

Government Management of Information Mega-Technology: Lessons from the Internal Revenue Service's Tax Systems Modernization

New Ways to Manage Series



Barry Bozeman
Regents' Professor of Public Policy
School of Public Policy
Georgia Institute of Technology

NEW WAYS TO MANAGE SERIES

**Government Management of
Information Mega-Technology:**
Lessons from the Internal Revenue
Service's Tax Systems Modernization

Barry Bozeman

Regents' Professor of Public Policy
School of Public Policy
Georgia Institute of Technology

March 2002

T A B L E O F C O N T E N T S

Foreword	5
Executive Summary	6
Introduction	9
The IRS Today	9
A Cautionary Tale	10
Objectives and Approach	12
The IRS and Its IT Challenge	13
Information Technology at IRS: From “Pre-History” to TSM	15
Early History	15
Pre-TSM IT Renewal Efforts	15
The TSM Saga	16
Post-TSM: Picking up the Pieces	21
“Modernization,” Blueprints, and Statutory Change	22
Outsourcing, Contracting, and the PRIME	26
Understanding IT Management Failure: Alternative Explanations	28
Explanation 1: Task Complexity and Difficulty	28
Explanation 2: Insufficient Technical Knowledge Resources	29
Explanation 3: Inadequate Contracting and Outsourcing.....	31
Explanation 4: Flawed Organizational Culture	32
Explanation 5: Failures of Internal Management and Leadership	35
Explanation 6: Public Sector Constraints	37
Conclusions and “Lessons Learned”	43
Was TSM Really a Failure?	43
The Organizational Culture Lessons	44
The “Generic Management” Lessons.....	45
The Public Sector and Political Context Lessons	47
Is the IRS Finally on the Right Track?	48
Endnotes	49
About the Author	52
Key Contact Information	53

The PricewaterhouseCoopers Endowment for
The Business of Government

F O R E W O R D

March 2002

On behalf of The PricewaterhouseCoopers Endowment for The Business of Government, we are pleased to present this report by Barry Bozeman, "Government Management of Information Mega-Technology: Lessons from the Internal Revenue Service's Tax Systems Modernization."

There is no doubt that the Tax Systems Modernization (TSM) program undertaken by the Internal Revenue Service (IRS) in the late 1980s and early 1990s encountered many problems. While stories about government problems are common and appear frequently, Professor Bozeman's study is unique in that his emphasis is on what IRS learned from the problems it encountered during the TSM program. While many organizations aspire to be "learning organizations," Professor Bozeman chronicles how IRS truly learned from its problems. Based on the TSM experience, he describes how IRS dramatically changed the way it now undertakes large information technology projects.

While IRS clearly learned much from its TSM experience, Professor Bozeman's report is intended to share this knowledge with other organizations throughout government. Professor Bozeman sets forth a series of insightful lessons learned that can clearly be applied by public sector organizations across the nation at the federal, state, and local levels. This report is also unique in that Professor Bozeman attempts to understand and explain why the TSM program encountered the problems it faced. His analysis provides a fascinating roadmap for government agencies to follow in improving their capacity to undertake large-scale technology programs and projects.

We trust that this report will be helpful and enlightening to both government executives and students of government. There is much to be learned from this case study about the challenge of successfully implementing large-scale information technology programs.

Paul Lawrence
Partner, PricewaterhouseCoopers
Co-Chair, Endowment Advisory Board
paul.lawrence@us.pwcglobal.com

Ian Littman
Partner, PricewaterhouseCoopers
Co-Chair, Endowment Advisory Board
ian.littman@us.pwcglobal.com

EXECUTIVE SUMMARY

The Internal Revenue Service (IRS) information technology renewal effort known as Tax Systems Modernization (TSM) is by some accounts one of the most striking failures in the public management of information technology (IT). Among the many interesting features of this case is that so little success was apparently achieved, despite the expenditure of billions of dollars and with a small army of talented people, both in the IRS and in private sector partner organizations, and despite consensus about the critical nature of the project. In analyzing just how this happened, the aim of this project is to identify lessons from the TSM experience that might apply to any federal agency undergoing a massive technological change. (The term used here is “mega-technology.”)

After reviewing the history of TSM (as well as the earlier and later experiences of IRS with implementing IT projects), a number of alternative explanations of TSM shortcomings are examined, including:

1. **Task complexity and difficulty.** Is the task itself one in which any organization is doomed to fail? Is the concept of the task a problem?
2. **Insufficient technical knowledge resources.** The IRS is not primarily a technology agency. To what extent is the lack of technical knowledge, inside or outside the organization, a mitigating factor?
3. **Inadequate contracting and outsourcing.** At each point in the life of IRS IT renewal, contracting and outsourcing has been a major component, differing only in the degree to

which it was part of the development strategy. Have there been contractor failures or IRS failures in contract management?

4. **Flawed organizational culture.** The culture of the IRS is distinctive, as nearly everyone acknowledges. To what extent is the organizational culture an explanation for IT failures?
5. **Failures of internal management and leadership.** To what extent are problems the result of management missteps? Are there failures in leadership, communication, or strategic vision?
6. **Public sector constraints.** Unlike most private firms, IRS has multiple superiors, each powerful and with differing expectations. To what extent do the problems experienced by IRS flow from the fact that IRS is a *public* agency, subject to federal personnel regulations, purchasing and bidding regulations, and federal budgeting and accounting procedures?

Evidence for these alternative explanations of the TSM experience is drawn from a number of sources. In addition to the review of hundreds of documents and reports, the study is based on interviews with more than 100 key people, including, among others, current IRS employees, former IRS employees, as well as consultants and officials of oversight agencies. The interviewing approach employed is best described as “tailored semi-structured.” While a few themes were common to all interviewees, particular care was given to identifying the particular role, perspective, and historical vantage of the interviewee and tailoring questions to the individual.

The study provides some support for five of the six explanations provided above. One is rejected: the idea that the task was simply too daunting for anyone to possibly succeed. This is belied in part by subsequent successes the IRS has experienced. But there is some merit to each of the other explanations. After reviewing these explanations in detail, including many quotations from the interviews, a model is presented depicting the relationship among these determinants of TSM failure, a model that may pertain more generally to the public management of IT.

The concluding section seeks to distill lessons learned from TSM. One lesson is that it certainly was not a complete failure. Some of the benefits from TSM included:

1. **Organizational learning.** Knowledge developed under TSM did not evaporate even if the IRS did experience a high level of turnover and executive succession.
2. **Training.** The organization learned about how to develop mega-technology—and particular individuals learned, often seat of the pants, about program and project management, technology's impacts on organization, and about how the IRS's organizational strengths and weaknesses matched up against the demands of a technologically dependent era. TSM was an important instrument for developing human capital, especially knowledge about project management.
3. **Infrastructure.** It is tempting for political opponents to characterize the money spent on TSM as a waste, but, in fact, much of the TSM funding went to purchase hardware and software still in use at the IRS, and several buildings were renovated under TSM. While telecommunications was not, strictly speaking, part of TSM, it is nonetheless the case that TSM funding helped support telecommunications systems and infrastructure now being used effectively.

The “lessons learned” from the study are considered in terms of whether they relate most closely to unique features of IRS, especially its organizational culture; to any large organization; or to the distinctive nature of public management and public sector constraints. Most of the “lessons learned”

seem to apply to any large organization seeking to develop and manage IT mega-technology. These lessons include:

- *Multi-organization management and interdependence requires “soft boundaries.”* The inability to deal with persons perceived to be at the boundary made it nearly impossible for TSM leaders to quickly integrate needed technical talent, even talent hired by the IRS.
- *IRS must become a “technology culture.”* Information technology not only is not the same sort of technology as IRS has experienced in the past, it may require a different culture than other technologies or technical functions. Information technology rewards specialization, adaptability, renewal, and project management skills.
- *If project management is a major determinant of success, do not try to learn it “on the fly.”* Any organization launching mega-projects while failing to assess—or improve—the project management skills of the persons in charge would have a low probability of success.
- *A new technological regime requires a “culture check.”* The very attributes that may have in the past been enabling often turn out to be, with technologically altered realities, liabilities.
- *Beware of the windfall, or at least be ready for it.* Vast technological projects, as compared to more routine and incremental changes in agencies' activities and functions, require that the vision and goals be taken several steps below the level where most executive and strategic managers work. Developing operational plans at a rapid pace, while at the same time learning about technology and assessing needs, is simply too complicated and demanding when one is dealing with IT mega-technology.
- *The bigger the opportunity, the greater the need to evaluate.* When the resources are flowing and there are plans to be made and projects to be put in place, it is always tempting to put evaluation aside. Generally, this is when rigorous evaluation is most important, when the pace of resources, plans, and projects is escalating beyond the ability of managers to be systematic and reflective.

- *Public managers are expert at dealing with public constraints.* Public sector context always provides some “cover,” but it is difficult for public managers, even very talented ones, to re-invent themselves as information technology managers.
- *Contracting out requires management within.* Perhaps this is the lesson most generalizable to public agencies. Contracting out does not succeed as a substitute for good public management; rather, it succeeds when it provides external resources to supplement good public management.

The study closes with brief considerations as to whether IRS is now, post-TSM, on the right track to achieve its IT and management goals. At this point, any conclusion is speculative—in IT management summative evaluations should be avoided until the technology is in place. But if we consider the “lessons learned” given above, it seems the IRS has learned well. While interviewees still point to some problems, the IRS has made great strides in contractor management and partnership. The technical and technology management experience credentials of the persons now in charge of IRS technology management are impressive.

Changing an organization’s culture is, of course, a daunting task, but there are positive signs there as well. The recent changes in mission and in organization structure certainly send the signals for organizational renewal and culture change. Yet many challenges remain. The IRS still seems to have some difficulty “opening up” to outsiders; turnover of skilled personnel continues to be a problem; and there are mixed reports on how well the IRS and its prime contractor are doing. But even in cases where the IRS is not where it wants to be, it seems to be taking steps along the right path.

Introduction¹

“It is important to understand the kind of process needed to modernize IRS’ systems. This process has sometimes been compared to designing and building a new airliner or a huge office building.... A better metaphor would be a project to redesign and rebuild a large, densely populated city, such as New York City, complete with rebuilding all the subways, utility lines, surface transportation and tall buildings, all without delaying or injuring any residents or businesses while accommodating ongoing growth and changes in the daily pattern of living and working.”

Internal Revenue Service, *IRS Organization Blueprint 2000* (Washington, D.C.: Internal Revenue Service, document 11052 [Rev.4-2000], p. 1).

The IRS Today

New millennium tax preparation is in some ways not much different than 1950s tax preparation—you still need the receipts, you still have a deadline to meet, and, of course, you still feel the motivating sense of anxiety. But in other ways, the 2002 taxpayer has a very different experience than the 1952 taxpayer. One of the most revolutionary changes is that the whole experience can be “cool,” in the cyberpunk, shooting-the-Internet-tube sense of cool. What technological visionary would have ever believed that the IRS website would be the place to be for the latest in high-tech multimedia? Sure, electronic filing was entirely predictable several years before it became a reality. A web presence for the IRS was, likewise, predictable. But who would have predicted cool? (See “A Visit to the IRS Digital Diary” on page 10).

The prize-winning website is, perhaps, the most obvious portal into the many computer and information technology advances the IRS has made recently, but it is neither the most challenging nor the most impressive one. While perhaps not the favorite of taxpayers, taxpayer efficiency has been abetted by the ability to speak to millions of data-

bases, including banks and pensions, match Social Security numbers, and automatically determine mismatches between interest earned and interest reported. The ability to get real-time, online tax assistance is valuable, and even if the enabling technology is nearly invisible to the user, it is nonetheless functional and sophisticated. For the taxpayer interested in reducing the revenues *spent* by the IRS, the agency’s Automated Underreporter Program has permitted the re-deployment of thousands of IRS employees who formerly had the tedious job of hand-checking tax returns.

IRS circa 2002 has succeeded in automating a great many tasks. Some of the noteworthy information technology (IT) accomplishments to its credit include not only those discussed above but electronic filing (a huge challenge, initially botched, now more and more successful), sophisticated security protection, and effective management of some potentially catastrophic Y2K problems. The IRS is making great strides in improving IT because it has a number of important assets it has employed well, including:

- A commissioner, Charles Rossotti, with a strong commitment to IT and a great deal of private

sector information management expertise (most previous commissioners were tax attorneys with little knowledge of computers). Commissioner Rossotti also realized the critical role that the business perspective plays in driving an information technology initiative.

- A chief information officer (CIO) with strong private sector technology management credentials.
- An information technology “blueprint” that, according to most observers, is more complete than past IT plans.
- Several General Schedule (GS)-exempt personnel, brought in on a limited-term appointment (no more than four years), at salaries above the Senior Executive Service (SES), to provide expertise that would not otherwise be available.
- A multi-million-dollar prime consulting contract that brings together some of the best private sector talent to help IRS envision, develop, and implement new technology.
- A new approach to managing technology and new technology management processes (e.g., “enterprise life cycle management”).

Taking a snapshot of the 2002 IRS information technology, one sees an agency that has made a

great deal of headway and is deploying technology with considerable success. This is an especially formidable accomplishment, especially if one considers the depths from which the IRS has risen in just five or six years. In 1996, the IRS information technology effort was a widely recognized disaster.

What were the causes of the IRS information technology disasters of earlier years? How has the IRS coped with these disasters, made progress toward much more effective IT, and improved its approaches to IT management? The purpose of this study is to sort out these issues, focusing particularly on the 1990-1996 period of IT development known as Tax Systems Modernization (TSM). Are there lessons in the IRS’s progress? What does the IRS’s recent history in IT development and management suggest for public management generally and for federal “mega-technology” management? This study is not a “how to” project or even a true evaluation. Rather, it is an exercise in promoting organizational learning and the diffusion of hard-won knowledge. We begin by trying to understand just how far the IRS has come in rising from the depths of 1996.

A Cautionary Tale

By virtually every account, whether press, advisory panel, government oversight entity, or Internal Revenue Service personnel themselves, the IRS Tax

A Visit to the IRS Digital Diary: A Hypothetical Case in Point

Let’s call our hypothetical 2002 taxpayer John No-Doe. Seeking to minimize pain from tax year 2001 liabilities, seeking information, and seeking to procrastinate a bit, John No-Doe decides to check out the IRS website at www.irs.gov. The home page, “Digital Diary,” has a newspaper-like façade and, surprise, some tax collector humor (e.g., describing the website as “faster than a speeding 1040 E-Z” and “printed daily and you don’t even have to recycle!”), along with an entirely humorless reminder “31 days until April 15.” The website is visually interesting and more what he would expect from *Salon* than from a stodgy government agency. A glance at the sidebar shows something that looks like an advertisement similar to ones appearing on Yahoo: “Order your 2001 Tax Products CD ROM Today!” John clicks, takes a look, and a web page opens with a nice graphic and more corny humor, “stay in shape with your taxes [barbell icon] and maybe fatten your refund [money icon].” John notes that the humor is not so great, but, after all, it is the IRS, not the

Onion. But the CD looks pretty good, offering current year tax forms, instructions, prior year forms, prior year publications, electronic forms, IRS bulletins and web page updates. It costs \$21, but is “discounted.” John clicks to order and finds an order form that would do credit to Amazon.com. And, speaking of credit, they will take any major credit card.

John’s next move is the IRS “e-file” button. On the ensuing web page, he finds a set of online streaming videos. He clicks on “Making Filing Taxes Less Taxing for Individuals,” and before he knows it, his Windows Media Player has loaded and he is listening to Mark Hamill (yes, Luke Skywalker himself) explaining e-filing. After checking out other IRS web tools, including a powerful search engine, links for personalized help, and up-to-date information on everything from employment opportunities to a disaster relief Q and A, John intones the ultimate cyber-surfer accolade: “Cool!”

Systems Modernization effort of 1990-1996, the largest program of information technology development and renewal ever undertaken by a U.S. federal agency, was a signal failure. Critics of TSM differ only in the degree of severity of their criticism.

- In 1996, Representative Jim Lightfoot, the Iowa Republican who was then chairman of the House appropriations subcommittee overseeing the IRS, characterized Tax Systems Modernization as “a \$4 billion fiasco.”²
- Then-Deputy Secretary of the Treasury Lawrence Summers, to whom the IRS commissioner reported, told a congressional oversight committee: “Let me put it plainly. TSM went off track. They tried to build the Taj Mahal.”³
- Senator Bob Kerrey, co-chair of the National Commission on Restructuring the IRS, observed that “while the world has moved into the wireless age with home banking, ATMs on every corner, and stock investing over the Internet, IRS technology has remained stagnant.”⁴
- A National Research Council study committee on Tax Systems Modernization (established at the behest of the IRS) concluded its five-year study saying, “technical lapses appear symptomatic of a fundamental management problem plaguing TSM.”⁵ (The National Research Council is the principal operating agency of the National Academy of Sciences in undertaking studies for government and the scientific and engineering communities.)
- Perhaps most damning, a long string of General Accounting Office (GAO) reports, ground out year after year, specified scores of technical and managerial shortcomings of the IRS modernization effort.

The IRS information technology renewal effort stands out as one of the most striking and well-publicized failures—apparently, at least—of public management. With so many talented people, both in the IRS and in private sector partner organizations, using so many resources, for so long a time, on so vital a project, how could this happen? Is it the enormity of the task? Is this level of technology renewal simply beyond human ability to manage? Is it the nature of *public* management? Is IT inherently more difficult in a government setting? Or is it something about

the IRS? Do the unique history, culture, and mix of assets and liabilities combine in some way to diminish the likelihood of success? Most important, are the IRS information technology management shortcomings a unique historical artifact—a convergence of time, place, people, and circumstance so unusual as to bear no resemblance to any other institutional challenge—or are there lessons to be learned, lessons that may be useful not only for the IRS but also for other government agencies?

If there was a sort of starry-eyed optimism in the funding zenith at the beginning of Tax Systems Modernization in the early 1990s, any hope for quick victories gave way long ago to a sober appreciation of the dimensions of the task. In interviews with IRS personnel, interviews that are central to this analysis, one theme that cut across the heterogeneity of experience is “we are humbled.” This is not a surprising change given that criticism has been sharp and steady. Despite the contributions of distinctive aspects of the IRS to the problems encountered in TSM, the IRS case is not unique. Most of the problems encountered by the IRS in its IT renewal efforts are ones that most agencies face when confronting enormous changes in management and technology.

