**Diffusion of Innovation**

**Innovation:**

An idea, practice, or object that is perceived as new by an individual or other unit of adoption (Rogers, 1995)

**Diffusion**: The process by which an innovation is communicated through certain channels over timeamong the members of a social system (Rogers, 1995)

**Definition**

In his comprehensive book Diffusion of Innovation, Everett Rogers defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. Rogers' definition contains four elements that are present in the diffusion of innovation process.

The four main elements are:

1. Innovation - an idea, practices, or objects that is perceived as knew by an individual or other unit of adoption.
2. Communication channels - the means by which messages get from one individual to another.
3. Time - the three time factors are:

(a) Innovation -decision process (b) Relative time with which an innovation is adopted by an individual or group. (c) Innovation's rate of adoption.

(4) Social system - a set of interrelated units that are engaged in joint problem solving to accomplish a common goal.

**Rogers’ Diffusion of Innovation**

**Stages of adoption:**

**Awareness -** the individual is exposed to the innovation but lacks complete information about it Interest -the individual becomes interested in the new idea and seeks additional information about it

**Evaluation -** individual mentally applies the innovation to his present and anticipated future situation,and then decides whether or not to try it

**Trial -** the individual makes full use of the innovation

**Adoption -** the individual decides to continue the full use of the innovation



**Factors affecting diffusion**

* Innovation characteristics
* Individual characteristics
* Social network characteristics
* Innovation characteristics

**Innovation characteristics**

**Observability**

The degree to which the results of an innovation are visible to potential adopters

**• Relative Advantage**

The degree to which the innovation is perceived to be superior to current practice

**Compatibility**

The degree to which the innovation is perceived to be consistent with socio-cultural values, previous ideas, and/or perceived needs

**• Trialability**

The degree to which the innovation can be experienced on a limited basis

**• Complexity**

The degree to which an innovation is difficult to use or understand

**Individual characteristics**

**• Innovativeness**

Originally defined by Rogers: the degree to which an individual is relatively earlier in adopting an innovation than other members of his social system–

Modified & extended by Hirschman (1980):

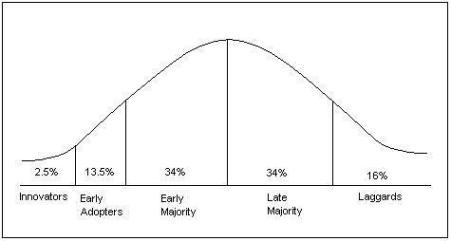
Inherent / actualized novelty seeking Creative consumer

* Reliance on others as source of information (Midgley & Dowling) Social network characteristics
* Opinion leadership: number of nominations as source of information Other possible factors
* Lyytinen & Damsgaard (2001)

Social environment of diffusion of innovation

Marketing strategies employed

Institutional structures (e.g., government)



Diffusion research examines how ideas are spread among groups of people. Diffusion goes beyond the two-step flow theory, centering on the conditions that increase or decrease the likelihood that an innovation, a new idea, product or practice, will be adopted by members of a given culture. In multi-step diffusion, the opinion leader still exerts a large influence on the behavior of individuals, called adopters, but there are also other intermediaries between the media and the audience's decision-making. One intermediary is the change agent, someone who encourages an opinion leader to adopt or reject an innovation (Infante, Rancer, & Womack, 1997).

Innovations are not adopted by all individuals in a social system at the same time. Instead, they tend to adopt in a time sequence, and can be classified into adopter categories based upon how long it takes for them to begin using the new idea. Practically speaking, it's very useful for a change agent to be able to identify which category certain individuals belong to, since the short-term goal of most change agents is to facilitate the adoption of an innovation. Adoption of a new idea is caused by human interaction through interpersonal networks. If the initial adopter of an innovation discusses it with two members of a

given social system, and these two become adopters who pass the innovation along to two peers, and so on, the resulting distribution follows a binomial expansion.

**Adopter Categorization**

The criterion for adopter categorization is innovativeness. This is defined as the degree to which an individual is relatively early in adopting a new idea then other members of a social system. Innovativeness is considered "relative" in that an individual has either more or less of it than others in a social system.

