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ABSTRACT

This report identifies factors that have an influence on the successful institutionalization and transfer of innovative uses of telecommunications. It examines which factors promote or deter the institutionalization of demonstration projects in the public service field, as well as alternative strategies for institutionalization and innovation diffusion. Barriers to successful institutionalization and transfer are identified through a review of the literature on demonstration projects conducted by other programs and agencies. Institutionalization-related results of a survey of recent public service experiments and demonstrations are then examined. Based on these reviews, several options for the Department of Education's Telecommunications Demonstration Program are identified. (LMM)

STRATEGIES FOR INSTITUTIONALIZING TELECOMMUNICATIONS DEMONSTRATIONS: A REVIEW OF INNOVATION BARRIERS AND PROGRAM ALTERNATIVES

Final Report
#146-04

Submitted to the
Department of Health, Education and Welfare
in response to
RFP 149-78-HEW-05

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EXECUTIVE SUMMARY

This report is the fourth in a series of reports submitted to the Office of Telecommunications Policy (OTP) of the Department of Health, Education and Welfare (DHEW) in response to RFP 147-78-HEW-05.* The goals of the contract, awarded to Kalba Bowen Associates in September 1978, were to (1) review and evaluate the first-year activities of OTP's Telecommunications Program; (2) develop approaches for evaluating individual demonstration projects in the future; (3) identify factors that have an influence on the successful institutionalization and transfer of innovative uses of telecommunications; and (4) provide information on which to base future actions for Program development and offer recommendations concerning future roles for the program.

This report, prepared in response to goal three, examines which factors promote or deter the institutionalization of demonstration projects in the public service field. Alternative strategies for institutionalization and innovation diffusion are examined. Barriers to successful institutionalization and transfer are identified through a review of the literature on demonstration projects conducted by other programs and agencies. Institutionalization-related results of a survey of recent public service experiments and demonstrations then are examined. Based on these reviews, several options for the DHEW program are identified.

Other reports resulting from Kalba Bowen Associates' research include:

- Evaluation of Telecommunications Demonstration Projects and Recommendations to the DHEW Telecommunications Demonstration Program, Executive Summary Report #146-01
- Evaluation of Telecommunications Demonstration Projects and Recommendations to the DHEW Telecommunications Demonstration Program, Summary Report #146-02
- Planning and Evaluating Telecommunications Demonstration Projects and Assessing the Costs of Telecommunications Demonstration Projects, Final Report #146-03.

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*/ During the preparation of the final reports, OTP was moved from DHEW to the Department of Education. While, in some cases, the impacts of this move are discussed within the context of the reports, we have chosen for the most part to refer to OTP/DHEW since this was the location of the Telecommunications Demonstration Program at the time of our research.

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1.0 INTRODUCTION

This report addresses two questions. First, what factors promote or deter the institutionalization and transfer of demonstration projects in the public service field? Secondly, how might the insights gained from examining answers to this first question be used in shaping OTP/DHEW's overall demonstration strategy?

This report is also intended to assist OTP/DHEW in resolving some of the specific issues concerning the future of the demonstration program. These issues include, but are not limited to, the following:

- should the program be open to a wide range of demonstration proposals or should it have a more specific focus (e.g. with respect to technology, number or type of applications, selection of sites or grantees, etc.)?
- should the demonstrations be limited to a one- or two-year period or be seen as part of a longer process including, possibly, planning, demonstration, review and evaluation, implementation, dissemination and diffusion phases?
- should local matching funds be a requirement for all or some demonstration grants (at all or some phases of the process)?
- what other roles, if any, besides grant selection, funding and evaluation should OTP/DHEW undertake in support of the demonstration program (e.g. technical assistance, information dissemination and referral, support of "networking," etc.)?

In relating our findings to these specific issues, we do not want to imply that other perspectives should be excluded in shaping the Demonstration Program. The fact that a demonstration project is (or is not) converted into an operational program is only one measure of its impact. Other objectives of the Demonstration Program could include, for example:

- the generation of information on the costs and/or benefits of telecommunications-supported public service delivery; 1/
- the development of local skills in the utilization of telecommunications-supported delivery modes, which may or may not correspond to the local institutionalization of a given demonstration;
- the creation of broader professional or public awareness of the potential role of telecommunications in public service delivery;
- the use of telecommunications technology as a catalyst for changing or improving other aspects of public service delivery;
- the development of new institutional relationships (e.g. federal/local, among local agencies, or between OTP/DHEW and other DHEW units), which may or may not have short-term "institutionalization" payoffs.

At the same time, "institutionalization" is one

1/ By this measure, a demonstration that is not institutionalized because the telecommunications delivery mode is evaluated as not cost effective can be considered a "success."

legitimate objective for the demonstration program. In the following sections, we will (1) examine alternative strategies for encouraging institutionalization; (2) review research on barriers to institutionalization of telecommunications-based service delivery; (3) examine institutionalization-related results in recent public service experiments and demonstrations; and (4) discuss the implications of these findings for OTP/DHEW's demonstration program.

2.0 STRATEGIES FOR INSTITUTIONALIZATION AND TRANSFER

In general terms, a demonstration project that is designed to introduce an innovative service approach is institutionalized once it becomes a routine activity in one or more organizations. As Yin suggests,[2/] there are a number of signs that typically accompany institutionalization, for example:

- the demonstration project becomes a formal program, possibly with its own line item in the agency's budget;
- the innovative approach is continued even after key personnel involved in the demonstration leave the agency or take other responsibilities;
- personnel associated with the introduction of the new approach are promoted or otherwise rewarded;
- an ongoing training program is established to introduce new practitioners to the innovative approach;
- there is growth in the use of the new approach in the demonstration agency and/or other organizations.

It should be noted, however, that institutionalization does not mean that the innovative approach has been proven to be cost-beneficial compared to a more conventional approach. It simply signifies that the innovative approach

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[2/] See Robert K. Yin, Changing Urban Bureaucracies: New Practices Become Routinized, The Rand Corporation, Santa Monica, CA, March, 1978.

has been adopted on an ongoing basis by the demonstration agency or some other organization(s). Additionally, institutionalization should not be equated with "diffusion," since it is possible for a service innovation to be adopted by the demonstration agency but nowhere else.[3/]

2.1 Institutionalization Modes and Cycles

Institutionalization can occur in a number of ways. Generically, at least five options are possible:

1) the demonstration project becomes an ongoing program within the demonstration agency;

2) the project is institutionalized by some other part of the demonstration agency;

3) an outside agency adopts the service delivery innovation on a regular basis;

4) a consortium (possibly including the demonstration agency) institutionalizes the innovation; and

5) a new agency is created to provide the innovative service.

In addition, a demonstration project can lead to other demonstrations, which in turn are institutionalized.

Awareness of these institutionalization options can be important for the selection of demonstration projects.

[3/] Some of the differences between institutionalization of an innovation and its diffusion or transfer will be discussed in Section 3.4 below.

For instance, an agency which has numerous "branches," such as a state health department with multiple clinics, could institutionalize a service innovation more easily than a single agency -- all other things being equal. There would simply be more choices in finding a suitable setting for institutionalization. Of course, things are not always equal. For formal or informal reasons, the multi-branch agency may not allow one branch to deliver services in an "idiosyncratic" manner, however innovative the approach may be. It may also take longer to arrive at a policy decision in the multi-branch agency, particularly if it is larger, older, and more procedure-oriented than the single-branch agency.

These considerations notwithstanding, it may be important to take an agency's structural constraints and resources into account in selecting demonstration projects. When combined with other criteria, such as the agency's record in adopting service innovations in the past, or its budgetary resources, these structural aspects may provide an initial clue to the likelihood of institutionalization.

A related factor is where the agency stands with respect to the bureaucratic growth cycle. As Downs and others have pointed out, young agencies are more likely to seek new functions and responsibilities, whereas mature bureaucracies may be more concerned with simply preserving

their position in a federal, state or local government system.[4] Younger agencies are also more likely to reward individuals with the initiative to carry forward service innovations, a factor that is important in the adoption of innovations. On the other hand, younger agencies are less likely to be multi-branch or have extensive external ties, which may be constraints on institutionalization.

2.2 The Service Innovation Process

While it is useful to contemplate alternative routes to institutionalization, the mere existence of one or more alternatives will not insure institutionalization. What is required for an innovation is a complex coalescence of resources, not entirely dissimilar from what occurs in the private sector when a new product or system is introduced. Awareness of the innovation must be generated, interest must be aroused, experimental usage must be facilitated, authority figures -- whether sports notables, political leaders, or technical consultants -- must be willing to endorse the product or system, and the whole process must be well managed.

