

CONTAINER MANAGEMENT SYSTEM IN BATUMI PORT

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RESUME

Currently, the maritime economy of Georgia is developing quite rapidly. The special geopolitical position of our country in the Eurasian region, in the neighborhood of countries on the path of market reforms, forces the Georgian government to restore the infrastructure of the national economy to effectively use our territorial traditional advantages: mineral resources, free agricultural areas, a large coast, to create convenient port complexes. All this contributes to the development of modern marine transport, cargo, passenger, as well as mixed cargo-passenger complexes. Sea transport is used to transport goods between the country's ports, as well as to develop and ensure Georgia's foreign economic relations with foreign countries.

As of 2015, maritime transport accounted for more than 86% of the country's export-import traffic. In 2021, sea vessels entered the ports of Georgia 370 times from 65 foreign countries, which provided more than 86% of the country's needs in foreign trade transportation. In recent years, major technical retooling of seaports has been carried out, tonnage has significantly increased, and the capacity of ships has increased. The capacity of the ships' power plants has increased, automation of several production processes on ships has been introduced, and new transport technologies have been introduced, which ensure safer and more trouble-free navigation of the fleet. The modern port system is a complex hierarchical structure that combines ship companies and fleets, navigation and information support systems, computer systems, and computer-related means of land transportation of goods.

Keywords: Container management system, Batumi port, container platform, computer system.

INTRODUCTION

Previously, container management according to the old scheme was unsystematic. Containers were arranged randomly, not according to their type or condition or according to the location of each shipping company. The container platform was not divided into separate areas, and the locations of the containers were not precisely defined.

DISCUSSION

Currently, the containers entering the Batumi port are managed by a computer system. Containers are classified radically to create convenient conditions for conducting management informatics. Platform planning is primarily done for each shipping company. Containers are stacked on each company's platform, so that transactions or loading-unloading operations, entering and exiting, have complete comfort. In addition, loaded and empty containers are located separately for each type. Cargo containers are also divided by type: current, cold, and special containers. However, the planning of the loading scheme for import cargo mainly serves to quickly free up ships and is based only on the availability of free cells remaining on the platform, and only then is the platform freed up to receive the next voyage. As for the cargo loading plan, it is not considered completed until the minimum required number of cargo containers has been received.

MANAGEMENT

A. Receiving containers from ships.

A1. Working steps

1. Offer of the container imported by the agent.
2. The main computer of the central office.
3. Proposed platform for placing (unloading) containers. Drawing up a plan for unloading containers.
4. Implementation of unloading.
5. Completion.

A2. The sequence of development of imported containers

1. Import account
2. Direct delivery of containers.
3. Unloading of containers.
4. Imported container platform.
5. Delivery of containers at the EIR gate.
6. Transportable containers.
7. Transformation of the state of imported containers - in the delay of hulls.
8. Transformation of the status of cargo clearance into the delay of the hulls.
9. Completeness.

Before the ship arrives at the port, the master or the owner of the cargo gives the agent a "notice of the arrival of the ship". The agent sends a "notice" to the cargo owner about the arrival of the vessel. After that, the cargo owner brings the original receipt to the agent to change the "Notification" to "Consignment Disposition" and starts the customs procedure for the imported goods. At the same time, the agent sends the port administration (management) a "notice" of the ship's arrival, together with all the necessary documents related to the port, loading, and unloading of goods, such as a Manifest of cargo (3 copies), Cargo plan (2 copies), List container (4 copy), diagram of the ship's cargo holds, existing requirements for the use of shore cranes (if necessary). In the presence of direct transportation goods (cargo) on the ship, a list of directly removed containers is required. According to the port's regulations, the amount of cargo handled directly accounts for only 20 to 30 percent of the total cargo handled at the port. If the port has the authority to receive the cargo, one set of receipts (invoices) should be sent.

