, of course, on what one means by “new.” “New” in form? “New” in function? “New” in application? “New” in acceptance? “New” in accessibility? Or, “New” in consequence? Some distinctions which are of great consequence in the newspeak of the Information Age, may be unimportant theoretically, and vice versa.

4. **The most easily observed linkages are sometimes the least significant theoretically.** In our efforts to understand and integrate the various facets of the Information Age, the most obvious bridges may be the least helpful. Computers, FAX, and cellular phones play an increasingly pervasive role in a broad range of personal, social, occupational, and geographical contexts. And the same can be said of databases, CD ROMs, video games and VCRs. These technologies and their applications, therefore, become obvious foci for efforts to develop integrated Information Age theories and curricula.

But are specific technologies such as these the most appropriate or profitable linkages or focal point for thinking about key issues of the Information Age? Not necessarily. History tells us that explanations that are tied too closely to particular technologies may be subject to limited generalizability and rapid obsolescence. Frameworks that offer more abstract explanations—frameworks, for instance, which emphasize individual uses and behavior, or social and cultural processes and outcomes—avoid this pitfall. More generic theories, however, may fail to give us much to say about the specific technologies with which the general public, the marketplace, and sources of research funding are often most concerned.

**Considerations in the Development of Theories, Curricula, and Academic Programs**

For those who seek to design integrative theories, curricula, or programs for the Information Age, the task essentially involves: (1) linking relevant disciplines and subdisciplines; (2) deciding which of the many manifestations of the Information Age are truly significant, of lasting importance, and worthy of our study; (3) selecting an appropriate level of analysis for theoretical, curricular, and programmatic undertakings; and (4) identifying concepts that form the basis for a meaningful integrating framework.

**Interdisciplinary Considerations**

As various authors have noted, a plethora of issues merit scholarly attention in the context of the Information Age (e.g., Hunt & Ruben, 1993; Ruben, 1985a, 1985b; Salvaggio, 1983; Schement & Lievrouw, 1987; Williams, 1991). Many of the important issues of the time transcend the boundaries of any one traditional discipline. These include:

- Impact of a growing emphasis on information as a commodity that can be bought and sold by individuals, private- and public-sector organizations, and societies.
- Personal, interpersonal, organizational, and societal impact of the increasing volume of available information, information sources, and information channels.
- Recognition of the need for broadened concepts of literacy that includes computer-based, and other information-handling capabilities along with reading, writing, and speaking.
- Personal, social, economic, and political infrastructure considerations for organizational, national, and international communication and information systems.
- Regulation and governance of communication and information technologies and applications by individuals, groups, organizations, and societies.
- Impact of communication and Information Age technology on ideologies and pragmatics of freedom and privacy.
• Influences of communication technology and transnational data flow on political, social, and economic development.

In addition to Communication and Information Studies in which these issues are of obvious concern, a number of other disciplines have a potential role to play in meaningfully addressing such matters, among them:

• Cognitive Science/Psychology: Emphasis on individual perception, interpretation, storage, and use of information.
• Economics: Emphasis on production and consumption of information as an economic resource.
• Political Science: Emphasis on information as a political and developmental resource.
• Computer Science and Electrical Engineering: Emphasis on mathematical properties, decision systems, and computer applications of information.
• Business and Management: Emphasis on information as a strategic resource and marketable commodity.

Communication and Information Studies, both of which are themselves largely interdisciplinary in origin and application, also suffer from some discipline-bound constraints that must be overcome to address many of the issues of the Information Age.

One school of communication theory and practice—that which grows out of speech communication—has traditionally emphasized verbal and nonverbal language, conversation, persuasion, and interpretative processes in interpersonal, group, organizational, and public communication contexts. A second subdisciplinary group within communication has focused more on media, mass communication, journalistic roles and institutions, and their individual and societal impact. Each orientation has an obvious contribution to make to the dialogue of our time, but connections between the two groups cannot be taken for granted.

Within information studies, scholars whose interests center around information organization, storage, and retrieval have much to contribute to the discussion of issues of the day. So do others more concerned with libraries and information institutions and their role in society. Here again, however, theoretical and research linkages between these two groups cannot be assumed.

