Executive Summary

Electronic commerce has enabled the Federal government to meet the demands of an ever changing marketplace for its services. There are some broad differences between the private and public sectors with respect to e-commerce and information technology, but at the same time, there are some commonalties that allow for a good comparison between the methods used by corporations in selecting and launching e-commerce projects versus the methods used by government. Since government moves at a pace that is not influenced by market forces or competitive pressures, there is a better chance to implement projects gradually with specific focus on sustainability, customer needs and goals, as well as the project life cycle.

In this report, we outline some of the processes involved with selecting, implementing and reviewing e-commerce projects throughout the Federal government. By conducting primary and secondary research into 11 different e-commerce initiatives within the government, we have been able to identify six case dimensions that tend to overlap almost every e-commerce project that we have studied. These dimensions are: idea generation, customer and market research, technology development, risk, approval process and success measures. There are two other dimensions that we identified— funding and development process—but we chose not to incorporate these topics within the scope of this report.

Having identified these areas, we were then able to develop a four step process that may be used in building a business case for an e-commerce project within the government. The steps are: identification, value chain analysis, implementation and feedback. These steps produce an iterative loop which can give life to new projects or reengineer old ones.

The last portion of this report lists our recommendations, which are broken down into each of the six case dimensions. For each one, we chose to focus on an aspect that occurred most commonly across the different cases and how best to develop that aspect further into the future. We believe that this report should serve not as a road map, but as a helpful tool for government project managers who are charged with developing, launching and maintaining e-commerce initiatives.

Elements of a Business Case

There are many elements to consider when developing a business case for the implementation of an e-commerce project or, for that matter, any type of information systems project. Although there are some unique differences between the private and public sectors, agencies within the federal government face many of the same issues and challenges that private firms must deal with when developing and launching a new project. The following diagram illustrates some recommended steps in the development of a business case for government e-commerce initiatives:

Step 1: Identification of sustainable projects   Figure 1

Step 2: Value chain analysis

Step 3: Implementation

Step 4: Feedback and review
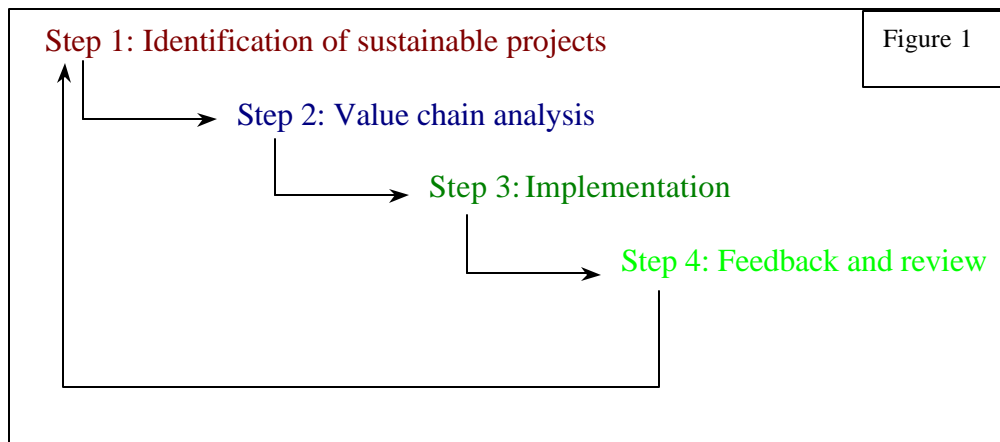
For each step in this process, it is necessary to evaluate a project based on a number of different issues. The following is a list of topics that pertains to public e-commerce projects:

Case Dimension	Description
Idea Generation	the source and impetus for a new project
Customer and Market Research	an evaluation of the intended potential users and beneficiaries of a project
Technology Development	an analysis of the technological resources necessary to build and service a new project
Risk	uncontrollable factors that may jeopardize implementation or customer adoption of a project
Approval Process	the level of authority within the government required for project initiation
Success Measures	tools used to assess whether or not a project has met its intended goals

The main focus of this paper will be on the first six topics and the relative importance and impact that each topic has on developing a successful public e-commerce project. Two additional topics—development process and funding—were discussed in a previous consulting project conducted by students at the Robert H. Smith School of Business, and are thus beyond the scope of this paper (interested readers are urged to review the previous report). The goal of this paper is to compliment and add value to the earlier project as well as provide a lasting and useful guide for the development, implementation and maintenance of public e-commerce initiatives.

Government-to-Business (G2B)

One of the main differences between the public sector and the private sector concerns profit motive: a private firm will not undertake an expensive and risky project if there is no prospect for a substantial future return on such an investment. This is a critical and overwhelming concern for a private company and in the development process, many of these companies attempt to make reasonable assumptions about future cash flows and expenses in order to justify any initial expenditure of capital. Frequently, if the net present value of a project is positive and its internal rate of return exceeds the firm's cost of capital, a project will go forward given that all of the assumptions about revenues and costs have been properly examined and the risks and uncertainties surrounding a project have been minimized.

Agencies within the public sector must consider many different variables other than profitability when deciding whether or not to launch an e-commerce project. Certainly, cost reduction is important, but profits are not necessarily the driving force behind getting a project approved and launched. To the contrary, it may be a *disincentive* to launch a project that generates an overly positive cash flow, since the excess profit will generally not be retained by the agency responsible for implementation. This can also result in a reduction of future operating budgets and perhaps a formal audit or review of the budgetary needs for an agency. Clearly, there may be a penalty for success (or at least the belief that there is one) and this factor can draw away from the other positive benefits that a project may yield. Just as private companies must serve the interests of their shareholders, Government agencies are accountable to many different stakeholders, including Congressional oversight committees, task forces and taxpayers. Due to this fragmented constituency and the absence of a profit motive, there are many different qualitative factors that generally take precedence in the development of a business case for public e-commerce projects.

Aside from these concerns, there are other significant differences and similarities between the government and private corporations with respect to the six case dimensions. Quite often, entrepreneurial idea generation is rewarded in the private sector, but at the same time, there is clearly more risk-tolerance in this sector which allows for these types of projects. Additionally, private firms are acutely aware of who their customers are and how best to address their needs in the marketplace. In contrast, some government agencies serve either huge, undistinguishable markets or tiny, focused segments. Finally, the private sector may put a greater emphasis on financial success measures while the public sector frequently chooses to value more qualitative measures.

Methodology

This report was produced through a combination of secondary and primary market research. Secondary research consisted of researching industry journals, reports, web sites, and recent articles on e-commerce projects and business cases. Primary research consisted of conducting telephone and face-to-face interviews with government agencies that engaged in e-commerce project development as well as subject matter experts. (Please see Appendix A).

Secondary research was initially conducted in order to gain a better understanding of e-commerce business models as well as successful and unsuccessful government projects. In addition, five (5) government agency officials who implemented government e-commerce projects were interviewed. Once this data was collected and analyzed, the findings were delivered to the Office of Electronic Commerce team members via a mid-project oral presentation held in the GSA building in Washington, D.C. on October 27, 2000. Feedback on our findings and additional industry contacts were collected during this meeting. This provided a good basis for the next phase of the project, which entailed collecting additional qualitative data via six (6) additional interviews with Federal Government agencies.

A list of agencies to be interviewed was obtained through John Thomas, Team Leader for the Federal Electronic Commerce Program. Federal agency projects were recommended for interview by the GSA team based on their knowledge of these projects. A total of ten (10) interviews with government executives, three (3) interviews with private consultants and two (2) interviews with subject matter experts were conducted. The interviewees are current employees of the Federal Government or professors at the Robert H. Smith School of Business, University of Maryland, College Park. Interviews were attended by two consulting team members and scheduled for approximately thirty minutes each, though most interviews went beyond that time period. Nine (9) of the fifteen (15) total interviews were conducted via telephone and lasted between thirty to sixty-minutes each. The five (5) face-to-face interviews that were conducted lasted between twenty to sixty-minutes each.

The interview protocol utilized in this process was developed based on interviews with subject matter experts in the field of E-Commerce, Strategic Management, Decision and Information Technology, and Accounting. In addition, various MBA textbooks and e-commerce and business web sites were used in developing the interview protocol (referenced in Appendix B). The interview protocol covered broad topics such as idea generation, technology development, project approval process, development process, customer/market research, success measures, business and political risks, and additional personal comments that may be useful (please see Appendix C).

The qualitative data gathered via the interview format was synthesized with the data collected via secondary research and analyzed in order to determine trends and opportunities for developing a comprehensive e-commerce business case development scenario.

Case Studies

For each case that we examine in this section of the report, we have provided a standard format. First there is a brief description of each agency. Within each agency group is a discussion of each individual project as well as a section in which we examine the lessons learned with respect to the six case dimensions that we have already defined.

Agency - Federal Communications Commission (FCC)

The FCC regulates the telecommunications industry in addition to a large number of media companies that utilize the broadcast airwave spectrum in the United States. For the projects outlined below, Kimberly Hancher provided information about the background and strategies involved with the FCC's e-commerce initiatives.

Case Analyzed – Universal Licensing System (ULS)

The FCC has implemented several e-commerce initiatives with a high degree of success over the past four or five years. One project in particular, the Universal Licensing System (ULS), was created to streamline the processing of license applications for telecommunications providers. The project has been brought forth and developed through the efforts of the Wireless Telecommunications Bureau (WTB) and it is estimated that ULS will save over $7 million annually in filing costs to telecom providers. Also, the ULS severely reduced the number of forms that were required to apply for a license; under the old system, a company would need to fill out and process roughly 40 forms, but with ULS these companies merely need to process five. In addition, the system is thought to provide millions of dollars in cost savings to the WTB and the FCC. As of late 1999, the system had over 2 million subscribers and adoption and usage are expected to increase as the telecom industry continues to grow very rapidly.

