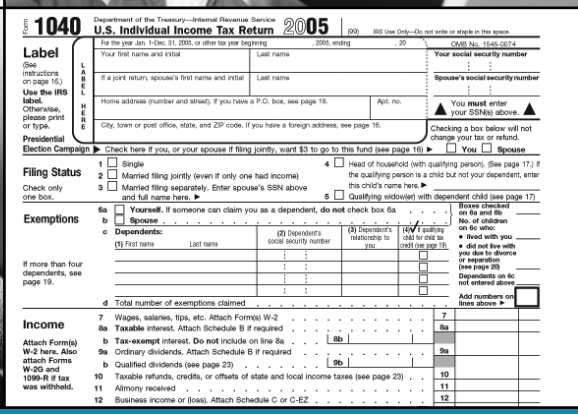
2006

A Model for Increasing Innovation Adoption: Lessons Learned from the IRS *e-file* Program



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Innovation Series

IBM Center for
The Business of Government

INNOVATION SERIES

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TABLE OF CONTENTS

FOREWORD

On behalf of the IBM Center for The Business of Government, we are pleased to present this report, "A Model for Increasing Innovation Adoption: Lessons Learned from the IRS *e-file* Program," by Stephen H. Holden.


Albert Morales

E-government is the use of technology—mainly via the Internet—as a way to deliver government services. Oftentimes this approach dramatically improves service, increases customer satisfaction, and reduces costs. It is expected that by 2009 the federal government will make nearly $6 billion in new investments in e-government services. To date, the successful adoption of e-government services is still relatively uneven.

However, one example of success stands out: the IRS *e-file* program. In less than a decade, the number of taxpayers filing their tax returns electronically has gone from 20 percent in 1998 to 57 percent in 2006. This is a huge rate of adoption in an area affecting millions of Americans. What factors have contributed to this success that other agencies might emulate with their own programs?

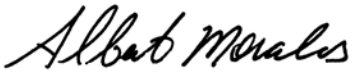

Jeffrey Smith

In evaluating the IRS *e-file* program, Dr. Holden uses an "innovation adoption model" to describe what the IRS did to increase taxpayers' use of the e-file system. Based on this model, Holden provides new and valuable insights into key factors involved in the successful adoption of e-services. He identifies the critical challenges and key steps that agencies can take in assessing their approach to adopting innovative ways of delivering services.

In addition to an organization's technical strategy for implementing innovation, Dr. Holden highlights the importance of external relationships with stakeholders, distributors, and taxpayers as well as internal leadership, policy, and organizational structure issues. Effectively managing both external and internal dynamics were key to e-file realizing its long-awaited potential.

IRS clearly has some unique attributes in its ability to implement the e-file program. Other agencies will have different program measures and institutional factors supporting or impeding adoption of their

e-government program. We trust that this report will offer lessons that other federal agencies can apply when developing their own e-government programs. The report includes a series of recommended actions that are highly relevant for any federal agency seeking to increase adoption of an innovation such as an e-government initiative.



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EXECUTIVE SUMMARY

As the amount of fiscal and human resources applied to e-government continues to climb, it becomes increasingly important that the public actually uses these electronic services commensurate with the level of investment. INPUT, the government business and information technology (IT) market research firm, projects that federal spending on e-government will grow 38 percent, from slightly more than $4 billion in fiscal year (FY) 2004 to nearly $6 billion by FY 2009 (INPUT, 2005). To date, public adoption of e-government has generally not achieved the great expectations of sponsoring organizations and proponents.

One example of an e-government program that has rapidly increased its adoption rate is the Internal Revenue Service's (IRS) *e-file*. After languishing for years at relatively low rates of adoption, the program experienced a dramatic increase in adoption beginning in 1998. The e-file story bears further examination now that adoption rates have increased from 20 percent in 1998 to more than 57 percent of all tax returns filed in 2006. This case study analysis examines some of the changes internal and external to the IRS beginning in 1998 that may provide possible explanations to this increase in adoption.

A review of the literatures of information systems and public administration yields several interconnected concepts that form the basis for a model of innovation adoption that frames the case study of IRS *e-file*. These literatures identify several factors or sets of organizational actions that may shape the adoption of new technologies such as e-government. E-government is a prime example of a new technology that must go through the traditional innovation adoption process. External factors influencing e-innovation adoption can include legislative mandates and societal comfort with e-commerce and e-government products and services. Within sponsoring organizations, there may also be institutional actions that can be taken to increase the adoption of an innovation like e-government. Finally, federal agencies may take advantage of the rich literature of program evaluation to assess the benefits and impacts of innovations like e-government to help shape future investments and e-government product improvements. Taken together, these streams of literature form the basis of an innovation adoption model, which this report uses to analyze one of the federal government's most visible and popular e-government programs: IRS *e-file*.

Framing the case study of IRS *e-file* within a model of innovation adoption yields a set of lessons learned for other federal agencies to consider when analyzing their own e-government programs. While some might consider IRS *e-file* unique, it possesses both positive and negative attributes for adoption. As a result, the lessons learned should be quite relevant for any federal agency seeking to increase adoption of an innovation like e-government. Even if other agencies have different program measures, external factors, or institutional factors supporting or impeding adoption of their e-government program, recognizing those factors as important variables that influence adoption provides an analytical lens for assessing adoption issues.

IRS's relationships with external stakeholders, including oversight organizations like Congress and the private sector firms that support e-file, have changed dramatically over the history of the electronic filing program. In the early years of e-file, the IRS faced constant external criticism from oversight groups and its e-government partners. Those relationships changed when the IRS began working with

those same groups on the common goal of increasing e-file adoption. Once the IRS found a common interest in increasing e-file adoption, oversight organizations provided more support for needed innovations, and industry partners were willing to share both program and financial risk to enhance their profitability while helping the IRS increase e-filing volumes.

External validation for the goals of electronic filing came from Congress through legislation that included authority and encouragement to market the benefits of e-file to the public. While the IRS had built the technology infrastructure for e-file back in the mid to late 1980s, part of what increased adoption of this innovation was a concerted effort to market e-file and its benefits to taxpayers. The primary way to promote the value proposition for taxpayers was to compare the benefits of e-filing to filing on paper even if that meant casting the paper filing process in a less than flattering light. The shift in the tone and substance of the promotion activities was built on a series of investments the IRS had made in market research and product features over time.

Even in the early days when program results were modest, the IRS continued to build on electronic filing's legacy as a research and development program by continually testing new technologies and program ideas. While not all of these investments paid immediate results, over time the IRS staff gained invaluable experience and knowledge from the investments and experimentation. Working with industry and international standards groups has enabled the IRS to launch a new standards-based platform for next-generation electronic filing, starting with business returns.

Part of what made it possible for the IRS to reshape its relationship with its stakeholder community was another form of investment in innovation within the organization. The IRS created an organization with the sole responsibility to increase e-file adoption, the Electronic Tax Administration (ETA), which helped provide strategic significance to these efforts and allowed it to speak with one voice on e-file adoption issues, where in the past several organizations had shared that responsibility.

The IRS was able to build on a strong tradition of output measurement for submission processing, both paper and electronic, to create a comprehensive set of performance measures for e-file. These measures ranged from traditional output measures like returns processed and cycle times for refunds, to activity-based costing and customer satisfaction. The IRS was able to use these various sources and forms of performance data to support its promotional efforts, support further investments in program enhancements, and demonstrate program success.

The case study of IRS *e-file* provides an example of how one federal agency was able to create a favorable environment for innovation adoption, taking advantage of favorable external conditions and taking supportive institutional actions internally. Investments in e-government innovation and aggressive promotion and marketing of the benefits of the e-government program combined to build on previous efforts to increase public adoption of IRS *e-file*. While it was certainly not an instantaneous success, IRS *e-file* has emerged as one of the premier e-government programs of the federal government. The innovation adoption model, based on the literature reviewed and explored through the case study analysis of IRS *e-file*, should help other federal agencies seeking to increase adoption of their e-government programs. The report concludes with five lessons for other federal agencies seeking to replicate the e-file adoption success story:

- **Lesson 1:** Create an organization focus
- **Lesson 2:** Develop collaborative partnerships with stakeholders
- **Lesson 3:** Invest in innovation
- **Lesson 4:** Shift from a "Field of Dreams" mentality of marketing to proactive outreach
- **Lesson 5:** Use program performance data to drive decisions

Introduction

This study analyzes the Internal Revenue Service's (IRS) strategy and tactics for transforming its once underperforming electronic filing program for individual tax returns (IRS *e-file*) into a model of innovation adoption for other federal agency e-government programs. While much has been made of the IRS's efforts to change its relationship to the customers and distributors of e-file, there is little documentation of what happened in IRS's external environment and within the organization that brought about this change in philosophy. This study documents how the IRS addressed external relationships with stakeholders, distributors, and taxpayers—as well as internal leadership, policy, and organization structure issues—to help this long-standing e-government program begin to realize its long-awaited potential.

A review of previous research (including e-government, technology adoption, and innovation diffusion) provides an analytic lens for the IRS *e-file* program that should enable other federal agencies (or even public organizations more broadly) to reassess their innovation adoption strategy and tactics. Grounding the IRS *e-file* case study in these literatures provides an interdisciplinary perspective on what it takes to make e-government successful. Implications span the spectrum of e-government implementation perspectives with the exception of technology, focusing primarily on management, policy, and evaluation. The case study analysis, framed by a model of innovation adoption, offers other federal agencies a benchmark for assessing their efforts to promote adoption of innovations like e-government programs.

