

The project resulted in four practical tools to assist other public organizations in their efforts to provide Web-based services to their customers. Each of these tools is available on the CTG Web site and is discussed below.

- Developing & Delivering Government Services on the World Wide Web: Recommended Practices for New York State
- World Wide Web Starter Kit
- Cost/Performance Model for Assessing WWW Service Investments
- Online Seminar on Internet Security Topics

Developing & Delivering Government Services on the World Wide Web: Recommended Practices for New York State

Like the Testbed agencies, many government organizations that only a year ago had no knowledge of or experience with the Internet have suddenly been faced with demands to make their information and services available online. Their ability to respond has been made very difficult by the fact that the technologies of the Internet, including the WWW, are evolving very rapidly in terms of availability, functionality, and compatibility. As a result, agencies struggle with high expectations, new and unfamiliar tools, accelerating rates of technological change, and a need to combine skills and resources in unusual ways in order to succeed. These conditions led to one of the key deliverables of the Internet Services Testbed — a set of practical guidelines to help agencies negotiate this new territory.

The guidelines are based directly on the experiences of the Testbed agencies. The agencies used, evaluated, and refined all of the tools that are included and contributed many insights and suggestions that are incorporated in the final document. The guide is not intended to be an exhaustive treatment of all Internet services, tools, or technologies. Instead, it presents principles, planning tools, and good practice guidelines to help government managers decide how best to use the World Wide Web as a mode of service delivery. Each chapter outlines a key decision or action a government organization will face in designing or delivering a Web-based service. The guide covers such topics as how to define a service that is relevant to customers, how to identify likely costs and benefits, how to assemble the right professional team, and how to manage information effectively in this new environment. Technology topics include how to decide whether to “make or buy” services, what are good design principles, and how to assess infrastructure needs. Appendices give examples and references.

The handbook emphasizes that the process of designing, developing, and then managing a Web Service is not linear. The document is organized around Figure 3, which helps to illustrate the iterative nature of the enterprise.

The guide is available as a 94-page printed document and as an electronic file downloadable from CTG’s Web site. The introductory chapter is available as a hypertext document on the CTG Web site. The remaining chapters cover the following topics:

- Assembling the right project team discusses staffing-related topics such as understanding the unique characteristics of Web services, building a cross-functional team, clarifying team member roles, and providing specialized training.
- Gathering ideas: technology awareness and best practice reviews suggests ways to understand the basics and explore the potential of the WWW by becoming familiar with the Web itself and by tapping the experiences of others.
- Setting objectives: Why should your organization have a Web service? presents some practical tools for setting objectives, identifying stakeholders, setting priorities, specifying resources, and defining costs, benefits, and performance measures.
- Design considerations presents guidance on selecting, structuring, and inter-linking the information content of a Web site.
- Implementing your Web site covers several aspects of the very challenging, time-consuming, and detail-oriented process of implementation including prototyping, technical infrastructure, testing, and marketing.
- Managing your Web service offers guidance for managing the impact of Web services on an organization and its customers.
- Evaluating the impact of your service recommends ways to answer the important bottom-line question: is the

Web service effective?

- Appendices include definitions of commonly used terms, a NYS-specific Web page style guide, contact information for New York State organizations who can be resources on WWW topics, and a list of useful WWW sites and reference books.

World Wide Web Starter Kit

During the course of the Internet Services Testbed, many organizations requested information about how to get started with a Web site. Since the guidelines were planned as an end product reflecting the full experience of the Testbed agencies, the CTG project staff created an interim deliverable called "A WWW Starter Kit" which presents the essential first steps in the Web site development process. The Starter Kit is available as a hypertext document on the CTG Web site.

The Starter Kit is designed to help agencies at the very earliest stage of WWW exploration when they often know little more than that they need to "be on the Internet." The WWW Starter Kit was designed to help agencies avoid false starts and ineffective shot-gun approaches by offering a way to organize the exploration process. It contains information and links to selected resources for WWW site beginners that the Testbed agencies found very helpful in getting off to a good start. They were not chosen as the result of exhaustive analysis, but they were generally recognized as good, solid resources that are helpful in mastering the fundamentals.

The Starter Kit focuses mostly on the definition and design stage of Web site development, with some introduction to Web technologies. Its primary purpose is to help agencies begin to address these critical design questions:

- What information or information-based services of your agency are suitable for electronic delivery over the World Wide Web?
- Who wants this kind of information or service? Are these potential customers likely to be connected to the Web?
- Who will benefit from a Web-based service and how will they benefit?
- Who in your agency is responsible for the information resources you want to put on the Web? Are they on your team?
- What kind and level of skill and effort will it take to turn existing information resources into Web-friendly ones? Are those resources available?
- What will it cost in terms of dollars, people, and technology to build and operate an effective Web site?

