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Final Report for the Virtual Reliability Realization System LDRD

Theodore A. Dellin, Christopher L. Henderson, and Edward J. O'Toole

Prepared by
Sandia National Laboratories
Albuquerque, New Mexico 87185 and Livermore, California 94550

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Final Report for the Virtual Reliability Realization System LDRD

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Abstract

Current approaches to reliability are not adequate to keep pace with the need for faster, better and cheaper products and systems. This is especially true in high consequence of failure applications. The original proposal for the LDRD was to look at this challenge and see if there was a new paradigm that could make reliability predictions, along with a quantitative estimate of the risk in that prediction, in a way that was faster, better and cheaper. Such an approach would be based on the underlying science models that are the backbone of reliability predictions. The new paradigm would be implemented in two software tools: the Virtual Reliability Realization System (VRRS) and the Reliability Expert System (REX). The three-year LDRD was funded at a reduced level for the first year (\$120K vs. \$250K) and not renewed. Because of the reduced funding, we concentrated on the initial development of the expertise system. We developed an interactive semiconductor calculation tool needed for reliability analyses. We also were able to generate a basic functional system using Microsoft SiteServer Commerce Edition and Microsoft Sequel Server. The base system has the capability to store Office documents from multiple authors, and has the ability to track and charge for usage. The full outline of the knowledge model has been incorporated as well as examples of various types of content.

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Final Report for the Virtual Reliability Realization System LDRD

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Edward J. O'Toole (4817)
October 16, 2000

Executive Summary

Current approaches to reliability are not adequate to keep pace with the need for faster, better and cheaper products and systems. This is especially true in high consequence of failure applications.

The original proposal for the LDRD was to look at this challenge and see if there was a new paradigm that could make reliability predictions, along with a quantitative estimate of the risk in that prediction, in a way that was faster, better and cheaper. Such an approach would be based on the underlying science models that are the backbone of reliability predictions. The new paradigm would be implemented in two software tools: the Virtual Reliability Realization System (VRRS) and the Reliability Expert System (REX). The concept is designed to advance the state-of-the-art in reliability prediction and modeling. The software is designed to have two major components. The first component is a reliability prediction package that incorporates model quality and uncertainty to help better predict reliability based on science, rather than relying solely on statistical methods. The second component is an expertise tool that can serve as a knowledge repository for reliability information. This repository is designed to be easily accessed through the web and updated using standard Microsoft Office applications (Word, Excel, PowerPoint).

The three-year LDRD was funded at a reduced level for the first year (\$120K vs. \$250K) and not renewed. Because of the reduced funding, we concentrated on the initial development of the expertise system. We developed an interactive semiconductor calculation tool needed for reliability analyses. We also were able to generate a basic functional system using Microsoft SiteServer Commerce Edition and Microsoft Sequel Server. The base system has the capability to store Office documents from multiple authors, and has the ability to track and charge for usage. The full outline of the knowledge model has been incorporated as well as examples of various types of content.

I. Introduction

Reliability is an important aspect of design products and systems, especially when the consequences of a failure are high. The genesis of this LDRD proposal was a concern that current approaches to reliability have deficiencies, deficiencies that increase in the future. For example, reliability predictions do not give an accurate picture of the *total* uncertainty in the predicted reliability value. Thus the person using the prediction to design and/or accept a product does not have a true picture of the risk involved. The only uncertainty element typically reported has to do with the statistical risk associated with drawing results from a small sample size. No assessment is typically made of the risk that the wrong statistical distribution was used, or even more importantly, the wrong model of the failure mechanism was used.

On top of these concerns is the fact that reliability predictions will be done against the imperative to make all products “faster, better and cheaper.” In general, current approaches to reliability do not get better as the reliability prediction process becomes faster and cheaper. For example, faster reliability characterization using more highly accelerated stressing may change the failure mode. Furthermore, cheaper reliability characterization generally means a smaller sample size, which increases the uncertainty of the predictions. Current reliability approaches may, in the near future, be the limiting factor in continuing faster, better and cheaper.

The goal of the original proposal was for a significant, three-year research project aimed at producing a realistic faster, better and cheaper approach to ensuring reliability that would include a meaningful measure of the true risk associated with a prediction. To accomplish this it was proposed to

- Conduct a critical review of existing approaches to ensuring reliability. The goal was to develop:
- Develop a new reliability paradigm
- Provide the software tools necessary to implement that paradigm:
 - Virtual Reliability Realization System (VRRS)
 - Reliability expertise system (REX)

Sandia had conducted a similar “fresh look” exercise in approaches to Surety decades ago and the results of that study provided the basis for better approaches to Surety. It was hoped that a similar study in reliability would have proven to be equally productive.

Unfortunately, the LDRD project funding was cut in the first year and the project was cancelled at the end of the first year. It was decided to focus on the reliability expertise system since this was an area in which the most progress could be made with reduced funding (and with the sense that the project would not survive the first year due to changing in LDRD priorities).

Thus the majority of this work focuses on the development of REX. However, we will also document a brief overview of the basis of a new reliability paradigm and what the Virtual Reliability Realization System might look like.

Figure 1. Reliability prediction is based on models.

II. A New Paradigm of Science-based Reliability

Reliability prediction is very difficult:

- There are multiple failure mechanisms and a failure rate prediction needs to be made for each mechanism
- For each mechanism there are several physical and statistical models that need to be derived and validated.
- The reliability models and the parameters used in those models are difficult to determine and validate. Larger sample sizes and long term characterization is generally required. This is expensive and time consuming and the opposite for cheaper and faster.

The search for a better reliability paradigm was not funded. The idea that would have pursued was a “science-based” approach to reliability. The focus would have been on the reliability models. The uncertainty in the models and in the model parameters would have been included in the estimate of the uncertainty of the reliability prediction.

Figure 2. Schematic diagram of Virtual Reliability Realization System

III. Virtual Reliability Realization System (VRRS)

The Virtual Reliability Realization System (VRRS) software purpose is to design, optimize and track the activities throughout the lifecycle that impact reliability. Figure 2 shows a schematic of the proposed VRRS.

The key attributes of the VRRS were to be:

It considers the activities throughout the life cycle that impact reliability

It explicitly identifies the techniques and models used

Ideally, the VRRS would be used at the start of a product realization process to design and optimize all of the reliability activities performed during the product's lifecycle.

The VRRS would identify the reliability model(s) and/or model parameters that most impacted the reliability prediction. This information could be used to direct R&D investments to improve the limiting models.

Figure 3. Schematic diagram of Reliability Expertise System (REX)

IV Reliability Expertise System (REX)

REX, the Reliability Expertise System is envisioned to be an expert help system for Microsystems Reliability. The end product will capitalize on the success of FASTAdvice, a failure analysis computer-based training tool. We envision REX as a web-based information source that provides a moderate level of knowledge on a comprehensive set reliability technologies, issues, and concepts. This product will fit squarely between the two most prevalent knowledge sources currently available for reliability, books and conference proceedings.

