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**DUBAI PORT AUTHORITY
ELECTRONIC MESSAGING**

By
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Dubai Ports Authority: Number One in the Middle East

Today, DPA is one of the most prominent players on the economic scene of the Emirate and the largest port complex in the Middle East. More than 125 shipping lines serve Dubai through the DPA ports, and this makes Dubai one of the great transshipment centers of the world.

The Dubai Ports Authority (DPA) was established in May 1991 by merging two existing terminals: Port Rashid in downtown Dubai and Jebel Ali Port about 35 km from the city.

The two terminals have 102 deep water berths and 25 gantry cranes between them. The year 1998 witnessed an increase of 8 per cent in container cargo handling by DPA, making a record 2.8 million TEUs, and is ranked 11th among the container ports of the world.

One factor that distinguishes DPA from the ordinary, is the constant investment in the state-of-the-art equipment. The Authority operates a unique range of cargo handling equipment. The container terminal uses a combination of cranes ranging from basic tangos to recently ordered 'Super post-Panamax' gantries. The container yards are served by top loaders, RTGs and straddle carriers. Improvement and upgrading of equipment is a constant process and aimed at ever-increasing productivity.

Supporting the massive container trade are two repair yards: Middle East Container Repair based in Port Rashid and Emirates Container Repair based in Jebel Ali. Both enable DPA to add value to its port services.

In addition to the container business DPA handles General Cargo, and has developed specialized facilities to meet the demand of this trade. One example of these facilities is the Cold Store at the Jebel Ali terminal where 43,000 cu metres of cold store capacity are located right at the quayside to allow immediate transfer from refrigerated vessels.

Another noteworthy feature is the Timberland which is a giant storage and distribution for wood products.

Dubai: The Gulf's redistribution center

DPA goes beyond the traditional role of a port complex. Its function is not merely to channel goods to the domestic market, but to act as the distribution hub for the whole region, which includes the GCC countries, Iran, the Asian Subcontinent, the CIS and North & East Africa.

The concept of a regional distribution hub is well received. To support the just in time systems, Multinational vendors have increased sales by keeping product in market ready for quick dispatch.

By using a regional redistribution hub, business benefits in terms of shorter supply times, quick response to changes in demand, less investment tied up in stockholding, and substantial savings on transport.

DPA have helped regional distribution work effective by offering efficient cargo handling, specialized storage facilities, a reliable and efficient in-house trucking operation, and fast and accurate cargo control systems.

Jebel Ali Free Zone

The sprawling Jebel Ali Free Zone is part of the Jebel Ali Port Complex. It was set up in 1985 to encourage investment in the industry, through the zone is ideally suited for trading and warehousing as well. The Government investment far exceeds the USD2.5 billion for the infrastructure and establishment of the port and free zone.

Investors are offered a host of incentives in the Jebel Ali Free Zone, such as tax-free regime; full foreign ownership, full rights to repatriate capital and profit, superb infrastructure etc. Not suprisingly, the free zone is now a base for around 1400 multinational manufacturers and distributors.

Dubai's strategy

DPA's strategy as a port authority matches Dubai's strategy as a business center. The highlights of the policy are :

1. Invest now, to bring future prosperity. Have the facilities in place to bring business tomorrow. Create a demand for facilities by understanding and anticipating the customer's need.
2. Utilizes the best systems and the best technology; in data processing. In cargo control and in management information.
3. Make improvement a continuous process.
4. Think globally. Business has no frontiers.

EDI in Dubai Ports Authority

With the handling of over 10,000 ships annually, representing an average of more than 27 ships per day, some form of electronic messaging to support these volumes is a necessity.

DPA implemented an EDI based solution in order to provide its customers with better services, delivered in a more timely manner. The original solution chosen was a functional and flexible EDI translator.

The first application area which utilised this EDI solution was in the handling of ships' Bayplans. Bayplans are an integral source of information detailing the cargo on board any ship. This Bayplan information gives details of the location and content of the containers on board the vessel, as well as other important facts such as the container identification number, load and discharge ports, container weights, the type of goods (which is especially important for dangerous consignments), the permitted storage temperature for refrigerated cargo, etc.