Moreover, the resources brought to bear in institutionalizing an innovation are quite different in many cases from those used in the demonstration phase. Idea

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4/ Anthony Downs, Inside Bureaucracy (Boston: Little, Brown & Co., 1967).

generation, proposal development, staff recruitment, selective outreach, service reorganization, and the procurement and use of subcontractors are key elements in the demonstration phase. In contrast, budgeting, authorization, job specification, professional acceptance, routine outreach, and service management are the overriding functions in the institutionalization phase. In the process, the role of local authorities and agencies is also likely to increase.

At the demonstration phase, the demonstration unit is likely to require the following local support: (1) authorization to submit the proposal; (2) the freedom to conduct the project unhampered by regulatory or bureaucratic constraints; and (3) occasional assistance in implementing the demonstration, such as the referral of clients, or the use of facilities. For institutionalization to occur, a number of other forms of local support must be available, including: (1) willingness of other units or agencies to forego budgetary resources allocated to the service innovation; (2) permanent allocation of facilities to the service innovation; (3) ongoing cooperation; and (4) ongoing support by local political authorities, professional or labor organizations, third-party payment institutions and the user community.

Similarly, if an attempt is made to go beyond the initial local institutionalization of the service innova-

tion to its transfer to multiple locations (including non-local ones), still another set of resources and relationships must be brought into play. The cooperation of disseminators of the innovative objectives and practices must be obtained; wider interest in the service innovation by service agencies, professional associations and user groups must be secured; and evaluations indicating the appropriate application and service utility of the innovation need to be circulated. In addition, the availability of technical and software resources on a more widespread basis must be ensured. Finally, federal support may need to be made available, either from the original demonstration funder or from program agencies operating in the same service environment as the service innovation, so that the innovative approach can be tested and ultimately institutionalized in other settings.

2.3 Participants in Service Innovation

The changes in activities and responsibilities previously discussed can also be examined from the perspective of asking who participates in the service innovation process. First, despite the important roles of obvious participants, such as the demonstration unit, that part of the demonstration agency directly involved in introducing the service innovation, and the demonstration funding agency, a number of other players must also be involved. These include the

demonstration agency, political authorities, equipment suppliers and professional associations, among others. Secondly, the importance of a given player's participation can change from one phase to another. For example, national associations normally play a minor role, if any, during the demonstration and institutionalization phases but could be critical participants in the transfer of the innovation to other settings. Thirdly, the number of participants with a key role to play often increases from the demonstration phase to the institutionalization phase and from the institutionalization phase to the transfer phase.

Exhibit 1 illustrates these points by indicating which players may have a primary role in each of the three phases. The specific listings presented in the table are not definitive, since the specific nature of the service innovation, the original demonstration unit, and the institutionalization or transfer strategy being pursued, could alter the player mix. Nonetheless, it provides an overview of the complex participation process often required in moving an innovation from demonstration to transfer.

The greater number of potential participants in the institutionalization and transfer phases of service innovation is a reflection, in part, of the greater degree of inter-institutional coordination that may be required. While initiating and implementing a demonstration project

PARTICIPANTS IN THE SERVICE INNOVATION PROCESS

PARTICIPANTS	PHASES		
	DEMONSTRATION	OPERATIONAL	TRANSFER
Service Innovators			
Demonstration Unit	X	X	
Demonstration Agency	X	X	
Local Service Agencies		X	X
OTP/DHEW	X		X
Service Providers	X	X	X
Service Recipients		X	
Grant Applicants	X	X	
Communications Suppliers			
Equipment Suppliers	X		
Communications Carriers		X	
"Software" Suppliers	X	X	
Equipment Industry			X
"Software" Industry			X
Other Subcontractors	X		X
Policy/Community Support			
Federal Authorities			X
State/Local		X	
Communications Regulators		X	X
Professional Associations			X
Labor Unions			X
User Interest Groups		X	X
General Public (local)		X	
General Public (non-local)			X
Other Participants			
Payment Organizations		X	X
Private Service Agencies			X
Professional Schools			X
DHEW Agencies (non-OTP)			X
Federal Agencies (non-DHEW)			X
Press/Media		X	X

involves the development of numerous working relationships, most of these are internal; only a few are external, such as those between the demonstration agency and the equipment supplier. By contrast, institutionalization and transfer are likely to require the development of strong relationships with a greater number of external groups and organizations, ranging from professional associations and local political authorities to the media and third party payment institutions. At the same time, the number of relationships that will come into play can depend on the particular institutionalization or transfer strategy that is being pursued.[5/] Some strategies may require a small number of participants, others many participants.

2.4 Institutionalization and Transfer

In the remainder of this section we will outline a few of the strategies that can be pursued, whether explicitly or implicitly, in achieving institutionalization and transfer. Our list is not exhaustive, but is simply meant to suggest the range of strategy options and some of the implications of specific strategies. In general terms, these can be

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5/ "Strategy" may be too strong a word here, since we suspect that many cases involve little conscious decision-making at a strategic level. Nonetheless, organizations attempting to institutionalize or transfer a service innovation do pursue certain tactics rather than others. The mix of tactics employed, and the relationships these tactics generate, can be termed a strategy.

divided into institutionalization strategies and transfer strategies. The former are usually aimed at turning a demonstration project into an operational program at an agency participating in the demonstration. The latter usually seek to diffuse the service innovation beyond the immediate institutional context of the demonstration project.[6/]

Examples of institutionalization strategies are the following:

- The Local Agency Approach. This represents the simplest case where a local demonstration agency attempts to turn the innovative project into an ongoing program. The strategy may involve building political and budgetary support among municipal leaders, collaborating with other local service agencies, and soliciting the blessing of local user interest groups. Local media may also play a role.

- The State Agency Approach. A state agency may have a greater choice of sites where the service innovation can be institutionalized, but it may be more difficult to forge relationships with equipment or software suppliers and service providers, especially if a larger-scale or multi-site program is involved.

6/ A key issue in the case of transfer strategies is whether to collapse the institutionalization and transfer phases into one or whether to wait until the service innovation has been institutionalized in one or more sites before attempting its transfer on a more widespread basis.

- A Consortium Strategy. It may be harder to organize a consortium because of the differing objectives of the participants. Once operational, however, the program may have a greater chance of survival since no single budgetary decision is likely to require termination. On the other hand, decision-making "by committee" could stymie the development and spread of the program.

Similarly, it is possible to identify a number of possible innovation transfer strategies:

- The Private Sector Strategy. Key players in this case are likely to be private profit or non-profit service agencies, communications carriers or software suppliers, private service agencies as well as payment organizations, regulators (competitors may want the service curtailed), the media, and service recipients. The transfer process is relatively immune from political influence but may not involve the service groups with the greatest need.

- Federal/State Collaboration. A new program is launched with partial federal funding and state-level administration. The cooperation of professional associations, public sector associations, public sector unions, user interest groups, and local service agencies may be critical. Presumably, one or more federal agencies would be involved, creating potential jurisdictional conflicts.

- Innovation-oriented "Networking." The initiative here is taken by a loose coalition of service providers who have been stimulated by exposure to the innovative service delivery concept through conferences, professional schools, informal contacts, etc. Short-term success may be limited by the lack of specific funding programs, but the open-endedness of the strategy can have some longer-term payoffs as links are formed with federal or local authorities, service agencies, professional associations, user interest groups, and/or the media. Entry of members of the network into the private sector can also stimulate developments there.

Again, the above descriptions are meant to be brief, selective sketches. However, they do suggest some of the alternative directions that institutionalization and transfer efforts can take. Each strategy involves multiple participants but in differing configurations and with different focal points. Unfortunately, little is known about the appropriateness of the various strategies for telecommunications-supported social service delivery. A good deal of judgmental decision-making must inevitably go into selecting a strategy for a given situation. What is certain, however, is that the federal role depends on which strategy is being pursued.

The issue of appropriate federal roles in demonstration projects will be pursued in the final section of this report, following a review of specific barriers to institutionalization and several case studies in the demonstration and implementation of telecommunications-based service innovations.