Figure 3 shows a schematic of REX. It is used in one of two modes. First, it can provide training. Second, it can be used as an online reference. The online reference would contain both factual information (i.e., models of failure modes) as well as expert advice. REX will be a growing, extensible product. Information can be added by multiple authors and information from multiple sources can be cross referenced. The goal is to make a whole that is greater than the sum of its parts.

IV. A. Overview

REX will be deployed as a website. Alternatively, it may be sold as a webserver to companies wishing to create an internal resource. The web-model has been chosen over the CD-ROM delivery model for several reasons:

- The information can be maintained at one location (i.e., no distribution costs)
- A website can be updated consistently
- Companies are migrating their knowledge and practices to web-based systems
- Many tools are available for generating web pages and web content

- Office 2000 features can be linked into the Internet Explorer Web Browser to create interactive charts and presentations.
- Authors can develop content in Office 2000 and immediately load their data onto the web.

IV B. Project Work

Initially, we explored the option of using Microsoft FrontPage 2000 and Access 2000 to create the Reliability Expertise Site. Although we were able to create a database model and link it to FrontPage, we decided that an approach using an e-commerce server might be in order. Using an e-commerce server, various pieces of content or combinations could be accessed for certain fees. This would enable more control for other similar applications in the future. We contacted WebCo and had them help us develop the Reliability Expertise Site using Microsoft SiteServer Commerce Edition and SQL Server.

With the help of WebCo, we developed a project plan for the system (see Appendix A) and began development work. Ed O'Toole served as the e-commerce tool developer while Ted Dellin and Chris Henderson developed the structure, basic concepts and sample content for the system. The basic development and content was completed in September, 2000. The results of the system can be viewed at <http://www.suretyinstitutes.sandia.gov/mtrs>.

IV C. Knowledge Content

Work was performed on developing the knowledge content for REX. The initial application considered is microelectronics reliability. The commercial program MATHCAD was used to create an interactive ability to calculate a large set of basic semiconductor properties that would be used in reliability analysis. The user can click on any of the equations and/or graphs and change the variables used in the quantity being calculated (e.g., use a different doping level or a different temperature). One example of the large number of graphs available is shown in Figure 4.

**Energy Relative to
Intrinsic Fermi Level (eV)**

Figure 4. An example of the interactive calculations possible. Any of the variables in the graph can be changed by the user.

V. Conclusion

Although the funding for VRRS was limited to the Reliability Expertise System and then funding was further cut, we were able to demonstrate a basic system. Because the project was cancelled for FY'01, there will be no further development of VRRS or REX under the LDRD. We will investigate alternative methods to continue this project.

The basic issues that reliability predictions do not contain a meaningful estimate of the uncertainty (risk) in the prediction and that current approaches to reliability may limit our ability to implement faster, better and cheaper still remain as significant national challenges.

Appendix A – Project Plan for the Reliability Expertise System

eCommerce Application Server for the Microelectronics Center

WebCo Project Plan <DRAFT>

**Prepared by:
Ed O'Toole
Dan McCorquodale**

March 10, 1999

Problem Narrative:

The Microsystems Science, Technology, and Components Center currently has a collection of technical information in digital format (i.e., documents, graphics, videos, tutorials, etc.) that they would like to offer to subscribers for a fee. A small collection of this information is currently being presented on Sandia's SRN at no cost. The objective of this project is to implement a web-based eCommerce system that will allow Microelectronics Center personnel to charge a fee to access the various digital offerings that will be made available.

Attachments:

1. Prototype screen views that show what the application might look like.
2. Initial Entity Relationship Diagram.
3. Database Documentation.

Customers:

Chris Henderson, Failure Analysis Department 1739, 844-3216

Sponsor-

Ted Dellin, Microsystems Science, Technology, and Components Center 1700, 844-2044

End Users-

- Members of the microelectronics industry that are involved in failure analysis research (approximate population is 10,000 people).
- Potential application end-users will include Sandia personnel as well as university and industry researchers.

Stakeholders-

Human Factors-

Systems

Production Services

Security

Communications

C/S Product Support

CSUs

Training

Database Administration

Infrastructure

Help desk

Requirements:

- Create a web-based eCommerce system that will allow subscribers to browse and download digital content—from both the open Internet and the SRN (i.e., the site will be hosted on a server residing on the SON).
- Provide an introductory section (no login required) to welcome, and register, prospective subscribers/authors to the site.
- Potential subscribers will be screened prior to being allowed access to the site via a login dialog. The customer will develop the process for screening prospective subscribers.

- A content submission interface will be provided for content authors. Submitted content will be earmarked as requiring review prior to being posted on the public web site.
- A content review and approval mechanism will be implemented to ensure that no sensitive information is posted to the site.
- Unapproved content will be routed back to the content author for revision, and resubmission.
- A credit card verification and validation mechanism will be implemented. This will require the involvement of a local bank.
- Security issues will be addressed to ensure that all project data is protected.
- Possible need to restrict site access by IP and/or domain.
- Protect downloaded .xls files from revision.

Architecture:

Presentation Layer-

Web browsers: Internet Explorer 4.0 (or higher) and Netscape V4.61 (or higher).

Functional Layer-

Microsoft's Site Server 3.0 Commerce Edition will be used to generate a foundation for the eCommerce solution. Microsoft's Active Server Pages Framework will then be used to develop any necessary custom functionality. The credit card validation component that will most likely be used for this project is CyberCash's 'Cash Register Payment Component.' Customer hardware (i.e., server) and software will be used (i.e., Corporate infrastructure will not be used—other than a SON network connection).

Data Layer-

Microsoft SQL Server 7.0 will be used for the backend database. Microsoft Index Server will be used to create an index of site content. This index will then be used to allow user's to search and link to site content. Customer hardware (i.e., server) and software will be used (i.e., Corporate infrastructure will not be used—other than a SON network connection).

Environment:

Server:

- Windows NT 4.0, running Internet Information Server 4.0
- Site Server 3.0 Commerce Edition
- MS Transaction Server
- MS Index Server
- Database - MS SQL Server 7.0
- Applications - Microsoft Office 2000.

End-User Workstations:

- Browser – Internet Explorer 4.0 (or higher) or Netscape 4.61 (or higher)

Security:

All site content will be unclassified. The site will require that potential subscribers register prior to being allowed to access the site's digital contents. After the user registers, they will be evaluated for suitability to view the digital contents. If they are granted site access rights, they will be provided with a login account on the system. All security issues will be addressed (and documented) in conjunction with Computer Security personnel as they are discovered.

Production Support/Operations:

There will be approximately 10,000 users at a maximum. NOTE: It is unlikely however that there will be more than 25 concurrent users.