Were the IRS case essentially *sui generis*, it would be of little theoretical interest, but would still be of great practical import. Were the IRS case unique because the IRS is a uniquely mismanaged agency, then we would simply expect that well-managed agencies would not repeat the same mistakes. But the IRS is *not* uniquely mismanaged; in many respects, the IRS is quite well managed, having (now and in the past) competent top leaders, strong career public management traditions, solid training programs, and the respect of many of the people who work most closely with IRS—vendors, contractors, and other government agencies. Indeed, in the 1960s and early 1970s, the Internal Revenue Service was often cited as a bastion of quality public management and only after a series of crises beginning in the late 1980s did the managerial reputation of the IRS begin (in many ways unfairly) to decline.

The IRS failures with IT modernization are of great interest *because* the IRS has talented managers and, in many respects, excellent resources. If the IRS IT modernization failures comprise a morality tale, its name should be “How Good Managers, Confronting

a Critical Mission, with Great Dedication and Billions of Dollars, Can Nonetheless Fail.” It might be subtitled “How They Have Begun to Recover.”

Objectives and Approach

After reviewing more than 100 IRS reports and working documents, and an even larger number of reports produced by oversight agencies and critics, and after interviewing a great many IRS employees, consultants, government overseers, and other knowledgeable people—and after serving two terms on the National Research Council committee to advise the IRS on Tax Systems Modernization—the author has naturally formed opinions about the steps that are most likely to enhance the success of the IRS IT modernization efforts. But making recommendations for IRS is *not* the primary objective of this study. The IRS suffers no dearth of suggestions. Despite the fact that this research focuses intensively on IRS IT modernization efforts, the purpose is to develop “lessons learned” rather than prescriptions for IRS action.

The focus here is on lessons that seem important for any government agency undertaking implementation of large-scale IT projects (referred to here as “information mega-technology projects”). Naturally some of the IRS experience is not readily generalizable. A part of this story is about unique features of the IRS—its unique culture and peculiar mix of organizational and managerial strengths and weaknesses. But much of the story of IT modernization at IRS is quite relevant to most any federal agency and, perhaps, to state and local agencies and even to large private firms. Much of the story is political, but the political tensions are familiar ones. Much of the story pertains to organizational processes that are part of any government agency—issues related to hiring, contracting and contractor management, and purchasing and acquisition.

The chief focus of this study is the period 1990-1996 and the initiative known as Tax Systems Modernization. But periods before and after that era are examined as well, albeit in less detail. A historical and chronological perspective is necessary because it is not possible to appreciate fully the IRS IT modernization effort as a snapshot frozen in time. An understanding of TSM and the ways in which IRS rose from its ashes requires working knowledge of the beginnings of computerization in the 1960s, the proliferation of systems during the next decade

or so, the earliest IRS plans for IT renewal and modernization in the late 1970s, and the earliest forms of Tax Systems Modernization circa the late 1980s. Similarly, the steps taken after TSM must be understood, and thus there is some attention to highlights of IRS IT management from the TSM period to the present. But the chief focus is on the TSM period and understanding just what went wrong.

Any study of IT management and implementation that divorces technology and management does so at its peril. But the emphasis here is on management. Most of the failures IRS has suffered are not primarily technology failures. Indeed, even at this late date, relatively little technology has been put in place under the IT modernization label. Small-scale problem-solving technology has been continually created and has evolved as the IRS solves operations problems.

In addition to reviewing documents and reports, the study is based on interviews with more than 100 key people, including, among others, current IRS employees, former IRS employees, consultants, and officials of oversight agencies. The names of the individuals interviewed for the study are not given. While no promises of confidentiality and anonymity were made, it seems that little is gained by identifying interviewees. Thus, while the report includes ample quotations and paraphrases, they are not attributed. In the few cases where quotations are attributed to individuals, the source is not the author’s transcripts but quotations from public domain resources.

The interviewing approach employed is best described as “tailored semi-structured.” While a few themes were common to all interviewees, particular care was given to identifying the particular role, perspective, and historical vantage of the interviewee and tailoring questions to the individual.

The organization of this report is as follows: the ensuing section provides a sketch of the IRS, focusing particularly on its IT needs. Then the core case of TSM is considered, along with a brief pre-TSM history. This is followed by a discussion of post-TSM activities. Then alternative explanations for TSM problems are explored, using the interviews as a primary source of data. Finally, a conclusions section focuses chiefly on “lessons learned.”

The IRS and Its IT Challenge

The Bureau of Revenue, as the IRS was known before 1953, was not in its early years an organizational behemoth, not even by the standards of the day. Before 1800, the United States relied chiefly on customs duty for its revenue. In 1850, customs duties yielded \$25.6 million, whereas internal revenue produced less than \$50,000. This changed dramatically as an income tax helped finance the Civil War. In 1862, the Office of the Commissioner of Internal Revenue included only three clerks in the Treasury Building, but after the passage of the Revenue Act of 1862 their number was closer to 4,000. This was about the size of the Bureau of Revenue for the next 50 years, with growth spurts occurring predictably during World War I and World War II. Even as late as fiscal year 1939, the 6.5 million citizens who paid income tax provided only \$1 billion in revenue, about the same amount as excise taxes yielded. But by the peak war year of 1945, 48 million taxpayers were paying \$19 billion in income tax revenue. Unlike previous wartime spikes, the income tax did not recede after World War II.⁶ In 1952, the Bureau of Revenue underwent a massive reorganization, creating the modern IRS as a geographically distributed organization that was to change relatively little in its structure until the IRS Restructuring and Reform Act of 1998, an act that not only fundamentally changed the organizational structure of the IRS but its mission as well.⁷

An event that did not make much of a news ripple in 1961 is, in retrospect, a crucial element of IRS history. It was in 1961 that the IRS took its first giant step into the computer age, opening its National Computer Center in Martinsburg, West

Virginia, the county seat of Berkeley County, West Virginia. The Martinsburg center is the home of the IRS Masterfile on taxpayers, a system vital to the functioning of the IRS, which includes information on virtually every taxpayer. In 1961, the computers and software of the Martinsburg center were near state-of-the-art. In 2002, they are antiquated and would be more at home in the Smithsonian than in one of the most complex information-processing organizations in the world. For years, a major challenge to the IRS has been to find ways to improve the Masterfile while at the same time ensuring that the most vital part of the system does not come crashing down. The IRS has succeeded in a large number of IT modernization tasks, but Martinsburg Masterfile renewal is not yet one of them.

There is a prodigious gap between today's IRS operational requirements and its information technology resources. Few organizations, public or private, have a more daunting operational mission than the IRS. The agency's activities are the lifeblood of the federal government. The IRS is responsible for collecting more than \$2 trillion in gross revenue each year, more than 95 percent of the federal government's total revenue. The IRS employs more than 100,000 people to accomplish its mission.

Perhaps not surprising for an agency employing so many accountants and statisticians, the IRS provides a wealth of statistical information about itself. In reviewing the statistical reports issued by the IRS, one cannot help but be impressed by the magnitude of IRS operations. One study projects that more than 232.5 million tax returns (of all types)

were filed in calendar year 2001 and estimates that by 2007 the figure should reach 258 million.⁸ The individual income tax form (1040, 1040A, 1040EZ, 1040PC) constitutes the bulk of returns—130 million in 2001—but not necessarily the bulk of content (since single corporate income tax forms 1120 and 1120S can run to book length).

In 2001, the estimated number of electronic filings was 42.3 million, with the expectation that this number should grow by an average rate of about 12 percent per year to the year 2007.⁹ This means that among the 143 million individual tax returns expected to be filed in 2007, 73 million (51 percent) are expected to be filed electronically. Some of the most important statistics about IRS tax operations do not relate to time series projections but to big policy changes that render each filing season unique (and thus limit the “programmed” aspects of IRS work). For example, just in the 1999 tax season alone, new changes in the tax code changed the expected yield by tens of billions as relatively minor changes were made in the deductibility of student loans, child tax credits, earned income tax credits and capital gains taxes.¹⁰ Similarly, the 2001 Bush administration tax cut and its tax rebate of \$500-\$600 for most taxpayers required a prodigious and not entirely predictable commitment of human and information resources. IRS operations are anything but static.

Excepting military information technology users, IRS is perhaps the single largest organizational information technology user in the world. Among the more than 100,000 full-time and seasonal IRS employees, over 70,000 use computers to deliver services to taxpayers. The IRS installed base (IRS officials no longer use the out-of-favor term “legacy systems”) includes a network of 40 main-frame computers, 871 mid-range computers, over 100,000 personal computers (desktop, laptop, and Personal Digital Assistant [PDA]), 2,779 vendor-supplied software products, and over 50 million lines of IRS-maintained computer code.¹¹

Several aspects of the IRS IT operation are the envy of other nations’ tax agencies. Many of the IRS IT capabilities are unique among tax agencies and others are, if not unique, state-of-the-art. Yet, despite the important IT progress the IRS has made in the past decade or so, progress often overlooked

amidst the storm of modernization criticism, the IRS still has not achieved many of its most important IT goals. Even today the IRS continues to have relatively limited interoperability, insufficient integration, and relatively few modernization project successes. Most important, the IRS remains (as we all do) at the mercy of the Martinsburg Masterfile, its computer tapes, and its near-retirement (or post-retirement) Assembly Language Code (ALC) programmers. So we return to the question advanced at the beginning: “How could something so important go so wrong for so long?” Much of the answer to this question requires an understanding of not only recent modernization efforts but also pre-1990 failures.

Information Technology at IRS: From “Pre-history” to TSM

Early History

The automation of tax-return processing has long been a dream of IRS officials. In 1918, IRS Commissioner Dan Roper, using Frederick Taylor-style task measurement and design, found that the name, address, and amount of tax from each taxpayer needed to be recorded at seven different points in the processing procedures. He set out to acquire the latest efficiency-promoting technology: mechanical stencils. Similarly, in 1927, David Blair, IRS commissioner during Calvin Coolidge's administration, purchased 16 automated folding-and-sorting machines. One of a long line of IRS technophiles, Blair bragged that his new machines were capable of doing the work of three human processors.¹²

The ultimate technology great leap forward, though, was in 1961 with the beginning of the Martinsburg-based National Computer Center. This was the dawning of the IRS computer age and carried with it a new managerial verity, one affecting every technology-based organization: the need for periodic technological and managerial renewal.

The technological renewal imperative was not lost on the IRS, but the efforts to renew have been highly variable in their scope and effects. In some cases, IRS successes or failures in its renewal efforts have been very much due to the efforts of IRS officials, but in other cases the key has been congressional satisfaction or dissatisfaction and its largesse or tightfistedness. In every case, IRS renewal efforts can be understood as a complex mixture of external political happenstance, IRS leadership, organi-

zational culture, bureaucratic change, changing demographics, and tax law.

The mini-history presented here considers three periods of IT renewal: the first focusing on efforts prior to the 1989-90 launch of the ambitious Tax Systems Modernization, the second during the TSM period, and the third since the 1996 criticism and dismantling of TSM and the subsequent effort to bring IT renewal to life with a different, smaller scale, more incremental approach. The TSM period is given greatest attention here because it is the most instructive. TSM is in many respects a cautionary tale for what can go wrong with public sector mega-technology programs.

Pre-TSM IT Renewal Efforts¹³

The most important thing to know about IRS early modernization efforts is that they largely fell on deaf ears. Computer-based processing went nationwide in 1967, and the IRS computer system was widely viewed as leading the world in the automation of tax collection. IT renewal plans were developing at the same time as the system was being brought online throughout the nation. The “System of the Seventies” was developed in 1969 and, since the chronology-based title was not so exciting once the 1970s arrived, was soon renamed the Tax Administration System (TAS). This system, the IRS's first major renewal effort, was also the first to fail.

Interestingly, IRS early modernization efforts were to some extent a casualty of Watergate. The Tax Administration System was projected to cost \$649 million and to be rolled out in the early 1980s.

The proposal went to Congress in September 1976. The timing could hardly have been worse. With Congress still reeling from Watergate, including President Nixon's political use of the IRS to snoop for information about those on his infamous enemies' list, Congress was not eager to enhance the ability of the IRS to gather and manage information on taxpayers. When in 1977 the Office of Technology Assessment provided a report raising many questions about the privacy and security protections under TAS, the initiative was essentially dead.¹⁴ Congress simply advised the IRS to replace worn-out computers, nothing more.

The next IRS attempt to develop a sweeping IT renewal was the innocuously titled Equipment Replacement and Enhancement Program, later the Equipment Replacement Program (ERP). Congress found this sweeping plan indigestible, but provided a modest technology upgrade increment for the IRS budget for a program labeled Service Center Replacement System. In 1983, a comprehensive technology improvement plan was presented to Congress under the name Tax Systems Redesign (TSR). With a price tag of \$225 million, TSR was to be rolled out in 1985. Part of the strategy to get approval for the comprehensive change under TSR was to show gains from the Service Center Replacement System. IRS haste to introduce new technology for the 1985 tax season was in large measure responsible for the infamous 1985 service center "meltdown." This system collapse was an event that lives in infamy, but was, at the same time, the chief impetus for congressional support of Tax Systems Modernization.¹⁵

The systems replaced under the Service Center Replacement System led to the well-publicized episode often referred to as the Philadelphia Service Center calamity. Actually, it was even worse than usually portrayed. The story broke in April 1985, after a janitor reported finding unopened and often mangled returns in the bathroom and in wastebaskets outside the Philadelphia Service Center. Of the 109 envelopes recovered, 94 had checks made out to the government, all totaling more than \$300,000.

What most people did not know at the time is that the other service centers were experiencing delays and Ludditism equaling the Philadelphia experi-

ence. The new systems simply did not work. The result of implementing a poorly tested system was that tax processors could not do their jobs and often panicked. This, in turn, resulted in postponement of return processing at a cost \$15.5 million in interest payments on delayed refunds.¹⁶ After receiving angry mail and phone calls from constituents, members of Congress quickly agreed that a technologically inept or backward IRS was not in the nation's interest or their own political self-interest. The response to the service center meltdown was an unusually lavish reward for failure. In 1989, Tax Systems Redesign became Tax Systems Modernization, replete with an open checkbook and broad latitude about the design, acquisition, and implementation of new IT technology.

The TSM Saga

After the 1985 service center technology meltdown, Lawrence Gibbs, a Washington tax attorney, was appointed IRS commissioner and given a mandate to make the IT systems work. Gibbs began by soliciting the ideas, opinions, and experience of government and corporate executives who had designed or implemented large IT systems. He told the *New York Times*, "We knew we didn't have all the procurement and technical capability in information systems we needed ... (w)e were not a bunch of bumbling bureaucrats who just started off not knowing what we were doing."¹⁷ One of the lessons learned from consulting the experts was that it was not sensible to just let a contract and have an industrial group or consortium design and implement the system. According to Gibbs, the received wisdom was that agency officials should be deeply involved in every aspect of IT renewal, not only because of the unique experience of the IRS in collecting the nation's revenue but also because "you can't just throw this to the outside and have people within the agency buy into it. Even if you bring in state-of-the-art systems, you're going to have difficulty making them work unless people inside accept them."¹⁸

In 1989, Tax Systems Modernization began with considerable fanfare. Congress had been told that TSM was likely to cost \$4 billion and would not be fully operational until about 2000, and Congress did not blink. Furthermore, Congress, as well as the George H. W. Bush administration, had become convinced that the job was best accomplished by

insiders, persons with knowledge of “the business side,” rather than by outside contractors who, while perhaps having more technical knowledge, would need years to learn about the IRS and its operations.

The new commissioner, Fred Goldberg, a tax attorney by training, appointed the first IRS CIO, Hank Philcox, an IRS insider who had risen from the ranks after beginning as a revenue agent. In 1990, Commissioner Goldberg approached the National Research Council (NRC), asking it to set up a study committee to provide technical and management advice about TSM. The NRC’s Computer Science and Telecommunication Board appointed a committee that included, among others, academic researchers from a variety of backgrounds, ranging from computer science to public administration, CEOs who had helped design and implement large IT systems, a privacy lawyer and privacy advocate, a high-level union official, a former IRS commissioner, and IT officers from other government agencies.¹⁹ The committee was chaired by Robert Clagett, a member of the National Academy of Engineering and a retired AT&T technology manager.

The committee began its operations August 27, 1990, in Washington, D.C., at the National Academy’s Wisconsin Avenue offices. Commissioner Goldberg and Philcox began by introducing the key IRS players and assuring the committee of the IRS’s interest in and receptivity to independent criticism. Among those key players were Mark Cox and Wally Hutton. Cox was the TSM executive in charge of all new projects and Hutton was the person who was to keep the train running, making sure that the existing systems functioned even as they were to be phased out over a 10-year period. In early meetings, the IRS provided drafts of its Design Master Plan, the overall operational plan for developing, integrating, and implementing the many projects envisioned under TSM.

In November 1990, Philcox shared the early TSM vision with one of the IRS’s major stakeholder groups, professional accountants. In a paper published in *The CPA Journal*, he noted that TSM operated under a “double imperative—first, that we be clear in our own minds about where we are headed, and second, that we articulate our plans to stakeholders and prove we are serious about

incorporating their ideas.”²⁰ He went on to emphasize the careful planning behind TSM, noting that while most of TSM would not be implemented until about 2000, “specific milestones and clear objectives already direct us every step along the way. Already, more than 40 major modernization projects have been identified.”²¹

What is especially interesting about that early article, especially in light of the failure of much of TSM and the dismantling of most of the “more than 40 major modernization projects,” is Philcox’s assessment of the risks. Under a section entitled “What Can Go Wrong?” he began by dismissing some possible threats. Executive turnover was not a problem because TSM “is not the brainchild of any individual IRS commissioner or chief information officer” and because the approach also “represents the accumulated wisdom of outside experts—private sector information technology specialists, members of Congress with IRS oversight responsibility, General Accounting Office government-wide directives, and an independent review by the National Academy of Sciences.”²² (Philcox may have had his rose-colored glasses on here since the private sector information technology specialists were not formally represented at the time, the Congress certainly had no ability to design or evaluate the technical details of an information system, GAO at that time had very few relevant government-wide IT directives, and the NRC system appoints [pro bono] persons who have their own full-time jobs and who meet irregularly and work episodically with NRC staff to craft a usually brief report.)

