

Model of Information Integration of Management in Road Transport Companies

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Abstract: In modern business conditions, the management of work by road transport companies is becoming more and more complex, and it is challenging to manage the companies' management and business continuously before the management of these companies.

The expansive development of information and communication technologies, technique and technology, the globalization of the world economy, the ever more diverse requirements of transport service users require efficient adaptation of the business of road transport companies. The application of modern information and communication technologies facilitates the business and operation of road transport companies, and management information systems create the preconditions for efficient decision-making by all decision makers in road transport companies.

In order to improve the process of managing the work of a road transport company it is necessary to explore the possibility of information integration of the management of a road transport company, which will integrate all the managers regardless of the level of management they belong to. Infrastructure integration is necessary in the horizontal line of management, especially operative and medium, and in the vertical line all levels of management (top, middle and operational).

In this paper, a new model of information integration of management will be proposed, which can be applied in medium-sized and bigger transport companies.

Keywords: road transport companies; road transport; information systems; management.

INTRODUCTION

Road transport is an open and dynamic system within which car transport companies operate which carry out public transport of goods and / or passengers.

In modern business conditions, the management of road transport companies is becoming more and more complex due to increased competition in both the domestic and international transport market, globalization of the market, technical and technological development, and so on.

The complexity of the business of road transport companies imposes the need for adequate information to managers at all hierarchical levels of governance.

As a prerequisite for a successful and efficient management of the operation of a road transport company, the availability of management is timely, useful and accurate information that will be used in the decision-making process.

The expansive development of information and communication technologies has a strong impact on road transport. Road transport companies that perform public road transport of goods and / or passengers must use

modern information and communication technologies in their work to ensure survival, achieve an adequate level of competitiveness and development.

Decision makers in road transport companies have at their disposal modern information systems that enable them to make decisions efficiently.

In order to more efficiently manage road transporting companies it is necessary to provide information integration of management at all hierarchical levels.

In this paper, in order to improve the management process in road transport companies, the possibility of horizontal and vertical information integration of management in road transport companies will be explored and a new model of information integration proposed.

REVIEW OF THE PROBLEMS IN THE LITERATURE

Road transport companies are open and dynamically complex systems operating in a changing and turbulent environment.

Thus, according to Peter Drucker [1] “the future development of the global environment can be observed in the following way:

- The world economy will continue to be highly competitive and turbulent,
- There will be an urgent need for information from the external environment of the organization,
- Knowledge as a resource will increasingly be accepted in the heads of employees in the organization,
- Management will significantly change the attitude towards employees, as the organization of the future will be composed of highly skilled staff,
- Organizations will have to show their employees how important they are,
- The notion of “management” will have to change its meaning and content and focus on knowledge and learning as the basic elements of organizational success.”

“Management is the process of planning and deciding, organizing, managing and controlling human, material, financial and information resources of an organization in order to achieve its goals in an efficient and effective manner.”

The author of the previous definition Peter Drucker gave a simplified definition: “management is an effective and efficient use of resources to achieve the desired goals”.

A well-known theoretician in the field of information technology for management Efraim Turban defines the information as follows [2]: “Information is data that is organized so that it has the meaning for the recipient”.

Turban and his associates further define the information system management as follows: “systems that support management in functional areas are called information systems management”.

Speaking about the importance of information technology, Turban states [2] that “for real success it is necessary to know how to use information technology to improve their performance (quality, speed and efficiency in doing business) and how to improve their products and services so that they get a greater usable value with consumer aspects”.

Famous theorist James O’Brien states [4] that it is important “that managers and IT experts realized that data and information are an important organizational resource.”

Road transporting companies through the development of information systems create the preconditions for gaining competitive advantage in the transport market.

It is necessary to know that the competitive advantage in practice does not last long and that the competition quickly responds to changes, harmonizes its business with them and thus improves its development.

From the foregoing, it can be concluded that road transport companies must constantly identify models for improving the management of the company’s operations in order to maintain an adequate level of competitiveness in the transport market.

Thus, on the management of road transport companies, the permanent task is to improve the process of managing the operation of road transport companies through the founding of new models.

ORGANIZATION OF ROAD TRANSPORT COMPANIES

One of the most important conditions of a rational organization of a road transport company is its size. Road transport companies determine their internal organization autonomously, and in terms of structure, it is projected in a vertical and horizontal line, vertically from top to every single workplace, and divisions, departments and / or sectors are formed in the horizontal. The structure of the internal organization of the road transport company has no limitations, but it depends on the processes and scope of transport and the complexity of the work that the company carries out in that process. Every modern road transport company has its own organizational scheme that is designed based on the established organization and business policy, and in accordance with the personnel resources and the degree of development achieved by the road transport company.

