Web Enabled Library Information System

Project work done at
Cognizant Technology Solutions India Ltd.,

PROJECT REPORT

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE OF
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CERTIFICATE

This is to certify that the project work entitled **"Web Enabled Library Information System"** for Cognizant Technology Solutions India Ltd., Chennai is a

Bonafide Record of work done by

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Under my guidance during the period January 2002 to April 2002

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Head of the Department

Guide

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SYNOPSIS

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This project work is entitled "**WEB ENABLED LIBRARY INFORMATION SYSTEM** " is an internet application developed using Active Server Pages for Cognizant Technology Solutions India Limited, Chennai.

The web enabled library information system is mainly developed to increase the accessibility of library by the remote associates of Cognizant Technology solutions India Limited. Associates can take the books, Compact disc, Journals and video files. This is possible by a team maintained by the Cognizant Technology-Helping desk. If one associate is in need of a book then he can search it from our tool and he can reserve the book. Similar process is followed for Compact Disc, Journals and Video Files.

This is an Internet application and hence all the advantages of using an Internet are extracted in this system. This system has been linked to other systems like cognizant Virtual school, Cognizant Online etc. Integrity is also taken care.

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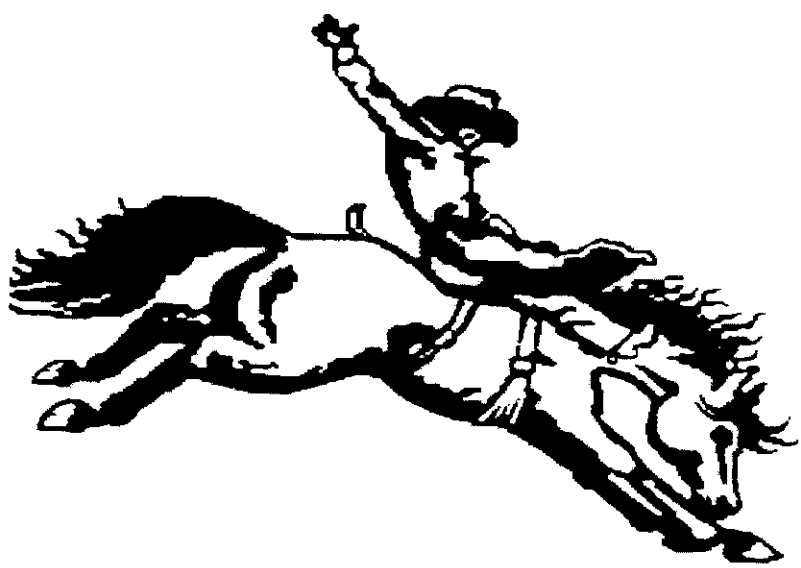


INTRODUCTION

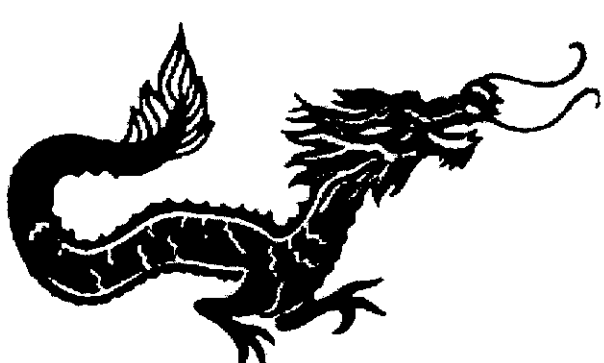
INTRODUCTION

This project work entitled " Web Enabled Library Information System" is an Internet based application. Generally Internet can be simply defined as a connecting computers such that people in a related environment can share, process and work within an organization and reduce work.

Intranetted computers share data with other using WWW protocol storing information on an Internet web server and providing each and every computer on the network with a browser.

This project deals with Book ,Compact disc, Journals, video issues, renewal, reserve, and return. It deal all the basic library transactions. The Associates can access all the library information form their working place itself. They can also take the book from their working place. This is done with the help of helping desk maintained by the cognizant Technology Solutions.

Suppose One associate is in need of one book he can reserve the book using our Web tool. This is one of the special feature of this site. Here every thing is done by minimal key strokes. The associate can refer all the information which he want is achieved by minimal key strokes.



PROJECT OVERVIEW

1.1 PROJECT OVERVIEW

This project work is entitled "**WEB ENABLED LIBRARY INFORMATION SYSTEM**" is an Internet based application. The web tools are nowadays very popular and commonly used in the Internet world. Software is increasingly gaining popularity due to their characteristics of being interactive, user friendly and immensely interesting. Accessing the library from a remote place is a great one and is more important in today's busy world. So our web tool, which is capable of performing remote data access will satisfy all the basic needs expected by the organization.

The library information system comprises of the following sections.

1.1.1 THE DATABASE

Since information processing, maintenance and retrieval forms the core of this system, Database form its backbone. The importance given to the database maintenance is very high. MS SQL is chosen as the backend because of its flexibility more than its power, security and very large transactions. Since information needs to be accessed frequently sufficient provisions have been given for fast access and retrieval. Several security measures haven been taken during the access of the database. The package thus turns out to be flexible, reliable and dependable system.

1.1.2 THE MODULES

The modules can be categorized as:

- Account validation.
- Searching
- Issue Module.
- Renewal Module.
- Return module.
- Reserve Module.
- Tutor

1.1.3 THE FEATURES

The main features of the Tutor are as follows

- Flexible
- Upgradeable
- Easy to Access

1.1.4 DESIGN

The package is designed in such a way that modularity and reliability are given prime importance. Modularity has been maintained from the start till the end and this is an important factor for the success of the project. The project is divided into independent forms with the clear line of demarcation laid between them. Reliability comes through with the form design. Enough emphasis has been laid in maintaining a high level of reliability.

1.1.5 INTERFACE

The Interface of the system is designed carefully so as to provide maximum of user friendliness. A comfortable user interface always reduces the strain on the user. Since many different types of users are expected to use the system for massive data process and other intricate data processing, prime importance is given to the user interface. The function available in this web tool should be invoked with least effort and minimal keystrokes to speed up the operations performed on the system.

1.2 ORGANIZATION PROFILE

Cognizant Technology Solutions India limited

Founded in 1994 as a division of Dun & Bradstreet Corporation, Cognizant Technology Solutions began doing large-scale full lifecycle software projects. This background has helped us to build and e-business and outsourcing powerhouse capable of delivering 24x7 project management on the largest software projects, backed by a world class R&D organization that helps clients manage through rapid changes in technology.

Our unique value proposition of better, faster, and less expensive development and management is compelling to our many clients in the US and Europe, most of whom regard us as a long term partner helping them to achieve their business objectives.

Having gone public in 1998 (NASDAQ: CTSH), we were awarded "IPO of the Year" by *Red Herring* magazine. In 1999, the New Jersey Technology Council chose us "Public Company of the Year". We are the employer of choice in India, the Top Solution

Provider in Business Week magazine's list of Hot Growth Companies and according to *Forbes* magazine, The Best Small Company in America.

Headquartered in Teaneck, New Jersey, we have sales offices located in Chicago, Dallas, Minneapolis, Los Angeles, San Francisco, Toronto, London and Frankfurt. We have eleven development facilities in India spread across Chennai, Calcutta, Pune and Bangalore.

2. SYSTEM STUDY AND ANALYSIS

Need for Analysis :

A complete understanding of the software requirements is essential to the success of a software development effort. No matter how well designed or well coded, a poorly analyzed and specified program will disappoint the user and bring grief to the developer.

The requirement analysis task is a process of discovery, refinement, modeling and specification. The software scope, initially established by the system engineer is refined in detail. Models of the required data, information and control flow and operational behavior are created. Alternative solutions are analyzed and allocated to various elements. The information gathered after being analyzed, are processed and presented to the user in a particular design format.

2.1. EXISTING SYSTEM

Currently there is no web tool available in the organization. So the people should move to the library and search for the book and journals and every thing. Every thing is done manually. The account information is also entered manually by the librarian. So in order to make it computerized the library information system is needed.

Bottlenecks of the Existing system

1 Large amount of clerical or official time is wasted.

2 Duplication of data entry and data storage ie redundancy of data cannot be avoided.

3 Data reliability and maintainability is difficult

4 Access of accurate information is not possible.

5 Delay in information search and retrieval.

6 In case of decision , it is error prone as it is done manually.

7 Security to data is not provided.

8 Documents are not handled properly or stored safely.

2.2 PROPOSED SYSTEM

In order to make the library as web enabled we are going to implement our project in the organization. To launch this project we take a report form many associates those who are working in the organization. From their report we analyzed many things to develop the web tool.

Features of the Proposed system.

- It reduces clerical time.
- Gives access rights to authorized users providing security.
- Remote accessing facility for the library
- Data entries, deletion, updations are made easy.

- Fast search and retrieval is possible.
- Online reservation for books, Compact Disc, Journals, Video File.
- Search facility by author wise, Book wise, Title wise etc.
- Issue, renewal, return, of books CD, Journals.

2.3 REQUIREMENTS ON NEW SYSTEM

The system is required to maintain larger databases and also work very fast. And also it has to maintain the integrity and should care for duplication of data.

Due to the large amount of data it should retrieve the data very fast from the databases. So the functions, which will be used in the site, should take care about the speed up of the basic transaction.

2.4 FEASIBILITY STUDY

Feasibility is defined as the likelihood the system will be useful to the organization Feasibility study is the determination of whether or not a project is worth doing.The process followed in making this determination is called Feasibility study.