Philcox perceived the chief threats to TSM as factors external to IRS. One threat was the red-tape-bound legalistic federal procurement system of 1990, a system designed to procure standard commodities and a system permitting endless challenges from disappointed bidders. A second perceived threat was the annual federal budget cycle and the lack of a multi-year capital budget. Finally, Philcox viewed federal personnel constraints as a possible Achilles’ heel, including the difficulty of paying competitive salaries to persons with technical skills. The 1990 federal personnel system generally based pay rates on number of people supervised rather than technical qualifications for technical jobs.

Once TSM was fully under way, project ideas were developed at a staggering rate. Table 1 provides a list of TSM projects and acronyms, not only to suggest the proliferation of projects but also as a glossary for some of the projects that are described below only by their acronym.

As the projects proliferated, so too did the sense that not all was as it should be. One of the first highly public TSM embarrassments occurred with a 1993 GAO report finding that the IRS could not account for \$301 million of TSM expenditures.²³ But the most important problems with TSM had less to do with financial management than technology management.

By 1996, the list of canceled and endangered projects was piling higher and higher. Cyberfile, an experiment to permit submission of tax returns over the Internet, was canceled at a cost of \$17.1 million. As the primary plan for moving from paper to electronic forms, the Service Center Recognition/Image Processing System (SCRIPS) was one of the cornerstones of TSM. But the technology never came up to standard. After noting that it was not possible to determine exactly how much the IRS had spent on SCRIPS, due to the fact that the IRS “does not have an accurate cost accounting system,” GAO estimated in its report that SCRIPS had already cost \$145 million, despite no sign of technological viability, and was on track to cost another \$140 million.²⁴

The Corporate Accounts Processing System (CAPS) was meant to create a single integrated database of taxpayer account information. The idea was to resolve corporate issues immediately via access to the CAPS database. The system was terminated after \$179 million was spent on it. The Integrated Case Processing (ICP) system was supposed to permit customer-service representatives to access in one step all the data needed to answer taxpayer questions and resolve problems. A total of \$44.8 million was spent on ICP before it was suspended.

**Anatomy of IT Management Failure:
The Document Processing System**

The project that sounded the death knell for TSM was the Document Processing System (DPS), a \$1.3 billion system to digitize paper tax returns.

Table 1: TSM Projects and Acronyms

Project Acronym	Project Title
ACI	Automated Criminal Investigation
AICS	Automated Inventory Control System
ALSS	Automated Litigation Support System
AUR	Automated Underreporter
CAPS	Corporate Accounts Processing System
CASE	Counsel Automated Systems Environment
CFOL	Corporate Files on Line
CHEX	Check Handling Enhancement Expert System
CPS	Case Processing System
CSM	Corporate Systems Modernization
DPS	Document Processing System
EF	Electronic Filing
ELF	Electronic Filing (test project for Cyberfile)
EMS	Electronic Management System
ICP	Integrated Case Processing
ICS	Integrated Collection System
MIA	Mirror Image Acquisition
OCRSR	Optical Character Reader System Replacement
SCRIPS	Service Center Recognition/Image Processing System
SERP	Service Electronic Research Project
TIES	Totally Integrated Exam System
TSAW	Taxpayer Service Advanced Workstation
TSIS	Taxpayer Service Integrated System
WMS	Worldwide Management System

After spending \$284 million of the total cost of the project, the DPS was scrapped. The trial runs indicated that the system was not functioning at an acceptable level and had little promise of accurately capturing sufficient digital images to allow replacement of paper processes.

Like SCRIPS, the Document Processing System was meant to create optical images from paper returns, converting them to a readable format for the agency's computers. DPS was central to the TSM development plan. The idea was that TSM would be an integrated system and that DPS would be one of the chief links. Thus, tax returns would be processed by DPS, by electronic filing (ELF, later Cyberfile), and by telephone filing (TeleFile), and each of these would result in the same form of electronic tax return that would be routed to a central computer. In this format, data could be retrieved according to IRS business needs. The vast majority of IRS forms were to be channeled through the DPS system.

The DPS system included high-speed, non-impact printers, document processing equipment, and forms-conversion software. The intention was for DPS to read data from 1040 forms and, ultimately, all of the 285 IRS forms. The chief DPS contractor was Lockheed Martin Corporation, but a stable of software and hardware vendors lined up behind the Lockheed Martin prime contractor, including IBM/Pennant and Elixir Technologies Corporation, among others.²⁵

The target date for IRS-wide rollout of DPS was 1996. Instead, that was the year the project was terminated. When DPS was closed down in 1996, IRS Commissioner Margaret Richardson said, "Given the revised priorities and budget realities for the next several years, the IRS has decided not to invest additional resources in DPS."²⁶ The contract with Lockheed Martin was canceled as a "partial cancellation for convenience," which is another way of saying that considerable negotiations occurred to enable the cancellation, with all parties agreeing that contractor performance was not a factor and that the option remained of re-opening the contract (which, of course, no one contemplated doing).

The chief problem was not changing priorities or cost overruns but the simple fact that DPS did not

work. The scanning state-of-the-art system did not seem to be up to the IRS need to examine forms that included both handwritten and typewritten information, not to mention notes taped or stuck on. The GAO's Rona Stillman, chief computer scientist, noted: "At the time they were closing it [the DPS project] down, they were asking, 'Which forms should be read? How much of the data should be read?'—those are questions that should be asked at the beginning, not \$280 million into it."²⁷

According to one former IRS official who was intimately involved with DPS, there were two sorts of failures—one technical, the other a failure of managers to see the inevitability of technical failure:

The technology simply wasn't ready. The character recognition was around 50 percent, so you miss one number you miss them all. For it to be worth the money, it had to have downstream benefits such as seeing the image of tax returns rather than pulling it. You need to see all the return—margin notes, Post-its, etc. If you capture all the data, you can store, generate cases, and have a way to get images distributed. You can have workstations and tools in the hands of customer service reps so they can use it.

When asked how this project got so far along if only 50 percent of the forms material could be read, the former IRS official replied:

Right in the middle of DPS [one of the project managers] said we would actually have more keystrokes with DPS than we did before. He even showed us. The big problem was moving paper through the system, just like a paper jams in a Xerox machine. [A project manager] went to see a demo and said they have nice pristine returns with no Post-it notes or paper clips. They had returns in stacks of eight at a time, and they did it because the machine jams and the block of a hundred has to be rerun, so they were done eight at a time. But there was so much pressure keeping the thing going, tacit pressure but still there, people sometimes said they can do it in six months. They couldn't do it, but

they felt so much pressure. People were not going up the line and airing their bad experiences. It was not a good atmosphere for saying “my project isn’t working.”

The same thing happens in my shop. We go overboard to tell people we expect them to have problems, create an open atmosphere, but that’s tough for people to believe. They think they will get shot if they say their project has a problem. That’s what happened in 1985 [with the Service Center breakdown]—they were trying to be good soldiers, got to have that “can do” attitude, got to make it work myself. They say, “We are going to fix it, we are going to fix it, we can’t fix it.”

The DPS case encapsulates many of the problems IRS has had with IT renewal, especially under the TSM regime. Many factors contributed to failures. The causes are multiple. The nature of the technological task was (and remains) very difficult, as in DPS. The operational benchmarks are not entirely clear, as in DPS. The organizational culture undermines communication, as in DPS. But many of these problems have been resolved and others diminished.

Post-TSM: Picking up the Pieces

The IRS experience with TSM has been a force for revolutionizing the agency. As is so often the case, disaster has chipped away at old assumptions. Since 1997, the IRS has adopted a new, sweeping strategic plan, undergone its most significant reorganization since the early 1950s, and even changed its mission from one focused chiefly on revenue collection to one elevating taxpayer service to the highest of priorities. It has its first IT-savvy commissioner, Charles Rossotti, and has had a succession of CIOs with significant high-level IT experience in government or industry.

These changes have not gone unnoticed. According to Sharon Cranford, an officer of the National Association for Enrolled Agents, a group representing taxpayers in dealings with the IRS, “the cultural shift is enormous ... [the IRS] is a case study in how to overhaul an agency and do it right.”²⁸ Even the National Treasury Employees Union (NTEU), a group representing 97,000 of the IRS’s 102,000 employees and a group often at odds with IRS management, is impressed by the IRS’s post-TSM progress. Robert Tobias, then NTEU president, noted that the “IRS is really headed in the right direction for the first time in [the] 30 years I’ve been working with them.”²⁹ Considering not only these unlikely testimonials but also a positive GAO report on the IRS modernization blueprint,³⁰ one infers that not only is the revolution well under way, but that it has a good chance of victory. The IRS now has more technical expertise on top and on tap, it has a prime contract to help it develop and implement IT, and it has the confidence of its external political overseers.

What IRS does not yet have is a new, high-performing, integrated IT system. Instead, the IRS has undertaken two extreme challenges in place of one. In the words of a GAO report: “The sheer magnitude of undertaking both business and systems modernization will strain IRS’s management and staff. Such an ambitious undertaking, along with the need to ‘stay in business,’ makes the restructuring initiative a high-risk venture that will take years to fully implement.”³¹

Indeed, it will take years, probably at least another five or six, to implement fully the restructuring and, in tandem, IT modernization (and both Commissioner Rossotti and GAO officials agree that the two must be undertaken simultaneously). What this implies for the task at hand—the task of analyzing the development, implementation, and management of IT mega-technology—is that lessons must be distilled not from a completed episode but from a never-ending story. This is perhaps fitting in one sense: IT renewal in any large organization is never completed but evolving. But in another sense, the IRS story is not only never-ending but still writing its early chapters. Even today, more than 12 years after the term “Tax Systems Modernization” was developed, very little new integrated IT technology or systems have been implemented by IRS. Thus, rather than providing an evaluation of post-TSM efforts, this section provides a brief overview of major post-TSM activities. While there have been several important changes during the post-TSM period (1997-present), the ones most important for IT modernization are: 1) the Modernization Blueprint and statutory

change, 2) the award of the prime contract, and 3) changes in IT management.

“Modernization,” Blueprints, and Statutory Change

The IRS mission was changed not by agency introspection and self-assessment but by statute. The IRS Restructuring and Reform Act of 1998 (RRA) changed the IRS mission from a major focus on compliance to “provide America’s taxpayers top quality service by helping them understand and meet their tax responsibilities and by applying the tax law with integrity and fairness to all.”

The IRS has gone from Tax Systems Modernization to Business Systems Modernization (BSM),³² implying a from-the-ground-up overhaul, starting with the mission statement but reaching nearly every aspect of the IRS. According to the RRA, “the Internal Revenue Service shall review and restate its mission to place a greater emphasis on serving the public and meeting taxpayer needs.”

One means of achieving the new taxpayer service mission is through a mandated reorganization focusing on taxpayers with similar needs rather than the traditional regional and functional organization. In 1998, the IRS organizational structure was based chiefly on districts (33) and service centers (10), with each taxpayer being served by one of each. These offices were divided into functional units including Examination, Collection, Criminal Investigation, Submissions Processing, and Customer Service. These district offices and service centers reported to one of four regional offices and the national office, which also operated three computing centers. The hierarchy included eight levels between the first line managers and the deputy commissioner. Under the new structure, first proposed in 1998 and implemented in 1999, there are four divisions, based on taxpayer type and serving integrated functions. These operating divisions include Tax Exempt and Government Entities, Large and Mid-Size Business, Small Business and Self-Employed, and Wage and Investment Tax Payment. Two agency-wide divisions include Shared Services, focused on facilities and procurement, and Information Technology Services, the new home of IT and directed by the IRS CIO. Interestingly, the Infor-

mation Technology Services unit includes 7,000 employees, making it larger than the Shared Services unit, larger than any of the remaining functional units (Appeals, Taxpayer Advocate Services, Criminal Investigation), and larger than one of the four operating divisions.

While it is too early to judge the impacts of the reorganization, it is certain that there will be important impacts on information technology. One result is that the IRS 1997 “blueprint” for IT modernization required updating. In May 1997, the IRS released its *Blueprint For Technology Modernization*,³³ the chief legacy of then-CIO Arthur Gross (who resigned shortly thereafter and was replaced by Paul Cosgrove). This first blueprint included the following principles, based in large measure on recommendations of a 1995 GAO report:³⁴

1. Ensure that the modernized computer system maximizes IRS employees’ ability to serve taxpayers.
2. Develop a centralized, mainframe computer system that guarantees taxpayer privacy and minimizes cost.
3. Fully integrate the central computer with the existing computers and enable all systems to communicate.
4. Require that technological improvements be implemented incrementally; that new stages be installed only when previous stages have been proven successful.
5. Provide credible estimates of potential cost and deliverables before implementation.

This version of the blueprint included the following requirements:

- A centralized and flexible system that is capable of adapting to constant changes in tax law.
- A computer system that is easy to use and enables IRS employees—customer service representatives and compliance personnel—to access accurate and timely information from one terminal in order to be more productive and offer better service.
- A centralized database that better analyzes taxpayer records to improve compliance.

- An interactive computer system that will move the IRS to a paperless system, decrease operating costs, and expedite processing of taxpayer returns and refunds.

While there is little in the RRA that explicitly invalidates the earlier blueprint, there are several important differences of emphasis. And, as the GAO noted, the fact that the first blueprint was completed eight months before the commissioner announced the reorganization “raises questions about the modernization blueprint’s validity.”³⁵

In *Modernizing America’s Tax Agency*,³⁶ the document that plots a new course for the agency, IT is featured prominently, both as a cause of past problems and as a solution in progress. The current approach is described as follows:

The approach that the IRS is taking to deal with this monumental task [IT modernization] is to establish an overall architecture for a set of new systems that will accommodate all essential tax administration functions according to modern standards of technology and financial management. Achieving this new system architecture must then be accomplished by defining a sequence of targeted and manageable size projects that meet important and specific needs while, at the same time, working to complete the overall architecture.

This approach is, indeed, different from that employed in TSM and is more incremental than holistic. It remains to be seen whether the approach will be effective, but it certainly seems to fit better with new realities, including an appropriations process that entails more scrutiny. This additional scrutiny is not confined to the IRS. The Information Technology Management Reform Act of 1996 (the Clinger-Cohen Act)³⁷ requires corporate-style capital planning for IT projects.³⁸

While the financial accountability for IRS IT development seems clearly to have improved, the question of IRS architecture remains controversial. In his barbed commentary after leaving a high-level IT post, a former IRS executive quotes Lincoln:

It is said that Abraham Lincoln once pointed to his dog asleep on the porch and asked his companions, “Gentlemen, if we call a tail a leg, how many legs does a dog have?”

“Five,” they said.

“No, gentlemen,” he replied, “you are wrong. Calling a tail a leg does not make it one. The dog has but four legs.”

And, despite the best of intentions, calling someone who is not an architect an architect does not make him or her one. One becomes an architect through years of training and experience. It takes the ability to extract the general from the specific. It takes the skill to cut through complexity to abstract the essence. It takes the experience to know how to describe the architecture of a complex system in a handful of pages of picture and text, the will to do so, and, most importantly, understanding why you must do so. It also takes the artistry to describe all of this clearly.

It is clear that the IRS has an IT architecture and, indeed, has had several—of a sort. Whether the plans are now ones that can be implemented and will lead to meeting operational requirements remains to be seen. Presently, relatively little new technology is being introduced, and the effectiveness of IT implementation cannot be determined until there is additional technology in the field.

Whether or not there is an “architecture” (an issue that seems to depend on the visual perspective of the beholder), there is an IT blueprint. While the latest blueprint was jointly developed by the IRS and the Prime Systems Integration Service Contract (PRIME) contractor Computer Science Corporation (CSC) (see next section), it draws upon the one developed in 1997 by then-CIO Arthur Gross. The blueprint takes into account not only the reorganization of IRS but also new developments in IT technology and needs. The blueprint, unveiled in January 2001, is to serve as a guide, albeit one often readjusted, for the next 15 years of IT modernization. The components of the revised blueprint include:³⁹

Excerpts from a Conversation with Charles Rossotti Commissioner, Internal Revenue Service

(In February 2002, Barry Bozeman interviewed Commissioner Rossotti to discuss this report and to obtain his perspectives on the IRS Tax Systems Modernization [TSM] experience.)

On the Challenge of TSM

The problem was where we started. We were far behind [in technology] when we began modernization. In the private sector, if you were this far behind the curve, you wouldn't be around. Either you would have long ago gone out of business or someone else would have acquired you. We were really far behind and the system was very big and very complex. If you put all this together, it means that management is on the extreme edge. Even now we still have [outmoded technology in] Martinsburg, we have no systemwide data administration function, no systemwide database.

On Reorganizing the IRS

When I came to IRS, I actually put off some of the IT work to deal with structure issues. There was a matrix system in place and there were nine service centers and 45 district offices. I don't think we could have succeeded with that structure. Each region was a mini-IRS with its own computer center. Not even e-mail was standardized across IRS. So we did reorganization first.

On the Integrated Collection System (ICS)

What we have is not a fantastically great system, but it is a much better tool than we had eight years ago, in part because everyone uses the same system. Before, there was not standardization, too much fragmentation, and nothing could be implemented because of that fragmentation. Everyone in the regions was doing IT their own way and there was no consistency. It took two and a half years to change the structure, and now we have a centrally managed information system. Now modernization is still a big challenge, but it is doable. With the previous structure it would have been almost impossible.

On Oversight of IRS

... this is often still a problem. It makes it difficult to succeed. In technology development, you inevitably go down some blind alleys and then you backtrack

and go the right way. The ability to do this is critical to success. If you can't do this, you just go on until everything collapses. But the IRS is not always able to make the mistakes necessary [for progress and organizational learning]. We live in a fishbowl. It is difficult to make even a small mistake because it immediately gets magnified. A small mistake is quickly interpreted as "now the whole thing is falling apart." Anything you do for correction is a *cause celebre* for everyone thinking the whole thing is falling apart.