The Starter Kit encourages agencies to become WWW content providers by first becoming active WWW users. It takes advantage of the fact that most of the information needed to develop and maneuver around the Web actually lies within it. Users are encouraged to visit and evaluate existing sites to see how similar organizations are using the WWW to deliver online information and services. They are directed to style guides and tutorials that help them understand that effective sites combine a clear purpose, thoughtful organization, substantive content, graphic arts, good writing, and ease of navigation. The Starter Kit encourages users to become involved in the online community by joining electronic discussion groups and listservs devoted to Web development topics. Finally, it identifies some government sites that have done a good job of identifying and presenting policy guidance on the use of the Internet and the WWW.

Cost/Performance model for assessing WWW service investments

Creating an effective Web service requires a significant investment of resources. It is easy to underestimate the costs and overstate the benefits because the technology is so attractive. Once an agency has investigated the capabilities that the Web offers, and decided that the technology can provide significant benefits to important stakeholders, the next question is "How much of an investment is it worth?" A Cost/Performance Model was developed to help agencies answer that question. The complete model and explanations can be found in *Developing & Delivering Government Services on the World Wide Web: Recommended Practices for New York State* on the CTG Web site .

The model serves two purposes. First, it identifies expected costs and benefits that are components of the investment decision. Second, it quantifies these factors in the form of explicit expectations about expenditures and performance improvements. Together, they enable a pre-implementation evaluation and a post-implementation assessment of whether the project has achieved its goals.

Performance measures

The benefits of a WWW initiative typically fall into three performance categories: services that are better, cheaper, or faster. WWW technologies can enable all three types of improvements, depending on the specific goals and objectives of the proposed service. The following list of sample performance improvements was drawn from a number of sources, including the experience of the Testbed agencies.

Cheaper (for customers, for general public, for other agencies, for own agency)

- Time savings: personnel
- Cost savings (direct): telephone, mailing, printing, travel

Faster (for customers, for general public, for other agencies, for own agency)

- Reduce response/waiting time: 24-hour availability; on demand
- Reduce information distribution time

Better (for customers, for general public, for other agencies, for own agency)

- Consolidation of services: one-stop shopping, fewer steps in a process
- Innovation: new services, new ways of using information
- Improved access to services: people use more appropriate services

Some measures will be relatively easy to describe in quantitative terms, especially those in the cheaper and faster categories. Others will need to be described in more qualitative terms that, nonetheless, can be translated into empirical measures that can be quantified. For example, "increased client satisfaction" can be operationalized by "an increase of at least 25 percentage points in the number of clients who answer 'Satisfied' or 'Highly satisfied' on the customer feedback questionnaire."

Cost categories

In general, costs for developing an Internet-based service fall into five categories:

- Getting the organization ready to support the service
- Internet access for end-users of the system
- Training and help desk support for end-users
- Resources to develop the content of the service
- Computer facilities to host the system

In each of these categories, there may be one-time costs that are necessary to get the project started, as well as annual maintenance and development costs to operate the service and keep it current. The five categories of cost are identified in the worksheet presented in Figure 4.

Each category contains two types of costs: infrastructure and human resources. While it is relatively easy to predict the types of hardware, software, and communications equipment that will be necessary to develop the service, the harder-to-quantify human resource costs typically dwarf those for the electronic infrastructure. In making estimates, agencies should account for all the staff time necessary to launch and operate the service. For example, there are two elements to consider in estimating training costs: the cost to buy or develop and deliver the training program, and the cost of having staff actually attend the training classes.

The cost worksheet can also be a useful tool for planning the evolution of a Web service. Consider completing a worksheet to represent the costs of a site which provides very modest services such as basic information and pop-up e-mail, then for a more complex site which provides interactivity such as online requests for information or online registration. Finally, complete a worksheet outlining the costs associated with an elaborate service which includes support for transactions and real time database queries. Outlining the costs associated with short term goals (6 months to 1 year) as well as with longer term goals (1 to 2 years) is also a useful way to plan the evolution of a Web service.

Online seminar on internet security topics

An Internet presence opens an organization up to the world. Yet, this easy availability of information can also represent a liability in terms of privacy concerns and internal system integrity. Security breaches may range from the simple curious probing of a site to the outright malicious destruction of information. Any well designed and maintained WWW service must balance the need for security with the goal of access. These security issues were very important to the people who helped frame the objectives of the Internet Testbed.

Early in the Testbed, CTG hosted a one day seminar discussing security on the Internet. The seminar brought together nearly 200 government managers to hear security experts explain some of the key issues. The focus was on raising awareness about security issues and ways to manage security risks. The presenters emphasized the need to become aware of security threats and the ever increasing complexity of security issues. The audience was exposed to many available technologies as well as some of the organizational issues that must be considered when implementing a security plan.

- Internet security as part of the overall security plan
- Risk assessment: the foundation for security planning
- Securing the server and LAN
- Methods for securing data transmission
- Methods for testing the security solution
- Monitoring the system/preparing for and responding to a break-in