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ScienceDirect

Procedia Engineering 187 (2017) 526 – 531

Procedia Engineering

www.elsevier.com/locate/procedia

10th International Scientific Conference Transbaltica 2017:
Transportation Science and Technology

Efficacy of Data Security in Managing the Database of SIMMAG 3D System

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Abstract

The basis of functioning of the systems from different industries are reliable data. They can be both input parameters for operation of individual modules and representation of their work results. Due to multitude of functions performed by these systems, number of necessary parameters is very big. The most convenient form for their storage and processing are database with implemented management system. This article presents how to manage database on example of IT system supporting area of logistics – SIMMAG 3D, prepared within framework of a project funded by the NCBR under the Program for Applied Research (PBS3). The aim of system is modeling of warehouse facilities in 3D, their visualization, spatial planning and evaluation of processes occurring in them, as well as placement of objects in logistics network. SIMMAG 3D system has modular structure and each module gets values from database. The flow of data between its elements was discussed. During flow of data can occur risk of access to them by unauthorized entities. This article analyzes database of SIMMAG 3D system in terms of data security against unauthorized access.

Peer-review under responsibility of the organizing committee of the 10th International Scientific Conference Transbaltica 2017

Keywords: SIMMAG 3D, database, data security, decision support systems

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Peer-review under responsibility of the organizing committee of the 10th International Scientific Conference Transbaltica 2017
doi:10.1016/j.proeng.2017.04.410

1. Introduction

Nowadays, there is need to take many important decisions and often in very short period of time [7]. In order to minimize risk of error, which can have more or less serious consequences, there are building systems that support decision-making [9–12, 17]. Their use allows for identification of the problem and using a series of input data for selection of variant, which from the viewpoint of various criteria will be the best.

Because of the size of considered problems, it is necessary to take into account a number of input data, which come from different subject areas. The most appropriate place to support them are database [4]. In databases data are collected according to strict rules and then using systems to manage databases are processed. The database is therefore one of the elements of the IT system [1, 6].

One of decision support systems in the logistics industry is SIMMAG 3D developed within the project funded by the NCBR (The National Centre for Research and Development) under the Program for Applied Research (PBS3). The aim of system is to support modeling and visualization of warehouse facilities in 3D. To the basic functions of SIMMAG 3D system, we can include: modeling of warehouse facilities in 3D, designing of warehouse facilities in 3D, visualization of warehouse processes in 3D optimal placement of objects in the logistics network, designing of supply chains in different planes, shaping and dimensioning of warehouse facilities, scheduling process, internal transport, multi-criteria evaluation of proposed solutions, simulation of the flow of materials in different functional areas of warehouse facilities. For its appropriate work it is required number of input data [18], which are collected and processed according to specific rules.

The article presents how to manage database implemented in IT systems. The flow of data between their elements were discussed. The example of IT system supporting area of logistics – SIMMAG 3D, prepared within the framework of project funded by the NCBR under the Program for Applied Research (PBS3) were indicated. The system has modular structure and each module gets values from database. In addition, analysis of SIMMAG 3D system database in terms of data security against unauthorized access were performed.

2. Database management in IT systems

In each IT system, data are important element. They can be divided into two groups. The first group are input data for operation of individual system components. The second group are data resulting from work of these components, which in addition to resulting function can be used as input data to selected module. Because of the size of some problems, the amount of data can be quite large. To provide a comprehensive data service they are collected and processed in a database. Scheme of a typical IT system is shown in Fig. 1.

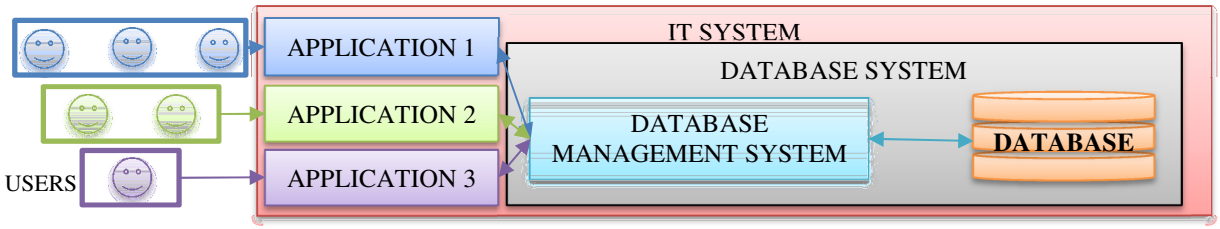

Fig. 1. Scheme of a typical IT system.

In Fig. 1 it can be seen database system [14], which consists of database (DB) and database management system (DBMS). As mentioned above, database is the media on which data describing the reality are stored according to strict rules [2]. For correct storage and gathering of data is responsible DBMS [16]. It allows for [5]: data management, ensuring data integrity and security, their disaster recovery, access to collections by many users at the same time, giving access privileges for particular types of users and optimization of database.

Database system is one of the IT system subsystems, in which should be mentioned client applications allow for access to the database through the management system. The flow of data between database and applications can be