Much of the data for the case study was gathered when the author was a participant observer to the IRS's policy and management changes that led to the significant increase in e-file adoption that began

Acronyms and Abbreviations

ABC	Activity-Based Costing
ACSI	American Customer Satisfaction Index
BSM	Business Systems Modernization
CERCA	Council for Electronic Revenue Communication Advancement
CPA	Certified Public Accountant
CPE	Continuing Professional Education
DCM	Distribution Channel Management
EA	Enrolled Agent
ERO	Electronic Return Originator
ETA	Electronic Tax Administration
GAO	Government Accountability Office
IRS	Internal Revenue Service
IS	Information Systems
NACTP	National Association of Computerized Tax Processors
OMB	Office of Management and Budget
PKI	Public Key Infrastructure
R&D	Research and Development
RFA	Request for Agreements
RRA '98	Internal Revenue Service Restructuring and Reform Act of 1998
SCOS	Service Center Operations Study
TIGTA	Treasury Inspector General for Tax Administration

in 1999. After having left the IRS and having reviewed the literature of e-government and business, it became apparent to the author that several sets of literatures, but primarily from the field of information systems (IS), could help explain the theoretical basis for the IRS's innovation adoption efforts. Patton (2002) identifies the participant observer approach as an appropriate qualitative research method where specific observations, especially through case study analysis, may build toward more general patterns through inductive analysis. This methodology offers the strength of firsthand knowledge, access, and nuanced understanding of dynamics that are not observable to "outsiders" (Jorgensen, 1989).

The report begins by providing some brief background on e-government research that provides context, with the primary emphasis on federal-level e-government. This background section also provides a brief history of the IRS *e-file* program prior to internal and external changes to the program that led to the dramatic increase in adoption that began in 2000. The bulk of the report consists of a case study of factors and actions that coalesced around and within the IRS and that might serve as a set of lessons learned for other federal agencies interested in increasing adoption for e-government programs. The case study analysis is organized around a model of innovation adoption in which each facet of the IRS's program to increase adoption of e-file is explained by an element of the model. The report concludes with a set of lessons learned for other federal agencies to consider based on the IRS's experience with increasing innovation adoption in IRS *e-file*.

Background

As West (2005) points out, most e-government research to date has focused on high-level theoretical works or detailed case studies of individual agency e-government efforts. There is also a stream of research that has examined government offerings of government information and services online and public attitudes about e-government, including discussion of what users like and don't like about e-government to the extent they know what it is. Among these streams of research, there is little that is empirically grounded and that tests previous theories of innovation adoption from information systems or public administration.

E-Government

This section on e-government focuses primarily on U.S. federal e-government since that is the context for the case study that makes up the analytical section of the report. The case study analysis will also include citations to other literature that help to explain the IRS *e-file* strategy for innovation adoption. This other literature, which comes mostly from business and IS, helps to provide the outline for the case study analysis and the resulting model of innovation adoption. The literature of IS provides the theoretical foundation for the study of new technology adoption, of which electronic filing of tax returns is a good example. As will be discussed, studies of technology adoption have shaped the development and deployment of e-commerce capabilities for some time. Despite the obvious parallels between e-commerce and e-government, there have been relatively few studies of e-government adoption that build on this stream of IS literature.

West (2004a, 2004b) has provided some of the best-known studies of e-government deployment across a number of levels of government. For the last several years, he and his research team have examined e-government websites of national governments, federal agencies in the United States, and state and local governments in the United States. These research reports have provided an overview of the progress of e-government offerings from a provider perspective and rank the quality of the offerings based on a number of criteria. It is possible from these reports to learn that in 2004, the Department of Education had the best website, and the Department of Labor the worst, among U.S. federal cabinet-level departments based on the stated criteria (West, 2004b). Other than seeing how the agencies rated on each of the criteria, though, the reader is not able to deduce how or why these federal agencies did well or poorly against the criteria used in the study.

Other studies have examined U.S. federal e-government progress as well, but generally in the context of larger international e-government assessments. As noted, West (2004a) does one such assessment each year. The United Nations has also completed two reviews of e-government maturity and readiness among its member countries (United Nations, 2002, 2004). Consultancies have also produced somewhat similar studies, examining different facets of national-level e-government offerings to compare and assess countries' e-government offerings. Accenture (2006) has completed several such studies, the most recent also including an analysis of both national government offerings and public adoption of available services. This comparison of e-government offerings and public acceptance reveals that while many governments are increasing transactional offerings, the public continues to be more interested in simpler e-government information seeking and interactions, especially in the

United States. Surveys of e-government users confirm this finding (Larsen and Rainie, 2002), underscoring a potential gap between what at least some agencies are offering and what some users are willing to use.

This gap between e-government providers and users raises the larger issue of whether e-government is fulfilling the promise articulated by its many proponents since the 1990s. Consistent across the books and articles found in the e-government journals cited earlier is a claim that e-government may transform the way governments interact with users. The fusion of the Internet and government information and service delivery was supposed to be revolutionary (Council for Excellence in Government, 2000). As the literature cited earlier points out, though, the revolution turns out to be more of an evolution. West (2005) makes the point that even evolutionary change brought on by technology can result in significant impacts, which he labels "secular" changes, falling in between incremental and transformational change. The IRS case study that follows may well be an example of such secular change where an innovation adopted over time, based on knowledge accumulated over a period of years, still resulted in significant impacts on an organization and program results for the public.

IRS *e-file* History

Since the program's inception in 1985, the IRS has made a variety of changes to the e-file program, its organizational support, and the technology it relies on. Some changes seem as simple as changing the name from electronic filing or "ELF" to IRS *e-file*; others are as fundamental as changing how the IRS relates to its private sector partners. The nature of these changes has significance for other federal agencies seeking to replicate the success of IRS *e-file* in increasing e-government adoption. These facets of the program, combined with the recent dramatic improvements in public adoption, make it a good candidate for comprehensive study and satisfy the conditions identified earlier:

- It's one of the longest-standing e-government programs, dating back to 1987 and predating popular notions of e-government. As a result, there are nearly 20 years of history and documentation to explore, in addition to a myriad of changes.
- Both internally and externally to the IRS, the electronic filing program was considered either underperforming or a failure for its first 15 years. That began to change around 1998, which presents an opportunity to explore what changed to prompt the dramatic turnaround in performance.
- IRS *e-file* is faced with conditions that most e-government programs would find insurmountable barriers to adoption:
  - There is no legal or regulatory mandate for individual taxpayers to e-file their tax returns
  - Paper filing is essentially free, and electronic filing often costs taxpayers money for software or services.
  - Private sector firms intermediate the vast majority of electronic transactions.
- Despite its slow start, IRS *e-file* is generally considered to be a success. The IRS announced that it received 70 million e-filed individual returns at the end of the 2006 filing season, more than filed on paper (Internal Revenue Service, 2006a). (See Appendix I for a table of data supporting Figure 1 on page 13 for historic adoption rates of IRS *e-file*). The Government Accountability Office (GAO) found that of the 24 initiatives identified in the federal government's original strategic plan for e-government (Office of Management and Budget, 2002), the IRS *e-file* initiative was one of two initiatives that substantially met its originally stated objectives (Government Accountability Office, 2004).

Part of what makes studying IRS *e-file* so compelling is its relative and absolute success of adoption in an area of innovation (i.e., information technology and e-government) where there is little visible success on a larger scale. Recent testimony by GAO (2004) on the federal strategic plan for e-government reported that the ambitious goals originally set out for initiatives that constitute the plan remain largely unmet. One exception was the IRS *e-file* initiative, which is one of two initiatives GAO reported largely met the objectives stated in the federal e-government strategy. As has now been documented, though, IRS *e-file* has not always been considered a model e-government program. One major reason for the initial lack of success was that the IRS launched electronic filing in the mid-1980s, prior to broad public adoption of either

e-commerce or e-government. Several other factors external and internal to the IRS environment likely contributed to the relatively slow start of e-file.

While the IRS *e-file* program has experienced significant growth, especially in the last several years, the IRS was under significant pressure in the mid to late 1980s to more rapidly increase the proportion of electronically filed returns. External stakeholder groups, most notably GAO on behalf of Congress, issued a report saying the IRS was not doing enough to increase electronic filing rates (Government Accountability Office, 1996). Within the executive branch, the Office of Management and Budget (OMB) and the Treasury Department were also reported to be pushing the IRS to increase electronic filing as a means to reduce paper submission processing costs. Even private sector partners in the IRS *e-file* program, such as professional groups like the Council for Electronic Revenue Communication Advancement (CERCA) and the National Association of Computerized Tax Processors (NACTP), argued that the IRS was still not doing enough to enable and promote electronic filing. Prior to 1998, though, there was no real coordinated legal or policy initiative from the legislative or executive branch to boost electronic filing volumes.