Foci and Level of Analysis Considerations

Linkages among disciplines and subdisciplines can be significant only to the extent that an appropriate analytic foci and level of generality is selected. For instance, speech and media scholars have little in common if the former focuses solely on speeches, while the later examines media programs. However, if the focus is more generally placed on messages, sources, processes, audiences, and outcomes, a number of potentially valuable connections become possible. In the same sense, to the extent that scholars of library and information studies focus solely on libraries, and media studies scholars examine only mass media such as television, newspapers, and magazines, these groups have little to say to one another, though both play an acknowledged role in the developments that characterize the Age. If, on the other hand, students in each area shift to a somewhat more generic level of analysis, libraries and mass media can be viewed as institutions concerned with information organization, packaging, and dissemination, and in these respects have many things in common in terms of sources, message, processes, applications, technologies, outcomes, and economics.

Four Integrating Concepts

Taking account of considerations relative to interdisciplinarity, focus, and level of analysis, four useful integrating concepts are:

• Communication
• Information
• Mediation
• Institutions

Communication

There are, of course, any number of approaches to communication. For integrative purposes, one workable definition is: Communication is message-related behavior (Ruben, 1984, 1992a). Given this view, communication is seen as an inevitable activity involving the construction of messages and meaning, and responses to them. Consistent with this perspective is an understanding of communication as the process by which living systems interact with their environment and other systems through information processing (Miller, 1965; Thayer, 1968, 1986; Ruben, 1972, 1992a, 1992b). Communication is seen necessary for the emergence and adaptation of living systems, and to the formation and maintenance of relationships among their component parts, between a system and its environment, and between systems. Thus, human communication is the process through which individuals in relationships, groups, organizations, and societies
receive, create, and transmit messages to relate to their environment and
one another (Ruben, 1992a).

The communication process involves messages and meanings which are
constructed:

1. intentionally (e.g., a speech, a computer program, or a painting) or
   unintentionally (e.g., a regional accent, a programming error, or a blush
   of embarrassment);
2. in a visual (e.g., text or graphics), auditory (e.g., voice or music),
   tactile (e.g., tactile text or human touch), olfactory, or gustatory mode;
3. to inform (e.g., news or on-line catalogues), to persuade (e.g., advertis-
   ing or promotion), to entertain (e.g., videogames or general appeal
   magazines), or to deceive (e.g., “misinformation” or “disinformation.”

**Biological and individual levels of analysis.** At the most basic biological
level, communication provides the primary means through which living
systems function in and adapt to their physical and social environments.
For animal, as well as human systems, communication plays an indispen-
sable role in physiological self-regulation, navigation, territory establish-
ment and maintenance, mating and reproduction, and parent-offspring
relations, social and life-skill learning.

At the individual level, communication is also fundamental to higher-
level perceptual, cognitive activity, and spiritual activity, and plays an
essential role in personality development, self-expression, decision mak-
ing, problem solving, self-reflexiveness, and self-monitoring, among other
human activities.

**Interpersonal, social, and cultural levels of analysis.** At the level of
social systems, it is through communication that relationships, groups,
organizations, and societies are defined, relationships and networks among
individuals formed, and joint task and social activities undertaken and
coordinated. It is through these same mechanisms that social control is
established and socialization achieved. By means of communication, cul-
turally based messages and meanings are developed, intersubjectified,
negotiated, and socially validated.

**Information**

As with communication, there are many perspectives on information.
For present purposes, *information* can be defined as any coherent col-
clection of messages or cues organized in a way that has meaning or utility for
a system (Ruben, 1988). Such a view regards information as a phenome-
on, or thinglike (cf. Buckland, 1991; Saracevic, 1991). It is important to

note that such a perspective is more generic than some definitions. This
view of information does not limit the use of the term based on *factuality*
or *form*. Thus, “information” is used to refer to messages that are:

1. **factual** (e.g., scientific findings and news) or **fictional** (e.g., poetry or
television drama); or
2. **environment-based** (heat from the sun or a flickering neon light in a
   classroom), **document-based** (e.g., books, journal articles, or govern-
   ment documents), or **interpersonally-based** (e.g., conversation and
gestures) in form.