Deployment:

The application will be deployed via the web. It is preferable that site subscribers use Microsoft's Internet Explorer browser (5.0 or higher), as certain types of digital content will not provide full functionality with other browsers (e.g., MS Excel dynamic charts, etc.). The use of Netscape's 4.61 (or higher) browser will allow the user to access most of the available site functionality. There are no additional requirements for deployment at this time.

Help Desk Information:

Business support contact list: Chris Henderson, 844-3216
Application support contact list: Ed O'Toole, 844-2696

Schedule:**Phase 1 (Proof-of-Concept):**

- **A** - Basic functionality by end of May FY00. Initial SQL Server database designed and online. Initial server architecture defined and implemented as required to support basic functionality. The uploading and viewing of content will be supported at this level.
- **B** - Additional functionality by end of September (FY00). To include authoring interface with review and approval functionality

Phase 2 (FY01 work):

- **A** - Refine database design to include additional tables as required to allow for the proctoring, grading, and reporting of testing information. Enable automated credit card validation.
- **'Product' Announcement at Major Conference** – On or about April FY01, 1700 will start promoting the product within the electronic micro-systems industry.
- **Application in Production** – The completed/tested application will be put into production on October 1, 2001.

Milestone	Date
Phase1-A	May 30, 2000
Phase1-B	October 1, 2000
Phase2-A	Ongoing through FY01
'Product' Announcement	April 2001
Application In Production	October 1, 2001

Implementation Plan:

WebCo personnel will maintain the server during FY00. Additional system administration and computer security personnel will be used as consultants as required. Future application enhancements will be negotiated as a new project with the customer. A maintenance agreement will need to be negotiated upon completion of the stated project requirements.

Test Plan:

A test plan will be generated in parallel with site functionality. Problems encountered during testing will be reported immediately using telephone, email, or FAX to those parties listed as application support contacts in the 'Help Desk Information' section of this document.

Other Risks and/or Issues:

- A charging strategy will need to be developed such that all content contributors are fairly reimbursed for their intellectual property (i.e., digital content).
- A licensing strategy will need to be developed such that all intellectual property (i.e., digital content) is officially released (to the application?) for distribution to whoever has been granted access.
- A 'subscriber access approval' strategy will need to be developed such that all approved subscribers are granted access to all content (or only certain content based on their 'subscriber approval designator/level?').
- A financial relationship with a local bank will need to be created so that they may provide credit card validation services electronically.
- A credit card validation component will have to be found, and approved, that will handle all corporate ecommerce needs.
- Computer security personnel have been contacted regarding the application. Any issues related to this issue will need to be resolved and documented in a computer security plan. The plan will have to be approved by the Computer Security organization.
- The application will have to comply with Sandia's External Web "Review & Approval" requirements since Sandia data will reside on the site. Industry, university, and other Nuclear Weapons Complex researchers will also provide digital site content.

- Corporate resources (i.e., The IIS Center) will not provide database or server administration services—although they will be consulted as required to ensure project completion.
- Delivery dates are promises—not guarantees, due to the lack of previous experience with the products. We will however, do our best to meet the proposed deadlines.
- A backup procedure will need to be developed and put into place for all database and application-related data and files.
- A version control system will need to be put in place to track author content submissions.
- During FY00, MS SQL Server may need to be set up on a separate computer due to the amount of services that will be running concurrently on the application server. If the application is brought into production, another computer will be required.
- Server RAM will need to be maxed out due to the amount of services that will be running concurrently on the server.
- Unknown—Upload .doc/.xls/.ppt files NOT Office generated .htm files THEN convert the files to .htm on the server (This apparently creates a folder of support files related to the original file—on the server).
- The use of an all Microsoft system (i.e., Meaning the use of the Office 2000 / Internet Explorer-only browser approach) will limit the consumer base in all likely-hood—which will probably affect the level of income generated by the site. We will allow non-Microsoft browsers to view the site, although some dynamic features will not be supported with the use of a non-Microsoft browser.
- Credit card transaction fees are an unknown at this point. In general, a setup fee will be charged by the 'processing' bank (Bank of America for example), and then in addition there will also be either a monthly fee, or a per transaction fee charged.
- The project as discussed by the customer and our team involves the development of an ecommerce system—the LDRD proposal however discusses the development of an expert system.
- No formal Conceptual Design Review (CDR) can be held until all risks have been addressed/mitigated.
- Possible Contacts for various issues:
 - Intellectual Property (IP): Tim Stanley (845-8124) manages IP at Sandia.
 - Licensing agreements: Angelo Salamone (843-4146) at Tech Transfer.
 - Brokering of money in the DOE complex: ??? I have heard that there is a DOE order in place that governs the brokering of money at DOE facilities. Who brokers the money from Sandia run conferences?
 - Computer Security: Alex Quintana (284-2882) and Darl Patrick (284-3034)

Documentation:

This document is a living project plan representing formal agreement between the customers and the suppliers of the products and/or services described herein.

Acceptance and signing of this document signifies a working agreement between the customers and the supplier on performance, cost, and schedule, and a commitment of funds by the customer and a commitment of performance by the supplier.

Sponsor

Date

Org.

Project / Task

Appendix B – REX Database Structure and Dependencies

Appendix C – Reliability Expertise Site E-Commerce Documentation

MTRS eCommerce System Documentation

1. Introduction

The Microsystems Science, Technology, and Components Center currently has a collection of technical information in digital format (i.e., documents, graphics, videos, tutorials, etc.) that they would like to offer to subscribers for a fee. A small collection of this information is currently being presented on Sandia's SRN at no cost. The objective of this project is to implement a web-based eCommerce system that will allow Microelectronics Center personnel to charge a fee for allowing system users on both the SRN and SON to access the various digital products that have been made available. The customer and sponsor for this project are Chris Henderson (Failure Analysis Department 1739), and Ted Dellin (Microsystems Science, Technology, and Components Center 1700). Potential system end-users include Sandia personnel, as well as, university and industry researchers that are involved in microelectronics failure analysis research.

The system has two main web interfaces: the shopper interface, and the eStore manager interface. The shopper interface is used to register and authenticate prospective shoppers. Shoppers can view eStore products without having to first login or register. Once a shopper either attempts to add a product to their shopping basket, or clicks on either the 'Basket' or 'Pay' icons—they will be required to register and/or login to the system.

The eStore manager interface is used to authenticate those people that have been granted administrative rights on the Site Server computer. EStore managers have create, review, update, and delete privileges for eStore data related to store merchandise as well as customer, transaction, and system related information. Initial actions that may be taken from the shopper and eStore manager interfaces are described below. Appendices A and B contain further details related to these interfaces.

2. MTRS Shopper Interface

The following screen is what the shopper will see when going to the shopper interface for the first time.

