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## METHOD OF THE OPERATION CONTROL ON THE RAILROAD SIDINGS OF THE FREIGHT OWNERS IN THE CONDITIONS OF IT DEVELOPMENT AT THE RAILROAD

*Analysis of the available methods of the clients (freight owners) service at the railroad-siding facilities (non-public places) during the handling of documents and operations of carriages loading/unloading using the PC software is carried out. The development of new tool in the form of the fast acting access, involving the mobile application is suggested.*

*Arrangement of the interaction of the railroad with the users of the railroad services (freight owners) is realized by means of signing documents, confirming the realization of the commercial operations with carriages and loads in the points of the carriages transfer between the participants at freight points.*

*According to the available tooling base of the customers, who use the services of the carrier, there is the software for PC, web-sites and Intranet servers. Software is installed on the stationary work places of the operators, who take part in the freight delivery to the freight owner.*

*Authors suggest to use the technique of data processing and usage in the program, developed on the base of the platforms apk and iOS.*

*Importance of the research is stipulated by the necessity to provide the efficient methods of the control and analysis of the data entry of the freight for the presentation of the events, taking place in the process of the carriages reception at the terminal points of the freight operation, including their preparedness for the transportation by the railroad.*

*The researchers underline that IT support of the technological process, taking place at the railroad is a necessary condition for the development of the optimization models of the interaction systems [2]. Examples of ACS possibilities usage, formalization of the operation process events at the interaction with the consumers of the services, at determination of the time of the delay start and end of the carriages and freight, delivered to recipient of goods are suggested in the research [3].*

**Key word:** *railroad siding, receiver of the railroad services, software, mobile application, IT, intranet, apk, iOS, electronic document flow.*

### Introduction

Client-oriented approach is the key for the involvement of the services consumers, increase the volume of transportation and increment of the financial benefits for the railroad.

This problem was studied in the research of the Candidate of Science (Engineering), Assistant Professor Kyrychenko G. I., «*Optimizations of the interaction of the railroad and freight owner – the aim of the development of Information Technologies (IT)*».

Information Technology is the most advanced form of knowledge in social production. Information Technologies (IT) enable to optimize various information processes, activate and efficiently use the information resources of the society [1].

Nowadays the IT development gains the intensive character and actual demand. Business, production processes, control systems, culture – all these branches widely use IT technologies.

At the same time, in spite of its revolutionary nature IT technologies did not cancel completely production processes and did not deprive people from the right to decision making – however IT technologies simplified the work and helped to save time and money.

Tooling for freight control has changed. In its turn, tooling influenced greatly all the processes, namely: planning, organization, management, control.

**Problem set up:** Perform the analysis of the available technology of data transfer in the processes of the control and management of the acceptance and transfer of carriages and containers on the freight points of the users tracks.

**Aim of the research:** Determination of the application efficiency for the mobile platform.

Propose the developed suggestions for the work of the freight owners with railroad.

**Main material:** Control over the complex by the structure and form model of the railroad transportation (and commercial work, in particular) must provide presentation of the complex information in the simple form, with a possibility of viewing the whole data base of documentation within the limits of one application, thus calibrate information processes, prior to the event itself, as a result, the transfer, reception, exchange, conversion, usage and storage of information will be performed [6 – 7].

Operational events, taking place at the railroad are reflected or fixed in the system «Unified automated system of the freight transportation control of Ukrrailroad» (ACS FT UZ-U).

AS, AWP, ACS – these are automated control systems (work places), which are referred to the program products with the interface, where the operator can work with input, output, storage, accumulation and processing of the information, that interacts with the data bases, created for the personal of the freight railroad stations, calculation and logistic centers, specialists of the commercial management of the railroad.

Complex automation of the technological processes of freight the railroad stations created the preconditions for the implementation of the electronic documents flow first in the internal technology then in the interaction with clients.

One of the important functions of the mobile application is the possibility for the client to view the normative railroad base: Railway Transportation Rules, Railway Shipping Rules, Traffic Provision, List of the classes of Transport Rates, Regulations on the Transport of Dangerous Goods, Agreements on International Goods Traffic, etc.

Interaction, namely acceptance and transfer of carriages, signature of the corresponding documents of the railway with the customer is carried out in the places, determined during formation of the contract between the participants, namely – railway according to the terms of the agreement may deliver the carriages with the freight on the railway siding facilities for the consumer at the freight points for the realization of the loading operations or transfer the carriages with the freight at specially fixed places on the railway siding facilities, if the client has his own shunting locomotive. Information, regarding the operations execution requires rapid and reliable transfer to the central system, where calculations, exchange of data, concerning the account of the interaction and drawing of financial documents, formed for mutual calculations, carried out, is shown in the diagram, Fig. 1.