In modern business conditions, carriers must adapt their organization in line with changes that occur in the environment and in line with changes in the company itself (a significant increase in the number of means of transport, the expansion of the transport market, etc.). Only in this way road transporting companies will be able to keep up with competition in an increasingly demanding transport market and provide effective adaptation and adequate level of competitiveness.

Organizational structure of a road transport company

Despite the differences that are reflected in the size, purpose or specialization of transport capacities, an organizational structure can be designed, in practice, with most road transport companies that are larger or average in size.

In an average size or larger car carrier, it is common to organize functions across sectors, and the most common ones are:

- transport sector,
- technical maintenance sector,
- the financial and accounting sector,
- the commercial sector,
- general affairs sector.

The diversity of road transport companies by size, purpose, means of transportation, territorial coverage, etc. shows that it is not possible to design a universal organizational scheme for a road transport company[3].

Therefore, it can be concluded that the functional model of the organizational structure is applied in larger road transport companies.

The basic characteristic of the functional model of the organizational structure is that it is a centralized organizational structure that is based on a functional grouping of tasks, and functions in an enterprise are organized on the optimal number of sectors and services.

STRUCTURE OF MANAGEMENT IN ROAD TRANSPORT COMPANIES

Given that the most commonly used medium-sized and larger carriers are the functional model of the organizational structure with the projected sectors and services, hierarchical levels of management are designed accordingly, and the number of managers is determined.

Accordingly, three levels of management in road transport companies can be formed[6]:

- top management,
- middle management,
- operational (lower) management

Figure 1 shows the levels of management of the road transport company by vertical line

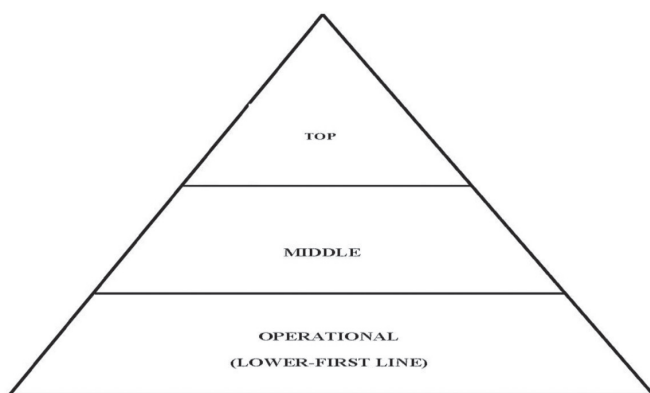


Figure 1. Levels of the management of the road transport company by vertical line

The top managers define business policy, ie goals and strategies for their realization. They also make the strategic plans for the development of a road transport company and are responsible for the functioning and performance of the company's operations.

The structure of top management in road transport companies is most often comprised of: board members, executive directors, executive assistants, etc.

The middle management of a road transport company is positioned between the top and operational management and it is tasked to elaborate the strategy and transfer the plans and goals from the top to the operational management.

Middle managers are responsible for the implementation of policies and plans brought by top managers and they coordinate and control the operation of operational managers.

Also, middle managers are authorized to manage organizational units or sectors and are responsible for the results of these organizational units.

Middle management consists mostly of sector directors, managers, etc.

Operational managers are managers at the lowest level through the hierarchy of the management of a road transport company and their task is to coordinate and monitor the work of direct executors. They are responsible for the daily activities of the company.

In road transport companies, operational management must provide the necessary resources for the production of transport services such as:

- motor fuel, lubricants, tires, spare parts for transport means,
- necessary personnel (drivers, car mechanics, workers of other specialties),
- necessary professional staff (dispatchers, operators, controllers, etc.),
- necessary staff for procurement, sales, accounting, administration, etc.

The operational management of a road transport company includes all managers who manage services, units or drives, that is, those in the first line from the execution of jobs.

MANAGERS' NEEDS FOR INFORMATION IN ROAD TRANSPORT COMPANIES

In order to efficiently and effectively manage the road transport companies, it is necessary that managers, as decision-makers in the decision-making process, have timely, accurate and useful information [5].

According to the hierarchical levels of management, the management information systems in the road transport company should provide information for[6]:

- top management,
- middle management.
- operational (lower) management.

Top management in road transport companies needs information that relates to the whole enterprise.

Based on this information, the top management determines the business policy and goals of the road transport company, as well as adopts the company development strategy.

Middle management in road transport companies has a need for information related to the work of organizational units (sectors) they manage. This information refers to the needs for transport services, then the information necessary for the planning of the volume of transport, the accomplished transport work, the personnel necessary for fulfilling the tasks of the organizational units, the realized revenues, expenses, etc.

