Fry Communications, Inc

State of Colorado, Department of State

**Proposal For Electronic Publication
of the Agency Rules of the
State of Colorado**

October 3, 2002

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I.   Executive Summary

Fry Development on Demand, the development services division of Fry Communications is exceptionally well qualified to develop and maintain the State of Colorado, Department of States' Electronic Publishing System. Fry's offer, detailed throughout this proposal, includes a sound approach to meeting the goals outlined within the State of Colorado's Request for Proposal.

Fry's specific experience in large, legal publishing projects is extensive. Our clients over the past several years have included the Board of Governors of the Federal Reserve System, the National Oceanic and Atmospheric Administration, the Commonwealth of Pennsylvania, and the Internal Revenue Service.

The scope and complexity of each job has varied, depending on the unique needs of our customers. The wide variety of services that we have provided include: document analysis; DTD development; two–way structured data conversion; workflow development; fully integrated editorial systems; document management system design; integration with back-end systems; and product development, including print, CD-ROMs, and World Wide Web sites.

Many of these projects have involved the added challenge of converting legacy data that were traditionally used to produce intermittently expanding and contracting publications. These databases frequently are printed in a loose-leaf format. We have an exceptional understanding of the impact of change to the business process in this type of environment, including the impact on the authoring, editing, and publishing process; the conversion and ongoing maintenance of the database itself; the existing and emerging products; and most importantly, on the individuals involved in the entire publication process.

Today, there are countless companies in the electronic publishing business. The Fry difference is a roll-up-your-sleeves-and-let's-get-to-work attitude. Let's face it; in the time it takes you to read this response, technology has changed…again. Add to that a reality in which most online libraries are generated from multiple data feeds from different sources, all using different formats in different environments, involving different people. To meet these challenges, you need more than a "one size fits all" solution.

What Fry provides isn't just technical expertise or a single solution. Fry provides a team that knows many technologies, is experienced in many environments, and above all has an attitude that fosters partnership and teamwork in facing the challenges of a moving target.

As you review our response, we are confident that you will find Fry to be the right partner for the following compelling reasons:

- Fry has specific, analogous experience in regulatory and legal publications, with customers at the Federal (FDIC, Federal Reserve Board, Social Security Administration); State (Pennsylvania and Maryland); and Local (more than 400 individual municipalities) level.

- Fry has remained cognizant of both start-up and maintenance costs and has developed an approach that leverages existing Colorado infrastructure and where possible has proposed industry-standard, widely available components.

- Fry is an independent developer and is not locked in any single solution. This allows us to choose sound, appropriate technologies that fit customers' needs, budgets, and long-range goals.

- Fry provides exceptional customer service, for not only public customers, but also State employees working with the system for either editorial or system maintenance.

- Fry very often works with primary vendors and third-party providers and is committed to being a solid partner with both in-house groups as well as the contract printer.

II. Company Background

Fry Communications began in 1934 as one of the country's first publishers of weekly shopping guides. A small, family operation, the company focused on publishing the shopper for over 30 years. Henry Fry, our current president and owner, formally joined the company in 1958.

Fry bought its first offset printing press, a nonheatset web, in 1967 for the initial purpose of printing the shopping guide. By 1970, however, Fry began printing government and commercial work, and by 1975 became the largest Federal contract printer in the United States.

In 1981, the purchase of our first heatset web press enabled the company to enter the world of commercial publications. Since then, the entrepreneurial spirit which drives this company has been invoked time and again, allowing Fry to become one of the top printers in the nation with a permanent work force of 1600.

As part of its ongoing commitment to the publishing sector, Fry began adding ancillary information services, including keying and content maintenance, in the 1970s. From the inception of electronic data capture, Fry has provided appropriate technologies and sound strategies for disseminating information.

In 1995, Fry developed and launched its first Web site. An ambitious undertaking, the site was a collection of more than 44,000 pages that were, and continue to be, authored and updated by more than 100 groups. Since that time we have developed and launched a variety of sites, including online publication sites with robust searching capabilities, as well as portal sites that require integration of back-end and third-party data feeds.

With more than 30 years in the industry, we have gained great understanding of databases, data conversion, mark-up languages, and information architecture, making Fry's breadth of experience and length of service to content providers unparalleled in most development companies.

A. Fry Development on Demand

Fry Development on Demand is a group of software engineers, information architects, graphic designers, and mark-up production specialists that provides services to content providers utilizing Web-based technologies. Services include mark-up languages; data conversion; database development and design; integration; graphic design; content management; site architecture; site maintenance; and hosting.

We currently have a development staff of 8 technical professionals; 2 graphic artists; 3 project managers; and 5 production specialists. Our Internet development group is supported by full-time, onsite Fry personnel as follows: Network service which includes 5 network support persons; IT, which includes 10 programmers and 3 project managers; Graphic design support which includes 5 artists.

B. Project Profiles

1. Commonwealth of Pennsylvania, Legislative Reference Bureau
  Mary Jane Phelps, Room 641 Main Capitol Building, Harrisburg, PA 17120-0033, (717) 783-1530

Project Scope: The Pennsylvania Code is a 44,000-page database that is more than 20 years old and had a variety of formats and missing text. Fry cleansed the database, creating a single format, full-text database. From a single source which Fry composes and maintains, Fry publishes print and derivative products, produces a CD-ROM, several world wide web products, and distributes the database to resellers for use in all of the major online services, including WestLaw and Lexis-Nexis. Years of Service: 1978 to present

2.   **American Geriatrics Society**
Andrea Sherman, Managing Editor, Geriatrics Review Syllabus, American Geriatrics Society, 9 Hallmark Drive, New City, NY 10956, (845) 634-3209;
Andreasherman@aol.com

Project Scope: Fry developed full web-based content management system, with remote editorial access. Project includes developing Microsoft Word based templates; conversion routines, tracking and record keeping, XML repository, print, electronic, and derivative products for leveraging content to create new revenue streams.

