



IAPH IT Award 2007

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Case study - MAINSYS - Maritime Integrated System at Israeli Ports

Three commercial seaports, Haifa, Ashdod and Eilat, handle Israel's maritime trade. Container traffic at these ports increased from 900,000 boxes in 1998 to 1,200,000 boxes in 2006 (33% increase). Total cargo traffic increased from 32 to 38 million tons (18.75% increase) during the same period.

1. Project Summary

1.1 The Business Problem.

Following legislative reform of the Israeli port sector, the Israel Port Authority, an operating port authority, was split into four government-owned companies: three port operating companies (in Haifa, Ashdod and Eilat) and a 'landlord' company, the IPC – Israel Ports Company.

Following the split, there was a need to control and maintain unified processes in regard to port customers to prevent confusion that could damage trade by creating unnecessary complexity and a multiplicity of processes and interfaces, despite the fact that it was expected that each of the three port operating companies would be developing and operating their own information systems.

This was the rationale for the creation of **MAINSYS organization** – the **Maritime Integrated System**.

MAINSYS was created as a cross-platform, cross-industry project that would improve and tighten the coordination among all maritime trade partners - including the government.

MAINSYS is financed, developed and operated by the IPC.

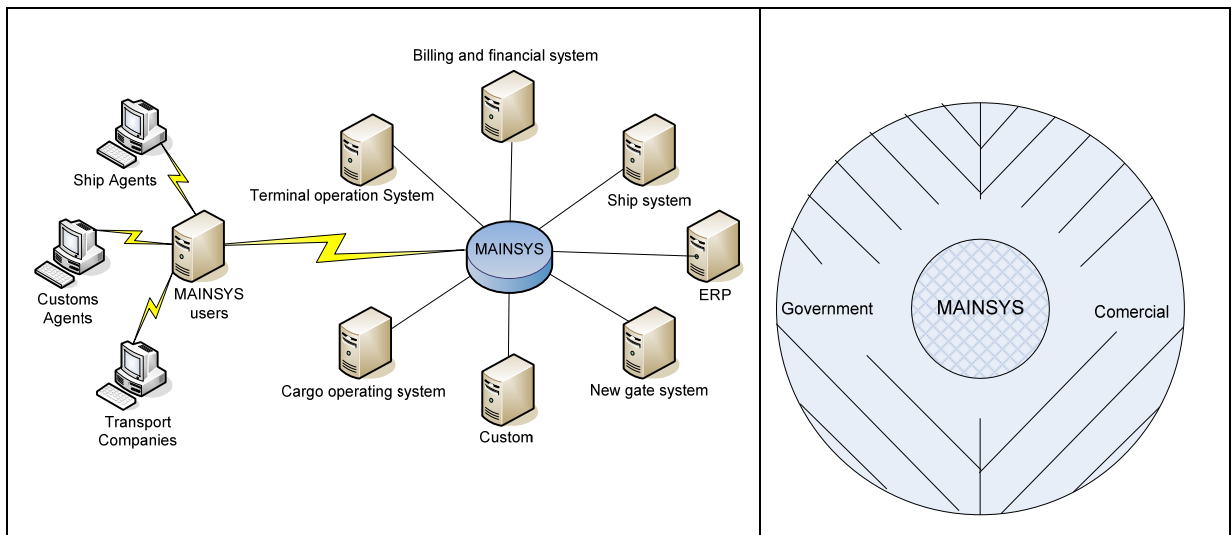


The maritime community is represented by 'Board members', representing the various community partners and by an 'executive committee' representing the primary players: Customs, the port companies and others.

1.2 Technical solution.

MAINSYS as a public-private unifying force.

The EDI message structure



The EDI message system is a set of standardized **electronic messages** that are exchanged among the port systems, Customs and various users such as shipping agents, customs agents, trucking companies and others. The electronic messages replace existing paper forms and procedures. The messages are sent via a **secured FTP**. The system includes a unique "**Message engine**" developed by the Port Authority that channels the messages between some four hundred maritime sector users. The EDI message system manages about fifty different message types. It also translates different private formats to the standard format.



1.3 Time of implementation.

System development began in 1998 and has grown to become one of the port sector's most important tools. MAINSYS was not developed from scratch; it has been constructed upon the platform of a predecessor project.

The use of the system and its services was voluntary for most of users. With time, most port clients recognized their potential to reap huge benefits from use of the system and quickly 'joined the boat'. Today, a user who works outside the system would find most processes are practically impossible.

2. Results achieved.

2.1 Improvement result - Cost & time saving.

In 2006 about 44.6 Million messages where sent through the system.

On average it takes about one minute of working time to fill, send and receive a real paper form. The time that would have been needed to manually transfer these messages (if filled by paper forms) would have been 4200¹ months or 350 working years. Since the project regularly hires about 20 full time workers, it can be said to have saved about 330 workers per year or about 9,900,000² \$/year.

Message movement estimates 2006

Message	Messages sent 2006
Manifest	6,600,000
Import cargo	5,400,000
Cargo movement	4,560,000
Invoices	4,560,000
Custom manifest	3,600,000
Storing feedback	2,700,000
Empty container	1,740,000
Storage document	1,620,000
Customs storage document	1,620,000
Exit from port gate	1,500,000
Ship transaction	1,200,000
Storage document feedback	1,020,000
Delivery order	864,000
Feedback on delivery order	840,000
Customs authorization	840,000
Other	6,180,000
Total	44,600,000

¹ => 44.6M[min] / 60 [min/hour] / 180 [hour/month] = 4200 months.