What I've tried to do is to tell people we will make mistakes and to let it all hang out. But when we do this, we are still blasted for dropping the ball. It is possible to manage this problem, but there is no solution to it.

On IRS Information Technology Accomplishments

The most important was putting a foundation in place by reorganizing the agency to be positioned for IT success. By the time we were done with Y2K preparation, we had more standardization of software and communication, consolidated mainframes, went from 13 mainframe centers to two, consolidated mid-range centers, and we reduced the number of vendor products being used. The Business Systems Modernization Office and the Life Cycle process both contributed to this.

In the next few months, we will have three big pieces delivered. First, we have a major upgrade in our phone system that expands our phone filing capabilities. Second, we have three security portals for the three main business lines. This is the hardest part, and if we deliver as planned, it will be a big deal. The third is CADE (Customer Accounts Data Entry).

These are our three building blocks. These are our enterprise-wide technologies. We also have some important targeted programs and some significant enhancements to legacy systems. Some of the

targeted programs we have coming in 12 to 18 months are electronic filing improvements and the ability to do electronic signatures. We have a great many business unit applications that will lead to improved productivity on a day-to-day basis.

On the Use of Planning Portfolios

Our planning portfolio process helped with this. We are now organized into portfolios. Before that we had no real [choice] process; it was more “who has the money,” or who shouted the loudest.

The portfolio application is important for the future because we have standard platforms and main-frames, the PCs are standard, and we have our three portal STAR security system that gives us security across the board. With all that in place, we can implement more efficiently because everything has the same software, security, and platform. By 2003 we will see more benefits from these enterprise systems, and then we can really begin to roll out the business systems benefits.

We have four or five thousand revenue agents doing corporate auditing, but they have never even had software for tax calculation; now they will. Before we had standardization it would take seven or eight years to have real change; now it can be done much more quickly, usually a year or so.

On Future Challenges

It's taken a lot longer to raise the level of service to end users than I would have liked. Service to the end user has improved, but not at an acceptable level. We're getting there, but it is taking too long. We were so far behind when we started that everything moves more slowly than I hoped. I spent 28 years doing this in the private sector, building up a company. That was tough, but this has been a lot tougher.

I think it's going to get a lot better now and that we will make more rapid progress. We will soon have a fully documented, useful enterprise architecture—our version 2.0 is a big advance over the earlier version. With this we will have a vision of the future. I think it is the best product of its kind. I don't think anyone has anything at this level. Our first version was useful, but it had a lot of holes. This version is something that really has value.

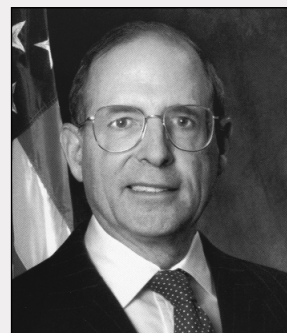
On Project Management at IRS

We have access to the George Washington University project management curriculum and we have put more than 200 managers through it. But it's not just about training. People learn to manage projects by managing projects. IRS does have problems with project management, but everyone does. We've come a long way, but it's just very hard.

We're getting help from contractors and from the PRIME, but we can't just turn it over to them. We're not just putting in technology, we are changing the way the IRS works. Still we are trying to get people to move away from the idea that contractors are just resource providers, and I think we are mostly over that.

About Charles O. Rossotti

As the 45th Commissioner of Internal Revenue, Charles O. Rossotti assumed his duties as Commissioner on November 13, 1997, pledging to turn the IRS into an organization that will consistently provide top-quality service to America's taxpayers.



Mr. Rossotti came to the IRS from American Management Systems, Inc. (AMS), an international business and information technology consulting firm, which he helped found in 1970 and where he was chairman of the board. From 1965 to 1969, he held various positions in the Office of Systems Analysis within the Office of the Secretary of Defense. He was honored with the Distinguished Civilian Service Award for his work as Principal Deputy Assistant Secretary of Defense.

A native of New York City, Mr. Rossotti holds a magna cum laude bachelor's degree from Georgetown University and an MBA with high distinction from Harvard Business School.

- Creating three portals on the IRS website to give taxpayers, businesses, and internal employees access to tax information.
- Converting tape-based master files to a different database, beginning with the simplest tax returns for the past five years—about 6 million files.
- Giving taxpayers the option of communicating with the IRS via e-mail when there are questions about a tax return.
- Giving taxpayers the authority to give someone power of attorney to communicate with the IRS electronically.

According to a CSC press release, the Enterprise Architecture 1.0 “provides a consistent, efficient, standardized, and structured framework that allows the IRS to move forward in modernizing business systems and implementing new technology.”⁴⁰ According to Stephen Kalish, the president of CSC’s Civil Group, “the IRS Enterprise Architecture 1.0 is among the most comprehensive architectures of its kind in both the private and the public sectors.⁴¹ The implementation of the enterprise architecture will be managed through “Enterprise Life Cycle Model,” an approach that integrates business and technical changes in an organization and which, thereby, is responsive to the IRS effort to simultaneously change its business enterprise and its IT systems.

Even now, the IT development is at the beginning stages, but the reorganization has been implemented. While the jury is still out, most of those interviewed for this study felt the Rossotti-led reorganization would prove successful, and some felt that it had already led to some positive changes. According to a knowledgeable and experienced consultant to the IRS, “some of the changes developed under TSM actually got implemented with Rossotti’s reorganization. The strength now is better management and people, but also better process.” A related view from another well-informed outsider:

If you don’t look at Masterfile [where there has been little progress], they have done an incredible amount of modernization, very creative and persistent. But they do it in a stovepipe way, and it’s about projects they can manage, not about more funda-

mental change. You get a sense of competition between incremental change and modernization, and incremental change always wins.

Is this a criticism? Perhaps it depends upon one’s value for incremental change. The TSM approach was certainly not incremental change but wholesale change. With current assets and expectations, incremental change may be the most feasible and realistic.

Has (or will) the reorganization and new approach to modernization changed the IRS culture? Opinions differ. Speaking to one of the hard and fast organizational culture attributes of IRS—tension between the national office and the field—one long-time IRS veteran who has served extensively in district offices, the national office, and service centers was reasonably optimistic:

Cultures die hard. There will always be headquarters chatter, but the way we do business now is different. All the business units are business focused, Large and Mid size on large and midsize, Wage and Investment on wage and investment. From an IT perspective, we centralized all resources, and so there are no funds to run differently. We have one big organization for IT. It’s nice to have [the] core team in one place.

Outsourcing, Contracting, and the PRIME

IRS heard Congress’ message that a greater proportion of information technology development and implementation should be outsourced and that more use should be made of contractors. In December 1998, the IRS awarded a 15-year, multi-billion-dollar contract to Computer Science Corporation. The responsibility of CSC under the Prime Systems Integration Service Contract is to provide omnibus program management, coordination, and systems integration for IT modernization. Corporate partners for the PRIME include, among others, IBM, KPMG, Avaya, Logicon/Northrop Grumman Corporation, Science Applications International Corporation, and Unisys Corporation. The PRIME contract also includes a number of

small consulting firms, some staffed by former IRS employees.⁴²

Armed with information about pre-TSM efforts, TSM itself, and more recent post-TSM developments, we can consider the TSM experience with a longer-term perspective. In the next section, several alternative explanations are offered about IT failure during the TSM period. While most of the points discussed pertain to IT management in general, the particular focus is on learning from TSM.

Understanding IT Management Failure: Alternative Explanations

Many of the problems encountered in the IRS IT mega-technology saga are ones familiar to readers of the IT management literature and the public management literature. To put it another way, during the TSM experience with IT management, most of the things that could have gone wrong did go wrong. As in any reconstructed history, the “what?” question is somewhat easier to agree on than “why?”

Rather than developing detailed hypotheses, this section is organized according to alternative explanations of the public management and IT problems that led to the failures of TSM. These alternative explanations include:

- **Task complexity and difficulty.** Was the task itself one in which any organization is doomed to fail? Was the level of complexity beyond human capacity to manage?
- **Insufficient technical knowledge resources.** The IRS is not primarily a technology agency. To what extent was the lack of technical knowledge, inside or outside the organization, a mitigating factor?
- **Inadequate contracting and outsourcing.** At each point in the life of IRS IT renewal, contracting and outsourcing has been a major component, differing only in the degree to which it was part of the development strategy. Were there contractor failures or IRS failures in contract management?
- **Flawed organizational culture.** The culture of the IRS is distinctive, as nearly everyone acknowledges. To what extent was the IRS organizational culture an explanation for IT failures?
- **Failures of internal management and leadership.** To what extent were problems the result of management missteps? Were there failures in leadership, communication, or strategic vision?
- **Public sector constraints.** Unlike most private firms, IRS has multiple superiors, each powerful and with differing expectations. To what extent did the problems experienced by IRS flow from the fact that IRS is a public agency, subject to federal personnel regulations, purchasing and bidding regulations, and federal budgeting and accounting procedures?

The analysis of these alternative explanations is not, of course, scientific, but interpretive. After considering the evidence from the interviews, a summary assessment section is provided that distinguishes among the various explanations with three simple categories: 1) explanation supported, 2) explanation somewhat supported, and 3) explanation not supported.

Explanation 1: Task Complexity and Difficulty

Some feel the IRS IT modernization effort has no parallel. The magnitude of the task is certainly daunting. In the public sector, it is the largest IT renewal effort in history, and it is distinctive because of the importance of the IRS mission and the need to sustain the integrity of the system while changing it. There have been enormous private sector IT development and renewal projects, but these are in some important respects quite different. For example, the private firms have more control over the resources that can be brought to bear.

In considering the IRS's IT management, one has the image of a snowball gathering size as it runs down the mountain, changing at some point into a full-scale avalanche:

- “We couldn’t seem to recognize how darn big this thing [TSM] really is. We thought we had a handle on it, but in retrospect it was bigger than we thought.” (An IRS official who worked in the Austin Service Center during TSM years).
- “Underestimating the magnitude of this is the biggest downfall of both the contractors and the very top IRS leadership. At some point, most of them say, ‘Holy smokes, I didn’t know how big this really is.’ You have to have people who are up for it [massive IT change], really engaged, and will do it for comparatively little money.” (An IRS executive who has spent more than 15 years in IT).
- “I don’t think anyone fully comprehends the unbelievable heavy lifting it takes to modernize our tax systems. The scope of these undertakings is so far beyond what any private sector company deals with it is mind-boggling—the volume of information, the iterations of the information in the life of the systems, the adjustments, the appeals, and the transactions are in different functions, different departments. It is much more complex than simple billing systems. No one really appreciated the depths of what they had to do before they got on the job. We can’t build a new system in the back room and shut off the old one and turn on the new one. Requirements for safety nets are enormous.” (A high-level IRS official involved in both IT renewal and business systems planning).

While most everyone interviewed was quite impressed by the enormity of the IT renewal task and implied that many difficulties could be simply explained by the toughness of the job, one of the few people who did not come to that conclusion is also one of the people who has the most extensive technical credentials of anyone interviewed. According to this interviewee, who is no longer with the IRS, there is “an immense physical management element [to IRS IT], an immense data system, *but* all very straightforward. Oracle [corporation] and others have already solved these sorts of problems.” When asked if there are public

agencies that have succeeded in the batch operations aspect of IT, he indicated that the Health Care Financing Administration (now the Centers for Medicare & Medicaid), the Central Intelligence Agency, the Social Security Administration, and the Veterans Administration had all solved these sorts of problems. The problem is not the size of the system but the requirements for interoperability, for different aspects of IRS business to work together. Currently, according to this interviewee, the administrative and financial aspects of IRS are poorly integrated. But even this seemed to him not in principle a great challenge: “Nothing IRS is doing is state of the art, and the timing requirements for its activities are, for the most part, very liberal. Some of their tasks push the envelope on magnitude, but certainly not on technology.”

A former IRS official, now working with IRS as a member of a large consulting firm, agreed that it is not the magnitude of the task and the technological challenge that is the chief problem; rather, it is integration and staying abreast of changes: “What we are talking about there is integration, step by step, in a fully modernized environment and where the need is for the latest technology, and it changes so rapidly. Integration is the key.” Another consultant echoed these thoughts: “The hardest job was not big project management—you could succeed at that—it was system integration.”

Assessment: Explanation Not Supported

The IRS IT modernization task was and is a formidable challenge. But it is not unprecedented. Other organizations, generally other private sector organizations, have taken on tasks of similar magnitude and succeeded. Any task is “too large” if one does not succeed. It is important to remember not only the magnitude of the task but also the magnitude of the resources marshaled for the task. One of the best reasons to assume that the task itself was not the primary culprit in the IRS TSM failures is that the IRS has subsequently made a great deal of progress on the same complex tasks (though obviously not identical ones) as envisioned in TSM.

Explanation 2: Insufficient Technical Knowledge Resources

Historically, the IRS has not been a technologically intensive organization. The IRS relies on

accountants, lawyers, and MBAs, not engineers and computer scientists. The IRS “Technical Division” of past decades had nothing to do with computers, but rather technical issues of taxation. Thus, it seems plausible that some of the problems the IRS has faced in IT modernization may flow from the use of non-technical personnel in positions requiring technology expertise. One former IRS employee, one particularly well qualified in the technical aspects of IT, observed:

They had people from all over doing [technical work on TSM]. There was this one person who came out of personnel and had all the jargon down, but didn’t know anything about computer systems. There were others who tried to get up to speed, didn’t, and got themselves fired. There was no view from the top. No single person in IRS at the highest level had any idea what was going on.

At the outset, TSM relied on IRS insiders, people knowledgeable about IRS “business lines” (as they refer to the IRS functional activities), but not expert in IT. A person with a bachelor’s level degree in accounting and a great deal of on-the-job experience may not seem the most likely candidate to head a putative \$8 billion IT initiative. A former deputy commissioner explained the process by which technical expertise at the top was sacrificed for business-line expertise:

We had a lot of discussion about who should lead TSM; we paid about a million dollars or so to a consulting firm. They told us we should let people in the IRS make the decisions because these were the people who would understand the IRS and who would get buy-in. The strength would be with those who worked there. Fred [Commissioner Fred Goldberg] knew we needed help from the outside and we interviewed them, but the consensus was that the best one [for CIO] was Hank Philcox; then we gave Mark Cox the tomorrow stuff and Wally Hutton the legacy stuff. They did fine, but not together.

This implies (and other interviewees confirmed) that the advice IRS received was to make sure the CIO

really understood IRS and its mission and that the technical expertise could be resident in the contractors. This was advice from experienced, private sector consultants. While the need to understand the IRS’s unique business seems clear, the continuing lack of IT expertise at the top would seem, at least in retrospect, to be a problem. Indeed, the first recommendation of the NRC committee on TSM was “the IRS has had serious technical capability problems that, in the committee’s view, cast doubt on the overall success of TSM if they are not solved.”⁴³ But few of those interviewed cited lack of technical expertise as a major impediment to IT modernization success.

One reason that technical expertise is not more often viewed as a problem is that IRS has made strides in providing for exempt personnel, persons paid at a higher rate than the usual GS level. In the first place, in the mid-1990s several “senior level” (SL) personnel were brought in at Senior Executive Service ranks. The SL personnel have chiefly technical rather than managerial duties, but are paid at levels comparable to the Senior Executive Service, managers who supervise large numbers of employees. These individuals included, among others, Richard Wexelblat, the first person in the United States to receive a Ph.D. in computer science and a long-time government information management executive, and Jim Robinette, a veteran Defense Department computer technician and systems analyst.

The technical personnel deficit was reduced further a few years after the TSM era. Chapter 95 of Title V of the IRS Restructuring and Reform Act (RRA) of 1998 (P.L. 105-206; 5 USC 9501-10) permitted the IRS to recruit “critical pay” personnel. These individuals, brought in for a maximum of four years, need not be recruited through traditional channels and can earn a maximum compensation equal to the vice president of the United States.⁴⁴

While the jury is still out on the critical pay personnel, the SL personnel have had mixed experiences and the reactions to them have not always been positive:

We brought in SLs at SES [Senior Executive Service] salary and they reported directly to the CIO. The theory was that it’s not

happening in the line [management], so bring in a small group of experts to lead us. Didn't work.

Some other interviewees were more sanguine about the IRS's ability to hire IT technical experts and to have them fit in with the organization, especially since the agency has been permitted to hire senior level technical employees. As one current employee observed: "Personally I have zero reservations about that [the ability to bring in outsiders]. If we have the ability to bring in people and they are really good, we can. The one person [SL] I have is thrilled that he is here and there is zero resentment." But it is worth noting that few of the SL recruits (or critical pay personnel) have lasted for more than a year. One ex-IRS employee, an expert brought in as an SL employee, complained:

There were some people who understood you [as a technical expert], even liked you. But going in as a Senior Level instead of an SES was a big mistake. They would never listen to me, because I was a second-class citizen, one they were a little afraid of.

Assessment: Explanation Somewhat Supported

There is little question that during the TSM era the IRS did not have the technical expertise needed for such a large and daunting project. But the explanation is only *somewhat* supported because the inadequate technical resources were due, in large measure, to political and managerial limitations rather than the unavailability of technical expertise. During much of the period the IRS was limited to some extent by constraints of the federal civil service system. But there was no dearth of available talent in the private sector, and, considering the funds available to the IRS, an effective contracting strategy and effective use of the IRS Federally Funded Research and Development Center (FFRDC) may well have reduced the role of technical expertise to a relatively minor one.

As an institution, an FFRDC is defined (by one of the leading FFRDCs, the MITRE Corporation) as an "organization that assists the United States government with scientific research and analysis, systems development, and systems acquisition."⁴⁵ According to MITRE, FFRDCs were established during World

War II to "bring together the expertise and outlook of government, industry, and academia to solve complex technical problems that cannot be solved by any one group alone." An FFRDC is different from a traditional contractor in that it works in partnership with the federal agency.⁴⁶ One reason for developing an FFRDC is for the agency to obtain more objective and more open communication than can normally be expected of a more traditional vendor who has a more conventional and short-term business interest. All FFRDCs are, by statute, non-profit and are prohibited from engaging in manufacturing activity or in competing with industry.