**Fig. 1 - Adopter categorization on the basis of innovativeness**

Adopter distributions closely approach normality. The above figure shows the normal frequency distributions divided into five categories: innovators, early adopters, early majority, late majority and laggards. Innovators are the first 2.5 percent of a group to adopt a new idea. The next 13.5 percent to adopt an innovation are labeled early adopters. The next 34 percent of the adopters are called the early majority. The 34 percent of the group to the right of the mean are the late majority, and the last 16 percent are considered laggards.

**Adopter Categories**

Innovators are eager to try new ideas, to the point where their venturesome ness almost becomes an obsession. Innovators’ interest in new ideas leads them out of a local circle of peers and into social relationships more cosmopolite than normal. Usually, innovators have substantial financial resources, and the ability to understand and apply complex technical knowledge. While others may consider the innovator to be rash or daring, it is the hazardous risk -taking that is of salient value this type of individual. The innovator is also willing to accept the occasional setback when new ideas prove unsuccessful.

Early adopters tend to be integrated into the local social system more than innovators. The early adopters are considered to be localities, versus the cosmopolite innovators. People in the early adopter category seem to have the greatest degree of opinion leadership in most social systems. They provide advice and information sought by other adopters about an innovation. Change agents will seek out early adopters to help speed the diffusion process. The early adopter is usually respected by his or her peers and has a reputation for successful and discrete use of new ideas.

Members of the early majority category will adopt new ideas just before the average member of a social system. They interact frequently with peers, but are not often found holding leadership positions. As the link between very early adopters and people late to adopt, early majority adopters play an important part in the diffusion process. Their innovation-decision time is relatively longer than innovators and early adopters, since they deliberate some time before completely adopting a new idea. Seldom leading, early majority adopters willingly follow in adopting innovations.

The late majority are a skeptical group, adopting new ideas just after the average member of a social system. Their adoption may be borne out of economic necessity and in response to increasing social pressure. They are cautious about innovations, and are reluctant to adopt until most others in their social system do so first. An innovation must definitely have the weight of system norms behind it to convince the late majority. While they may be persuaded about the utility of an innovation, there must be strong pressure from peers to adopt.

Laggards are traditionalists and the last to adopt an innovation. Possessing almost no opinion leadership, laggards are locality to the point of being isolates compared to the other adopter categories. They are fixated on the past, and all decisions must be made in terms of previous generations. Individual laggards mainly interact with other traditionalists. An innovation finally adopted by a laggard may already be rendered obsolete by more recent ideas already in use by innovators. Laggards are likely to be suspicious not only of innovations, but of innovators and change agents as well.

**Adopter categorization**

**Innovators (2.5%),**

1. **Innovators** - venturesome, educated, multiple info sources, greater propensity to take risk
2. Less self-conscious / ‘the bleeding edge of technology’

**Early Adopters (13.5%),**

1. **early adopters -** social leaders, popular, educated
2. Tend to be well-connected opinion makers
3. Some tend to look for new innovations - looking for new fashions

**Early Majority (34%),**

Early majority - deliberate, many informal social contacts adopt since something has been shown to work

**Late Majority (34%),**

Late majority - skeptical, traditional, lower socio-economic status

**Laggards (16%)**

Laggards - neighbors and friends are main info sources, fear of debt don’t like the new innovation - But they might be right!

Interactive media have grabbed the attention of communication researchers in the latter half of the 1990s, but the focus to date has been primarily on media audiences and their use of these new forms. This paper suggests four approaches that may help provide theory based underpinnings in a different area: the study of journalists and the ways in which their roles and jobs are changing. The approaches are gate-keeping theory; diffusion of innovation theory; sociological perspectives, particularly those involving the sociology of news work; and a somewhat eclectic perspective that explores the idea of journalism as a potential force of cohesion in an increasingly fragmented society.

**Introduction**

The explosion in interactive media forms has grabbed the attention of communication scholars in the latter half of the 1990s. The number of studies is burgeoning, and new ones appear at a steadily accelerating pace. The focus to date has been primarily on the audience for computer-based media forms, particularly on the uses and effects of these new media. Adding to our understanding of computer-mediated communication have been explorations of everything from the effects of computer and video games on adolescents' self -perceptions [(Funk and Buchman, 1996)] to audience perceptions of interactivity in e-mail sent to a network news show [(Newhagen, Cordes and Levy, 1995)] to a whole host of forays into the constitution, implications and ethics of online community (see, for example, [Jones, 1995]; [Brennen and Primeaux, 1997]; [Weinrich, 1997]).

