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Digital Competences in the Context of the Integrated Rescue System's Use of ICT

Technologie informacyjno-komunikacyjne na potrzeby zintegrowanego systemu ratowniczego

Abstract

Organisations cannot work without timely, accurate information which is normally provided through a specific information system. All components of the information system must share a common language, be able to mutually communicate, and support the transmission and storage of information.

Keywords: Logistic information systems, Information and communication technologies, Integrated Rescue System

Omówienie

Organizacje nie mogą funkcjonować bez aktualnych i dokładnych informacji, zwykle dostępnych w specyficznych systemach danych. Wszystkie komponenty systemu informacji muszą posiadać ten sam język, aby można było wzajemnie się porozumiewać, przekazywać i przechowywać informacje.

Słowa kluczowe: logistyczne systemy informacji, technologie informacyjno-komunikacyjne, zintegrowany system ratowniczy

Introduction

The level of societal safety of the citizens of the Members States of the European Union is determined by the speed, quality and availability of services provided to the population in situations involving a threat to the life or health of an individual or the public, or their safety, private or public property or the environment, or any other situation in which the affected entity is dependent on immediate assistance. Services involving rescue operations are provided to the Slovak Republic's citizens by the Integrated Rescue System.

1. Logistic System and ICT

The main role of logistic information systems (LIS) is to provide the processing, gathering, transmission and distribution of data within organisations. LIS facilitate the transacting of business and, at the same time, support the decision-making processes at all levels [5]. Pursuant to the planned generally applicable objectives of logistic functions, an organisation must function as a material and technical resource, and both accept and deliver a quality between a reliable supplier and a reliable consumer in the required amount, in the required place and at the required time (Dvořák, 2007).

With regard to its specific functions, an information system is referred to as:

- KWS – Knowledge Work System or Expert Information System;
- GIS – Geographical Information System;
- OIS – Office Information System;
- CAD systems;
- MIS – Management Information System;
- DSS – Decision Support System;
- TPS – Transaction Processing System;
- EIS – Executive Information System.



Figure 1. Information flow management within a logistic network

Source [2].

The main objective of the application of logistic information systems in management can be defined as ensuring rational management through the flow of information across the entire logistic network and at all hierarchical levels.

The goals target that determine the direction towards the main objective. In this case, the main objective of management using a logistic information system inevitably requires the implementation of following three partial goals:

1. Organise the efficient functioning of the flow of logistic system information;
2. Provide the necessary resources required for the flow of information (technical means, hardware, software, communications, personnel);
3. Coordinate and manage the efficient functioning of the information flow.

The processing of data to become information at a later stage requires certain tools, referred to as information technology (IT), and the exchange of such information requires communication technology (CT). A growing demand for those technologies has been seen in many sectors, logistics in particular.

The design of an organisation's information system is based on, first of all, its functionality and purpose, taking regard also of the organisation's available funds.

The following are technical means commonly used in corporate environments:

- Desktop computers, laptops;
- Computer accessories (processors, motherboards, memories, hard disk drives);
- UPS units;
- Monitors, copiers, printers, scanners;
- Servers, modems, WiFi, routers;
- Digital projectors, mobile phones, wireless stations, two-way radios.

A man is the biggest threat to an information system, be it due to intentional action or negligence. To create a well-functioning information system, a man is inevitable at all stages of the preparation, from the information system project definition and preparation up to the launch and improvement of the information system [4]. All preparatory stages require the involvement of various credible and trained persons. The following problems may arise during the information system building stage:

- Inappropriate selection and preparation of people;
- Unclear definition of responsibilities;
- Unclear definition of powers;
- Management's reluctance to listening to others' opinions.

1.1. Information and Communication Technology Used by the Integrated Rescue System

This refers to the use of electronic telecommunications means for the standardised data exchange between entities and transmission of structured business data based on agreed electronic messaging standards between computer systems within an organisation alone. Electronic data interchange (EDI) allows data transmission via the public telephone network or Internet using fixed or mobile lines, or satellite or radio transmission [3]. The transmission of complete data packets in a structured form is enabled in communications between partners using the EAN code. Real-time transport monitoring within the logistic chain helps to track the position during transport and monitor the time to delivery, and respond flexibly to customer's requirements.

Monitoring technologies include the following:

- Global Positioning System – GPS;
- Geographical Information System – GIS;
- Events Activated Tracking System – EATS.

The Global Positioning System is a satellite based localisation system initially developed by the US Ministry of Defence for military purposes. At a later time, the Congress approved its use in the civilian sector, subject to certain restrictions. GPS is able to independently provide positioning information 24 hours a day. The Geographical Information System *is a system representing spatial data of the real world*. It allows the data gathering, searching and storing. The following criteria are taken in regard in the representation of the processed data:

- The position relative to a defined coordinate system;
- Descriptive properties (various statistical data);
- Spatial relations to other objects.