Explanation 3: Inadequate Contracting and Outsourcing

There is a good deal of consensus that contracting and outsourcing have been a problem for IRS. There is less agreement on the nature of the problem. Some feel that there simply has not been enough outsourcing, others that contracts have been poorly managed, still others that the contractors have not been as helpful as expected.

Some feel that contracting is potentially the answer to almost all of IRS IT problems. Members of Congress, conspicuously Senator Charles Grassley of Iowa, have pushed for more and more outsourcing and privatization, including the option of just handing the job to the private sector. There may be a practical political limit to outsourcing. As one IRS top manager noted: "Outsourcing is a religious issue for the NTEU [National Treasury Employees Union]." The union members of IRS go up to an unusually high GS-level and that, perhaps, is why this manager believed that outsourcing "will be ugly and the union already sees the threat." But he also agreed that it is vital to increase outsourcing.

While most of the interviewees do not seem to agree that the IRS should, essentially, be on the sideline, one former high-level IRS employee feels that the IRS has proven that it cannot do modernization and that it should be handed over to the private sector. This individual, now a private consultant and one of the most experienced and technically proficient interviewees, said:

Hand it over [to the private sector] and let government engage in detailed oversight

and writing requirements. That's what the Inland Revenue did in England; EDS did that with their IT modernization. It might take three to five years, and you would need significant incentives to do it right and on time. There are security and privacy issues, but they could be dealt with. I think it's the only solution. I didn't used to believe that, but now I do.

Among IRS employees, views about contractors are mixed, but many feel that contractors do not pull their weight. A representative comment from a 25-year veteran who has served in many middle- and upper-management positions: "Sometimes I question why we are spending the money on the contractors. I feel like we are doing their work. But maybe contractors are the price we pay for credibility, especially when there is more outside intervention."

Another IRS official, one critical of the agency's ability to work with contractors, said, "Some IRS employees think 'we are paying you [contractors] enormous sums of money, you are working right next to me and getting three times my pay, but I'm the one who makes it work.'" He went on to say that the sentiment is understandable but that the reason it is the IRS employee "who makes it work" is that contractors are undercut, in part because of insularity and distrust of outsiders:

At IRS it's black and white. You are in the family or you are not. If you carry a blue badge [official IRS], you are in the family; anything else, you are not. MITRE [the IRS Federally Funded Research and Development Center contractor] has tried to sell their role as an honest broker, but then there is that red [contractor's] badge. They are still the outsider. We use ... contractors as an extension of staff, for specific tasks. We can't seem to break out of that mold.

In part, the difficulty of contracting and outsourcing is developing sensible rules of thumb about what should be done in-house and what should be done by contractors. Even when relationships with contractors are solid, built on mutual trust and with clear communication, these choices remain difficult:

It's a fragile balance, what you do in-house and what you do by contract. I would never ever build my own network again. I would buy by the drink, not by the bottle. You should never build something already available; you should use off-the-shelf products, especially ones that don't need any tweaking. We need to reengineer processes to meet what is commercially available. So often, if it's not invented here, government people don't want anything to do with it.

Another particularly pessimistic assessment:

The people who manage IRS contracts have ... no technical education, but they are empowered to make technical decisions. But then, no government agency seems to be very good at managing contracts.

Since so much of the IRS's current strategy involves partnerships and contracting, including the PRIME contract, one hopes the criticisms above are less appropriate for the contemporary IRS than for the TSM era.

Assessment: Explanation Supported

Regardless of how one feels about contracting and outsourcing of IRS IT, almost no one seems to feel the IRS has a history of effective use of contractors. The problem does not seem to be a technical one—the IRS contracts office was not identified by any of the interviewees as a source of problems. The inability to work with contractors seems to be due to: 1) unwillingness of some employees to pass work to contractors; 2) difficulties working effectively with contractors; 3) inability to set specifications that contractors can use as sufficient guides to their work; and 4) problems managing large, multi-organizational, multi-sector programs.

Explanation 4: Flawed Organizational Culture

Every organization has a culture that is in some respects unique, but the IRS organizational culture is unique in many ways and understandably so. Nearly everyone who works for the IRS understands that their neighbors are likely to be either curious about them, revile them, or fear them,

sometimes all at the same time. Those working at managerial levels in IRS understand that their life will resemble career military personnel—brief assignments, rotating to a new duty. The mission of the IRS shapes its culture. Dealing with money, secrets, and incredible legal complexities requires an unusual set of work skills and perhaps breeds a unique worker.

The selection effects for working in IRS surely must be strong. There is no reason to believe that the IRS would attract persons who are strong nonconformists, whose life is governed by creative opportunity, who rebel against authority, or who cannot live within a hierarchy. At the same time, the IRS has never been a sinecure. The jobs are challenging and the fact that managers typically circulate from one functional area to another means that those who want to play it safe have difficulty succeeding. It is a strange mix. Layer on top of this mix a new mandate to become technologically adept, or at least to engage technology, and it is clear that the organizational culture is a demanding one where, if we can engage in a bit of dime psychology, people are likely to have crosscutting demands, to be job-focused and tightly wound. It is not easy to succeed in the IRS.

Not everyone agrees on the nature of the IRS organizational culture, but all the interviewees seem to be acutely aware of the impacts of organizational culture and felt that the IRS culture is like no other. One point of widespread agreement is that IRS management-level employees tend to be insular and distrustful of outsiders. If so, this may be a good starting place to look for ways in which organizational culture can undermine efforts at IT renewal—and organizational change in general.

One interviewee (no longer with the IRS) who came to the IRS from another agency, but who had worked with IRS for years and who knew many people in IRS before joining the agency, said he felt like a “stranger in a strange land.” When asked if he felt like an outsider when he tried to work closely with others on a particular IT project, he responded:

I’m one of the poster children for that [feeling like an outsider]. I ended up staying there [IRS] for six years and had a really good experience. But there were days

when I felt I was in this club where I didn’t know the secret handshake[.] I had some credibility coming in the door and I was given some good people to work with, and though I was hard on them, they thought I was fair. I don’t think IRS is as insular as it used to be, but I still had to prove myself. The question is whether someone who was not known to IRS would have to prove themselves more than I.

Why the historical insularity and distrust of outsiders? As one senior executive put it: “For years we didn’t recruit outside the service. I’m a 20-year vet [of the IRS] and only recently really one of the family. There’s a very military career path. Now we’re bringing in people from the outside ... but there is still a lot of suspicion of people recruited from the outside.” In many respects the insularity is not difficult to understand. In the first place, working at IRS is a truly thankless task. Very few outside of IRS appreciate its work and many are hostile. Second, the past two decades of experience with outsiders involved in criticizing IRS reforms, including TSM, have not been pleasant. Many have been scapegoated. Interviewees spoke of more than one high-level IRS official as “falling on his [her] sword for the Service.” The news media have often portrayed the IRS and its employees as incompetent or malevolent. It is not difficult to understand how such an environment can foment distrustfulness and insularity.

Other aspects of IRS organizational culture have reinforced insularity and distrust, pitting one geographical or functional group against another. (Changes in the 1998 IRS reorganization address both these factors). As is the case with many agencies, there is a long-standing animosity between headquarters and field. It is commonplace for IRS managers to scorn the Washington, D.C., national office while, at the same time, angling to get a plum job there, knowing that it is generally a prerequisite to continued advancement. To some extent, headquarters-fields relations are strained, typically with the “Washington doesn’t know what it’s like here out in the field” point of view (and the corresponding “why can’t those out in the field understand national priorities” point of view). But in some cases problems in communicating management priorities may

be owing to dysfunctions not obviously related to culture.

An employee who remains with the IRS and who has been with the agency for many years was asked if he thought there was less insularity and distrust than in the past. His response indicated that this issue was mixed up with communication issues inside IRS:

Are we less insular? Yes and no. Sure, there are many new faces, many from the outside. But if you go down a little into the organization [i.e., below the top management levels], you still find pretty strong resistance to any kind of change. Not much happened in TSM that changes day-to-day life. Modernization hasn't penetrated down. The commissioner has made calls for changes in the grass roots, especially changes in values.

Another IRS IT project member explained how much care his team had taken in developing an IT architecture and physical design for a project to be deployed in the Austin Service Center. The response: "That's nice. Now here is what we are really going to do." IT modernization has taken so long and delivered so little in the way of fully functional technologies that many in the field have, essentially, given up on solutions coming from Washington. It is not clear whether this is organizational culture or simply the triumph of experience over optimism.

Many aspects of IRS culture have, at the same time, bad and good sides to them. Sometimes a strength can be turned into a weakness. One conspicuous example is the long-standing "can do" attitude that emphasizes local problem solving and performing assigned tasks rather than complaining about them. This attribute often leads to accomplishment and pride in work. The bad side of this is a tendency to suppress dissent and a failure to deliver bad news even when it is clear that doing so may have disastrous results. As mentioned earlier, this is one of the primary explanations of the 1985 service center meltdown.

In an atmosphere of distrust and poor vertical communication, one would predict risk-averse behav-

ior.⁴⁷ The IRS culture does, indeed, seem to inhibit risk taking. It is easy enough to identify some individuals who have taken enormous risks, but usually at great cost and at considerable personal sacrifice. It seems to be the case that the organizational culture does not reward risk. Consider the following:

I remember a conversation with Larry Westfall [TSM-era CIO]. He felt no one really took a chance with their best systems on modernization; they were always hedging the bets. The key is to understand what the Philadelphia Service Center disaster meant. It was the genesis for TSM, but it also left an indelible mark on IRS's ability to take a risk with change. It made it very hard for people to take [a] leap of faith to really commit to modernization. But Larry did.

Another former IRS employee, one who worked on IT projects in IRS and other government agencies, felt that risk aversion was, in part, due to the atmosphere created by the nature of congressional oversight:

The Hill bears some of the responsibility; with their legitimate desire for oversight, they exacerbated the risk aversion that already exists at IRS. I really think it's unintentional.

One wonders, of course, whether the IRS is any more risk averse than other public agencies or even private firms. With a few notable exceptions, the interviewees describing risk aversion at the IRS have not worked in other organizations. One consultant interviewed, an individual who has worked not only on IT projects with the IRS but many other federal agencies, described working with the Federal Aviation Administration on a roughly comparable IT mega-technology project:

At FAA the culture was so risk averse that it was better to do nothing except what is safe. Operations were too risky. Like IRS, they were working with mission-critical systems, not much different than the IRS Masterfile. But IRS feels that necessity [to make critical systems work] in their bones. I have so much respect for those folks.

Assessment: Explanation Supported

The IRS organizational culture is a double-edged sword, but one that cuts deeply into its ability to succeed with TSM. The very aspects of IRS that had allowed it to solve problems effectively for years—“can-do, don’t-complain,” rotating management personnel so they get the “big picture” rather than develop management specialization, promoting through the ranks, emphasis on the field and regional decentralization—turned against the IRS with TSM.

Explanation 5: Failures of Internal Management and Leadership

In a sense, any organization’s performance is tied to its internal management and leadership. But the question is whether there are specific aspects of IRS internal management and operations or its leadership that account for its difficulties in TSM-era IT modernization. We shall not deal with the leadership qualities of specific individuals here. The chief interest is not so much in the unique attributes of individuals but the contextual issues of leadership. Does the institution afford an environment in which a leader can succeed?

Regarding internal management, the issue, again, is the managerial context of IRS. There are able managers, and less able managers, in any large organization, but some organizations empower managerial excellence and others make managerial excellence an uphill battle. One factor that has sometimes undercut managerial performance at IRS, both at the commissioner level and in upper management, has been rapid executive succession, especially with respect to TSM. While executive turnover is, generally, a problem, there is also a tendency among some career IRS executives to treat IT modernization as a short-term hazardous duty and, after being exposed to the IT “battlefield,” they return to more traditional IRS jobs, ones with a higher likelihood of success and a lower likelihood of “burnout.” When asked why he left a challenging job and resigned from the IRS, one former IRS executive who was in the IT trenches for much longer than most explained:

I was toast. That last year and half ... I was having phone meetings until 10 at night, checking voicemail, and I wasn’t really

present for my family. I had been working in leadership on TSM [and other IT assignments] for six years. I told people as I was leaving that I was physically and emotionally burnt out. Some days I still miss being in the middle of things, especially now that they are closer to success. It would be fun to be there when we throw the switch.

When IRS “throws the switch,” very few of the TSM veterans will be there to witness it, even if the switch is thrown soon. At IRS, IT has been a revolving door. The CIOs have changed about every two years; IT modernization has been under way during the terms of five commissioners; but, most important, the SL employees and the level of management just below the CIO have turned over almost completely during the past few years. As one interviewee noted, a long-term IT manager still with the IRS, “If you decide to do a [technology] project that is a billion-dollar-plus investment, you have to have well-educated and well-trained people and can’t have a lot of turnover—you need them for four to six years.” This is a need met rarely at IRS. Another interviewee, no longer with the IRS, said that the level of management and IT turnover in the IRS leads to a “not me” problem, the idea that “I need to stay out of harm’s way until I’m out of this job or out of IRS.”

The most common observation among interviewees about IT leadership at IRS was a not surprising one: that few of the people at the top of the organization have any background in IT or other technological aspects of organizations. A conspicuous exception is the current commissioner, Charles Rossotti, who came from an industry job that provided a great deal of IT experience. But most previous commissioners have been from a single mold: tax attorneys. While most of them seem to have understood the importance of IT to their success, few had much experience with it.

One interviewee, an employee of the IRS FFRDC and long associated with the IRS, noted that organizational barriers undercut IRS managerial leadership:

The leadership issues in IRS are so confused, the organization barriers are so strong, it’s difficult to get much done. They

used to have functional stovepipes, but now it's business divisions. There is so much competition for funding. With all the fragmentation and competition and lack of a real achievable strategy, the leadership's energies are dispersed and it undermines what they can accomplish. The GAO reports focus on execution, but it's more fundamental, under the surface.

One interviewee noted a tendency among IRS leadership to engage in "magical thinking": "There's a tendency to just wish for things to be true, such as thinking DPS will happen despite problems with the technology or [identifies former CIO] thinking he can just outsource all this and modernization will happen, when it is really too integral to the business for outsourcing to solve all these problems."

The most common managerial criticism, one about which there was seemingly no dispute, was the IRS's deficits in project management. One commentary is especially compelling inasmuch as it comes from an individual who managed one of the few IRS IT projects generally deemed an operational success:

I went to an Air Force base in Massachusetts to learn about what they were doing in project management. After hearing about all of the training that military people took to become a project manager, I told [identifies another IRS employee] "I'm totally unqualified; I didn't know the vernacular, project management skills, even the terms." For me that was symptomatic; I had responsibility and I was not prepared for it. I think this speaks volumes about the IRS, and they are just now coming to grips with this.

While there is some evidence that project management has improved considerably at IRS during the post-TSM era, the following comments from interviewees seem to suggest that project management problems have been at the core of many past failures:

- "What they had under TSM was a litany of unrelated projects not being managed with any engineering or management discipline.

Nobody knew how to manage projects. The idea was that if we have enough projects and enough money, maybe things will work out. IRS leadership didn't know what was going on or even want to. They had a tax attorney running the organization." [A GAO analyst who reported on TSM]

- "Back in TSM days, the whole approach to testing and field evaluation, including user value and validation, that sort of activity just didn't go on. If somebody got a project, the project manager was hell bent on delivering it. There wasn't much thought about whether it had value, you just had to put something out there." [A GAO analyst in the Information Technology Systems Division]
- "They had almost no semblance of project management. They just changed dates with no central authority and accountability. [At the end of 1996] when the pressure came on, they had started to do some good things [especially accountability and evaluation]. What I found disturbing was that when the pressure went off, so did some of those good things. When the pressure left, the functional people's responsibility went astray." [An experienced senior IT consultant, hired by the Department of the Treasury to work with the IRS, assessing project management]
- "It all gets down to project management. Systems work when you have milestones, project accountability for producing results, and an ability to air problems as soon as you can air them." [A consultant to the IRS during the TSM era]

One of the most important rationales for project management is economic efficiency. To some extent, the IRS, during the TSM years, may have been undone by its newfound wealth. When money seems to be falling from the skies, efficiency is not likely to be a top priority. More likely, especially in an organization that has been for years starved of IT money, a likely reaction is "quick, let's spend it before it goes away." This is in many respects a key to understanding the failures of TSM. The following extensive quote from a former deputy commissioner not only underscores the point but also gives an idea of the heady atmosphere during the TSM period:

I once said to [CIO] Hank [Philcox], “Thank God, we didn’t get all the money we asked for.” It varied a lot from project to project, some [project managers] cooked right along and, left to their own devices, did well. But others asked for the moon and then when they got it were unprepared and unable to do things they had to do. We carried over a lot of no-year [i.e., rollover budget] authority as things went along, and so we went through pains to make sure that was first money getting spent. If we didn’t spend it, we thought things would look bad. Our eyes were bigger than our stomachs. If you have \$4 billion, you build things you wouldn’t even start with \$2 billion. We should have known in 1994 that the system couldn’t be that big and we needed to reload and re-plan. We didn’t do it... (W)e kept everything alive, kept everyone on life support, but didn’t get much done. Then finally we re-scoped in late 1995.

Interestingly, too much money, too quickly, seems to create its own managerial pathologies. The quotation below, from another senior IRS employee, suggests that the presence of a great deal of money can have the effect of encouraging ambitious managers to ignore systemwide, agencywide success in order to focus intensively on their own projects:

We have always tried to do everything at once. It is not a resource problem; we were sort of hypnotic for a while we had so much money and FTEs [full-time equivalent personnel]. Project managers say this to themselves: “I’m 35 and I want to be a success. I can be successful at managing my project, I can ignore some things at the side, but if I keep the walls up and drive on, I can be successful.

To some extent, the problems of TSM are those one might expect when project management is learning by doing. As one veteran IRS IT manager observed:

Going back to the old days, we tried to do too many things at the same time, too many initiatives going on at the same time. We were probably getting too much money

and so we were stretched thin, we were just learning how to develop systems. On top of those growing pains, we had more oversight than before. We had so many new initiatives while we were still learning.

