Application of Database Program Technology Using Visual Basic in Data Management Information System of Oceanic Hydro-Meteorology Observation

Daowei YUAN[1,*], Yan **ZHANG**[2,*], Duyi **JIANG**[3]

[1]*National Marine environment Monitoring Center, Dalian 116023, CHINA*

[2] *College of Marine Environmental Engineering, Dalian Ocean University, Dalian 116023, CHINA*

[3] *North China Sea environment Monitoring Center, SOA,Qingdao 266033, CHINA*

[*]*Responded author, Email*: *zhyan@dlou.edu.cn,ydwyyq@163.com*

Abstract: Database program technology is used widely in the field of computer application. It is one of the most prominent characteristic for Visual Basic to visit the database conveniently. Be combined with the exploiture process of the data management information system of oceanic hydrometeorology observation station, the paper introduces the method of visiting the Microsoft SQL Server database using Visual Basic 6.0,and how to set up a new table,a new view of SQL Server database using the Structured Query Language. And further more, the author proffers the programming technique to realize the function of inserting a new record into database table, searching the specifically records according to the user's qualifications.In the article,the author offers some pivotal programme of the Visual Basic.

Keywords: oceanic hydro-meteorology observation data; Microsoft SQL Server database; programme technique; Structured Query Language

1 Introduction

VB (Visual Basic) is Microsoft's launch of the WINDOWS-based operating system easy to learn and use the development platform, as it effectively to avoid the C + + programming too much red tape and less abstract, at the same time to achieve a good majority of Windows The purpose of the program, which has become a very viable Windows programming language [1]. The most high-profile Features of Visual Basic is its powerful functions of visit to the database.

In the computer information processing, will involve the application of database technology, database technology occupy the field of computer application in a very significant share. Refers to the database must be stored in the form of computer storage medium on the inter-related data collection. Database as a information storage, it has the smallest redundancy, secure and reliable data storage, security performance, and the independence of good data. Database management system [2] (DBMS) is a database management system software, databases and user interface, such as the use of this paper, the Microsoft SQL Server database. DBMS provides the user database operated by a variety of command, tools and methods [3], including the establishment of data and records input, modification, retrieval, display, delete and statistics. In accordance with the organization of the data, the database can be divided into 3 types: network databases, and database-level relational database. The application is the most common relational database, such as the SQL Server database, which is based on the relationship between model-based database is based on the table, and field record of the relationship between the organization and a visit to the database through a number of A two-dimensional table (Table) to store data, and through the relations (Relationship) will be linked to these tables, it provides a structured query language called [4] (SQL) standard interface, the interface allows the use of a variety of database Tools and products.

Marine hydro-meteorological observation data management information system by drawing on the Visual Basic 6.0 development environment for coastal observation stations along the coast of the ocean hydro-meteorological observation data and data management expertise developed by [5].

System interface as shown in Figure1. The software system to achieve a seaside hydro-meteorological observation data warehousing and automatic query show. The use of software systems make it easier for the coastal hydro-meteorological observation data entry and management. Operation of the system data entry module, the

beach can be automated hydro-meteorological observation data entry of local data-processing center database and data warehousing for real-time monitoring of the entire process. Operation of the system data query module will allow users to limit the inquiry on the conditions of the target database retrieval, and in line with the query data on the program interface.
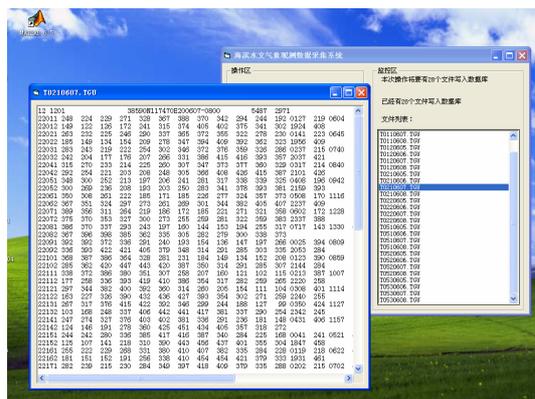
Fig.1   System Interface

2 Describe the mechanism

2.1 ADO and OLE DB Technology

OLE DB (Object Linking and Embedding DataBase) is a new data access methods, it provides a common data source to visit the bottom of the interface, can be achieved through the OLE DB data source on any visit. As long as developers know how to use OLE DB interface without having to consider the format and data storage methods. OLE DB technology has two advantages: high efficiency; can access various types of databases.