The shopper has the following options from this screen (please see Appendix A for screen shots and further detail related to these and other available options).

Select a department

Doing so will allow the shopper to drill down from top level departments to lower level departments—where they will find training and reference materials (i.e., products) that they can choose to purchase (i.e., add to their shopping basket, and subsequently pay for).

View the Product Listing Page

Doing so will present the shopper with a complete listing of all eStore departments, and their associated products (training and reference materials). Links are provided so that the shopper may elect to add the available products to their shopping basket. NOTE: All of the products that appear in the product listing have been reviewed and approved by the eStore manager—prior to their appearing in the product listing. If a shopper would like to become a product author, they must contact the eStore manager. EStore manager contact information can be found on the 'About' page.

Login link

The shopper may elect to login at this point in time, wait until they decide to access their basket, or pay for their previously selected products. If the user has not previously registered with the eStore, they may do so here. NOTE: All new shopper's must be approved by the eStore manager before they will be allowed to purchase (and subsequently download) the eStore's training and reference materials.

Click the About icon

Doing so will provide the shopper with a high level overview of the purpose of the site as well as store manager contact information. If a shopper would like to author, and present for sale any of their training and reference materials, they will need to contact the eStore manager for further information. If a company would like to make the training and reference materials available within this eStore available to their entire workforce, they will also need to contact the eStore manager for further information.

Click the Lobby icon

Doing so will bring the shopper to the site's main page (as shown above).

Click the Find icon

Doing so will allow the shopper to perform a search of all available training and reference materials—for a particular text string.

Click the Basket icon

Doing so will prompt the shopper to login to the eStore (if they have not already logged in for a session). If the shopper has already logged into the eStore for a session, the contents of their shopping basket will be displayed (if they currently have anything in their basket).

Click the Payment icon

Doing so will prompt the shopper to login to the eStore (if they have not already logged in for a session). If the shopper has already logged into the eStore for a session, they will be allowed to pay for (or adjust, and then pay for) the contents of their shopping basket (if they currently have anything in their basket).

3. MTRS eStore Manager Interface

The following screen is what the eStore manager will see when going to the site for the first time.

The eStore manager has the following options from this screen (please see Appendix B for screen shots, and further detail related to these and other available options).

Merchandising:

Departments

Clicking the department button will bring the user to a listing of all current eStore departments. From this page, the user can add new, delete existing, and/or edit existing department details.

Products

Clicking the products button will bring the user to a listing of all current eStore products. From this page, the user can add new, delete existing, and/or edit existing product details.

Content Types

Clicking the content types button will bring the user to a listing of all currently used eStore content types. From this page, the user can add new, delete existing, and/or edit existing content type details.

Customers:

Authors

Clicking the authors button will bring the user to a listing of all current eStore authors. From this page, the user can add new, delete existing, and/or edit existing author details.

Companys

Clicking the companies button will bring the user to a listing of all current eStore companies. From this page, the user can add new, delete existing, and/or edit existing company details.

Edit Shopper Info

Clicking the edit shopper info button will bring the user to a listing of all current eStore shoppers. From this page, the user can delete existing, and/or edit existing shopper details. Note new shoppers must be added using the shopper interface.

Transactions:

Orders

Clicking the Orders button will bring the user to the following list of order related links. These links will return order related transactions to the user.

- All Orders – Clicking this link will return a listing of all orders that have been processed.
- Orders by Month – Clicking this link will return a listing of orders that have been processed within a particular month. The user can select the month/year that they would like to see an order listing for.
- Orders by Year - Clicking this link will return a listing of orders that have been processed within a particular year. The user can select the year that they would like to see an order listing for.
- Orders by Product - Clicking this link will return a listing of products (sorted by sku) that have been processed within a particular month. The user can select the month/year that they would like to see a product listing for.
- Orders by Shopper - Clicking this link will return a listing of shoppers (sorted by shopper_id) that have been processed within a particular month. The user can select the month/year that they would like to see a shopper listing for.

Shopper History

Clicking the Shopper History button will bring the user to the following list of shopper related links. These links will return shopper related transactions to the user.

- All Shoppers - Clicking this link will return a listing of all shoppers that have been processed.

- **New Shoppers by Month** - Clicking this link will return a listing of shoppers that have been processed within a particular month. The user can select the month/year that they would like to see a shopper listing for.
- **New Shoppers by Year** - Clicking this link will return a listing of shoppers that have been processed within a particular year. The user can select the year that they would like to see a shopper listing for.

System:

Edit Pipeline

Selecting a pipeline configuration file in the combo box, and then clicking the edit pipeline button will direct the user to the Site Server Pipeline Editor.

WARNING: Editing the pipeline files without a sufficient amount of Site Server Commerce Edition programming experience can cause the ecommerce store to cease to function. **Do not use the pipeline editor!**

Shop Site

Clicking this button will direct the user to the main page of the shopper interface.

Close/Open Site

Clicking this button toggles the ecommerce store open and closed. Closing the MTRS site will make the shopper interface unavailable to all shoppers.

Reload Site

Clicking this button reloads the eStore application (i.e., the global.asa file is re-executed). This action reinitializes all of the MTRS site's global objects, and terminates all current MTRS web sessions.

Site Builder Wizard

Clicking this button will run the Site Server Site Builder Wizard. **WARNING:** Running the Site Builder Wizard in the same location as the existing MTRS ecommerce site will **OVERWRITE** all existing custom code that has been developed.

Promotions Wizard

Clicking this button will run the Site Server Promotions Wizard. **NOTE:** The MTRS ecommerce store does not make use of the promotions functionality that Site Server Commerce Edition offers. **Do not use the Promotions Wizard.**

4. MTRS SQL Server 7.0 Database Information

The following tables, fields, and data types are currently in use within the MTRS ecommerce site's database.

TABLE NAME	KEY(s)	FIELD NAME	DATA TYPE
Authors	Pk	AuthorID	[int] IDENTITY (1,
1) NOT NULL		shopper_id	[char] (32) NOT
NULL		StatusID	[smallint] NOT
NULL			
Company	Pk	CompanyID	[int] IDENTITY (1,
1) NOT NULL		CompanyName	[varchar] (120) NOT
NULL		StatusID	[smallint] NOT
NULL		ContactName	[varchar] (100) NULL
		ContactPhone	[varchar] (100) NULL
		ContactEmail	[varchar] (100) NULL
ContentTypes	Pk	ContentTypeID	[int] NOT NULL
	NULL	ContentName	[varchar] (120) NOT
	NULL	ContentExtension	[varchar] (10) NOT
mtrs_basket	Pk	shopper_id	[char] (32) NOT
NULL		date_changed	[datetime] NOT
NULL		marshalled__basket	[image] NOT NULL
mtrs_dept	Pk	dept_id	[int] NOT NULL
		parent_id	[int] NOT NULL
		dept_name	[varchar] (255) NULL
		dept_description	[varchar] (255) NULL
mtrs_dept_prod	Pk	dept_id	[int] NOT NULL
	Pk	sku	[varchar] (100) NOT
	NULL		
mtrs_history	Pk	shopper_id	[char] (32) NOT
NULL			