In the conduct of the feasibility study preliminary investigation examines three types of project feasibility.

They are

Operational Feasibility

Technical Feasibility

Financial or Economic Feasibility

Operational Feasibility

The proposed project is beneficial only if they can be turned into information systems that will meet the library operating requirements through net. The main aspects that make this project operationally feasible are

- The project gains sufficient support from the management as well as the users. The current system incorporates the associated components (ASP upload) that are available for the remote accessing facility for the library.
- The technology required to support this system is Windows 98/Windows 2000 or Windows-NT platform with ASP (Active Server Pages) and MS-SQL with web servers being PWS or IIS are readily available in the existing organization and implementation of the new system becomes easy for the online reservation for books, Compact Disc, Journals, Video File
- The proposed system provides adequate response to queries regarding the details of books and Search facility by author wise, Book wise, Title wise etc are available

- The proposed system can be enhanced adequately and expanded if developed further.
- The system is in no way harmful to the routine activities of the library system. It provides efficient and satisfactory results in all areas.
- Accessibility of results is consistent and uniform .The system enhances the operation of the entire organization, since all the details are available online, on time and also there is a secure and planned access to data information on the Issue, renewal, return, of books CD, Journals.

Technical Feasibility

This is concerned with specifying equipment and software that will successfully satisfy the technical needs of the system. The aspects fulfilled during investigation to make this project technically feasible are

1 The proposed system needs a Pentium processor with RAM capacity as 32 MB , keyboard with 104 keys, mouse and printer.

2 The cost associated with the installation of software and hardware is estimated.

Installation costs - Windows NT version

(Software) - ***ASP*** (Active Server pages)

- MS-SQL

- PWS or IIS

(Hardware) - Pentium Processor

5 minimum of 32 MB RAM

6 Keyboard

7 Mouse

The cost required is less but performance is high.

1 The cost of implementation is reduced and errors are reduced to minimize the error-correction costs. The check of input data validity prevents the user from giving invalid input during preliminary investigations. This prevents processing of invalid data. Such fault handling exception demand additional information.

2 The system is reliable and accuracy in its processing ; access of data and security.

Hence the proposed system is technically feasible to a large extent.

Financial/Economic Feasibility

Economic feasibility , otherwise called as the "*Cost/ Benefit*" Analysis is the procedure to determine the benefits and savings that are expected from the proposed system. If benefits outweigh costs, a decision is taken to prioritize the options. If a solution is not arrived at, the proposed system is subject to further justification and have alternate ways.

1 The proposed system is technically more cost and incur special design efforts

2 If the proposed system is never developed and the existing system is retained then a cost estimation is made to find the most efficient project-ie whether it should

Node

Processor Type	:	Pentium II or Celeron	Rs. 15,000
Speed	:	300 MHz	
Main Memory	:	64 MB RAM	
Hard Disk	:	2 GB Free Space.	
			Rs. 45,000

Comparing the costs we find that the proposed system is more economically feasible than the existing system.

PROGRAMMING ENVIRONMENT

3. PROGRAMMING ENVIRONMENT

3.1. HARDWARE CONFIGURATION

Requirement of Server

Processor Type	:	Pentium III
Speed	:	600MHz
Main Memory	:	128 MB RAM
Hard Disk	:	4 GB Free Spaces
Drive	:	1.44 MB

Requirement of Client:

Processor Type	:	Pentium II or Celeron
Speed	:	300 MHz
Main Memory	:	64 MB RAM
Hard Disk	:	2 GB Free Spaces.

Software Requirements:

Server Software:

Operating system	:	Windows 98/Windows-2000/Window -NT.
Server side Processing:		Active Server pages
Backend Databases	:	MS-SQL
Web Server	:	PWS or IIS
Components	:	ASP Upload

Client Software:

Web Browser (IE 5.0, Netscape 4.74 above)

SOFTWARE
AND
TOOLS

3.2 DESCRIPTION OF SOFTWARE AND TOOLS USED

This project is basically a web-based project. So Active server page is the main software used in this project. And also many tools used in this project. They are described one by one.

Active Server Pages:

- An ASP file is just the same as an HTML file
- An ASP file can contain text, HTML, XML, and scripts
- Scripts in an ASP file are executed on the server
- An ASP file has the file extension .asp
- When a browser requests an HTML file, the server returns the file
- When a browser requests an ASP file, IIS passes the request to the ASP engine. The ASP engine reads the ASP file, line by line, and executes the scripts in the file. Finally, the ASP file is returned to the browser as plain HTML
- Dynamically edit, change or add any content of a Web page
- Respond to user queries or data submitted from HTML forms
- Access any data or databases and return the results to a browser
- Customize a Web page to make it more useful for individual users

- The advantages of using ASP instead of CGI and Perl, are those of simplicity and speed
- Provides security since your ASP code can not be viewed from the browser
- Since ASP files are returned as plain HTML, they can be viewed in any browser
- Clever ASP programming can minimize the network traffic

MS-SQL SERVER 2000:

Business today demands a different kind of database solution. Performance, scalability, and reliability are essential, and time to market is critical. Beyond these core enterprise qualities, SQL Server 2000 provides agility to our data management and analysis, allowing the organization to adapt quickly and gracefully to derive competitive advantage in a fast-changing environment. From a data management and analysis perspective, it is critical to turn raw data into business intelligence and take full advantage of the opportunities presented by the Web. The record-holder of important benchmark awards for scalability and speed, SQL Server 2000 is a fully Web-enabled database product, providing core support for Extensible Markup Language (XML) and the ability to query across the Internet and beyond the firewall. For a detailed description of SQL Server 2000, download the Product Guide or visit the Features page for more information.

Fully Web-Enabled

SQL Server 2000 provides extensive database programming capabilities built on Web standards. Rich XML and Internet standard support gives you the ability to store and retrieve data in XML format easily with built-in stored procedures. You can also use XML updategrams to insert, update and delete data easily.

- **Easy access to data through the Web.** With SQL Server 2000, you can use HTTP to send queries to the database, perform full-text search on documents stored in database, and run queries over the Web with natural language.

- **Powerful, flexible Web-based analysis.** SQL Server 2000 Analysis Services capabilities are extended to the Internet. You can access and manipulate cube data by means of a Web browser.

1. Highly Scalable and Reliable

Achieve unparalleled scalability and reliability with SQL Server 2000. With scale up and scale out capabilities, SQL Server meets the needs of demanding ecommerce and enterprise applications.

- **Scale up.** SQL Server 2000 takes advantage of symmetrical multiprocessor (SMP) systems. SQL Server Enterprise Edition can use up to 32 processors and 64 GB of RAM.

- **Scale out.** Scale out distributes the database and data load across servers.

- **Availability.** SQL Server 2000 achieves maximum availability through enhanced fail over clustering, log shipping, and new backup strategies.

Fastest Time-to-Market

SQL Server 2000 is the data management and analysis backbone of the Microsoft .NET Enterprise Servers. SQL Server 2000 includes tools to speed development from concept to final delivery.

- **Integrated and extensible analysis services.**

With SQL Server 2000, you can build end-to-end analysis solutions with integrated tools to create value from data. Additionally, you can automatically drive business processes based on analysis results and flexibly retrieve custom result sets from the most complex calculations.

- **Quick development, debugging, and data transformation.**

SQL Server 2000 features the ability to interactively tune and debug queries, quickly move and transform data from any source, and define and use functions as if they were built in to Transact-SQL. You can visually design and code database applications from any Visual Studio tool.

- **Simplified management and tuning.**

With SQL Server 2000, it is easy to manage databases centrally alongside all enterprise resources. Stay online while easily moving and copying databases across computers or between instances.

SYSTEM DESIGN AND DEVELOPMENT

4. SYSTEM DESIGN AND DEVELOPMENT

After the designing phase has been completed successfully the next step is System Development. The main activity in this phase is coding. Adequate care has to be taken while coding is being proceeded. Adequate comments are one of the very important considerations. The coding must be easily understandable as well as effective and efficient. Indentation must be provided wherever necessary. The coding can be proceeded module by module.

4.1 Input Design

Input design is the part of the overall system design, which requires very careful attention. Most expensive part in this is the collection of input data in terms of equipments and persons involved. If a data going in to a system is incorrect then processing and output will magnify these errors. Objectives during input design are as follows.

- Produce cost effective method of input
- Achieve high-level accuracy
- Ensure that the input is free of ambiguity

Several stages during input design that are to be carried out are:

- Data Recording
- Transfer of data to input form
- Data verification
- Transmitting data to computer
- Data correction

Not all these stages need to be present. Data conversion and data verification are not usually necessary. Data control and Correction will be involved in various points. Main aim of the System Analyst must be to reduce number of stages involved.

Input Types

One of the early activities of input design is to determine nature of input data.

Different types are

External - Prime input to the system

Internal User - Communication to the system

Operational - Computer Departments Communicate to the system

Interactive - Which are inputs entered during a dialogue

Here in this system in each module associate name and his associate id is taken as input. Based on this input various other details are furnished. In each form validation of input values are done. At each stage only the associate id and the book title or id with respect to each associate are given. So all the material requisitions for that particular service executive are available. This prevents unauthorized access to this page.

IV. Output Design

Output from computer systems is required primarily to communicate results of processing to users. They are also used to provide 'Hard Copy' of the results for the later consultation.

The organization and which require special attention.

Internal output whose destination is within the organization, which requires careful design. Interactive output which involve user in communication with the computer.