A3. Acceptance and delivery at the debar cader

Based on the available information about the berth of the ship, their types, and at the request of the owner of the goods, berths, debar caders, and necessary equipment for work are placed in the port, at the same time it is necessary to draw up a loading and unloading plan and deliver it to the port administration and navigator. After the completion of the procedure, the loading, and unloading of containers are carried out in the port. In the process of unloading the cargo from the ship, the worker of the receiving port checks and controls the condition of the containers, the number and brand of the containers, the seal, etc. And he writes them in the Tally Report document. In case the original seal is not available, it should be reported to the ship's representative so that it can be sealed and after that, both parties write a note in the Tally Report („No. on new seal issued by the ship's company is damaged“).

After unloading a certain number of containers, usually around 20-30, the dock clerk and the ship's representative sign the confirmation at the end of the Tally Report and Tally Sheet and exchange the confirmation sheets. At the end of each work shift, these sheets are handed over to the office of the container platform. Based on these documents, at the end of one voyage of the ship, the employee working on the balance of the port account, together with the captain of the ship, signs the act confirming the amount of

unloaded cargo. Such an act is called the Receipt of Cargo Receipt-Balance Act – „ROROC“. Upon discovery of damaged and broken goods packed in containers, that is, in the presence of containers that have bent, misshapen, deformed, broken, torn, cracked, etc. places, the two parties draw up a COR - a document of goods damaged in the absence of a substantial cause, or if there is any doubt about the loss, a „prediction of objection letter“ must be drawn up to guarantee the claim of the cargo owner.

As a rule, each damaged container is sorted separately, on one side, a COR is drawn up, which ensures that a disorderly situation is avoided during the process of loading and unloading cargo. After drawing up the act (COR), the ship and the port unanimously resolved this problem. In the case of containers damaged by workers, an „Internal Damage Report“ should be drawn up with the team of workers, the existing condition should be recorded and the drawn report should be signed by the concerned persons.

A4. Direct or platform shipping of goods

- Direct shipping of goods: these are containers that are in the „List of direct shipping containers“ provided by the agents to the port. For these containers, the owner must change the „load release order“ to „goods release order“ and remove them from the port.

- Loads (goods) arranged on the platform: these are containers that are not named in the above list. These containers, after being removed from the ship, are loaded into a port vehicle for transport to the port platform. When the containers are loaded onto the trucks, the receiving officer and the driver working at the debar cader draw up an „Inland Transport Sheet“, which is the basis for moving the goods to the platform. The port driver, under the guidance of the employees of the management department, is responsible for the transportation of containers to the platform. Here, the receiving employee of the platform, according to the number of containers transferred to the platform and the „Inland Transport Sheet“, establishes a „Valid Import List“, which indicates the specific state of the containers on the platform.

A5. Delivery of cargo to the owner's facility

A. First step:

- Based on the Manifest and after receiving the full receipt, invoice (or invoice) from the owner-client, the shipping company (agent) will transfer it to „Cargo Delivery Disposition“. After that, the owner-client carries out the procedure of opening the customs declaration. This procedure includes customs declaration, foreign trade sales contract, commercial receipt, and other documents.

- 3 forms of declaration opening: opening of cargo inspection on the platform, opening of cargo inspection in own warehouse, direct opening at the expense of transportation (sealed at the port) invoice.

B. Second step:

- The owner takes the full container and moves it to his warehouse. The owner of the goods goes to the shipping company, writes a „Letter about loans of hulls-containers“ and receives the company's „Decree of handover of hulls“. The owner goes to the „Receipt-handover procedures“ department of the enterprise, where he completes the procedure. After that, the owner will receive a „Container - EIR Order“ to remove the goods.

- The owner receives the goods at the port. The „Delivery of Goods Order“ goes to the „Acceptance Procedure“ department, completes the procedure, and receives the „EIR Container Order“, which is printed and handed over by the personnel of the „Acceptance Procedure“ department.