3.0 RESEARCH ON BARRIERS TO INSTITUTIONALIZATION

To obtain a better sense of the opportunities and limitations inherent in different service adoption strategies, it is important to understand the constraints inherent in service innovation. In this section we will examine several recent studies of the service innovation process which attempt to isolate key barriers and/or factors affecting successful adoptions. Not all of the studies agree on every point; nonetheless, a body of knowledge on the complexities of institutionalization is being developed and is worth reviewing for our purposes.

The six studies we will review are the following:

- Baer, W.S., L.L. Johnson, E.W. Merrow, Analysis of Federally Funded Demonstration Projects, prepared for the Experimental Technology Incentives Program, U.S. Department of Commerce, R-1926-DOC, Santa Monica, CA: The Rand Corporation, April, 1976.

  The goal of this study was to formulate guidelines for federal agencies in improving the planning, implementation, monitoring, evaluation, and dissemination of results of future demonstration projects. Analysis focussed on an examination of 24 completed demonstration projects spanning a wide range of federal agencies, technologies, and project characteristics. In order to qualify, projects had to include private business either as the intended adopters or manufacturers of the technology, thus excluding projects aimed at social change or requiring ongoing federal assistance.

- Berman, P. and M.W. McLaughlin, Federal Programs Supporting Educational Change, Volume IV: The Findings in Review (April 1975) and

Volume VIII: Implementing and Sustaining Innovations (May 1978), prepared for the U.S. Office of Education, Department of Health, Education and Welfare, R-15891-HEW, Santa Monica, CA: The Rand Corporation.

This multi-year, two phase study was conducted to analyze the evolution of federally funded programs designed to introduce and spread innovative practices in public schools. The first phase of the research examined four federal change agent programs to identify what strategies and conditions promote change in schools; the second phase examined the institutional and project factors that contribute to the continuation and incorporation of a project once federal funding terminates. Findings are based on survey data collected from a national sample of 293 change agent projects, 29 detailed case studies and interviews with federal project coordinators.

- Dordick, H.S. and R.J. Goldman, Telecommunications and Vocational Rehabilitation: Barriers to Utilization by State Agencies, prepared for the Rehabilitation Services Administration, U.S. Department of Health, Education and Welfare, 22-P-59035/9-01, Los Angeles, CA: University of Southern California, 1978.

  The purpose of the study was to assess the barriers to effective utilization of telecommunications technologies by state vocational rehabilitation agencies. Data was collected through over 130 personal telephone interviews with vocational rehabilitation professionals, telecommunications experts, handicapped individuals and others involved with social service/telecommunications applications. Interviews were supplemented by a national mail survey of state and private rehabilitation agencies.

  Also, H.S. Dordick and R.J. Goldman, "Social Services and Telecommunications: Innovation in Human Services Delivery," Telecommunications Policy, June, 1978, pp. 137-145, which is based on the above study.

- Office of Technology Assessment, The Role of Demonstrations in Federal R&D Policy, Washington, D.C.: U.S. Government Printing Office, July, 1978.

  The goals of this study were to develop a conceptual framework for the analysis of demonstration projects, synthesize the literature on demonstrations in relation to this conceptual framework, and draw out implications of the analysis for Congressional action. Conclusions were based on a review of literature concerned with (1) demonstrations as policy instruments, (2) analyses of specific social experiments, (3) R&D utilization and commercialization indirectly relevant to demonstrations, and (4) prescriptive analyses of R&D issues.

- Yin, R.K., K.A. Heald, M.F. Vogel, P.D. Fleischauer, and B.G. Vladeck, A Review of Case Studies of Technological Innovations in State and Local Services, prepared for the National Science Foundation, R-1870-NSF, Santa Monica, CA: The Rand Corporation February, 1976.

  The purpose of this study, aimed at federal policy-makers, was to assess previous experiences with technological innovations in local services and to identify those factors that have been associated with the successful use of such innovations. The study reviewed and analyzed 140 case studies of local organizations' first experiences with a new technological device.

- Yin, R.K., S.K. Quick, P.M. Bateman, and E.L. Marks, Changing Urban Bureaucracies: How New Practices Become Routinized, prepared for the National Science Foundation, R-2277-NSF, Santa Monica, CA: The Rand Corporation, March, 1978.

  The goal of this study was to describe how new practices in urban bureaucracies involved in service delivery (i.e. fire, police, education) became routinized. Findings are based

on life-history analysis of 19 case studies, which in some instances had endured 10 to 15 years. Corroborating evidence was also collected through telephone interviews at 90 additional sites.

In presenting the data generated by these research projects, we have organized their findings around five themes. These are:

- characteristics of the innovation itself which may affect adoption;
- the effects of the organizational environment in which the innovation is being adopted;
- specific implementation factors which could foster the adoption of an innovation;
- factors which could help to diffuse the innovation from its initial demonstration to more widespread use;
- the impact of federal assistance and intervention on institutionalization.

3.1 Characteristics of the Innovations

The six studies identify three features intrinsic to an innovation which could encourage its adoption within the immediate demonstration site as well as in other settings. These are:

1) the use of a technology which requires the manipulation of a hardware device on a daily basis;
2) an emphasis on the delivery of services to an outside user rather than the initiation

of changes in internal administrative procedures; and

3) an innovation which is compatible with existing user values or past experiences.

The studies offer conflicting findings on three further factors. These are:

4) the use of technologies which are simple to operate versus those with complex operating procedures (given sufficient practitioner training);

5) implementation processes which can be developed incrementally and which can be reversed at any point during the course of the demonstration versus implementations which affect immediately and irrevocably a core function of the agency involved in service provision; and

6) innovations which offer an advantage over the existing service delivery system versus innovations which affect positively "bureaucratic self-interest."

The first three of these factors need relatively little explanation. According to Yin, "successful" innovative efforts are correlated with the use of hardware devices (as opposed to information systems or data analysis) because they are visible and thus more easily communicated.[7/]

7/ Yin, R.K., et al., A Review of Case Studies of Technological Innovations in State and Local Services, Santa Monica, CA: The Rand Corporation, 1976. Yin considers a technological innovation "successful" when it produces a service improvement and is also incorporated into the activities of an organization or when it does not produce any improvement and is not incorporated. The two alternative combinations (incorporation but no improvement or improvement but not incorporation) are seen as "failures" (pp. 18-19).

Additionally, innovations that operate on a daily basis, even if this requires limiting the scope of the project initially, stand a better chance of success.[8] Dordick and Goldman concur, pointing out that adoption and use are most affected by the subjective views of potential users which are often bounded by more general frames of reference, such as attitudes toward technology or science. Technologies allowing such users to either observe demonstrations or gain personal experience with their applications will be most successful, since the perception of risks associated with the innovation can be reduced.

Correlated with this need for visibility, according to Yin's 1976 analysis, is the importance of "transitive" innovations which deal directly with changes in the way clients use services rather than merely with internal changes in

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8/ Yin, R.K., et al., Changing Urban Bureaucracies: How New Practices Become Routinized, Santa Monica, CA: The Rand Corporation, March, 1978. Yin, in his 1978 assessment, distinguishes between two types of innovations: task-specific, in which the innovation is limited to a single service application, and task-diverse, in which an innovation is potentially relevant to a variety of service applications. The author finds that, in some cases, different factors affect the successful routinization of each type of task. Thus, in the case of the "daily use" factor, a task-specific innovation's inherent limitations in performing a diverse array of applications to gain widespread practitioner support is compensated by the repetitive number of occasions upon which the single relevant application is performed.

administrative procedures.[9] At the same time, it is important that the innovation not conflict with a user's values or past experiences. Thus, again, material innovations (hardware devices) are more easily adopted than non-material ones (processes, ideas). Moreover, an innovation may have several attributes which users value, such as convenience, increased job safety, or reduced physical effort, but which differ from attributes valued by external evaluators, such as improved response time, lives saved or changes in student achievement. Thus, it is important to identify and include in service delivery designs pay-offs in terms that practitioners can directly experience.[10]

Finally, Berman and McLaughlin, among others, note that the values and goals implicit in an innovation project's design need to be congruent with those of both the project participants and their superiors.

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[9] It should be noted that Yin sees these intrinsic features (i.e. visibility and client-focus) as advancing the service improvement half of his two-part success model only. Incorporation, he feels, occurs when the chief executive supports the effort; the innovator, implementor, and advocate for the effort are located inside the agency; and there are no increases in agency staff.

[10] Yin, Changing Urban Bureaucracies, op. cit. This is particularly true of task-specific situations for which, Yin feels, adoption and implementation are the collective result of individual decisions made by individual practitioners.