3.   **Federal Deposit Insurance Corporation**
Jenetha Hickson, Office of the Executive Secretary, 1776 F St, NW, Washington, DC 20429, (202) 898-3807

Project Scope: Fry provides composition, database maintenance, html development, fulfillment, and print, bind, and mail services for this 5,000 page loose-leaf service. Additionally Fry worked with the FDIC to cleanse their database so that it is structurally consistent and can be output to PDF files that match the database 100%.

4.   **The American Society of Agricultural Engineers**
Donna Hull, Director, Publications
2950 Niles Rd, St. Joseph, MI 49085
Phone: 616-428-6326 Email: hull@asae.org   URL: http://asae.frymulti.com/

Project Scope: Full service internet development with specific focus on developing online library with searching capability across multiple publications; strong experience in XML and content management services; opt-in email notification services; hosting and ongoing maintenance.

C.   **Experience and Qualifications of Key Personnel**

Melissa Durborow, Contract Manager

101 Fry Drive Mechanicsburg, PA 17055, Phone: 717.766.0211, ext. 4520, email:
mdurborow@frycomm.com

Melissa is the Group Manager for Fry Information Services, which includes two publishing departments, a composition department, and Fry Development on Demand. FIS provides a variety of publication related services to publishers, government agencies, and other content providers. Melissa oversees projects both technical and editorial in nature. She provides a deep insight into publication redesigns, having spent 2 years as a proofreader, 9 years as an editor on loose-leaf publications, and 3 years as a publisher before leading several large enterprise-wide technical projects.

Melissa currently manages several large government projects including the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, the Commonwealth of Pennsylvania, and the State of Maryland. Each of these projects includes content provided in many file formats, stored in a managed repository, and published in both print and electronic formats.

Jason Hughes, Information Systems Design

Jason is the manager of Fry Development on Demand, a department within Fry Information Services. Employed full-time with Fry since 1992, he started in our Electronic Pre-press department as a pre-press technician and then moved to FIS (Fry Information Services) in 1995. He became manager of our development division in 1997 as a part of FIS. His responsibilities include technical project manager of document management projects; web site development, CD-ROM application design, document conversion, and database design and conversion. He also sits on the Fry's corporate technical committee and is responsible for Fry Communications' intranet.

Jason has been the lead technical project manager on the development of several document management systems, has created and maintains several web based systems, and has developed several CD-ROM applications that employ search and retrieval capabilities. Additionally, he has designed and implemented real-time credit card transactions that are performed using PaylinX payment processing systems.

Jason graduated from Drexel University with a Bachelors of Computer/Electrical Engineering degree. In a continuation to improve his skills, Jason is a member of the Association for Computing Machinery (ACM) and the Institute of Electrical and Electronic Engineers (IEEE). He also regularly attends the Maryland Access/Visual Basic User Group and the Washington Area SGML/XML User Group.

Terry Plyler, System Architect

Terry has been designing and implementing both applications and systems software for over 35 years. His project expertise ranges from enterprise-wide main frame-based solutions for industrial applications to PC and client server-based publishing systems. His experience encompasses both the public sector, at Federal (including National Institutes of Health, Army Corps of Engineers, and U.S. Army in Southern Europe) and State government levels, and the private sector, from Fortune 100 companies to "Mom and Pop" operations.

Terry is known for designing for the user's perspective and delivering for the business unit's perspective. His proven ability to select and integrate the best components for the job, from the desktop to the server, has been a key element in his many successful projects. He continuously monitors the fast-paced W3C standardization activities, including the many XML-related publishing tools being announced almost daily, and is an active beta-tester of some of the more promising ones.

For the past seven years Terry has worked exclusively with publishing clients, developing electronic publishing programs including content management systems. During this period he has become a pioneer and recognized industry expert in text conversion. He has directed dozens of successful conversions of print products to electronic form, involving legacy data from nearly every commercial typesetting language, many word processing programs, and SGML.

Instrumental in the success of these projects has been Terry's ability to add value and optimize these print products for electronic display. Through this experience he has evolved a unique text conversion system that allows non-programmers to map legacy data into XML, add electronic value (linking), and then map the XML to a target format (HTML, SGML, typesetting language, search engine, etc.). This technology is the basis of the content re-purposing element in Terry's current content management designs.

Reza Rahman, Software Engineer

Reza is a software engineer at Fry Development on Demand. Since joining Fry in March 2002, Reza has been involved in a number of critical projects, being actively involved in system design, implementation and testing. He is highly proficient with a number of development tools including Java, JavaScript, ASP, C++ and XML and is familiar with a wide range of database and operating system platforms including UNIX-based systems and Windows. In addition to database-driven web applications, he has also developed commercial Java/Swing based desktop solutions. He specializes in J2EE technologies like JSP/Java Servlets.

Reza graduated from Gettysburg College with a Bachelors degree. He double-majored in Computer Science and Economics and graduated Summa Cum Laude. He is a member of Phi Beta Kappa, the national honor society for undergraduates.