Automated Auctions System

Another e-commerce initiative that the FCC has installed is its Automated Auctions System. Using this system, telecom providers can make bids for a designated part of the telecom spectrum. In the past, these auctions had been conducted using sealed bids or open, in-person forums. One main challenge to the new system has been security: it would put a company at a disadvantage if its bids were known to its competitors ahead of time. With this in mind, the FCC has wisely chosen to conduct these auctions only over an intranet, which is only accessible through a dial-up connection. In addition, bidders are required to enter a PIN in order to gain entry to the system. While there are many encryption and security systems in development, the use of PINs and intranets (or wide area networks) are believed to be sufficient defenses against the risks and security hazards posed by the Internet.

One of the critical factors for the success of these systems has been the FCC's insistence upon improving how it interacts with the companies that use its services. These telecom

companies have gained significant cost savings and improved their own business processes through the use of ULS and the Automated Auctioning System. Another factor for the success of these projects has been consistent management (i.e. low turnover among the principals who oversee these projects) as well as a well-thought out plan for implementation. In addition, these projects were implemented in phases, which broke the projects down into manageable tasks; this gave the agency the option to abandon the project in midstream, if necessary, without making it a total loss had the projects been implemented in full from the start. (Fortunately, this option was never exercised.) Finally, since these projects were internally generated, there was little need to find cross-departmental support and assistance. Rather, the agency was able to fund these projects using its own budget and outside of the statutory budgeting process.

Lessons Learned

- Idea Generation: projects conceived and developed internally
- Customer / Market Research: transactions with large and small telecom companies, projects are meant to reduce customer filing costs and automate different application processes
- Technology Development: agency as well as the market it serves are very technologically capable
- Risks: user adoption, security of transactions
- Approval Process: discrete phasing of project as well as consistent management aided in getting projects approved
- Success Measures: increased customer satisfaction, savings and number of applications processed online

Agency - Joint Electronic Commerce Program Office (JECPO)

The Joint Electronic Commerce Program Office was created by the Secretary of Defense in 1998 to serve as central point through which electronic commerce will be accelerated into Department of Defense operations. The Joint Electronic Commerce Program Office (JECPO) was envisioned as a single office that would manage all aspects of DoD electronic commerce acquisitions. JECPO brought together formally fragmented e-commerce operations at the Defense Logistics Agency and the Defense Information Systems Agency to form an integrated electronic commerce office. In regards to JECPO, we had the opportunity to interview Matthew Maginniss of Price Waterhouse Coopers who had worked with the Central Contractor Registration system discussed below.

Case Analyzed - Central Contractor Registration System (CCR)

The Central Contractor Registration system (CCR) is a registration database for Department of Defense contractors. As of June 1, 1998, all vendors must register with CCR in order to conduct business with the Department of Defense. The database is accessible online and is managed within the Joint Electronic Commerce Program Office. The Director of Defense Procurement and Secretary of Defense for Acquisition spearheaded the CCR initiative to streamline the acquisition process. Thus, the approval and funding process for this system was not a problem because top people in the organization championed the initiative. The interest in streamlining the acquisition process was born out of the Federal Acquisition Reform and the Debt Collection Improvement Acts, which basically requires vendors to be paid through electronic funds transfer.

When this system was deployed, vendors were not ready to be online. A great majority of vendors did not have access to the Internet. However, the JECPO made sure that customers had enough room to adapt to the new system. Help desks were utilized, which allowed vendors to call or fax in their information. Additionally, vendors received help from Electronic Commerce Resource Center and Procurement Technical Assistance Center, which facilitated the ramp up process. Of course, when such a system is first introduced there some initial concerns about the security of vendor's data are to be expected. There may have been the perception that someone may steal a vendor's bank account number. However, once the specifics of the system security were explained, fears were quenched.

The CCR system has been a seemingly successful endeavor for the JECPO because it eliminated the paper trail that accompanied government vendors. Information is now easily updated because the vendors simply do it themselves. Streamlining this aspect of the procurement process also facilitates other aspects of procurement such as electronic payment because accurate vendor information on the front end of the process means that there is less room for error and duplication of effort in processing awards and payment.

Success is measured according to the total number of vendors registered on the system. Additionally, since CCR is integrally linked with electronic funds transfer, the percentage of payments that are processed through electronic transfer is indicative of the use of the CCR system. As a result of this system, the time it takes to service a customer has fallen dramatically, from approximately 30 days to 5 hours.

The Joint Electronic Commerce Program office would like to extend this system to many other government agencies. CCR is currently being used within the Department of the Interior, the Department of the Treasury, NASA as well as the Department of Transportation.

Lessons Learned

- Idea Generation: based on legislation
- Customer / Market Research: government aided the customer in technical development
- Technology Development: did not jump out as a significant issue in this case
- Risks: general security and privacy of issues in terms of the protection of sensitive financial information
- Approval Process: top down
- Success Measures: example of an e-commerce implementation providing efficiencies for an existing system (CCR facilitates processes relative to electronic funds transfer); success based on quantity of registrants

Agency - General Services Administration

The General Services Administration (GSA) was established in 1941 by President Herbert Hoover to consolidate efforts with regard to handling the supplies and office space that the government requires. Today, GSA serves individual Federal government agencies by providing workspace, products, services, technology and guidance on policy. GSA is one of three central management government agencies whose services blanket the entire Federal government

Case Analyzed - Access Certificates for Electronic Services (ACES)

ACES is the government's digital signature certificate program that allows the public to deal with the government electronically in a secure and protected manner. Federal agencies and entities are offering ACES certificates to the public and business trading partners on a no-cost basis, providing them with the capability to authenticate electronic digital signatures. The ACES project is currently under the management of the GSA.

The idea of this project came from the Social Security Administration (SSA) case three and a half years ago known as PEBES. The SSA came up with the idea of putting personal earnings and statement information online to let the public have access to that information, with a more user-friendly interface. However, USA Today reported the story and questioned the risks of privacy and security issues. After a Congressional hearing, the SSA was forced to take the website down. Since then, the government started to take interest in what Public Key Infrastructure (PKI) can do to facilitate secure online communications.

To put the information online, some agencies went to the GSA for a government-wide infrastructure solution of which they could take advantage of. Meanwhile, half of the US households were ready to be online.

The goal of the ACES project is to entice more agencies to use PKI and participate in online transactions. This project is supported by the GSA, which plays a government-wide role, the CIO Council and the Government Information Service Group. GSA's Office of Government-wide Policy was also involved on the policy side of things, such as certificate policy for access of PKI access and liability issues.

Each agency evaluated its own needs and makes its own decision about whether or not to participate in ACES. Agencies are obligated to pay transaction costs according to the proportion of certificates used, once they signed on to use ACES.

The ACES team used the following criteria to select industry partners: the ability to deal with liability issues, the ability to schedule timetables quickly and the ability to maintain the best transaction cost structure.

Agencies can expect lower transaction costs by using ACES. Potential risks to implementing ACES include conflicting agency cultures, bureaucratic issues and the

concerns posed by stakeholders and interest groups.

Many of the success measures used for analyzing ACES are qualitative including: the level of support for the project, the number of people and agency participants (currently 20 agencies) as well as feedback from citizens and corporations.

Lessons Learned

- Idea Generation: top-down idea generation
- Customer / Market Research: customer and market are well defined
- Technology Development: high technology. ACES project is the first mover of PKI and digital certificate technology among government agencies
- Risks: privacy issues, conflicts between agencies
- Approval Process: interagency coordination and development
- Success Measures: lacks clear success measures

Case Analyzed - Access America for Students (AAFS)

Access America for Students (AAFS) is a project aimed at post-secondary students who wish to access government information and services electronically. Serving as an online "yellow pages," the site helps students to navigate through different educational programs offered by various Federal agencies. This project brings together a number of agencies and departments including: Education, Labor, Treasury, the Internal Revenue Service (IRS) and the SSA. In addition to providing student financial assistance, schools and other organizations and partnerships are involved in this project to improve the services that they provide to post-secondary students.

AAFS is part of a broader program called "Access America" which began out of the National Partnership for Reinventing Government. The plan aimed to provide Americans with better access to Federal services and benefits, and specifically, it called for Federal agencies to work together to develop improvements in government services to citizens, business, and other Federal and state government agencies.

The project enjoyed widespread support across the government and was guided by a task force composed of officials from different agencies involved. Among the risks involved were: privacy concerns, reengineering business processes and "upsetting" the culture of different agencies.

Lessons Learned

- Idea Generation: top down initiation and support
- Customer / Market Research: post-secondary students tend to be highly computer literate and have easy access to the Internet
- Technology Development: high technology sophistication; multi-agency task force
- Risks: Privacy Act requirements, securing on-line transactions
- Approval Process: had various high-ranking "champions" around the administration as well as Congressional support
- Success Measures: mainly involve qualitative measures such as customer service

Case Analyzed - First Gov

The First Gov system is a portal that links individuals to various government sites and allows users to search for different websites within the government. The portal includes a search index, organizational directory, topic category, featured subjects and feedback areas. First Gov was pushed by the President's Management Council, which consists of representatives from 26 leading government agencies. Furthermore, the First Gov board of directors and development team were put together to implement the Council's vision.

The purpose of this system is to provide a centrally located source of information about the government for citizens, other government agencies and businesses. As with projects that have high-ranking champions, initial funding and approval was not necessarily an issue. In fact, the cost to develop the portal was minimal due to intense interest from project contractors who waived their fees to be involved. However, a major stumbling block is the difficulty of updating agency websites that are linked to First Gov.

Interaction with customers was critically important to the development of First Gov and customer focus groups were utilized in order to gain an understanding of the need for an online government portal. Additionally, the feedback feature on the website facilitates continued interaction from individual users in terms of what is working and what is not working.