Operational management in road transport companies has the need for information related to the execution of certain tasks such as information on the engagement of transport vehicles and rolling stock, the transport process, the cancellations of means of transport, the results achieved, the revenues and expenses, the working conditions, protection at work, etc.

MODEL OF INFORMATION INTEGRATION OF MANAGEMENT IN ROAD TRANSPORT COMPANIES

The intensive development of information and communication technologies, the improvement of transport means, the growing and diversified requirements of the users of transport services, and the increasingly pronounced competition in the domestic and international transport market condition the necessity of the modern operation of road transport companies.

The modern business of road transport companies can not be imagined if the company does not use modern information and communication technologies both in the operational part and in strategic planning and decision-making [5].

Application of information systems in road transport companies raises the level of quality of transport services, enables efficient operation and safe transport process, facilitates the decision-making process of all decision-makers, etc.

Modern road transport companies increasingly depend on computer information systems in terms of processing operational data, financial reports, human resources management, business transactions, management of individual organizational processes, etc.

Timely and efficient decision-making by the management of a road transport company provides a high level of transport services, and thus directly influences the level of competitiveness of the road transport company.

In order for an road transport company to operate efficiently on the transport market, it is necessary to integrate the information management system, that is management.

The information integration of the management of the road transport company is a new model that will ensure the functioning of the company on modern principles and will contribute to a significant competitive advantage in the transport market.

The new model of information integration of the management of the road transport company implies a dual integration:

- horizontal information integration of operational and middle management and
- vertical information management integration.

Horizontal information integration of the operational management of a road transport company

Horizontal information integration implies information flows at the same decision-making level and represents a modern form of integration, as it provides mutual exchange of information and data between all operational managers in the road transport company.

Operational managers in the road transport company are in charge of planning and executing operational tasks and tasks that they perform within regular business activities. They perform these tasks within all sectors, or services in the road transport company.

In modern business conditions, road transport companies are extremely important for operational management to be horizontally integrated in information, that is, that they have all the necessary information that they can use from a single database.

Figure 2 shows an example of horizontal information integration of the entire operational management of a road transport company.

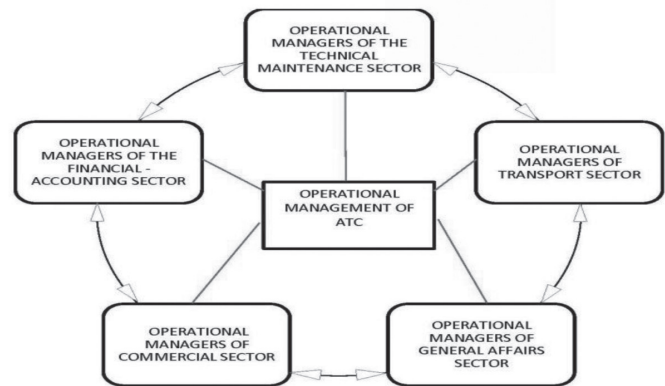


Figure 2. An example of horizontal information integration of the operational management of a road transport company

It is very important to note here that when designing horizontal information integration of operational management, operational managers must not be overloaded with redundant and unnecessary information or reports, for example, the same information is not required to the manager of the traffic operator and the manager of legal affairs.

Horizontal information integration of operational management enables operational managers to easily plan business operations, simplify communication and organization, and more effectively monitor and control all processes in the road transport company.

Horizontal information integration of middle management in road transport companies

Middle management in road transport companies in the governance process plays a very important role because the hierarchy is between top management and operational management and represents the level of management entrusted with the tasks of realizing plans and goals and achieving results.

In road transport companies, middle management, most often, consists of sector managers (transport manager, technical maintenance manager, commercial manager, financial manager, etc.).

Mid level managers manage organizational units (sectors) and propose to the top management the organization of these sectors, determine the work plans of the sector (annual, quarterly and monthly) and control the operations of the operational managers or the services they manage.

In order for the management of road transport companies to be efficient and functional, it is necessary to perform horizontal information integration of middle management.

The integration of information and reports exchanged by middle managers among themselves, depending on business activities, has multiple benefits for the whole process of managing the operation and operation of a road transport company.

In modern conditions of business of road transport companies, a large number of information and reports are available to middle managers, so it is of the utmost importance that these managers do not get overloaded with redundant and unnecessary information and reports.

Figure 3 shows an example of horizontal information integration of middle management in road transport companies.