Name given to each data item should be recorded and its characteristics described clearly in standard form.

- Whether alphabetic or numeric
- Number of characters
- Position of decimal points

Output Specification

System Analyst has two specific objectives at this stage:

To interpret the results of the computer part of system to users in a form, which they can understand, and which meets their requirements.

To communicate the output design specification to programmers in a way, which is unambiguous, comprehensive and capable of being translated in to programming language.

A. Screens

The system provides numerous highly controlled user interfaces built with the help of powerful tools. Some of the user interfaces and their functions are listed below.

B. Login Form

User logs in giving his user-id and password

C. Entry Form

Details of books, journals, cds and video are entered and stored.

D. Issue Form

Book details and associate details are referred and then the issue process takes place.

E. Return Form

Book details and associate details are referred and then the return process takes place.

F. Renewal Form

Book details and associate details are referred and then the renewal process takes place. The return date is modified and stored.

G. Reports

Various reports regarding issue of books, return of books, renewal of books, book reservation etc is developed.

Reports based on monthly data of issue, return, renewal and reservation are generated for reference.

Report for maintenance of data is generated.

4.3 DATABASE DESIGN

Database design is one of the most important step in system design phase of system development. A good design of the database cam reduce the problems like redundancy

and anomalies. The concept of Relational Data Base Management System is easier to design a database that can enforce all the securities and integrities which leads to secured and consistent databases.

Relational Data Base Management System

In RDBMS , the data is organized consisting of rows and columns . There is an explicit pointer stored in the rows .Each table has a unique name .To identify a particular row in a table , a column or combination of columns are used. This is called as a Primary Key.

The Relational model stores every information in terms of rows and columns of data. By storing this way the relation is automatically established and so in RDBMS , relation is implicitly understood.

There is no need to explicitly relate entities. This tabular form of representation forms the basis of implementation of relation in RDBMS.

FEATURES OF RDBMS :

Some of the Features and advantages of using the relational model are :

1 Redundancy can be reduced.

2 Inconsistency can be avoided.

3 Data can be shared.

4 Standards can be enforced.

5 Security restrictions can be applied.

6 Integrity can be maintained.

7 Conflicting requirements can be balanced.

4.4. PROCESS DESIGN

A detailed study of the existing system and its problems has been made , and an outline of the new system is drawn. A thorough study of the system revealed the structure of the databases involved . The Tables were created after normalizing the fields to the maximum extent possible.

The Project is mainly divided in to following modules

PROGRAM MODULES

- Account validation.
- Searching
- Issue Module.
- Renewal Module.
- Return module.
- Reserve Module.
- Tutor
- Mail.

Account validation:

Login screen serves as a multipurpose screen for workers, administrator and associates. Based on the information collected, the users are redirected to their

Concerned pages. If the Associate id is not a valid id that is Id not matched with the database then it won't allow the user to login.

Searching:

In this Process the user required to give the keyword to get the details about the book, CD, video, journal. He can select the search by title, author or book Id. After searching the book he can able to receive the following in formations. Whether the book is available or not ,who is currently hold this book, in which branch the book is available, which publications, when the book is purchased etc.

Issue Module.

This module contains 4 sub modules.

- Book Issue
- Journal Issue
- Compact disc Issue
- Video Issue

Renewal Module.

This module contains 4 sub modules.

- Book renewal
- Journal renewal
- Compact disc Renewal
- Video Renewal

Return Module.

This module contains 4 sub modules.

- Book Return
- Journal Return
- Compact disc Return
- Video Return

Reserve Module.

This module contains 4 sub modules.

- Book Reserve
- Journal Reserve

- Compact disc Reserve
- Video Reserve

Tutor

In this module various links are made to the tutors. One can have access to any type of tutors. Tutors of all languages, scripting languages, Databases, etc are available.

Mail:

When more than one user is in need of the same book at the same time then the book is issued to one of the users and the other users can reserve the book for the next issue accordingly, by mailing to the librarian. The local mail server of CTS organization provides these mailing facilities.

SYSTEM TESTING

5. SYSTEM IMPLEMENTATION AND TESTING

5.1 SYSTEM IMPLEMENTAION

Once the physical system has been designed in detail, the next stage is to turn the design into a working system and then to monitor the operation of the system to ensure that it continues to work efficiently and effectively.

5.2 SYSTEM TESTING

Software testing is a critical element of software quality assurance and represents the ultimate review of specification, design and coding. Testing is a process of executing a program with the intent of finding an error. It accounts for the largest percentage effort in software process.

Testing Objectives:

- Testing is a process of executing a program with the intent of finding an error.

- A good test case is one that has a high probability of finding on as yet undiscovered error.
- A successful test is one that uncovers on as yet undiscovered error.

The above objectives imply a dramatic change in view point. They move counter to the commonly held view that a successful list is one in which no errors are found.

Any engineered product can be listed in one of two ways :

1. Knowing the specified function that a product has been designed to perform test can be conducted that demonstrates each functions is fully operational.
2. Knowing the internal workings of a product, test can be conducted to ensure that "all gears mesh" that is, the internal operation of the product performs according to specification and all internal components have been adequately exercised.

The increasing visibility of software as a system element and the attendant "cost" associated with a software failure are motivating forces for well-planned, through testing. It is not unusual for a software development organization to expend between 30 and 40 percent of total project effort of testing.

The objective of software testing is to uncover errors. To fulfill this objective, a series of test steps-unit, integration, validation, and system tests - are planned and executed. Unit and Integration tests concentrate on functional verification of a module and incorporation of modules into a program structure. Validation testing demonstrates

trace ability to software requirements, and system testing validates software once it has been incorporated into a larger system.

Testing is an integral part of the software process and activity that must be carried out through out the life cycle. During the requirement phase, the requirements should be checked, during the specification phase, the specification should be checked and during the planning phase, the software production management plan must under go similar scrutiny. Each test step is accomplished through a series of systematic test techniques that assist in the design of test cases. With each testing step, the level of abstraction with which software is considered is broadened. The key theme is that testing must be carried out in parallel with all activities of the software process.

Testing presents an interesting anomaly for the software engineer. The engineer creates a series of test cases that are intended to "demolish" the software that has been built. A software engineer designs a computer program, a system, or a product with "Testability" in mind. Characteristics like operability, absorbability, simplicity, and stability are necessary for testability of a product.

If testing is conducted successfully it will uncover errors in the software. As a secondary benefit, testing demonstrates that software functions appear to be working according to specification and that performance requirements appear to have been met.

In addition, data collected as testing is conducted provides a good indication of software reliability and some indication of software quality as a whole. The primary objective for test case design is to derive a set of tests that have the highest likelihood for

uncovering errors in the software. Specialized testing methods encompass a board array of software capabilities and application areas. Graphical user interfaces, client/server architectures, documentation and help facilities, and real-time systems each require specialized guidelines and techniques for software testing.

After a product has been successfully maintained for many years it may eventually lose its usefulness and be superseded by a totally different product, in much the same way transistors replaced that electronic value. Alternatively, a product may still be useful, but the cost of porting to new hardware or of running it under a new operating system may be larger than the cost of constructing a new product, using the old one as a prototype. Thus finally, the software product is decommissioned and removed from services. Only at the that point, when the software has been irrevocably discarded, is it time stop testing.

It is not sufficient to test the end product of a phasae mearly at the end of that phase. The members of the specification while they develop them. It is not much use for the team to develop the complete specification document only to find, weeks or months later, that they made an error early in the process that necessities rewriting almost all the specifications. Thus, what is need is continual tested by the development team while they perform each phase, in addition to more methodical testing at the end of each phase.

Here comes the term verifications and validations. Verifications refers to the process of determining, whether a phase has been correctly carried out.

On the other hand, validation is the intensive evaluation process that takes places just before the product is delivery to the customer.

Verification : Are we building the product right?

Validations : Are we building the right product?

Both the types of testing, the execution – based testing and non – execution based testing is carried out in the case of the project, ie. It is being reviewed carefully as possible as well as being executed using test data. Software testing for utility, reliability, robustness, performance and correctness should also be conducted.

For the filename filed, the various test data, whish are correct are and the expected results are noticed. That is, for the correct inputs only the program will work properly. In other case, with the wrong input data, an exception will be called and that part of the program will get automatically halted. Verification and validation implied that the process of checking a phase could wait the end of that phase.

There are essentially two type of testing:

Execution based testing and non-execution based testing. In non execution based testing a document is carefully checked by a term of software professionals with a board range of skills. The advantage of a review by a term of experts is that the different skills of the participants increase the chance of finding a fault. In addition, a team of skilled individuals working together often generates a synergistic effect.

The execution based testing is a process of inferring certain behavioral properties of product based, input part, on the result of executing the product in a known environment with selected inputs.

The definition states that testing is an inferential process. The tester takes the product, runs it with known input data, and examines the output. The tester has no infer what, if anything, is wrong with the product. The other problems, which arise here, are environment and problems with selected inputs.

Types of testing

The software testing process commences once the program is created and the documentation and related data structures are designed. Software testing is essential for correcting errors. Otherwise the program or the project is not said to be complete.

Testing types

The following are the types of testing

i. Unit Testing

ii. Integrated Testing

iii. Validating Testing

iv. System testing

Unit Testing

Unit testing focuses verification effort on the smallest unit of software designs the module. Unify the procedural design description as a guide, important control paths are tested to uncover errors within the boundary of the module. The relative complexity of tests and uncovered errors is limited by the considered scope established for unit testing.