MTRS SQL Server 7.0 Database Information (continued)

TABLE NAME	KEY(s)	FIELD NAME	DATA TYPE
NULL	Pk	sku	[varchar] (100) NOT
		counter	[int] NOT NULL
		date	[datetime] NOT
NULL			
mtrs_product	Pk	sku	[varchar] (100) NOT
NULL		name	[varchar] (255) NULL
		description	[varchar] (255) NULL
		list_price	[int] NULL
		image_file	[varchar] (255) NULL
mtrs_product (continued)		image_width	[int] NULL
		image_height	[int] NULL
		sale_price	[int] NULL
		sale_start	[datetime] NULL
		sale_end	[datetime] NULL
		AuthorID	[int] NOT NULL
		CreationDate	[datetime] NOT
	NULL	ModificationDate	[datetime] NOT
	NULL	StatusID	[smallint] NOT
	NULL	FilePath	[varchar] (255) NULL
		FileName	[varchar] (255) NULL
		ContentTypeID	[int] NULL
		ReviewerComment	[varchar] (255) NULL
mtrs_receipt	Pk	order_id	[char] (26) NOT
NULL		shopper_id	[char] (32) NOT
NULL		total	[int] NULL
		status	[int] NULL
		date_entered	[datetime] NULL
		date_changed	[datetime] NULL
		marshalled_receipt	[image] NULL
mtrs_receipt_item	Pk	order_id	[char] (26) NOT
NULL			

	Pk	row_id	[int] NOT NULL
		sku	[varchar] (100) NULL
		quantity	[int] NOT NULL
		adjusted_price	[int] NOT NULL
mtrs_shopper	Pk	shopper_id	[char] (32) NOT
NULL			
		date_created	[datetime] NOT
		name	[varchar] (100) NULL
		password	[varchar] (100) NULL
		street	[varchar] (100) NULL
		city	[varchar] (100) NULL
		state	[varchar] (100) NULL
		zip	[varchar] (100) NULL
		country	[varchar] (100) NULL
		phone	[varchar] (100) NULL
		email	[varchar] (100) NOT
		Title	[varchar] (100) NULL
		StatusID	[smallint] NOT
		CompanyID	[int] NULL
StatusValues	Pk	StatusID	[smallint] NOT
NULL			
		StatusName	[varchar] (80) NOT
		StatusGroup	[char] (10) NOT

5. MTRS Status Table Details

The following describes the various status types, and values that are currently available within the MTRS site.

StatusGroup	StatusName	StatusID
Shopper	Pending	1
	Approved	2
	Inactive	3
Author	Pending	10
	Approved	11
	Inactive	12
Product	Pending	20
	Approved	21
	Inactive	22
	Delete	23
Company	Pending	30
	Approved	31
	Inactive	32

The following are not in use at this time:

StatusGroup	StatusName	StatusID
Course	Pending	40
	Approved	41
	Inactive	42
	Deleted	43
Test	Pending	50
	Approved	51
	Inactive	52

6. MTRS Shopper/Author Status Values and Possible Outcomes--via the Shopper Interface

Shopper Status	Author Status	Outcome
Approved	Approved	User can shop, and add new products.
	Pending	User can shop, but not add new products.
	Inactive	User can shop, but not add new products.
Pending	Approved	User can not shop, or add new products. Shopper_lookup.asp displays 'Sorry' message.

	Pending	User can not shop, or add new products. Shopper_lookup.asp displays 'Sorry'
message.		
	Inactive	User can not shop, or add new products. Shopper_lookup.asp displays 'Sorry'
message.		
Inactive	Approved	User can not shop, or add new products. Shopper_lookup.asp displays 'Sorry'
message.		
	Pending	User can not shop, or add new products. Shopper_lookup.asp displays 'Sorry'
message.		
	Inactive	User can not shop, or add new products. Shopper_lookup.asp displays 'Sorry'
message.		

7. Appendix A – Shopper Interface Screen Shots

Department/Product Selection

The product name, description, and price are displayed for the shopper. Clicking the 'Add to Basket' button will place this product into the shopper's shopping basket. Note the missing image—the site has the ability to display product images if the eStore manager so desires.

Product Listing

Note the three department levels and the product level links that are available for the shopper's use (clicking here will bring the shopper directly to the particular product's detail page).

Login and Related Pages.

Shopper Registration Page

This page allows the user to register as a prospective shopper. Newly registered shoppers are not allowed to make purchases until the eStore manager has reviewed and approved their request for eStore membership.

REX: Reliability Expertise Site: New Shopper - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Bookmarks Print Security

Bookmarks Location: http://www.suretyinstitute.sandia.gov:80/ntrs/shopper_new.asp?target=toku-tdep025fid

Please enter the following information

Title:

Name: Use: Lastname, Firstname MI.

Password:

Password again:

Street:

City:

State:

ZIP Code:

Phone:

Email:

Start View Source View Images View Long REX Microsoft Internet Explorer 4.01.02.34

Post Login Page (if the shopper is not an approved *shopper*)

If a user *that is not an approved shopper* attempts to login to the estore, the following message will be displayed: "Your request to be allowed to shop within our store has not been approved to date. Please click the 'About' button and contact the store manager regarding your request. Sorry for any inconvenience that this delay has caused."

REX: Reliability Expertise Site: Lookup Shopper - Netscape

File Edit View Go Communicator Help

Bookmarks Location: http://www.suretyinstitute.sandia.gov:80/ntrs/shopper_lookup.asp

REX: Reliability Expertise Site: Lookup Shopper

Your request to be allowed to shop within our store has not been approved to date. Please click the 'About' button and contact the store manager regarding your request. Sorry for any inconvenience that this delay has caused.

If you are a returning shopper, please provide your email and password.

Email:

Password:

If you have not registered with our store before, please click [here](#) to do so.

Start View Source View Images View Long REX Microsoft Internet Explorer 4.01.02.34 7:50 AM

Post Authentication Lobby page (if the shopper is not an approved *author*)

Note the addition of the Shopper Update and Order History page links. These links allow the shopper to change their personal information (i.e., address, phone, etc..) and view their order history details if any exist.

Shopper Update Page

This page allows the shopper to change their personal registration information (i.e., address, phone, etc..).

Order History Page

This page allows the shopper to view their order history details--if any exist.