As a consequence of development in the implementation of EDI based messaging at many of DPA's trading partners, and advances in EDI software, DPA installed an upgraded version of the EDI software in 1996.

The business flow:

A paper-based process would follow the procedures below :-

The local shipping agent in Dubai would collect all relevant documents, and the updated discharge information, for submission to the DPA Planning section in the Container terminal. The local agent would also supply the DPA planning section with loading list information in the form of Bayplan container information. This would detail those containers which are to be loaded on to the ship.

The Bayplan discharge and loading information would then be manually keyed into the DPA Container Terminal Management System (CTMS) by the data entry operator. This system and DPA's ship yard planning system would then produce a hard copy Bayplan after completion of the discharge and load operations. The printed Bayplan would then be provided to the vessel and to the local agent.

The business flow using an EDI system, however, is detailed in the following scenario.

The main components of any EDI system require the following components :-

1. Application interface.
2. Translation and Conversion.
3. Communications.
4. Management Interface.

For inbound messages the order of processing through the EDI system would be communications, followed by translation / conversion and finally the application interface. The management interface oversees all the other processes.

For outbound messages, the order of processing is exactly the reverse of the above.

Each of these components within DPA's implementation can be described in the following way :-

1. Communications interface.

Today, several different communications methods are used to exchange EDI messages between DPA and its partners. Commercial value-added networks, dial-up connections of varying sorts, and the Internet are all used today. Internet message exchange can be achieved either using E:mail attachments, or FTP for a point-to-point connection. The trend in the marketplace is more and more towards Internet based message exchange, and DPA are fully committed to supporting all adopted standards. DPA also contribute to EDI developments in the Shipping industry through its continued involvement with the Shipping Message Development Group – a fully fledged member of the United Nations standards body, EDIFACT.

2. Translation and Conversion.

Both of the above terms have basically the same meaning, they are both listed here to avoid confusion. Any document arriving at DPA's EDI computer is automatically converted from the International standard EDIFACT, to DPA's internal file format. The mapping between these 2 formats is specified and configured within the EDI software. Flexibility is achieved via automatic code conversions and multiple mapping capabilities, allowing diverse customer requirements to be satisfied. This process can be easily automated, and error reporting can be handled in many ways, e.g.; to a pager. This allows even more flexibility in support staffing requirements. Irrespective of the communications method used, the software can be configured to automatically post and fetch the documents required.

3. Application Interface.

Once the translation has been completed, we have a file in DPA's internal format, which is suitable for uploading to CTMS, DPA's Container Management System. The uploading is done by the container terminal staff themselves, and this saves costly data entry, with consequent re-keying and errors. The upload provides full information about all containers on a vessel and facilitates the operation of that ship in the most efficient manner.

4. Management Interface.

This allows the system manager of the EDI software to look after the environment on a daily basis. It provides facilities allowing for new customer entry and configuration, as well as the configuration and implementation of new message types, communications methods and trading partners. This is also where backups of all messages are handled, allowing for error handling and re-processing of any failed messages.

In addition to the above, DPA is also able to provide a hard copy version of an outbound vessel's bayplan directly to the vessel on diskette. This is of great benefit to the Captain for stability calculations, as all the container weights are present in the file.

DPA benefits:

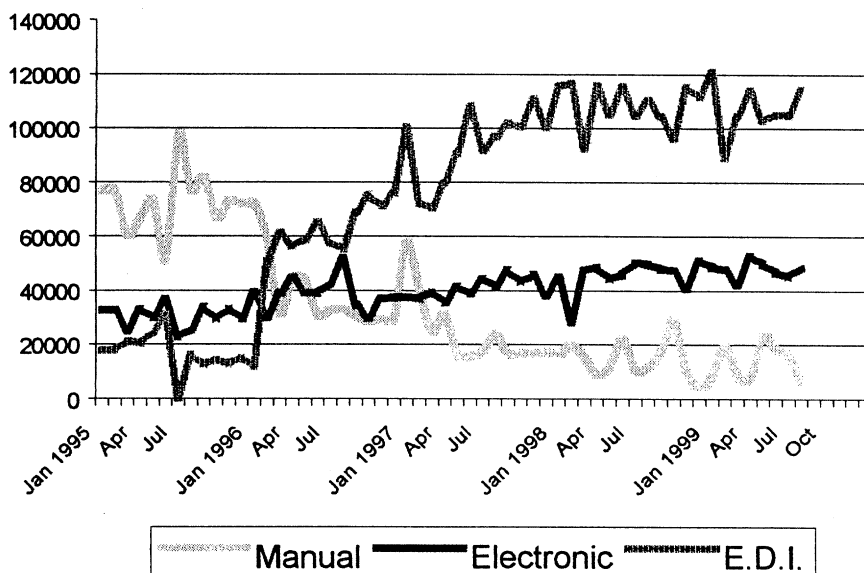
The EDI process described above represents time-savings of over 98% as compared with the manual method, because data throughput is much faster using the EDI system.