The module interface is tested to ensure that information properly flows into and out of the program unit under test. Boundary conditions are tested to ensure that the module operates properly at boundaries established to limit or restrict processing.

Proposed checklist for interface tests are

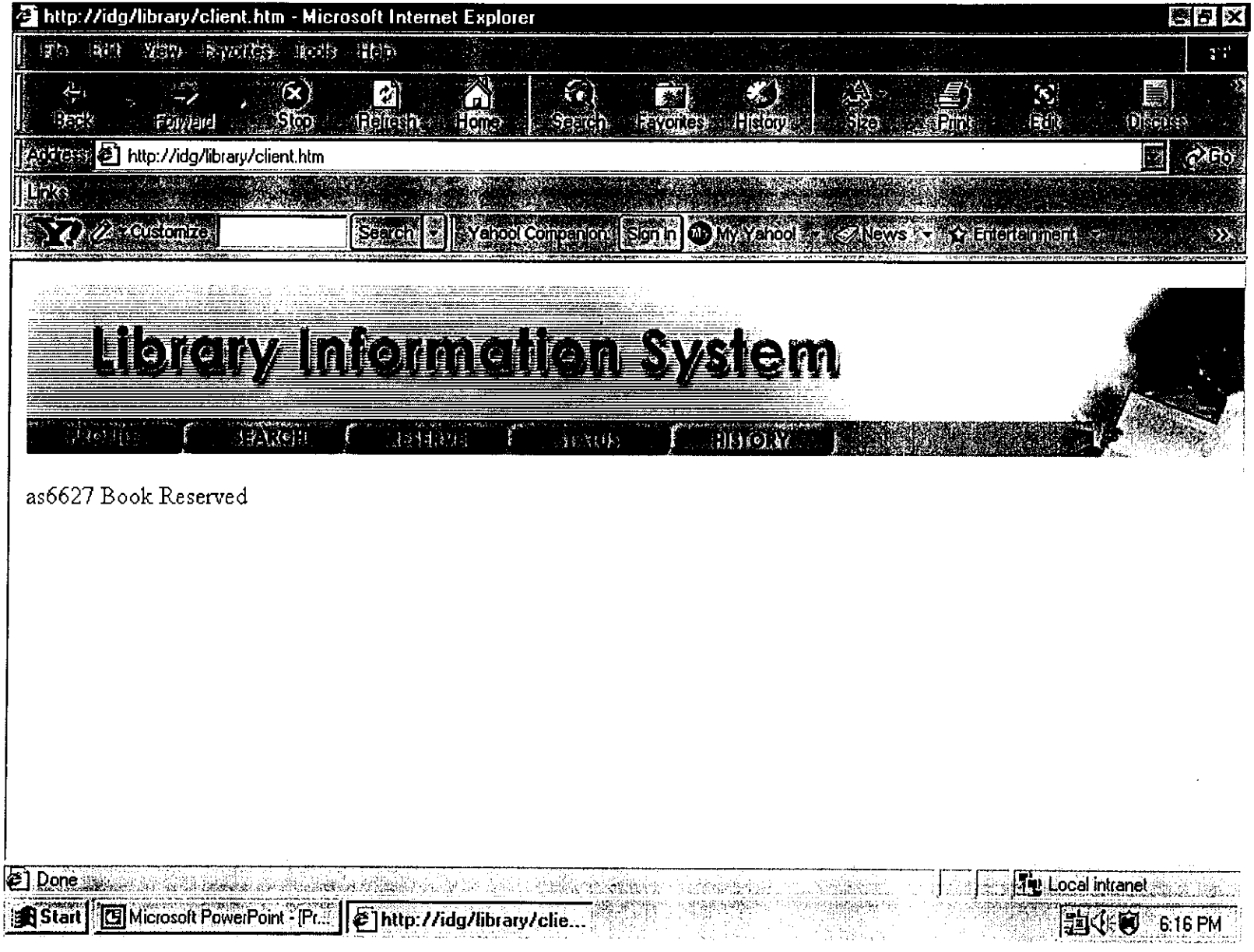
1. Number of input parameters equals to number of arguments?
2. Parameter and argument attributes match?
3. Parameter and argument units systems match?

Unit testing is normally considered as an adjunct to the coding step. After source level code has been developed, reviewed, and verified for correct syntax, unit test case design begins. A review of design information provides guidance for establishing test cases that are likely to uncover errors in each of the categories.

Integration Testing

Integration testing is a systematic technique for constructing the program structure while conducting tests to uncover errors associated with interfacing. The objective is to take unit tested modules and build a program structure that has been dictated by design. The integration process is performed in a series of steps.

1. The main control module is used as a test driver, and stubs are substituted for all modules directly subordinates to the main control module.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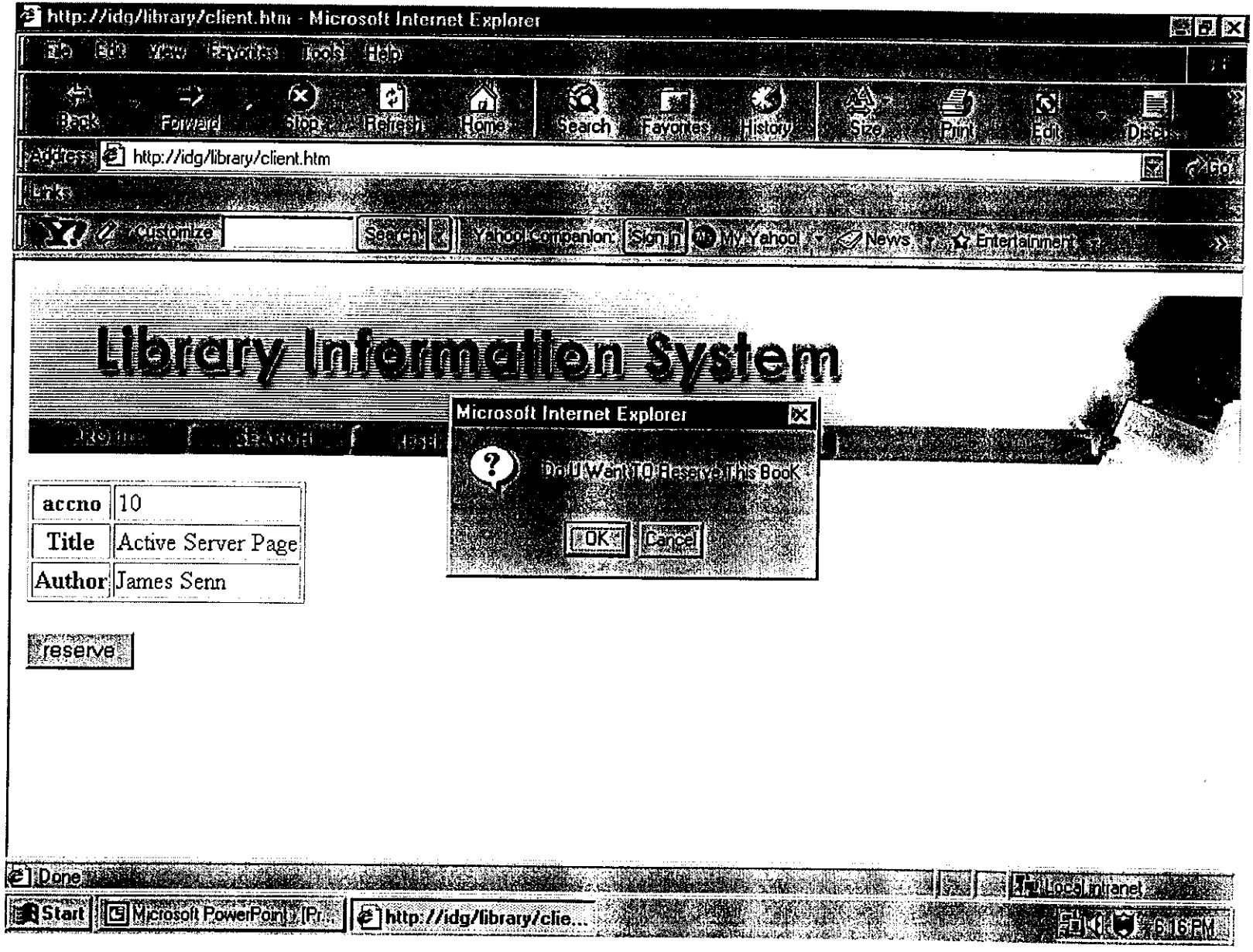
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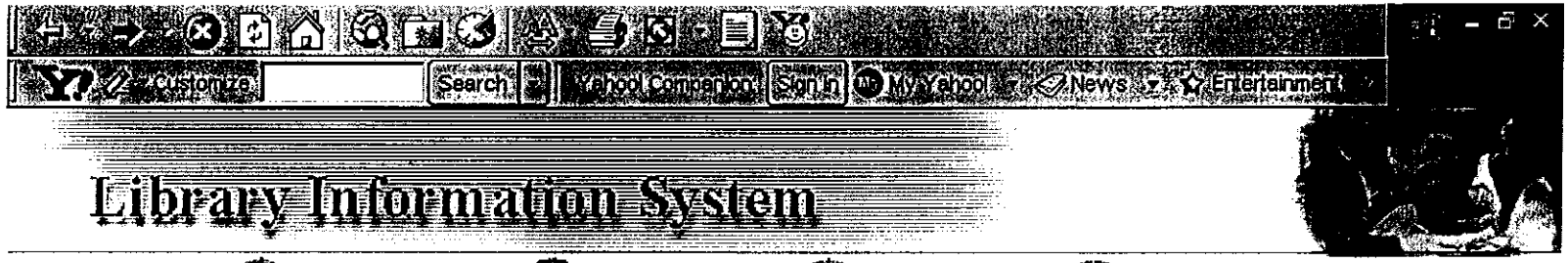