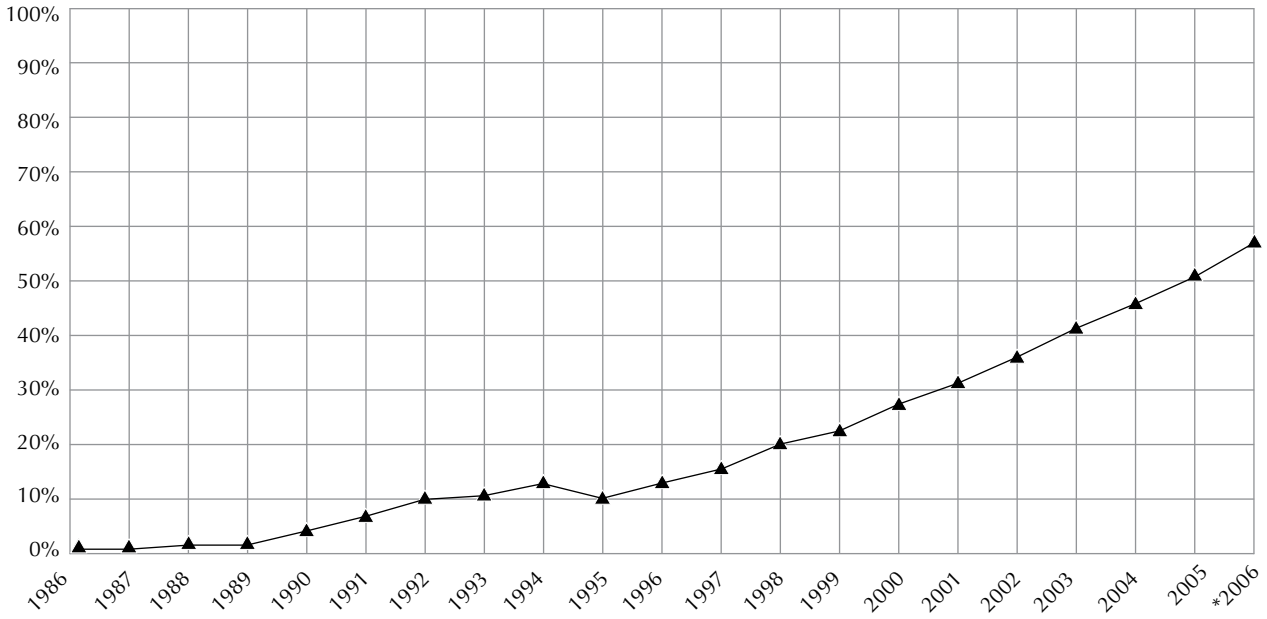
At the same time as the external pressure for electronic filing was growing, albeit somewhat disjointedly, there was also some internal impetus as the IRS hoped to decrease its reliance on the expensive and error-prone paper submission processing it had been using since the 1960s. For instance, the Service Center Operations Study (SCOS) was one of several IRS studies that recommended increasing electronic filing as a way to reduce the reliance on seasonal labor to process paper tax returns and generally shift staffing from returns processing to either compliance or customer service (Lacijan and Crockett, 2000). Despite some agreement within the IRS that electronic filing should be a strategic goal for the organization, concrete action to support adoption of this innovation was inconsistent.

Since the inception of the electronic filing program, it has had many and varied organizational homes. Electronic filing began as a research project in a staff organization that lacked line responsibility for processing tax returns. As electronic filing volumes grew, it became apparent that this research and development effort had evolved into a production system that needed an operational home. At the time, the most logical home for electronic filing was the submission processing organization that oversaw the paper processing pipelines in the 10 service centers. This meant that all submission processing, both paper and electronic, was managed by the same organization.

This consolidation of both paper and electronic filing led to some mixed results, however. As shown in Figure 1 (with supporting data in Appendix I), in the late 1980s and much of the 1990s, paper filing was still the dominant choice of most taxpayers, so that was the primary focus for the submission processing organization and the IRS as a whole. Management attention on electronic filing was fragmented and sometimes an afterthought. There were several years when two organizations were responsible for electronic filing—one unit that managed the operational aspects of processing the returns and another that did product development and marketing work for electronic filing (Lacijan and Crockett, 2000; Venkatraman and Kambril, 1991). Additionally, a variety of staff organizations supporting electronic filing, most notably Criminal Investigations, Information Systems, and General Counsel, played a role in making or influencing program decisions. Taken together, all of these IRS organizational units working on electronic filing resulted in a fragmented and somewhat inconsistent set of policy positions on whether the IRS wanted electronic filing adoption to increase.

External issues dampened adoption during the mid-1990s, too. Because of concerns with refund fraud in the electronic filing program in the early 1990s (Government Accountability Office, 1994), the IRS stepped up its efforts to regulate the behavior of the tax return preparers and processors that generated much of the electronic filing volume. Only firms approved by the IRS, called Electronic Return Originators (EROs), could electronically prepare or transmit returns of their clients—and only after submitting to a significant background check to ensure compliance with electronic filing program rules in previous years. Once allowed to file electronically, these firms had to comply with a lengthy set of program rules and reporting requirements (Internal Revenue Service, 2001a).

Figure 1: Historic Adoption Rates for IRS *e-file* (percentage of e-filers)



*Data for 2006 from the period January 1 through April 21, 2006.

Source: *Data for 1986 through 2000 from* Strategy for Growth *and for 2001 through 2006 from IRS Tax Stats at http://www.irs.gov/taxstats/article/0,,id=96629,00.html*

As the IRS sought to blunt criticism from GAO and Congress on the refund fraud problem, it increasingly regulated the electronic filing community in ways that industry felt stunted the growth of electronic filing unnecessarily. Some electronic filing industry leaders felt like they were trying to grow electronic filing volumes while the IRS policies and actions lacked coordination and consistent direction to support that goal. This divergence of both goals and tactics led to strained relationships between the IRS and the electronic filing industry.

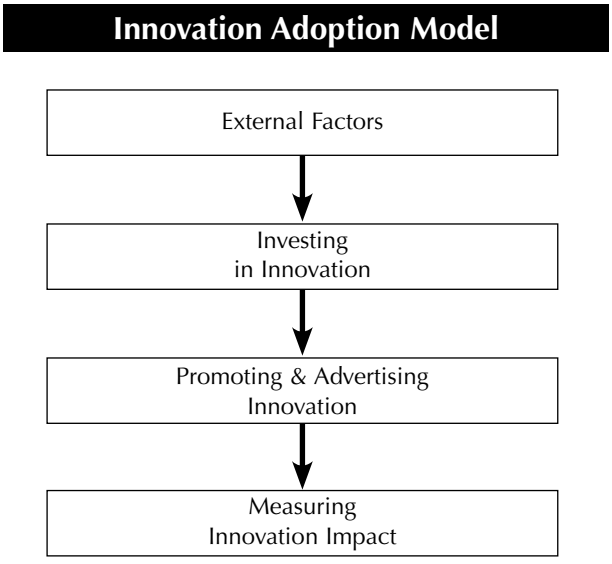
Not too surprisingly, the combination of the fragmented external and internal factors and inconsistent institutional actions for electronic filing led to poor results. The most telling results were the low rates of user adoption through the 1990s; e-filing rates actually declined in the mid-1990s after the IRS tightened program eligibility for both EROs and taxpayers as a result of the refund problems highlighted by GAO that were cited earlier. At the time, public adoption was the primary measure for the success or failure of the electronic filing program as there were no agreed-upon data on costs, public satisfaction, or even cycle times for refunds. As the case study documents, public adoption rates increased dramatically and a broader set of performance measures demonstrated that both the impact and success of electronic filing had finally arrived.

IRS *e-file* Case Study: A New Approach for Increasing Innovation Adoption

The case study of IRS *e-file* that follows is organized around several important facets of the program identified by labels borrowed from the various literatures of innovation diffusion, technology adoption, and e-government. Taken together and organized in a logical flow, a model of innovation adoption emerges. Figure 2 depicts that model and provides the basis for organizing the lessons learned that conclude the report.

The literatures of technology adoption and innovation diffusion help to explain both the customer-facing and the institutional changes that the IRS had to make to increase the share of individual tax returns filed electronically. E-government is similar to other new forms of technology in the way that users must understand it and appreciate its benefits before they adopt it. Historically, individuals and businesses have interacted with government organizations in person, by paper mail, or possibly over the phone. E-government offers the possibility that users may bypass such traditional forms of service delivery by using self-serve web and other electronic technologies. It is analogous to the shift of banks and their customers from traditional face-to-face teller service to ATMs for routine transactions like getting cash or depositing funds in an account. In both cases, users have a choice between a traditional form of service and a "new-fangled" alternative. The literature of technology adoption helps to describe a process of adoption where users shift from an old to a new way of completing tasks in which the new way typically involves the use of some technology.

Figure 2: Innovation Adoption Model



External Factors in Innovation Adoption

For public sector organizations, external factors often parallel the internal or institutional factors that support the adoption of innovative technologies. Some of these factors are similar to those found in private sector organizations. As an example, for e-commerce and e-government adoption, general public attitudes about using the Internet to complete sensitive and financial transactions represent one external factor common to public and private sector organizations. For instance, public acceptance of e-commerce and e-government more broadly raised taxpayer expectations and comfort levels for completing financial services transactions, like filing taxes, online, but only after the IRS had been accepting electronically filed returns for over five years (Council for Excellence in Government, 2000; Larsen and Rainie, 2002). The digital divide is another external factor affecting innovation adoption, which conversely is a drag on e-commerce and e-government adoption.

Public sector organizations, though, are often subject to other external factors that private sector organizations do not have to deal with. While private companies obviously may come under congressional scrutiny, federal agencies' funding and stature both depend on being responsive to congressional and other oversight requirements and demands. The IRS—because of its central role in financing much of the federal government's operations through revenue collection and its annually imposed paperwork burden on citizens' financial lives each year—is the subject of significant congressional oversight.