Success for First Gov is primarily anecdotal. Time savings to customers, including other government agencies, is an outcome of the searching capabilities of this portal. Possible future measures of success may be: how may people come and stay at the site, how many people return to the site, and how many people come back to reroute to other sites. With the enforcement of the Government Performance Results Act in 2001, success for projects in general may be focused on improving efficiencies and responsiveness rather than on return alone. In future upgrades to the system, GSA hopes to include an interactive feature to the site that allows users to complete transactions online.

Lessons Learned

- Idea Generation: task force idea generation origin
- Customer / Market Research: focus groups in all stages of this project as well as feedback areas on the website keeps this program focused on what works for the customer
- Technology Development: outside technical support to build the actual portal, but interagency coordination is critical
- Risks: not many since the portal system is based merely on providing aggregated access to information
- Approval Process: based on the consensus of the President's Management Council
- Success Measures: mostly qualitative

Case Analyzed - Electronic Asset Sales Initiative

The purpose of this project is to build an auction website that enables assets sales between government agencies and the private sector. The project has been out-sourced by GSA and the timeline of the project has not yet been finalized.

The idea behind the electronic asset sales initiative originated from NSF's auction website. Different agencies basically have varying outlets in which to sell assets (real estate, financial and personal properties). Based on NSF's online auction site, the Office of Government-wide Policy decided to investigate the potential of a site for online asset sales. The goal of this inquiry was to make the case for developing a government-wide portal that can provide a single source for Federal asset sales.

Originally, the project was meant to be a public service, but it has begun to provide a new source of revenue for many different agencies. Currently, the project is still in the approval stage, and has yet to become fully operational.

There are some risks present, such as consistency of leadership, political fallout and agency technological capabilities. The project depends to a large extent on project leaders from each agency can work can together. Other risks include the possibility that this model may not meet expectations concerning revenue growth and cost reduction.

Lessons Learned

The Electronic Asset Sales Initiative has not yet been implemented, so it is premature to apply the case dimensions to this project.

Case Analyzed – GSA Advantage

The Federal Supply Service (FSS) coordinates the procurement and delivery of physical supplies that are needed by various agencies and departments throughout the Federal government.

The planning behind the GSA Advantage system began in 1994 when the FSS decided to investigate the potential to expand and redesign its services through the use of the Internet. Although this was a time when there was still a lot of uncertainty about the future of electronic commerce, the FSS thought it was wise at the time to begin a thorough assessment of this new technology and the possibilities it would hold for various agencies in the government to procure needed supplies. Over the last six years, more and more federal agencies have become involved with GSA Advantage and have updated their technological capabilities and information systems in order to participate in this online procurement system. However, not all agencies are fully able to utilize this service; in addition, some agencies have logistical barriers to online procurement.

With approximately $200 billion in annual procurement expenses by various Federal agencies, there is clearly a strong need to streamline the way that these agencies research, order and take delivery of the products that are necessary for their operations. Before the Internet became available for online ordering, there were a number of systems that were in place to handle procurement, including the Federal Standard Requisitioning and Issue Procedures System (FEDSTRIP) and Multi-Use File For Interagency News (MUFFIN). However, these legacy systems did not have a graphical user interface, nor were they capable of handling HTTP and other Internet protocols. In addition to these systems, agencies were also able to order through paper catalogs, which could not be updated as frequently as an online system.

Although it would seem like a certainty that the FSS was justified to go through with its plan to implement GSA Advantage, there are some risk factors that were present and needed to be addressed thoroughly. Specifically, there was the risk that agencies would not use the new online system, electing instead to stick to the legacy systems. In addition, since there was a wide range of technological proficiency across different agencies, it is clear that some agencies may not have the capability to integrate GSA Advantage into their current operations. However, one of the clear benefits to the system is that it could be implemented at a very low cost in addition to the methods of procurement that were already available at the time. Also, since the project was generated internally, there were fewer layers of management from which the project would require approval; in fact, the project was given the green light by the commissioner of the FSS, which paved the way for a full-scale implementation of GSA Advantage. Finally, since over $300 million worth of goods has been ordered through the system (at a cost equal to a small fraction of this amount) it is clear that the project has paid for itself and will continue to provide the FSS, along with the agencies that take part in GSA Advantage, clear benefits long into the future.

Lessons Learned

- Idea Generation: grew out of in-depth study of the Internet
- Customer / Market Research: varying technological capabilities among agencies, but many have gotten up to speed quickly
- Technology Development: depends on each agency that uses GSA Advantage; some are more capable than others
- Risks: lack of user adoption, inability to meet demand
- Approval Process: aided by the need to update government procurement systems as well as the support of the Commissioner of the FSS
- Success Measures: metrics include total dollar value of sales, number of orders, users and "hits" to web site

Agency – National Science Foundation (NSF)

The National Science Foundation is an independent government agency responsible for promoting science and engineering through programs that invest over $3.3 billion per year in almost 20,000 research and education projects in science and engineering.[i] It was established by the National Science Foundation Act of 1950 in order to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes.

Case Analyzed – FastLane System

The National Science Foundation's Fastlane System is one of the earlier on-line grant systems in government, formally originating in 1994 with predecessors that date back to 1985. The purpose of FastLane is to experiment with ways to use the World Wide Web to facilitate business transactions and the exchange of information between the National Science Foundation and its client community including researchers, reviewers, research administrators, and others doing business with NSF.[ii] For greater detail regarding the history of FastLane, see Appendix D.

The National Science Foundation had several unique advantages that helped facilitate the creation of FastLane. First and foremost was their core initiative to promote innovation through the funding of merit-based research and education projects in science and engineering. For example, the NSF funded a project with the University of Illinois that created Mosaic, the first web browser. The NSF also worked with MIT in developing FastLane, though the project was eventually developed internally within the NSF using internal funds. This type of access to Internet related innovation placed the NSF in a unique position as it relates to developing its own e-commerce initiatives.

The level of technological development for the NSF and its customer universities is similar given the nature of their interactions. This also provided an advantage in knowing and intimately understanding the level of their customers technological development so that any e-commerce system developed by the NSF would be immediately useable by their customers.

Involving customers directly in development process was one of several critical success factors for the FastLane project. NSF sought customer buy-in for smaller segments of the project first, then gained support for more ambitious segments of project. The NSF had the luxury of continually working with its customer base throughout the development of FastLane as there was no specific time limit set for final construction. It was an ongoing project that was looked upon as an experiment.

Some other helpful information that was offered through our interview with the NSF follows: internal systems need to be integrated into front end of e-commerce architecture, don't overlook user support/training, IT people need to work with policy people, need success metrics on front end, think of interoperability, and the need to anticipate customer support needs.

Lessons Learned

- Idea Generation: continuous customer feedback
- Customer / Market Research: able to receive iterative customer feedback due to long, open ended system development process
- Technology Development: invested in internal systems improvements
- Risks: anticipate maintenance cost of large, heavily trafficked system (more lines of code, more maintenance)
- Approval Process: leverage government support (had good support all along)
- Success Measures: technologically enabled customer base

Agency - The Social Security Administration

The Social Security Administration (SSA) provides public information materials concerning Social Security, supplemental security income programs, and information on Medicare. Social Security is generally viewed as a retirement program in part due to 61% of its beneficiaries receiving retirement benefits. The remaining percentages of beneficiaries encompass the disabled, spouses and dependents of someone who receives Social Security, widows, widowers, and children of the deceased. Currently 44 million Americans receive Social Security benefits. Franklin D. Roosevelt's message to Congress on June 8, 1934 summaries the original intent of Social Security.[iii]

> "SECURITY was attained in the earlier days through the interdependence of members of families upon each other and of the families within a small community upon each other. The complexities of great communities and of organized industry make less real these simple means of security. Therefore, we are compelled to employ the active interest of the Nation as a whole through government in order to encourage a greater security for each individual who composes it.... This seeking for a greater measure of welfare and happiness does not indicate a change in values. It is rather a return to values lost in the course of our economic development and expansion."

In government to business transactions, the major driver of idea generation comes from legislative mandates. The legislative mandates that have shaped idea generation within our study are listed below.

> **Government Paperwork Elimination Act (GPEA)**
> **December 17, 1999 White House Memorandum**
> **Federal Acquisition Reform and the Debt Collection Improvement Acts**
> **President's Management Council**
> **National Partnership for Reinventing (NPR) Government**

Case Analyzed - Overview of initiatives

The electronic commerce initiatives created by the SSA consist of a wide variety of issues and customers. The SSA is faced with the daunting task of uncovering the needs and wants of the citizens and businesses of the United States. To assist the SSA with these tasks they have compartmentalized the needs of citizens into three sub suites consisting of the post entitlement suite, the retirement suite, and the disability suite. Within each suite the needs of the citizens are researched through workload studies, customer focus groups and usability studies.

The majority of electronic commerce projects conducted by the SSA have been driven through legislation. The current administration at the SSA works in a top-down approach in dictating the direction of electronic commerce projects. The executive steering committee distributes the goals for e-commerce projects with working level implementation teams carrying out the initiatives. The remaining electronic commerce

projects flow from the Government Paperwork Elimination Act, the Vision for 2010 for electronic service, and the December 17, 1999 Presidential Memorandum. These legislative mandates have lead to the creation of more information sharing between the SSA and its constituency. Furthermore, this has created programs that decrease transaction times and increase efficiency for all parties involved. Some of the more widely used initiatives include the following:

- Ability to apply for Social Security retirement benefits online requests for replacement Medicare Cards
- Up to date cost of living information
- Programs to help citizens prepare and plan for retirement.
- Changes to social security cards
- Complete Benefit Information Publications
- Requests for a Social Security Statement – requests are mailed to respondents.

