

Data Warehousing and Control & Guidance Command Verification of Post Trial Data by Multi-User through a Common GUI



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ABSTRACT:

The proposed idea is to provide a common platform GUI to the users who are dispersed to verify and analyze Dynamic Trial data of various Underwater Vehicle Projects through a secure protocol. This project deals with different levels of data storage and retrieval where huge amount of Dynamic Trial Data will be maintained at different data repositories. The main objective is to provide an effective GUI wherein a user can retrieve data very easily. This goal can be achieved by connecting IDE framework to database using an appropriate Database connectivity tool. This system will include display of various Control System parameters during Pre-launch, Stabilization, Straight Run (ISR) and Circular Search phase by incorporating Event based logic. It should facilitate navigation through separate Windows for phase-wise analysis and verify the actual generated Control Commands during trial against computed control commands. Provision for Guidance Command verification will also be incorporated.

The overall architecture of this system starts with user logging into the network and the user is being authenticated for the one's chosen Project. So, intrusion into the system is not possible as the intruders cannot access the data. This ensures data security. Accessing data through the GUI over different platforms, valid user must be able to interact and query for the required data. The Project

Coordinator for each Project is allowed to update the data in the database.

Keywords: *Data Warehousing, Security protocol, User Interfacing.*

1. Introduction:

In computing, a data warehouse (DW or DWH), also known as an enterprise datawarehouse (EDW), is a system used for reporting and data analysis, and is considered a core component of business intelligence. DWs are central repositories of integrated data from one or more disparate sources. They store current and historical data and are used for creating analytical reports for knowledge workers throughout the enterprise. Examples of reports could range from annual and quarterly comparisons and trends to detailed daily sales analysis. The data stored in the warehouse is uploaded from the operational systems (such as marketing or sales). The data may pass through an operational data store for additional operations before it is used in the DW for reporting.

The electromagnetic education, the fundamentals of electromagnetic scattering theory are usually taught through solutions of scattering from some canonical objects due to excitation by incident plane. In general, these solutions are available in closed mathematical forms, which in many cases are hard to visualize, and it can be difficult to extract from these solutions the

physical characteristics of the scattering process. Therefore, it is important to have such canonical solutions programmed and arranged in an easy-to-use tool for the purpose of visualizing the physical phenomena of scattering from these objects. Thus, the availability of such programs that solve these types of canonical problems on the widely available personal computers and workstations provides students with a better understanding of electromagnetic scattering theories.

Furthermore, such tools can be used as benchmarks for a wide range of researchers who are developing numerical electromagnetic techniques, and these researchers would be able to have immediate access to solutions to a variety of test cases to verify their techniques. With these needs in mind, a graphical user interface (GUI) has been developed to calculate and display the scattering from three-dimensional dielectric sphere, based on exact boundary-value solutions and also used to connect GUI user with database administrator. The retrieving of database through GUI is done. GUI is on of the easy tool to access.

The purpose of this project is to describe all the external requirements. This project describes the interfaces for the system that is how to access the data as accurately and securely as possible. Faster Processing and multi-user access is to be ensured.

2. Functional Requirements

Basically, functional requirements describe the feature, functioning and usage of product/ system/ software from the perspective of the product and its user. Functional requirements also often are called “functional specifications”, and “specification” is a synonym for design.

This application consists of the following modules.

- Project User module
- Single Database Administrator module
- Data Warehouse Administrator module

A. Project User Module:

This module is for the GUI users of the system. There will be a limited set of Project Users. Each Project User is provided with a username and a password. Project User is only given the right to read the data. By giving username and password, user is being authenticated and allows legitimate user to read the data. In this defense organization, only technical officers with higher ranks and scientists are the legitimate users.

B. Single Database Administrator Module:

In this defense organization, there would be several departments. So, each department contains its specific operational data regarding the various Underwater Vehicle Projects. So, each department has its own database and for each database there would be a Database Administrator who has all access rights of loading the data, updating the data after every trial.

C. Data Warehouse Administrator Module:

Data Warehouse is being processed using all ‘n’ number of databases in the organization. The Data Warehouse is administered by a Data Warehouse Administrator who has complete access rights over all the databases of every department in the organization.