He is currently pursuing a Sun Java 2 Programmer Certification program as well as a Microsoft Certified Solution Developer program.

III.   Problem Evaluation and Solution

A.   Scope

Based on analysis of the request for proposal, supporting materials and our prior experience providing enterprise-class solutions, Fry Communications will provide a comprehensive solution for the State of Colorado, Department of State. The system will provide for both the existing print publications, the *Colorado Code of Regulations* and the *Colorado Register*, as well as new online products. In addition to the published products the system will facilitate communications, editing, management and archival of documents. Our proposal includes all of the following:

- Collection and integration of printed material on a continued basis.
- Collection of electronic documents constituting the publications from various agencies.
- Editing and validation of received documents.
- Management of these documents to facilitate automated creation of publications, rule history, archives, etc.
- ADA-compliant WWW publication that ensures maximum support for persons with disabilities.
- Advanced search and retrieval tools that are capable of analysis at the most in-depth level and providing these capabilities to subscribers on the web.
- Access control to publications on the basis of subscription, management of subscriptions as well as integration with existing billing and financial system. The billing system constitutes of both electronic and non-electronic payment mechanisms.
- Integration with and facilitation of existing printing schematic.
- Built-in support for sale of publications on Compact Disk media.

We recommend utilizing a custom client/server based application and extending existing DOS resources to provide a robust solution to all aspects of the goals.

B.   Solution Overview

Although a detailed system design plan will be provided after examination of the existing environment as well as client requirements, a basic scheme for the solution is outlined in the diagram on the following page. At the heart of the system is the document repository. The repository holds all documents, document metadata, user profiles and application data structures. All application modules interact with the repository by storing, retrieving, analyzing and organizing data.

Agencies are provided guidelines and templates to create and send documents to DOS via an interface to the system. Agencies choose to send prepared documents back either through this interface or via printed media. In the case of electronic transfer, the documents and data related to the documents are sent directly to the repository and marked for review by DOS. In case of printed media, DOS converts documents to electronic format by scanning the document into the repository and editing it. A high-resolution scanner and OCR software that can recognize and preserve formatted text can used to help implement this function.

As soon as DOS performs edits to a document, it may mark it approved. All approved documents may then be organized into the new edition of a publication (alternatively, publications can be setup to auto-generate at specific intervals). History and archiving will be automated as much as possible. For example, in case of a new rule, the new document will be marked as the most recent

and the older version will be analyzed and linked to it. In other words, each document will have detailed "knowledge" of its history. Manual archiving and history changes may also be performed if desired. At this point, the repository should house all required publication data in an organized and efficient manner.
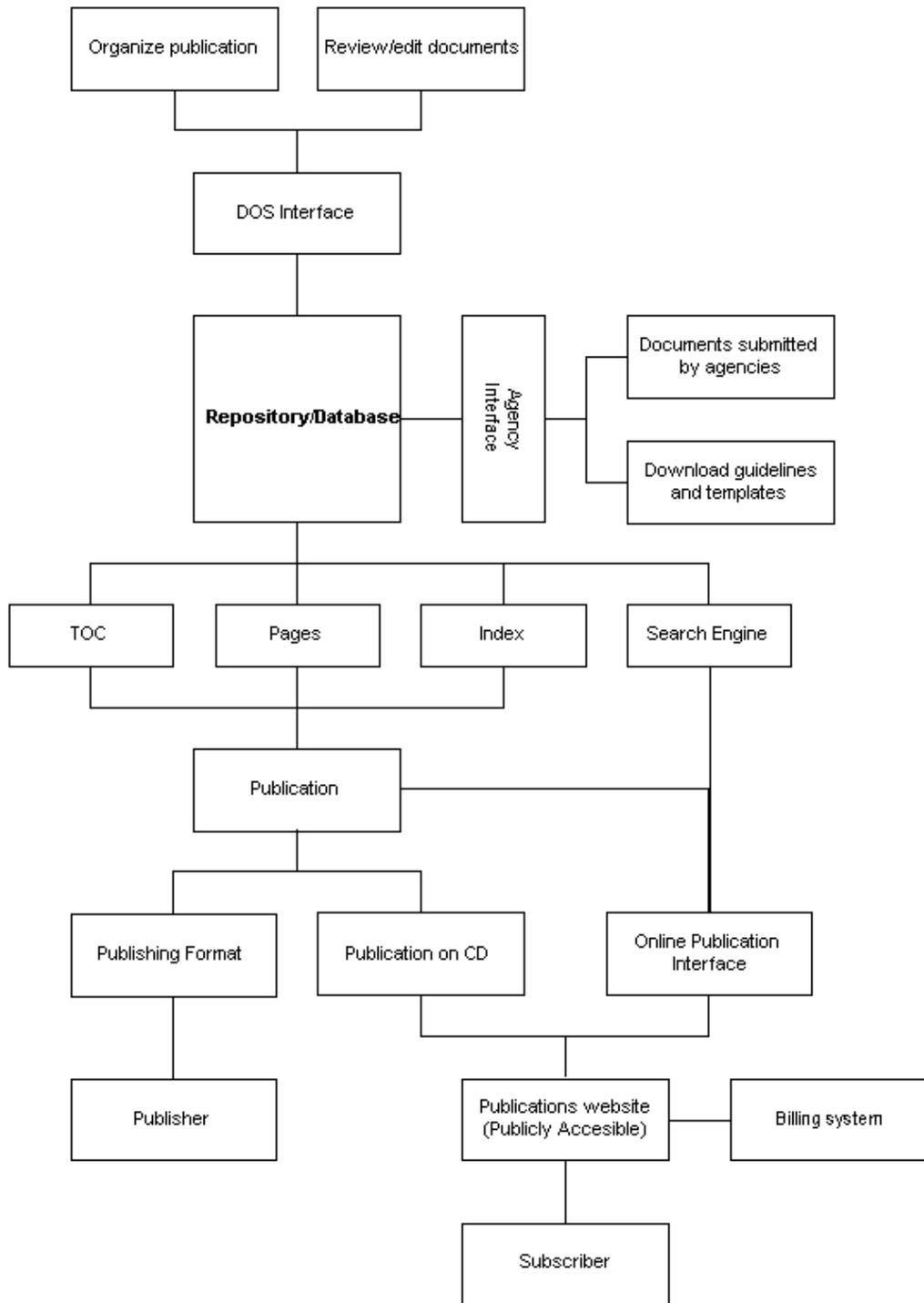