The screenshot shows a Netscape browser window titled "Hi-X: Reliability Expedition Site: Order History - Netscape". The address bar displays the URL: <http://www.suretyinstitute.sandia.gov:80/ntrs/receipts.asp?macsid=EUEERSEG60SR2PFE00Q799CQF2FA500439>. The page content includes a header for "Order History for 'O'Toole, Ed'" and a table with the following data:

Order #	Date	Amount
EMFERSEG60SR2PFE00Q799CQF2	6/1/00	\$10.00
FDGERSEG60SR2PFE00Q799CQF2	6/1/00	\$12.00
KHGERSEG60SR2PFE00Q799CQF2	6/2/00	\$10.00
44H6RSEG60SR2PFE00Q799CQF2	6/5/00	\$10.00
F2HWXET85S92PXF00Q799CQF2	6/21/00	\$20.00
L1HWXET85S92PXF00Q799CQF2	6/21/00	\$10.00
M2HWXET85S92PXF00Q799CQF2	6/21/00	\$10.00
U277HB6894SR2PFE00Q799CQF2	6/28/00	\$10.00
QJHTEBFB4SR2PFE00Q799CQF2	7/26/00	\$10.00
06D7T2W3B6SR2PFE00Q799CQF2	8/13/00	\$10.00

Post Authentication Lobby page (if the shopper is an approved *shopper* and an approved *author*)

The Shopper Update and Order History page links are also available to shoppers that are approved authors. Note however, the addition of the 'Add a New Product' link to the bottom of the page. This link allows approved authors to submit new training and reference materials for approval by the eStore manager.

Add a New Product Page

This page allows the shopper (who also happens to be an approved author) to submit new products for review by the eStore manager. NOTE: Newly uploaded products do not appear in the eStore until the manager has approved them for sale. This action will cause the product file to be uploaded to the C:\Microsoft Site Server\Sites\Publishing\mtrsContent\Pending folder on the web server, an email to be sent to the eStore manager, and the product's StatusID to be set to Pending.

Author's 'Add New Product' Page - Netscape

Back Forward Home Search Guide Print Security

Location: www.surtyinstitute.sandia.gov/80/ntrs/Author/product_new.asp?mscssid=DxEERSE6805R2FFE00Q79SCQJFPQ36UC

New Product Submission Form

Author: Henderson, Chris L.

Prod. Name: Ex: 'Analog Test Data'

File Name: Browse Allowed file types: .doc, xls, ppt, gif, jpg, mpg

Description:

List Price: Ex: Type '11.25' for \$11.25

Department: Select one dept.

- Adders
- Advanced Emitter Structures
- Aluminum
- Analog Design Tools
- Analog Testing
- Analytical Techniques
- AND/OR Gates
- Anti-reflective coatings
- Automatic Test Equipment
- Automatic Test Pattern Generation
- Basic Electrical Effects
- Basic Theory of Laser Diodes

Document Done

Start Stop ViewBox Export ASCII My Microw Symbol ID100 525 4:57 PM

About Page

This page contains contact information for the eStore manager.

REX: Reliability Expertise Site: About - Netscape

Back Forward Home Search Guide Print Security

Location: <http://www.surtyinstitute.sandia.gov/80/ntrs/about.asp?>

About REX: Reliability Expertise Site

The Microsystems Knowledge and Reference Site provides comprehensive, up-to-date training on a wide range of subjects within the field of Microsystems (Microelectronics, Photonics, MEMs, and Compound Semiconductors). The site also contains an extensive body of reference material on Microsystems that includes Terms and Definitions, Short and long descriptions of Microsystems topics, interactive graphs and charts, photographs, and video clips.

Address: Microsystems Science Technology and Components Center
P.O. Box 5800, Mail Stop 1071
Albuquerque, NM 87185-1071

Tel: (505) 844-3216

Fax: (505) 844-2991

Email: chende@sandia.gov

Document Done

Start Stop ViewBox Export ASCII My Microw Symbol ID100 525 4:52 PM

Find Page

This page allows the shopper to do a search of all approved products.

Basket Page:

With Login prompt

This page is displayed if the shopper has not previously logged in during this session.

With Basket Contents Displayed

Note the ability to remove items, empty and update the basket contents, and purchase the items in the basket.

Pay Page:

With Login Prompt:

This page is displayed if the shopper has not previously logged in during this session.

The screenshot shows a Netscape browser window titled "HPX: Reliability Expertise Site: Lookup Shopper - Netscape". The address bar displays the URL "http://www.suretyinstitute.sandia.gov/ntrs/shopper_lookup.asp?target=shipping%2Easp". The page features a header with the Sandia National Laboratories logo and navigation buttons for "Home", "About", "Find", "Basket", and "Pay". The main heading is "REX: Reliability Expertise Site: Lookup Shopper". Below this, a prompt reads: "If you are a returning shopper, please provide your email and password." There are two input fields: "Email:" with the value "cjt00018@sandia.gov" and "Password:" with masked characters "*****". A "Lookup" button is positioned below the password field. A link is provided for new users: "If you've never been here, please click [here](#) to register." The browser's status bar at the bottom shows the document title "Document Flow", the address bar, and the system clock "1/01/00 00:00:00" with a "6:39 PM" timestamp.

With Shipping Information Displayed

Note the ability to edit the shipping information. Pressing the 'Total' button takes you to the 'Final Approval' page.

Order Confirmation Display

Note, that an order confirmation number and a link to the 'Product Download' page has been displayed. Clicking the order number will take the shopper to an Order Details page. Clicking the 'Download Products' link will take the user to the Product Download page.

Order Details Page

This page allows the shopper to view details of their previously placed orders. It also provides a link to the download page.

Intentionally Left Blank

8. Appendix B – eStore Manager Interface Screen Shots

Merchandising:

Department Listing Page

The department listing page contains a search feature that allows the eStore manager to narrow their result set. Clicking on a department link will allow the user to edit the particular department's attributes.

Department (Add New) Page

This page contains a 'Used DeptIds' list that can be used to help select an appropriate department number for the new product. Departments are arranged hierarchically with the 'Root Department' at the top level.

New Department - Netscape

File Edit View Go Communicator Help

Bookmarks Location: http://www.suretyinstitute.sandia.gov/ntrs/manager/dept_new.asp

REX: Reliability Expertise Site: New Department

Manager | Departments | Products | ContentTypes | Authors | Companies | ShopperInfo | Orders | Shoppers

Dept Id:

Note: Dept Id can be any number from 0 through 100000, but NOT one of the numbers shown in the following "Used Dept Ids" List

Used Dept Ids:

Parent Dept:

Name:

Description:

Document: Dept

Start | View | Explorer | New Dep | Microsoft W | 6:20 PM

Department (Edit/Delete) Page

This page allows the eStore manager to edit the name, description, and parent department of an existing department. The manager also has the option to delete the department from the store.