3. Data storage:

A data storage device is a device for recording (storing) information (data).

Recording can be done using virtually any form of energy, spanning from manual muscle power in handwriting, to acoustic vibrations in phonographic recording, to electromagnetic energy modulating magnetic tape and optical discs. A storage device may hold information, process information, or both. A device that only holds information is a recording medium. Devices that process information (data storage equipment) may either access a separate portable (removable) recording medium or a permanent component to store and retrieve data.

Electronic data storage requires electrical power to store and retrieve that data. Most storage devices that

do not require vision and a brain to read data fall into this category. Electromagnetic data may be stored in either an analog data or digital data format on a variety of media. This type of data is considered to be electronically encoded data, whether it is electronically stored in a semiconductor device, for it is certain that a semiconductor device was used to record it on its medium. Most electronically processed data storage media (including some forms of computer data storage) are considered permanent (non-volatile) storage, that is, the data will remain stored when power is removed from the device. In contrast, most electronically stored information within most types of semiconductor (computer-chips) microcircuits are volatile-memory, for it vanishes if power is removed.

Except for barcodes, optical character recognition (OCR), and magnetic ink character recognition (MICR) data, electronic data storage is easier to revise and may be more cost effective than alternative methods due to smaller physical space requirements and the ease of replacing (rewriting) data on the same medium. However, the durability of methods such as printed data is still superior to that of most electronic storage media. The durability limitations may be overcome with the ease of duplicating (backing-up) electronic data.

Modern digital computer represents data using the binary numeral system. Text, numbers, pictures, audio, and nearly any other form of information can be converted into a string of bits, or binary digits, each of which has a value of 1 or 0. The most common unit of storage is the byte, equal to 8 bits. A piece of information can be handled by any computer or device whose storage space is large enough to accommodate the binary representation of the piece of information, or simply data. For example, the complete works of Shakespeare, about 1250 pages in print, can be stored in about five megabytes (40 million bits) with one byte per character.

Data is encoded by assigning a bit pattern to each character, digit, or multimedia object. Many standards exist for encoding (e.g., character encodings like ASCII, image encodings like JPEG, video encodings like MPEG-4).

By adding bits to each encoded unit, redundancy allows the computer to both detect errors in coded data and correct them based on mathematical algorithms. Errors generally occur in low probabilities due to random bit value flipping, or "physical bit fatigue", loss of the physical bit in storage its ability to maintain distinguishable value (0 or 1), or due to errors in inter or intra-computer communication. A random bit flip (e.g., due to random radiation) is typically corrected upon detection. A bit, or a group of malfunctioning physical bits (not always the specific defective bit is known; group definition depends on specific storage device) is typically automatically fenced-out, taken out of use by the device, and replaced with another functioning equivalent group in the device, where the corrected bit values are restored (if possible). The cyclic redundancy check (CRC) method is typically used in communications and storage for error detection. A detected error is then retried.

4. Security Protocol:

A security protocol (cryptographic protocol or encryption protocol) is an abstract or concrete protocol that performs a security-related function and applies cryptographic methods, often as sequences of cryptographic primitives. A protocol describes how the algorithms should be used. A sufficiently detailed protocol includes details about data structures and representations, at which point it can be used to implement multiple, interoperable versions of a program.

Cryptographic protocols are widely used for secure application-level data transport. A cryptographic protocol usually incorporates at least some of these aspects:

- Key agreement or establishment

- Entity authentication
- Symmetric encryption and authentication material construction message
- Secured application-level data transport
- Non-repudiation methods
- Secret sharing methods
- Secure multi-party computation

5. Results:

The results show how the interfacing is been done. After user authentication selecting of project through main GUI is done as show in below figure 2

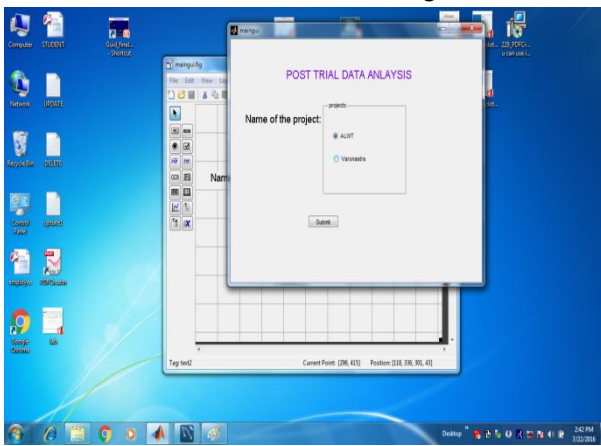


Fig 2. selecting project through main GUI

Now select the data to import, after selecting the data import the files as shown in fig 3.