Evidence supporting the importance of simplicity, "trial-ability," and technological advantage over existing service delivery systems as factors in adoption and institutionalization is not as clear-cut. Thus, on the one hand, both Dordick and Goldman's and Yin's analyses cite past research on innovation adoption behavior which found that the complexity of operation (i.e. number of components of the technology, behaviors and skills necessary for successful use and maintenance, etc.) is inversely related to adoption.[11] On the other hand, Yin, in his 1978 assessment of "routinization" in urban bureaucracies, finds that the amount of personnel training an innovation requires -- one measure of complexity -- does not affect the outcomes of the task-specific innovations he examined, given sufficient practitioner payoffs (see above).

It is interesting to observe that an interim evaluation of the Fund for the Improvement of Postsecondary Education (FIPSE) comes out even more strongly in favor of complex innovations.[12] Research done for HEW by the NTS Research

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11/ The degree of complexity perceived by users may be aggravated if telecommunications experts who consult on the purchase and installation of equipment, leave project staff with little training in the daily use and maintenance of the technology.

12/ NTS Research Corporation, An Evaluation of the Fund for the Improvement of Postsecondary Education, Volume 2: Interim Report, August 1979. While this study makes several observations of relevance to this report, we have not formally included it in our review because of the incomplete status of the projects under evaluation.

Corporation found that "multidimensionality" was an important indicator of a project's success. NTS found that 96 percent of the education-based projects funded between FY1973 and FY1979 addressed at least five of eight Congressional purposes for establishing the Program. Additionally, over half of the projects pursued at least seven endeavors (e.g., counseling, instruction, faculty development, etc.) and created at least five impacts (e.g., enhanced career opportunities, improved instructional techniques, increased access).[13/] Such "multidimensionality" was favored by FIPSE staff under the assumption that complex educational problems had a better chance of succeeding if several facets of the project were attacked simultaneously.

Additional disagreements arise over the impacts of innovations on organizational practices. Dordick and Goldman's and Yin's 1976 analyses find that successful innovations are those that are "divisible," in the sense

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13/ While no direct correlation was made in the FIPSE report between number of endeavors and/or impacts and degree of institutionalization, the authors did note that of the Fund's projects which were completed or nearing completion and which were not designed to terminate after accomplishing a discrete task, 70 percent met the necessary criteria to achieve institutionalization. These criteria were 1) the projects continue after Fund support ends; 2) activities or services are not substantially reduced; and 3) the project is optimistic about its long-term survival.

of being testable on a restricted portion of the target population, and "reversible," in that one can return to the status quo with little difficulty. These are in marked contrast to Yin's 1978 finding that innovations which become routinized are those which involve a "core agency practice." According to this later finding, a new practice can be routinized more effectively if one of two conditions occur: either the capability for carrying out the old practice is systematically removed after the new practice has been installed, or the new practice broadens the agency's original array of services and is formally recognized in a revised version of the agency's mandate.[14/]

In their analyses of innovation in educational organizations, Berman and McLaughlin concur with Yin's 1978 findings. They observe that "treatment complexity" involving a comprehensive area of curriculum and a critical mass of project participants or requiring an overall change in teacher behavior is likely to induce innovation by establishing a norm for altered behavior in the setting. Similarly, projects are more likely to succeed if they are integrated into the on-going procedures of the school or district. In contrast, the authors point out that "structural complexity" requiring a great deal of co-ordination across school

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14/ This is true for both task-specific and task-diverse innovations, as explained in footnote 8.

grades and levels is not likely to result in successful projects. Finally, the FIPSE report mentioned above notes that over half of the Fund's projects caused significant changes in the operations of the host institution.[15/]

Finally, both the Dordick and Goldman and Yin studies support the thesis that an innovation must have a relative advantage over the system it supercedes. However, drawing from his own case study analysis, Yin discerns two different modes of how local agencies innovate, paralleling his two-part schema for successful innovations. The first model sees innovation resulting from a concern for product efficiency. It emphasizes problem-solving, results in service improvements, and is dependent for its success on the merit of the innovation over existing practices. In the second model, the acceptance of an innovation is motivated by bureaucratic self-interest. Innovations are adopted where they foster bureaucratic growth, status, and power, even though little service improvement may occur. Thus, according to this two-part schema, the organizational model within which one operates will determine the importance of an innovation's advantage over existing systems.[16/] It is only in the ideal case that service improvements also result in bureaucratic rewards or vice versa.

15/ NTS Research Corporation, op. cit., p. iv-17.

16/ Yin, R.K., et al., Changing Urban Bureaucracies, op. cit.

3.2 The Organizational Environment

In examining organizational factors influencing the adoption of an innovation, Yin found that the case studies he analyzed in 1976 all underscored the overriding importance of a centralized agency with one or more layers of supervisory relationships. While such centralization can prohibit the development of horizontal coalitions which might otherwise initiate an innovation, it does facilitate the adoption of an innovation once it has been introduced. In contrast to Yin's findings, Dordick and Goldman believe that hierarchical structures may act as a barrier to innovation because of the high probability that information conveyed through the organization will be distorted or lost. Additionally, the OTA study stresses the importance of operational flexibility which allows project personnel either to avoid or recover from negative events or to take advantage of positive ones. We suspect that these two conditions are not mutually exclusive and will depend upon the working relationships between project directors and their staffs.

In considering the organization as it faces the external environment, both the Dordick and Goldman and the OTA studies stress that innovations requiring cooperative action among elements of an institutional environment will be less likely to diffuse than ones where their application is within the scope of a single institution. Thus, even if the environment is

developed, the technology is free of uncertainty and federal funding to support the innovation is available, diffusion will be slow and sporadic if organizations have to (1) share resources, (2) adjust their operational modes to accomodate other operational units, or (3) accomodate agencies with disparate and conflicting goals. 17/

Another way in which the organizational environment can impinge on the outcome of a demonstration project is through the rules and regulations imposed on the demonstration agency. For example, Dordick and Goldman note that state procurement policies often require acceptance of the lowest bid. In the case of telecommunications equipment, this rule often prevents reliable suppliers from competing, and can result in technical difficulties at the outset or during the course of the demonstration project. Frequently, the ultimate result is that the demonstration is terminated.

3.3 The Implementation Process

Perhaps the greatest number of factors influencing the institutionalization of an innovation are specific to the conditions under which the innovation is implemented. The studies identify seven of these implementation-specific factors:

17/ The OTA study suggests that the use of cable telecommunications to provide social services will face diffusion problems because effective use of the medium requires cooperation among a number of social service and regulatory agencies as well as several levels of government. These organizations frequently resist efforts of other agencies to enter their areas of specialization.

1) the innovation must be initiated at the local level;

2) the chief executive and/or top agency administrators of an agency should support the innovation;

3) the innovation should be led by an active innovator who will promote the conditions necessary for an agency's initial use of the innovation;

4) those with responsibility for the diffusion of an innovation within the agency should participate in the planning and operation of the demonstration including, when necessary, practitioner-training programs;

5) clients should participate in the implementation of the demonstration;

6) there should be no specific opposition to the innovation; and

7) no rigid time constraints should be imposed on the innovation.

Several of the studies stress that those demonstration projects that are most successfully diffused are those in which the initiatives for action come from local rather than federal levels. Baer found in his analysis of demonstration projects that nearly all of the projects which showed little or no diffusion success were pushed strongly by federal agencies.[18] Yin concurs, pointing out that since the major conditions that lead an innovation to be routinized all appear to be internal

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18/ Baer categorized cases showing federal initiative as those involving either (1) a local response to a federal request specifying the kinds of devices, systems, or processes to be demonstrated; or (2) a direct federal initiative in which an organization is requested to operate a demonstration. Locally initiated projects are those which involve either (1) an unsolicited proposal from a local organization, or (2) a local response to a broad federal initiative directed towards a general problem.

to the specific local agency, federally initiated agendas should either be limited or designed with great sophistication.[19] Dordick and Goldman emphasize that from the potential users' side, clients are most likely to adopt those innovations which alleviate an agreed-upon high priority need, created either by crisis conditions or by chronic service deficiencies. User willingness to overcome technical problems and limited resources is related to the perceived importance of the need. Finally, Berman and McLaughlin point out that projects initiated in a problem-solving fashion and addressed at a district's central priorities have the best chances for success. As the authors observe:

> "(P)rojects with high district priority were likely to be continued even in cases where they had not been relatively successful during their temporary funding and when they were expensive for the district." [20]

Other implementation-specific factors largely pertain to the role each member of the agency plays in the development of the innovation. Thus, top agency administrators who are usually involved in key decisions about an innovation, such as making available staff or budgetary funds, must support the innovation, in effect telling project staff how seriously they should take the innovation's objectives.