Edit Department 'System on a Chip' - Netscape

File Edit View Go Communicator Help

Bookmarks Location: www.suretyinstitute.sandia.gov/ntrs/manager/dept_edit.asp?deptId=10100&deptName=System-on-a-Chip

Site Manager:

REX: Reliability Expertise Site: Edit Department 'System on a Chip'

Manager | Departments | Products | ContentTypes | Authors | Companies | ShopperInfo | Orders | Shoppers

Dept Id: 10100

Parent Dept:

Name:

Description:

FIELD LABELS IN BOLD DENOTE REQUIRED FIELDS

Document: Dept

Start | View | Explorer | Edit Dept | Microsoft W | 6:22 PM

Product Listing Page

The product listing page contains a search feature that allows the eStore manager to narrow their result set. Clicking on a product link will allow the user to edit the particular product's attributes.

Products - Netscape

Site Manager:
REX: Reliability Expertise Site: Products

Manager | Departments | Products | ContentTypes | Authors | Companies | ShopperInfo | Orders | Shoppers

Add New Product

#	Status	SKU	Name	Price
1	Approved	<u>Analytical Techniques for Root Cause Analysis</u>	<u>Analytical Techniques for Root Cause Analysis</u>	\$10.00
2	Approved	<u>Decapsulation Backside Sample Prep</u>	<u>Decapsulation Backside Sample Prep</u>	\$10.00
3	Approved	<u>Deprocessing</u>	<u>Deprocessing</u>	\$10.00
4	Approved	<u>Electrical Testing</u>	<u>Electrical Testing</u>	\$10.00
5	Approved	<u>Electron Beam Tools</u>	<u>Electron Beam Tools</u>	\$10.00
6	Approved	<u>Exotic Techniques</u>	<u>Exotic Techniques</u>	\$10.00
7	Approved	<u>Failure Analysis Principles and Procedures</u>	<u>Failure Analysis Principles and Procedures</u>	\$10.00

7:55 AM

Product (Add New) Page

This page allows the eStore manager to add a new product (i.e., approved file type) to the store's inventory. This action will cause the product file to be uploaded to the C:\Microsoft Site Server\Sites\Publishing\mtrsContent\Approved folder on the web server, an email to be sent to the author of the product, and the product's StatusID to be set to Approved.

The screenshot shows a Netscape browser window titled 'New Product - Netscape'. The address bar displays the URL: http://www.suretyinstitute.sandia.gov/mtrs/manager/product_new.asp. The form contains the following fields and options:

- Author:** A dropdown menu with 'Henderson, Chris L.' selected.
- Prod. Name:** A text input field with the example text 'Ex. 'Analog Test Data''.
- File Name:** A text input field followed by a 'Browse...' button. To the right, it lists 'Allowed file types: .doc, .xls, .ppt, .gif, .jpg, .png'.
- Description:** A text input field.
- List Price:** A text input field with the example text 'Ex. Type '11.25' for \$11.25'.
- Department:** A list box containing the following items: Adders, Advanced Emitter Structures, Aluminum, Analog Design Tools, Analog Testing, Analytical Techniques, AND/OR Gates, Anti-reflective coatings, Automatic Test Equipment, Automatic Test Pattern Generation, Basic Electrical Effects, Basic Theory of Logic Design, Behavioral Synthesis, BiCMOS Technologies, and Bipolar Transistor Physics and Performance. To the right of the list box is the text 'Select one dept.'.

At the bottom of the form is an 'Add Product' button. The browser's status bar at the bottom shows the taskbar with icons for Start, Visualizer S..., Explorer, L..., New Prod..., and Microsoft W..., along with the system clock showing 12:01:00 PM on 9/12/00.

Product (Edit/Delete) Page

This page allows the eStore manager to review submitted products and then edit their properties (Status ID, Reviewer Comments, etc..) as needed. The manager also has the option to delete the product from the store's inventory. NOTE: Deleting the product from inventory moves the product file to the C:\Microsoft Site Server\Sites\Publishing\mtrsContent\Deleted folder on the web server, an email to be sent to the author of the product, and the product's StatusID to be set to Deleted—but the product's records in the mtrs_product and mtrs_dept_prod tables are not deleted (they are kept for historical purposes). The manager should be sure to add a reviewer comment related to the change in product status (this comment will be sent to the product's author upon submission). Also, do not change any of the values in the fields with red names (they are required default values).

Form fields and values:

- Author: Henderson, Chris L.
- Prod. Name: Deprocessing
- Skin: Deprocessing
- File Name: Deprocessing.ppt
- Content Type: MS PowerPoint
- Description: Product description goes here.
- List Price: \$10.00
- Department: Adders (selected from a list including Advanced Emitter Structures, Aluminum, Analog Design Tools, Analog Testing, Analytical Techniques, AND/OR Gates, Anti-reflective coatings, Automatic Test Equipment, Automatic Test Pattern Generation, Basic Electrical Effects, Basic Thermal and Logic Design)
- View Product link
- FolderName = Pending
- FileName = Deprocessing.ppt
- Ex Type '11.25 for \$11.25
- Select one dept.

Content Type Listing Page

The content type contains links that allow the eStore manager to edit the particular content type's attributes.

Content Type (Add New) Page

This page allows the eStore manager to add a new content type to the store's inventory.

Content Type (Edit/Delete) Page

This page allows the eStore manager to review and/or revise content type-related attributes. The manager also has the option to delete the content type from the store's inventory. NOTE: Do not change any of the values in the fields with red names (they are required default values).

Site Manager:
REX: Reliability Expertise Site: Edit Content Type: MS Word

[Manager](#) | [Departments](#) | [Products](#) | [ContentTypes](#) | [Authors](#) | [Companies](#) | [ShopperInfo](#) | [Orders](#) | [Shoppers](#)

Content Type ID: 1

Content Name: MS Word

Content Extension: .doc

FIELD LABELS IN BOLD INDICATE REQUIRED FIELDS

[Manager](#) | [Departments](#) | [Products](#) | [ContentTypes](#) | [Authors](#) | [Companies](#) | [ShopperInfo](#) | [Orders](#) | [Shoppers](#)

Customers:

Author Listing Page

The author listing page contains links that allow the eStore manager to edit the particular author's attributes.

This page allows the eStore manager to add a new author to the list of eStore content contributors. **NOTE:** Adding an author causes an email to be sent to the author--notifying them of their new status. The author's StatusID is set to Approved.

Author (Edit/Delete) Page

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Company Listing Page

The company listing page contains links that allow the eStore manager to edit the particular company's contact information.

Company (Add New) Page

This page allows the eStore manager to add a new company to the list of companies interested in purchasing eStore content. NOTE: Adding a company causes an email to be sent to the company contact--notifying them of their new status. The company's StatusID is set to Approved.

