THE IMPORTANCE OF INTEGRATION OF INFORMATION COMMUNICATION SYSTEMS IN TRANSPORT

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Summary: This article describes the integration process of information systems in transportation. Introductory section is devoted to the theoretical framework of information systems in transportation, also presents some practical information about using information systems and explains the reason for the integration of information systems in transport.

Key words: Transport systems, information systems in transport

1. INTRODUCTION

The current crisis in the world, have significant limitations on financial resources in all sectors of the economy. There was a significant decrease in the volume of shipments, on the road network by 40%, on the rail network by 45%, in other modes of transport by 30%. A significant decline in consumption leads to the slowdown in the financial, material and transport flows.

2. THE THEORETICAL FRAMEWORK OF INFORMATION SYSTEMS IN TRANSPORTATION

For a proper understanding of the functioning of transport systems is required to characterize transport system. It is a system that includes a stationary subsystem, mobile subsystem and management subsystem. If we consider as an example rail transport, it is possible to describe the system as it is shown on Figure 1.

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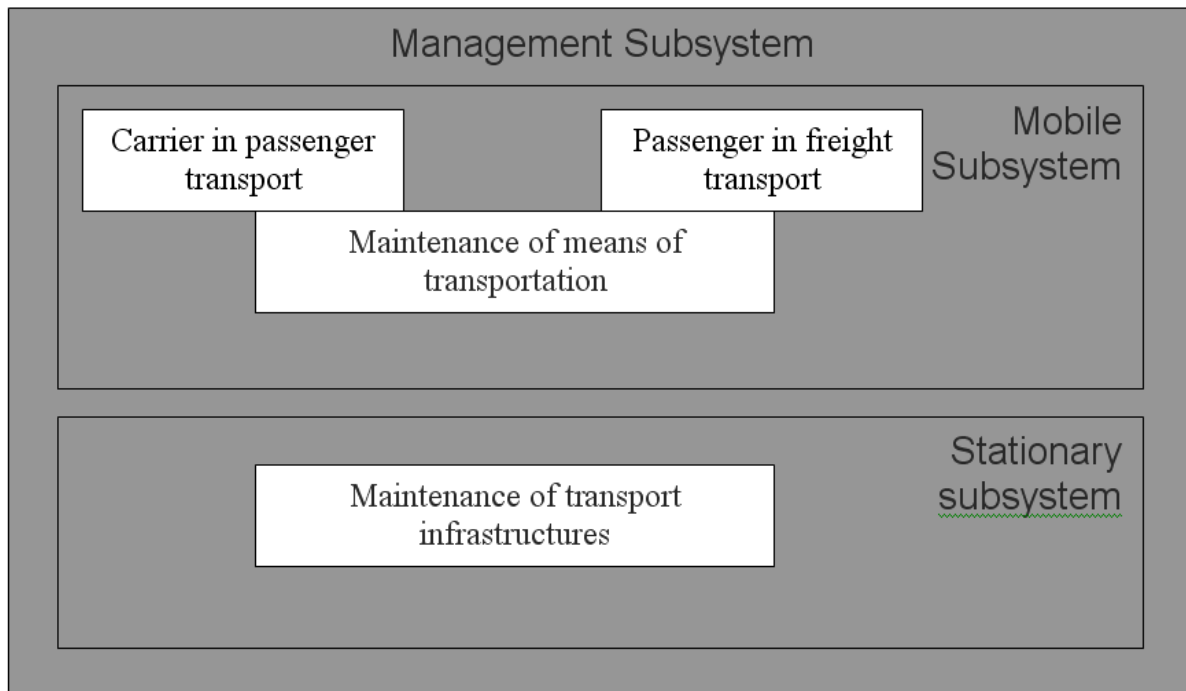
Source: Authors

Fig. 1 - Relationships of subsystems in the transport system

3. INFORMATION SYSTEMS IN PRACTICE

In the context of the concept of the transport system, it is important to define the concept and information systems in transport. Usually these information systems will provide information on the status of infrastructure, the state of the vehicle and its load and driver - his ability, fatigue, disposition and experiences. Let's have a look on examples of stationary and variables information system for passengers in the bus and air transport.