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[19] Yin, et al., Changing Urban Bureaucracies, op. cit.

[20] Berman, P. and M.W. McLaughlin, Federal Programs Supporting Educational Change, Volume IV: The Findings in Review, Santa Monica, CA: The Rand Corporation, 1975, p. 17.

Additionally, a motivated change agent from within the agency is needed to bring information into the agency, to develop support for the innovation, and to establish appropriate skills and resources for initially operating it.[21] Although this responsibility can be shared by several people, it is critical that the innovator(s) come from within the agency because such sources habitually carry greater credibility and leverage with other members of the staff. Likewise, throughout its early life history, an innovation must gain increased support from agency practitioners. Such support can be generated, in the case of task-specific innovations, by promoting individual use of the innovation through the provision of practitioner training, frequent and regular planning meetings, and practitioner participation in day-to-day implementation meetings. In the case of task-diverse innovations, greater appeals to bureaucratic self-interest may be necessary. Finally, client participation in the design of the application is instrumental in assuring the adoption of an innovation not only because such participation enhances cooperation and identifies unanticipated barriers but also because participation may provide external pressure on the process. Consequently, agency managers may act with greater care and perseverance if clients are even potentially involved.

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[21] It should be noted that Berman and McLaughlin believe that project continuation depends more on having the early and lasting support of a principal who affords the project legitimacy and can secure continued funding than on an effective project director. This may be particularly true of educational settings.

Two additional factors identified by some of the studies deserve mention: the first is that in addition to internal support for an innovation, no adversary group outside the agency should specifically oppose the innovation. The second is that only loose external time constraints should be imposed on demonstration projects, since, as the Baer study points out, how much time a project takes is much less important than the information generated. Baer's case study analysis showed that all the projects enjoying greatest diffusion success were able to operate without stringent time deadlines. It may be that setting stringent deadlines reduces the amount of external interaction between a demonstration agency and other organizations who may adopt the innovation in the future.

3.4 Factors Affecting Transfer

Three factors have been identified by the studies as affecting the diffusion of an innovation from the demonstration site to other agencies. These are:

1) the technology used in the innovation should be well in hand and highly reproducible from site to site;

2) a strong industrial system for commercialization should support the technology used; and

3) no major institutional or regulatory barriers to diffusion should be present.

Baer's analysis of twenty-four demonstrations indicates that those projects having significant diffusion success were those with medium or low technological uncertainty. This relationship is not surprising since, as Baer points out, the value of a demonstration in providing useful information to potential adopters depends on its operating reliably in a real world environment. If the technology is not well in hand, project managers will be preoccupied with developing and improving the technology rather than with assessing the resulting product or service. Similarly, as Dordick and Goldman emphasize, potential adopters will be hesitant to invest resources in a technology if they remain unsure of its reliability, durability, administrative feasibility, and operating costs under routine conditions.

The OTA study further points out the importance of demonstrations using technologies with high reproducibility from site to site, because unless similar successful results are experienced at multiple locations, they will not be credible to potential adopters.

In addition to low technological uncertainty, the Baer study emphasizes the importance of a strong industrial system for commercialization whose various elements (manufacturers and purchasers of the new technology, regulators and other target audiences) are included in the demonstration planning and operation. This may be particularly difficult if the

market is new and supplier-purchaser relationships have not yet been developed. However, Baer found that only one demonstration project which excluded some "active components" of the institutional environment was diffused. "Active components" are defined by Baer as "those (suppliers and/or users) whose practices would have to be modified if the diffusion were to take place."[22/]

Finally, as Baer points out, an innovation clearly will not be diffused if regulatory or institutional barriers prevent its widespread use. Demonstrations may be far weaker tools for attacking such barriers than direct government intervention through changes in regulations or subsidies. In addition, as Dordick and Goldman state, potential users are less likely to adopt an innovation if they perceive the possibility of "red tape."

3.5 Federal Funding and Assistance

Those studies which examine the effect of federal support on the institutionalization of innovations make the following observations:

22/ It should be remembered that Baer's analysis dealt only with projects which included private business either as the intended adopters or manufacturers of the innovation. His focus on the ultimate commercial viability of an innovation may lead him to give more emphasis to such factors as low technological uncertainty and industrial user/supplier participation in planning than might be required by projects with ongoing government support.

1) federal funding on a case-specific basis (i.e., to demonstrations) may actually inhibit the full incorporation of an innovation; and

2) cost and risk sharing by non-federal participants is closely associated with demonstration success.

In their educational innovation analysis, Berman and McLaughlin conclude that while federal funding policies did have an impact in providing impetus to projects that could not have otherwise been initiated, federal money in and of itself did not stimulate support, commitment or interest in change on the part of project personnel. Since federal funding did not alter basic motivations, it failed to influence those features of the innovation that shaped project implementation strategies or outcomes.

Additionally, in his 1976 case study analysis, Yin discovered that there was no relationship between the outcome of an innovative effort and the presence of federal support for such activities as technical assistance, implementation, and training of local personnel.[23/] In fact, when Yin examined service improvement and bureaucratic adoption separately,

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23/ Similarly, most project directors surveyed during the FIPSE evaluation cited in Section 3.1 did not believe that the Fund's monitoring activities substantially influenced their projects despite the fact that 90 percent had found those monitoring activities at least of some help in project operations and 80 percent found the Fund helpful in identifying and correcting specific problems.

he uncovered a negative relationship between bureaucratic adoption and federal funding. Yin does point out that while no single project may be able to link its success to the availability of federal dollars, such activities can be extremely important in developing a more general and long-term R&D capability in the service sector, both by stimulating technological developments and by supporting a network of professional activities. However, he also stresses that the impact of federal R&D is likely to be limited if it is not adequately tied to goods producers, purchasers, and even to the actions of federal agencies in other sectors.

Closely related to this theme of a federal R&D-commercial sector link are arguments for cost and risk-sharing with non-federal participants. These are raised by both the Baer and the OTA studies, which stress that a serious commitment to an innovation, as indicated by the performers' willingness to share costs and risks, is vital to the successful operation and diffusion of a demonstration. Baer's analysis reveals that demonstrations with large shares of federal funding (more than 90%) have a poor chance of diffusion success. According to the OTA study, an unwillingness to contribute to costs may reflect technological uncertainty, weak market demand, or inhibiting institutional factors.

The focus of both the Baer and OTA studies on private industry participation in the innovative process may lead them to overemphasize this cost-sharing factor. However, Dordick

and Goldman's analysis of state vocational rehabilitation agencies also concludes that projects operating totally on federal funds are less likely to become institutionalized than those in which the organization invests some of its own resources. This investment may be in terms of (1) sufficient and long-term budget allocations; (2) assignment of adequate numbers of qualified personnel to the project; (3) adequate training of staff members, and (4) provision of sufficient supplies and maintenance.

Risk-sharing is closely connected to cost-sharing, according to Baer, and may be even more important, particularly if cost-participation involves little risk. Thus, if participants agree to share in the construction of a project, but do not share in contingency cost overruns or stand to gain a return on their investment regardless of the outcome of the project, their motivation to aid in the development and diffusion of the demonstration is weaker than if they sustain substantial losses when the project fails.[24/]

Based on the findings of their respective studies, several of the authors, Baer and Yin in particular, assess the role of the federal government in promoting the adoption and routinization of innovations. Their recommendations all

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24/ Baer cites the example of a Personal Rapid Transit System in which West Virginia University, the county, and the city of Morgantown all donated land for the necessary rights of way as their cost contribution to the demonstration. However, a clause in the contract stipulated that if the demonstration did not meet the university's needs, the system would be dismantled at federal expense and the land restored to its original condition.

note limitations on the effectiveness of demonstrations for advancing widespread innovation diffusion.

Baer breaks his conclusions down into four observations on the characteristics of demonstrations: (1) they have a narrow scope for effective use since they are appropriate only when uncertainties are not large and a strong rationale for federal involvement exists; (2) diffusion of demonstrations depends on a well-articulated market "pull" rather than technology "push"; (3) demonstrations are weak tools for tackling institutional and organizational barriers to diffusion; and (4) large demonstrations with heavy federal funding are particularly prone to difficulty. In light of these observations, Baer offers the following strategies for selecting demonstrations:

- conduct the demonstrations on as small a scale and with as little visibility as possible;
- do not ignore small projects involving incremental improvements to existing products or processes in favor of large and experimental projects;
- make sure technologies being used are well in hand; and
- allow sufficient time for slippage in the project's schedule, especially when the projects are large and technologically uncertain.