The screenshot shows a Netscape browser window titled "New Company - Netscape". The address bar displays "http://www.surtyinstitute.sandia.gov/nits/manager/company_new.asp". The page has a navigation menu with links: Manager, Departments, Products, ContentTypes, Authors, Companies, ShopperInfo, Orders, and Shoppers. The "Companies" link is highlighted.

The form contains the following fields and controls:

- Registered Company:** A text input field containing "aTest3" and a dropdown arrow.
- Company Name:** A text input field.
- Contact Name:** A text input field.
- Contact Phone:** A text input field.
- Contact Email:** A text input field.
- Status ID:** A dropdown menu currently showing "Pending".
- Add Company:** A button at the bottom of the form.

The bottom of the browser window shows the Windows taskbar with the Start button, taskbar buttons for "VisiBroker S...", "Exploring...", "New Com...", and "Microsoft W...", and a system clock showing "12:01:08 PM" on "6/22/00".

Company (Edit/Delete) Page

This page allows the eStore manager to review and/or revise the company contact information. The manager also has the option to delete the company from the list (this action will cause the company's record to be deleted from the database). NOTE: Changing a company's status has no effect on the operation of the estore at this time (this was to be addressed in phase two of the project). Changing the status of a company will cause an email to be sent to the company contact—notifying them of their new status.

Site Manager:
REX: Reliability Expertise Site: Edit Company: Sandia National Laboratories

[Manager](#) | [Departments](#) | [Products](#) | [ContentTypes](#) | [Authors](#) | [Companies](#) | [ShopperInfo](#) | [Orders](#) | [Shoppers](#)

Company 1
ID:

Company Name:

Contact Name:

Contact Phone:

Contact Email:

Status ID:

Shopper Listing Page

The shopper listing page contains links that allow the eStore manager to edit the shopper's registration information.

Shopper Info - Netscape

File Edit View Go Communications Help

Bookmarks Location http://www.suretyinsubute.sandia.gov/sisiz/manager/shopperinfo_list.asp

Site Manager:
REX: Reliability Expertise Site: [Shopper Info](#)

[Manager](#) | [Departments](#) | [Products](#) | [ContentTypes](#) | [Authors](#) | [Companies](#) | [ShopperInfo](#) | [Orders](#) | [Shoppers](#)

Name	Status	Shopper ID
Baton, Daniel L.	Approved	LWEERSEG60SR2PFE00Q799CQFJSC5MNE
Deby, Gills	Pending	HUCFT2W3B6SR2PPF00Q799CQFA500439
Henderson, Chris L.	Approved	JXEERSEG60SR2PFE00Q799CQFIPQ3GUC
O'Toole, Ed	Approved	F27E6RR0G3S92P7G00Q799CQFIAHDICB
Strick, Michael P.	Approved	LOEERSEG60SR2PFE00Q799CQFAU9DC7
Yahoo, You	Pending	BD77HB6894SR2P7F00Q799CQFA500439

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Start | | Document View | | | 753 KB

Shopper (Edit/Delete) Page

This page allows the eStore manager to review and/or revise shopper registration information. The manager also has the option to delete the shopper from the list (this action will cause the shopper's records to be deleted from the database).

The screenshot shows a Netscape browser window titled "Edit Shopper Info Henderson, Chris L.". The address bar shows a URL with a long alphanumeric string. The main content area is a form for editing shopper information. The fields are as follows:

Shopper ID:	JXEERSEG60SR2PFE00Q799CQFJPQ3GUC	
Title:	Dr.	
Name:	Henderson, Chris L.	Use: Lastname, Firstname MI.
Street:	111 Any Avenue	
City:	Albuquerque	
State:	NM	
Zip:	87109	
Phone:	505-844-3216	
Email:	clhendes@sandia.gov	
Company:	Sandia National Laboratories	
Status:	Pending	

At the bottom of the form are two buttons: "Update Shopper" and "Delete Shopper". The browser's status bar at the bottom shows the time as 12:01:08 PM.

Transactions:

Orders

For a description of the available order-related options see the MTRS eStore Manager Interface section above

Shopper History

For a description of the available shopper-related options see the MTRS eStore Manager Interface section above. The manager can also delete a shopper (and all their records) under the 'All Shoppers' link.

9. Appendix C – SQL 7.0 Table Definitions not used by the MTRS Application at this time.

The following tables are not currently in use within the application. They have been put into place to handle proposed application features as follows: Topic definitions, Subject area and Tutorial test development, uploading, proctoring, grading, and results reporting (including transcript generation).

TABLE NAME	KEY(s)	FIELD NAME	DATA TYPE
StudentTestResponses	Pk	shopper_id	[char] (32) NOT NULL
	Pk	TestEventID	[int] NOT NULL
	Pk	TestID	[int] NOT NULL
	Pk	QuestionID	[int] NOT NULL
	Pk	AnswerID	[int] NOT NULL
SubjectCourse	Pk	CourseID	[int] IDENTITY (1, 1) NOT NULL
		dept_id	[int] NOT NULL
		CourseName	[varchar] (255) NOT NULL
		Description	[text] NULL
		StatusID	[smallint] NOT NULL
SubjectTest	Pk	TestID	[int] IDENTITY (1, 1) NOT NULL
		CourseID	[int] NOT NULL
		Description	[varchar] (255) NOT NULL
		StatusID	[smallint] NOT NULL
		AuthorID	[int] NOT NULL
		DateCreated	[datetime] NOT NULL
		DateModified	[datetime] NOT NULL
SubjectTutorial	Pk	CourseID	[int] NOT NULL
	Pk	Sku	[varchar] (100) NOT NULL
TestAnswers	Pk	TestID	[int] NOT NULL
	Pk	QuestionID	[int] NOT NULL
	Pk	AnswerID	[int] NOT NULL
		AnswerText	[text] NOT NULL
		CorrectFlag	[char] (1) NOT NULL

TABLE NAME	KEY(s)	FIELD NAME	DATA TYPE
TestGrades	Pk	shopper_id	[char] (32) NOT
NULL	Pk	TestEventID	[int] NOT NULL
		TestID	[int] NOT NULL
		Grade	[int] NOT NULL
		DateTaken	[int] NOT NULL
TestQuestions	Pk	TestID	[int] NOT NULL
	Pk	QuestionID	[int] NOT NULL
		Question	[text] NOT NULL
		InstructionalNotes	[text] NULL
TopicDefinitions	Pk	dept_id	[int] NOT NULL
	Pk	DefinitionID	[int] NOT NULL
		Term	[varchar] (255) NOT
NULL		Definition	[text] NOT NULL
		Source	[varchar] (120) NULL
		Date	[datetime] NULL
Transcript	Pk	shopper_id	[char] (32) NOT
NULL	Pk	dept_id	[int] NOT NULL
		SubjectGrade	[int] NOT NULL
		CompletedFlag	[char] (1) NOT
NULL		CompletedDate	[datetime] NULL

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