ActiveX Data Objects ADO (ActiveX Data Object) is Microsoft's database access technology [6], also known as the "data source" connection, it is built on the OLE DB data access on the basis of a high-level access technology, which is based on common objects Model (COM), greatly simplifies the operation of the OLE DB. OLE DB procedures for the use of a large number of COM interfaces, and the interface package ADO and OLE DB has all the features, a user-friendly application layer data access interface. ADO is based on the Component Object Model (COM) data access interface, with its access to any type of data sources, including relational,

non-relational, structural and non-structural data sources. The ADO connection can be divided into OLE DB Provider with the OLE DB Provider for ODBC way. OLE DB Provider for ODBC The ADO is the default providers, ODBC Provider allows ADO to connect to any ODBC data source; ODBC driver for today's use of a variety of DBMS are effective, including SQL Server, Access, FoxPro, as well as Oracle databases and other non-Microsoft Products. Simply put, OLE DB is a system-level programming interface, ADO is the application programming interface layer. The relationship between ADO and OLE DB as the figure 2 shown.
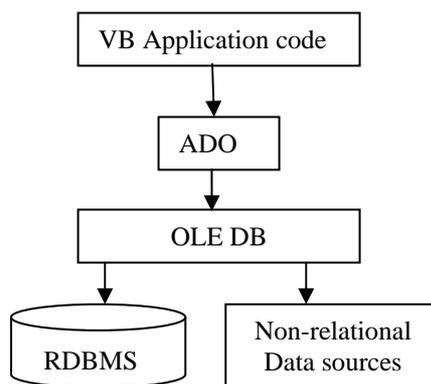
Fig.2   relationship between ADO and OLE DB

2.2 Connect SQL Server through ADO

ADO object to the adoption of the following code with SQL Server 2000 database connection:

Dim strCnn As ADODB. Connection; Set strCnn = New ADODB.Connection

strCnn.Open "Provider = SQLOLEDB.1; Persist Security Info = True; User ID = sa; Initial Catalog = 'database name'; Data Source = 'SQL server name or IP address'; password =' database password '"

Connection of the main targets include the following attributes:

1) Provider: designated OLE DB data or the name of the service providers, you can default.

2) DSN (DataSourceName): This is in the air, no need to specify the ODBC data source to connect the name.

3) UID (UserID): for ODBC data source specified user ID (user account).

4) PWD (Password): for ODBC data source specified user password must be equipped with the authority.

5) Persist Security Info: boolean type, for True, the show integrated security mechanism; if False, indicates that do not use integrated security mechanism.

ADO can be used to control data bound controls and data providers to connect, when used from the menu / parts of the dialog box to select "Microsoft ADO Data Control 6.0 (OLE DB)", to add it to control toolbox. There are two ways to visit specific:

(1) using ODBC connection string access the data source name

Dim adocn As ADODB.Connection; Dim cnStr As String

cnStr = "PROVIDER = MSDASQL; dsn = data source name; uid = user name; pwd = password;" Set adocn = New ADODB.Connection

adocn.Open cnStr

(2) direct access to ODBC data source name

Dim adocn As ADODB.Connection; Dim adors As ADODB.Recordset

Set adocn = New ADODB.Connection

adocn.Open "DSN = data source name", "username", "password"

Use the following record set targets to access the database information:

Set adors = New ADODB.Recordset

adors.Open "select * from table", adocn, adOpenStatic, adlockoptimistic

Or: adocn.execute "standard SQL statement"

3 Key technology in managing the Marine hydro-meteorological observation data

Marine hydro-meteorological observation data entry module to automatically connect the waterfront hydro-meteorological observation data storage computers, if it connect successfully, it will automatically scanning the specified directory and the directory-by-deal with the observation data files to be processed data and indicators for the purpose of the database related records than the right, finally treated to meet the requirements of the data into the local server-side data processing center for the purpose of SQL Server 2000 database, the automatic completion of the data storage capabilities, and new documents to be copied to the local server specified directory, the original The back-up data files. The module