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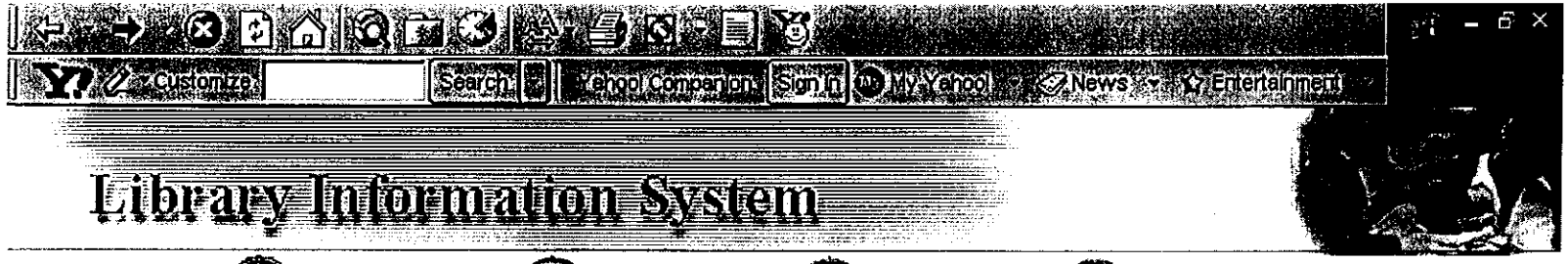

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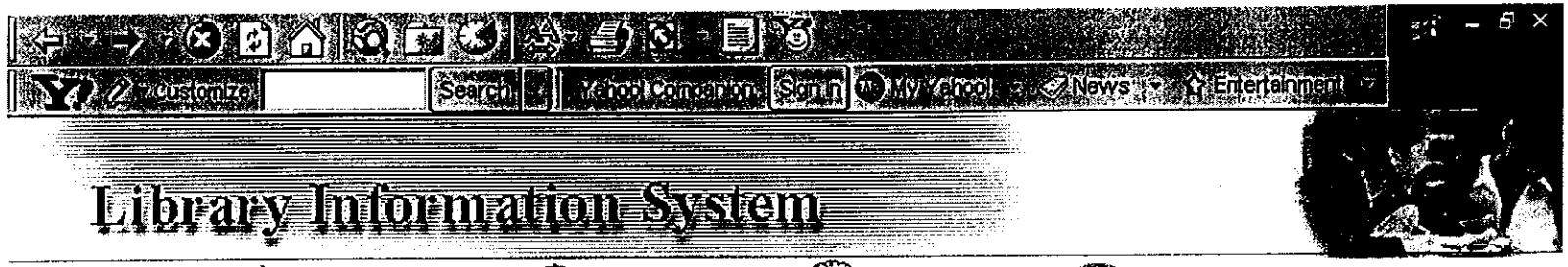

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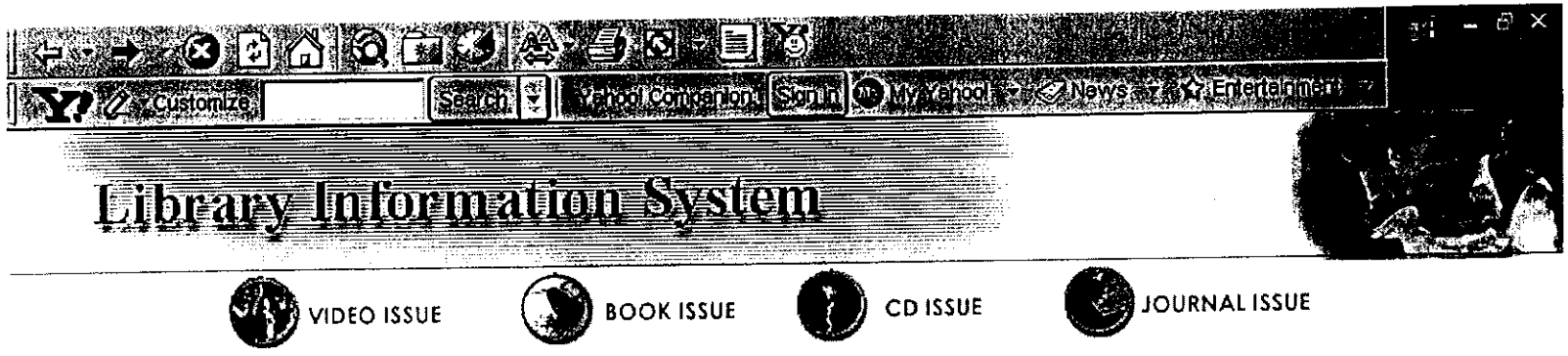
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CD ISSUE
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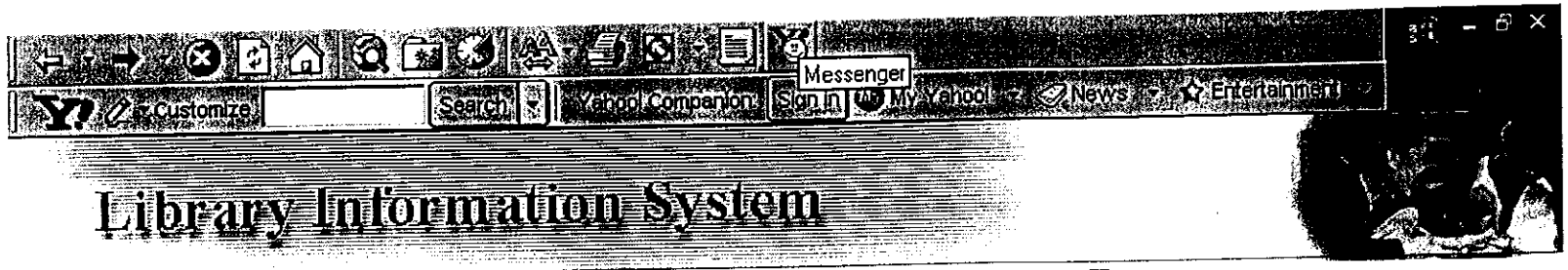

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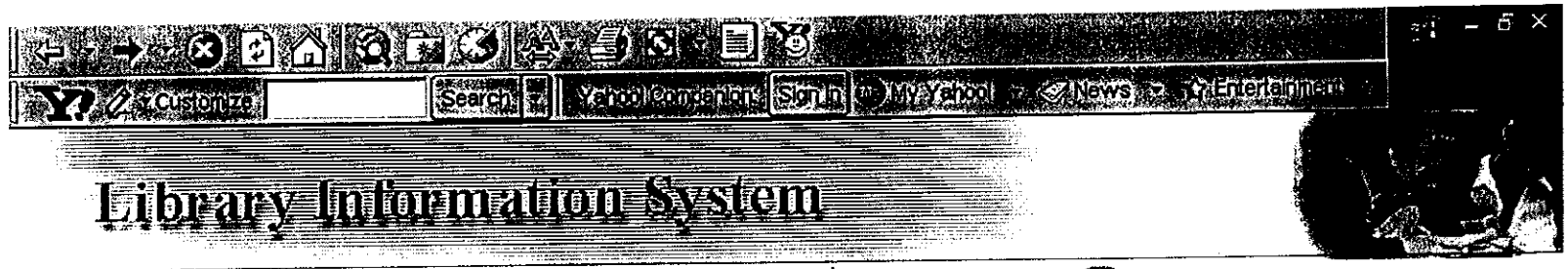

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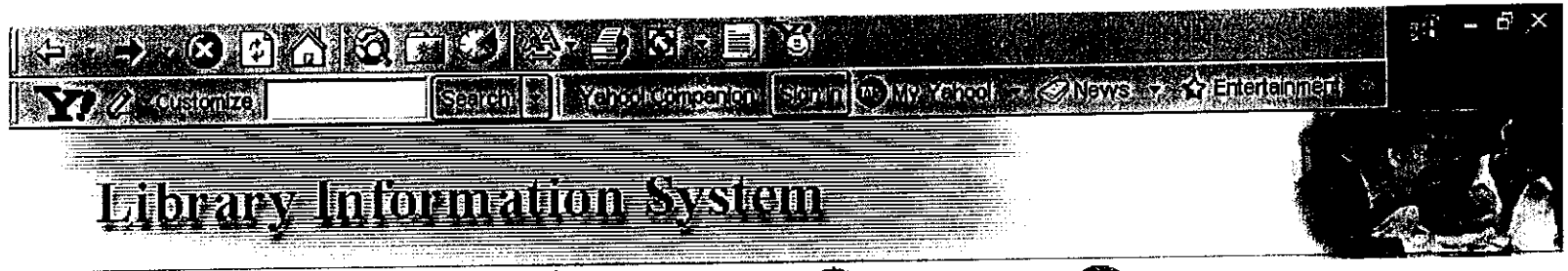

VIDEO ISSUE BOOK ISSUE CD ISSUE JOURNAL ISSUE

ASSOCIATE DETAILS

ASSOCIATE ID	ps2667
NAME	Pichandi Srinivasan
PROJECT	Web Support
LOCATION	Chennai