Yin, in the conclusion to his 1976 analysis, suggests that since his evidence showed no relationship between federal policies and the outcomes of specific innovative efforts, such federal policies may have to aim instead at changing some of the common conditions across local service organizations. Thus, rather than funding specific demonstration projects, federal policies could be used to influence (1) the social network of service professionals; (2) the marketing context within which an agency operates; (3) the organizational context within which the agency operates; (4) the internal bureaucratic context by which the agency itself is organized and operates; and (5) the regulatory environment.

In his 1978 analysis, Yin points to four additional functions in which he feels the federal government has a role which cannot be fulfilled by other agencies. These are: (1) support of R&D on innovations that are applicable to local service agency programs; (2) promotion of the transference and diffusion of ideas from one local site to another; (3) evaluation of local project performance and accomplishments; and (4) assistance to local jurisdictions in dealing with problems deemed national in significance.

4.0 AN ANALYSIS OF HEALTH SERVICE DEMONSTRATIONS

In addition to reviewing the above studies on adoption of service innovations, we performed a separate analysis of factors affecting institutionalization. Our sample was 53 demonstration projects utilizing telecommunications in the delivery of medical and health services. These projects, which cover a broad range of technologies, applications and demonstration agencies, are summarized in the Telehealth Handbook: A Guide to Telecommunications Technology for Rural Health Care.[25/]

In the first phase of our analysis we compared the longevity of each project with other factors (such as type of technology, application and agency), which may have influenced the duration and institutionalization of the project. In a second phase, we interviewed the directors of a sample of the projects to learn what, if any, additional factors may have contributed to the extension or termination of their respective projects.

4.1 The Cross-Tabulation Results

The information that was available to us consisted of the project's title, its time period (including whether it was on-going at the time of publication), the technology(s) used (e.g.,

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25/ Bennett, A.M., W.H. Rappaport and F.L. Skinner, Telehealth Handbook: A Guide to Telecommunications Technology for Rural Health Care, prepared for the National Center for Health Services Research, U.S. Department of Health, Education and Welfare, May 1978, pp. 91-146.

high-frequency radio, two-way television), the intended application(s), a contact person (usually the project director), and a 50 to 200 word narrative. This narrative typically included the local agencies involved, the setting (rural or urban), and a brief discussion of the application and/or the evolution of the project. Most of the projects were initiated in the early or middle 1970s. However, one, which is still ongoing, dates back to 1959 and several others were started during the middle to late 1960's. The projects operated in over 30 different states.

In addition to longevity, the factors we examined in our analysis were:

- type of technology;
- number of technologies used;
- setting (urban or rural);
- area covered by service;
- type of application;
- number of application areas;
- contact person;
- type of organization.

More specifically, we examined the number of years that demonstrations with specific characteristics have lasted. These results are presented in Exhibit 2.

From these results we see that project longevity does appear to be related to certain factors more than others. For example, longevity varies by as much as 4.3 years depending on the type of technology used in the demonstration. By contrast, the number of technologies involved has virtually no impact on longevity.

Exhibit 2

COMPARISON OF PROJECT LONGEVITY AND OTHER FACTORS

	No. of Projects	Longevity (Ave. No. of Years)
Type of technology		
computer	8	4.9
telephone	15	5.8
satellite	8	3.6
2-way audio/data/video	27	6.5
microwave	18	7.9
cable	7	7
No. of technologies used		
one	9	6.2
two	28	6.1
three	16	6.1
Setting		
rural	18	4.7
urban	9	8.2
both	15	6.5
Area covered by service		
local	11	7.1
county-wide	13	4.3
statewide	7	8.4
region-wide	9	8.3
one or more specific sites	9	3.9
Type of application		
primary care	45	5.7
education	28	7.8
administration	18	5.2
No. of application areas		
one	25	6.1
two	19	6.4
three	9	6
Contact person		
MD	24	5.9
non-MD	29	6.5
Type of organization		
federal	6	5.6
state	5	6
university	21	7.5
hospital	6	5
medical service	11	5.1

Numbers do not always add up to the total of projects (53), since in some cases more than one factor applies to a single project and in other cases entries were eliminated from the exhibit (i.e., categories with four or fewer entries).

We will begin our analysis by examining those factors which appear to be unrelated to longevity. These include (1) number of technologies used, (2) number of application areas, and (3) type of contact person. In the first two cases, it might be argued that an increase in the number of technologies or the number of applications would increase the complexity of the demonstration project and consequently increase the possibility of technical or organizational impediments. However, this hypothesis is not confirmed by the evidence. The longevity of the projects does not substantially decrease as the number of applications or technologies rises. Similarly, longevity does not appear to be affected by whether or not the contact person, generally the project leader, is a professional/specialist (M.D.) or an administrator/manager (non-M.D.).

4.2 Factors Related to Longevity

Two other factors -- type of application and type of organization -- reflect a moderate degree of correlation with project longevity. Educational applications have survived longer than primary care applications (e.g. telediagnosis), which in turn have fared better than administrative applications. These results are not surprising in that the educational applications tested were likely to involve more conventional uses of technology (e.g. instructional television) than primary care and administrative applications. Similarly, the greater longevity of primary care vs.

administrative applications may be due to the fact that the former are more likely to use visible hardware devices and to be aimed at outside users, factors which Yin and others have suggested encourage adoption.

The finding with respect to organizational setting is more difficult to interpret. State agencies and, in particular, universities appear to be more successful in institutionalizing (or prolonging) telemedicine demonstrations than hospitals, medical service organizations, or federal agencies. Possibly, the results suggest that for a demonstration agency to be successful in institutionalizing a service innovation, it may need to have a broader range of skills than a traditional service provider. Universities and state agencies may bring more motivations and resources to the implementation of demonstrations than hospitals and medical service organizations. In addition, they may be less wedded to prevailing service delivery practices.

Finally, there are three other factors that correlate highly with project longevity. These are: (1) the area covered by the service demonstration, (2) the type of technology, and (3) the setting. In the sample studied, a project with a statewide or region-wide service area was likely to last twice as long as a county-wide or site-specific demonstration. Again, interpretation of these results is difficult, since we suspect they reflect a mix of historical, managerial, and political factors. One possible explanation is that wider-area demonstrations are more likely to obtain legislative or

budgetary support at the state level. Another is that wider-area projects are likely to involve more mature technologies and less innovative applications. At the same time, the finding challenges the assumption that demonstrations should start small and be limited to specific sites. 26/

The relationship of project longevity to technology, though complex, is in some respects easier to explain. Projects utilizing microwave and cable systems as well as advanced two-way applications exhibited greater longevity than those in which satellite and telephone systems or computers were involved. The longevity of microwave- and cable-based projects is due in part to the maturity of these technologies. Their use is likely to present fewer system reliability, availability and/or maintenance problems. On the other hand, the shorter life span of the computer-based projects may be related to the less "visible" applications involved (i.e., administrative) and to software development difficulties. Finally, we suspect that some of the differences can be ascribed to non-technological factors, such as the duration of federal funding commitments. Many of the satellite service demonstrations have been restricted to short-term funding, whereas a number of the two-way (terrestial) applications have received extended support.

The last factor we were able to identify as potentially

26/ It is also possible that some of the statewide and region-wide projects were initiated on a smaller scale and were subsequently expanded.

playing an important role with respect to project duration was the demonstration setting. The longevity of the urban projects in our sample was almost twice that of rural projects, with mixed urban-rural projects falling in between. Federal funding commitments and the obvious difficulties of initiating and operating technology-based service innovations in rural areas, where the institutional and technological infrastructure is likely to be more limited, may have influenced this result. The results, to the extent that they validly reflect urban-rural differences, suggest that institutionalization will occur more readily in urban settings. To the extent that project longevity is an objective, they also suggest that rurally-oriented projects should involve an urban component as well.[27]

4.3 A Profile on Ongoing Projects

To reach beyond some of the limitations of the cross-tabulation approach as described above, we also interviewed by telephone the directors of a sample of the health care demonstration projects. Twelve projects were chosen to

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[27] Before utilizing the results of our analysis in designing future demonstrations, several caveats should be taken into account, including the following: Our tabulations included both ongoing and terminated projects. Thus, it may be that some of the ongoing projects with short life spans because of more recent start-up dates will continue to operate and in fact be institutionalized. In addition, interdependency among factors cannot be measured by means of simple cross-tabulations. It is conceivable, as we have tried to suggest in our interpretations, that it is a particular mix of factors rather than any single factor which contributes to project longevity or termination.

represent a range of technologies, applications, sponsoring organizations, and settings. The projects were evenly spread between ongoing and terminated projects.[28] Our questions focused on:

- technologies used;
- services provided;
- source and type of funding;
- presence or absence of cost and risk sharing;
- use of planning grants;
- reasons for continuation or termination of the project;
- factors promoting diffusion;
- need for [redacted]etary government support.