Figure 1.1: Solution Schematic

A table of contents and index will be generated as soon as the publication is prepared based on the metadata of the documents. The publication pages themselves, the TOC and the index can be gathered and converted to appropriate formats in order to publish on the web, on CD or for printing. The publication website module will present the CCR and CR in an organized manner to all authorized subscribers. In addition, the website will also allow access to the search engine. Each visitor to the website will be permitted to subscribe to a particular publication on the web or purchase a publication on CD.

In either case, the module will interact seamlessly with the existing payment processing system. The print-publisher may also interact with a part of this system that will enable them to download a publication in a desired format when DOS posts it for printing.

C. System Components/Development Phases

The solution is highly modular and will be accomplished in a number of stages. Please note each module is part of the same system and does not necessarily represent distinct interfaces. These stages/components can roughly correspond to technical deliverables. Each of the phases are briefly described below:

System Assessment: Before development can begin, a detailed analysis of DOS's existing servers, software, websites and network infrastructure will be performed in order to ensure the solution fits the existing platform seamlessly and efficiently.

Requirements Analysis: Beyond the limited scope of this proposal, a detailed requirements analysis will be performed based on interaction with DOS personnel. Such an analysis will include all the features required of each module of the system and how the implementation will accommodate these features.

System Design and Setup: After the requirements analysis is successfully completed, the system framework details will be designed and implemented. Namely, this will require defining the data structures and logic that constitute various modules and setting up the environment for development work to begin. This may include setting up new directories, creating new users, making configuration changes to existing web and application servers, adding files to backup existing schedules, etc. Detailed plans for training as well as testing and review will also be developed at this stage.

Database Setup: Once the development environment is prepared, at least one new database will be created to act as the central repository. Depending on the design, the database may simply contain pointers to documents on a separate server.

There are many possible ways that documents could be organized in the repository. One way would be creating separate tables for each type of document (rule, notices, opinions, etc). Each document record would then contain a variety of metadata that would facilitate organizing the data in a multitude of views. This data could include person and agency submitting the document, submission date, edition, detailed category information, document identification information (e.g. rule number) and links to other documents (e.g. citations, amendments, opinions, annotations etc). Each document will also include a field to indicate its status. The documents status will change over its lifetime. For example, when a document is first submitted, it will be marked "submitted for review." When a document has been checked out for editing, it will be marked "being edited." When the document is reviewed and activated, it will be marked "approved." Finally, when a new version of a document is submitted, it is then "retired."

A separate table will store all publication data. Each publication instance will have links to documents. As a result, each document can be mentioned in multiple publications. Alternatively, some documents may not be included in any publication at all (e.g. items in review or being edited). Naturally, these data structures will have to be supported by a variety of other information including personnel and agency records, usernames and passwords, publication organization data (categories), etc. In this manner, the same data can be organized in a variety of views, such as "all documents submitted by agency for review," "latest version of approved documents," "all documents in a publication by type or category," "history of a document," etc.

*Database Initialization***:** After the database has been setup, it will then be populated with some minimal data. Most critically, this data should include DOS Personnel information, information on agencies and their relevant personnel records, data about publications, etc.

Department of State Data Management Module: The most prudent component to implement next may be the interface required for DOS personnel to interact with the repository. This interface will perform the following functions:

- Establish guidelines and templates for each document type to be distributed to agencies.
- Review documents submitted by each agency.
- Enter new documents into the system on behalf of an agency or on behalf of DOS.
- Download documents for editing.
- Upload edited documents.
- Organize and archive documents.
- Create and post new publications to the web or to the publisher.
- Manage subscribers to the web site or CD purchases.

Because of the very nature of this interface, it will require an individual DOS user to log on with a secure password to access information. Each user will be assigned a specific "role", and will have access to a specific set of functions and areas. Perhaps only one or two users should have "universal" administrative access.

*Document Templates***:** Each document type will have a recommended guideline as well as template. The templates will be created in Microsoft Word in order to encourage a standard format. In addition, the system will support RTF, text, html and various web-compatible image format inputs. The only two major document formats that will not be supported are PDF and WordPerfect, but clear instructions to convert these documents to compatible formats (such as RTF) will be provided.