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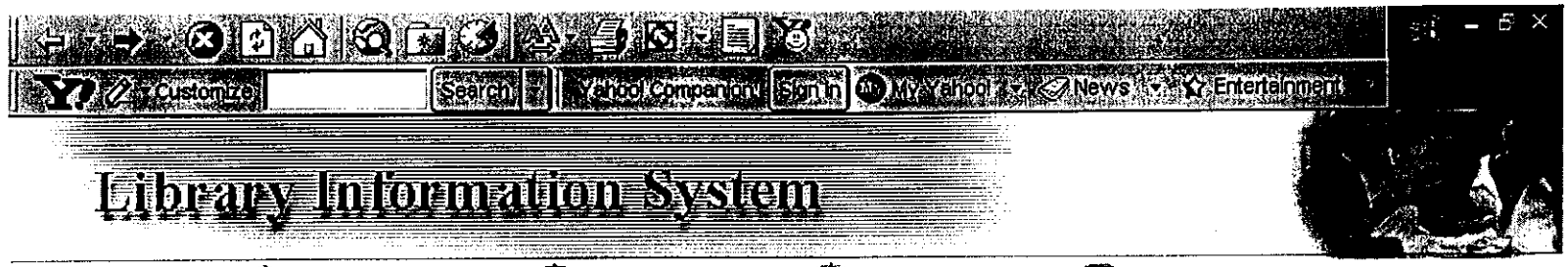

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NAME	Pichandi S
PROJECT	Web Supp
LOCATION	Chennai

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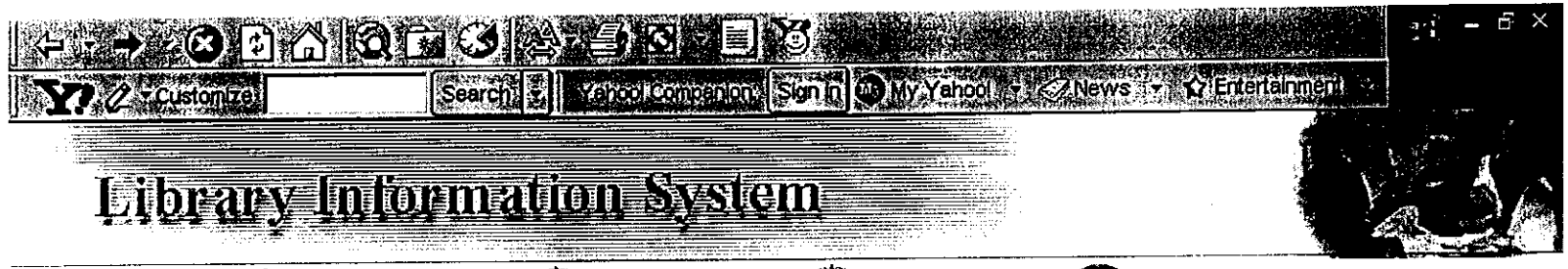

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ASSOCIATE DETAILS

ASSOCIATE ID	ps2667
NAME	Pichandi Srinivas
PROJECT	Web Support
LOCATION	Chennai

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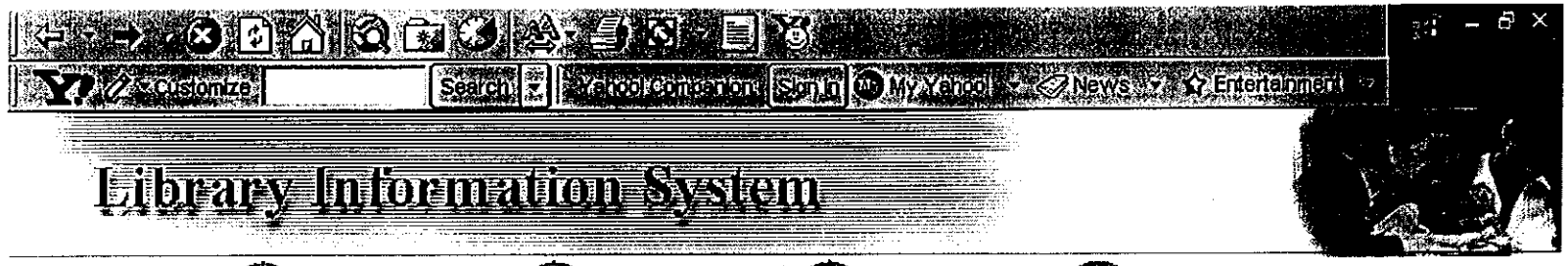

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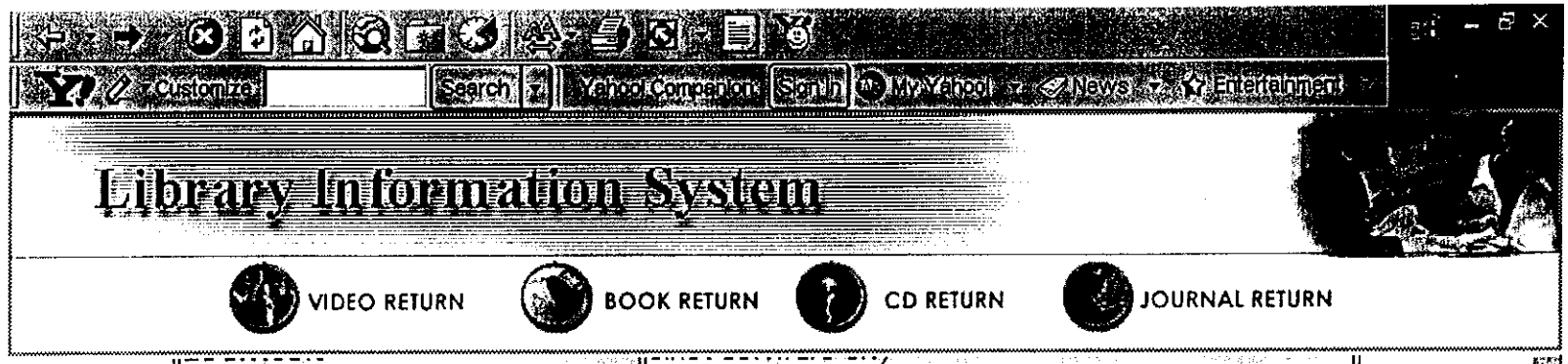

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ASSOCIATE ID	as6627
NAME	sivagami sundari
PROJECT	AS400
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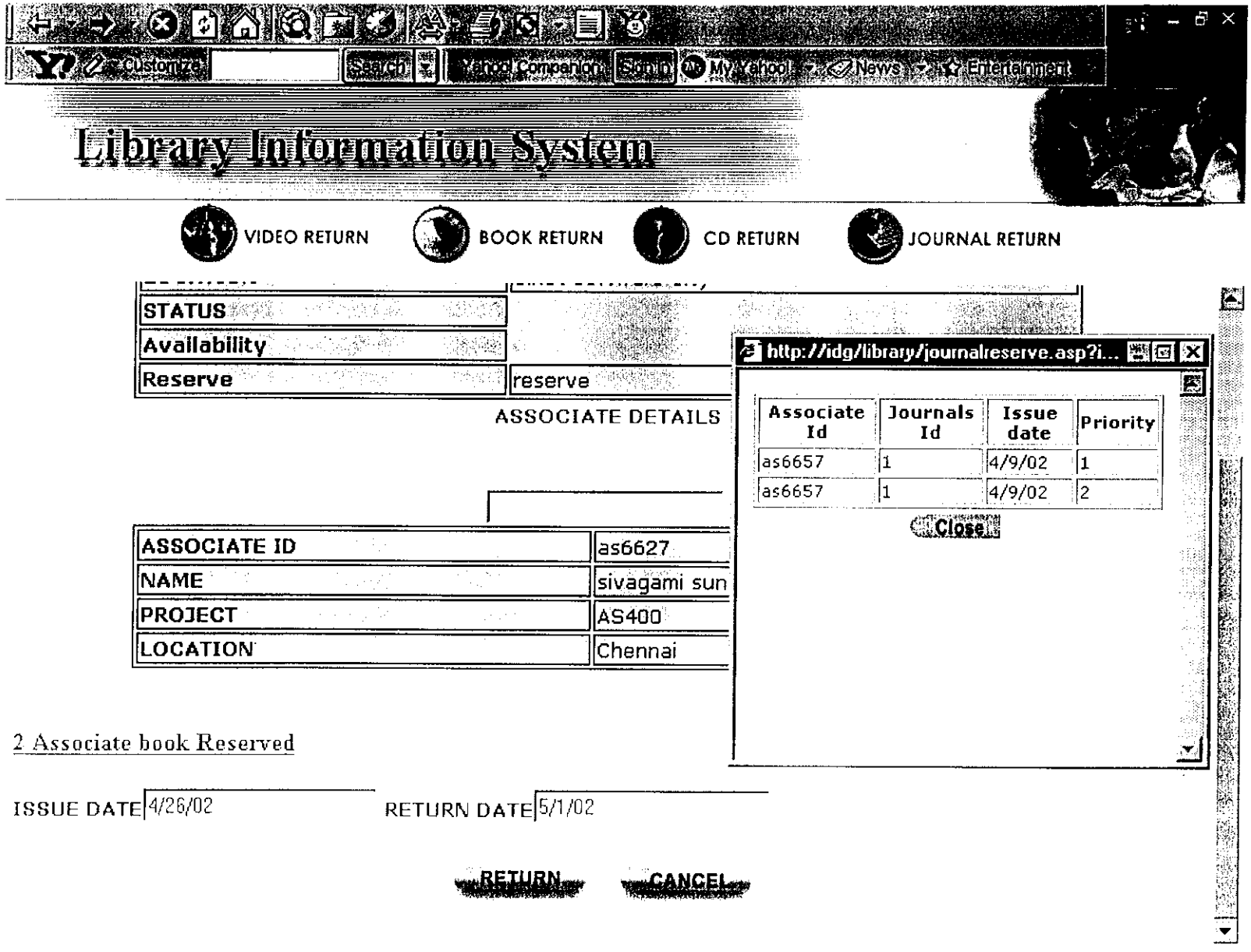
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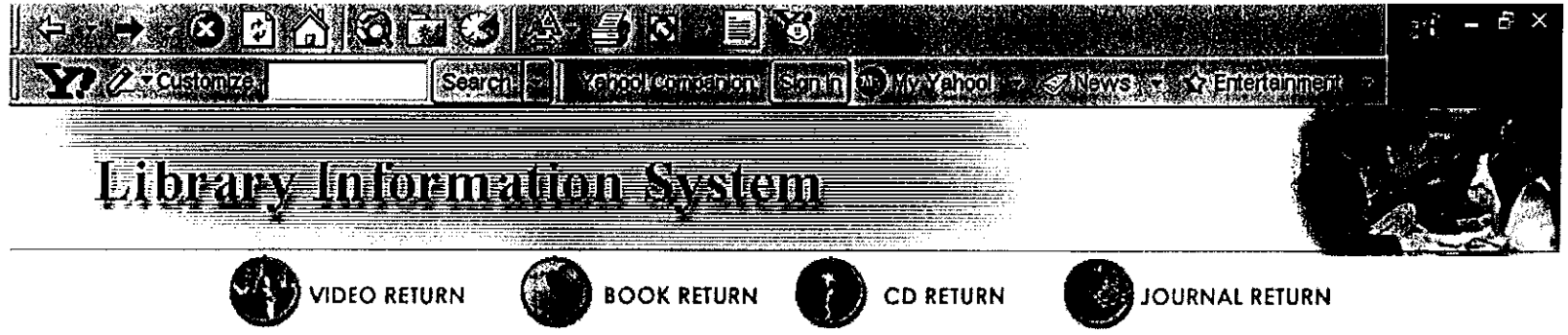