At about the same time the IRS centralized management of e-file, Congress was also agreeing that the IRS needed some support and a prod to make a cultural break from its historic reliance on paper. The IRS generally was undergoing extraordinary external scrutiny, led by the Senate Finance Committee, through a series of scathing hearings in the fall of 1997. These hearings publicized accusations of the IRS abusing its trusted relationship with taxpayers in a number of significant ways, ranging from IRS employees scanning taxpayer records inappropriately to ignoring basic taxpayer rights in the pursuit of unpaid tax liabilities (Rossotti, 2005). Although not the primary focus of those Senate Finance Committee hearings, electronic filing became a prominent issue in the resulting commission that examined a broad restructuring of the IRS.

The public law that created the National Commission on Restructuring the Internal Revenue Service cited the IRS's continued reliance on paper processing in the amount of 14 billion pieces of paper each tax year. The resulting commission report (National Commission on Restructuring the Internal Revenue Service, 1997) devoted significant attention to the issue of expanding electronic filing. When the commission's report was published, the proportion of individual tax returns filed electronically was at 20 percent. The resulting Restructuring and Reform Act of 1998 (RRA '98) provided the impetus to make sure that the IRS made changes to the electronic filing program, requiring the IRS to increase taxpayer use of electronic filing to 80 percent by 2007.

Increasing electronic filing from 20 to 80 percent between 1998 and 2007 represented and remains a significant challenge for an organization that still emphasized paper processing of tax returns and was not known for its innovative thinking or risk taking (Bozeman, 2003). Several internal and external events converged, however, that at least put the IRS on a fundamentally different trajectory for user adoption.

The combination of this aggressive mandate and supportive provisions of RRA '98 cleared up any ambiguity about congressional intent and support for electronic filing. Treasury and IRS staff worked with the Restructuring Commission to provide the e-file program with some of the tools needed to address long-standing barriers to cultural adoption within the IRS itself and to user adoption by the taxpaying public and intermediaries in the tax preparation and related software development businesses. As an example, the IRS's new Electronic Tax Administration (ETA) leadership team embraced the 80 percent adoption target as a challenge to surmount and not as an unreasonable goal. That specific adoption target and implementation date became a rallying cry for creating change within the IRS where there had previously been either ambivalence or hostility to achieving high levels of electronic filing. In many ways, the congressional mandate changed both the tenor and language of the discussion about e-file. The conversation within the IRS shifted from *whether* to enable e-file to *how* to enable e-file. External pressure had legitimated e-file within the IRS after years of ambiguity.

Support from Congress also coincided with significant new leadership for the IRS and for electronic filing, which not only took on the mandate as a leadership and management challenge, but relished some of the new authority RRA '98 provided (Holden and Fletcher, 2005). The mission statement of the ETA (Internal Revenue Service, 2000) and the tagline on slide presentations, "Revolutionizing How Taxpayers Transact and Communicate with the IRS," conveyed the needed sense of urgency. The ETA leadership team, with support from Treasury, argued successfully that the IRS should have the authority to spend appropriated funds to market and promote e-file. This was unusual since most federal appropriation laws prohibit the use of appropriated funds for promotional purposes. One additional provision helped address the long-standing problem of paper signature documents in the electronic filing program. The law legitimized electronic signatures as equivalent to paper signatures, encouraging the IRS to eliminate one of the vestiges of paper in the e-file program (Holden, 2004).

Combined with the external support for e-file just documented, the IRS was able to make management and policy changes internally that capitalized on these favorable conditions in the external environment. The next section outlines the management and policy changes the IRS made to support the goals of electronic filing once the organization was in place and external factors seemed supportive of moving aggressively to increase electronic filing volumes.

Most studies of organizational adoption of new technologies rely on or build on the study by King et al. (1994) on what they called the institutional factors in IT innovation. This report adapts several forms of institutional action from King et al.'s work to support innovation adoption and presents them through a model that distinguishes whether the actions are either supply-push or demand-pull. In this context, supply-push actions emphasize what the sponsoring organization is doing to make innovation available to the public for adoption. Demand-pull actions, on the other hand, involve the sponsoring organization focusing more on making the innovation attractive to users so that they are more willing to use the innovative technology based on their own value calculation.

King et al.'s model also highlights that government institutions have two major ways to create change. Governments have the option to compel action through regulatory actions that either punish or reward certain behaviors through government rules or regulations. While governments have unique powers of compulsion through such regulatory action, they share the ability to influence behavior with private sector innovation sponsors by using education and socialization as a form of persuasion. This report does not address that facet of King et al.'s model explicitly, but given federal agencies' tendency to use more coercive than persuasive forms of influence, it is nonetheless worth noting. Appendix II provides a table with generic definitions of the institutional actions available to all organizations seeking to promote the adoption of innovative technologies like e-government.

Investing in Innovation

Existing models of technology adoption oftentimes focus on private sector firms and, as a result, often look at competitive pressures as a driving context for why organizations adopt (or not) technology innovations. Despite the obvious difference between the public and private sectors, there are still organizational factors that might reasonably be applied in public sector organizations. As the remainder of the case study points out, technology played a relatively minor role in the adoption of e-file as an innovation, so it does not receive much analysis in the report.

Tornatzky and Fleischer (1990) found that how organizations deploy "slack resources" is one indicator of support for innovation adoption. The term "slack resources" refers to resources, primarily financial, not deployed for operations or production functions that might be used to invest in innovation. While the availability of slack does not always determine technology adoption, management's willingness to create slack by reallocating resources to innovative technologies clearly does. For this case study, the analysis discusses the deployment of slack resources as an investment decision, which may or may not involve investment of financial resources.

Organizational Focus

As an example of devoting "slack resources" to an innovation, the IRS decided in late 1998 to create an organization devoted solely to the adoption of electronic filing called the Electronic Tax Administration. The ETA brought together executives, managers, and staff from the recently disbanded program management office of Tax Systems Modernization and the two parts of the submission processing organization working on electronic filing.

The centralization of staff working on e-file issues had several effects. For the first time, electronic filing was not one of the issues on some other organization's "to do" list. In many ways, the ETA became a primary player in the internal negotiations for resources such as the IS organization's programming resources, communications and marketing messages, and attention from general counsel for legal opinions. Additionally, it represented an unambiguous commitment to increasing the volume of electronic filing. For the first time, both responsibility and authority for increasing electronic filing volumes were concentrated in one organization and not beholden to other mission requirements like processing paper tax returns. This new staff also proved to be invaluable in responding to the

newfound legal and policy focus on e-government in general, and IRS *e-file* in particular, as discussed in the next section.

The creation of a single organization devoted to electronic filing helped with communications issues both inside and outside the IRS. This is also consistent with Tornatzky and Fleischer's findings about how organizations created linkages or structures that allowed for lateral information sharing about innovations both within and outside the organization. Organizations that tended to adopt innovations used these communication mechanisms, which were both formal and informal, to gather information to deal with uncertainty and change brought about by adopting new technologies. The ETA was now the responsible organization for such communications within the IRS and with the e-file stakeholder community, which was quite important to innovation adoption. While the next section, "Promoting and Advertising Innovation" (beginning on page 20), addresses promotional and advertising efforts to increase user adoption of new innovative technology, there is also some literature that explains that organizations must be sufficiently committed to the adoption of an innovation to invest a variety of resources to the process of innovation. This section of the case study highlights the wide range of investments the IRS made over time to support the organizational adoption of electronic filing as an innovation.

Research and Development

As noted earlier, the electronic filing program we now know as IRS *e-file* started as a research project in a part of IRS that historically has done both programmatic and information technology research and development (R&D). Electronic filing is a good example of such an initiative, where the innovative technology was the use of modems in the mid-1980s to accept electronically filed returns instead of having the IRS receive and process the returns manually. While it does not seem like R&D by today's standards, recall that IRS efforts at the time predated e-commerce, let alone e-government. It did not take the IRS or the tax preparation industry long to realize the mutual benefits to electronic filing and move to institutionalize the research initiative.

There are also more recent examples of how IRS used R&D to address long-standing obstacles to e-filing adoption. IRS issued a Request for Agreements (RFA) on November 27, 1998, seeking industry help to confront several known impediments to e-file adoption based on informal discussions with stakeholders and distributors (Holden and Fletcher, 2005). These known impediments included enabling electronic payments (including credit cards), eliminating paper signature documents, expanding marketing opportunities for the IRS *e-file*, and making electronic filing services available to low-income filers for little or no cost. In some cases, the IRS signed agreements to enable new product features, with credit card payment being one example. In other cases, though, the IRS signed agreements or contracts with firms to explore possibilities. For example, the IRS signed a contract with Verisign to do some pilot testing of public key infrastructure (PKI) technologies and processes for secure document exchange internally and externally to the IRS.

The IRS also began its efforts to eliminate paper signature documents by running several pilot projects with respondents to the RFA (Holden, 2004). The IRS engaged in a systematic effort to work with different partners on a variety of ideas to reduce barriers and augment product features to increase e-file adoption by end users. Along the way, the IRS also engaged important stakeholders—the distributors of the e-file product in the tax preparation and related software industries.