The request for a social security statement is very popular and this information was once available online. Unfortunately, at the time it was provided, security and the Internet were sensitive subjects. This service was discontinued due to political pressures. While there were no reported cases of privacy invasion, the Personal Earnings and Benefit Estimate State (PEBES) was shut down. There are however, lessons that can be learned from this miscalculation. Well-intentioned and researched projects are often at the mercy of public and political opinion, leading us to conclude that project selection should be carefully screened as to how the political environment may react to them. Timing can be critical when potentially sensitive projects are undertaken. It should be noted that if PEBES was proposed later, the backlash against it might not have materialized. PEBES in essence became a lightening rod that people embraced during a period of uncertainty surrounding the Internet.

The SSA is now cautious when providing possibly sensitive information over the Internet. They now conduct risk assessments with respect to privacy and are working on improving authentication, and Internet security. In addition, the SSA now attempts to foresee the political implications of its Internet projects while providing services the public desires.

Currently the SSA has been exploring how to measure the success of their Internet projects. They realize the need for both qualitative and quantitative benchmarks for success. Furthermore, the SSA expressed the understanding that the public's benchmarks for success are based on what is expected in the private sector. The SSA is striving to match that level of customer service and satisfaction. The public is very vocal about its desires, and the SSA strives to provide a level of support the public requests. In providing this level of service, the SSA on occasion benchmarks itself with the best practices from states that have implemented successful Internet initiatives.

Lessons Learned

- Idea Generation: top down approach
- Customer / Market Research: success using workload studies, customer focus groups and usability studies to gauge customer needs and expectations
- Technology Development: SSA attempts to match the needs of citizens and businesses. It understands that the technical comfort level varies widely among citizens which makes it best to make simplicity a goal in e-commerce.
- Risks: due to political pressures from the PEBES project, the SSA strives to forecast all potential roadblocks to electronic initiatives
- Approval Process: approval for projects is not a major issue because project selection is guided from the top
- Success Measures: SSA understands the need for success measures and is currently looking into developing and implementing measures before projects begin

Agency - United States Postal Service

William J Henderson, Postmaster General and CEO of the US Postal Service said, "Only the United States Postal Service provides the American people with a secure and efficient connection that binds our nation together. Only the Universal Postal Service is the gateway to the American Household."[iv] According to statistics from 1999, the U.S. Postal Service delivers mail to over 134 million different addresses around the country. The USPS is also a large provider of business services, including correspondence and transactions, advertising, express delivery, publications delivery, standard package delivery, and international mail.

Case Analyzed - GovKey

The GovKey system is a pilot program within the United States Postal Service that facilitates the generation and use of digital certificates (PKI). Currently, a private company named Imigtas is responsible for funding and implementing the GovKey system. The GovKey initiative is similar to the ACES digital certificate initiative within the GSA. However, GovKey also encompasses state and local governments and has a different technical infrastructure.

In general, GovKey is likely to be adopted by individuals with some amount of technical savvy and who are enthusiastic about doing business online. Several rounds of focus groups were formed in order to understand potential customers and their needs.

The primary risks involved with this project concern privacy and security of sensitive information. Technology in this case was not a risk in and of itself.

Lessons Learned

- Idea Generation: idea presented by an outside entity
- Customer / Market Research: customer focus groups
- Technology Development: not a significant issue in this case
- Risks: general privacy and security concerns
- Approval Process: top down
- Success Measures: qualitative for customers; qualitative and quantitative for individual agencies

Results from Research

Based on all of the interviews and secondary research conducted throughout this project, we have outlined many of the recurring and significant data into the four-step process involved with a business case. In addition, we have grouped much of our findings within the six separate categories that are outlined above.

Step 1: Identification of sustainable projects

Ideas for new projects may come from a variety of sources. Either a top-down or bottom-up approach may be used within an agency to identify and select potential e-commerce projects. Alternatively, the idea for a project may be mandated by law or by executive order: these types of projects mainly involve wide-scale and inter-departmental cooperation and implementation. Once a project idea has germinated, there are several steps that may be used at this stage either to develop a project further or to reject it without investing any more time or money. In the private sector, it has generally been found that projects which come from top-down managerial directives usually have an overarching strategic purpose, while those that come from individual departments or smaller corporate units have more of a tactical purpose and a more narrow scope. Once several potential ideas have been brought forth, through any of these methods, it is necessary to rank and prioritize each one, given budgetary limitations, agency resources and the potential for the project to fulfill an agency's mission. Some of the issues that must be considered at this stage involve the intended benefits and beneficiaries, scope, duration and technological requirements.

The following table illustrates some of the aspects and the rationale that may be used for identifying and selecting a new e-commerce project within the government:

Project Idea Source	Rationale
Top Tiered Leadership	Strategic focus / Large scale and scope / Long duration
Government Task Force	Interdepartmental cooperation / Detailed use of financial payback measures Large scale and scope
Individual Agency	Tactical mission / Migration of legacy systems to Internet ready and capable interfaces / Further development and fulfillment of agency's goals
Agency Sub-unit	Surgically focused / Short-term or possibly temporary duration / Below the radar screen of budgetary decision makers

There are several possible outcomes to this first step in identification and selection. A project may be given approval and proceed immediately toward funding and implementation. Alternatively, a project may be rejected out of hand and not be given further analysis for approval. A third decision would be to delay implementation of a project until further data are collected concerning the needs of stakeholders, available resources or the "fit" that the project may have with an agency's mission. Finally, a project may be deemed necessary at this stage, but not in its current form. It is then up to the participants who have identified the project to regroup and fine-tune a better and more feasible plan so that the project may go forward at a later time.

Step 2: Value Chain Analysis

A critical step in assessing the importance and scope of an e-commerce project involves analyzing what value a project can add to the current operations of an agency and how a

project can streamline and reduce costs involved with the different functions and systems that an agency maintains. The following diagram illustrates the value chain and the various steps involved with providing goods and services to the public.

The Government Value Chain
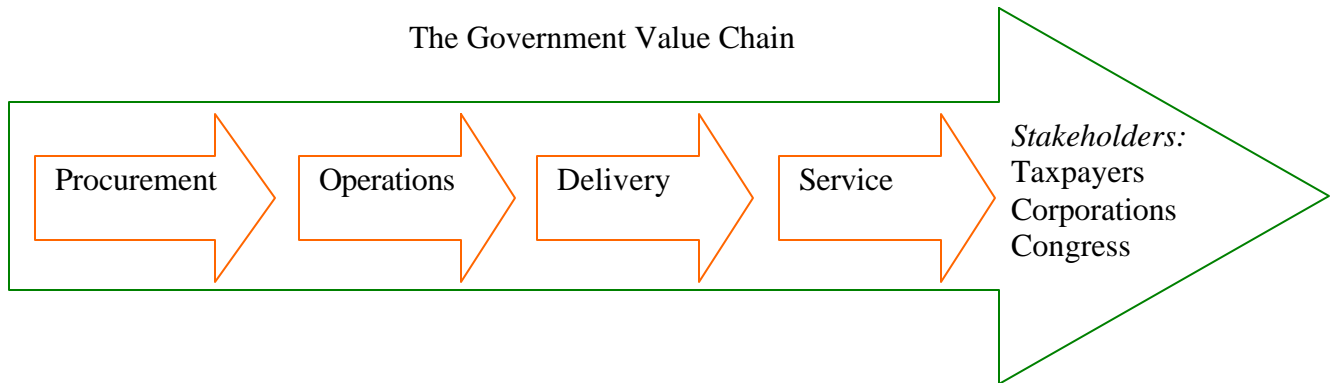
Value chain analysis may be conducted at three different levels:

- The micro level - involving just one agency or a bureau within an agency
- The general level – covering a number of agencies with a cross-functional scope
- The macro level – spanning the entire federal government

At the micro level, an agency must consider how a project will reduce costs or add value at any one of the steps outlined above. If an agency spends a large portion of its budget on procurement each year, it may want to focus on e-commerce projects that minimize costs in the inbound logistics link in the value chain. Alternatively, if an agency incurs high labor and overtime expenses, it might look to projects that automate parts of the processes involved with operations.

In terms of the general level, there are many e-commerce projects that have involved a high degree of inter-agency cooperation and coordination. Clearly, some agencies have competing interests in that they are constrained by limited resources, statutory regulations or budgetary guidelines, but there are possibilities to create systems that benefit all agencies involved with launching a project. The goal at this level should be to realize synergies that may be gained from combining and sharing resources.

At the macro level, a project must have a far reaching purpose and function so that potentially all stakeholders as well as the various different areas of the Federal government may realize a number of benefits. Procurement at this level is another type of activity that can potentially affect how many different agencies conduct business in addition to how private contractors interact with the range of agencies that they serve. Additionally, there may be a government-wide transformation of how documents and traditionally paper-intensive systems are structured. Digital receipt and distribution of applications, documents and records will enable the government to realize substantial

cost savings at the macro level. Also, e-commerce initiatives can provide excellent opportunities to add value and minimize costs at this level.

Step 3: Implementation

There is a striking difference between e-commerce projects within the private sector versus those within the public sector. As the last five years has shown, many corporations have rushed to build themselves a web presence with little regard for cost, duration, scope or overall purpose. The general sense concerning electronic commerce has been a feeling of urgency and a need to outmaneuver one's competitors. In this climate of a "gold rush," countless start-up companies have entered and occupied markets that have previously had very high barriers to entry. It seems clear that many private companies have implemented e-commerce web systems without using a gradual, strategic approach; this is due in large part to competitive forces, profit motives and the need to meet the expectations of shareholders.

Fortunately, the Federal government does not compete in these types of competitive markets and there is more of an opportunity to plan and implement e-commerce projects with a great deal of thought by using a methodical and strategic approach. Once a project has been identified, selected and analyzed as to its contribution to the value chain, it may then be implemented in a variety of ways. Most importantly, projects should be divided into discrete phases with clear and firm deadlines. Within each phase, a project should be broken up into manageable stages of development, whether this involves securing resources, installing new software or systems or rallying different champions around the government to promote a certain project and solicit the support of other agencies that may be linked to the value chain.