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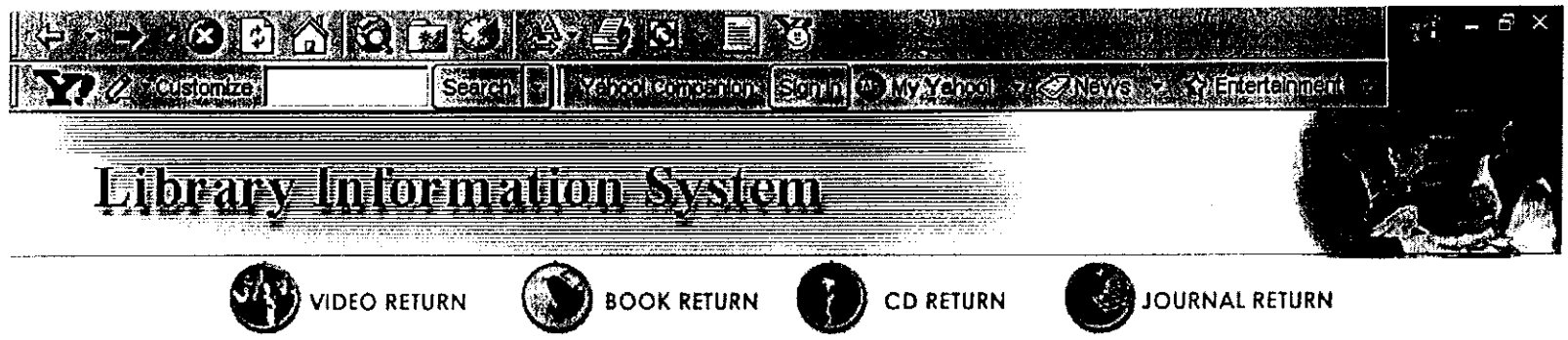

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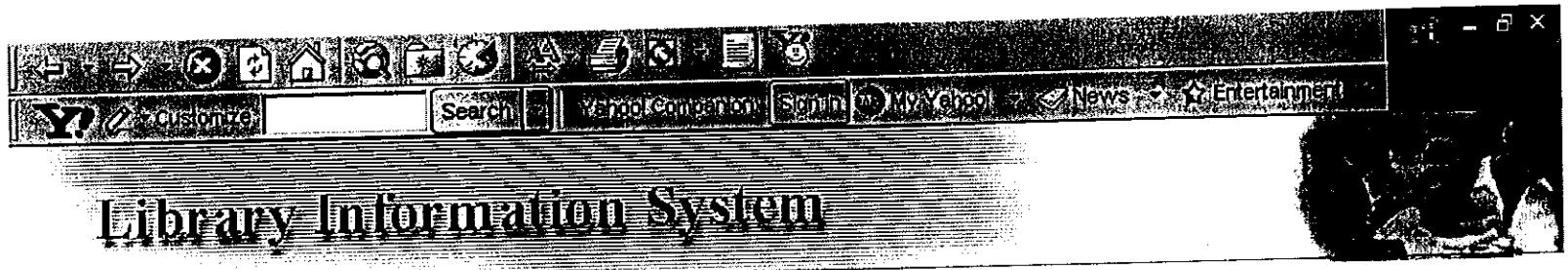

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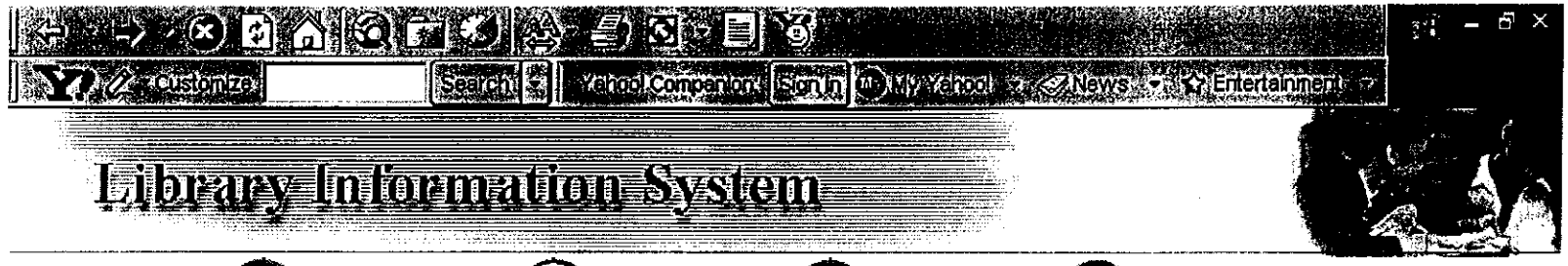

VIDEO RENEWAL | BOOK RENEWAL | CD RENEWAL | JOURNAL RENEWAL

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LOCATION	WCC
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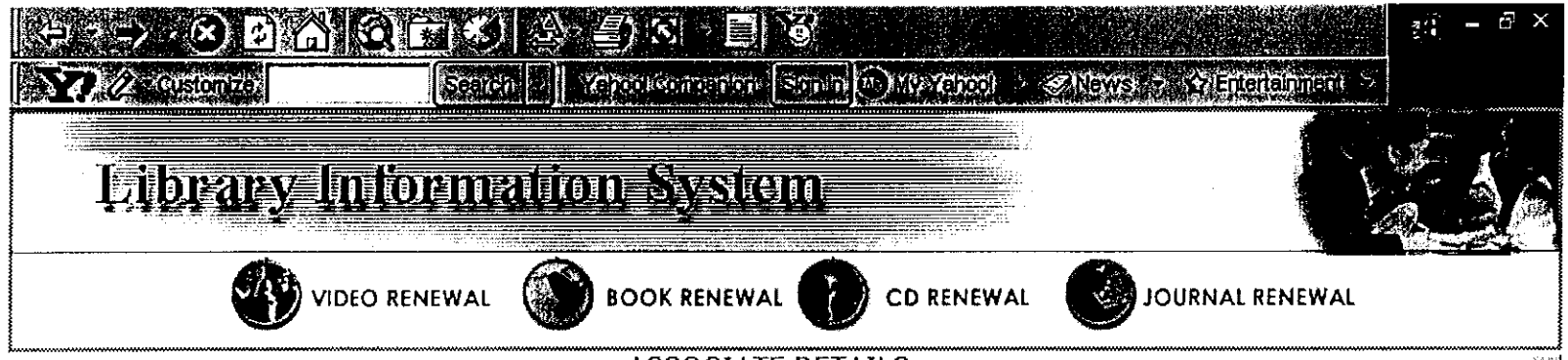
ASSOCIATE DETAILS