Certainly, on-the-job learning is a great approach to management in many instances, but perhaps not when billions of dollars hang in the balance. Learning how to do project management in the middle of one of the most complex, risky, and expensive civilian IT projects ever undertaken would imply that even the most talented of managers would be “stretched thin.”

Assessment: Explanation Supported

The IRS has for years had a wealth of managerial talent. It recruits persons with managerial potential, provides excellent and diverse experience for them, and has solid managerial training programs. The managerial and leadership problems IRS experienced with TSM chiefly related to the new tasks IRS managers were called upon to perform. Perhaps most important, the informal, seat-of-the-pants approach to project management is satisfactory as long as: 1) the managers are talented; 2) the projects have a modest technical component; 3) the projects are relatively simple in terms of the level of coordination and planning required; and 4) the projects’ targets and technologies remain relatively fixed. During TSM, IRS met only the first criterion.

Explanation 6: Public Sector Constraints

For several years there has been considerable interest in the differences between public and private sector management from modest beginnings in the 1970s, and extensive literature has grown featuring a wide range of theories and empirical results.⁴⁸ Some studies hold that public and private management are different in nearly every important respect; others that public and private management differ little, that “management is management”; others that the differences are great with respect to some functions, very little with respect to others; and still others that the question is misleading, that the most important issue is the mix of political and economic authority rather than the organization’s legal status or sector.

The effects of the “publicness” of IRS seem especially important because the issue has much to say about the best approaches to improving managerial performance, not only at the IRS but in any agency, perhaps even any organization, dealing with mega-technology projects. The primary approach to considering this set of issues is to focus on two factors—first, external political control, especially the role of Congress and the GAO, and, second, public sector management processes. According to research findings, certain aspects of management are particularly subject to differences between public and private organizational status. These include personnel management, budgeting and financial management, and procurement, each of which is externally controlled in public sector agencies to a much higher degree than is typically the case in the private sector.

While there is debate about the extent to which public and private management differ from one another, one point of general agreement is that organizations subject to high degrees of external political control tend to be quite different from those which are not. This point seems to be true regardless of the sector or ownership type of the organization. Thus, some private sector organizations (e.g., government contractors) are subject to higher degrees of external political control than others, and some government agencies have greater external political control than others. Similarly, the degree of external political control, and especially external mindfulness, can vary a good deal over time. It seems fair to say that the IRS during the past decade or so has been subject to a great deal of external oversight by political controllers, as well as a greater degree of political constraint (e.g., more tightly controlled IT appropriations).

External political control is not inherently good or bad. Congress and other governmental entities have clear responsibilities for oversight and cannot and should not abrogate them. But, obviously, the degree of attentiveness, the number of GAO studies, the times the agency is called before Congress to testify—these factors vary a good deal in both frequency and outcome. The question here is the extent to which external political control seems to have affected IRS IT modernization, especially during the TSM era, and whether those effects have been salutary.

Generally, current and former IRS interviewees seemed to have a moderately favorable view about the role of GAO and the Office of Management and Budget (OMB) in the IRS modernization effort. While there were a few complaints about the role of Congress, these seemed, for the most part, problems endemic to political processes. Naturally, agency personnel are almost always ambivalent about external political authorities, and the quote below from a 30-year IRS veteran who has had extensive dealings with OMB and GAO is representative:

Some things GAO did were useful; DPS, for example. OMB has some good examiners; [names a particular OMB examiner] tried to get things right. However, we spent too much time trying to chase “good process” for GAO, best practices and such. We engaged GAO people to talk about best practices so we could follow them, but then GAO beat the hell out of us on that topic. They [GAO] had a chance to say, “This is hard stuff, but they [IRS] are trying hard and doing some things right,” but they had rather beat the hell out of us. Once we got a call from Customs about some of our process, and Customs said, “We wanted to talk to you about this process because GAO says you do it best.” This was the same thing they had just beat the hell out of us about.

Among the interviewees, there seemed to be a higher level of frustration with Congress than with either OMB or GAO. The shifting priorities of Congress were of some concern. One high-level IRS official intimately involved in TSM noted that former IRS CIO Hank Philcox and, later, IRS Commissioner Margaret Richardson, told him that the TSM projects were best “sold” to Congress from “a compliance and enforcement point of view.” But after about 1994-95, Congress seemed unreceptive to any arguments about the relation of TSM to compliance and enforcement, and, instead, projects had to be sold on the basis of contribution to taxpayer assistance. Another high-level official had a quite similar view:

Maybe we have higher [than private firms] IT startup costs because we have legislative mandates that sometimes don’t give us

much choice; we just have to do it. We have to react to Congress. Sometimes they go up route 1 and the next week up route 5 and we have to follow along. For example, in the past they didn't seem to have much interest in customer service; it was all about revenue collection. But now it's all about customer service.

Reports about the changeability of Congress are not surprising, nor is it unusual that members of Congress seek to protect their political self-interest. One IRS official often involved in testifying before Congress and well-known to congressional staff explained congressional caution in the wake of continued IRS IT failures:

We would have these meetings, not necessarily hostile meetings, and congressional staff would say, "I can't have my member supporting this thing with this objective record of money going away with no tangible result; it's personal suicide for them." And, yes, it is a risk, for both Congress and the IRS. Read Bill Gates; it's about learning from mistakes. I don't find that at IRS, mainly because of political oversight.

This seems to imply that the understandable caution of members of Congress and their staffs has had some impact, in turn, on the IRS's ability to take risk and to learn from mistakes.

Even in cases where Congress and other external political authorities are not directly involved with the IRS, the agency remains subject to the same federal management processes as other agencies. The impacts of the appropriations process, federal procurement policy, and the civil service and public employee unions are distinctive for each federal agency, but all are subject to some common rules and procedures.

One obvious difference between the public and private sector is the ability to "roll over" funding. Generally, appropriations in the public sector are for a single fiscal year (though there have been some exceptions with respect to the IRS budget) and there is no capital budget. These are factors the first TSM CIO, Hank Philcox, cited as among the most likely barriers to TSM success.⁴⁹ But history

has proved that budgetary process issues have not been among the primary mitigating factors in IT project success, at least according to those interviewed for this study. And even during TSM, IRS was given considerable budget flexibility.

With respect to the lack of a capital budget, one IRS senior manager noted:

We aren't sure if the money will be there, we aren't in control of the decision, and so the single-year budget can be problematic. Private industry would never approach modernization on a one-year basis. They would plan for years and know what they are getting into.

But this was a minority view. An IRS IT budget analyst's view was more representative of the general sentiment about the problems posed by appropriations process:

This was to some extent an impediment, but I wouldn't hang failure of any program on that. The art of juggling a fiscal year budget took a lot of time, but we did have "no year" authority for a lot of money. It was never a major problem.

Another veteran of the IRS IT budget wars says that the need for a multi-year budget is to some extent a ruse:

We always hear "if only we had multi-year budget authority..." Well, there's been a decade of multi-year authority with DoD, they still have problems. We would prefer multi-year, but I'm not sure we are ready for the level of oversight that goes with it. GAO and OMB say we already struggle with the amount of budget supervision we have and that we can't work out coherent budget forecasts. I'm not sure multi-year authority would be a blessing.

Similarly, procurement seems to be more a bogeyman than a major impediment to IRS realizing its IT modernization goals, especially now that recent procurement reforms have been implemented. The Federal Advisory Committee Act has made it easier to obtain outside help. Changes in the General

Services Administration Board of Contract Appeals have also helped. Federal agencies' procurement officers now have more discretion than in years past. According to one IRS veteran who has been involved in procurement in three different divisions, "The procurement process is not an issue; with every piece of equipment we need from procurement, everyone had their act together." One former IRS executive intimately involved in IT-related procurement observed:

Procurement can sometimes be part of the bureaucratic malarkey that goes on here, but during my time [1994-1997] we actually had a moderately enlightened contract shop. We've made some pretty innovative arrangements with them. It's easy to make procurement the fall guy, but their rules are not the malarkey; generally they are not a problem at all.

Interviewees seemed to feel that federal civil service restrictions sometimes had significant impacts on the ability to accomplish IT modernization, but that these restrictions were not nearly so important as other factors. Consider some of the following comments:

- "Does the pay scale have an impact? I think most people are involved not for the money but because they think 'we're here because this is a classic wicked problem and wouldn't it be cool to be part of the team that conquered this?' Salary is not as much a driver as people think it is."
- "I really don't think [personnel issues] are problems now. IRS has FTE reduction, but we have a lot of talented people and we are able to use more use of contractors now. We have the dollars to get the contractors."

While there was no great concern about the limitations of the civil service system, some interviewees had reservations about SL and "critical pay" individuals. It is not clear, however, that these concerns are owing to distinctive personnel systems in government; more likely this relates to IRS culture.

According to one IRS manager:

It's not just a matter of let's "hire the right people." We have hired outside for years. We hired a bunch of critical pay folks. Some have stayed only for a year. Since we use a commissioner's silver bullet on each one of these people [critical pay positions are limited], we should care why they leave. Too much is expected of these people and they are not accepted by the culture.

If we consider together the impact of public sector management systems—procurement, budgeting, personnel—it seems that these have not been the most important determinants of IT modernization performance. They do sometimes pose real problems, but just as often they serve as a dodge. One executive who has been involved at high levels in IT modernization provided this account:

There are the same recurring themes, the ones you hear all the time [i.e., public sector limitations]. But it's not procurement or technology or funding; it's how things are being managed, it's whether anyone is in control, it's whether people are buying into it, it's whether contractors are being managed.

Assessment: Explanation Somewhat Supported

In part, the importance of political factors and external context depends on the period of TSM in question. During the early years, some of the features of the civil service system, certain contracting and procurement policies, and limitations on the appointment of advisory boards had some effect on the ability to accomplish TSM tasks successfully. But between 1990 and 1996, many of these problems were resolved—some by statutory change that had little to do, directly at least, with IRS problems, and some by policy and procedural changes, including some initiated by IRS.

While Congress often makes an attractive whipping boy for the problems of bureaucracy, the chief con-

Table 2: Summary for TSM Alternative Explanations

Alternative Explanation	Summary Assessment	Key Feature
Task Complexity and Difficulty	Not Supported	Task was difficult but not impossible, as current efforts now show
Insufficient Technical Knowledge Resources	Somewhat Supported	True, but as “symptom rather than disease”
Inadequate Contracting and Outsourcing	Supported	IRS had problems passing work to contractors, managing contracts
Flawed Organizational Culture	Supported	Insularity and management rotation proved negatives
Failures of Internal Management and Leadership	Supported	Major managerial failure: poor project management
Public Sector Constraints	Somewhat Supported	Moderate at beginning of TSM

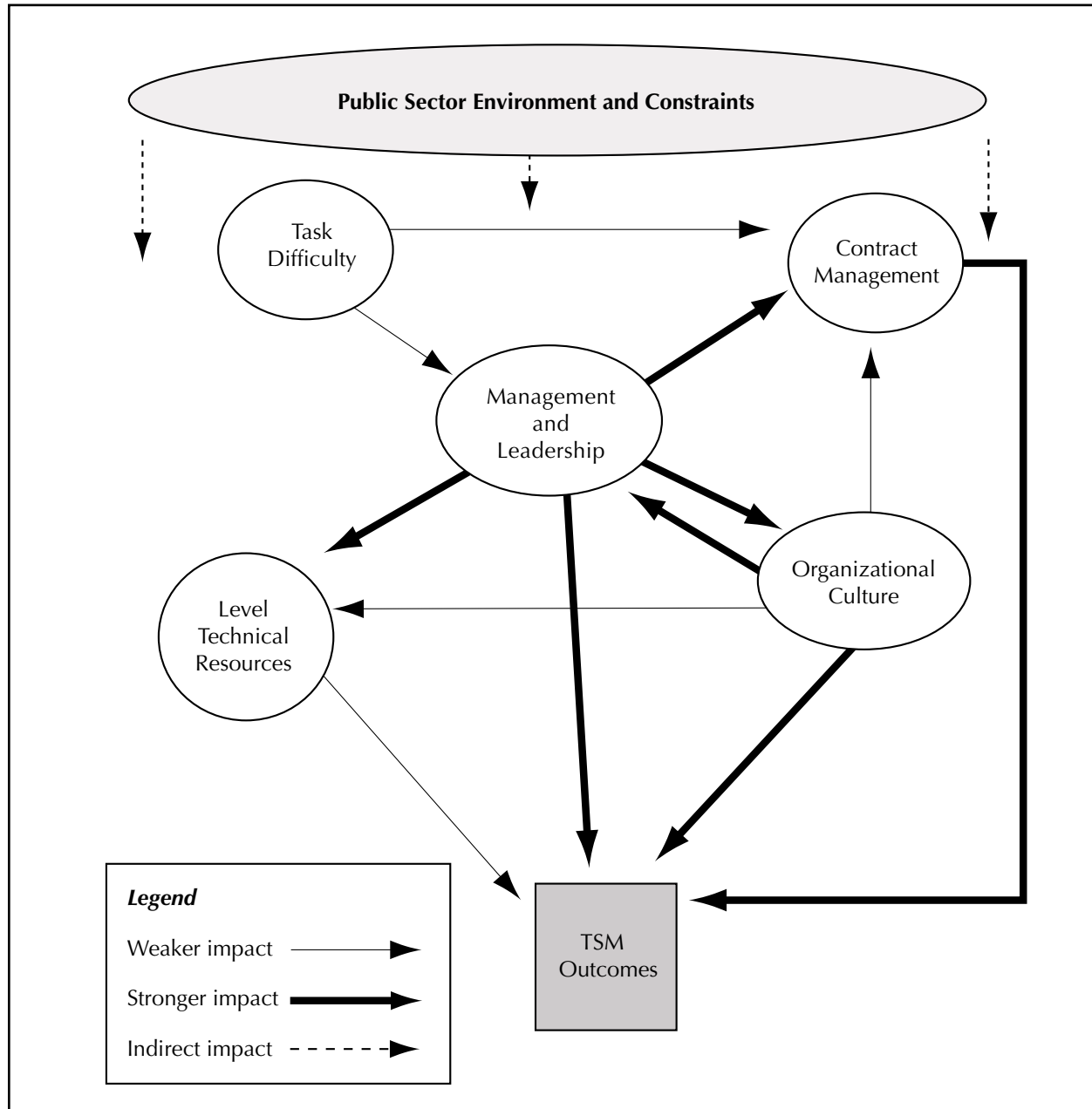
gressional “culpability” is in providing IRS too many resources, too quickly, and with too little oversight. Similarly, the GAO was often a thorn in IRS’s side, but rarely were its critical reports much off the mark.

Table 2 provides a summary of the alternative explanations for TSM problems and an assessment of the veracity of each of the explanations.

We can consider the IRS TSM experience in terms of a simple analytical model as presented in Figure 1. Two key features of the model are: 1) the

public sector context is treated as an encompassing factor that has impacts, but chiefly indirect ones; and 2) internal management and leadership are at the center, affecting contract management and level of resources, having strong reciprocal effects with organizational culture, affected by task difficulty. Task difficulty has no direct effects on TSM outcomes, except as mediated by management and leadership and as it affects contract management. In terms of both direct and reciprocal effects, the “big three” problems relate to managerial leadership, contract management, and organizational culture.

Figure 1: Model for TSM Management Problems



Much of the story of the IRS attempt to manage information mega-technology is a story of the IRS: its unique history, its mission as the nation's tax collector, the strengths and weaknesses of the particular people who have worked there. But much of the IRS experience seems quite relevant for any public

organization undertaking large-scale IT planning, development, and implementation. The concluding section deals with the implications of the IRS experience, TSM and post-TSM, for other agencies. Most of the lessons are really quite simple in concept, but much more difficult to implement.

Conclusions and “Lessons Learned”

In this concluding section, the objective is to sort through the “multiple realities” that describe any historic, large-scale change, with a view to learning from the IRS experience. The IRS experience with information technology is a rich source of learning for anyone concerned about either IT or public management of mega-projects. But it is not easy to be sure of the exact lessons to draw from the experience. We begin with the most fundamental questions: Was TSM really a failure?

Was TSM Really a Failure?

In trying to understand TSM, its failures and its successes, the first two questions to confront are: “Was TSM *really* a failure?” and “What factors determined TSM outcomes?” Neither question has an unambiguous answer.

Yes, by most criteria, TSM was a failure. But a summary judgment is complicated by the fact that some very important benefits resulted from TSM work. We can be reasonably confident that TSM provided at least these benefits:

- *Organizational learning.* Knowledge developed under TSM did not evaporate even if the IRS did experience a high level of turnover and executive succession.
- *Training.* The organization learned about how to develop mega-technology, and particular individuals learned, often seat of the pants, about project management, technology’s impacts on an organization, and about how the IRS’s organizational strengths and weaknesses matched up against the demands of a technologically

dependent era. TSM was an important instrument for developing human capital, especially knowledge about project management.

- *Infrastructure.* It is tempting for political opponents to characterize the money spent on TSM as a waste, but, in fact, much of the TSM funding went to purchase hardware and software still in use at the IRS, and several buildings were renovated under TSM. While telecommunications was not strictly speaking part of TSM, it is nonetheless the case that TSM funding helped support telecommunications systems and infrastructure now being used effectively.

Despite the value of each of the above “remnants” of TSM, it is not difficult to argue that TSM was a public management failure. The best evidence for this argument is that few TSM projects developed to the implementation stage and even fewer proved successful and remain today as part of IRS operations. It is not easy to identify which of those few surviving projects are really TSM because some “legacy systems” co-mingled with TSM projects. There was never a rigid boundary between TSM technology and other IRS IT projects and systems. But by virtually any standard, and by the accounts of all the interviewees for this study, TSM produced very few projects with sustained direct impacts on IRS. Since its purpose was to do just that (and more), it seems fair to declare TSM, overall, a failure.

If there is anything we have learned from historiography during the past few decades, it is that single-dimension, deterministic explanations more often mislead than elucidate. Were TSM problems unique

to IRS? Were they related to the public sector context of IRS? Were they problems that could occur in any large organization—public, private, or nonprofit? The answer: yes. The failure of TSM to deliver is almost certainly owing to a complex admixture of IRS failings, the characteristics of public management in the federal government, and problems that might occur in any organization. As we saw in the “alternative explanations” section, the interviewees for this study identified a great many factors they perceived as responsible for TSM outcomes, but all these respondents cited multiple factors with complex interactions.