**Three types of information.** Information is often used to refer to a broad
range of document/artifact/thinglike/representational entities, such as data
in a computer, words in a book, utterances in a verbal exchange, concepts
we think about, or the meaning of a red light at an intersection. While
viewing any representation as information is convenient and even useful
for some purposes, it can also be misleading and dysfunctional in other
contexts.

For present purposes, at least, it is suggested that there is a need to
distinguish among three rather distinct concepts of information-as-repre-
sentation (Ruben, 1992b). The first order of information, which can be
termed, *Information*, is environmental data, stimuli, messages, or cues—
artifacts and representations—that exist in the external environment. This
is the order of information that has *potential* significance for a living
system, but that potential is not yet actualized. It is raw data, stimuli,
messages, or cues yet to become attended to and utilized.

*Information*, refers to the second order of information—internalized,
appropriations, and representations. This order of information is *Information,*
which has been transformed and configured for use by an individual.
*Information*, refers to: (1) the often transitory, internalized, idiosyncratic
appropriations, representations, or constructions of *Information*; and (2)
the long-term “artifactual” consequences of this process, variously re-

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<th>TABLE 10.1</th>
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| **Information**—(First Order Information): Environmental artifacts and representa-
tsions; environmental data, stimuli, messages, or cues. |
| **Information**—(Second Order Information): Individualized, internal appropriations
  and representations. |
| **Information**—(Third Order Information): Socially constructed, negotiated, validated,
sanctioned and/or privileged appropriations, representations, and artifacts. |
ferred to as cognitive maps, cognitive scheme, semantic networks, personal constructs, images, rules, or mind (see table 10.1).

Information refers to the third order of information—socially/culturally constructed, negotiated, validated, and sanctioned appropriations, representations, and artifacts. This is the order of information that comprises the shared information/knowledge base of societies and other social systems.

The Information—Information distinction is a very fundamental one (Ruben, 1992b). It helps explain the multiple interpretations (Information) that exist for any message in the environment (Information). The representational or appropriate form (Information)—whether of a poem or a retrieved list of potential sources—is different than its environmental referent (Information). Moreover, the Information that represents Information is different for each individual, as it may well be for a particular individual over time.

The Information—Information distinction helps to clarify why descriptions of a library, a concert, a speech, or the appearance of another person (at the Information level), may bear little predictable relationship to their (Information level) significance and meaning for particular audience members or users. For instance,

For some a library (at the Information level) is “an institution which plays a vital role in the life of a community or institution.” For others it may be “a place to work,” “a place to do research,” “a place to do photocopying,” “a place to go to be alone,” “a place to go to make friends,” even a “place to get change for the parking meter.” (Ruben, 1992b)

The Communication—Information Relationship

Communication and information have long been regarded as interrelated topics by scholars and practitioners (e.g., Cherry, 1957, 1966; Cherry, 1971; Krippendorff, 1977; Lin, 1973; Otten, 1975; Ruben, 1972, 1975, 1979; Ruben & Kim, 1975; Shannon & Weaver, 1949; Thayer, 1961, 1968, 1979; Wiener, 1961.). And beyond a concern about the communication-information relationship in general theories, there has also been interest in connections between the two among researchers who have focused on specific contexts, including biological (e.g., Lawson, 1963, Miller, 1965), cognitive (Bruner, 1973; Lachman, R., Lachman, J. L., & Butterfield, 1979; Loftus & Loftus, 1976; Schroder, Driver, & Streufert, 1967), psychiatric (Ruesch & Bateson, 1951), information science (Belkin & Robertson, 1976; Greer, 1987; Pemberton & Prentice, 1989), library (Derwin, 1977; Penniman & Jacob, 1984), economic (Machlup, 1952, 1962), and cultural (Schiller, 1981; 1989, Smith, 1966).


In the integrative perspective being proposed here, the relationship between communication and information is seen as a very intimate one. Communication is a process—an interactive process involving the transformation of information. Information is an artifact, representation, of product (a text, vocalization, a document, an image). Information arises out of communication; it is the product of communication. Communication occurs with respect to information. Process and product are inseparable (Ruben, 1992b). Information is not, per se, transmitted between or retrieved by individuals when they interact. Rather, communication involves the ongoing creation of information (a, b, c), and l,—by interactants through a process that influences—and is influenced by—participation in relationships, groups, organizations, cultures, and societies.