Our examination of project director responses to these question areas has led us to formulate the following composite description of six ongoing projects, ranging in duration from four to thirteen years. The projects almost all use technologies that were fully developed at the time of project initiation, including microwave, two-way audio/video/data, cable and telephone. Only one site used a new application of a developed product. Ensuing technical difficulties led to abandonment of the equipment in this case, although service delivery continued using more conventional means.

The applications tested in these projects included primary care, education and administration, they involved both single and multiple functions, and they were targeted at both single and multiple types of users. Service delivery covered local, regional, and statewide areas and both urban and rural settings.

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[28] One terminated project could not be used in this analysis because of inadequate information provided during the interview.

What is important to note is that in all cases the project expanded a core function in the agency's operations to new locations.

While the projects were always centrally administered, input into decision-making was frequently sought from top level representatives at user sites. Provision for such input was important to the project directors, since all six projects involved the participation of several agencies both as service deliverers and recipients. Involving several agencies may have made agency participation more visible and thus, less easily retractable. It may also have prevented service applications from becoming too site-specific and less capable of generating a broad base for support and/or diffusion.

A majority of the projects received funding through a combination of local initiative and strong federal urging to "think bigger." One project was initiated in response to a federal RFP. Another was mandated by the state legislature. In addition, three of the projects received seed money for the first one to three years of existence. These projects are now largely self-sufficient, relying on charges to users, Medicare and Medicaid reimbursements, and ongoing support as line items in state health care budgets. The remaining three projects have received ongoing federal or state support since their initiation, supplemented again by user charges and/or grants made to individual service providers. None of the projects required explicit cost- or risk-sharing on the part of the service deliverer.

Half of the projects did not have planning grants and project directors do not think they would have been useful. The remaining projects had planning grants ranging from $14,000 to $50,000 and found them useful in generating interest and coordinating efforts but not a vital step in the development of the project.

Project directors attributed their successes to several factors. First among these is the existence of a substantial need for the services provided by the project. In several cases, this need was initially provider-driven with community interest and involvement coming later. Additionally, the directors felt that their projects had developed because of the individual personalities involved -- their vision could generate both top-level support for the project and establish facilitating connections with other agencies. One project director also pointed out that the political and budgetary climate in the early 1970's had cultivated a personal diplomacy which may no longer be possible. Thirdly, directors attributed their successes to the participation of highly-qualified staff, who perceived the projects as opportunities to develop their careers. Finally, several project directors stressed the role of on-site coordinators or promoters, who urged and facilitated use of the system.

Project directors were unclear on mechanisms for promoting the adoption of their service delivery systems at other sites.

Most felt that informal diffusion was provided as physicians and students observing or working in the system moved to other locations. One project director advocated that doctors who had led the initial project development should be the ones to advise other sites. Another director explained that, although similar projects existed, diffusion had been very slow until the projects banded together to share information resources; once such cooperation had been established, however, diffusion occurred rapidly. In only two cases had the government (at the state level) played any role in diffusion. In one case the Department of Elderly Affairs replicated the original project model as a result of ongoing contact between state agencies. In the second case, the state Medicaid office issued an RFP and funded three new projects based on the initial project approach.

In considering ways in which the government might provide assistance beyond funding, project directors urged that from the outset federal funders should view innovative projects as potentially successful businesses and should both promote and, where possible, facilitate the transition to self-sufficiency through contacts, lobbying for changes in prohibitive federal policies or other means. They further urged that given the goal of self-sufficiency, the government should be willing to make longer-term financial commitments to projects (up to five years) so that projects with the potential for success would not collapse prematurely for lack of funds. The project leaders also favored mandatory site visits to similar projects for information-sharing purposes.

4.4 A Profile of Terminated Projects

In evaluating the responses of directors whose projects had lasted from nine months to five years but were then terminated, several interesting contrasts to the above profile become apparent. Almost all of the projects involved relatively simple applications to single target groups at specific sites. In addition, no cooperation between autonomous agencies was required. Less than half of the projects were initiated locally; the others were responses to a specific RFP, the urging of private industry, or direct federal solicitation. Finally, all but one of the projects received seed funds only.

While each project director named a specific reason for why the project was terminated, these reasons stemmed largely from the above characteristics. For example, in one site-specific application, a change in medical personnel obviated the need for the service provided by the project. For other projects, the relative simplicity of the application and its single agency focus made it easier for one malfunctioning element to disrupt the entire project and/or for projects with problems to be abandoned when their supporting agencies experienced a financial crunch.

Secondly, those projects which were initiated in response to external encouragement rather than a locally-felt need encountered several problems which would have probably deterred them from initiating such efforts on their own and which contributed to their termination. These problems included lack

of clearcut user interest, union troubles with service providers, political conflicts between user sites, and a lack of top-level commitment. In several cases, such externally-generated projects also resulted in services with no clear advantage to users and technologies that were inconvenient for users to work with and/or costly, particularly where these technologies were experimental.

Finally, (according to project directors) short-term seed funding which was terminated prematurely and/or funding which required cost-sharing between the federal government and state or local agencies with fluctuating budgets led to crippling financial obstacles in several cases. It is also interesting to note that even in those cases in which projects had the support of commercial entities (a cable TV company, Bell system), budget cuts in one case and inappropriate technologies in the second terminated the project.

4.5 Summary of the Findings

In reviewing these projects, it should be remembered that some of the factors we have attributed to their success or termination may be influenced by the projects' particular focus on health care services. Thus, applications which expand a core function in an agency's operations to new locations, the absence of initial cost/risk sharing with state or local agencies, and the opportunity for projects to be absorbed ultimately into ongoing state or Medicare

budgets may be factors which are particularly relevant in health care situations. Nevertheless, we believe that most of the factors discussed above have relevance to a broader range of social service applications.

Based on our analysis, we have identified ten factors which appear to positively influence the duration and institutionalization of health care demonstration projects. These are:

- the use of fully-developed technologies;
- applications which extend an agency's core function(s) to new locations;
- central-agency management but provision for the participation of several autonomous agencies in the delivery or receipt of a service;
- a project which is locally initiated and satisfies user-felt needs but which receives federal encouragement to enlarge service delivery plans where necessary;
- no initial cost or risk sharing by state or local agencies if budgets appear unstable;
- opportunities for costs of established projects to be absorbed either into state or local ongoing budgets or to be covered by user or institutional charges, etc.;
- project personnel with connections to other influential agencies (in some cases, such connections are the result of a single strong personality and cannot be willfully included in the project's design);
- projects which offer personnel increased opportunities for career development;
- provisions for information exchange and diffusion through both formal and unscheduled visits to sites attempting similar service delivery systems;

- government support for and facilitation of a transition to self-sufficiency through encouragement of the application of business principles to project management, assistance in the establishment of federal agency contacts, and promotion both to other federal, state, and/or local agencies and to users within the project's demonstration site.

Several of these factors including the use of fully-developed technologies, central agency management, and satisfaction of user-perceived needs corroborate the research findings detailed earlier in this report (Section 3). Other factors, however, such as the benefits of collaborative relations between autonomous agencies and the hazards of cost- or risk-sharing requirements are in direct conflict with the earlier findings. In addition, we have found that projects with wide-area coverage, undertaken by state agencies or universities are more likely to endure than rural, single-site, local agency projects. Similarly, projects involving educational applications have a higher chance of surviving than those with primary care and, especially, administrative applications.

5.0 OPTIONS AND IMPLICATIONS FOR OTP

In this final section, we will apply our research to the design and management of OTP/DHEW's demonstration program. Our discussion of options and suggested courses of action will, in some cases, also be based on knowledge of how related demonstration programs operate. Specifically, we will address how OTP might modify its demonstration program guidelines and grantee selection criteria in light of the research findings as well as alternative activities it might undertake to foster the institutionalization of demonstration projects.

