



In 2013, the container traffic through UK ports was over nine million TEU



i-PORT:

a new IT service for optimising intermodal container transport in European ports

A new app, i-PORT, has been launched to improve efficiency and customer service as well as reduce costs for hauliers moving goods through European ports.

ContainerPort is a pan-European project that aims to create a cloud-based communications infrastructure that will further optimise the passage of intermodal freight imports and exports through European ports. The project, called i-PORT, is based on collaboration between the European Space Agency, Aimes Grid Services and Avanti Communications, ports, including the port of Liverpool, and several shipping lines and container hauliers. Deployment will start during 2015 within the UK and Germany.

i-PORT will utilise any vehicle-based telematics, PDAs or smartphones to facilitate communications between all parties in the port-based supply chain and offer visibility of freight at each stage of the import or export process to all interested parties on a secure basis. The low-cost/no-cost project approach of using phones and apps is the key to providing real-time data communications to the transport and freight community that the tight financial cost constraints of the industry have previously obstructed.

i-PORT enables communication between a truck while in transit and its destination – port, delivery or collection point – to facilitate container delivery or pick-up. It will give advance notice of whether or not the driver has been able to meet the timeslot previously agreed. During transit to a port, i-PORT will send data continually to the port's vehicle booking system (VBS), so the time slot can be adjusted as necessary to fit the estimated time of arrival and the availability of the required assets for picking up or setting down. Similarly, planning for deliveries or collections at customer sites will be improved.

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SECTOR HIGHLIGHTS

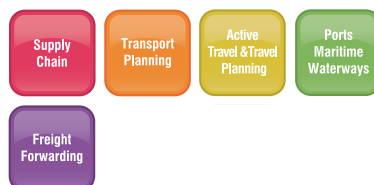
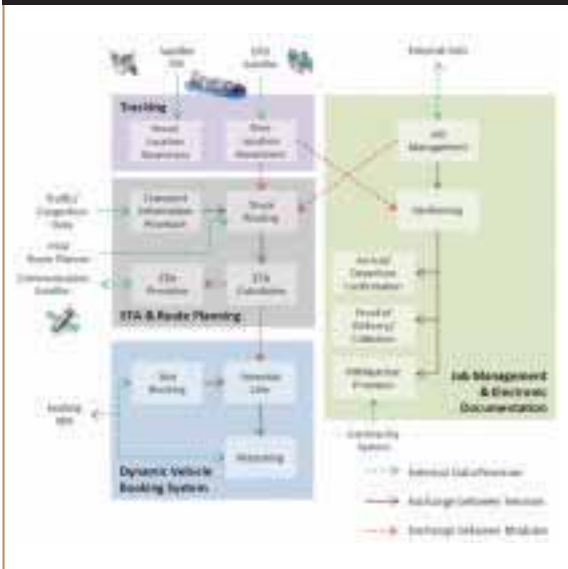


Figure 1: Schematic diagram of the i-Port system



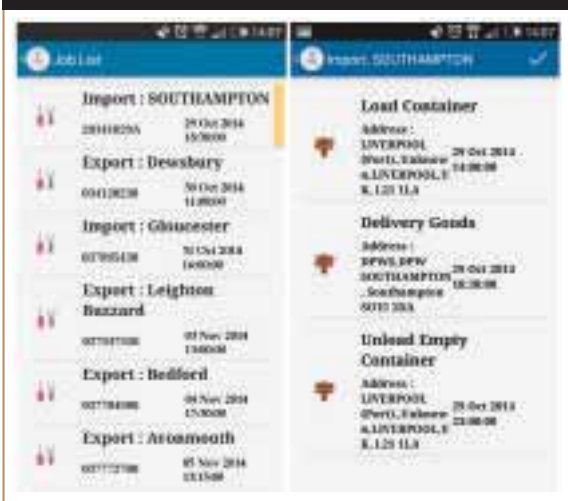
The project is currently in its demonstration phase, the objective of which is to test the system in an operational environment and to gather user validation to be used to refine the services for an operational rollout. Demonstration phase data will be made available to any European port on request, and will initially trial with Liverpool, Southampton, Bremerhaven, Wilhelmhaven and London container terminal. This data will include forecasts of missed booking slots and freight able to fill available slots and enable the ports to develop their VBS systems further. It will also send and receive information via links with the port community services network and maritime cargo processing (MCP). This phase will provide the project with sufficient scale to enable a full evaluation of its potential for an implementation in a commercial environment.

The problem

In 2013, the container traffic through UK ports was over nine million TEU. In particular, Felixstowe handled 3.7 million TEU, Southampton 1.5 million TEUs, Liverpool 700,000TEU and London (Tilbury) over 500,000TEU.

While the cost of transporting containers over water has steadily gone down as the size of container ships has increased, the cost of transport in the UK has actually increased, due to rising cost of diesel fuel, maintenance, road tax and wages. In addition, hauliers still have to cope with the UK's road infrastructure.