- Owner receives empty containers. The owner goes to the shipping company to collect the „empty container handover order“ and takes it to the „handover procedures“ department, completes the procedure, and receives the „EIR container order“.

C. Third step:

- The owner receives a full container. Depending on the position of the containers, which is writ-

ten in the “EIR container order”, the areas for placing the goods and means of unloading the goods are determined. The platform workers, according to the EIR order, transport the means of loading the goods using the owner’s vehicles. After that, the employee signs the EIR and receives the order.

- The owner receives the goods at the port. After the owner positions the containers to move the goods, platform workers move the container movers around the area to remove the goods from the containers and load them onto the owner’s vehicles. The receiving employee signs the EIR and receives 1 order.

- Owner receives empty containers. After the EIR has determined the position of the empty containers, the owner moves the necessary means to remove the empty containers to the platform. The employee signs the EIR and receives 1 warrant.

D. The fourth step.

- The owner drives the container vehicles to the port gate. Here the port gate workers check the condition of the containers, the brand of the containers, and their seals and compare them with the EIR data. If everything matches, then they receive 1 EIR order and release the funds through the port gate.

A6. For co-owned containers

A. Step 1: To unload the cargo, the containers are transported to the CFS warehouse under the supervision of the shipping company, customs, Vina control, and the port representative. All parties witness the opening of the containers and unloading from the containers, then draw up a “Co-Owner’s Development Deed”. According to this act, the shipping company issues a “Consignment Warrant” to the owner for the owner to take the goods.

B. the second step. The owner brings a “Decree of delivery of the goods” and carries out the procedure for the removal of the goods. Here, the staff writes the “goods delivery order” and hands over the goods to the owner.

C. The third step. The owner, to receive the goods, gives the CFS warehouse owner an “order for delivery of goods”. Based on this order, CFS warehouse employees write an “export order” and transfer the goods to the owner’s vehicle.

D. The fourth step. The owner of the goods drives the container vehicle to the gate of the port and shows the “Export Order” to pass through the gate.

B. Export of goods by ship

B.1. working steps

1. Agent – goods offered by the ship, containers, export.
2. The main computer of the central plant.
3. Proposed placement platform for containers awaiting export. Drawing up a plan for unloading containers on the ship.

4. Extension of implementation.

5. Completion.

The rule of development of exported containers.

6. Receiving containers at the EIR gate.

7. Direct export containers.

8. Completeness:

- Loading scheme;

- Export report.

9. Container platform on the ship.

10. Containers for intermediate transportation.

11. Exchanging the delay state of cases on the export of cases.

12. Exchange of closing condition of goods for export.

13. Concentration of containers awaiting export.

14. Acceptance of containers at the EIR gate.

B2. Receiving containers at the port.

A. Packing of goods at the port

- First step: the shipping company gives the owner the “Decree of empty containers” and one seal.

The owner transports the goods to the port and carries out customs procedures to prepare the goods for storage in containers.

- The second step: the port places the workers carrying out the work of loading the goods into the containers under the supervision of the customs, then the goods containers are sealed with the seal of the customs and the shipping company.

- Third step: the owner completes the procedure in the “Acceptance Procedures” section, receives the EIR, and brings it to the platform’s acceptance-handover staff to transfer the containers to the platform in anticipation of export to the ship.

B. Delivery of a full container.

Containers passing through the port gate are pre-checked for the number of seals and their external condition.

- First step: the owner completes the procedure of placing containers on the platform in the “Receipt-Handover Procedures” section. According to the list previously provided by the company, the procedure personnel carry out the procedure of placing the containers on the platform.

- Second step: The owner receives the EIR from the procedures staff, and brings it to the platform so that the worker working there can start moving the loading vehicle to the platform area. The receiving worker signs the EIR and receives 1 copy of the EIR.

C. A delay on the platform.

If the containers have arrived at the port along with the arrival of the ship and all the procedures related to the delivery of the goods have already been completed, then the containers are directly loaded onto the ship without delay on the spot.