Before proceeding with our suggestions, two points need to be re-emphasized. One is that the primary perspective of this report continues to be that of institutionalizing demonstrations. As noted in the introduction to this report, we recognize that institutionalization may be only one of several legitimate program objectives. Consequently, our suggestions should be evaluated against other objectives that may be pertinent. Secondly, it is obvious that sound research on the institutionalization process for social service innovations is only beginning to develop. As we have noted in previous sections, conflicting evidence exists on a number of important issues, such as the role of formal and informal collaboration among institutions. Other issues have not been examined systematically, if at all. Our suggestions should be seen in

this context. They are not magic formulae, but they may add some value to OTP's internal decision-making.

5.1 Program Implications

There are a number of interrelated issues that arise with respect to how OTP's demonstration program might be restructured:

- how much emphasis should be placed on new vs. established technologies?
- should single- or multi-service applications be supported?
- should a larger or smaller number of projects be supported and how much of the budget should be allocated to continuation support?
- what kinds of institutions should be supported?
- should cost-sharing requirements be made more explicit or increased?
- should a planning phase precede the demonstration phase?

Several of these issues can be addressed in terms of the research results detailed in earlier sections of this report (Sections 3 and 4). These findings suggest that: (1) established technologies should be favored; (2) the number of applications does not materially affect the likelihood of institutionalization; (3) federal support should not be limited to a highly limited time period (e.g., one year); (4) projects undertaken by state agencies and

universities with access to multiple service sites are more likely to endure than local agency projects; and (5) cost-sharing and planning grants may or may not contribute to the adoption of service innovations. A related finding is that educational applications are less risky from an institutionalization perspective than service delivery or administrative applications.

We believe that above findings can be readily translated into OTP's program guidelines and selection criteria for the demonstration program. For example, we suggest that the equipment technologies used in the demonstrations be relatively well-established and reliable. Alternatively, proposals involving more innovative technologies should be carefully screened by OTP with respect to availability and reliability.[29/] In addition, applicants should be required to demonstrate that the resources for servicing and/or modifying proposed technical equipment will be available either internally or on a subcontract basis.

On the question of the types of applications to be tested in demonstration projects, our findings suggest that emphasis should be placed on educational uses. However, it may be that

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29/ OTP should consider drawing on the resources of other agencies (e.g., NTIA, FCC) or technical consultants to verify the availability and reliability of the proposed technical equipment.

such an emphasis would run counter to the basic objectives of the demonstration program. Proposals that aim to develop innovative approaches in service delivery and administration should not be excluded per se, but these proposals should be expected to meet other selection criteria even more stringently than those involving educational applications, so as not to dilute the prospects for institutionalization and transfer. With respect to the related issue of number of applications per demonstration, our findings suggest no need for restrictions in this area.30/

Given the strong evidence that unreasonable time constraints should not be placed on demonstration projects and that several years may be needed to go from initial demonstration to institutionalization, we recommend that a substantial portion of the program's funding be allocated to continuation grants. This is not to suggest, however, that all existing projects be automatically refunded. Evidence of progress and the meeting of the types of selection criteria advanced in this report should precede the decision to refund an ongoing project.

30/ This is not to imply that a more focused demonstration program (e.g. health-oriented or multi-service oriented) might not be appropriate for other reasons. It might be easier to manage a more focused program and/or to complement the efforts of other DHEW and non-DHEW agencies.

In contrast, the evidence on cost-sharing and the value of pre-demonstration planning grants is not clear-cut. Consequently, we would not recommend the pursuit of formal requirements in either of these areas. However, the program should consider making a small portion of its funds available for planning grants to applicants who feel this would improve the chances of mounting a viable demonstration. Alternatively, or in addition to the planning grant option, OTP should consider soliciting pre-proposals from demonstration grant applicants.[31] This would increase the chances of screening salient ideas and approaches as well as provide an opportunity for pointing out deficiencies in the proposed approach, prior to the applicants' having committed substantial resources to proposal preparation.

Finally, the research findings suggest that more careful attention may need to be placed on the types of organizations that receive demonstration support. State agencies, universities, and other organizations with access to several service delivery sites and/or organizations capable of close collaboration with one or more agencies in demonstrating and institutionalizing innovative services should be given a preference over local agencies with more limited institutional and staff resources. Although the findings on this point are not

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31/ This approach has been relied upon, apparently successfully, by the Fund for the Improvement of Postsecondary Education; interview with Raymond Lewis, Jr., FIPSE, and Keith Baker, Office of Policy and Planning, DHEW.

conclusive, they suggest that certain organizations are more likely to be able to take advantage of service delivery "networks" than others, and that access to such networks may be an important ingredient to institutionalization. 32/

5.2 Fostering Institutionalization

One of the most difficult managerial challenges for OTP will be identifying and evaluating the presence of appropriate institutional climates for testing and adopting service innovations. As we noted earlier, the number of inputs necessary to carry a service innovation from "brainstorm" and demonstration to adoption and transfer is extremely varied, and undoubtedly surpasses the resources of any given agency. At the same time, the genesis of a useful service innovation, and the commitment to see it become a reality on a larger scale, may stem principally from a small core of individuals. In what ways can OTP identify and facilitate the coming together of appropriate individual agency and "network" resources?

What follows are several specific approaches that could individually or collectively increase the chances that a demonstration project is institutionalized. The first approach

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32/ It should be added that these networks can be formal (i.e. as in the case of a multi-site state service agency) or informal (e.g. collaborative relationships among a group of agencies and/or individuals).

reflects what has been already emphasized above. To foster institutionalization, OTP may need to develop more specific project selection criteria and devote more resources to evaluating proposals prior to issuing grants. The advantage of this approach is that it concentrates OTP attention on a particular phase of the demonstration process -- grantee selection. Scrutinizing the budgetary, technical, and institutional capabilities of applicants in greater detail could increase the prospects of ultimate innovation adoption considerably. The disadvantage is that the research on which selection criteria might be based is still limited, and that the proposal requirements which applicants must meet are already extensive; adding additional ones could be burdensome.[33/]

The above approach could also burden OTP's limited resources, requiring probably one or more site visits per applicant. An alternative is to place more emphasis on the applicant agency demonstrating that it has sufficient ties with external institutions and individuals, who could play a role in the adoption or transfer of the innovation. For example, each applicant could be required or, at least, encouraged to form an advisory board, consisting of representatives of collaborating service agencies, user groups and community leaders.

33/ However, when combined with the "preproposals" suggestion, which would screen out many applicants, the number of applicants who would need to demonstrate their ability to meet the increased proposal requirements would be reduced.

Still a third approach would be for OTP to directly assist selected demonstration projects in moving from the demonstration to the institutionalization phase. The effort involved might be two-pronged. On the one hand, OTP could require the projects to undertake some institutionalization-oriented planning activities (including financial planning and service management) as the demonstrations progress. On the other, OTP could support these steps by advising the grantees on alternative approaches to achieving operational self-sufficiency, helping in the promotion of worthwhile projects and serving as a clearinghouse for sources of funding and/or technical assistance in DHEW and elsewhere. This type of support role, if implemented effectively, could contribute significantly to the adoption of service innovation on an ongoing basis; however, it would undoubtedly require greater staff resources than are currently available to OTP.

A final option that should be considered is the encouragement of national "networking" in telecommunications-related public service delivery. This is an activity that OTP is already pursuing in both formal and informal ways. However, the role could be strengthened by developing a regular program of activities, including, for example: (1) the organization of an annual workshop, (2) the conducting of special seminars on particular public service areas, (3) the encouragement of regular contacts among demonstration project staffs, (4) the management of a clearinghouse of funding and information

resources, and (5) the publishing of a newsletter of periodic reference works. Some of these activities could be undertaken on a joint basis with other DHEW agencies and/or other organizations such as NTIA, Cable Television Information Center and university programs among others.

It may be useful to pursue all of the directions noted above. However, resource limitations are not likely to permit this. Which particular option is selected should depend on the level of resources available (including staff predispositions toward a given option), the type of relationship with grantees that OTP will be comfortable in maintaining, and the priorities the program sets for itself. For example, if building awareness of new service delivery approaches is paramount, the networking approaches may be most appropriate. In contrast, if the principal objective over the next two or three years is to demonstrate that innovative services can be turned into operational programs, then greater emphasis should be placed on selecting appropriate grantees and/or assisting individual projects in achieving operational status.