Expedience and reliability of the data regarding these processes is needed for all the participants of the process.

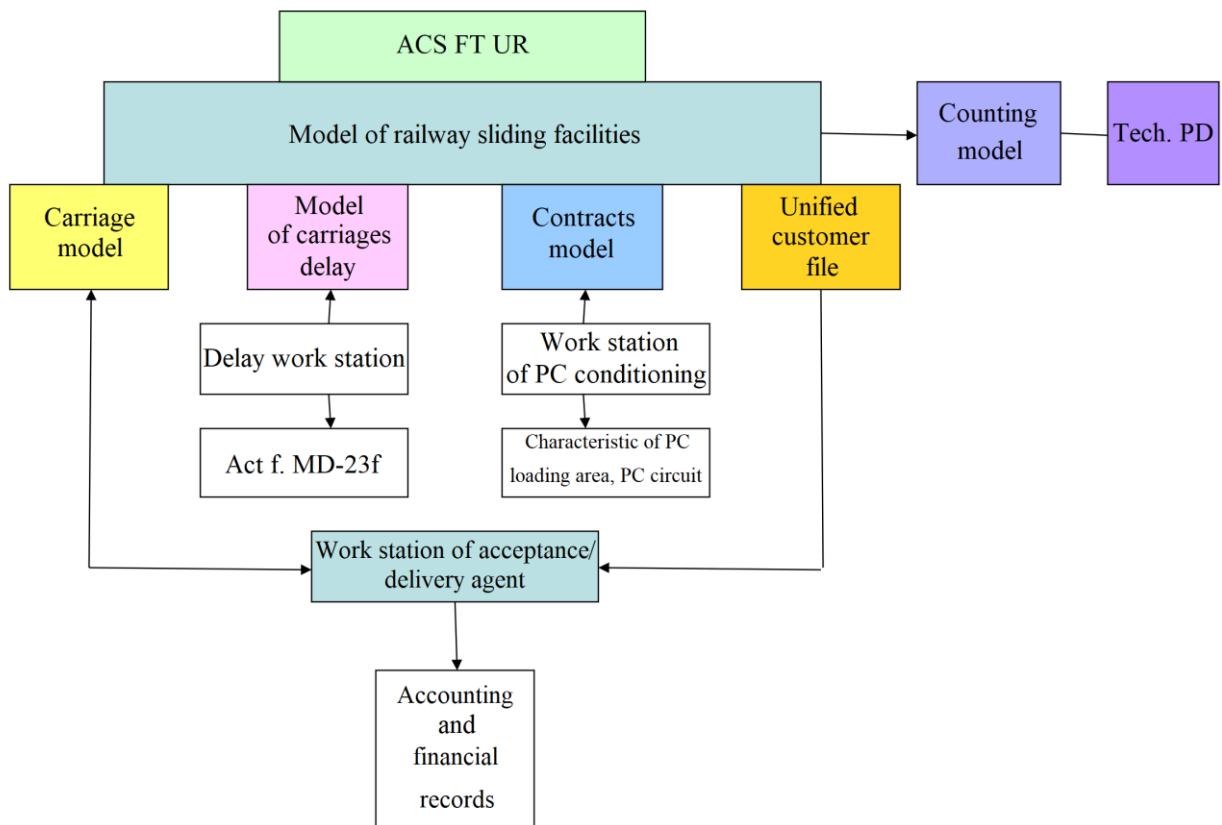


Fig. 1. Scheme of mutual exchange of data on the account of the interaction for mutual exchanges

*Non-public railway tracks* – are railway siding facilities, connected directly or by means of other railway siding facilities to the public railway tracks and are intended to provide services to the customers (clients, freight owners) on the conditions of the contracts or execution of the work for the own needs of the carrier.

Non-public railway tracks, may belong to the owner of the infrastructure and other legal entities, entrepreneurs.

Place of loading/unloading of freight is a part of non-public railway tracks, directed to the unsheltered storage areas or sheltered warehouses (packhouses).

Content of the events, taking place is shown in Fig. 2.