Other benefits stemming from the use of such a system are :-

- Greatly reduced error occurrences.
- DPA can now handle the arrival of vessels on a short lead-time, automatically, and more accurately.
- The system has resulted in improved customer service and customer satisfaction.
- Faster throughput means DPA's operation is more streamlined, which enables the handling of more ships.
- Lower costs in terms of manpower requirements and paper.

History:

The growth of EDI based messaging within DPA has been substantial over the last 5 years. This is well illustrated by the following graph. The diagram highlights the increase in electronic based Bayplan information, and the consequent reduction in manual, paper-based information processing.

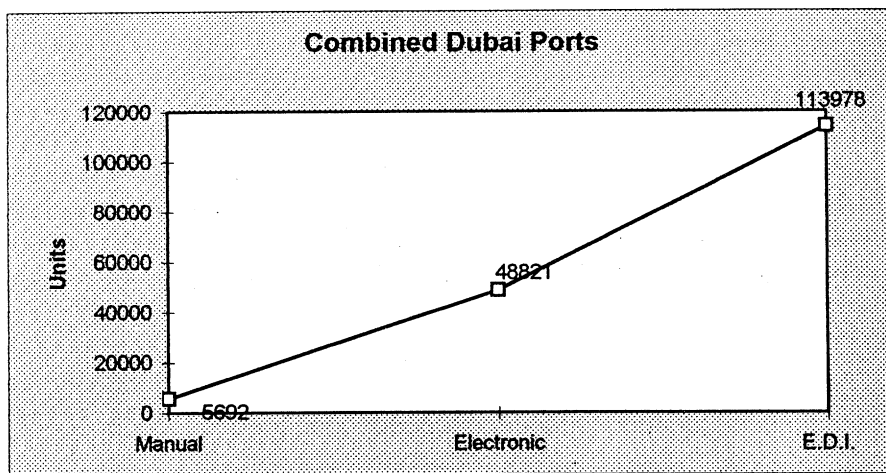
Container Data - Dubai Ports 1995-99

FACTS :-

The graph below illustrates message throughput.
If we look at the number of messages relating to container moves operated by DPA in we can see that for example :-

The month of July 1999 :-

168491 container moves were completed.
EDI messages represented 68% of the total.
Flat files delivered in electronic format was 29%.
The rest (representing manual operation was less than 4%).



Types of messages currently being handled by DPA's EDI system:

BAPLIE Bayplan message
TPFREP Terminal Performance Report

Messages under consideration for implementation in the near future include :-

MOVINS Stowage Instructions Message
COARRI Container Arrival Confirmation Message (Quayside moves)
CODECO Container Delivery Confirmation (Gate moves)
COPRAR Container pre-arrival / pre-departure message
COPARN Container pre-announcement and release message
COREOR Container Release order
DESTIM Container Repair Estimate

Invoicing messages

This includes the EDIFACT message IFTFCC (Freight Costs and other Charges).

In addition, DPA offers dial-up facilities, enabling lines and agents to obtain almost real-time information regarding their container inventory and movements.