In this case, according to the list of export containers on the ship given by the agent, the port will issue a “direct handover order” or so-called “handover order” to the owner. “Order of delivery through warehouse”. Based on this order, the containers are directly loaded onto the vessel for transshipment.

If the containers arrived at the port before the ship entered, then, as already mentioned above, the owner does the procedure of loading the goods onto the platform. If containers are damaged while loading containers on the platform, then the receiving-handover staff and the driver draw up an act on this condition of the goods.

In the case of the owner returning the hull containers to the platform, the owner carries out the acceptance-delivery procedure in the same way as in the case of delivery of full containers.

D. Loading containers onto the ship.

When the ship enters the port, the port, following the agreement with the shipper, starts loading the containers on the ship. The receiving-handover personnel of the dockyard draw up confirmation documents indicating the actual number of containers brought onto the ship. damage, breakage, breakage, etc. In this case, a similar COR of imported goods should be made. After loading the cargo and completing all the procedures, the ship can leave the port.

C. Procedure for receiving goods at Batumi port.

To receive the goods at the Batumi loading-unloading facility, the client, upon receiving the goods, must carry out the procedure with the following steps:

A. First Desk: Account Description Service.

The owner shows the agent of the transport company the “goods delivery order” and requests the

start of loading and unloading activities: the service of exporting goods from the container to the car; At the same time, the accountant of the enterprise calculates the tax based on the tariff. If the owner signs an economic contract of loading and unloading, then with this contract he issues a service bill (possible cash settlement or payment in the future).

The service account consists of 3 documents:

- White sheet: to the port
- Pink sheet: to the owner
- Yellow card: lateness.

B. Second table: receiving money.

Depending on the amount in the service account, the employees of the money-receiving service enter the data of the receipt and receive the money.

C. Third table: order description (acceptance of delivery).

Customers coming to pick up containers who have already passed desks 1 and 2 will come to this desk here:

- The owner issues the "Decree on delivery of the goods".
- The owner shows a business account and a receipt (receipt of money) with an ID card.
- The staff of the third desk prints 4 sheets of the container delivery order (EIR), keeps the white sheet for himself - for the delay, and returns the other sheets (yellow, blue, pink) to the owner.

D. The fourth table: the seal of the order to leave the platform.

Customers who receive other non-container goods, after passing 2 starting desks, must come to this desk to receive the order to leave the platform.

E. Fifth table: registration and management of removal of goods.

5. Container management software

5.1. General scheme of the possibility of cyclic transportation of containers

Here it is:

1. Import of containers filled with goods (cargo);
2. Import of hulls-containers on the platform (NKV);
3. Export of containers filled with goods (cargo) from the platform to the ship (HKN);
4. Export of hulls-containers from the platform to the ship (XKV);
5. Import of containers full of goods (cargo);
6. Import of containers from within the country - on the platform;
7. Export of hulls-containers from domestic platforms of the country (XKV);
8. Export of containers filled with goods (cargo) from domestic platforms of the country (HKN);
9. Direct transportation of hull containers from the ship - inside the country or, on the contrary, direct export of hull containers to the ship (without landing on the platform);
10. Direct transportation of containers filled with goods (cargo) from the ship - within the country or, on the contrary, direct export of containers filled with goods (cargo) to the ship (without landing on the platform).

Containers imported from a ship to an inland platform may be empty. Transported containers can only be filled with goods (cargo). The process of importing a single container can be depicted as the diagram shown above.