Another key factor during any phase is consistency of leadership and management. Project development often involves competing time requirements: phases of a project should be long enough so that there is sufficient time to complete all the steps necessary for implementation but these phases also need to be short enough to ensure quality and consistency of management. It is extremely detrimental to any project to have a high degree of turnover among those involved with implementation. It is especially detrimental to have turnover at the managerial level.

Perhaps the most critical factor in the implementation stage concerns the market and the characteristics of the customer base for which a project is intended. Although there should be much consideration for market segmentation during the identification and selection process, this issue becomes critically important during implementation. For one, there may be a long time lag between when a project is conceived and when it is implemented. In this interim, project developers must ask themselves:

- Has the intended market for this project changed in any meaningful way?
- If we build it, will they use it?
- Are my customers ready, knowledgeable and enthusiastic about being online?

- How can I minimize the risks that a customer may feel, especially related to privacy and security?

One part of examining the market for a project concerns where intended customers fit on the "technology adoption curve." The following diagram lists five types of customers based on how quickly and readily they adapt to and use innovative technological systems:

Technology Adoption Curve
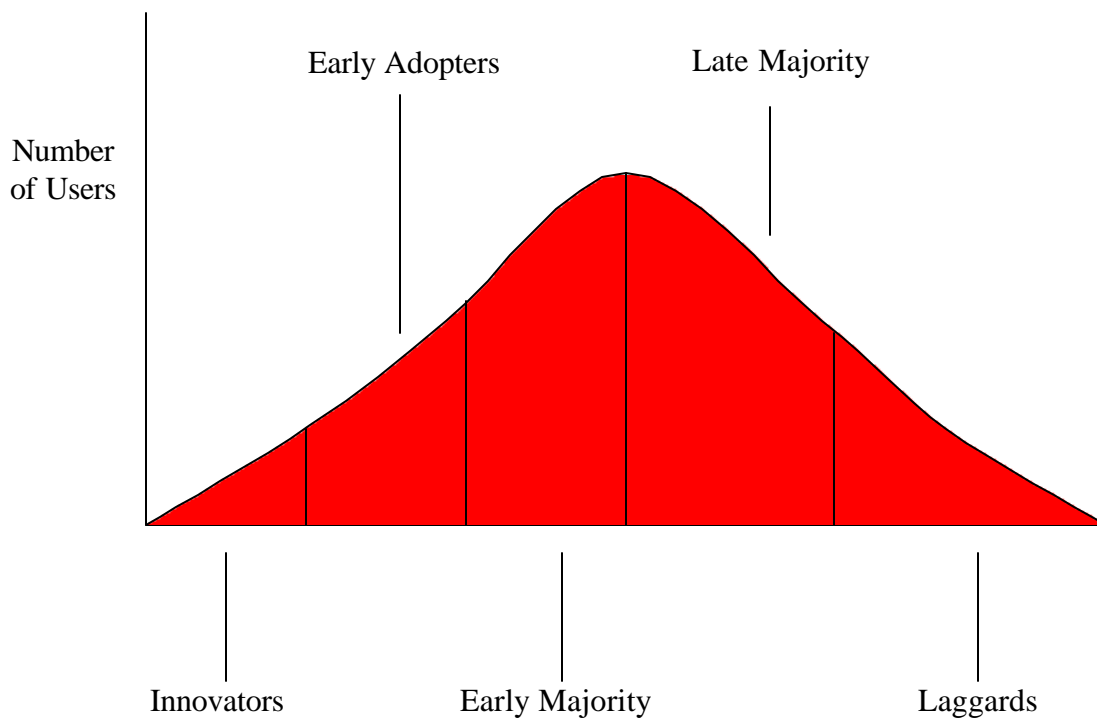
Recognizing that in order for a project to be successful, a thorough and well-thought out analysis of the customer base must be completed. If the intended market consists of a segment that has no history of using or adopting technology, then will there be a sufficient installed user base for the project to succeed? Also, although a group may be currently averse to technology, will the dynamics of the group change over time as more people and corporations rely on information technology in their daily lives?

Step 4: Feedback and review of success or failure

A final step in any e-commerce project concerns an analysis of a project from a number of different angles. It is critical to know at this stage whether or not:

- A project met the goals that were outlined in its original plan
- Costs and revenues were accurately forecasted
- The project should continue in its current form
- The project should continue in any form

Many different tools can be used at this stage to evaluate and benchmark projects and recommend a future strategy based on these results. For projects that generate significant revenue, any financial payback measure, such as NPV and IRR, would be suitable for determining the project's costs and benefits. Other quantitative measures such as, percent increase in customer adoption, percent decrease in labor and other expenses are also suitable at this stage.

There are a number of qualitative and anecdotal measures that also must be used at this stage. Customer satisfaction, acceptance, experience and positive public awareness are all essential to success, but these qualities are very difficult to measure. However, there are opportunities to interview potential customers and solicit feedback from current ones.

A final method of evaluation should encompass an entire organizational or multi-agency scope. Generally speaking, once a project has reached this stage of review after several years of operation, it is necessary to determine whether the project is still aligned with the goals of the agency that developed it in the first place. One common difficulty related to e-commerce is that agency needs and goals tend to change as rapidly as the technology that supports them. Projects must be reviewed constantly in order to see that the bases upon which they are founded are capable of meeting the dynamic goals of the agency.

Project Dimension Results

Idea Generation

Idea Generation throughout the agencies we reviewed is predominately derived through legislative mandates. The remaining agencies we interviewed had successful projects that originated from different sources. The United States Postal Service (USPS) started an e-commerce project from an idea that arose from the private sector. Imagitas, a private company just outside of Boston, MA, presented the idea of making postal services more accessible to the everyday citizens through on-line transactions. The Federal Supply Service (FSS) started one of its major initiatives by proactively looking at the changing environment and how the Internet could improve their procurement processes. We have also found instances where agencies have learned from each other, or from their own internal e-commerce projects. This concept was apparent in the formation of ACES, which was initiated from the privacy concerns surrounding the SSA's PEBES project.

Customer / Market Research

Customer or market research has been a recurrent theme in the decision, planning, and evaluation phase of e-commerce projects. One of the more prevalent sources of customer research we uncovered in our interviews is the focus group. Focus groups have been

used to evaluate the potential of proposed initiatives and to determine whether the operational systems continue to meet customer needs.

In our interviews, two main issues surfaced with regard to market research. The issues are as follows:

- Customer's Technical Sophistication
- Interaction with Customers

Customer Technical Sophistication

Through our interviews we discovered differing levels of customer technical sophistication. Some of the businesses that the government works with were ahead of the curve in terms of e-business and therefore eager to conduct online business with the government. However, there were instances in which customers had low technical sophistication, were unsure about the idea of changing current practices, and were concerned about security issues.

Interaction with Customers

In our interviews, we discovered that a majority of the agencies had strong relationships with their customers. These agencies knew whom their customers where, whether they were academic institutions or other industry vendors.

Technology Development

There are two topics analyzed in this dimension: the *level of technology sophistication* and *approach of technology development*. From our interviews we found close relationships between the two issues. The level of technical sophistication for an e-commerce project is significantly influenced by the technological experience of the agencies involved. There are three separate characteristics involved: number of people responsible for a project, technological maturity and the nature of the agency's business. Projects that have a set level of technology sophistication followed a developmental approach. With respect to agencies approach to technology development there are three options. These options are internal development, outsourcing, and multiple agency task forces.

Risks

Government e-commerce projects face a multitude of risk factors, many of which are not present in the same magnitude as in the private sector. How well an agency manages these risks frequently determines the success or failure of a project. Risk is a major factor to be considered. One of the most often encountered risk factors surrounds the uncertainty of user adoption. Agencies risk total failure when they are unaware of their customers' needs and abilities to interact online.

A second risk factor has to do with security.   One large challenge in the private sector has been the difficulty of assuring consumers that it is safe to make purchases online with their credit cards. It seems that the private sector has confronted and, for the most part, resolved this feeling of doubt for the consumer, but there is still room for improvement in both the private and public sectors as far as security is concerned.

Approval Process

The approval process refers to the process through which Federal Government agencies navigate in order to receive permission to move forward on a project. Based on the eleven projects studied within this report, we found that the vast majority of projects were implemented under a top down approval process environment. Several different methods were employed in order to navigate this approval process. GSA Advantage, for example, employed a six-month study in 1994. This study helped the commissioner of the FSS gain support in getting the GSA Advantage project approved. Other agencies, such as the FCC, made a "compelling case" for getting projects approved by phasing-in the project so that each part was manageable. The ACES project was supported by the GSA's FTS, CIO Council, and Government Information Service Group.

A bottom up approval process exists when it is possible for a project to be pushed up through the organization chart in order to receive approval. The environment for such an approval process would have to be highly entrepreneurial, encouraging all employees to contribute their ideas with a strong possibility for adoption.

Based on the projects studied within this report, we found that the vast majority were implemented under a top down approval process environment, with many agencies implementing their projects in response to the Government Paper Elimination Act.

Success Measures

There is an overriding trend among different projects concerning success measures and the difficulty involved with developing reliable and measurable goals for the various e-commerce projects. Some agencies preferred to use cost-benefit analysis, while others ignored this method altogether. There are a number of other tools, including percent and rate of customer adoption, "eyeballs," cost reduction and time savings.

Recommendations

Idea Generation

Idea generation throughout the agencies we studied was generally initiated through legislative mandates. While this may appear to limit entrepreneurial spirit, this method is actually helpful because the mandates are designed from the desires of the government's constituencies. Furthermore, idea generation can be encouraged on an agency level through the creation of an entrepreneurial culture, and by focusing on the agencies' customer needs.

The NSF is a prime example of a culture that fosters ideation – idea generation. Employees at the NSF understand their customers and what they desire. Further, setting the NSF apart is the culture within the organization. It can be compared with highly successful and very innovative companies such as Intel and 3M. The cultures within these companies foster idea creation among their employees. Agencies should strive to compare themselves with the best practices in the private sector with respect to ideation.