Agency Data Management Module: The agency module will have a limited but highly specialized set of functions. Each agency will have at least one user that can log into the system and perform these tasks. The functions are the following:

- Download guidelines and templates for each document type.
- Upload new documents and send them to DOS. Whenever an agency performs this function, the new documents will be organized automatically and DOS will be notified in order to perform a review.
- View a history of documents sent to DOS.

- Because of the very limited set of functions "roles" and access control for the individual authorized agency user may not be needed, beyond keeping access agency-specific. However, if deemed necessary, such a feature could be added.

Auto-Generators: After DOS establishes that a new issue is to be published and finishes organizing all documents into the publication, the table of contents generator will run. The generator will gather information on all documents and generate a TOC for the particular publication. This TOC then will be used as part of the publication. TOCs of different formats can be generated for each media type (web, CD or print).

The publication index generator and search engine indexer agent are very similar in nature to the TOC generator. In the case of the index generator, the logic will be almost the same as the TOC generator except for how the output is sorted and presented .The bigger difference is in the implementation of the search engine indexer since it will have to store all text of a document to facilitate full-text searches and determine relevant keywords based on text placement and occurrence. After the indexer executes, it creates data that can be used by the search and retrieval interface of each publication.

Document Format Conversion: The document format conversion module must make document management and generation as easy as possible while keeping costs reasonable since most of the conversion functions will require proprietary third-party software. In the case of plain-text input through web-page forms or formatted text input like HTML and web-compatible images, the conversion module can easily perform all required conversions without using any third-party software. However, it is reasonable to assume that the system should also handle both RTF and MS Word. If deemed too expensive, only the RTF conversion capability could be supported, which would be much cheaper than trying to support Word. This is a reasonable limitation as both the Microsoft Office and WordPerfect suites have features for easy conversion of native formats to RTF. Once developed, the conversion module will convert all input to web/CD (XHTML) and print (XML) compatible format.

Online Publication Implementation: The WWW front-end for online publication is the only part of the system that will be readily accessible to the general public. This module is therefore crucial and performs multifarious functions:

- Allow users to subscribe to a publication (or any chosen section/part of a publication). The user can subscribe on a lifetime, yearly, monthly or hourly basis. In case of hourly subscriptions, usage will be explicitly recorded and reported in real-time. At the end of each hour, the user will be presented the options to buy more time or logout.
- Allow users to manage their subscription (e.g. renew/cancel subscription).
- Enable secure, login-based access to publications.
- Facilitate easy navigation of a publication, including a search engine.
- Allow users to view the history of any specific rule, etc.
- Process sale of CDs.
- Integration with existing billing system to process all CD sales and subscription. This will include support for cash and check payments in addition to online payment. In case of an offline payment, the payment proposal will be emailed to DOS personnel and subscription/sale will be deferred until payment is received. Once DOS records the receipt of payment, the system will complete the transaction.
- Fully conform to ADA handicapped accessibility standards.

Print-Compatible Publication Generator: In addition to publishing on the web, the system will also work seamlessly with the publisher. Namely, this means when DOS posts a new publication and notifies the publisher, an XML copy of the publication will be created for download by the publisher. The publisher may then logon to the system, download the publication and notify DOS of receipt. If needed, DOS can make changes to documents and regenerate the publication after collaborating with the publisher.

CD-Format Generator: In addition to facilitating CD sales, the system will be capable of dynamically creating CD format publications. It would be a natural extension to create these files in HTML (navigable with any browser, without support from a host server). However, for an additional cost these files could also be generated in PDF since such a feature would also require third-party software. The files could then be downloaded and burned onto a CD quickly and easily.

Help and Tutorial System Integration: Each complex part of the system will be equipped with a well-placed help function. The help function will open up a help interface for the specific part of the application and guide the user, step-by-step, through a function or feature. In addition, an offline "how-to" or "getting started tutorial" will be supplied for DOS personnel, agencies and publishers. These documents could be sent to the specific user-group before they log into the system via email.

Testing and Review: Testing and quality assurance will be performed on a variety of levels. After each module is completed, the quality assurance will perform rigorous on the module. In addition, client review and feedback will be incorporated during of each stage. Once all development work is done, another round of testing and review will ensue to finalize the staging version of the system

System Deployment: After thorough testing has been conducted, the system will be moved from development to production. Changes made to the overall environment will be mirrored in production servers and further development, testing and configuration changes will be made to ensure client-satisfaction.

**D.   Technology Utilization/System Integration**

The technology used to implement a solution has crucial effect on the system's maintainability, efficiency, adaptability, scalability, stability and robustness in the long and short run. In case of a system superimposed on an existing framework, consideration of the existing environment is also a critical issue. An effective technology choice can dramatically reduce costs and development/maintenance time and complexity by making maximum utilization of existing hardware, software and network configuration. From both perspectives, a J2EE (Java 2 Enterprise Edition) based solution, utilizing Informix, the iPlanet Web Server and the iPlanet Application Server on the Sun Microsystems hardware platform makes excellent sense.

J2EE is one of the premier enterprise client-server development platforms, peered only by the Microsoft .NET framework. It is a technology widely espoused by industry giants like Sun Microsystems, IBM, Oracle Corp and Hewlett Packard. The hallmarks of the technology are portability, stability, scalability, robustness, modularity and performance. It is arguably the most feature-rich, well-supported and documented development tool on non-Microsoft platforms.