## Components in calculating the time spent by the wagons in use by the customer

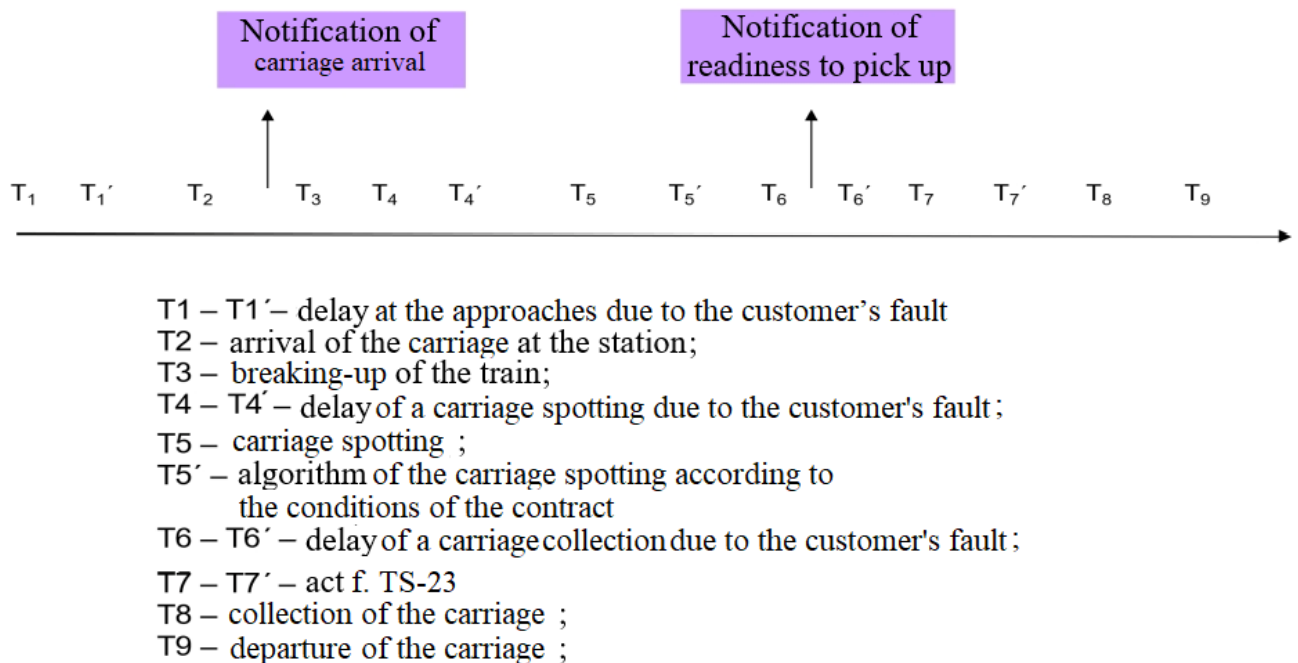


Fig. 2. Events which compose the circulation of the carriage at the railway siding

Term «carriage turnover», used in this context – it is the time, needed for the execution of the whole complex of operations, connected with the handling of the carriage at railway siding facilities from the time of the arrival and to the return of the carriages to the delivery-acceptance tracks of the connecting station.

Production estimate of the carriages stay duration at the railway siding facilities is one of the most important conditions of their operation and main component of the contracts and unified technological processes. If the customer loads and unloads without undue delay his freight and the carriage is not delayed under the operation «Slow handling operations», this will reduce the customers expenses and increase the profit of railway.

The value of the time is influenced by the level of the technical equipment and technology of the railway sidings operation.

Accounting of the time of the carriage stay at the railway sidings is recorded and is shown in such documents as: Spotting picking time sheet (f. MD-46) on the base of the memory card about carriage spotting picking of the carriages and acts of general form, if they are composed (MD-23).

During the carriages, containers stay at the railway siding facilities of the customer, freight owners pay the carrier for the carriage hire charge according to the railway Tariff Provision № 2 (Tariff the catalogs).

It should be noted that Tariff Provision № 2 is normative-legal document, which fixes the extent of the payment for the stay duration of the carriages containers in consignors, receivers or for the idle time of their supply or receiving for the reasons, depending on the consumers or railway.

Transfer of the loaded /empty carriages on the railway siding facilities is confirmed by the document (Form MD – 45).

Delay of the carriages at the station waiting for the delivery of the carriage on the railway siding

facilities of the customers fault or railway is documented by the act of the general form (form MD – 23), including the numbers of the delayed carriages.

To provide correctness and computation chain the object of management is selected – carriage and container, that is why, it is expedient to perform the account of the time of carriages, containers stay at the railway siding facilities of non-public usage by means of number method.

Processing of the documents in electronic form enabled to automate the handling of the records of the delivery and collection of carriages, improving the quality of the accounting.

Payment settlement procedure for carriages, containers usage with the rail carriers is determined in the contract for railway sidings operation and in the contract for delivering and collection of carriages.