Customer / Market Research

Customer's Technical Sophistication
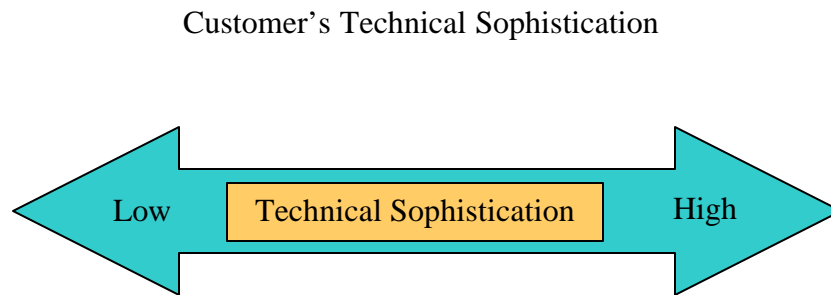
Customers with high technical sophistication may appear more apt to be able to accept e-commerce solutions that change the way they conduct business with the government. However, that doesn't mean that e-commerce initiatives should exclusively serve the needs of customers who are ready to be online and ready at that point to take advantage of the system. In some of the cases presented, agencies have developed systems before customers have been ready to adapt to the new procedures, but have been able to help customers to develop the needed level of technical maturity in terms of general education about the issues, privacy and otherwise, as well as actual technical capabilities.

Thus, the current level of customer technical maturity is not necessarily indicative of successful e-commerce initiatives. Technical sophistication of the customer seems to be most useful in determining the extent to which the customer can be made comfortable with the concept of e-government or the appropriate timing of the project based on the customer's technical maturity.

Interaction with Customers
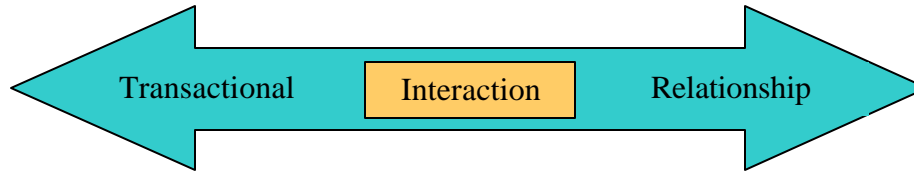
An agency's relationship with the private sector says a lot about its ability to understand needs as well as its ability to design a system that is likely to be adopted. If an agency's interaction with its customers is merely transactional and distant, then the system's impact on that customer and the system's ultimate success is difficult to predict. Whereas, if a particular agency has a relationship based interaction with customers, the agency is more likely to be able to judge an e-commerce initiative in terms of bringing value to the relationship.

In conclusion, customer needs should be the foremost thought in evaluating the potential of an e-commerce initiative. Once a need is determined, then one can better evaluate how potential initiatives can or will serve the customer. In evaluating these customers, their technical sophistication should be evaluated to determine the appropriate timing of the project or needed technical support. Additionally, the level of the relationship with customers may serve as an indicator of the agency's ability to educate the customer and aid in their technical development. In evaluating customers relative to these issues, one may be able to decipher the possible impact of e-commerce initiatives on the people whom the system is intended to serve.

Needless to say, interaction with the customer should not end at any stage of an e-commerce project. Continued feedback from customers like the feedback garnered from the First Gov website serves as a reality check for the project. Focus groups as well as other customer research methods can be utilized throughout a project's life cycle.

Technology Development

The level of technical sophistication for an electronic commerce project will be significantly influenced by the technological maturity of the agencies involved. This involves three separate characteristics: number of people involved with a project, technological maturity and the nature of the business solution. For example, a project involving a single agency will frequently require fewer technological resources than a multi-agency project.

Combining the critical factors outlined above, technology development of an electronic commerce project can be viewed by using the following diagram:
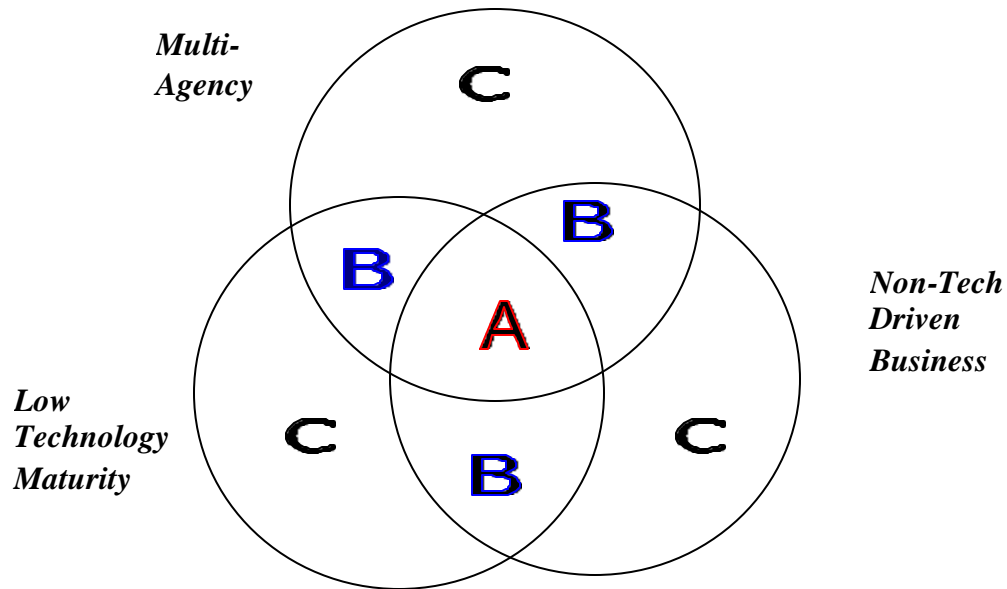
- Region A - Overlap of all factors. Projects falling into this area require the highest level of technology sophistication.
- Region B - Overlap of two factors. Projects in this area are identified to be moderately sophisticated in technology.
- Region C – In one factor only. Projects in this area need the relatively low level of technology sophistication.

Basically, there are three approaches toward technology development for agencies involved in a specific electronic commerce project: internal development, outsourcing or multi-agency cooperation; there are also hybrids of each of these approaches.

According to the case studies, agencies that use internal development are generally have cutting-edge resources and facilities under their command. Frequently, outsourcing and multi-agency approaches are preferable for e-commerce involving some agencies that lack sufficient technological resources. Depending on the state of an agency's technological development, a hybrid approach may be taken.

Risk Management

To overcome this uncertainty, the private sector has implemented some very effective educational programs aimed at assuring consumers that their account information will remain intact. Also, there have been advancements in encryption technology as well as

certain alliances in the financial services industry that have enabled far greater security in online transactions. For instance, Visa and MasterCard have instituted the Secure Electronic Transactions (SET) initiative, which uses digital certificates transmit credit card numbers. SET is based on four underlying security principles:

- Authentication – ensuring that users are who they claim to be
- Confidentiality – making it impossible to view secure data by using encryption
- Integrity – having certainty that data has not been altered during transmission
- Non-repudiation – guaranteeing that a user who initiates a transaction cannot later deny that they have done so

These four principles should guide government project coordinators in their management of risk. Also, it is important to consider that security for credit card transactions in the private sector may not always be translatable to the public sector since these transactions often involve far more sensitive and critical information, including a person's social security number, and other highly confidential information; G2B transactions also involve very sensitive corporate information, such as company secrets, sealed bids for auctions, and financial information.

Success Measures

Through studying the various cases, it appears that the following list relating to success measures can be reviewed in many e-commerce projects:[v]

- A clear and concise definition of the project's goal and strategic objectives
- A well-researched definition of the project's target market (i.e. Who are the customers and end-users for the project? What are their requirements?)
- An effective measurement system must build upon consistent and well-understood operational definitions for the performance criteria (e.g., effectiveness, efficiency, and profitability/budgetability).
- Measure intermediate-term and longer-term outcomes. Set dates for revision of intermediate-term outcomes to reinforce the perception of their temporary status.
- Do not stop with measurement. Take time to analyze results of measurement, changes in behavior, etc. Also take time to communicate results and propose improvements.

In "Performance Indicators", Ian McDonalds describes the elements of good metrics: 1) directional - to confirm that you are on track to reach the goals, 2) quantitative - to show what has been achieved and how much more is to be done, and 3) worthwhile - adding more value to the business than they cost to collect and use. Based on these factors, agencies should use the following set of criteria:

Quality of the projects

- Functionality - capabilities, compatibility, privacy and security

- Usability - human factors, consistency and documentation of the product

- Reliability - frequency and severity of failures as well as consistency of success

- Performance - the speed and efficiency of the project as well as the resource consumption

- Supportability – maintainability, serviceability and needs concerning installation

Quality of the relationship with the customer

- Anticipation - the ability to identify, understand and help solve customer needs before they become problems

- Availability - the degree to which the projects for uninterrupted usage at full functionality

- Responsiveness - the ability to provide timely, accurate and complete information and/or solutions to customer initiated requests for help

- Transitions - the ease of initial startup and of ongoing changes as the projects evolve and conform to new needs and technologies

Conclusion

Although there are some large differences between private and public sector electronic commerce, there is still an opportunity to use the private sector as a model by which government information technology managers can gauge the development of their own projects. With respect to privacy, cost reduction and security of online transactions, the private sector can clearly give public managers some valuable insight into the technologies and the resources that are required.

The model that our group has developed can be used to address some of the issues that are unique to government e-commerce and the expanded role that public agencies can serve in cyberspace. We have identified six important areas that are critical to taking an e-commerce project from the idea stage to the finished product. In addition, we have outlined a four step process that can be used to select and launch a project, once these six areas have been thought through. Finally, we have made recommendations based on the best practices that we have observed in each of the six case dimensions.

Appendix A - Interviews

Beecher, Tom. Imagitas, "GovKey".