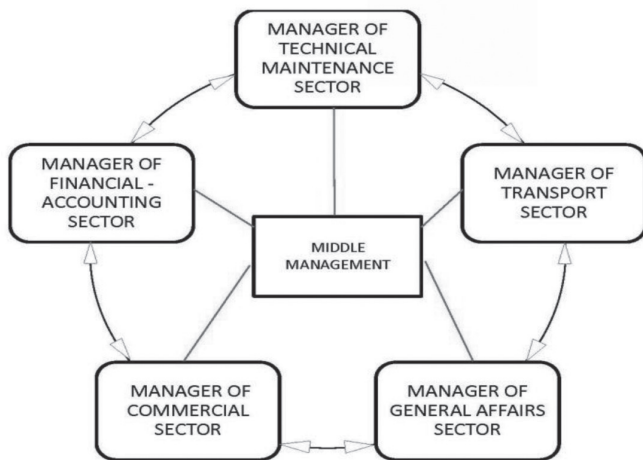


Figure 3. An example of horizontal information integration of middle management in road transport companies

Vertical information integration of management in road transport companies

Vertical information integration involves information flows between different levels of management, from top management to middle to operational management (from top to bottom) and vice versa from operational management through middle to top management (from bottom to top).

The information that goes from top management to middle and operational management is management decisions, and the information that goes from operational management to middle and top management is input information.

From this it can be concluded that vertical information integration of management represents an important segment in improving the management of the management in road transport companies.

In this way much more efficient work of all levels of management is achieved and they achieve significantly better results of work and better organization of all managing structures of the road transport company. Figure 4 shows an example of the flow of information in the system of vertical information integration of management in road transport companies.

Figure 4 shows an example of the flow of information in the system of virtual information integration of management in road transport companies.

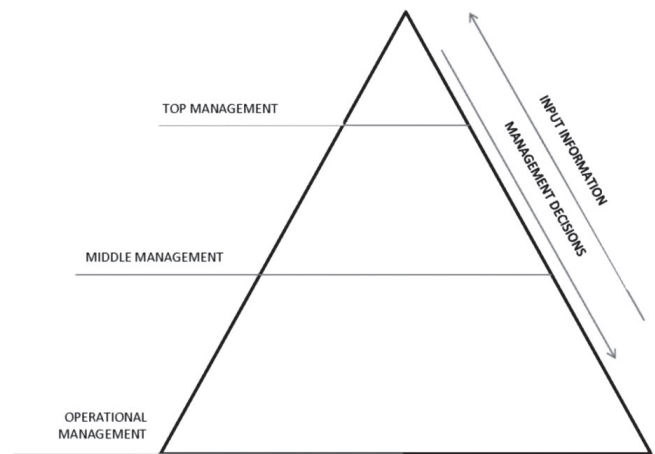


Figure 4. An example of the flow of information in the system of vertical information integration of management in road transport companies

Expected effects of the proposed model of information management integration

By applying a new (proposed) model of information integration of management in road transport companies, the management process would be significantly improved and in this way would create the preconditions for more efficient and effective operation of the road transport company.

At all stages of the management from the planning process to the control process, better communication

would be achieved and considerably facilitated the decision making process.

As a result of the information integration of the management, the organization of the entire transport process will be significantly improved, which will result in the improvement of the quality of the transport service and the level of competitiveness of the transport company in the transport market.

CONCLUSION

Road transport, as an open and dynamic system, is very subject to change, especially those that come from the environment, so road transport companies need to permanently adjust their organization and business exactly to these changes.

Road transport companies, as complex systems by their organization, operate on an increasingly demanding domestic and international transport market.

In modern conditions, road transport companies must use modern information and communication technologies in their work in order to ensure more efficient operation, increase the level of quality of transport services and maintain an adequate level of competitiveness in the transport market.

Managing the operation of road transport companies is a complex process that is becoming more and more complex with the expansive development of information and communication technologies, increased competition in the transport market, globalization of the economy, growing demands of users of transport services, requirements for environmental protection and so on.

In this paper, the possibilities of improving the management of the operation of road transport companies have been explored through the proposed model of information integration of management, which is necessary to be implemented through horizontal information integration, especially operational management and middle management, as well as vertical information integration.

Improving the management of the operation of road transport companies through this model is reflected in the more efficient work of the overall management of the road transport company, significantly faster flow of information between decision-makers in the decision-making process and certainly better communication in the company, resulting in a more competitive appearance in the transport market.

Horizontal and vertical information integration of management in road transport companies will provide for a more efficient management process in all phases from planning to control.

In further research of this model, it will be necessary to explore the possibilities of information integration of the sales function, especially from the aspect of road transport companies that are territorially dislocated or road transport companies that operate as dependent companies (eg more road transport companies with the same owner). Thus, it is possible to supplement the proposed model of information integration of management especially with larger road transport companies.

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