



Management of information in data bases to concerned the navigation and routing systems

Reza Zendejboudi ^{a*}, Jalil Azimpour ^b, Hamed Gorginpour ^c

^a IT- (Network)1 MSc student in Information Technology
reza.zendejboudi@live.com

^b Department of Hardware Engineering, Faculty of Engineering Sciences, Bushehr, Islamic Azad University, Bushehr, Iran
iauiran@gmail.com

^c Department of Electrical Engineering, Faculty of Engineering Sciences, Bushehr, Persian Gulf National University, Bushehr, Iran
ha.gorgin@gmail.com

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Abstract

Nowadays mobile navigation and routing systems take into account as a guidance system. In this systems, the whole information/data of mobile navigation and routing, reserved in concentrated data bases. These data bases are capable to reserve great amount of information. Therefore the main deficiency of these data bases will appear in the time of synchronous updating (deletion, registration & editing) by so many users. totally, all of these deficiencies are called anomaly or spreadable errors.

In this deficiencies, if a data involved error, this error will spread in all other data. For this respect, we are trying to present a new updating system by doing this research, in order to use in data bases of navigation and routing systems, so that the new system involve the least error in updating data. Therefore, we used a powerful module in the presented system which its name is DBManager, that in fact it is an intelligent class in order to doing updating operation. Because of being intelligent, we can use this module in each point/process of program. Indeed, this specification is superior nature of this management system with the other similar management systems.

Keywords: Management - Encryption - Decryption - SQL Dbmanager module.

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1. Introduction

Nowadays, routing problem is considered one of important and key topics due to the growing population, increasing movable devices (land, sea and air), and the identification of various locations. This is highlighted when these devices face failure. This comprehensive and universal system has caused users to exchange a great deal of information in these systems. Therefore, routing and navigation systems require having a powerful database and an Integrated Management System. So far, various systems have been created to manage existing database in routing and navigation systems. Along with the benefits, these systems also have some weaknesses. This article aims to propose a new system to manage database

in routing and navigation systems. To this end, we proposed a new smart class known as DBmanager to update data which can be used by different databases. This is mainly associated with the modular system. As stated earlier, database is highly regarded in movable routing and navigation systems because these systems require different or common databases due to storing diverse data and having various programs. Therefore, we used the database in accordance with the operation and data in each section of proposed program so that this system is responsive and efficient enough and uses the minimum system resources. Table 1 shows the programs in routing and navigation system as well as the type of database used.

Table 1: Programs in used database

Database	Program
SQL Server	database management system link the system with database server
SQL Server	database management system and related factors
SQL Server, SQLite, XML	database management system in maps, routing, and navigation
SQL Server	simulation program to send and receive mobile data

It is possible to implement these programs on other databases such as MYSQL, Postgre SQL, and Oracle due to modular programs. This is, in fact, considered an advantage.

2. Proposed system

An integrated and comprehensive system is required for database management in order to reduce propagating error in database of routing and navigation systems. As stated in the first section, this article aims to offer a comprehensive and smart system. The system is characterized as follows. This is a service/client system so that all related updating operations are procedurally stored in the system. Therefore, we used SQL Server R22008 to implement this system. This version is a service/client database. As a result, the speed of updating operations has increased in the proposed system. On the other hand, we were able to encrypt database operation because calling a procedure is performed from the client to the server. All related databases to movable routing and navigation are stored. In this regard, the mode is capable of using different databases. The basis of this system is SQL Server.

2.1. SQLite database

In this system, SQLite is employed for map image storage, map data storage, updating, geo-tagging, and navigation and routing information in cache in management program. This database is used because of its easy and efficient nature in Storing and Retrieval operations of map images. This database does not need installation and configuration and acts in the form of a library (Relational databases). There are other reasons to use this database: it is free of charge and the availability of source code and the use of open source GMAP library are two main advantages. In order to store received data, this library uses SQLite. As a result, the system is comprehensive and good.

2.2 XML database

XML is used to store routing and navigation data in map input and output. This database is mainly used because of its simplicity, data labeling, and modular nature. Labeling and modularity have made this system consistent with program structure. This database also stores and retrieves data similarly to file-related operation.

In this management system, we used the database to load routes traveled by a movable, monitoring, movable display, the storage of transportation routes, and exchange of meteorological information (via web). XML database uses GPX for monitoring and displaying the movement. This is a global frame and configuration is performed through web. This frame consists of some characteristics such as vertical and horizontal position, height, Greenwich Mean Time and Date, and GPS details.