The interest in online audiences may be especially acute because of the nature of these newer media forms: by definition, interactive media blur the lines between the receivers and senders of a mediated message. The use of a medium such as the Internet obviously involves not only active participation in the traditional audience roles of selecting and processing media messages, but active participation in creating them, as well. However, the traditional receivers are not the only ones profoundly affected by this change. The traditional senders of media messages -- the journalists -- are faced not just with a new delivery method but with what may be a fundamental shift in their role in the communication process. How is what we know as "traditional" journalism similar to or different from online journalism? How does the nature of the interactive medium affect what journalists do?

This paper will suggest four foundations, resting on existing theories and conceptual approaches, upon which researchers might build in studying that changing journalistic role. Morris and Ogan [(1996)] have help us study their role. But before we take that leap, we have much to learn by using familiar aids to guide us along new paths.

**Gate-keeping Theory**

One of the most easily accessible theories is the journalist as gate-keeper, a role that clearly seems threatened by a medium in which users can put their fingers on virtually any bit of information that interests them. "No other medium," one observer has suggested, "has ever given individual people such an engaged role in the movement of information and opinion or such a proprietary interest in the medium itself" [(Katz, 1994,50)]. Though the term "gate keeper" originated with sociologist Kurt Lewin, it was first applied directly to journalists by White, who studied the choices made by a wire service editor at a small Midwestern newspaper. "Mr. Gates," who selected a relatively limited number of stories for publication and rejected the rest, saw to it that "the community shall hear as a fact only those events which the newsman, as the representative of his culture, believes to be true" [(White, 1950, 390)]. Subsequent studies have indicated that the journalist's self-perception as the person who decides what people need to know is deeply ingrained. Indeed, it has been suggested that the identification and dissemination of what is worth knowing is the journalist's most basic and most vital task in a democratic society, in which information plays a central role [(Janowitz, 1975)]. It would seem that the notion of gate keeping goes right out the window with the Internet. The 'Net, and its user-friendly World Wide Web graphical overlay, is the best example yet of a postmodern medium; it provides the opportunity for creation of a highly personal pastiche, in which all importance, all meaning is relative to an individual perspective. Users can find anything they want online. They don't need someone else to do the picking and choosing. They don't need someone else to decide what's important. They don't need someone else to digest and package their information. They don't need someone else to interpret that information for them. Or do they?

Gate-keeping theory may provide a more valuable basis for study in this new media environment than it first appears. "What happens when the gate keeper goes away?" is not the only question to be asked. It might not even be the best question. Although few published studies have specifically addressed gate-keeping in the online environment, there is some evidence that journalists see that function as evolving and adapting rather than disappearing. A study by Singer [(1997)] indicates people inside the newsroom are modifying their definition of the gate keeper to incorporate notions of both quality control and sense-making. In particular, they see their role as credible interpreters of an unprecedented volume of available information as fundamental to their value -- even their survival -- in a new media environment. Her findings are in line with the most recent survey by Weaver and Wilhoit [(1996)], who found that

Journalists continue to see their primary role as interpreters, rather than mere gatherers and

Disseminators, of information.

Those findings raise interesting follow-up questions for interactive media researchers to

pursue. Do the growing numbers of journalists now working online also value the interpretive role? If so, how might they see themselves fulfilling it? Another approach might be to examine whether the real or perceived need for a gate-keeping or sense- making role -- among both journalists and members of the public -- increases or decreases as the amount of information expands and people are empowered to make their own news judgments. Although the evidence is still largely anecdotal, there is some indication that online user -- despite much-publicized exclamations of elation at their new freedom from media control over information -- may actually be looking for some sort of gate keeper. For instance, with the Communication Decency Act thrown out as unconstitutional, one of the hottest topics for Internet access providers today is how to keep children from seeing certain content online. The perceived solution, so far, has largely been a technological one: filtering software such as Cyber Sitter or Net Nanny to carry out, in effect, editorial decisions about what is appropriate and what is not. It seems that people do still want someone or something to make -- or help them make -- judgments about content. Or consider "know bots," the little personalizable pieces of software that will go rooting around like truffle-hunting pigs in the incomprehensible, and exponentially expanding, vastness of the online universe to find content that matches users' identified interests. In addition to help making judgments, people are searching for help in finding information. Indeed, they also may be looking for help of a more human nature -- from, in fact, the very journalists whose influence they can, if they choose, escape online. Aside from the search engines, the most popular and widely used sites on the Web include many of those produced by