Source: Authors

Fig. 2 - Preview of stationary variables and passenger information systems

In real life, as part of the management subsystem are still more and more implemented managelent systems based on real monitoring of the transport system – See figure - management of highway transport in large agglomerations.

Fig. 3 - Example of integrated information system for traffic on the highway

3. THE INTEGRATION OF INFORMATION SYSTEMS

Integrated Information System (the IIS) is generated from data base, data structure, hardware, software and organizational links. It usually has more complicated, complex and precise links, while the number of elements in the integration decreases. IIS is in comparison to usual IS more complex, dense and comprehensive. The ideal IIS is done by complete integration. Currently it is based on the basic integration - that means the basic nature of the turnover in the information system. A typical feature of integration is the unification and linking by-now isolated subsystems. Viewing reality is more complex, resulting from the combined information is enriched by many parameters.

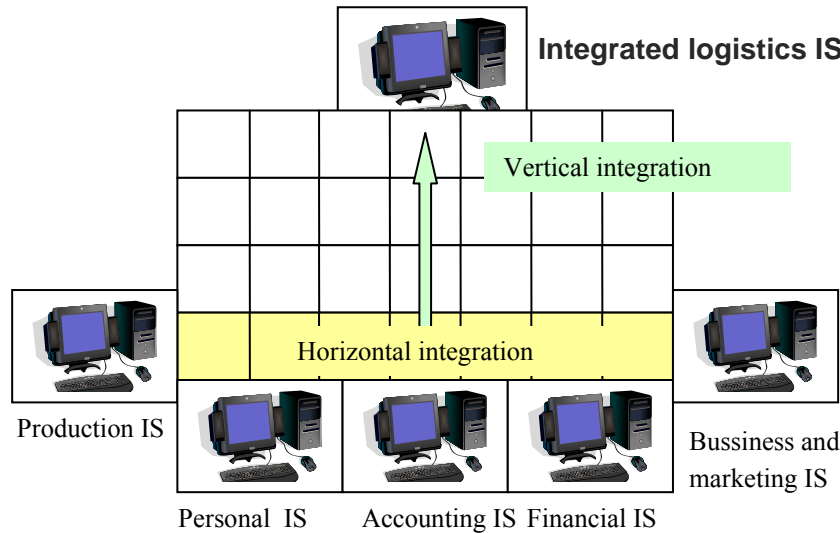**The reason for the integration of information systems**

Initial systems are generally decentralized, based on batch data exchange. Creation of a new IIS usually requires a high coordination of the work sometimes dozens of subcontractors. Generally, it is possible to formulate the objectives of the following upcoming IIS as following:

- to automate the collection of corporate information,
- to integrate the processes and their resulting data and information,
- to cover all critical processes in information system,
- to provide accessible information system for all production and economic centres,
- to create a centralized IIS,

- to accelerate the flow of information in society.

Integrating information systems are organized in two levels:

a) horizontal - one of the subsystems, the levels,

b) vertical - the process of getting from one resolution level to another, and to lower levels to higher levels - the route aggregation, or data path of the most important information.