Mediation

Mediation occurs when our natural individual abilities to create, transmit, receive, and process visual, auditory, olfactory, gustatory, or tactile messages are extended, expanded, or enhanced technologically by media, or interpersonally by human intermediaries. Mediation may occur with:

1. formal information systems (e.g., searching a computerized databases or watching cable television) or informal information systems (e.g., asking a friend a question over the telephone or giving lecture notes to a friend);
2. “old media” (e.g., pencils and paper), or “new media” (e.g., computers and cellular phones);
3. media used for mass communication (e.g., television or books), media used for organizational communication (e.g., intercoms or newsletters), media used for scholarly/scientific communication (e.g., journals or technical reports, or media used for interpersonal communication (e.g., telephones and answering machines); and
4. technological interfaces (e.g., keyboarding or a telephone answering machine) or human interfaces (e.g., a reference librarian or a newspaper editor).
Functions of Mediation

Mediation extends human communication and information processing relative to: (1) production and distribution; and (2) reception, storage, and retrieval. Production involves the creation of messages using communication media. Distribution has three components: (1) Transmission; (2) reproduction and amplification; and (3) display—making messages physically available once they arrive at their destination.

Mediation in production may involve messages that are auditory in form, such as spoken language or music produced by human performers or musical instruments, as well as those conveyed by telephones, letters, radio, or recordings. Visual mediation may involve text forms, illustrations and other symbols created, transmitted and displayed by means of hand and arm signals, signs, printing, or photographic equipment. Television, film, and satellites extend our auditory and visual capacities simultaneously; other tools such as pencils, pens, typewriters, and paints and brushes serve similar mediating functions. Such media also further our human capacity for transmitting and displaying these messages, as do computers, video games, and even hand-held calculators. Examples of media that duplicate or amplify messages include carbon paper, printing presses, duplicating and copying equipment. Radio and television receivers, and even magnifying glasses, radar, stethoscopes, and telescopes assist with the reception of visual information, while earphones and hearing aids expand capabilities for receiving auditory messages. Computers mediate storage and retrieval processes, as do all forms written and graphic documents.

"New," "Old," and Converging Uses of Media

Traditional distinctions between various communication media and their uses are rapidly eroding. The newspaper once was the primary means for providing society audience with the summary of events of the day. Television, radio, and film were primarily mass entertainment media, and telephones were traditionally used socially and in business contexts, generally as a substitute for short face-to-face conversation.

These traditional distinctions are rapidly becoming obsolete. Together, the computer, telephone, and television can become a newspaper, magazine, game, reference tool, catalog, index, and a variety of other things. When a printer is added, the telephone, television, and a computer become a typewriter and printing press, a group decision-making network, a card catalog and the stacks of books at a reference library in medicine or law. When connected to a video disc or video cassette, television is a movie screen. When the tapes played are recorded on a portable videotape unit, television is a home movie—a family album. In combination, these tools are at once media for interpersonal, group, organizational, scholarly/scientific, and mass communication.

Convergence and change are also apparent in the patterns of ownership of various communication and information media. Particularly in the past twenty-five years, the pattern of single-medium specialization and ownership has given way to an increasing prevalence of cross-ownership of media.

Intermediaries

As mentioned earlier, and integrative concept of mediation refers not only to technological mediation, but also to human mediation and human intermediaries—journalists and editors in the context of journalism, acquisitions and reference librarians in the context of libraries, and curators and public information staff in the context of museums. Moreover, these gatekeepers have their counterparts in a great many other communication and information arenas including film, book publishing, public relations, advertising, theater, music, and politics.

Communication and Information Institutions

Communication and information institutions are organizations that create, organize, package, repackage, display, or distribute information products and/or services to an audience (cf. Budd & Ruben, 1988; Hunt & Ruben, 1993; Ruben, 1992a; Schiller, 1989; Thayer, 1988; Turow, 1984, 1992).