If the customer on the railway siding has his own rail tractor, the contract is signed with the customer «On the operation of the railway siding facilities», if the customer needs the delivery of the carriages directly to the railway cargo fronts – in this case the contract «On the delivery and collection of the carriages» is signed.

As we see, the events, with the carriage and freight, occurring in the process of the customer service, are recorded and taken into account in financial documents for the settlements with the railway office. That is why, it is important to have reliable information, regarding the event in the processed of the operation with the carriages and containers. Unfortunately, actual level of the technical equipment of the work places is low and the technology of the railway siding operation does not meet all the necessary requirements, needed for the realization of the rapid and timely termination of the handling processes.

Problem of the development and implementation of new method of events accounting, based on the usage of the application for mobile platform is really important problem.

Total market of the mobile platforms comprises:

– 51.2% of the platforms, on the base of which mobile devices operate are apk (**Android Package**) format of the extension of the archived files-applications for Android, where all the necessary data are archived in one file, which includes the whole code of the programmes, resources and libraries;

– 43,5% of the platforms on the base of which mobile devices operate is iOS (**iPhone OS**) mobile operation system for the smartphones, tablets, players and other devices, developed and manufactured by American company Apple;

– 5,3% are other platforms (Windows Phone, Symbian).

As the main base of such system the available ACK BII V3-Є and its subsystems is proposed to use, their task is to provide information support of the customers. They include computational platform, which will answer the requests of the customers. The suggested technology of data processing accelerate the time of the events transfer to the general data base.

As a result, there appears the need to use ACS FT UR-Є and its subsystems AWS TA(work place of the commercial staff, cargo and baggage acceptance /delivery agents), AWP FC(work places of the commercial staff, freight cashiers), AS «Misplan» (automated system of the freight transportation plans management, monthly transportation) using coded connection between two networks by means of Virtual Private Network (VPN) for the information exchange between the system of the data base and subsystems of the work places.

ACS – is the base of the automated control system, referred to the program products with the interface, where the course of events and operations, carried out directly with the carriages, containers and cargos, transported in them can be controlled. Automated control systems are developed for the interaction with AWS and enable to provide normative-reference information and logic control the technological cycles of information processing.

ACC, AWS are work places, referred to the program products with the interface, where the information can be input, output, stored, accumulated and processed. Work places interact with the

data bases and are created for the staff of the freight stations, financial settlements centers, logistic centers, specialists in the sphere of the commercial management of the railway.

Improvement of the technology and regulatory framework, as well as complex automation of the technological processes at freight stations, created the preconditions for the introduction of the electronic turnover of documents first in the internal work of the railway, further in the interaction with the customer.

One of the important functions of the mobile application is the possibility to skim over the normative base: Railway Regulation, Railway Transportation Rules, Tariff provision, List of Classes of Transport rates, Regulation on the Transport of Dangerous Goods, Agreement on International Goods Traffic, etc.

