APPENDIX A

ROGER'S SOCIAL DIFFUSION OF INNOVATIONS MODEL

Good ideas do not sell themselves!

According to one of the most well know and early social science researchers in the area of diffusion, Everett M. Rogers, innovation is "an idea perceived as new by the individual" and diffusion is "the process by which an innovation spreads." (Rogers 1995). Rogers used well-established theories in sociology, psychology, and communications to develop a concise and easily understood approach to the diffusion of innovations. The model of diffusion and innovation proposed by Rogers was originally used by rural sociologists to study the diffusion of agricultural technologies in social systems (Rogers and Svenning 1969). It has been successfully applied to specific information technology products such as Java® software used in Internet and Intranet environments or hypertext environments.

THE CHARACTERISTICS OF THE MODEL: CHANGE AGENTS

After its conception, an innovation spreads slowly at first - usually through the work of *change agents*, who actively promote it - then picks up speed as more and more people adopt it. Eventually it reaches a saturation level, where virtually everyone who is going to adopt the innovation has done so.

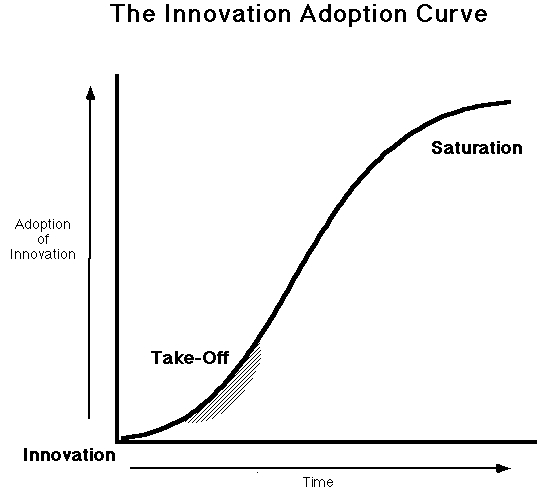

Figure A.1

A key point, early in the process, is called *take-off*. After the forward-thinking *change agents* have adopted the innovation, they work to communicate it to others in the society by whatever means they believe appropriate. When the number of early adopters reaches a critical mass - between 5 and 15% - the process is probably irreversible. The innovation has a life of its own, as more and more people talk about or demonstrate the innovation to each other. What makes an innovation *successful*? Innovation diffusion theorists have identified *five critical characteristics* that may be helpful in explaining this. Note that these are not *requirements* for a successful innovation, but their presence or absence could greatly affect the rate at which it gets adopted.

- *Relative Advantage* - Is the innovation better than the status quo? Will people *perceive* it as better? If not, the innovation will not spread quickly, if at all.
- *Compatibility* - How does the innovation fit with people's past experiences and present needs? If it doesn't fit *both* well, it won't spread well. Does it require a change in existing values? If members of the culture feel as though they have to become very different people to adopt the innovation, they will be more resistant to it.
- *Complexity* - How difficult is the innovation to understand and apply? The more difficult, the slower the adoption process.
- *Trialability* - Can people "try out" the innovation first? Or must they commit to it all at once? If the latter, people will be far more cautious about adopting it.
- *Observability* - How visible are the results of using it? If people adopt it, can the difference be discerned by others? If not, the innovation will spread more slowly.

INNOVATIVENESS AND ADOPTER CATEGORIES IN ORGANIZATIONS

According to Rogers, the individuals within a social system do not adopt an innovation at the same time. Rather, they adopt in an over-time sequence, so that individuals can be classified into adopter categories on the basis on when they first begin using an idea. We know more about innovativeness (the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of the system), than about any other concept in diffusion research. Because increased innovativeness is the main objective of change agencies, it became the main dependent variable in diffusion research. Innovativeness indicates overt behavioral change, the ultimate goal of most diffusion programs, rather than just cognitive or attitudinal change.

A turning point for diffusion research was the Saucío study (Fals Borda 1961) conducted by Paul J. Deutschman, a professor of communication from Michigan State University, and Orlando Fals Borda, an American-trained Ph.D. who founded the field of sociology in Colombia. Despite the fact that 80 percent of the population lived in the Third World, all of the five hundred or so diffusion research studies completed by 1960 were conducted in North America and Europe. This investigation in Colombia was the first diffusion study in a peasant village in Latin America, Africa or Asia. At the time that the Saucío study was carried out in 1962, it was not known whether or not the diffusion of innovations would be similar in peasant villages characterized by high levels of illiteracy, poverty, and by very limited mass media exposure. What Deutschmann and Fals Borda discovered was that the diffusion of agricultural innovations seemed to display striking similarities in Ohio and Saucío. The diffusion process seemed to represent a *general pattern of human behavior*. The Saucío study became a diffusion classic, opening the way for hundreds of diffusion investigations to be conducted in Third World countries in the years that followed. The Deutschman and Fals Borda study demonstrated the usefulness of the conceptual tools of innovativeness and adopter categories.

For innovation diffusion theorists, innovativeness is related to such independent variables as: (1) individual (leader) characteristics, (2) internal organizational characteristics, and (3) external characteristics of the organization. The internal organizational characteristics include:

> *Centralization* – the degree to which power and control in a system are concentrated in the hands of relatively few individuals. Centrality has usually been found to be negatively associated with innovativeness; that is, the more power is concentrated in an organization, the less innovative the organization tends to be. The range of new ideas in an organization is restricted when a few strong leaders dominate the system. In a centralized organization, to leaders are poorly positioned to identify operational-level problems, or to suggest relevant innovations to meet these needs.
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> *Complexity* – the degree to which an organization's members possess a relatively high level of knowledge and expertise, usually measured by the members' range of occupational specialties and their degree of professionalism expressed by formal training. Complexity encourages organizational members to conceive and propose innovations, but it may be difficult to achieve consensus about implementing them.
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> *Formalization* – the degree to which an organization emphasizes following rules and procedures in the role of performance of its members. Such formalization acts to inhibit the consideration of innovations by organization members, but encourages the implementation of innovations.
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> *Interconnectedness* – the degree to which the units in a social system are linked by the interpersonal networks. New ideas can flow more easily

among an organization's members if the organization has a higher network interconnectedness. This variable is positively related to organizational innovativeness.

Organizational slack – the degree to which uncommitted resources are available to an organization. This variable is positively related to organizational innovativeness, especially for costly innovations.

Socioeconomic and personality individual characteristics will define the individual's role in the diffusion process, which can be one of the following: (1) innovators, (2) early adopters, (3) early majority, (4) late majority and (5) laggards. Diffusion research found that earlier adopters were more likely to be literate, had more years of formal education, higher social status, and greater degree of upward social mobility than late adopters, therefore it was concluded that the individual's socioeconomic status and innovativeness were closely related. Though personality variables were difficult to measure in field interviews, earlier adopters seemed to have a personality with greater empathy, were less dogmatic, had greater ability to deal with abstractions, were more intuitive, were less fatalistic, had greater rationality and intelligence, displayed a more favorable attitude towards change and science, were better at coping with risk and uncertainty, and had higher educational and occupational aspirations than late adopters. As far as the communication behavior of early adopters, it included: more social participation, more interconnections through personal networks, more cosmopolite, greater exposure to mass media, actively seek information about innovations, and have a higher degree of opinion leadership than late adopters. It is interesting to point out that many of the socioeconomic and personality characteristics mentioned in diffusion studies are equivalent to some mentioned earlier in the research on effects of modernization on individuals.