Integrated logistics IS

Vertical integration

Horizontal integration

Production IS

Bussiness and marketing IS
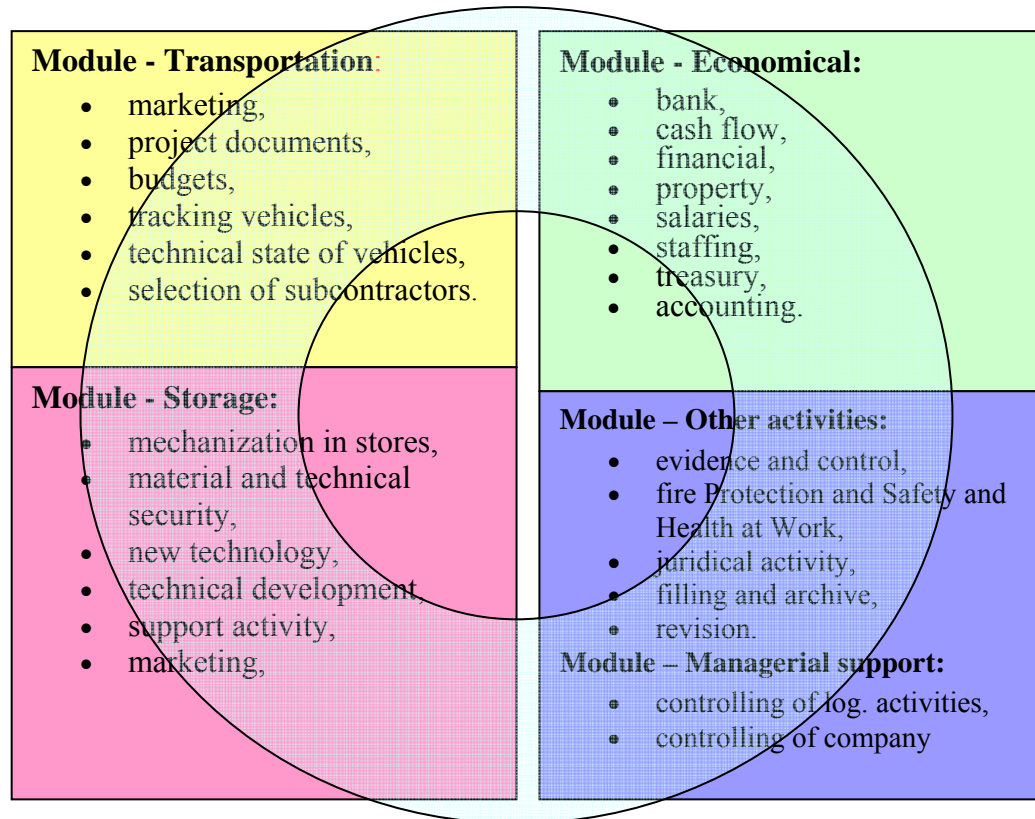
Personal IS   Accounting IS Financial IS

Source: Authors

Fig. 4 - Horizontal and vertical integration, integrated logistics information system

The strategic objective of building IIS is to improve support for management decisions and pave the way for the creation of management information system. As a possible model of the IIS architecture for construction companies can be used modules listed in Figure 5.

In a business environment, are proceeded those activities which have the highest priority. As an example where in the first stage of solution information system is introduced to support marketing processes, and processes for the preparation of contract. Than follows the information system to support the economic and labour processes. In the next step of the information system is to support construction management production and information system supporting the production of a construction, such as traffic engineering and other production. Following the introduction of various parts of IIS it is needed to test it or set a test operation. After tuning problems it is possible to start working in routine operation state. The main benefits of IIS usually cover:

- centralized data base, security of data processing in real time,
- availability of a wide number of data users,
- provision of the data base of production-economic organizational units distributed outside the factory,
- the provision of real data for the top decision-making.

Module - Transportation:	Module - Economical:
• marketing, • project documents, • budgets, • tracking vehicles, • technical state of vehicles, • selection of subcontractors.	• bank, • cash flow, • financial, • property, • salaries, • staffing, • treasury, • accounting.
Module - Storage: • mechanization in stores, • material and technical security, • new technology, • technical development, • support activity, • marketing,	Module – Other activities: • evidence and control, • fire Protection and Safety and Health at Work, • juridical activity, • filling and archive, • revision. Module – Managerial support: • controlling of log. activities, • controlling of company

Source: Authors

Fig. 5 - Architecture of model IIS for a logistics company

Technical part of integrated information systems

Each IIS project is based on the functioning of local servers, the intranet and enabling communication through the Internet. At headquarters it is recommended to install two database servers, application server and terminal server. To subordinate sites are servers, which serve as a domain, communication and local file servers. Software support database operations can be handled, for example by database system MS SQL Server 2000 Enterprise Edition, which also operates under the MS Windows 2003 Server. Any upcoming IIS is designed to enable work of a few hundred users.

The benefits of integration of information systems

During the integration decreases the number of differentiating features and it changes the number of links between them. Non-transparency and chaos change into clarity and order. In parallel, it is necessary to create special tools to integrate. These instruments are for examples following methods:

- balance sheet analysis
- functional analysis,
- modelling,
- production of indicators.

4. CONCLUSION

The aim of the article was to bring insight to the process of integration of information systems in transport. The present period can be characterized as a period of massive development of navigation systems for drivers. It also brings intensive development of electronic information systems for passengers as well as reconstruction of old semi-command and information systems to fully automatic - computerized command and control systems.

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