It contains a multitude of precise geographical data, such as a road network mapped by a GPS device, complemented with the street system, objects of interest, areas derived from the satellite imagery of the Earth and GPS measurements [1]. Automatic vehicle location is based on the transmission of information in certain time intervals. The unit is activated as the vehicle is started. When the vehicle is turned off, the unit stops to transmit information. The Events Activated Tracking System is an active monitoring system triggered by events, designed to secure the vehicle and enhance the driver's safety.

The Integrated Rescue System (IRS) uses a system supporting the management and processing of information within the communication information infrastructure of IRS. The system, proven in practice, is used to receive emergency calls and coordinate rescue operations by allowing accurate decision-making. The system also provides real-time access to necessary information for all rescue forces. It creates optimum pre-conditions to facilitate the saving of lives and property by supporting the adoption of right decisions.

The following software applications are most common in real practice: CordCom, Radmon, Sehis 97, Action Report, Redat and geographic information systems.

CordCom, a management support software helps to coordinate the rescue action sequence, from the receipt and identification of a an emergency call to the dispatch of the police, fire brigade, emergency medical service, mountain rescue service, mine rescue service, civil defence chemical control labs, railway police and other rescue corps to the site, as well as a retrospective analysis of action with a view to improving the management of rescue operations.

The use of the Geographic Information System (GIS) and Communication System of IRS is an inevitable prerequisite for localising the caller and quickly analysing the events and the surrounding situation. Obtaining information is important for an as precise as possible definition of the conditions of intervention by one or more IRS corps. This application contains a set of GIS tools supporting the work with maps, complemented with specific tools for working with events. It allows very comfortable and fast map searching, which is inevitable in situations when every second matters.

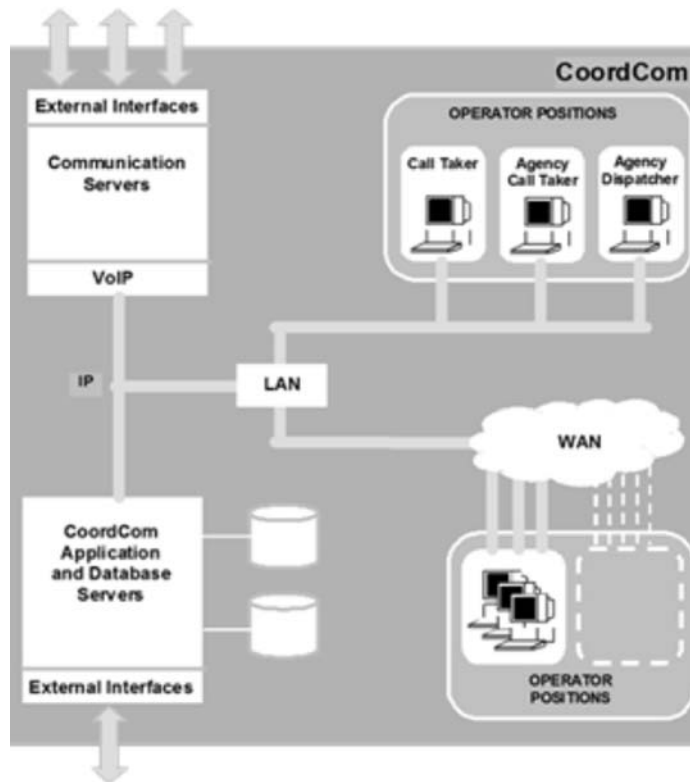


Figure 2. Working principle of a management support system

Source: [3].

Radmon, a radiation monitoring software collects, processes and stores continuous radiation measuring results. The continuous radiation monitoring system comprises monitoring points distributed across a specific area. A measuring station incorporates a probe serving as the ionising radiation detector, a computer and software. The measuring in a normal mode is made every ten seconds and the readings can be averaged on hourly a daily bases. The system triggers the emergency mode by giving out an acoustic alarm signal when the warning level is exceeded.

Sehis 97 is a comprehensive system used to warn and notify persons. The user software comprises modules that allow the two-way selective control of sirens and support interim warning system testing. It also allows data communication and RDS messaging between the different warning and notification systems. It is based on the technology of the national warning system which currently encompasses over 2000 sirens controllable from 30 warning centres.

Action Report is a software application used by the Fire and Rescue Force in addition to the management support system mentioned above (CordCom). The system used for statistical monitoring by station. The overall course of an action is recorded in the system, including the names of the involved staff, type and place of action, a detailed description of the location, times of arrival to and departure from the site and the duration.

Conclusion

An uninterrupted flow of information is crucial to a quick response and correct decisions at all management levels. A particularly important organisational step is, therefore, the deployment of advanced information and communication technology to facilitate the work. The information system of the Integrated Rescue System constitutes a fundamental pillar in ensuring the state's security. Any failures of the information system and communication are unacceptable since quick response is the critical factor in situations concerned with saving human lives that often involve a race against time.

The informatisation of public administration and general government should be seen in the context of the employment and use of information and communication technology (ICT) as a controlled process that should take place across the entire structure. It is a process of creating societal, legislative, methodological, technological, organisational and staffing conditions to enable and manage the efficient application of ICT in the exercise of administration and government. The result of this process is an efficient electronic form of government, e-Government.

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