Information products are collections of messages organized in a particular way for a particular purpose or use by a particular audience (Hunt & Ruben, 1993). Corresponding to the broadened definition of information noted earlier, the phrase, information product includes not only news, but also entertainment, public relations and advertising, computerized databases, even museum exhibits or theatrical plays. Information services are activities associated with preparation, packaging, repackaging, distribution, organization, storage, or retrieval of information. Information services include news or editorial research, abstracting and indexing, public relations consulting, and electronic information delivery.

The term audience refers to the group of individuals who have potential for being exposed to and using an information product or service. In the terminology of the Information Age, the audience is the user group (Hunt & Ruben, 1993; Ruben, 1992a).
Traditionally, "audience" was defined in terms of a large, diverse group of viewers or readers all being exposed to the same information products at more or less the same time, and all unknown to the information producers (Wright, 1986). However, mediating devices like VCRs, CDs, portable cassette tape players, and personal computers suggest the value of broadening this concept. These media make it easier to direct messages to specific segments of a mass audience at varying times. Therefore, the view of audience presented here does not presume that the user group must be of a specific size, nor be particularly diverse, nor that all of its members must be exposed to the same information at a similar point in time, nor that members of the group must be unknown to the information producers. More basic is the requirement that the information product involved must have been purposefully produced, organized, and/or distributed by a communication or information institution for a particular constituency. A network television program fits this definition, as does a collection in a library, a videotape produced for a particular corporation, a church newsletter, or a museum exhibit.

Implications and Conclusions

In combination, the concepts of communication, information, mediation, and institutions provide a promising foundation for addressing many significant issues of the Information Age. As examples of the types of connections and questions suggested by the framework, consider the following:

- To what extent do similarities and differences exist between communications as it operates in mass, public, transnational, intercultural, organization, political, group, interpersonal, intrapersonal, and technological contexts? What processes, goals, and outcomes are comparable in varying contexts? What general principles and frameworks apply across these contexts—for instance, principles relative to sources, channels, functions, individual and cultural impact, and/or information reception, retention and use?
- How can a generic concept of information be useful for understanding the structure, organization, and use of messages not only in documents, but also in intrapersonal, interpersonal, group, organizational, and cultural domains?
- Can the distinction between varying types of information—in terms of whether it is environmental, personal, or sociocultural—be useful not only in information systems design and implementation, but also in other contexts?

- In what ways is technological mediation parallel to and/or distinct from human mediation? What are the functional similarities and differences among structurally diverse technological intermediaries, such as telephones, computers, television sets, VCRs, and answering machines?
- What commonalities in processes, goals, and outcomes exist across different classes of human intermediaries, such as newspaper editors, reference librarians, documentary film producers, social science researchers, college teachers, and textbook acquisitions editors?
- To what extent should computer-human interaction be viewed as a distinct class or context of interaction? How is computer-human interaction similar to and/or different from FAX-human interaction, movie-human interaction, telephone-human interaction, or face-to-face interaction? How are the communication processes, mediation dynamics, and information products involved similar and/or different? In what ways is the role of the audience member or user comparable? Considering sources, how is the role of the computer programmer different from that of the movie or television "programmer"? How can knowledge from individualized contexts and roles be productively applied in other mediated contexts or roles?

- To what extent do mass media institutions share common forms, functions, and roles with libraries, information services, software producers, and museums?
- How can theoretical, research, evaluative, economic, policy, and regulatory considerations that are pertinent for one institution be made more relevant and accessible for others? For instance, might not cultural studies, critical theory, and concepts of media uses and gratifications be applicable, in principle, to the study of libraries, museums, online information services, and "new" technology? To what extent are issues of library and information institution ownership/sponsorship, control, and regulation pertinent to concerns regarding the ownership/sponsorship, control, and regulation of mass media institutions?

Concepts of communication, information, mediation, and institutions—and the framework they collectively define—transcend disciplinary boundaries. Moreover, they suggest a focus and level of analysis which help to overcome limitations of overly specialized or overly abstract approaches, and provide the basis for a much-needed conversational linkage between scholars, practitioners, and the general public. These concepts are equally promising as cornerstones for the design and construction of integrative communication-information courses and programs.

References


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