B. For empty containers - there are 4 following possibilities:

1. NKV - CV - HH - XKH
2. NKV - DH - XKH
3. NKV - XKV
4. NKV - CV

Definition:

- NKH: import of containers full of goods (cargo) from the ship to the platform
- XNH: return of containers filled with goods (cargo) to the owner by order (order) of the transport company
- HV: Import - Lowering a hull from within a country to a port to be returned to owners or transported from another location by a shipping company
- XKV: export of container hulls from platforms to ships
- CV: Delivery of the container body from the platform to the owner, together with the shipping company
- HH: landing of containers full of goods (cargo) from within the country - on the platform, waiting for export by ship
- DH: packing-placement of goods from the warehouse - in the empty containers on the platform
- RR: removal of goods from containers - to warehouse platforms
- XKV: export containers to ship
- XKH: export of containers filled with goods (cargo) on a ship.
- NKV: import of empty containers from ship to platform.

1.1. Container Management Model.

From the above analysis of container management processes, we can imagine the following procedure:

A. Management of imported goods

- The main basis of the management action is the Manifest and the notification of the valid import. The content of the Manifest includes all the specifics related to the consignment, namely: O.B/L number; name, address, consignor, consignee, notifying authority, port of departure, port of destination, number of containers with SEAL number; name of goods (cargo); package number, weight, block number, etc.
- Import position and required information including cargo/carriage, ship, flights, berth date, B/L number, container brand, seal number, loading port, unloading port, import date, and serve management.
- This chain is completed with the account of imported containers.

B. Platform management

- The condition of the containers should be checked daily, constantly, continuously, and accurately. Based on the analysis of the cyclic shipping capacity of one container, we obtain the state of the containers, including import state, packing state, goods (cargo) loading state, hull return, hull handover, and export ship status.

Completion documents include a list of containers on platforms and notifications about containers on platforms.

5.2. Computer Programming

A. Programming block diagram

Based on the analysis of the container management procedure and their modeling, the program is built on the block-archive scheme of the main program. In particular:

- Container Management System Block Archive Diagram: This is an archive diagram that generally outlines the main elements of the program. The block diagram of the archive shows the program, which consists of 5 sub-elements: receiving data, daily contact with data, correcting data, printing a report, and others, which serve to manage containers. The given block diagram illustrates the complete procedure of container management by the management department.
- Container platform import program block diagram: This block diagram illustrates the container import process, including Manifest information such as ship name, container number, date of arrival, and U.T.N. Date of import. When importing containers on platforms, it is necessary to check the consistency of several data, such as the ISO container number, the date of container import, or the identity of

the container number with the number on the platform. During an incorrect import procedure, the program displays (issues) incorrect information, and the operator can correct the information accurately.

- block-archive diagram of the daily contact with the state of the containers on the platform. This is a block archive scheme that expresses the possibility of cyclic transport of containers, as already analyzed earlier. The possibility of changing the condition of containers can be: delivery of imported containers with hulls - from the company's ship, hulls - delivery of containers to the owner's warehouse for packing, the owner returns the hull.

- The device, after removing it from the ship, brings the container full of goods (cargo) to the platform, where it is waiting for packaging and export.

B. Programming Language

High-quality object programming language - Windows. Additionally, applied programs are written with this linguistics. With Visual Basic, we can manipulate many data objects, such as Microsoft Access (*.mdb) databases, Visual Foxpro (*.dbc) databases, Microsoft Excel (*.xls) spreadsheets, Microsoft Word (*.doc) documents, or even a file with a txt tail. With rich design skills, a programming operator can create a specialized program to participate in the sale of a soft product application. In addition to already specialized devices (tools), Visual Basic allows the operator to use a message, function, or procedure in the standard Windows persistent application programming interface area (Application Programming Interface API). With the API we can implement almost anything needed in a Windows application program. Thanks to the Windows programming language, we can comfortably use the "mouse" and the reports are more beautiful than other language fonts available in Windows.