Diaz, Deborah. General Services Administration. *"FirstGov"*.

Dugger, Brad. Chief of Information Officer. State of Tennessee. *Multiple projects.*

Hall, Cynthia. Department of Depense Joint Electronic Commerce Program Office. *"Contractor Central Registration System"*.

Hancher, Kimberly. Federal Communication Commissions. *Multiple projects.*

Iagnemmo, Al. Federal Supply Service. General Services Administration. *"GSA Advantage"*

Kannan, P.K. Associate Professor of Marketing. Robert H. Smith School of Business, University of Maryland. *Multiple projects.*

Maginniss, Mathew. PriceWaterhouseCoopers. Joint Electronic Commerce Program Office. *"Central Contractor Registration System."*

Rindova, Violinda. R.H Smith School of Business, Strategy Professor.

Roach, Harold. Federal Supply Service. General Services Administration. *"GSA Advantage"*

Skyrme, Leslie. Booz-Allen-Hamilton. *"Electronic Asset Sales Initiative"*.

Spencer, Judith. General Services Administration. *"Access Certificates for Electronic Services"*.

Stuck, Gerry. Deputy Director. Division of Information Systems. National Science Foundation. *"Fastlane"*.

Temoshok, David. General Services Administration. *"Access America for Students"*.

Trenkle, Tony. Director. Electronic Services Staff. Social Security Administration. *Multiple projects.*

Appendix B - Question Resources

1. **Interviews with Experts**
   - Dr. Violina Rindova, Professor of Strategic Management at R. H. Smith School of Business.*(Questions 24, 25, 27, 28, 29)*
   - Dr. Partha Sengupta, Assistant Professor of Accounting Department at R.H. Smith School of Business. *(Questions 13, 14, 15, 16)*

2. **Secondary Research**

   (1) **Reference Literature**
   - E. Raymond Corey, "MBA Field Studies-A Guide for Students and Faculty", Harvard Business School Publishing Division, Boston, Massachusetts, June 1998.
   - Virgil R. Carter and Robert A. Falin, "A Framework for Project Management", Project Management Institute Education Department, Newtown Square, Pennsylvania, 1999. *(Questions 1, 9, 23)*
   - Stephen A. Ross, Randolph W. Westerfield and Jeffrey Jaffe, "Corporate Finance", The McGraw-Hill Book Co., Singapore, 1999.
   - Larry L. Duetsch, "Industry Studies", M.E. Shape, Inc., Armonk, New York, 1998.
   - Tevfik Nas, "Cost-Benefit Analysis: Theory and Application", Sage Publications, 1996. *(Questions 13, 14, 15, 16)*
   - GSA, Access America for Students, "Access America For Students Strategic Plan", July 30 1999.
   - GSA, Access America for Students, "Report on The Access America For Student Pilot Program", September 29 2000.
   - Ward Hansen, "Principles of Internet Marketing", South-Western College Publishing, 2000. *(Question 3)*
   - Shikhar Ghosh, "Making Business Sense of the Internet", Harvard Business Review, March-April, 1998. *(Question 3)*
   - Paul Timmers, "Business Models for Electronic Markets", European Commission, Directorate-General III, April 1998. *(Questions 9, 12, 26)*
   - Volpe Brown, "B2B Commerce: The Next Frontier", Business 2.0, Sep. 1999.
   - Jeffery F. Rayport and John J. Sviokla, "Managing in the Marketplace", Harvard Business Review, Nov.- Dec., 1994.
   - Philip B. Evans and Thomas S. Wurster, "Strategy and the New Economics of Information", Harvard Business Review, Sep. – Oct., 1997.
   - Jonathan Palmer and Maryam Alavi, "Use Information as a Catalyst for Organizational Change", Blackwell, Sep. 1999. *(Questions 7, 11)*
   - Philip Kotler, "Marketing Management", Prentice Hall, Aug. 3, 1998. *(Questions 6, 8, 17, 20, 21)*

   (2) Reference Web sites
   - Center for Technology in Government of University at Albany-SUNY, "And Justice for All: Designing Your Business Case for Integrating Justice Information", (http://www.ctg.albany.edu/resources/htmlrpt/justice_for_all/index.htm) *(Questions 2, 7, 10, 11)*

- The Deciding Factor (TDF), "The Business Case Answer Place", (http://www.decidingfactor.com/about.htm) *(Question 4)*
- U.S. Office of Management and Budget, "Government agencies Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs", (http://www.whitehouse.gov/WH/EOP/OMB/html/circulars/a094/a094.html) *(Questions 13, 14, 15, 16, 18, 19, 22)*
- Economic Development Research Group, "Economic Impact Analysis – Models, Guides", (http://www.edrgroup.com/B23.html) *(Question 10)*

(3) Case Study
Freddie L. Robinson at University of Miami, "Building a Business Case for

Imaging/Document Management at the University of Miami",

(http://palimpsest.stanford.edu/bytopic/imaging/business.html) *(Questions 5, 9)*

Appendix C – Interview Questions

<u>**Project Specific**</u>

Idea generation (for new projects)
1. Where did the idea of this project come from?
2. What were your business goals for the technology solution?

Customer/Market Research
3. To what extent are your customers ready to be on line?
4. How much of an impact did the size of the market have on the likelihood of the project being approved?

Development process
5. What is the predecessor to your current e-commerce model?
6. What alternative solutions did you consider and why did you choose this project?

Technology development
7. Describe your agency's technology sophistication at the time?

Risk
8. What were the risks and how did you evaluate and handle them?

Approval process
9. What was the approval process for this project?
10. What justification was needed?
11. What type of support (management or otherwise) did you have in getting the project off the ground?
12. What is the current cycle time for e-commerce project approval/completion?

Funding (financial)
13. Was funding an issue?
14. What strategy did you employ in funding this project?
15. Did you have alternative funding strategies?
16. Why did you choose the current funding strategy?

Success measures
17. How do you measure success?
18. What is the performance measurement tool? (NPV, ROI, cost-benefit analysis)
19. How do you quantify your intangible benefits and costs? (EVA, index/scoring program)
20. How frequently do you evaluate the success of your project?
21. What are your expected benefits?
22. What are your benchmarks for success?

General for persons who have had experience with several e-commerce initiatives:

Idea generation (for new projects)
23. In general, where do the project ideas come from?

Project Goals
24. How do you align agency goals with e-commerce initiatives?
25. Which goals take priority?

Approval Process
26. In general, what is the approval process?

Funding
27. Which projects rise to the top and receive funding?
28. What sets these apart?
29. Can you please give us some examples from start to finish.

Appendix D - History of FastLane

(from NSF website - https://www.fastlane.nsf.gov/a0/about/fastlane_history.htm)

Introduction
The origins of the FastLane Project can be found in NSF's response to the dramatic growth in workload and budget levels experienced during the 1980s. During that period, the NSF budget nearly tripled to $3 billion and the number of fully reviewed proposals increased by 40%, while personnel resources remained level. NSF's solution for handling increasing workloads with level staffing resources was to become a leader in the use of information technology to perform critical business activities, much as NSF is viewed as a leader in funding merit-reviewed scientific and engineering research.

One area of the Foundation's focus was the application of advanced information technology to support proposal processing activities. In 1985, initial plans for experiments in electronic proposal submission were developed. This eventually led to the initiation of the EXPRES (EXPerimental Research in Electronic Submission) project in 1986.

EXPRES
In 1986, the Division of Information Systems (DIS) developed the concept for a research project to be conducted by universities to explore electronic proposal submission capabilities. Working jointly with the Directorate for Computer and Information Science and Engineering (CISE), DIS participated in the proposal competition to award grants under the EXPRES project. In October 1986, two awards were made (to Carnegie Mellon University and the University of Michigan) to create an interoperable environment which would enable scientists and engineers to exchange multimedia documents freely among dissimilar hardware and software platforms. The NSF proposal preparation, submission and review process was chosen to be the experimental testbed, partly because this process offered many challenges common to electronic document exchanges: high volume of activity, geographic dispersion, and heterogeneous environments.

The EXPRES project was ahead of its time in some respects. Some of the technical hurdles to the electronic transmission of compound documents (i.e., those including text, graphics, equations, etc.) among computers using different operating systems (DOS, Mac OS and UNIX) could not be overcome at that time.

EPS (Electronic Proposal Submission)
A pilot program was begun in 1988 (and coordinated with the EXPRES Project) to experiment with online proposal and forms submission. The following year, NSF management reduced funding for the EXPRES project. At the same time, the scope of the project was reduced and responsibility transferred to DIS. The NSF Director approved the establishment of the EPS program in DIS. This new program was to focus on a lower cost experiment to establish a technological base for exchanging proposals electronically

between NSF and the university community. NSF-to-university electronic transmission activities were increased over the next several years.

FastLane
In 1994, an NSF Task Force on Electronic Proposal Processing was formed and chaired by the Director, DIS. This task force evaluated the past experiments with electronic proposal submission and recommended a new approach. Rather than focus strictly on proposal submission, the task force recommended that NSF invest in automating all business transactions with the research, engineering and education communities. The Director, NSF, approved the task force report. The project was named FastLane and would utilize the Internet, World Wide Web and browser technology.

FastLane continued NSF's long-standing emphasis on reducing the administrative burden on NSF staff and institutions, and improving business processes through the application of advanced information technology. FastLane was intended as an experimental program to explore methods to redesign and streamline the way NSF does business with its customer communities. The program strategy was to create pilot projects that would demonstrate in the early phases the technical feasibility of various approaches, and test new processes for exchanging information among proposers, reviewers, university research administrators and NSF staff. The early pilot systems were tested with subsets of the NSF research community. Successful pilots were then implemented more widely.