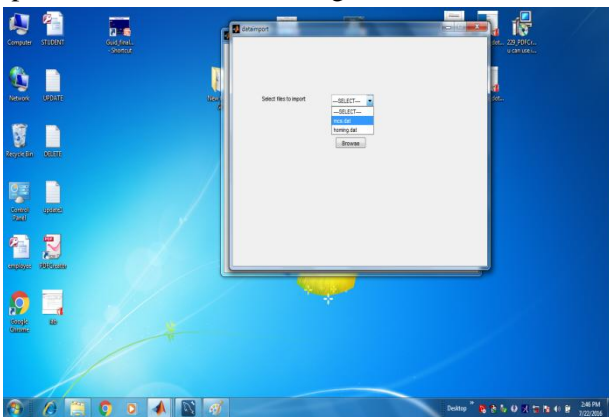


Fig 3. Selecting files to import

The files selected are to be viewed in the data viewer Inorder to implement our project, a back end tool Mysql is been used to create schema and tables. The tables created with column names and their datatypes.

The next step is to Insert values into the table. After inserting the values connect database through ODBC as shown in fig 4.

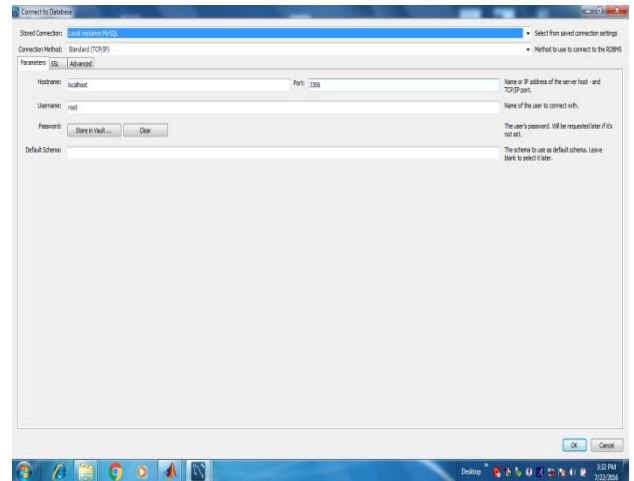


fig 4. Connecting data base through ODBC

After connecting the database , now connect the data base and the matlab as shown in fig 5

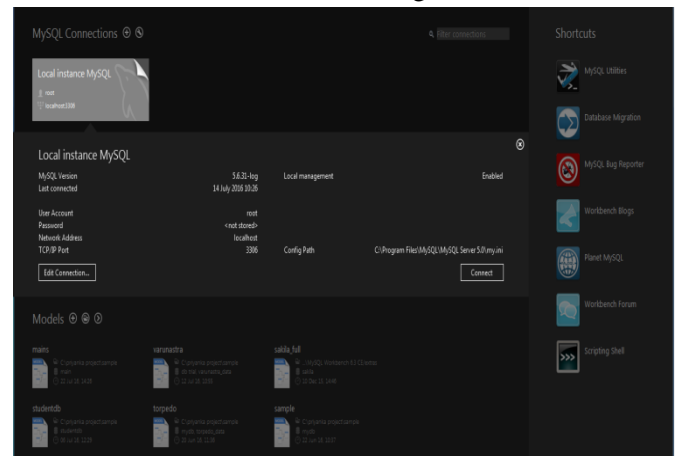


Fig 4. Connecting database and matlab

6. Conclusion:

In this project, the implementation of GUI based application retrieved from multiple heterogeneous databases forming into a single Data Warehouse. The implementation done using MATLAB tool to create GUI and Mysql to access the data. This project provides data confidentiality, data integrity and data accuracy.

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