ASSOCIATE DETAILS

ASSOCIATE ID	as6627
NAME	sivagami sundari
PROJECT	AS400
LOCATION	Chennai

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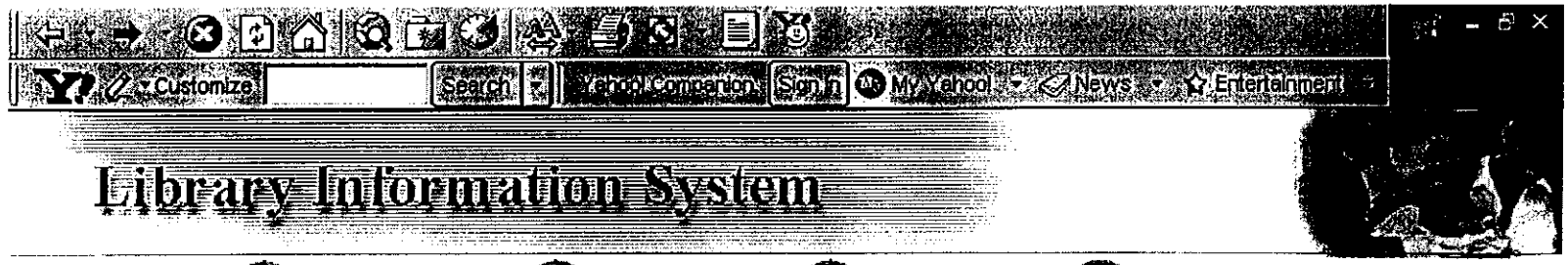

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ASSOCIATE DETAILS

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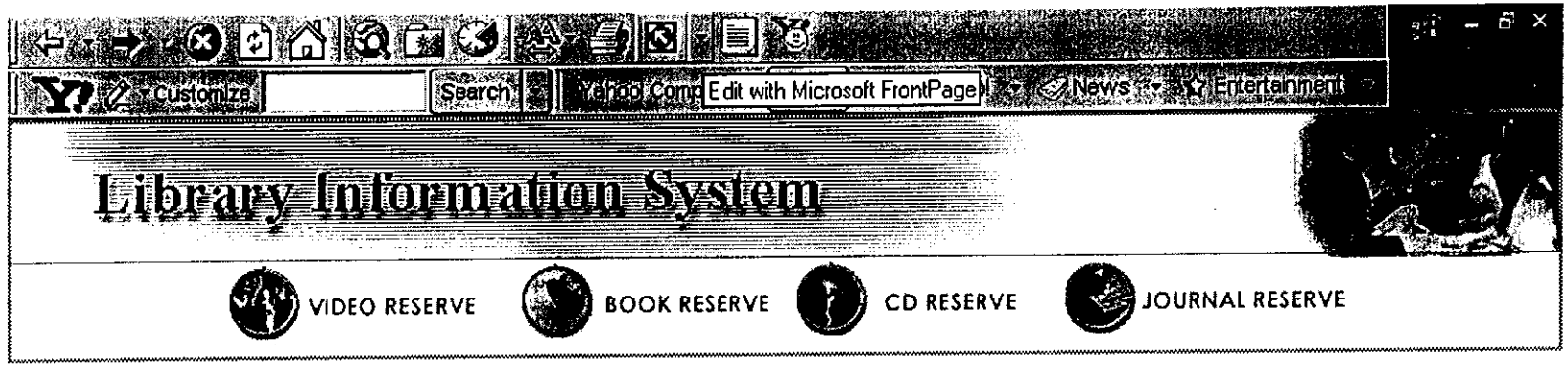

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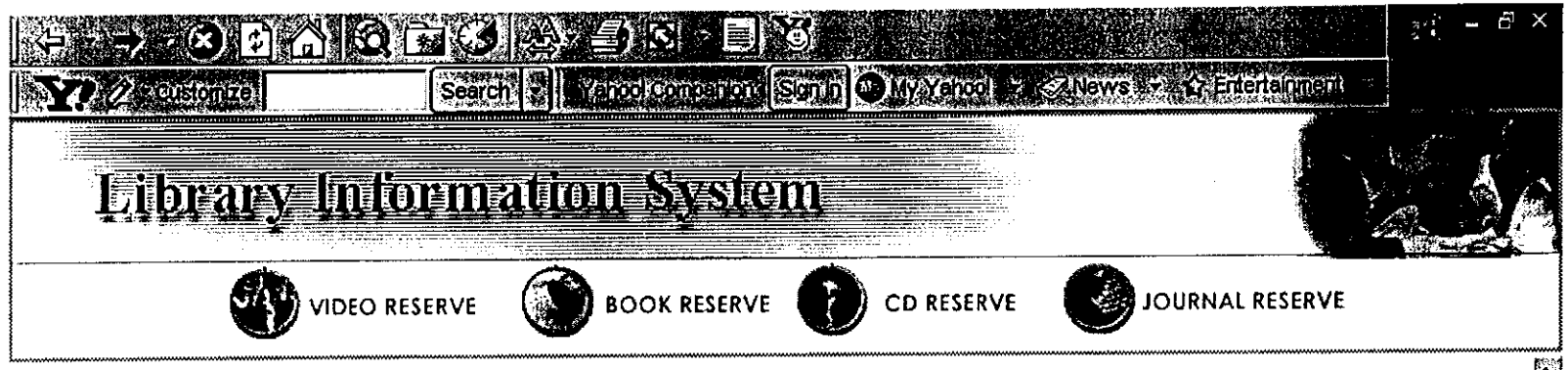
ASSOCIATE DETAILS



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NAME	pichandi srinivasan
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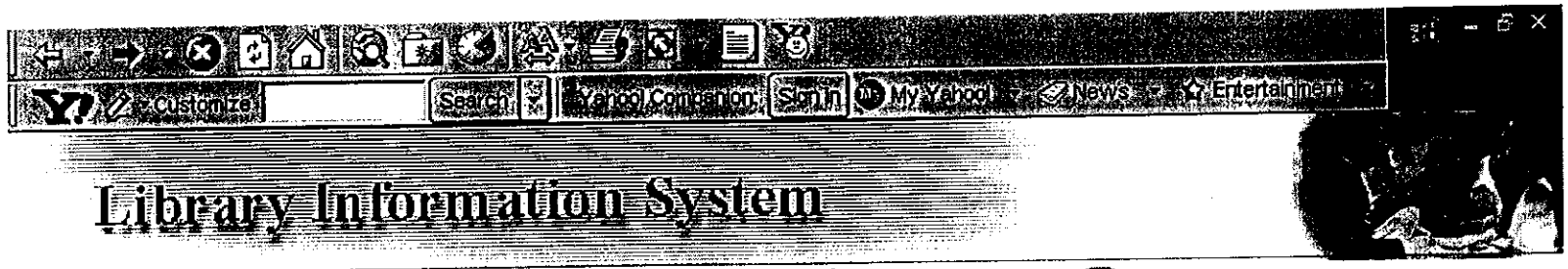

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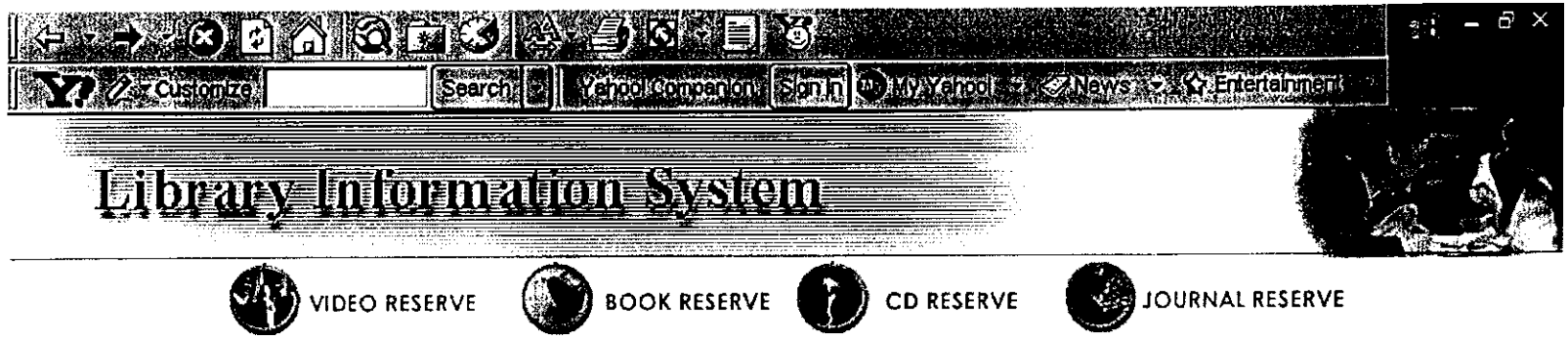

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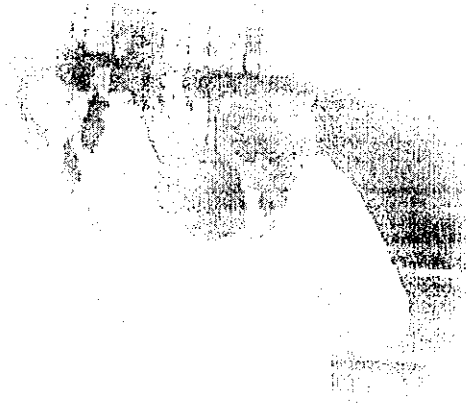

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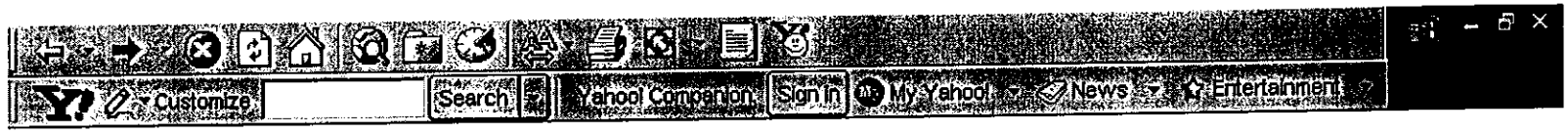

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TITLE ○

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