Another piece of the IRS's innovation R&D knowledge building was an investment in objective market research. Prior to 1999, the IRS had done some market research, but it was mostly qualitative research like focus groups that attempted to identify barriers to e-file adoption. Several themes emerged from a collection of market research efforts prior to 1999. However, it was difficult to generalize to the whole taxpaying population from these efforts because the research did not use systematic sampling and addressed a variety of different issues with different user and stakeholder groups. Discussions with the tax preparation and software development stakeholder communities generally confirmed that the primary barriers to e-file adoption were cost, complexity, and privacy/security concerns, which was consistent with the preliminary results of IRS's qualitative market research as documented in the internal strategy leading to the creation of the ETA and the subsequent ETA *Strategy for Growth* (Internal Revenue Service, 1997, 2000).

Despite the limitation of the market research conducted prior to 2000, it nonetheless provided a good basis for investing in systematic market research. Working with the Communications Division within the IRS, the ETA signed a contract with a marketing firm to expand IRS's understanding of its product, users, and distributors. Starting in 1999, the IRS launched a multi-faceted, multi-year market research effort to understand users and non-users of e-file. Because of the role of intermediaries in delivering e-file to the public, the IRS wanted objective attitudinal, behavioral, and satisfaction data not only on the end users (i.e., taxpayers), but also on the distributors of e-file (i.e., tax preparers and software developers).

One of the first steps was to identify whether taxpayers knew what the product was and what the benefits were. In marketing terminology, the IRS had to establish a baseline of brand recognition and user attitudes. The purpose of the baseline was to gather data on some of the same questions on brand recognition and attitude over time. Establishing this baseline and tracking progress against it over time served as an evaluation metric for both the marketing campaign and the e-file program more generally.

Once it established whether taxpayers recognized the e-file brand and product, the IRS used market research to understand the demographic characteristics of users and where they heard about e-file. For instance, had taxpayers seen magazine or TV advertisements or heard a radio spot? Or, instead, had they learned about e-file from their tax preparer or from a provider of tax preparation software services? After gathering typical demographic data, the market research firm also asked adopting taxpayers what they liked about e-file, and asked non-adopters why they did not use e-file and what it might take to change their behavior (Internal Revenue Service, 2001b).

The IRS also used the marketing firm to conduct surveys on user and distributor satisfaction. These data provided annual snapshots and subsequently a longitudinal view of the degree to which taxpayers and distributors of e-file were satisfied (Internal Revenue Service, 2002). Results of these market research efforts are presented later in the section on measuring program results (beginning on page 23), but it is worth noting the significant investment that the IRS made over time to gaining insight into user knowledge and attitudes about its e-government offering—the demographic characteristics of users and non-users, their likes and dislikes about e-file, and their level of satisfaction.

While not all of these investments paid immediate results, over time IRS staff gained invaluable experience and knowledge from the investments and experimentation. That tradition continued with an early investment into the capabilities of XML. Working with industry and international standards groups has enabled the IRS to launch a new standards-based platform for next-generation electronic filing, starting with business returns (OASIS, 2003a, 2003b).

Education and Training

One finding of the market research in 1999 and 2000 was that distributors, primarily tax preparers, either did not know much about e-file or the benefits of e-file for their business or clients. The IRS had run a series of tax forums in the past that helped to keep tax professionals informed about changes in tax administration (Internal Revenue Service, 2006c). These forums, held in four to six cities across the country, were organized by the IRS with the support of a firm that specialized in organizing professional trade shows. Tax preparers made up the vast majority of attendees, who participated in large part to earn continuing professional education (CPE) credits to maintain their professional status as Enrolled Agents (EAs), certified public accountants (CPAs), or lawyers. The IRS provided the speakers for the CPE sessions, emphasizing not only recent changes in IRS policies, but also new tax laws. Historically, the predecessors to the ETA had run the tax forums, and, as a result, the forums historically included a lot of information sharing on electronic filing.

The creation of the ETA and an aggressive 80 percent public adoption goal set by Congress helped to further sharpen the focus of the tax forums. The ETA worked to return to more popular convention forums, most notably Las Vegas, with the goal of increasing attendance. Whereas in the past, mid-level and senior staff had provided the training at the tax forums, the ETA began the practice of having its executive team be present at each forum, with one of them serving as the executive host. This gave the ETA the credibility to ask for other IRS executives to attend, including some of the most senior leaders of the organization.

The training sessions for electronic filing expanded over time to include a wide variety of topics. As the topics expanded, the ETA even created a track of training sessions for new or prospective electronic filers to help expose them to the benefits of becoming an ERO and offering e-file to their clients. Because more experienced e-file tax professionals typically did not need information on how to apply for the program or how to troubleshoot technical aspects of the program, the IRS included more advanced topics such as sharing market research or trying new product features as a way to increase their business through electronic filing. The section below on mobilization discusses how the tax forum evolved to include recognition of tax preparers that achieved a certain volume and quality standards (Internal Revenue Service, 2006c).

Direct and Indirect Subsidies

In King et al.'s institutional actions model of innovation adoption, government investment in innovation, which they call subsidies, can take two forms. Direct government subsidies might involve public sector funding of research or lowering the cost of adoption for institutions and users. In the early days of e-file, Telefile, the touch-tone phone filing method for 1040EZ filers, might be an example. The government absorbed the cost of the innovation so that selected taxpayers could get the benefit of e-file for free. Proposals to offer tax credits for e-filing, which never gained momentum, would be another example of a direct subsidy. Governments may also use indirect subsidies, which typically involve developing an infrastructure for innovation and adoption, which is what the IRS did. As part of the Business Systems Modernization (BSM) program at the IRS, the latest effort to modernize IRS's aging IT infrastructure and business processes, the ETA provided business sponsorship for a set of tools for EROs as an incentive for e-filing.

The creation of the ETA and the leadership of Commissioner Charles Rossotti (who headed the IRS from November 1997 through November 2002) helped to push the IRS to realize that it should be examining, if not embracing, electronic communications with the preparer community. The commissioner presided over the gradual shift away from voice mail to e-mail as the primary mechanism for sharing information and news within the IRS (Rossotti, 2005). At the same time, the ETA embraced the notion that the IRS had to move away from paper and phone transactions when dealing with the public, both for filing taxes and for all the related questions before and after the act of filing.

The preparer community had begun to express some interest in electronic communications and transactions beyond just filing returns. For preparers that offered more full-service tax administration support to their clients, like CPAs and EAs, there would be clear benefits to automating some of the common transactions they had with the IRS on behalf of their clients. What the IRS did, though, to tap into that interest, consistent with the goal of increasing e-file volumes, was to offer the initial suite of secure e-services only to EROs that met certain eligibility criteria for quantity and quality of electronic-filing volumes. Preparers that had either five individual or business returns accepted by the IRS could use e-services to complete a power of attorney to represent their client before the IRS, to get a copy of a transcript of their client's tax return history, and to resolve account issues electronically (Internal Revenue Service, 2006b). These services are not available to preparers unless they meet the e-file eligibility, thereby creating an incentive (i.e., indirect subsidy) for tax preparers who otherwise might be reticent to promote e-file to their clients.

Policy Support for Innovation

As discussed earlier, there is no question that inclusion of the 80 percent goal in the RRA '98 mandate provided not only external validation for the e-file program, but it provided impetus for innovation adoption internally within the IRS. The ETA strategic plan for e-file, *A Strategy for Growth*, outlined both the revolutionary attitude it would take to achieve that aggressive goal set by Congress and the tactical steps to make it plausible, if not possible. As defined by King et al., an innovation directive, which this report refers to as policy support, regulates how an organization will use and deploy an innovation. The IRS made several policy decisions, as documented in *A Strategy for Growth* as ETA's internal innovation directive, which had the effect of limiting some of the benefits of electronic transactions to those taxpayers or preparers who e-filed.

The previous section provided the example of the IRS limiting the availability and convenience of e-services to e-filers only as a way to promote adoption. This is

the most recent in a series of decisions to exclude the benefits of certain electronic product features from paper filers. Two of the most prominent examples are electronic signatures and electronic payment options. Taxpayers who want to sign their return electronically or pay electronically, using electronic funds transfer or credit card, have to file electronically to enjoy the convenience of those features.

Additionally, the IRS decided to maintain and increase the cycle time difference for refund processing between paper and electronically filed returns. First, the IRS stopped devoting more resources to processing paper tax returns, thereby holding the cycle time for processing returns and providing refunds to paper filers relatively constant at six weeks since 2000. This meant that the IRS could continue to market the difference in refund processing cycle times aggressively, as discussed in the next section. Potentially more dramatic in the long run, efforts to put the master tax records online and speed up refund processing from weeks to days will begin with electronically filed returns and end with paper returns. This will have the effect of further increasing the disparity of refund cycle times between paper and electronic filing (Mosquera, 2006). The IRS also marketed e-file at the expense of paper filing as part of its mobilization efforts, as the next section discusses.

Standardized Business Processes

Starting late in 1998, the IRS standardized its business processes by initiating a Request for Agreements for requesting assistance from its stakeholder community to reduce barriers and create incentives to adoption that serves this purpose.