² => 330[workers] * 12 [month/year] * 2500 [\$ /month] = 9,900,000 \$/year



MAINSYS EDI System

2.2 Scope of action

The need for quick efficient operation and the opposite need for careful and secure entrance to the port are balanced through permanent technological improvement. It is an endless race as technology continues to improve. Computerized paperless processes are important in order to maintain a high level of security, a quick efficient operation and a good service level. The scope of MAINSYS is big. It is not only a computerized system but an entire world of rules, entities, companies and computers working together simultaneously to achieve efficiency. MAINSYS vision is to be a "single window" – a single interface for Import & Export procedures. It is important that the client will receive all data needed for fast efficient and secure trade.

3. Technology used

MAINSYS in numbers

- ◆ 20 Servers supporting the system.
- ◆ 70 Message Types (active and in development), 45 Million Messages per year
- ◆ 400 Active companies working with MAINSYS
- ◆ Some 30 men - years invested in development and implementation.
- ◆ 500,000 \$ yearly Budget.
- ◆ 4 Separate Communication Lines, 2 Internet Services Providers to ensure zero downtime.
- ◆ 60 MB WAN connecting the ports.

MAINSYS features and characteristics

The MAINSYS vision includes:

- ◆ A strong use of the internet.
- ◆ Full redundancy of critical systems for disaster recovery.
- ◆ IMO, UN/CEFACT and Private format messages as accepted standard.

Security and data safety:



- ◆ Verification of user identity.
- ◆ Secure networking, with every organization having access only to its own data.
- ◆ Archiving of information.
- ◆ Reconstruction of corrupted files (DRP).

Current development

- ◆ Developing in advanced technologies such as Web Service.
- ◆ Use of digital signature technology.
- ◆ Secure with vault technology such as Cyber-Ark tools.
- ◆ Creating 24/7 Help desk operation for solving technical problems.

4. Obstacles overcome

4.1 The primary problems.

We have found that the technological issues were not the major issues. Rather, the issues were the large diversity of technologies used and the number of users who interact with the port. These made this major development project more of a human coordination and educational effort than a technical one.

4.2 Coordination of separate entities.

The initial reason for the division of the single port company into four companies was to enhance competition, improve efficiency, raise the service level, and in the future enable privatization of the ports.

After the separation, since every port started creating its own procedures and computerized systems there was a need to control and keep unified processes to



prevent confusion that could damage trade by creating unnecessary complexity and chaos.

The need to create standard code tables and standard interfaces was the basis for the development of **MAINSYS**.

MAINSYS's goal was to improve sea transport through better coordination of all groups involved. Being voluntary, and having no enforcement power on organizations and governmental bureau outside itself, it had to maneuver among the parties and governmental bureau, to find and to map their different and similar interests and to create mutual benefits for all of them.

4.3 Doing the right thing in the right time.

The non-obligatory principle has its advantage in creating a natural filter for processes that are not in the consensus. Despite slowing down development and causing some waste of effort on unproductive political struggles, it also ensures that when new developments actually take place, they best benefit **all parties involved**.

5. Technology Base

Before MAINSYS and the EDI messages developed, working with the port was somewhat a race in a paper labyrinth of form filling. The sea commerce is a complex business. It has developed in many years of international trade. The EDI messages system changed the "**way of doing things**", as demonstrated by export process below.

Export process – New vs. Old

<u>New Process</u>	<u>Old Process</u>
Ship's agent sends <i>ship arrival message</i> , informing about expected ship.	Faxes, phone. Some come personally ...
Exporter sends <i>Booking request message</i> to ship agent for booking places on ship. Ship agent confirms to exporter and port with <i>Booking confirmation message</i> .	Fax, e-mail or phone... some important details are missing –difficulties to monitor...



<p>Exporter asks for empty container from ship agent by <i>booking request</i>, or <i>Empty container request message</i>. Ship agent confirms with <i>Empty container approval message</i>.</p>	<p>Papers forms. Confusion, paper lost...</p>
<p>Before entering the port - Custom Broker (CB) sends <i>full container message</i>. The message includes the trucking company ID. When accepted, port sends <i>OK feedback message</i> to CB and to trucking company.</p>	<p>Driver picks pre-prepared paper "Storage document" from CB. Time wasting for driver, paper work for CB. Sometimes papers were lost...</p>
<p>Receiving previous information about expected cargo earlier - enables Terminal Operating System (TOS) to perform efficient yard planning.</p>	
<p>Custom is informed in advance about cargo entering the port – by <i>full container message</i></p>	<p>Custom knows only after entering the port.</p>
<p>Truck reaches port's gate. Gate's security system automatically checks matching between container, driver and truck.</p>	<p>Waiting of driver while clerk gate keys storage document.</p>
<p>Truck enters port's gate. <i>Cargo entrance message</i> automatically sent to both custom broker and trucking company.</p>	<p>No real time control.</p>
<p>Cargo transported to the most appropriate yard location following ship destination and first port of discharge.</p>	

6. Conclusion

Computerized paperless processes are important in order to maintain both a high level of security and quick and efficient operations. The scope of MAINSYS is large. It is not only a computerized system but a world of rules, entities, companies and computers working together to achieve efficiency. MAINSYS vision is to be a single window as well as to leverage the use of FAL IMO forms.

We hope that client and service orientation will continue to be the watchwords of port development together with the efficient and secure operation.

6.1 Recommendations for others



If we can summarize more than ten years of work into a short recommendation for another country wishing to create its own EDI message System, we can say the following:

- In cases of privatization of ports, to form a unifying project similar to MAINSYS in order to allow the development of uniform processes.
- To focus on compliance with EDIFACT / EbXml international formats of data representation in order to be able to interact with international systems in the future, and to avoid local format of data representation.
- To use advanced web tools and utilities such as XML and Web Services in order to make the system accessible for small users.