realize the beach hydro-meteorological observation data storage automatically, and data storage for the entire process of real-time monitoring, but also to see the original data. Technical process of automatic data entry functions as shown in Figure 3.
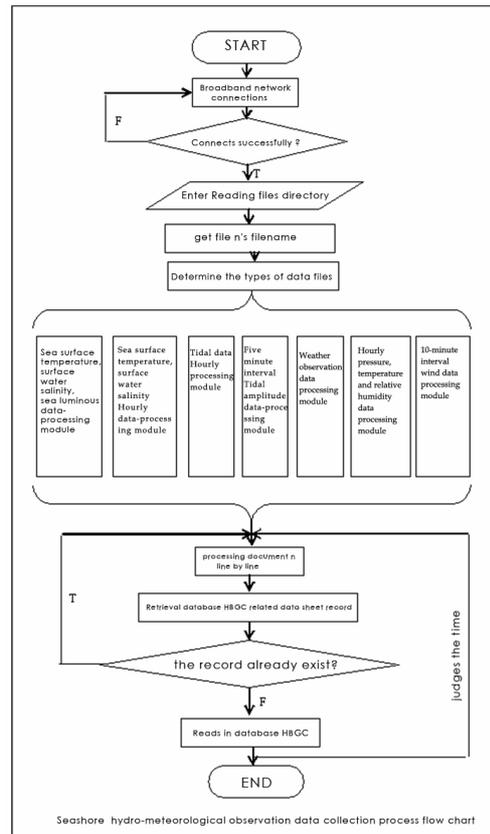

Fig.3 technical process of automatic data entry funtions

3.1 Create a new table, new view

During its visit to the database before the first use of the following statements and the corresponding database connection.

Public Cn As ADODB.Connection

Cn.Open "Provider = SQLOLEDB; Data Source = '" name server "'; User ID =**; Password =**; Initial Catalog = '" database name "'; Persist security Info = True"

After the establishment of a database and can connect to the table Arbitrary operate, for example, create a new table:

Cn.Execute "if not exists (select 1 from sysobjects where id = object_id ('table') and type = 'u') begin" & "create table Table 000 (1 field of data types, the field of data 2

Type, ..., n the field of data types) end "

In the establishment of a data table on the basis of the type of relationship can be linked into a data table view of data:

Cn.Execute "IF EXISTS (SELECT TABLE_NAME FROM INFORMATION_SCHEMA.VIEWS WHERE TABLE_NAME = N 'view of') DROP VIEW View"

Cn.Execute "CREATE VIEW view of AS" & _

    "SELECT dbo. Table 1. N AS alias field n, ..., dbo. Table n. field n AS alias n" & "FROM dbo. Table 1.INNER JOIN dbo. Table 2 ON dbo. Table 1. Field n = dbo. Table 2. field n ... INNER JOIN dbo. Table n ON dbo. Table m. field n = dbo. Table n. field n "

3.2 Add, retrieve specific records

Add records through the database can be dealt with after the operation in line with the requirements of the target data into the local server-side data processing center for the purpose of SQL Server 2000 database in order to complete the automated data storage:

Private Cnn As ADODB.Connection

Cnn.Execute "Insert Into [of the database table n] (Field 1, Field 2, ..., field n) values (the value of a field, the field value 2, ..., n value of the field)"

Users can VB visual query interface of choice to limit search area, can use SQL statements based on the realization of the SQL Server database to retrieve data:

Set rs = New ADODB.Recordset; Dim strSQL as string

strSQL = "select * FROM table or view of where the user query order by field m, ..., field n"

rs.Open strSQL, Cnn, adOpenStatic, adLockReadOnly

4 Conclusions

VB for its convenient and efficient development of object-oriented features, as well as the support of a large number of control in database application development in a strong competitive advantage. In this paper, marine hydro-meteorological observation data management information system to develop the actual process, introduced the Visual Basic 6.0 to connect Microsoft SQL Server 2000 database implementation language, VB, as well as through the SQL statements to create the new SQL Server database table, create a new view, add a new record, In the database to retrieve specific records meet the conditions of the most common operations, such as programming, and gives the Visual Basic language related to the core routines in the hope readers can play a forward role.

References

[1] Liu Xinmin, CAI, Bai Kang-sheng, VISUAL BASIC 6.0 programming, Tsinghua University Press, 2004.

[2] Liu Su, Zhu Jian, database technology in mechanical design. Computer applications, 2001,3:39 40.

[3] Luo Tao, master MSSQLServer7.0. Electronics Industry Press, 1999.11.

[4] Zhang Ying, VB6.0 visit SQLServer database technology. Information technology, 2002,8:69 ~ 70.

[5] People's Republic of China National Standard GB / T 14914-2006 coastal observation norms (2006-02-16 published 2006-2007 to implement-08-01).

[6] Paul Nielsen, Microsoft SQL Server 2000 book, China Railway Press, 2005.

[7] Wang Jianguo, Cui Xiaofeng, and so on, MicrosoftSQLServer2000 in Tianjin earthquake precursor network-centric applications. North China Earthquake Science, 2006, 24 (3): 57-59.