The IRS identified several known impediments to e-file adoption based on informal discussions with stakeholders and distributors, and then sought private sector suggestions and proposed solutions to help the IRS overcome the identified challenges and any that the respondents might want to bring to the IRS's attention. With the advent of new e-commerce business models, the IRS used the RFA to establish whether it was possible to add products to the e-file program through private sector initiative at little or no cost to the IRS. The RFA tested the notion that the IRS and its trading partners could establish a mutually beneficial exchange of value without using a traditional procurement vehicle that resulted in a contract where the IRS paid for goods and services. Instead of contracts, non-monetary agreements became the mechanisms for industry to request either privileges or relief from IRS *e-file* regulations if industry could describe a new product feature they could offer that they believed would increase e-filing volumes (Holden and Fletcher, 2005). The U.S. Patent and Trademark Office went on to replicate IRS's approach to the RFAs (U.S. Patent and Trademark Office, 2000) for its own electronic filing program.

The list of product features enabled or tested through the RFAs is a testament to the effectiveness of this formal process in promoting e-file adoption. In the first year, for example, the IRS worked with the financial services industry to accept credit card payments for e-file returns for the first time. The RFAs also resulted in several pilots to eliminate paper signature documents that ultimately led to the electronic signature program the IRS currently uses (Holden, 2004).

The most visible initiative created by the RFA process was the series of agreements that the IRS struck with e-file software developers and service providers to list the availability of these services, in many cases for free, on the IRS website in return for reducing the cost to taxpayers. These RFAs for free e-file services eventually led to creation of the Free File consortium that has offered free e-filing to millions of taxpayers who make less than $50,000 in adjusted gross income as part of the federal strategic plan for e-government (Holden and Fletcher, 2005; Office of Management and Budget, 2002; West, 2005). Several other less visible initiatives involved cooperative marketing agreements with organizations seeking to promote e-file with their customers or members.

Promoting and Advertising Innovation

As noted earlier in the policy support section, one significant authority the IRS gained from RRA '98 was the authority to spend appropriated funds for marketing and paid promotion. This marketing effort built on the market research as discussed in the section on knowledge building, with the IRS using the same "Madison Avenue" advertising firm that did the market research to create a brand strategy; develop marketing materials for print, radio, and television advertising; and place those advertising materials.

Promoting a Good Product Through Paid Advertising

For the first year, the focus was on creating the advertising materials and establishing the new brand for electronic filing, IRS *e-file*. Early quantitative market research conducted by the ad firm confirmed both industry market research findings and previous qualitative findings from IRS research that taxpayers liked electronic filing for three benefits it provided over paper filing. Taxpayers liked e-file because it:

- Shortened the cycle time for refund processing dramatically
- Provided an acknowledgement of return receipt and acceptance
- Decreased the likelihood of subsequent IRS contact to correct errors inherent in the paper processing process

The ad firm used the findings of the market research to convince the IRS that e-file was quite marketable and that the goal of any marketing campaign should be to highlight the benefits of electronic filing over paper filing. This meant that the IRS had to move away from its traditional "inform and educate" promotional stance to really "sell" taxpayers on the benefits of e-file. In other words, the IRS would explain what was in it for them if they e-filed. Implicitly, this meant that the IRS had to highlight the disparities in the user experience between paper and electronic filing.

For an organization that prided itself on processing paper returns with ultimate efficiency, it was likely difficult for the submission processing organization to be on the wrong end of a marketing campaign promoting the benefits of electronic filing. The first television ad addressed all three of the benefits of e-filing, in part by disparaging paper filing. The ad, which featured astronauts discussing e-filing while on the moon, highlighted the convenience of filing from wherever you have a computer, getting your refund in half the time of paper, checking the acknowledgement of the return electronically, and avoiding getting "one of those letters" from the IRS due to the error rate of less than 1 percent for electronic filing.

What helped to sell the ad campaign both internally and externally was its reliance on facts and empirical data. Unlike some marketing campaigns for commercial products and services that might involve "stretching the truth" to highlight differences in product features, IRS lawyers made sure that any claims made in the advertising were grounded in empirical fact. Because the IRS measured the outputs of its paper processes so completely, it had the data to back any comparisons between paper and electronic filing. While the IRS had known of these differences in the past, it had been hesitant to highlight the disparities to promote electronic filing at the expense of the reputation of paper filing.

With this new attitude about promoting e-filing and the accompanying insights from market research, the IRS was positioned to begin actively promoting e-file. With its new legal authority for paid advertising, the IRS placed ads on radio and the Internet and ran print ads in national newsmagazines like *U.S. News & World Report* and *Sports Illustrated*. To conserve its advertising budget, the IRS worked with the advertising firm to place the TV ads as public service spots, which had mixed results; some people reported having seen the initial e-file TV ads on obscure cable outlets in the middle of the night.

Focusing on Market Segments

Beyond this kind of anecdotal effectiveness data, the IRS had the ad firm conduct tracking surveys during the advertising campaign to assess the impact of the advertising on brand recognition over time and also evaluate which advertising media were reaching intended market segments most successfully. As an example, market research prior to the ad campaign revealed that commercial tax preparation services like H&R Block and Jackson Hewitt had made significant inroads into the relatively lower-income taxpaying market segment, which included many who wanted a fast refund and oftentimes were eligible for the earned income tax credit.

Based on typical e-commerce adoption patterns, this was quite unusual for a market segment with relatively low levels of income to have higher market penetration than higher-income users with more education. This led the IRS to focus its advertising budget on those taxpayers who used tax preparation software, which both IRS and industry market research found to be higher income, computer savvy, better educated, but not yet e-filing. Besides being a market segment that would normally adopt a technology

innovation early on, these taxpayers filed longer, more complicated 1040 returns that the IRS wanted to receive electronically to avoid rekeying the return data manually. Early results of the ad campaign found that the radio, Internet, and print ads were in fact increasing brand name awareness among taxpayers. The relatively low success rate of the public service ad campaign led the IRS to start paying for placement of the ads in subsequent years.

Marketing Cooperatively with Industry

Since one of the primary goals of the ad campaign was to increase brand awareness with these higher-income taxpayers who filed their own returns, the IRS worked with the tax preparation and related software industries to promote the e-file brand. This met with some initial skepticism since the largest firms had already invested heavily in their own brand identity for electronic filing and related services and were doubtful of IRS's marketing efforts given how lackluster its marketing had been previously. Despite this early hesitation, many of the large firms decided to "co-brand" with the IRS, meaning that the firms used their brands and logos alongside the IRS *e-file* logo, thereby protecting their own brand identity but also associating themselves with the paid advertising campaign the IRS was launching around e-file.

For smaller, independent firms that did not have a brand identity or advertise much, piggybacking on IRS efforts was quite attractive. The IRS made it easy for these smaller firms to benefit from the creation of a national brand and advertising campaign by providing ready-made marketing materials. All preparers and software developers who were approved by the IRS to offer electronic filing (i.e., the EROs) received a package of marketing materials the first year of the ad campaign. The marketing kit included a placard with the new e-file logo that identified the firm as an "Authorized IRS *e-file* Provider," copies of print ads that firms could customize for use in local newspapers, and text for radio ads that they could use for their own paid advertising. Not too surprisingly, all the ad materials the IRS made available to the EROs reinforced the benefits of e-file that the IRS was promoting through its paid advertising efforts.

Managing Distribution Channels

This cooperative marketing effort with the EROs was part of a larger effort to engage the firms that typically were more influential than the IRS in shaping individual taxpayers' decisions about whether to file on paper or electronically. The IRS used the marketing concept of distribution channel management (DCM) (Wilkinson, 1996) to change its relationship with the preparers and software developers to support the program goals of IRS *e-file* (Frey and Holden, 2006). Bucklin defines a *distribution channel* as consisting of "the set of institutions and related activities that bring products/services to the end user from their manufacturing source" (Bucklin, 2000). *Channel management* refers to the degree to which the channel members are centrally managed by the source. The IRS had a direct channel with paper filing and Telefile programs, where it dealt directly with taxpayers. It also had an indirect channel for filing, where taxpayers filed either through a tax preparer or using third-party software from a store or on the web.

Anderson, Day, and Rangan (1997) provide several reasons why an organization might use an intermediary to serve customers. Lower communication costs may be realized because the organization does not have to contact each customer directly. Then-Commissioner Rossotti often cited this rationale for explaining why he believed it did not make sense for the IRS to offer direct e-filing of tax returns on the IRS website. If the IRS were to disintermediate the private sector tax preparation and e-file service providers on the web, it would then likely have to invest new resources in a new kind of customer service support at a time when it was struggling to answer tax law questions and provide more general customer service over the phone (Rossotti, 2005).

The IRS embarked on what might be characterized in the private sector as a classic distribution channel management program. How would the IRS strike a balance in product development, support, and marketing between its direct and indirect channels? Given the strategic focus on eliminating paper and the reality that most individual returns are prepared by tax preparers, accountants, and EAs, the IRS decided to focus on getting more electronic volume out of its indirect channel. The distribution channel management program for IRS *e-file* had several components:

- Assigning account managers who served as a single point of contact and, to some extent, advocated for major e-file product and service providers
- Creating incentive programs for distributors to increase the quality and proportion of electronic filings among existing EROs
- Recognizing exemplary EROs each year at the nationwide tax forums
- Streamlining the application process to increase the number of EROs
- Sharing marketing materials with EROs and allowing them to use the IRS *e-file* brand as part of their own local promotion
- Sponsoring competitions for non-monetary agreements for cooperative marketing and listing of e-file services on the IRS website (discussed in more detail in the next section below) (Holden and Fletcher, 2005).

Having now reviewed the institutional actions the IRS took to promote e-file, it is time to understand how IRS determined whether its strategy for increasing the adoption of e-file had been successful.