The section that follows provides some “lessons learned” according to whether the lesson seems to be associated with: 1) the distinctive features of the IRS organizational culture; 2) “generic” features common to all organizations; or 3) features pertaining to the public sector context. Even this simple categorization is not at all straightforward, however. For example, some lessons applicable to all organizations were nonetheless influenced by unique features of IRS or were exacerbated by government process constraints.

The Organizational Culture Lessons

During the TSM era, the IRS was still laboring with a circa-1950s organizational culture that was almost as out of date as the same era’s computer technology. What IRS needed (and is now undergoing) was a cultural revolution, or at least a cultural evolution. The IRS’s current cultural evolution, one carefully managed and planned with their new blueprint,⁵⁰ has initiated changes that cannot be fully assessed at this time but which are likely to have major impacts. The shift from region-based management to functional management is extremely important and will have far-reaching consequences. The increased emphasis on service, as compared to revenue collection, is less likely to take because it has been imposed by Congress (though through willing top managers) and because the change will be difficult to sustain. And the IRS does not yet seem to have made a major dent in its insularity, though it is well aware of the problem and is taking some steps to address it.

While there are many definitions of organizational culture available in the management literature, one that is both simple and to the point is Trice and

Beyer’s definition of organizational culture as patterns of shared meaning within an organization.⁵¹ Edgar Schein, who provides a much more detailed definition of organizational culture, distinguishes among three levels: 1) the most basic assumptions of the organization (e.g., the ways in which one should respond to hierarchical authority); 2) the basic values of the organization (for example, shared ideas about how to interact with persons outside the organization); and 3) the artifacts and creations of the organization (such as administrative handbooks, rituals, and ceremonies).⁵² While, as Schein points out, there are many different aspects of organizational culture, usually when one uses the term it is just another way of saying “the distinctive or unique features of the organization.” If this is what we mean by culture, then the IRS is a particularly “cultured” organization—there are many unique aspects of the IRS that frame its management.

Some of the most fundamental aspects of IRS culture are, at the same time, a blessing and a curse. Moreover, many of these features that have been strengths in the past have worked against the IRS’s ability to develop and implement IT, especially during the TSM period. Consider the case of the insularity of the IRS. In some respects, the insularity is the “dark side” of cohesion. The fact that the IRS tends to view employees as (in the words of interviewees) “family,” “part of the fraternity,” “the secret society,” also implies a strong bond among those viewed as insiders. The question often is one of balance. Arguably, the insularity-cohesion dimension of the IRS has not been in balance, certainly not during the TSM years, and this undermines the ability of IRS to work with contractors or even with new employees. Interestingly, it does not seem to play a similar role in the IRS’s ability to work with outside oversight groups. The GAO, OMB, and NRC review committee interviewees all underscored the accessibility of IRS employees and their willingness to engage.⁵³ The IRS interviewees, by the same token, seemed to have little antipathy to oversight groups, often respecting their contributions.

This seeming inconsistency—the difficulty of accepting new employees and contractors but relative ease of accepting outside groups—is not as strange as it seems. The key is the boundary-setting rules. The oversight groups are outside the bound-

ary, and the IRS culture has developed appropriate norms for working with those outside the boundary. But the new employees and contractors are not exactly outsiders or insiders; they are on the boundary, and the IRS culture does not seem to have developed consensual norms about the role of persons on the boundary. Since the boundary lines are not particularly permeable (that is, it is difficult to move from “outsider” to “insider”), the problem is especially acute.

Lesson Learned: Multi-organization management and interdependence require “soft boundaries.”

The inability to deal with persons perceived to be at the boundary made it nearly impossible for TSM leaders to quickly integrate needed technical talent, even talent hired by the IRS.

IT mega-technology makes its own cultural demands. Until comparatively recently, no one would have described IRS as a “high-tech” organization. But the proportion of de facto high-tech organizations in the federal government is likely to increase every year as functionality and even organizational survival depend on effective deployment of technology. Moreover, most organizations in the federal government are already “technical,” but with a different set of technologies—the technicalities of tax law, or the technicalities of human service delivery, or the technicalities of contracting, budgeting, and procurement. Most agencies have rewarded general management and functional management skills and have flourished by digging in and mastering a domain rather than by constant renewal and adaptation. This is no longer a good strategy for an organization whose success depends on IT competence.

Lesson Learned: IRS must become a “technology culture.” Information technology not only is not the same as other technologies, it may require a different culture than other technical functions. Information technology rewards specialization, adaptability, renewal, and project management skills.

The “Generic Management” Lessons

The idea that “management is management” and that the public or private sector context really is not that important is often referred to as the generic theory of management. While there is considerable controversy about the importance of the public sec-

tor context,⁵⁴ it seems likely that some aspects of management are much more generic than others.

Many aspects of IRS’s difficulties with TSM do not seem directly related to the public sector context or the peculiarities of public sector politics or management systems. Probably the most important of these are its problems with project management. While these problems have been both prodigious and varied in their nature, the most important cause of the problems is right on the surface: IRS invested very few resources on formal training for project management. It was extraordinary to have undertaken one of the largest civilian technology projects in U.S. history with the expectation that knowledge of project management would be garnered as on-the-job experience. This problem is not a public sector problem.

Lesson Learned: If project management is a major determinant of success, do not try to learn it “on the fly.” Any organization launching mega-projects while failing to assess (or improve) the project management skills of the persons in charge would have a low probability of success.

While the IRS deficits in project management skills, experience, and training are not in any way unique, those deficits were perhaps exacerbated by both organizational culture and public sector context. The public sector context made it more difficult (especially at the outset of TSM) to quickly recruit persons who already had high levels of project management skill and experience with mega-technology projects. People in the private sector who have managed projects of the importance and complexity of TSM command salaries well beyond the levels then available to IRS (more so during TSM, but even now after IRS has acquired critical pay authority).

Perhaps even more important is the culture of IRS, which has, in the past, done quite well by taking talented individuals, providing them with big challenges, and relying on their talent, team-building ability, and “can-do” attitude to succeed. Moreover, many of the training programs in IRS, especially their executive development programs, are very useful for many management tasks. This system simply broke down with TSM. The existing training incorporated very little training relevant to large-scale

project management. And while almost all high-level managers at IRS have hard-earned experience in project management, that experiential knowledge, both its level and substance, proved inadequate for the task of managing IT mega-technology.

Lesson Learned: A new technological regime requires a “culture check.” The very attributes that may have in the past been enabling often turn out to be, with technologically altered realities, liabilities.

Another “generic” problem that seems to have strongly affected TSM is the from-famine-to-feast infusion of resources. After years of turning a deaf ear to IRS’s needs for IT renewal, Congress lavished funds. “Lavish” is probably not the best term with respect to IRS needs, which were and continue to be enormous, but certainly with respect to the IRS’s ability to actually absorb the funds and spend them wisely. The rapid infusion of resources is a pleasant problem, but one that very few organizations, public or private, manage effectively. Again, the public sector context was a contributor to the problem in that much of the budget authority could not easily be rolled over—or, when it could, only with the perception of insufficient need—but the problem of digesting large-scale resources was not inherently a government problem.

Much of public policy making in the United States is highly erratic and sensitive to “big events.” If there is a huge earthquake, there is more money available for earthquakes. If there is a terrorist attack, the CIA evolves overnight from an agency whose budget has languished to a critical agency with stepped-up applications, vastly increased public attentiveness, stepped up personnel applications, and (who knows for sure?) increased budgets. Sometimes the “big event” is to some extent self-created. Certainly this was true with the IRS TSM windfall. In the 1985 service center meltdown, the system failed so colossally that it finally became clear to everyone that drastic efforts were required. To be sure, the IRS was only a minor partner in its own disaster—Congress had virtually ensured calamity by continually ignoring years of IRS requests for IT renewal.

The IRS had for years been preparing plans for IT renewal, but then seemed overwhelmed when the reality of available resources outstripped their fantasies. This says something about the plans them-

selves, especially that there may have been more attention to the wish list than to the specifications and functionality. The fact that IRS was such a long time in developing a satisfactory architecture seems to suggest that the very process and assumptions of technological planning had not at any point been adequate. Each generation of strategic plan, even ones not implemented, must give some detail to the operational implications of those plans. Absent that level of detail, one’s ship may finally come in and then sink just as it pulls into the harbor.

Lesson Learned: Beware of the windfall or at least be ready for it. Vast technological projects, as compared to more routine and incremental changes in agencies’ activities and functions, require that the vision and goals be taken several steps below the level where most executive and strategic managers work. Developing operational plans at a rapid pace, while at the same time learning about technology and assessing needs, is simply too complicated and demanding when one is dealing with IT mega-technology.

Any organization with a rapid infusion of enormous resources cannot succeed in the absence of strong planning, evaluation, and accountability mechanisms. While there is some disagreement on the “strong planning” element, the IRS had virtually no systematic evaluation systems in place and, indeed, did not even have plans for them. In its 1996 report, the NRC committee noted that one part of the advice from its earlier report had essentially been ignored:

In its 1992 report, the committee noted the tendency of managers to focus entirely on “making things happen,” neglecting the necessary planning required to accurately determine just how well “things happen”.... the IRS has not followed through and ... the lack of attention to clear-cut objectives, metrics for measuring those objectives, and evaluation approaches for making valid inferences about accomplishments has been one of the major barriers to greater progress in TSM.⁵⁵

Doubtless, this near obsession with “making things happen” and short-term results was, to a large extent, a predictable consequent of the availability

of huge resources and a perceived (and perhaps real) pressure to deliver as much as possible, as quickly as possible.

Lesson Learned: The bigger the opportunity, the greater the need to evaluate. When resources are flowing and there are projects to be put in place, it is always tempting to put evaluation aside. Generally, this is when rigorous evaluation is most important, when the pace of resources, plans, and projects is escalating beyond the ability of managers to be systematic and reflective.

The Public Sector and Political Context Lessons

The public context does not seem to be the leit-motif in TSM—generic management and organizational culture issues seem more important—but the public context shaped many of the TSM problems, as noted in the case of project management difficulties. Certainly, the IRS seems to have been subject under TSM to many constraints that private sector organizations would not experience, but those constraints do not seem in most instances to have been greater or qualitatively different than experienced by other agencies or even than experienced by IRS during other periods of its history. For example, the external political pressure on the IRS immediately after the infamous Nixon era punitive political use of the IRS was as great.

Interestingly, the circa-1990 concerns of CIO Hank Philcox, each compelling at the time, proved not to be the most significant barriers to TSM. Philcox was concerned about problems related to procurement, civil service limitations, and single-year budget authority. Early in TSM, each of these factors was to some extent a problem, especially procurement. As the decade of the 1990s began, protracted challenges to procurement were a matter of course, and contracting was not only time-consuming but in some respects tortuous. But contract and procurement reform diminished these problems, and none of the interviewees cited procurement as a major problem. Similarly, IRS was awarded “n-year” (or multiple-year) budget authority for many purposes related to IT. While bringing in sufficient technical expertise was, to some extent, a problem magnified by civil service strictures, the problem was solved in part with SL

employees. Moreover, remaining problems of recruiting and *using* technical experts do not seem to flow chiefly from civil service constraints.

Lesson Learned: Public managers are expert at dealing with public constraints. Public sector context always provides some “cover,” but it is difficult for public managers, even very talented ones, to re-invent themselves as information technology managers.

A sort of mirror-image lesson is that privatization, contracting out, and private-sector-oriented management solutions sometimes do not work in the public sector when public managers do not have the requisite skills and experience to manage relations with the private sector. One of the great myths of contemporary public management is that most public management problems can be resolved through contracting and outsourcing. To be sure, the wholesale movement of assets and responsibilities from public to private sector (i.e., true privatization) can sometimes provide a quick solution (albeit one used only rarely). But outsourcing is a solution only if the agency has considerable skill in setting up the contract and managing it. And that, indeed, is the vulnerability, both in the IRS and in so many misadventures in outsourcing.

The basic problem is simple: If an agency (or private sector organization, for that matter) is having difficulty with core organizational functions, what reason is there to believe that the organization will competently manage someone else’s performance of that function? If there is anything we know from principal-agent theory,⁵⁶ it is that the “moral hazards” of a principal’s oversight of functions delegated to agents are made more difficult when the principal has limited knowledge of the technical aspects of tasks and when there is limited incentive on the part of the agent to control costs. In many cases, outsourcing, even when it provides additional technical resources, does so at a great cost. There is simply no substitute for the contracting organization knowing enough about the technical dimensions of the problem to be able to develop a viable contract, complete with well-communicated and sensible specifications, and having the ability to see to it that “shirking” is minimal. Unfortunately, the very nature of mega-technology is such that the contracting agency is *not* likely to have a good understanding

of the many dimensions of goods and services required and their relationships to one another.

Even when there is sufficient technical knowledge to formulate a quality set of specifications and to select proficient contractors, there remains the necessity of working with the contractor. Again, the size and technical complexity of IT mega-technology makes this very difficult. With respect to current IRS modernization efforts, the level and range of activities expected of the PRIME is enormous and unlikely to succeed absent strong participation and partnership with the IRS. It will be interesting to see if one of the IRS's "lessons learned" from TSM is large-scale contract management and partnership.

What we have posed, then, is a very difficult scenario with no obvious route to success. The conundrum: The agencies most likely in need of contractor expertise are, in the case of large highly technical projects, least likely to be able to forge a good contract and to work effectively with contractors. One solution is to "double up" on outsourcing, working closely with a trusted contractor to help *develop* the contract. In the case of the IRS, the FFRDC *should* have been able to help with this task, but a long history of mediocre use and linkage to the FFRDC meant this option likely would not have been terribly fruitful. Another solution, one the IRS tried, was to use external advisory panels. But the external advisory panels must be brought in at a very early phase. The National Research Council panel that advised IRS was presented a grandiose plan but did not participate in its formulation. Moreover, the function of the NRC is such that it would not have been a good partner for IRS in its TSM planning. The IRS did not get the help it needed at the time it needed it.⁵⁷

Lesson Learned: Contracting out requires management within. Perhaps this is the lesson most generalizable to public agencies. Outsourcing is not a substitute for good public management; rather, outsourcing succeeds when it provides external resources to supplement good public management.

In sum, the story of TSM is a story of public managers challenged, but not primarily one attributable to the challenges of public management. Certainly, there are many elements of TSM that

have been shaped by the public sector context—indeed, almost all elements of TSM have been shaped indirectly by the public sector context—but it seems clear that the failures of TSM cannot be viewed as an impossibility of effective public management of IT mega-technology. One reason we can conclude that the public sector context is not necessarily a limiting factor is that IRS has made important strides since TSM.

Is the IRS Finally on the Right Track?

In IT management, summative evaluations should be avoided until the technology is in place. Even today, the list of IRS technology needs is much longer than the list of new working technologies. But if it is too early to tell if the IRS's post-TSM strategies will, on balance, prove effective, certainly the early signs are positive.

If we consider the "lessons learned" identified earlier, these seem, for the most part, to be lessons that the IRS has learned since TSM. While interviewees still point to some problems, the IRS has made strides in contractor management and partnership. The IT experience and credentials of the persons now in charge of IRS technology management (not only the CIO's office, but also the commissioner) far surpass those of the otherwise talented individuals who were in charge during the TSM era. Changing an organization's culture is, of course, a daunting task, but there are positive signs there as well. The recent changes in mission and in organization structure certainly send the signals for organizational renewal and culture change.

Many challenges remain. The IRS still seems to have some difficulty "opening up" to outsiders, and it is remarkable that persons who have worked there for years still do not always feel fully accepted. Related to this, turnover of skilled personnel continues to be a problem. There are mixed reports on how well the PRIME contract is doing. But even in cases where the IRS is not where it wants to be, it seems to be taking steps along the right path. With additional human capital development, outside technical help, and continued hard work and commitment (the latter being the IRS comparative advantage), IT mega-technology at the IRS may prove to be a textbook case of turning IT failure into IT success.

Endnotes

1. I am grateful to The PricewaterhouseCoopers Endowment for The Business of Government, which provided funds for this study, and to Columbia University's Center for Science, Policy, and Outcomes for providing office space and resources and for permitting me to work on this separate and unaffiliated project during my residency in Washington as Distinguished Research Fellow at the center. Among the many present and past IRS employees who helped me with this study, I am especially grateful to Dennis Szymanski for his role in coordinating interviews and providing material. At the Endowment, I am especially grateful to Mark Abramson, who provided detailed and very useful comments on an earlier draft. The opinions expressed herein are mine and do not necessarily reflect the views of PricewaterhouseCoopers; the Internal Revenue Service; the Center for Science, Policy, and Outcomes; or any of the individuals consulted during my research.

2. Robert Hershey, "A Technological Overhaul of IRS is Called a Fiasco," *New York Times*, April 15, 1996.

3. Richard Stengel, "An Overtaxed IRS," *Time*, April 7, 1997.

4. *Ibid.*

5. National Research Council, *Continued Review of Tax Systems Modernization of the Internal Revenue Service* (Washington, D.C.: National Academy Press, 1996).

6. J. Chommie, *The Internal Revenue Service* (New York: Praeger Publishers, 1970), pp. 22-30.

7. Earlier versions of the IRS mission simply emphasized the efficient collection of revenue. The new mission: "Provide America's taxpayers top quality service by helping them understand and meet their tax responsibilities and by applying the tax law with integrity and fairness to all." (*Internal Revenue Service Organizational Blueprint*, Document 11052 [Rev.4-2000], Washington, D.C.: Internal Revenue Service, 2000).

8. F. Zaffino, "Projections of Returns to be Filed in Calendar Years 2000-2007," in *IRS Statistics of Income Bulletin*, Winter 2000-2001, publication 1136 (Rev. 2-2001) (Washington, D.C.: Internal Revenue Service), pp. 146-152.

9. *Ibid.*, p. 148.