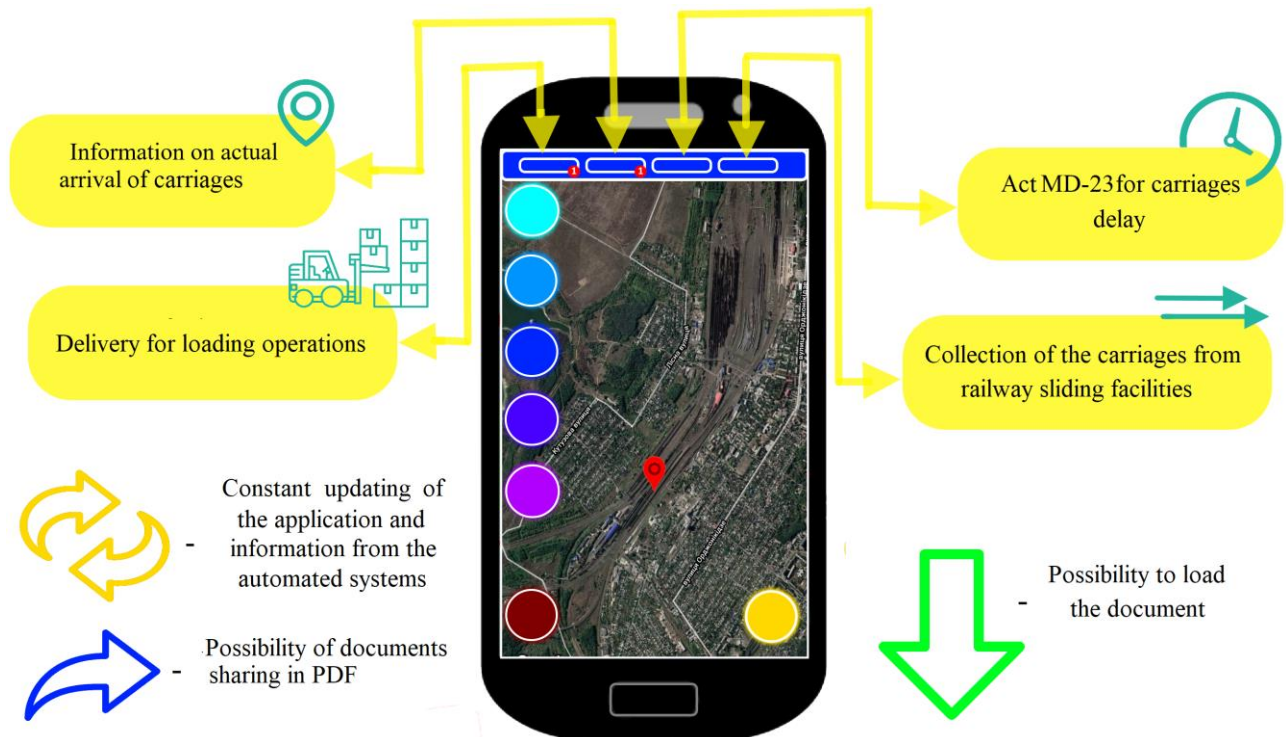


Fig. 3. Reflection of the messages about the operations with carriages in the application, skimming of the interface possibilities for the operation with the documents in electronic form

- Information, regarding carriages arrival report at the entry station (actual / current place of carriages dislocation);
- Information about actual arrival of carriages with cargo at the entry station (number of carriages, kind of cargo, time of arrival);
- Carriages delivery for handling operations (skimming of the information from «AWS TA» of the check lists of the form MD-45, where the time of carriages delivery, kind of work, number of railway siding facility, freight owner, direction, status are indicated );
- Act MD-23 of carriages delay (number of the act, date and time of act drawing, type, start of the delay, end of the delay, freight owner, freight designation, reason of the delay);
- Collection of the carriages from the railway siding facility (information regarding the termination of the handling operations / preparedness for collection and actual collection, time of delivery while collection, type of work, number of the railway siding facility, direction for carriage delivery).

Also options are provided to give prompts and inform the customer in the form of messages



about the incompleting action, warn in advance about the expiration of the contract with the railway and its conditions, about the payment of the proper charges for the transportation, additional services, use of the land plots, viewing of the statistical data, history of the realized processes, etc.



Fig. 4. Representation of the operation functions of the rapid usage regarding the operations with carriages, viewing the possibilities of the interface for the work with the documents in the electronic form

► Main information from the contract about the delivery and collection of the carriages / operation of the railway siding facilities (number and contract validity period, length and balance of the track, maximum one-time delivery on the railway siding facilities, capacity of the cargo front, front of simultaneous loading/ unloading in carriages, conditions of carriages exchange, type of the freight and conditions of execution of handling operations, etc.);

► Calculations of settlements payment, additional charges and possibility of their coordination.

► Private study of the customer gives a possibility to register and enter the system from any access point, stores data regarding the work done and performs statistical and analytical function.

Functional possibilities of the application:

Collection and analysis of the statistical and analytical data about the work, input of the reference characteristics and parameters for the comparison and determination of the optimal variants for further usage.

Comparison of the reference characteristics with current ones, enabling to reveal the dependences and use them.

Methods, proposed above have advantages and disadvantages, different efficiency degree.

Usage of the coded connection between two networks Virtual Private Network (VPN) for the interaction with the customer decreases the Internet data rate but the data exchange between the servers will be reliably protected.

Such an approach enables to plan micro-logistic chain for each customer and optimally organize the production process, providing the preparedness of the site for freight acceptance.

## Conclusions

The suggested method of the interaction of the railroad with the consumers improves the efficiency of freight carriages usage. The efficiency of carriages usage increases, as the amount of handling operations and profit from transportation increase.

Implementation of this method for freight transportation will promote the acceleration of the information exchange, simplification of the documents processing, reduction of the resources,

involved in the process, decrease of time and reduction of the amount of the labour force needed for operations execution.

Accordingly, the advantage will be increased reliability, higher quality of the operation of the railway and enterprises, which use the services of the railway.

The suggested method widens the functions of the available information systems and creates new possibilities for accounting the management processes and interaction of the railway and customers of the railway services.

Besides, the implementation of the method for the application enables to plan the logistics for the freight owners, provide higher level of automation, perform integration in the unified system of transportation process management.

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