Measuring Innovation Impact

The technology innovation literature lacks a feedback loop that links the adoption of innovative technology to business results. Moreover, the e-government literature does not provide much theoretical underpinning to the notion that e-government programs should evaluate program results once initiatives are launched. Stowers (2004) provides the notable exception to this statement, offering a framework for evaluating e-government results based on an analysis of e-government strategies taken from websites across all U.S. states, the District of Columbia, and the 25 largest cities, as well as the federal government's e-government strategic plan. Based in part on the program evaluation literature that emerged in the 1980s that is obviously still relevant today (Hatry, 1999), she suggests that e-government program managers focus not on inputs like costs (e.g., technology or services procured), outputs (e.g., forms downloaded), and intermediate outcomes (e.g., adoption rates), but instead focus on final outcomes (e.g., cost or staff savings).

Part of what makes IRS *e-file* such a compelling e-government success story is that the results, both outputs and outcomes, are very measurable. The following briefly illustrates how the IRS gathered data that demonstrated the effectiveness of its multi-faceted program to increase the adoption of e-file. While the discussion of marketing in the section on mobilization includes some mention of the benefits of e-file compared to paper filing, this section brings together all the measures and quantifies some of the differences. In most cases, measurement of impact centers on the differences between paper and electronic filing.

As already noted, one of the primary benefits of e-file for taxpayers has been the relatively shorter cycle time for processing refunds. At worst, for paper filers who request a paper check and file around April 15, it can take as long as eight weeks. At best, for taxpayers that e-file and request a direct deposit, it can be as quick as 10 days. The obvious difference is attributed to the paper return needing to be handled manually through the U.S. mail and in the IRS processing center, where selected data elements from the return are keyed. Taxpayers who choose paper refund checks instead of direct deposit in their financial institution account likewise have to wait for the process of having their check printed and then mailed.

Not too surprisingly, there is also a wide disparity between the error rates for paper and electronic filing. The historic error rate for paper returns after the initial data entry in the submission processing facilities is approximately 20 percent, with about half of the errors attributed to math and logic problems found on the paper returns, which are not subjected to math or edit checks unless prepared using software. While subsequent processing and manual error correction decreases this error rate, it is a laborious process that sometimes requires the IRS to correspond with the taxpayer. The other half of the errors are attributable to the manual data entry process.

By contrast, the error rate for electronically filed returns has historically been less than 1 percent. This is because the IRS and the software developers have worked over the years to minimize, if not eliminate, many of the common sources of error in return preparation and processing. Maintaining this

low error rate is one of the areas where the IRS and its business partners share a common interest. For both the IRS and the e-file industry, errors mean that the organizations have to expend resources to correct the errors. For the e-file industry, those customer service calls cut into profit margins, so they are very motivated to prevent errors as early in the return preparation process as possible.

These differences in cycle times and error rates have other virtuous benefits to the IRS in particular. Electronic filing of tax returns removes significant amounts of paper and associated staff years from the IRS cost structure. The classic way to quantify the financial impact of converting paper processes to electronic processes is through Activity-Based Costing (ABC). ABC allows an organization to determine the cost per transaction of various activities or business processes. The IRS invested in ABC in the late 1990s and analyzed submission processing activities for both electronic and paper-filed returns. Subsequent analysis of the ABC data by Booz Allen Hamilton revealed substantial differences in the cost per return, especially for direct labor. One surprising finding was the continued presence of direct labor costs for electronic filing, of which 85 percent was attributable to processing paper signature documents (Booz Allen Hamilton, 2000). A Treasury Inspector General for Tax Administration (TIGTA) report (Treasury Inspector General for Tax Administration, 2002) examined some of the same data and reported that the paper processing for e-file was costing the IRS $363.73 per thousand returns based on fiscal year 2000 data. More recently, estimates of cost impact show that for each tax return filed electronically instead of on paper, the IRS saves $2.15 per return in submissions processing costs (Office of Management and Budget, 2006).

A combination of that cost savings per return and the large volume of returns that have shifted from paper to electronic filing since the IRS devoted substantial management and financial resources to the e-file program raises the prospect of a significant shift in resources. In early 2004, the IRS announced that it was closing down two more submission processing functions after having closed one in 2003. Many of the staff in these locations were hired each year on a temporary basis just to process paper tax returns manually. The amount of returns filed electronically had reached a sufficient critical mass that the absolute number of paper returns filed had finally begun to decline. As noted in the IRS press release announcing the shutdown of these submission processing sites, savings from these staff reductions and cost avoidances were going to allow the IRS to rededicate those resources to more pressing mission priorities in tax law enforcement (Internal Revenue Service, 2004).

Beyond yielding benefits internally to the IRS, taxpayers' satisfaction with the IRS in general was increasing. Since the IRS began participating in the American Customer Satisfaction Index (ACSI), customer satisfaction for e-file had always exceeded that of paper filing by a wide margin. For the years federal agencies have participated in the ACSI, the ACSI score for all filers has increased from 51 percent in 1999 to 64 percent in 2005. In part, the increase in the proportion of filers using e-file compared to paper explains this gradual improvement. During this same period, the ACSI score for electronic filers has typically been at 77, while the score for paper filers has been about 52, a 25-point spread on the 100-point scale used by ACSI (American Customer Service Index, 2005b). At the end of 2005, the ACSI score for e-commerce brokerages was 76, indicating that taxpayers' satisfaction for e-file and for other financial services they were using on the web was roughly equal (American Customer Service Index, 2005a).

In an effort parallel to the participation in ACSI, the IRS used its market research firm to assess both customer and distributor satisfaction. Recall that the primary distributors of e-file to taxpayers were tax preparers and increasingly software developers. The IRS reasoned that given how influential these intermediaries are in shaping the filing habits of taxpayers, increasing their satisfaction with e-file would lead them to promote the benefits to their shared customers—the taxpayer. Surveys of e-file distributors not only confirmed the influence of the intermediaries in suggesting filing electronically instead of paper, but also found that distributor satisfaction for e-file was nearly as high as customer satisfaction and much higher than for preparers that filed on paper for their clients (Internal Revenue Service, 2002).

Not too surprisingly, this high level of customer satisfaction for e-file has resulted in a continued

increase in market penetration, or in the proportion of returns filed electronically instead of on paper. Most notably, as shown in Figure 1 earlier, the market penetration for e-file more than doubled between tax years 1999 and 2005, representing the time frame when the IRS made the changes to its flagship e-government program outlined in this report. The success of e-file allowed the IRS to abandon its award-winning Telefile program on August 16, 2005, due to the declining numbers of taxpayers using the system, the costs to maintain Telefile, and the availability of free e-file on the web through Free File (Office of Management and Budget, 2006).

This final section of analysis on program impact helps to underscore the important role of systematic data gathering and analysis. Because the IRS maintained a detailed work measurement system for submission processing, e-file emerged with a rich set of historical data and a tradition of measuring work processes that allowed for comparisons between paper and electronic filing. While this tradition of work measurement dates back a number of years, the ETA did not stop at just looking at outputs of work processes; it also sought out or developed outcome measures through its market research program and participation in the ACSI. By almost any measure, though, IRS *e-file* has been quite successful, which leads into the next section on lessons learned and recommendations for the federal e-government programs to consider.

Lessons Learned and Conclusion

While the IRS may not meet the 80 percent goal for electronic filing participation by 2007 set by RRA '98, the progress the IRS has made since that seminal legislation passed has arguably still been remarkable. In reality, the 80 percent goal was likely never attainable. The proportion of users who will not adopt an innovative technology, especially one involving the transmission of their tax data electronically to the IRS, surely exceeds 20 percent.

Nonetheless, the congressional attention and support surrounding the attainment of the goal would appear to be an important factor in the improvements in e-file between 1999 and 2006. It is that rate of improvement that makes IRS *e-file* such a compelling case for deeper understanding in the hopes that other federal agencies might replicate some of IRS's success.

Lessons Learned

Lesson 1: Create an Organization Focus

The creation of the Electronic Tax Administration was an important institutional factor that enabled the IRS to capitalize on the emerging legislation to reform IRS operations that became RRA '98. Prior to the creation of the ETA in 1998, the IRS had seemingly been ambivalent about electronic filing, with responsibility spread among various offices and a resulting lack of a singular voice within and outside the organization. Having responsibility spread across several offices also meant that there was a lack of accountability for program results. The ETA brought organizational focus and executive leadership to everything from resource allocation within the IRS to stakeholder management both internal and external to the organization.

Lesson 2: Develop Collaborative Partnerships with Stakeholders

Then-Commissioner Rossotti capitalized on the controversies over the IRS to talk with not only congressional stakeholders, but the many other stakeholders the IRS has in administration of taxes (Rossotti, 2005). IRS ETA executives used that time of external scrutiny and internal introspection to build consensus for the need to change the electronic filing program. While not thrilled with the specificity of the 80 percent goal, the ETA got much of the authority it sought to improve e-file, working with the Restructuring Commission staff and then the staffs of the Senate Finance and House Ways and Means Committees that drafted that RRA '98. While the IRS and the tax preparation and software industries did not always agree on specific recommendations for improving e-file, there was sufficient agreement on issues like marketing, electronic signatures, and electronic payments to convince Congress that the IRS and industry needed to work together to improve the program.