The de-facto web server platform for DOS is the iPlanet Web Server in a UNIX environment. This means it would be complex, cumbersome and costly to provide a solution that would

interface well with Microsoft based web technologies. Furthermore, DOS also possesses the iPlanet Application Server, an excellent J2EE tool that interfaces very well with its companion product, the iPlanet web server. Since both iPlanet and Java are Sun Microsystems technologies running on Solaris espousing J2EE will make integration of the new system as easy as possible. Lastly, the database platforms existing in DOS also make J2EE and excellent choice. In case of both Informix and DB2, IBM's suggested technology to make the databases web-enabled is Java (both databases have had excellent, well-supported JDBC drivers from the inception of Java as opposed to the ODBC drivers required for a Microsoft solution). As a result, configuring either database for a J2EE solution would require minimal effort. For the purposes of most web applications, the large-scale data management capabilities of DB2 are overkill.

As is the case of any well-designed web application, the solution is multi-tiered, client server based. A multi-tiered approach utilizes more than one machine in a distributed environment that cannot be matched by any single machine on its own. Additionally, using this approach makes the solution more modular in nature, making is scalable and maintainable. Since the DOS web, application and database servers are on different machines, an excellent 4-tiered design is possible.
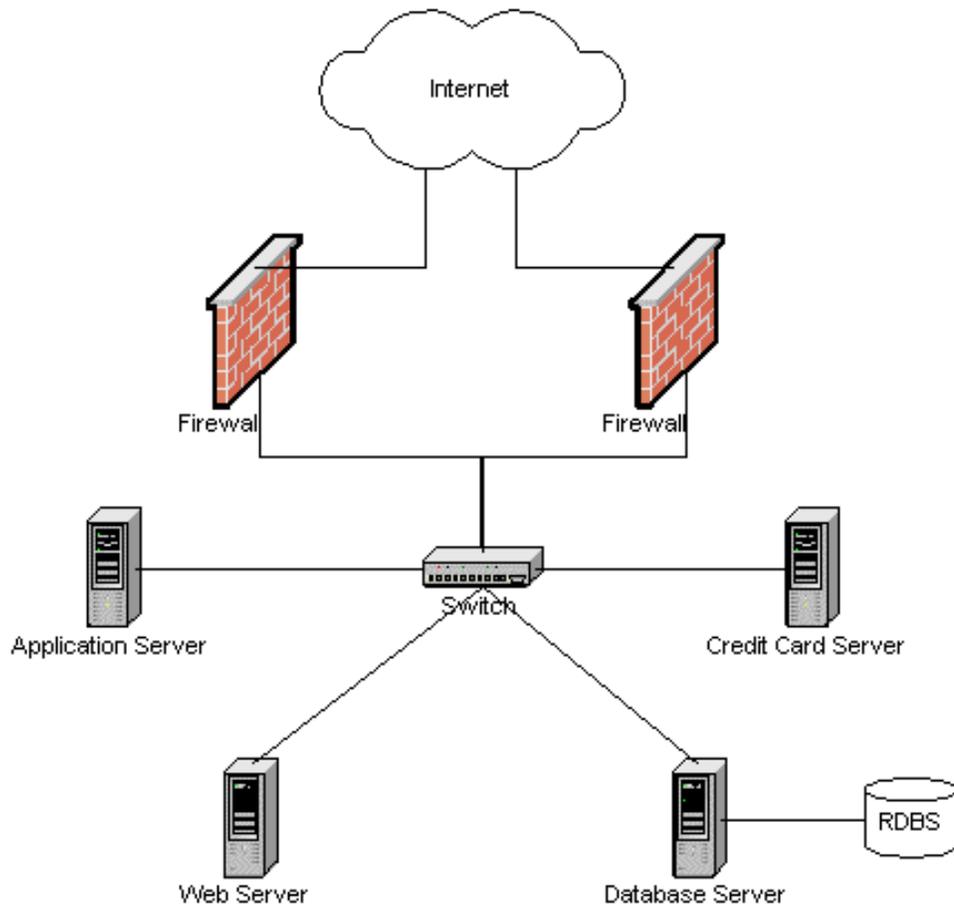
Figure 1.2: DOS Servers Used for Solution

Since the solution is web-based, naturally, the first tier is the web browser. The users will access the system by visiting a particular website through a browser like Netscape or Internet Explorer. The only parts of the system that will be publicly accessible via unsecured HTTP pages are the interface for site visitors to purchase a CD or select a particular publication to subscribe to, as

well as the login pages for DOS personnel, agencies, the publisher and subscribers. All other pages will be on a password-protected, secure HTTPS server. As a result, all data that is exchanged through these pages will be encrypted and completely unreadable by a third party. Using an HTTPS server is especially crucial for file transfer because as opposed to FTP and HTTP, it is completely secure for most practical purposes.