FUTURE Direction:

The current EDI product (Visual EDI) has served DPA's purposes for the last few years. DPA, however with its continuous growth, the need to expand the services offered to our customers, as well as the impact of the Internet on all business areas including messaging, is exploring the implementation of new products. DPA is in the process of evaluating more advanced EDI systems and this new direction will serve the following needs :-

- Utilisation of a more modular approach when interfacing to our Container systems.
- Accommodation of more messages and message types as mentioned earlier.
- Expansion of the use of Internet based EDI as needed by the customers.
- Exploration of possibilities to deliver EDI services for Jebel Ali Free Zone companies.
- Incorporate the usage of EDI in purchasing and invoice delivery.

DPA believes that continued investment and improvements in the use of electronic and EDI messaging systems, provides a service that benefits both DPA and its customers, leading to a mutual business relationship ready to meet the challenges of the new millennium.

Messaging for Cargo Manifest:

Paperless documentation, swift transfers of manifests, easy and fast removal of cargo, fast and accurate handling of documents and reduced customer wait time over the counter. These are only some of the benefits that users of the DPA's Manifest and Documentation System (MDS) have enjoyed since DPA had delivered this project in June 1996.

What is MDS?

The "manifest" which is the consolidated list of bills of lading, details the cargo carried by, and to be discharged, from a vessel to the port during its voyage. Prior to the introduction of MDS, several copies of the manifest were submitted by the cargo community to DPA to port operations for the discharge of cargo, documentation, statistics etc, and to Dubai Customs for cargo clearance.

BUSINESS FLOW

MDS facilitates agents to transmit the cargo manifest electronically to the port. It was developed by DPA to efficiently manage cargo handling process from pre-ship arrival through until delivery to the consignee at the cargo shed.

MDS eliminates the process of duplication and distribution of paper manifest to DPA and Dubai Customs. DPA and Dubai Customs have interacted with each other and finalized a single unified manifest format for Dubai cargo community. Dubai Custom's 'Mirsal' uses the manifest in DPA format. This saves the customers from submitting manifest in different formats to the two government agencies. Efforts are on between DPA and Dubai Customs to exchange more messages which will help customers to a great extent.

DPAMAN was the proprietary software developed and provided free of cost, by DPA for agents and freight forwarders who did not have any system of their own to handle manifest, or to generate an electronic manifests. This user-friendly PC based software reduced the burden of developing computer systems to generate electronic manifests off the shoulders of the agents / freight forwarders.

Why was MDS developed by DPA?

While international standard EDIFACT messages exist for container messages like discharge lists and BAPLIE (bay plans), the closest for manifests was the CUSCAR (customs cargo) message, which could support only one B/L at that time. This did not fully meet the requirements of Dubai's cargo community.

DPA in its endeavor to provide better services to the customers, remedied this by designing a proprietary electronic manifest message after discussion with Dubai Customs and a cross section of agents, lines and freight forwarders.

Project Concept

The main element of the project is electronic receipt of manifest. Vital role played by technology for receiving manifest by DPA from shipping agents and freight forwarders is also summarized in this document.

What is a Manifest? Cargo is carried on ships on the strength of document, which is called Bill Of Lading (B/L). Manifest consolidates every Bill of Lading (B/L) being carried by the ship to be discharged at a port on its voyage. The B/L gives detailed description of cargo such as its commodity, quantity, volume, weight and requirements of stowage and storage, country of origin, loading port, destination port etc. It also provides information related to trade, which is essential to the shipper, consignee and other parties involved.

The port needs the manifest to organize its cargo operation i.e. to discharge, store, delivery to consignees in case of import, load to vessels in case of trans-shipment, to collect port dues – handling, storage and other charges at the Documentation section before issuance of cargo and to compile cargo statistics to support the Marketing Division to take appropriate decisions. Dubai Customs needs it to control and clear cargo into Dubai after collecting Custom duty. The Agents who represent shipping lines and freight forwarders provide the manifest to DPA & Dubai Customs.

Initially three or four copies of paper manifests were supplied by agents/freight forwarders to various departments in DPA and copies were issued to Dubai Customs. The Manifest being consolidation of B/L and the fact that an average mother vessel carries about 600 to 800 B/L per call, is very voluminous. Therefore manual work at various departments took more time to provide service to customers. Moreover there was no standard format for manifest. Each shipping line followed its own format.