Lessons Learned

Lesson 1:	Create an organization focus
Lesson 2:	Develop collaborative partnerships with stakeholders
Lesson 3:	Invest in innovation
Lesson 4:	Shift from a "Field of Dreams" mentality of marketing to proactive outreach
Lesson 5:	Use program performance data to drive decisions

External to the IRS and in certain corners of the organization (most notably the commissioner and ETA), there was strong agreement that e-file adoption needed to increase significantly. Having external support and the support of the commissioner provided a level of needed support to confront some of the institutional tendencies to preserve the status quo (e.g., paper processing). By working effectively with external stakeholders, the ETA was able to create a powerful "innovation directive" for e-file. It may be somewhat rare among federal agencies, but the alignment of stakeholders and the IRS to increase e-file adoption was a direct result of the business opportunity from increased e-filing for the stakeholders.

The IRS realized that it could use the mutual interest in increasing e-file adoption to all parties' benefit instead of working against the stakeholders just because they happened to make money from e-file. This allowed the IRS and industry to reach an understanding of sorts about the IRS not offering direct e-filing for free on its website. In return for the private sector making this service available for free for millions of taxpayers, the IRS agreed not to compete with the private sector. By not enabling its own direct e-file channel to taxpayers, the IRS achieved peace in its distribution channel and realized the benefit of increasing volumes through their indirect channel (i.e., tax preparation firms and PC filers).

Lesson 3: Invest in Innovation

Across the elements of the adoption model, the IRS invested several different ways in increasing the volume of e-filing. These investments began with knowledge building at the outset of the program when the IRS initiated the innovation adoption process by creating an R&D project and fielding it as a prototype and then an operational program. Over time, the IRS invested funds and staff in modest program improvements and some preliminary qualitative market research. Even though these preliminary investments proved to be insufficient for the long-term desired level of adoption, it nonetheless laid the groundwork for the subsequent larger investments in both organizational staff resources and marketing in the late 1990s. The new push for adoption relied greatly on the experiences and related data the IRS staff and industry partners gathered over the first 15 years of the program.

Lesson 4: Shift from a "Field of Dreams" Mentality of Marketing to Proactive Outreach

As the section on mobilization made clear, the IRS abandoned the "build it and they will come" mentality of promotion in late 1998. The IRS realized that it had to recognize that taxpayers and tax preparers have a clear choice between competing products—paper filing versus e-filing. Cast this way, the adoption challenge resembles more traditional consumer marketing where users have brand and product choices for a commodity. For instance, it might be possible to present this as a marketing effort for a personal products firm like Proctor and Gamble trying to get consumers to buy its brand of soap instead of its competitors'. It may stretch the analogy too far to see that the IRS had to get its users to choose electronic "soap" over paper "soap." Nonetheless, it required the IRS to move away from the old "inform and educate" mind-set to that of a product-oriented organization that created brand identity and promoted the benefits of the e-file brand and associated product over the alternative (paper).

Lesson 5: Use Program Performance Data to Drive Decisions

A related investment the IRS made in e-file was in a variety of program measures. Some of these measures had their roots in the work analysis tradition from submission processing like the ABC data and cycle time for refund processing. Like many federal agencies, the IRS had a rich source of programmatic output and outcome data. What set the IRS apart in this instance, though, was its willingness to use the data to drive product enhancement decisions and evaluate marketing efforts. Even more so, the empirical program output data served as the analytical basis for the IRS's marketing efforts to distinguish e-file from paper filing and highlight the benefits to the users. Other sources of program data required the IRS to either invest in its own market research or participate in external measurement efforts like the ACSI program.

Taken together, the IRS not only generated, but also used both output and outcome data to demonstrate program success. This allowed the IRS to justify continued investment in the program over time. In addition, it allowed the IRS to abandon facets of the program that were no longer proving to be cost-effective. The best example of that is likely the

decision to stop offering Telefile after costs rose and demand weakened. Despite the fact that Telefile had been an award-winning program during the early days of e-file, the IRS showed a commitment to make decisions based on both positive and negative program results.

Conclusion

It is possible to argue that IRS *e-file* represents a "one of a kind" case of external factors, program attributes, and timing that may not be present in other federal agencies. Having started so early in e-government, the IRS clearly developed a unique set of experiences with staff to tell the stories that not many federal agencies can replicate. And not many agencies have such an experienced and well-organized set of stakeholders that also serve as intermediaries between the agency and its user base.

While some external factors provided the IRS with some advantages in its efforts to increase e-file adoption, it also faced some challenges to e-file adoption. The flip side to the benefits of having such experienced and strong stakeholders is that they occasionally had interests that did not coincide with the government's. For instance, IRS's agreement with industry through the Free File initiative prohibits it from offering free tax preparation and e-filing on the IRS website that would compete with private sector product and service offerings. Additionally, not many agencies have had to experience an oversight environment like that surrounding the Senate Finance Committee hearings.

Part of what prevents us from totally dismissing the IRS *e-file* adoption story as totally unique is the descriptive power of the business, information systems, and public administration literatures found in the e-government adoption model documented in this report. Much of what the IRS did to increase e-file adoption is well described and prescribed in academic literature. Until this report, though, it has not been possible to see the inter-relationships among the various pieces of literature in the e-government adoption model.

The e-government adoption model and the related IRS case study do not provide a cookbook answer to all the federal government's e-government adoption problems. Nonetheless, the model presents a recipe for analysis as much as implementation. For federal agency managers and executives seeking to understand why their e-government adoption rates are not as high as hoped, it may be possible to examine the elements of the model. Are there opportunities to take advantage of or to create external resources or realign internal resources through institutional actions to promote adoption? The program impact element of the model may be used to justify investments in e-government programs and support marketing messages, and then used to evaluate the effectiveness of e-government efforts more broadly.

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The author wishes to thank his former colleagues at the IRS and in the tax preparation and related software industries for helping to make IRS *e-file* the success it is today so I had such a compelling story of innovation adoption to tell. Looking back on those years working in Electronic Tax Administration between 1997 and 2000, I now realize what a special time and unique experience that was. I will be lucky if I am able to share in such a program transformation again in my career. Special thanks to Phyllis Gattos of the IRS for her insightful review of the draft of this report. I was fortunate to work with Phyllis when I was in the ETA organization. She kept me out of trouble and always provided insightful analysis on the business, technical, and political challenges our group faced as we enhanced e-file. I also want to thank Robert E. Barr, the first permanent director of ETA, who provided me with great mentoring and tremendous insight into the business of tax preparation. Thanks, too, to Mark Abramson and the IBM Center staff for helping me improve the organization and focus of the report. It's a much better report for their careful review, suggested improvements, and professional layout.

Appendix I: Adoption Rates for IRS *e-file*

Table A.1: Historic Adoption Rates for IRS *e-file*

Filing Season	Third Party	Telefile	Online	Total *e-file* Returns	Total Individual Returns	Percent Share Electronic
1986	25,000			25,000	103,030,000	<1
1987	78,000			78,000	107,000,000	<1
1988	583,000			583,000	109,700,000	1
1989	1,161,000			1,161,000	112,100,000	1
1990	4,204,000			4,204,000	113,700,000	4
1991	7,567,000			7,567,000	114,700,000	7
1992	10,919,000	125,000		11,044,000	113,600,000	10
1993	12,334,000	149,000		12,483,000	114,600,000	11
1994	13,502,000	519,000		14,021,000	115,900,000	12
1995	11,126,000	680,000	1,000	11,807,000	118,200,000	10
1996	11,971,000	2,839,000	158,000	14,968,000	120,400,000	12
1997	14,083,000	4,686,000	367,000	19,136,000	120,332,000	16
1998	17,668,000	5,955,000	942,000	24,565,000	122,967,000	20
1999	21,223,000	5,664,000	2,458,000	29,345,000	125,547,000	23
2000	25,201,000	5,161,000	5,019,000	35,381,000	127,474,000	28
2001	28,989,000	4,419,000	6,836,000	40,244,000	130,965,000	31
2002	33,287,000	4,177,000	9,428,000	46,892,000	131,728,000	36
2003	36,734,000	4,027,000	11,936,000	52,697,000	127,691,000	41
2004	43,161,000	3,771,000	14,575,000	61,507,000	132,200,000	47
2005	48,082,000	3,294,000	17,100,000	68,476,000	133,933,000	51
*2006	50,333,000	N/A**	19,736,000	70,069,000	122,721,000	57

*Data for 2006 from the period January 1 through April 21, 2006.

**Telefile discontinued in 2006.

Source: *Data for 1986 through 2000 from* Strategy for Growth *and for 2001 through 2006 from IRS Tax Stats at http://www.irs.gov/taxstats/article/0,,id=96629,00.html*

Appendix II: Institutional Actions to Promote Technology Adoption

Table A.2: Institutional Actions to Promote Technology Adoption

Institutional Actions	Definitions
Knowledge building	Providing scientific and technical knowledge to encourage and sustain innovation.
Knowledge deployment	Dispersion of knowledge to individuals and organizations via education and training.
Subsidy	Financially supporting innovation adoption and diffusion (direct or indirect support). Direct subsidy includes direct financial aid. Indirect subsidy involves government initiatives to build a strong infrastructure to enable adoption and diffusion.
Innovation directive	Establishing norms that regulate production and use of innovation.
Mobilization	Promotion and advertising by which governments aim to shape a desirable view of innovation adoption.
Standardization	Establishing formal practices for the innovation.

Source: *King et al. (1994).*

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