2.3 SQL Server database

As stated earlier, the basis of the program, which is aimed at managing stored information in mentioned routing and navigation system, is SQLServer. Optimized database in this system consists of data related to tracking device, vehicle, driver, vehicle's owner, companies, applications, etc. with corresponding table for each. DBmanager is the distinctive feature of the proposed model. This class, in fact, consists of updating smart orders (Delete, Create, and Update) which can be easily switched with other databases. This, in fact, shows the modular advantage of this management class. Another operation, performed by SQL Server database in management system, is encryption and decryption. In order to enhance the security level of updating operation in management program, encryption / decryption algorithms were employed. Rigmdeal algorithm was used in management program and encryption / decryption algorithms were used in database.

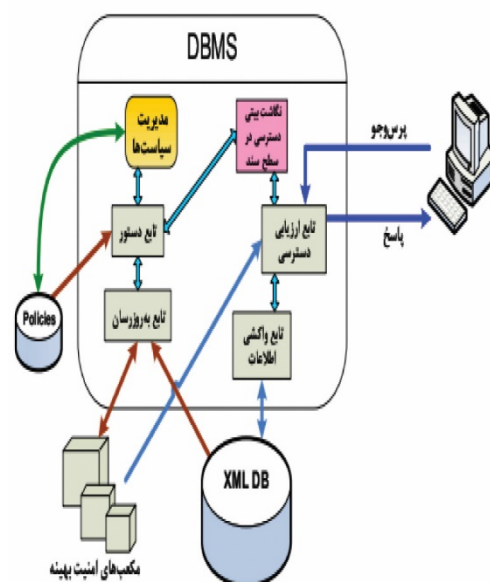


Figure 1: The architecture of proposed model

The pseudo code of DBmanager is as follows:

Test Dbmanger connection with selected database in configuration (automatically or manually)

If any exceptions event happened
Control exception and show managed error with code and explanation in user friendly interface Run module in asynchronous mode(with background worker)

If any exception event happened in any module
Control exception and show managed error with code and explanation in user friendly interface

Encryption function is as follows in the database:

```
CREATE FUNCTION dbo.Encrypt (@str
NVARCHAR(50))
RETURNS VARBINARY(100)
AS
BEGIN
    DECLARE @res VARBINARY(100)
    SET @res =
    ENCRYPTBYPASSPHRASE('PxYjHFFjcQiPelQw2FupAFNs
V8fRjv0eagMRIxA9fCo=',
@str)
    RETURN (@res)
END
GO
```

Decryption function is as follows in the database:

```
CREATE FUNCTION dbo.Decrypt(@encrypt
VARBINARY(100))
RETURNS NVARCHAR(50 (
AS
BEGIN
    DECLARE @res NVARCHAR(50 (
    SET @res =
    DECRYPTBYPASSPHRASE('PxYjHFFjcQiPelQw2Fup
AFNsV8fRjv0eagMRIxA9fCo ,'=
@encrypt (
```

```
RETURN (@res (
END
GO
```

All recorded data in important tables are stored in coded forms in this management system. Therefore, access to the raw data is not possible. To only way to access them, in fact, is to use management program. This leads to a good security system. In order to enhance the speed of search operation, we embedded an indicator on column which is related to record the tracking device serial number and its MAC address.

3. Discussion and results

In this article, the databases are studied in the proposed system. This system is capable of controlling any type of data by a certain database. This system has made the system capable of switching with other databases due to its modular nature. This advantage is not seen in other similar samples. This system is also superior to other systems because of DBmanger class. Table 2 summarizes existing systems and the proposed system.

4. Conclusion

This article aims to create a smart management system for the database in routing and navigation system in order to reduce problems and errors related to updating operation. As a result, a safe environment is created for the protection of users' data. To this end, DBmanager is generated for the smart implementation of updating. We are also able to perform encryption and decryption operations by Rigmdeal algorithm and the algorithm in SQL server. It is claimed that we are able to generate a management system with better

results than similar samples. This is mainly associated with the connection with other existing database, increased updating speed, and the use of server/client system.

Fig. 2: *Create* operation speed in the proposed model and other existing models

Method/Topic	Proposed model	Google Map	Yahoo Map	Sharp Map	Iranian Models
Speed of running and responding	High	Medium	Medium	Medium	??
Using Cache	Yes	Yes	Yes	No	Yes
Multilingual search	Yes	Yes	No	Yes	No
Data encryption / decoder	Yes	Safe Protocol	No	No	No
Number of database	3	1	1	1	1

Fig. 3: *Update* operation speed in the proposed model and other existing models

Table 2: the comparison of the proposed and existing models

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