FastLane was central to NSF's government re-invention initiatives. The Report of the National Performance Review cited "NSF's efforts to automate grant management activities...as an example of an effective way to keep up with increasing workload by handling program administration more efficiently." FastLane was also one of 53 projects selected to test measurement provisions of the Government Performance and Results Act of 1993. Performance indicators have been developed to measure the effectiveness of the FastLane pilots.

As originally conceived, many existing paper or telephone interactions would be re-designed to allow computer access to NSF via a dial-up or Internet connection to World Wide Web (WWW) servers. Anyone using standard PC technology would have "point and click" access to software that would facilitate most of NSF's business transactions - from completing proposal forms to inquiring about the status of proposals.

Doing business with NSF would be simpler, faster, more accurate, and less expensive. Proposers, reviewers and awardees would have more choices in how to do business with the Foundation and would be provided greater access to information and more control over their transactions. Most applications would be designed with a "smart form" that uses information already available in the NSF database in order to minimize the time and effort required to complete transactions and the amount of redundant information collected during proposal submission. Internal NSF systems were also re-designed to accept data entered directly from FastLane, thereby improving data quality and the productivity, timeliness, and effectiveness of the proposal and review system.

A FastLane Internal Review Committee (FIRCOM) was formed in May 1994 to provide guidance to the FastLane Project and to resolve policy issues. This steering committee includes representatives from NSF directorate management, program management, grants and contracts, financial management and information systems. That same year, development started on the first six pilot applications:

Electronic Proposal Forms Submission - provides the capability for electronic submission of administrative information related to proposals;

Proposal Status Inquiry - allows PI's and other authorized individuals to review the current status of a pending proposal;

Submission of Final Project Reports - provides an electronic version of the final project report and enables electronic submission of the form and attachments (in a future release, project results information will be made publicly available);

Cash Transaction Request - allows access to the cash request system;

Submission of Review Information - allows reviewers to enter ratings and review comments or to cut and paste from a local word processing document; and

Announcements of Award Actions - provides a list of recent awards, including information on the institution, principal investigator, amount, and duration.

Software development efforts for these systems were funded from the program accounts, reflecting the experimental nature of the FastLane Project and the fact that it supported programmatic requirements.

NSF worked with initial group of 16 universities to evaluate FastLane prototype activities. NSF directly involved these colleges and universities, representing a broad cross section of the grantee community, in the design and pilot testing of each application.

NSF established working relationships with other Federal agencies that are developing similar systems, including the Department of Energy, the National Institutes of Health and the Department of Defense. FastLane has been used as a model to ensure the development of systems government-wide that will promote a seamless interface between research institutions and Federal grant-making agencies.

In 1995, FastLane development included a voice response system for the status of proposals, a Graduate Research Fellowship Application, and the initial capabilities in the Electronic Jacket System. In July 1995, NSF established a FastLane Internal Implementation Group (FIIG) to provide advice on internal implementation issues, as more FastLane modules became operational. This group consists of program and administrative staff from each directorate at NSF.

In 1996, FastLane development continued and was made available to all NSF institutions. By the end of the year, nearly 400 institutions were registered. A pilot of a fully electronic jacket for internal NSF processing was implemented in ten NSF programs.

In March, a meeting was held at NSF with all research grant agencies and OMB to evaluate the technical approaches being developed for Federal electronic research administration. The Department of Energy had sponsored a demonstration with eight institutions of the use of EDI to transmit grant information. The FastLane Project was the primary World Wide Web approach. The consensus was that both approaches had merit for various applications and customer groups. Agencies were encouraged to work together to adopt the best of both technologies. NSF committed to the acceptance of EDI transactions for grant applications for those larger institutions capable of using that technology. Other agencies were encouraged to collaborate with NSF on common WWW implementations. In May, the Electronic Commerce Committee issued a Strategic Plan endorsing both technologies for implementation of electronic research administration.

In the fall of 1997, NSF formed a FastLane Divisional Experts Group consisting of representatives of each NSF division. The members of this group are expected to become FastLane experts and serve as a resource both to their divisional staff and to their research community for FastLane. This group meets bimonthly to discuss recent changes and share experiences.

In FY 1998, FastLane acceptance by the research community expanded rapidly. Over 17% of all full proposals (5,100 proposals) and over 17,000 reviews were submitted to NSF via FastLane in FY 1998. More than 1,000 institutions are registered. Major solicitations that required full or partial FastLane submission included IGERT, KDI and CAREER. A FastLane Implementation Plan, calling for full implementation by the end of FY2000, was published.

Project information is being disseminated widely through the Foundation's regular publications, via the NSF Home Page, and in presentations and site visits. NSF customer survey instruments and other feedback mechanisms have been used to solicit feedback on FastLane objectives and plans.

NSF staff conducted 60 outreach activities in FY 1998 to help the research and education community learn more about FastLane. Workshops were conducted in 21 states and Puerto Rico. These activities ranged from formal presentations and demos to workshops for hands-on training of Principal Investigators and institutions' Sponsored Research Offices.

In September 1998, NSF's Director, Rita Colwell, issued Important Notice 123 outlining NSF's goals for a paperless proposal and award system. A study of the impact of FastLane on Program Assistant positions was begun. Formal training and orientation activities for NSF staff were expanded. Performance goals under the Results Act for receipt of proposals via FastLane for both FY1999 and FY2000 were raised based on the excellent rate of acceptance of FastLane by the research community.

Appendix E – Key Legislative Mandates

The Government Paperwork Elimination Act (GPEA), signed into law October 1998, directs federal agencies to provide public access to government services and documents by 2003. Furthermore, GPEA fosters the development of electronic transmissions between the public and the government. The legal framework dictated by the GPEA instructs agencies to develop and implement information systems that enable online submission of materials such as government documents and data.

The December 17, 1999 White House Memorandum was instituted "to help our citizens gain one-stop access to existing Government information and services, and to provide better, more efficient, Government services and increased Government accountability to its citizens."(William J. Clinton, White House Memorandum) Listed below is a summary of the major goals this memorandum stipulates government agencies to complete by October 2003. (December 17, 1999 White House Memorandum)

- The heads of agencies shall promote the use of electronic commerce, where appropriate, for faster, cheaper ordering on Federal procurements that will result in savings to the taxpayer.
- The heads of agencies shall continue to build good privacy practices into their web sites by posting privacy policies as directed by the Director of the Office of Management and Budget and by adopting and implementing information policies to protect children's information on web sites that are directed at children.
- The head of each agency shall permit greater access to its officials by creating a public electronic mail address through which citizens can contact the agency with questions, comments, or concerns.
- The Director of the National Science Foundation, working with appropriate Federal agencies, shall conduct a 1-year study examining the feasibility of online voting
- Make a broad range of benefits and services available though private and secure electronic use of the Internet.
- The development of private, secure, and effective communication across agencies and with the public, through the use of public key technology. In light of this goal, agencies are encouraged to issue, in coordination with the General Services Administration, a Government-wide minimum of 100,000 digital signature certificates by December 2000.
- The heads of agencies shall develop a strategy for upgrading their respective agency's capacity for using the Internet to become more open, efficient, and responsive, and to more effectively carry out the agency's mission.
- Mechanisms for collecting input from the agency's stakeholders regarding agency use of the Internet.

Federal Acquisition Reform and the Debt Collection Improvement Acts
www.fms.treas.gov/debt/dmpca.html) DMS website

The Debt Collection Improvement Act of 1996 provides the impetus for the Federal Government to move toward its goal of using electronic commerce to assist in improved

cash and debt collection practices. This act mandates the use of electronic fund transfer (EFT) for Federal payments. This act has seven purposes that include: (DMS website)

1. Maximizing collections of delinquent debts owed to the Government through the use of appropriate collection tools and quick action in recovery of debts.

2. Minimizing the costs of debt collection through consolidation of related functions and activities and by utilizing inter-agency teams.

3. Reduction of losses arising from debt management activities. This is accomplished by requiring proper screening of potential borrowers, aggressive monitoring of all accounts, and the sharing of information within and among Federal agencies.

4. Ensuring that the public is informed of the Federal Government's debt collection policies. Furthermore, debtors understand their obligations to repay amounts owed to the Federal Government.

5. Ensuring debtors have all appropriate due process rights, including the ability to verify, challenge, and compromise claims, and access to administrative appeals procedures.

6. Encouragement of agencies to sell delinquent debt, particularly debts with underlying collateral.

7. Reliance on the experience and expertise of private sector professionals to provide debt collection services to Federal agencies.

President's Management Council (policyworks.gov)

The Electronic Processes Initiatives Committee (EPIC) of the President's Management Council was formed in 1997 as the Federal government's premier cross-functional interagency policy coordinating organization for electronic commerce and electronic government. The EPIC is central to coordinating the government's 1998 electronic commerce strategic plan. The EPIC concentrates on areas such as electronic funds transfer (EFT), purchase cards, smart cards, electronic identification, electronic benefits transfer (EBT), and electronic contractor registration.

Partnership for Reinventing (NPR) Government

The National Partnership for Reinventing Government, formerly known as the National Performance Review, is the longest running government reform effort. This program targets areas in need of reform and develops initiatives to solve these issues. Listed below are some of the recent initiatives. (www.npr.gov)

Access America – Program for using information technology to deliver government services electronically.

Benchmarking – Used in measuring government's practices and performance against the best in the world.

Conversations with America - Encourages federal workers to discuss how to improve customer service with the American public.

Community: Involving cross-agency federal and local partnerships to demonstrate services that get results at less cost.

Managing for Results - Using the Results Act of 1993 to develop a high-performing, outcome-driven, fully accountable federal government.

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[i] http://www.nsf.gov/home/about/

[ii] https://www.fastlane.nsf.gov/a0/about/whatis.htm

[iii] http://www.ssa.gov

[iv] Official website of the U.S. Postal Service: http://new.usps.com/cgi-bin/uspsbv/scripts/content.jsp?B=null&D=23842

[v] *"Public Management," Vol. 76, No. 9, Sept. 94.*