In order to obviate the problems briefed above, DPA embarked upon introducing electronic manifest to replace paper manifest. The creative and distinguished elements of the project concept are:

- Electronic Data Interchange of manifest between agents / freight forwarders and DPA
- Standardise and unify the manifest format so that customers need not send electronic manifests in two different formats to DPA & Dubai Customs.
- The manifest format must be such that customers could provide the details with minimum effort & cost.
- The system must be available 7x24 hours per week to support round the clock operations of the port. It is to be used for speedier discharge and

loading of cargo, storage, documentation clearance, issue to consignees and maintenance of statistical information.

- The system must be available to all the customers round the clock so that they can send the manifest at any time without delay only once.

DPA is the first port in Middle East to have manifests transmitted electronically. It is one of the very few ports in the world to think of computerizing the manifest. It is also an unique experiment in the world to have an electronic manifest format which is common to a port authority and Customs Department to ensure that the customers are saved from the trouble of submitting manifest in two distinct and different formats to each of them.

To ensure that the customers send in electronic manifest in the correct format with the right contents, two step process was formulated. Any new agent starting will send trial manifests to ISD until the format and contents are acceptable. Then they are handed over to MRC (Manifest Receipt & Control) cell who put them on trial for completeness and timeliness of submission of manifests. Once MRC is satisfied with the submission, the concerned agent is declared as 'paper-less' – meaning that agent need not submit paper manifest to DPA. As of 15-JUL-99, 106 agents are in 'paper-less' category.

As there were no international standards for manifests available and the requirements of manifest for DPA & Dubai Customs were different, we had initial difficulty while applying the project. DPA discussed these problems with cross section of agents, freight forwarders and Dubai Customs and designed a proprietary format, which was acceptable to all. It was adopted after several rounds of discussions.

Big shipping agents, who constituted 20% in number but contributing 75% of transactions, were offered consultancy and guidance in enhancing their systems to generate electronic manifests. Other small agents and freight forwarders, who constituted 80% in number contributing 20% of transactions did not want to invest in software development & maintenance. For them DPA developed a PC-based software DPAMAN and provided it free of cost for generating electronic manifest. Training and extensive user-support were also provided to them.

DPA has built security into the system, so that each agent can only look at their manifest.

The computer awareness of users in the port varied from illiteracy (associated with low academic background) & the associated 'fear of unknown' (e.g : Shed users) to power users who are experts in Office products (e.g: Statistics users).

Management provided much support for the system, which eased the difficulty. A key user was identified and trained in each area who in turn provided guidance

to his colleagues. By tailoring the user-training in accordance with varying levels of awareness and preparedness, confidence of each cross section was won.

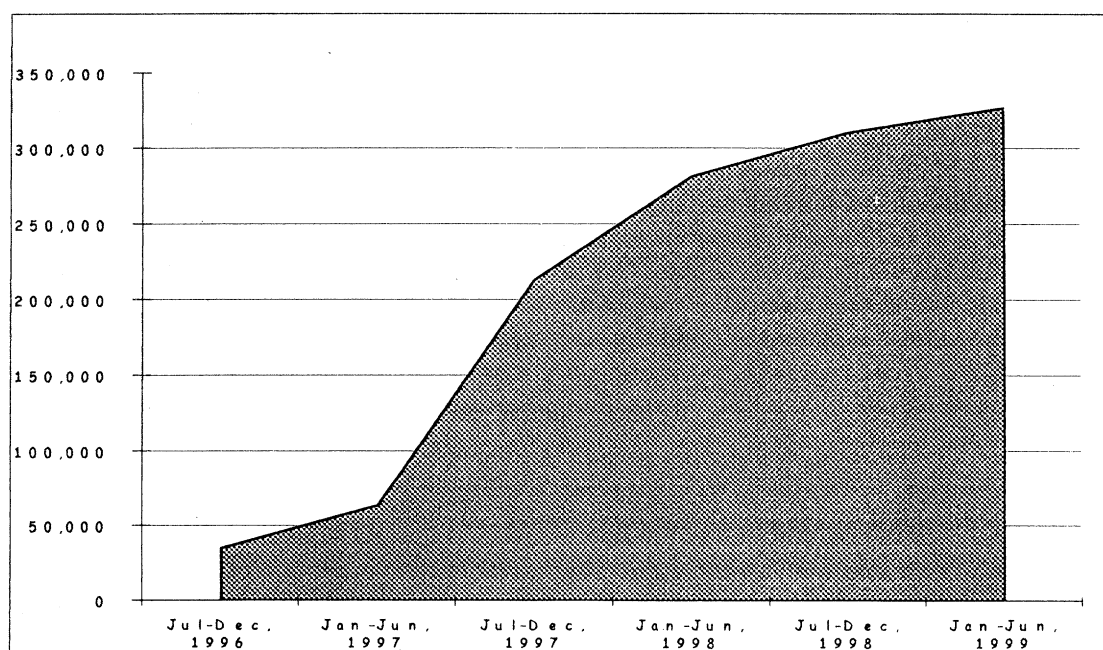
Staged implementation to ensure smooth pass over from manual to computer system:

- To iron out teething trouble of the system and that of each agent coming on board MRC (Manifest Receipt & Control) module was implemented
- Next Statistics was implemented since manual effort saved is directly proportional to the electronic manifests received
- After smoothening the above, documentation was brought on board – port by port (Jebel Ali / Port Rashid)
- As the no. of electronic transactions has crossed 50% and the above operations have stabilized, sheds were brought on board by trade (Gen. Cargo / CFS), port by port (Jebel Ali / Port Rashid)

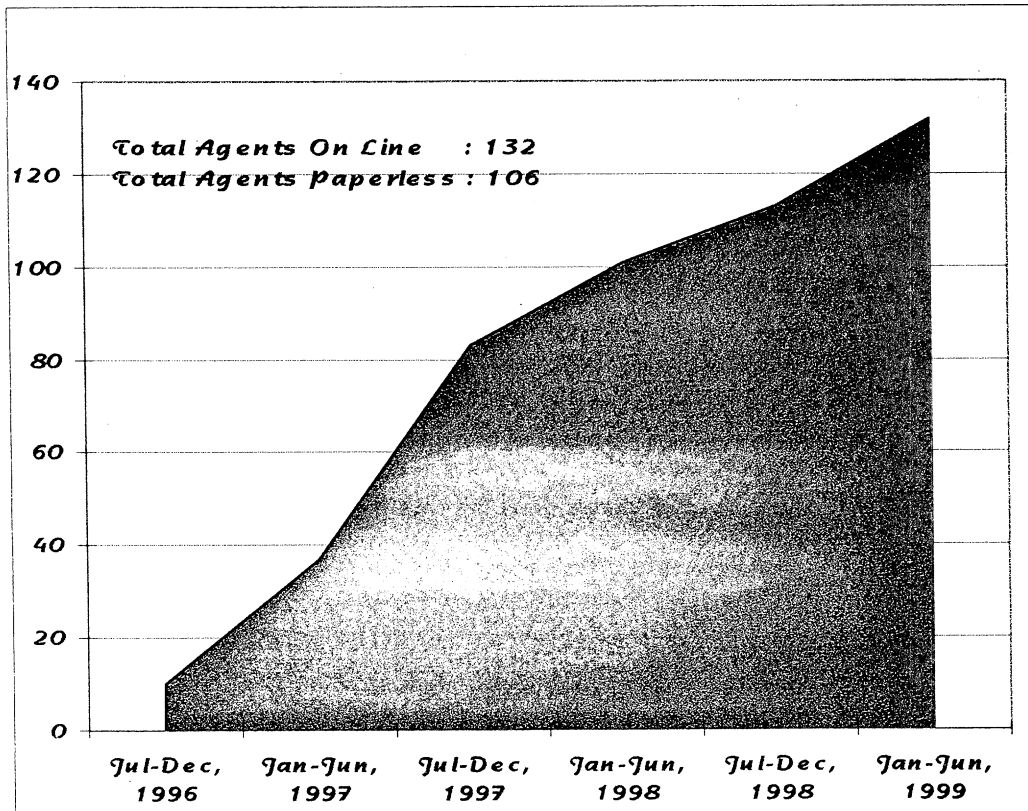
Rigorous testing was done to ensure the quality of the application before implementation. Internal as well as External users were given proper training and guidance. Dubai Customs were explained about the system.