As a database, we use a database designed by Microsoft Access. The database in Access allows us to use the Jet Engine data expansion facility, which is simultaneously adapted to SQL commands (Structure Query Language). It is the basis for software development on a local network using SQL Server and Windows NT. We need to define the following database:

- Database package. A set of information with a uniform essence, organized according to a certain principle, to reflect a single control object, called a database package.
- Record. A single set of natural character values representing a single control object.
- The field. A single natural character is present in the underlying data packet. Each field is defined by a field name, field type, and field dimension. The name is written with a maximum of 10 characters, including letters, numbers, and underscores. The name must start with a letter of the alphabet.
- Structure. The structure of a database package is a set of fields placed in a certain order. Each database package has only one structure.

CONCLUSION

As we have seen, database design is important. In container management software, we use multiple databases. Databases are packages of archival information that display one control object at a time and are organized according to a certain principle. Databases are a place where input information is received, then this information is processed to obtain the information (data) needed for the management service at the exit. Based on the above analysis, we can derive the main data tables.

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კონტეინერების მართვის სისტემა ბათუმის პორტში

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რეზიუმე

ამჟამად საქართველოს საზღვაო ეკონომიკა საკმაოდ სწრაფად ვითარდება. ჩვენი ქვეყნის განსაკუთრებული გეოპოლიტიკური პოზიცია ევრაზიის რეგიონში, საბაზრო რეფორმების გზაზე მყოფი ქვეყნების სამეზობლოში, აიძულებს საქართველოს მთავრობას აღადგინოს ეროვნული ეკონომიკის ინფრასტრუქტურა, რათა ეფექტურად გამოიყენოს ჩვენი ტერიტორიული ტრადიციული უპირატესობები: მინერალური რესურსები, თავისუფალი სასოფლო-სამეურნეო ტერიტორიები, დიდი სანაპირო, მოსახერხებელი საპორტო კომპლექსების შესაქმნელად. ეს ყველაფერი ხელს უწყობს თანამედროვე საზღვაო სატრანსპორტო, სატვირთო, სამგზავრო, ასევე შერეული სატვირთო-სამგზავრო კომპლექსების განვითარებას. საზღვაო ტრანსპორტი გამოიყენება ქვეყნის პორტებს შორის საქონლის გადასაზიდად, აგრეთვე საქართველოს უცხო ქვეყნებთან საგარეო ეკონომიკური ურთიერთობების განვითარებისა და უზრუნველყოფისათვის.

2015 წლიდან საზღვაო ტრანსპორტი ქვეყნის ექსპორტ-იმპორტის ტრაფიკის 86%-ზე მეტს შეადგენდა. 2021 წელს საზღვაო გემები 370-ჯერ შემოვიდა საქართველოს პორტებში 65 უცხო ქვეყნიდან, რაც უზრუნველყოფდა ქვეყნის საჭიროებების 86%-ზე მეტს საგარეო სავაჭრო ტრანსპორტირებაში. ბოლო წლებში განხორციელდა საზღვაო ნავსადგურების დიდი ტექნიკური გადაიარაღება, მნიშვნელოვნად გაიზარდა ტონაჟი, გაიზარდა გემების ტევადობა. გაიზარდა გემების ელექტროსადგურების სიმძლავრე, დაინერგა გემებზე წარმოების მთელი რიგი პროცესების

ავტომატიზაცია, დაინერგა ახალი სატრანსპორტო ტექნოლოგიები, რომელიც უზრუნველყოფს ფლოტის უფრო უსაფრთხო და უპრობლემო ნავიგაციას. თანამედროვე საპორტო სისტემა არის რთული იერარქიული სტრუქტურა, რომელიც აერთიანებს გემების კომპანიებს და ფლოტს, სანავიგაციო და საინფორმაციო მხარდაჭერის სისტემებს, კომპიუტერულ სისტემას, ასევე საქონლის სახმელეთო ტრანსპორტირების კომპიუტერთან დაკავშირებულ საშუალებებს.

საკვანძო სიტყვები: კონტეინერის მენეჯმენტის სისტემა, ბათუმის პორტი, საკონტეინერო პლატფორმა, კომპიუტერული სისტემა.

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