All the HTTP/HTTPS requests will be directed and captured by the iPlanet Web Server. All the static web content will reside on this server. With the exception of dynamic content (namely JSP pages and Java Servlets), all content will be handled by the web server on its own. In the case of dynamic content, the request will be passed to the iPlanet Application Server, which will execute the JSP page or Java Servlet. As needed, some functions performed by the dynamic content may utilize EJB or Java Beans residing in the application server environment. The application server, in turn, will have a JDBC connection to the Informix database. As a result, the JSP/Java Servlets will be accessing the Informix database from the application server. Executables at the application server level will also be connected to the credit card server through system-independent, text-based protocol messages.
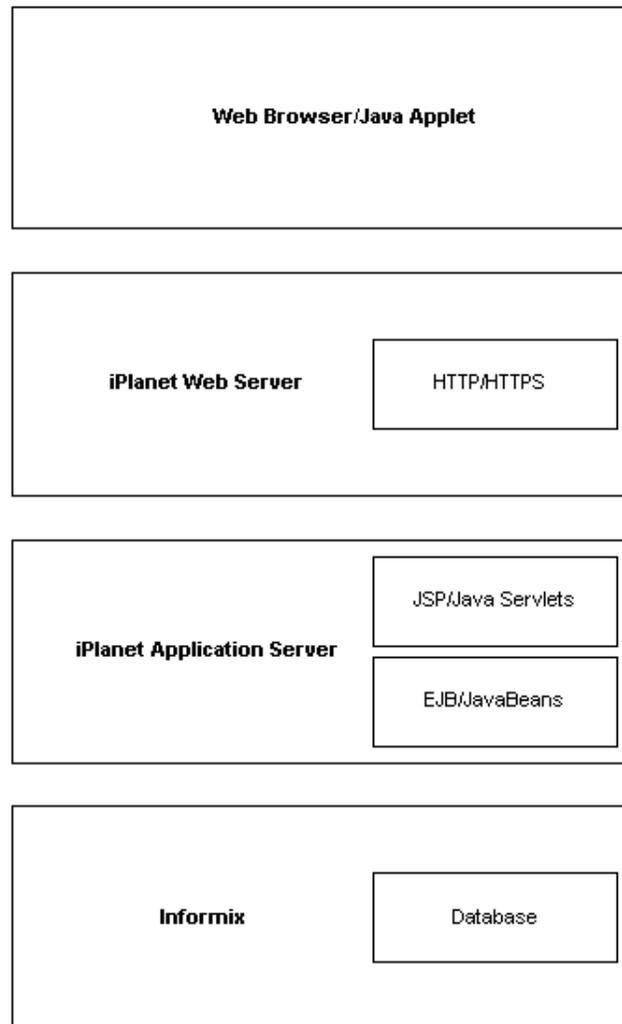
Figure 1.3: N-Tier Solution Architecture

As a summary, the following capabilities and resources will be expected from the DOS environment:

Minimum hardware capacities: All servers mentioned should at least have a 500Mgz CPU, 64MB RAM and a robust operating system. Except for the server storing database and repository documents, all servers should at least have 300MB of free space. The repository server should have at least 40 GB of free space.

Web Server: A J2EE compatible web server is required that can be configured to pass requests to a J2EE application server. This server should also be able to support the HTTPS protocol.

*Application Server***:** A J2EE compatible application server that can process JSP/Java Servlets is required.

Web-Enabled Database Server: A web-enabled database server that has a JDBC driver is required to host the repository.

Credit Card Server: Application pages will interact with the credit card server to process billing though text-based protocol messages.

Regular Backup: For disaster-recovery purposes, DOS should regularly backup all application modules and data, especially repository documents, to some removable media.

Based on the preliminary information, the following configuration changes/enhancements may need to be made:

- If the existing web server is not HTTPS capable, a secure certificate must be purchased and HTTPS must be setup on the server.
- A new database must be created.
- At least one J2EE application must be created on the iPlanet Application Server.
- A file upload API will need to be added to the iPlanet J2EE environment (e.g. JSmart).
- Additional conversion utilities/APIs must be installed on the application server including Apache POI, Cocoon, Xalan, Xerces, etc.
- At least one high-definition scanner must be purchased to scan-in documents. Software that can scan documents directly to editable format while preserving format will be required.

IV.   **Personnel and Project Management**

A.   **Management Process Overview**

Fry prides itself in the level of product quality and project management expertise it provides. At each stage of development, Fry managers work closely with developers and quality assurance personnel to execute projects in the most effective and efficient manner. In addition, we are committed to keeping the customer involved throughout all stages of development.

The development of the system will occur in the Fry staging environment. We will closely emulate the DOS system on our network and port the application to the DOS environment once development is completed. The staging environment is accessible via the Internet with a secure username and password. As result the customer can directly monitor development at any time. In addition, the customer will also be given access to the Fry project tracking system that contains detailed information on the status and progress of each task in any module in addition to contact information of any relevant personnel.

At the beginning of any module, managers analyze, create and assign necessary tasks. Each task includes detailed input and output specifications, usability and interface standards as well as testing checkout lists that incorporate functionality, usability, standards-compliance and overall system integration. Tests are performed for all major browsers on all major platforms. In addition to monitoring of progress, managers regularly coordinate the incorporation of any client feedback with personnel. Lastly, once development is done, Fry will review the site with the client to ensure compliance with the project statement of work and documentation.

B.   **Personnel**

Fry will provide all development, database/system administration and quality assurance personnel for development purposes, with minimal support from DOS IT personnel during deployment. Once the system is deployed, the following personnel needs can be envisioned:

Editorial Personnel: Personnel will be required to perform minimal interaction with the system to organize documents and create publications. We estimate that at least two or three editorial personnel will be required to edit/proofread documents as well as use the system. Familiarity with the publications and some minimal computer skills are required for these functions. If required, Fry will train these personnel to use the system in addition to built-in help systems and getting started guides. At least one of these personnel will need to know/learn how to operate a high-resolution scanner and capture, edit and save documents using Windows scanning software (e.g. OmniPage Pro). Training will be provided if required in this case as well.