How successful has MDS been?

Given the advantages that MDS offers, it is not surprising that the number of bills of lading transferred electronically in 1998, showed a sharp increase over 1997, shooting up to 92 per cent over 26 per cent of the previous year.

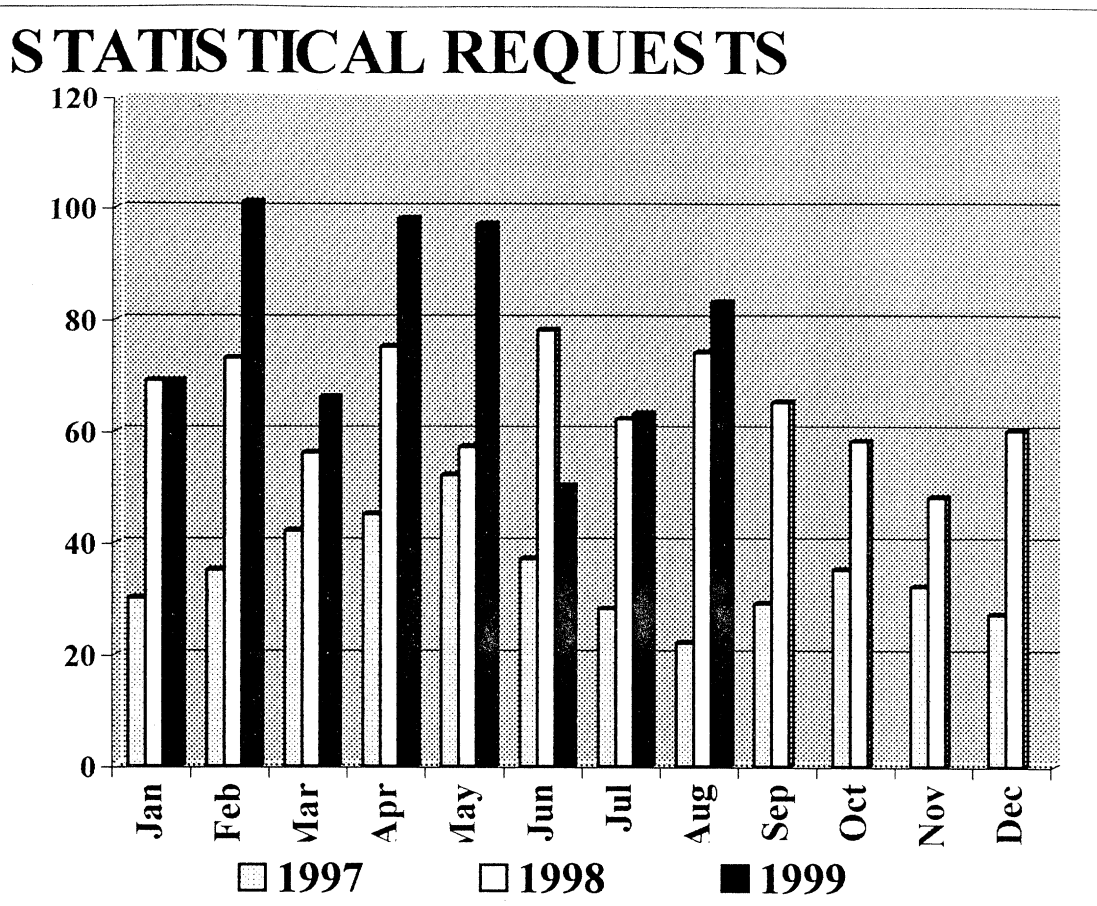


MDS has generated a very positive and encouraging response in the shipping community. An overwhelming 87 per cent of Manifest and Documentation System (MDS) users were satisfied with this recently introduced service according to a highly controlled user satisfaction survey of the local shipping agent community or on-line MDS users, published six months after the launch. Approximately 132 customers are presently connected to the manifest side. Over 3,000 manifest files are handled per month.