employees of traditional media outlets, from CNN to USA Today to ESPN.People are even willing to pay $49 a year for access to the online Wall Street Journal. In other words, they are turning to their favorite selectors, organizers and packagers of information -- ones whose brand identity they know and, at least to some extent, trust. Matt Drudge, the pseudonymous online scribe who boasts of having no editor, also has no credibility. Michael Schudson began his recent book, The Power of News [(1995)], by inviting readers to imagine a world in which everyone is able to deliver information directly to everyone else through a computer, a world in which everyone can be his or her own journalist. He suggests that people would quickly become desperate to figure out which sources were legitimate and would soon be begging for help in sorting through the endless information. Furthermore, he said, they would prefer to have that help come from a source that was at least relatively savvy about what all those other people were talking about, relatively nonpartisan and therefore relatively trustworthy. Journalism, in short, would pretty quickly be reinvented.

The world Schudson describes is, of course, more or less the world in which we live, one in which every politician, advertiser, hobbyist and lunatic is able to communicate with us directly through our computers. So perhaps it is time to revisit gate-keeping theory in this new environment. Though the role is undoubtedly changing, it seems unlikely to lose all relevance any time soon. Potential questions for additional intellectual exploration might include:

* Who are the gate keepers online? What attributes or skills will online gate keepers need?
* How does the concept of news judgment, which underlies gate-keeping theory, change as the media change? Does it become a matter of personal taste or does it encompass a broader, more public-minded component?
* If users do want gate keepers -- at least of some sort, at least some of the time – what sorts of functions might those gate keepers perform? Do users prefer that role be performed by humans or by software? Are the ideal functions different for each?
* The original need for gate-keeping journalists, in White's conception and the studies that followed his, came about because of the limited space (or time, for broadcasters) available in traditional media. Online media such as the Internet have unlimited space. Are there other limits, such as the user's time and patience, or the media organization's resources, that create comparable constraints? If so, how can they best be handled?
* How is the gate-keeping function influenced by the interactive nature of this medium? For instance, "push" technology lets users specify their interests and receive updates about them in an e- mailbox. There is already concern that online journalists' news decisions are being perhaps unduly influenced by user feedback [(Tucher, 1997)]. Will those influences continue to escalate? A re-examination of gate-keeping theory, then, can generate questions that are both plentiful and meaty. They offer opportunities to connect some of the existing scholarly emphasis on online users to studies whose focus lies within the newsroom. The following two approaches also can shine light in the same vicinity.

**Diffusion of Innovation**

Diffusion of innovation, a theory applied most directly to communication studies by Rogers [(1995)] and those who have built on his work, deals specifically with the spread of change through a social system; it therefore is a natural for this field of study. Again, much of the emphasis has been on diffusion among members of the media audience, ranging from an exploration of readership characteristics of early adopters [(Schweitzer, 1991)] to the degree to which the Internet is being incorporated into consumers' information-gathering patterns [(Stempel and Hargrove, 1996)] to a examination of likely predictors of personal computer adoption ([Lin, 1997], and earlier work). Studies within the newsroom also have been undertaken; the adoption of such new technologies as computer pagination, to offer an example from the world of print journalism, has received considerable attention (see, for instance, Russial, [1994]; Underwood, Giffard and Stamm, [1994]). Researchers also have begun to trace the use of computers within the newsroom for a variety of information-gathering tasks, from data analysis [(Friend, 1994)] to searches of online records [(Davenport, Fico and Weinstock, 1996)]. Garrison, who did extensive, earlier work with the adoption of computer-assisted reporting, has been at the forefront of efforts to trace the increasing use of the Internet and other interactive media by journalists([Garrison, 1997a], [1997b]). He has documented, among other things, a steady rise in the use of online information sources by reporters and a strong perception that such sources can be valuable journalistic tools.