DOS System/Database Administrators: At least one, preferably two, DOS database / network / system administrators will be required to monitor the system, perform backups, upgrades, license updates, disaster recovery, etc. Such personnel will have detailed knowledge of networks, the Internet, Solaris administration, UNIX systems maintenance, iPlanet Web/Application server maintenance, and Informix database administration.

Agency Personnel: At a minimum, these personnel should possess and have knowledge of a basic computer with a word processor to prepare documents in any of the supported formats as well as a web browser and Internet access to interact with the system. For training purposes, Fry will provide Getting Started Manuals in addition to help screens integrated with the system.

C.   Project Deliverables/Schedule

The tentative deliverables and schedule for this project is summarized below (we are open to negotiations on these terms):

Task	Start	Days	Finish	November	December	January	February	March	April
System Assessment	11/12/02	3	11/14/02						
Requirements Analysis	11/15/02	7	11/23/02						
Client interviews	11/15/02	2	11/16/02						
Overall project plan	11/19/02	5	11/23/02						
System Design and Setup	11/26/02	8	12/06/02						
Software and design plan	11/26/02	4	11/30/02						
Personnel plan	11/26/02	3	11/29/02						
Training and implementation plan	11/26/02	3	11/29/02						
Testing and final review plan	11/26/02	3	11/29/02						
Configuration changes	12/3/02	4	12/6/02						
Database Setup	12/7/02	6	12/14/02						
Creation of database	12/7/02	4	12/12/02						
JDBC connection	12/13/02	2	12/14/02						
Database Initialization	12/7/02	6	12/14/02						
Data collection	12/7/02	4	12/12/02						
Database population	12/13/02	2	12/14/02						
Interface Template Design	12/7/02	7	12/17/02						
DOS Data Management Module	12/18/02	11	1/2/03						
Implementation	12/18/02	10	12/31/02						
Initial testing	1/2/03	2	1/3/03						
Document Templates	12/18/02	16	1/6/03						
Word templates	12/18/02	11	1/2/03						
Integration with system	1/3/03	4	1/8/03						
Agency Module	1/3/03	10	1/16/03						
Implementation	1/3/03	8	1/14/03						
Initial testing	1/15/03	2	1/16/03						
Conversion Routines	1/17/03	15	2/6/03						
Software conversion utilities	1/17/03	4	1/22/03						
Conversion model	1/23/03	11	2/6/03						
Auto-Generators	2/7/03	15	2/27/03						
TOC generator	2/7/03	5	2/13/03						
Index generator	2/14/03	4	2/19/03						
Indexer agent	2/20/03	6	2/27/03						
Search interface	2/26/03	2	2/27/03						
Public Interface	2/28/03	8	3/11/03						
Online publication	2/28/03	8	3/11/03						
Subscription/payment system	2/28/03	8	3/11/03						
Publishing to Printer	3/12/03	10	3/25/03						
Publish routines	3/12/03	7	3/20/03						
Publisher interface creation	3/21/03	3	3/25/03						
CD-Format Publishing	3/12/03	3	3/14/03						
Help/tutorial System Integration	12/7/02	82	3/31/03						
Help Screens content creation	12/7/02	78	2/25/03						
Integration with system	2/26/02	4	2/31/03						
System documentation and user guides	12/7/02	82	3/31/03						
Testing and Review	12/7/02	89	3/31/03						
Beta Deployment	4/1/03	1	4/1/03						
DOS Personnel Training	4/2/03	7	4/8/03						
DOS Testing and Review	4/9/03	7	4/14/03						
Required Changes	4/9/03	14	4/28/03						
Final deployment	4/28/03	4	5/1/03						

D.   Cost Estimates

The cost estimate below is based on the listed deliverables. Barring significant changes to the project requirements, the estimate should be, by and large, accurate. The greatest variables are likely to occur in the software and equipment category.

Deliverables	*Cost*
I. Needs Assessment	**$ 22,000**
Overall Project Plan	$ 10,000
Software and Design Plan	$ 4,000
Personnel Plan	$ 3,000
Training and Implementation Plan	$ 2,000
Testing and Final Review Plan	$ 3,000
II. Development	**$ 114,500**
Database Setup	$ 12,500
Web Interface Creation	$ 7,000
Web Interface for DOS	$ 12,000
Document Templates	$ 15,000
Agency Interface	$ 10,000
TOC, Index and Search Engine	$ 17,000
Public Interface/Conversion Routines	$ 41,000
III. Testing	**$ 22,500**
Beta Release	$ 22,500
IV. Deployment	**$ 8,000**
Final Deployment	$ 8,000
V. Training	**$ 24,500**
Documentation, Help and Guides	$ 17,500.00
Training	$ 7,000.00
Deliverables Total:	**$ 191,500**
Software & Equipment	
Format Conversion Tools: Tools integrated into the system to provide conversion of the supported document formats.	$ 2,000.00
SSL Certificate: Provides secure transmission of data between the end-user and the server.	$ 350.00
Desktop Scanner: Scanning of documents submitted in hardcopy form.	$ 400.00
OCR Software: Scanning software to provide text recognition of hardcopy documents for import into word processor	$ 200.00
Software & Equipment Total:	**$ 2,950**
System Total:	**$ 194,450**

V.   **Conclusion**

Given our rich experience in developing similar enterprise applications and based on the information provided in the RFP, we feel confident that we can provide a J2EE based web solution that is not only adequate, but also cost-efficient, robust and flexible. We look forward to having the Department of State as a valued Fry Communications customer.