DPA has given priority to electronic communications in order to build closer relationships. Dubai is the established hub port of the region and a large amount of cargo handled by the port is for re-export transshipment, consolidation, export and other containerized cargo operations. MDS therefore offers swift easy clearance of cargo and considerable reduction in the time taken for it to reach its final destination. The next logical step is the total computerization of the operations in the Container Freight Stations (CFS), and this has already been embarked upon.

Apart from this, accurate statistics about cargo will also be available. By employing a sophisticated OLAP (On-Line Analytical Processing) tool over the cargo data, the Statistics section is able to meet various new adhoc queries from the customers on cargo statistics. The queries from customers have risen from 30 per month to about 100 per month in the last 6 months.



DPA's experience is being utilized in the evolution of CUSCAR for groups of Bills of Lading (BOL).

Effects / Benefits Of the Project

As shown in the figure 1, different layers of MDS have impacted and brought benefits to different categories of society in addition to different divisions of the department. The benefits and the reflections are explained below :

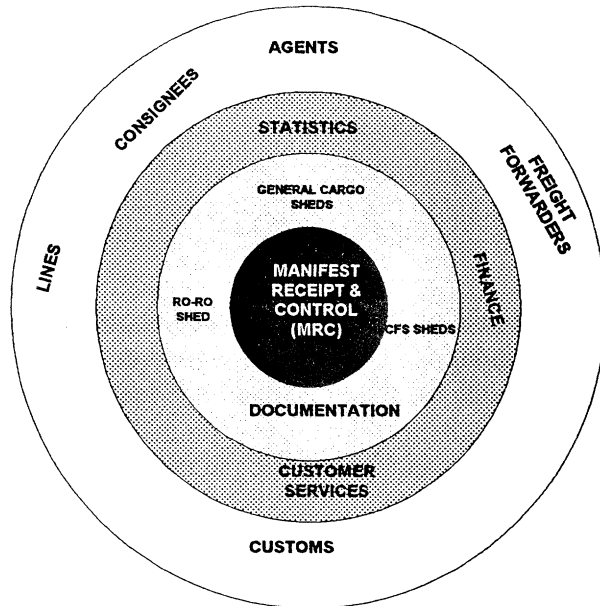


Figure-1

Benefits on different categories of society

Agents / Lines / Consignees

- 1) Paper is totally eliminated for 106 agents now
- 2) Since Dubai Customs also have adopted DPA's Manifest format, paper is eliminated there also.
- 3) Estimated paper saving per annum is 18 MT
- 4) The submission is once from the agent's office
- 5) Manifest received and shared by all the divisions of DPA
- 6) On-line enquiry facility is available which gives the latest status of the cargo
- 7) Each customer can look at his cargo only and not other's.
- 8) At Documentation counter, it used to take about 45 - 60 minutes to clear a Bill Of Entry (B/E). It now takes 5 - 10 minutes

CUSTOMS

Automation of Customs D/O, B/E process, was made possible as Custom's software was built over DPA's manifest format.

DPA Departments.

1. Cargo removal and location of cargo is readily available on-line
2. Computations on balance cargo available is more accurate
3. Landing Certificate to customers, but now completed in minutes as compared to days earlier.
(All information is available on-line in a user friendly mode)
4. Data Entry , Voluminous manual data entry (App. 50,000 txns per month) is almost eliminated. Current data entry is negligible (Less than 200 txns per month).

Majority of the benefits are improved services aiming at better customer lock-in by improving the efficiency and effectiveness of the internal processes. They will definitely have positive impact on our business.

FUTURE DIRECTIONS

Dubai Ports is always on the look out for new ways and innovatinos when it comes to improving efficiency and communication with its customers locally an d globally. Our next startegy is e-commerce for our customers and suppliers. This will incorporate EDI on the internet, security and confidentiality of the customer's data.

This paper was prepared with the assistance of the following from the Information Systems Department:

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She joined Dubai Ports in 1993, prior to DPA she had worked as a manager in the General Inforamtion Auhtority , the Federal government auhtority for development of software for the Ministries.

Lubna had worked for a private software company in the earlier years of her career.

She had also represented UAE in various conference in the country and internationally.

As part of her commitment for the community, she had served as the chairman for the advisory committee for Higher College of Technology. She is a regular speaker in technology for the University and the colleges.