Studies such as these provide solid data from within the newsroom, involving changes in journalists' use of and attitudes toward new communication technology, on which to continue building. More explicitly theoretical approaches would enable researchers to draw connections with the diffusion of other innovations, particularly within a fairly narrowly defined social system such as that created by journalism professionals. Studies

Such as those cited above indicate that the use and acceptance of online media are spreading, but we don't have a clear picture of just how that process is taking place. Specific aspects of diffusion theory raise a number of questions that have not yet been addressed. For example, innovations likely to gain a more rapid acceptance are those perceived as having a high relative advantage, or as being better than the idea they supersede, and as being highly compatible with the existing values of potential adopters. What are the perceived advantages of online information sources over more traditional news-gathering methods? How do such sources mesh with the value that journalists continue to place on investigating government claims -- or on avoiding stories with unverified content, a media role deemed "extremely important" by almost half the journalists in Weaver and Wilhoit's [(1996)] latest study? The role of opinion leaders, individuals within a social system who provide informal information and advice about innovations to others within the system, also raises intriguing questions. Who are the people within the newsroom whom others will follow? And what gives them the social status that marks them as leaders in this area? Are they the same people seen as leaders in other facets of newsroom life, or do different opinion leaders emerge for technological innovations? For instance, the investigative reporters who are already at the top of the newsroom food chain may now be winning prizes for stories based on online sources, stimulating interest in other reporters seeking to advance. Or leaders may simply emerge as random individuals, perhaps caught up in the diffusion of computer-based media outside the newsroom, become excited and spread the word among their colleagues. Or maybe the opinion leaders are journalists at other media outlets, such as the ones that serve as either real or ideal destinations for large numbers of working professionals: "If it's good enough for The New York Times, it's good enough for me." What role, if any, do reports carried in trade journals play? The answers to such questions are not just of academic interest; they have significant implications for managers seeking to encourage adoption of computer-based tools.

These are examples of diffusion-related questions to ask in looking within the newsroom at journalists' use of interactive media to carry out traditional functions, primarily reporting. But journalists are beginning to use interactive media not only to gather information but also to disseminate it. There are numerous questions to be raised relating to diffusion of the idea of online media services as acceptable places for journalists to work. Indications are that online journalists have not yet achieved parity with their traditional peers. Some report being denied equal access to news events [(Quick, 1997)]. Pay and benefits for a media outlet's online staff vary widely, but online staffers often are young and relatively inexperienced, and their compensation reflects that status. How to treat them is a subject of ongoing debate among union and management negotiators in many newsrooms [("On-Line: Guild Work, Guild Jurisdiction," 1996)]. In general, traditional journalists have seemed reluctant, in these early years, to consider online counterparts as peers. Among the questions that spring from this situation are:

* How does acceptance of the idea of working in a non-traditional environment diffuse within the traditional newsroom? Again, who are the opinion leaders, and what factors are significant in the process? Right now is an ideal time to launch studies in this because right now is when the process is occurring ...

or not. Are online media going to become separate entities, as television became separate from print? Or will they become arms of existing media forms?

* Can the innovation-decision process for new or current journalists considering a career in interactive media be identified? Rogers [(1995)] lists a series of steps, starting with knowledge and ending with implementation and confirmation. What do these steps look like for journalists faced with a new wrinkle on their jobs and professional roles? What factors might affect where an individual is in this adoption sequence?
* Another key element of diffusion theory is the idea of reinvention, or the degree to which an innovation is modified as it is adopted and implemented. What sorts of reinventions -- of roles, of content, of values, of practices -- are taking place as journalists become involved in online delivery of information?
* Ultimately, Rogers suggests, the components involved in the diffusion process come down to an evaluation of consequences: What will happen if an innovation is adopted or rejected? Today's journalists are, consciously or not, weighing that question in considering whether to become involved in online

media. A better understanding of the factors that go into that judgment may lead to a better understanding not just of tomorrow's media but of today's media, as well.

Such questions only scratch the surface of possibilities for applying diffusion theory to the exploration of how journalists and journalism are affected by interactive media. But even this brief overview raises questions that point to a third fruitful approach to studying the changing newsroom environment, drawing on a different body of work.

Gate keeping Theory examines one of the most enduring concepts in mass communication scholarship. Simply put, gate keeping is the process by which the billions of messages that are available in the world get cut down and transformed into the hundreds of messages that reach a given person on a given day.