10. Brian Balkvic, "Individual Income Tax Returns, Preliminary Data, 1999" (Washington, D.C.: Internal Revenue Service), pp.191-201.

11. Internal Revenue Service, *Progress Report IRS Business Systems Modernization Program*, Publication 3701 (Rev. 9-2000) (Washington, D.C.: Internal Revenue Service), p. 8.

12. Shelley Davis, *Unbridled Power: Inside the Secret Culture of the IRS*. (New York: Harper Business, 1997), p. 57.

13. Since the focus of this study is on TSM and its aftermath, and since the pre-TSM activity consisted of plans rather than projects and programs, this early phase receives less attention.

14. U.S. Office of Technology Assessment, *A Preliminary Analysis of the IRS Tax Administration System*. NTIS Order #PB273143, March 1977.

15. Davis, *op cit.*, pp. 60-63.

16. Michael P. Dolan, "IRS Acting Commissioner's Testimony at Ways and Means Oversight Panel Hearing on IRS Modernization," *93 Tax Notes Today* 72-49, March 30, 1993.

17. John Broder, "How an Agency was Left Behind on the Road Ahead," *New York Times*, February 10, 1997.

18. *Ibid.*

19. The author was a member of the NRC committee on Tax Systems Modernization, both the first committee and a re-appointed committee, serving from 1990-1995.

20. Hank Philcox, "Modernizing the IRS," *The CPA Journal*, November 1990.
21. Ibid.
22. Ibid.
23. U.S. General Accounting Office.
24. U.S. General Accounting Office.
25. <http://www.elixir.com/News/archive/irsdeal.htm>, downloaded August 27, 2001.
26. Christopher Dorobek, "800 IT Staffers Face RIFs Under IRS Plan," *GCN*, October 21, 1996, p. 1.
27. "IRS Struggling to Bring Agency into Digital Age," Associated Press story reported April 12, 1997 in *Lubbock Avalanche-Journal*, <http://www.lubbockonline.com/news/041397/irs.htm>, downloaded 8.27.01.
28. "Taxed by Technology," *GovExec.com*, February 1, 1999, p. 5.
29. Ibid., p. 3.
30. U.S. General Accounting Office, *Tax Systems Modernization: Blueprint is a Good Start But Not Yet Sufficiently Complete to Build or Acquire Systems* (Washington, D.C.: GAO/AIMD/GGD-98-54), February 24, 1998.
31. U.S. General Accounting Office, *IRS Management: Business and Systems Modernization Pose Challenges* (Washington, D.C.: GAO/GGD/AIMD-99-138), April 15, 1999, p. 2.
32. See Internal Revenue Service, *Modernizing America's Tax Agency*, Publication 3349 (Washington, D.C.: USGPO, 2000).
33. Internal Revenue Service, *Blueprint For Technology Modernization*, (Washington, D.C.: USGPO, May 1997).
34. U.S. General Accounting Office, *Tax Systems Modernization: Management and Technical Weaknesses Must Be Corrected if Modernization is to Succeed* (Washington, D.C.: GAO/AIMD-95-156, July 1995).
35. U.S. General Accounting Office, *IRS Management: Business and Systems Modernization Pose Challenges*, p. 7.
36. Internal Revenue Service, p. 43.
37. S. 1124. Sec. 5126.
38. B. Landauer, "IT Tool May Aid Financial Management," *Federal Times.Com*, August 28, 2000, http://www.federaltimes.com/infotech/it_tool.html, downloaded October 4, 2001.
39. J. Hasson, "IRS Unveils Modernization Blueprint," *Federal Computer Week*, January 12, 2001, downloaded November 27, 2001 from: <http://www.fcw.com/fcw/articles/2001/0108/web-irs-01-12-01.asp>.
40. Downloaded November 27, 2001: <http://www.csc.com/industries/government/news/98.shtml>
41. Ibid.
42. O. De Bruce, "IRS Taps CSC for System Overhaul," *Federal Computer Week*, December 21, 1998, downloaded November 27, 2001 from: http://www.fcw.com/fcw/articles/1998/FCW_122198_1340.asp.
43. National Research Council, op cit., p. 3.
44. For a detailed account of the IRS critical pay authority, see Hal Rainey, *A Weapon in the War for Talent: Using Special Authorities to Recruit Crucial Personnel* (Arlington, Va.: The PricewaterhouseCoopers Endowment for The Business of Government, December 2001).
45. MITRE Corporation, "What is an FFRDC?" <http://www.mitre.org/about/ffrdc.shtml>, accessed on December 12, 2001, last updated in July 1999.
46. MITRE Corporation was the original IRS FFRDC, replaced in 1993 by Illinois Institute of Technology, which, in turn, was replaced by MITRE in 1998.
47. Barry Bozeman and Gordon Kingsley, "Risk Culture in Public and Private Organizations," *Public Administration Review*, 58, 2, (1998), 109-119.
48. For an overview, see Hal Rainey and Barry Bozeman, "Public Organization Theory and the A Priori: A Review of Research and Theory," *Journal of Public Administration Research and Theory*, 10, 2, (April 2000), 67-80.
49. Philcox, op cit.
50. Internal Revenue Service, *IRS Organizational Blueprint, 2000* (Washington, D.C.: U.S. Treasury).
51. H. Trice and J. Beyer, *The Cultures of Work Organizations* (Upper Saddle River, N.J.: Prentice Hall, 1993).
52. E. Schein, *Organizational Culture and Leadership* (San Francisco: Jossey-Bass, 1992).
53. A personal note: All of the IRS officials I spoke with could not have been more cooperative and forthcoming.
54. H. Rainey and B. Bozeman, "Comparing Public and Private Organizations: Empirical Research and the Power of the A Priori," *Journal of Public Administration Research and Theory*, 10:2 (April, 2000): 447-469.
55. National Research Council, op cit., pp. 48-49.
56. For a cogent introduction to principal-agent theory, see Joseph Stiglitz, "Principal and Agent," in John Eatwell, Murray Milgate, and Peter Newman, (eds), *The New Palgrave: A Dictionary of Economics* (London: The Macmillan Press Limited, 1987).

57. In 1990-91, the IRS was limited in the number of advisory panels it could appoint. Advisory panels had been “frozen” throughout the federal bureaucracy and a new one could be created at IRS only by getting rid of one. Since the Commissioner’s Advisory Panel was, at that time, the only one in place, it was the only one that could have been sacrificed—not a good trade.

ABOUT THE AUTHOR

Barry Bozeman is Regents' Professor of Public Policy, Georgia Institute of Technology. He previously served as director of the School of Public Policy and was founding director of the Research Value Mapping Program. Before joining Georgia Tech in 1994, Bozeman was Professor of Public Administration and Affiliate Professor of Engineering at Syracuse University's Maxwell School of Citizenship and Public Affairs and the L. C. Smith College of Engineering.

Bozeman's research interests have focused on public management and science and technology policy. His two most recent books are *Bureaucracy and Red Tape* (Prentice-Hall, 2000) and *Limited by Design: U.S. R&D Laboratories in the U.S. National Innovation System* (Columbia University Press, 1998), written with Michael Crow.



Professor Bozeman has served as an advisor to a number of government agencies and worked briefly at the National Science Foundation's Division of Information Science and Technology and the Japanese government's National Institute for Science and Technology Policy. He received his Ph.D. in political science from the Ohio State University in 1973.

K E Y C O N T A C T I N F O R M A T I O N

To contact the author:

Barry Bozeman

School of Public Policy
Georgia Institute of Technology
D. M. Smith Building
Atlanta, GA 30332
(404) 894-0093

e-mail: barry.bozeman@pubpolicy.gatech.edu

ENDOWMENT REPORTS AVAILABLE

GRANT REPORTS

E-Government

Managing Telecommuting in the Federal Government: An Interim Report (June 2000)

Gina Vega
Louis Brennan

Using Virtual Teams to Manage Complex Projects: A Case Study of the Radioactive Waste Management Project (August 2000)

Samuel M. DeMarie

The Auction Model: How the Public Sector Can Leverage the Power of E-Commerce Through Dynamic Pricing (October 2000)

David C. Wyld

Supercharging the Employment Agency: An Investigation of the Use of Information and Communication Technology to Improve the Service of State Employment Agencies (December 2000)

Anthony M. Townsend

Assessing a State's Readiness for Global Electronic Commerce: Lessons from the Ohio Experience (January 2001)

J. Pari Sabety
Steven I. Gordon

Privacy Strategies for Electronic Government (January 2001)

Janine S. Hiller
France Bélanger

Commerce Comes to Government on the Desktop: E-Commerce Applications in the Public Sector (February 2001)

Genie N. L. Stowers

The Use of the Internet in Government Service Delivery (February 2001)

Steven Cohen
William Eimicke

State Web Portals: Delivering and Financing E-Service (January 2002)

Diana Burley Gant
Jon P. Gant
Craig L. Johnson

Internet Voting: Bringing Elections to the Desktop (February 2002)

Robert S. Done

Leveraging Technology in the Service of Diplomacy: Innovation in the Department of State (March 2002)

Barry Fulton

Financial Management

Credit Scoring and Loan Scoring: Tools for Improved Management of Federal Credit Programs (July 1999)

Thomas H. Stanton

Using Activity-Based Costing to Manage More Effectively (January 2000)

Michael H. Granof
David E. Platt
Igor Vaysman

Audited Financial Statements: Getting and Sustaining "Clean" Opinions (July 2001)

Douglas A. Brook

An Introduction to Financial Risk Management in Government (August 2001)

Richard J. Buttimer, Jr.

Human Capital

Profiles in Excellence: Conversations with the Best of America's Career Executive Service (November 1999)

Mark W. Huddleston

Leaders Growing Leaders: Preparing the Next Generation of Public Service Executives (May 2000)

Ray Blunt

Reflections on Mobility: Case Studies of Six Federal Executives (May 2000)

Michael D. Serlin

A Learning-Based Approach to Leading Change (December 2000)

Barry Sugarman

Labor-Management Partnerships: A New Approach to Collaborative Management (July 2001)

Barry Rubin
Richard Rubin

Winning the Best and Brightest: Increasing the Attraction of Public Service (July 2001)

Carol Chetkovich

Organizations Growing Leaders: Best Practices and Principles in the Public Service (December 2001)

Ray Blunt

A Weapon in the War for Talent: Using Special Authorities to Recruit Crucial Personnel (December 2001)

Hal G. Rainey

A Changing Workforce: Understanding Diversity Programs in the Federal Government (December 2001)

Katherine C. Naff
J. Edward Kellough

Managing for Results

Corporate Strategic Planning in Government: Lessons from the United States Air Force (November 2000)

Colin Campbell

Using Evaluation to Support Performance Management: A Guide for Federal Executives (January 2001)

Kathryn Newcomer
Mary Ann Scheirer

Managing for Outcomes:

Milestone Contracting in Oklahoma (January 2001)

Peter Frumkin

The Challenge of Developing

Cross-Agency Measures: A Case Study of the Office of National Drug Control Policy (August 2001)

Patrick J. Murphy
John Carnevale

The Potential of the Government Performance and Results Act as a Tool to Manage Third-Party Government (August 2001)

David G. Frederickson

Using Performance Data for

Accountability: The New York City Police Department's CompStat Model of Police Management (August 2001)

Paul E. O'Connell

New Ways to Manage

Managing Workfare: The Case of the Work Experience Program in the New York City Parks Department (June 1999)

Steven Cohen

New Tools for Improving

Government Regulation: An Assessment of Emissions Trading and Other Market-Based Regulatory Tools (October 1999)

Gary C. Bryner

Religious Organizations, Anti-Poverty Relief, and Charitable

Choice: A Feasibility Study of Faith-Based Welfare Reform in Mississippi (November 1999)

John P. Bartkowski
Helen A. Regis

Business Improvement Districts and Innovative Service Delivery (November 1999)

Jerry Mitchell

An Assessment of Brownfield Redevelopment Policies:

The Michigan Experience (November 1999)

Richard C. Hula

Determining a Level Playing Field for Public-Private Competition (November 1999)

Lawrence L. Martin

San Diego County's Innovation

Program: Using Competition and a Whole Lot More to Improve Public Services (January 2000)

William B. Eimicke

Innovation in the Administration of Public Airports (March 2000)

Scott E. Tarry

Entrepreneurial Government:

Bureaucrats as Businesspeople (May 2000)

Anne Laurent

Implementing State Contracts for Social Services: An Assessment of the Kansas Experience (May 2000)

Jocelyn M. Johnston
Barbara S. Romzek

Rethinking U.S. Environmental Protection Policy:

Management Challenges for a New Administration (November 2000)

Dennis A. Rondinelli

The Challenge of Innovating in Government (February 2001)

Sandford Borins

Understanding Innovation:

What Inspires It? What Makes It Successful? (December 2001)

Jonathan Walters

A Vision of the Government as a World-Class Buyer: Major Procurement Issues for the Coming Decade (January 2002)

Jacques S. Gansler

Contracting for the 21st Century:

A Partnership Model (January 2002)

Wendell C. Lawther

Franchise Funds in the Federal

Government: Ending the Monopoly in Service Provision (February 2002)

John J. Callahan

Managing "Big Science":

A Case Study of the Human Genome Project (March 2002)

W. Henry Lambright

Leveraging Networks to Meet

National Goals: FEMA and the Safe Construction Networks (March 2002)

William L. Waugh, Jr.

Government Management of Information Mega-Technology:

Lessons from the Internal Revenue Service's Tax Systems Modernization (March 2002)

Barry Bozeman

Transforming Organizations

The Importance of Leadership:

The Role of School Principals (September 1999)

Paul Teske
Mark Schneider

Leadership for Change:

Case Studies in American Local Government (September 1999)

Robert B. Denhardt
Janet Vinzant Denhardt

Managing Decentralized

Departments: The Case of the U.S. Department of Health and Human Services (October 1999)

Beryl A. Radin

Transforming Government: The Renewal and Revitalization of the Federal Emergency Management Agency (April 2000)

R. Steven Daniels
Carolyn L. Clark-Daniels

Transforming Government: Creating the New Defense Procurement System (April 2000)

Kimberly A. Harokopus

Trans-Atlantic Experiences in Health Reform: The United Kingdom's National Health Service and the United States Veterans Health Administration (May 2000)

Marilyn A. DeLuca

Transforming Government: The Revitalization of the Veterans Health Administration (June 2000)

Gary J. Young

The Challenge of Managing Across Boundaries: The Case of the Office of the Secretary in the U.S. Department of Health and Human Services (November 2000)

Beryl A. Radin

Creating a Culture of Innovation: 10 Lessons from America's Best Run City (January 2001)

Janet Vinzant Denhardt
Robert B. Denhardt

Transforming Government: Dan Goldin and the Remaking of NASA (March 2001)

W. Henry Lambright

Managing Across Boundaries: A Case Study of Dr. Helene Gayle and the AIDS Epidemic (January 2002)

Norma M. Riccucci

SPECIAL REPORTS

Government in the 21st Century

David M. Walker

Results of the Government Leadership Survey: A 1999 Survey of Federal Executives (June 1999)

Mark A. Abramson
Steven A. Clyburn
Elizabeth Mercier

Creating a Government for the 21st Century (March 2000)

Stephen Goldsmith

The President's Management Council: An Important Management Innovation (December 2000)

Margaret L. Yao

Toward a 21st Century Public Service: Reports from Four Forums (January 2001)

Mark A. Abramson, Editor

Becoming an Effective Political Executive: 7 Lessons from Experienced Appointees (January 2001)

Judith E. Michaels

The Changing Role of Government: Implications for Managing in a New World (December 2001)

David Halberstam

BOOKS*

Transforming Organizations (Rowman & Littlefield Publishers, Inc., 2001)

Mark A. Abramson and Paul R. Lawrence, editors

E-Government 2001 (Rowman & Littlefield Publishers, Inc., 2001)

Mark A. Abramson and Grady E. Means, editors

Managing for Results 2002 (Rowman & Littlefield Publishers, Inc., 2001)

Mark A. Abramson and John Kamensky, editors

Memos to the President: Management Advice from the Nation's Top Public Administrators (Rowman & Littlefield Publishers, Inc., 2001)

Mark A. Abramson, editor

Innovation (Rowman & Littlefield Publishers, Inc., 2002)

Mark A. Abramson and Ian Littman, editors

Human Capital 2002 (Rowman & Littlefield Publishers, Inc., 2002)

Mark A. Abramson and Nicole Willenz Gardner, editors

* Available at bookstores, online booksellers, and from the publisher (www.rowmanlittlefield.com or 800-462-6420).

About The Endowment

Through grants for Research and Thought Leadership Forums, The PricewaterhouseCoopers Endowment for The Business of Government stimulates research and facilitates discussion on new approaches to improving the effectiveness of government at the federal, state, local, and international levels.

Founded in 1998 by PricewaterhouseCoopers, The Endowment is one of the ways that PricewaterhouseCoopers seeks to advance knowledge on how to improve public sector effectiveness. The PricewaterhouseCoopers Endowment focuses on the future of the operation and management of the public sector.

About PricewaterhouseCoopers

The Management Consulting Services practice of PricewaterhouseCoopers helps clients maximize their business performance by integrating strategic change, performance improvement and technology solutions. Through a worldwide network of skills and resources, consultants manage complex projects with global capabilities and local knowledge, from strategy through implementation. PricewaterhouseCoopers (www.pwcglobal.com) is the world's largest professional services organization. Drawing on the knowledge and skills of more than 150,000 people in 150 countries, we help our clients solve complex business problems and measurably enhance their ability to build value, manage risk and improve performance in an Internet-enabled world. PricewaterhouseCoopers refers to the member firms of the worldwide PricewaterhouseCoopers organization.

For additional information, contact:

Mark A. Abramson

Executive Director

The PricewaterhouseCoopers Endowment for The Business of Government

1616 North Fort Myer Drive

Arlington, VA 22209

(703) 741-1077, fax: (703) 741-1076

e-mail: endowment@us.pwcglobal.com

website: endowment.pwcglobal.com

The PricewaterhouseCoopers Endowment for

The Business of Government

1616 North Fort Myer Drive
Arlington, VA 22209-3195

PRST STD US Postage PAID Permit 1112 Merrifield, VA
--