Figure 2: Job list, showing details of the current job (highlighted)



Container shipping lines, freight forwarders and non-vessel operating common carriers (NVOCCs) provide a door-to-door service for their customers' import and export cargo. Container shipping lines either manage the inland journey themselves or subcontract the transport to hauliers (container haulage companies) to provide the service on their behalf. The smooth operation of this service relies on sharing information across the many organisations that are involved with the clearance of the cargo by the port: customs and excise; security; health and safety; access in/out of the port at defined times; identification of the required container in the port; verification of documentation to establish ownership and transfer of responsibility; and arrival at the customer's site at a defined time.

Ports and terminals in general have well-proven systems for managing the operations in the port itself, including vessel planning, vessel operations, vehicle booking, electronic data interaction with customers, vessel manifest information and management of cargo clearance from the port – for example, customs, port health and payments. However, the port does not have a wider view of the impact of the constraints outside of the port; delays in traffic arising from bad weather, road works, vehicle breakdown or accidents, or other logistics or operational issues. Likewise, while times of arrival of ships and their loading or unloading can be estimated fairly accurately, there will be occasions where ships have to wait for a berth.

The port or terminal usually has a VBS system within which the haulier is assigned a time slot. The port/terminal can use this timing to arrange the relevant resources in its facility to match the workload required. In any one day many vehicles may be late or not arrive, so it can be difficult for the port to optimise the management of its resources. As a result typical wastage can be between 5% and 20% of slots.

For picking up or setting down a container load, a haulier will typically arrange a booking slot with the port giving a window of opportunity at which the driver will appear at the dock gates. If all goes well and the documentation is correct, the driver can be guided to the pick-up or set-down point, the container is transferred and the driver departs. However, for hauliers using the UK's ports there is often a major challenge if unforeseen delays result in drivers arriving at the dock gates outside their allotted time slot.

The information to allow access to the port is held in a number of systems, which can give rise to data transfer problems. A driver arriving at the port with incorrect shipping documentation or a booking reference will be denied access. In some ports, incorrect documentation has resulted in around 15% of drivers being turned away at the port entrance or held up. Incomplete documentation can lead to rejection and delays not only for the vehicle, but also for other vehicles waiting for access.

A problem can arise by incorrect references that the driver must have in order to pick up cargo. Drivers picking up import cargo need to have the correct release references (PIN/RAM). i-PORT will allow port authorities, hauliers and shipping lines to share information relating to constraints outside of the port and vehicle and container load documentation. This will certainly lead to smoother throughput of traffic in and out of the port, with savings and benefits for all parties.

The i-PORT system

The i-PORT system consists of four modules – see Figure 1. These modules are complementary and designed to work alongside existing systems – for example, most hauliers have a transport management system and, increasingly, mobile telematics modules running on phones, PDAs or in-vehicle telematics systems. i-PORT integrates with these existing modules in order to facilitate visibility of required data across all interested parties. A large haulier will often have mobile systems, but use many subcontractors that do not have the same facility. Subcontractors using the i-PORT app on a smartphone can gain maximum effectiveness and send more comprehensive data to their shipping line customers.

- **Tracking module** Working independently or alongside existing systems, will retrieve the location of the vessels and of the trucks. It uses satellite AIS data to track the vessels and also uses GPS data to track the trucks. This information can then be displayed on a map to the relevant actors to help them to plan requisite resources and used and in due course the ETA can be used by the DVBS service below.
- **ETA and route planning module** Monitors the location of the truck and its destination using an HGV-optimised route planner to calculate the most suitable route. The computation also takes into account traffic information to either provide a new route or to take into account the delay for the calculation of the ETA. Port terminals, hauliers and shipping lines will be able to view a list of trucks that according to the systems ETA calculation can meet any available slots.
- **Job management and electronic documentation module** Focuses on collecting data related to transport jobs for container import or export and providing this data to the DVBS service so that i-PORT can match the vehicles to the bookings at the ports.
- **DVBS module** Will complement existing vehicle booking systems (VBS) or reservation systems by enabling adjustment of vehicle slots in the port terminal. i-PORT will provide a framework/component that will enable currently deployed systems to be dynamic.

Where there is no currently deployed system, i-PORT will provide a VBS with standard functionalities offered by existing systems or a link to the port/terminal reservation or pre-announcement system if that exists.

Using the i-PORT system

The i-PORT mobile app runs on an Android smartphone or tablet supporting 3G and GPS sensors. (Phones offering these functionalities have been readily available since 2010 from a wide range of manufacturers.) The application can be downloaded and installed from a browser link.



Figure 4: Proof of delivery or collection



The Android device sits in the cab and can be used hands free. The app can run in silent mode, not interfering in any way with the driver, and the driver can switch from voice to text as needed. The apps are designed as far as possible to be intuitive and the driver will be led from the job list through to delivery instructions. Any job changes will prompt an alert to the driver, followed by the updated job details.

Available functions

- **Export/import job management** As shown in Figure 2, the driver will receive jobs directly to a smartphone, with the information necessary to carry out each job. The left-hand column gives a list the driver a list of current and future jobs and right the details of the current job.
- **Route planning** The driver can view an HGV optimised route from the current location to the next or requested destination(s). The driver can rely on the road traffic interface to adjust the ETA taking account of any road traffic problems and the reallocation of an achievable VBS slot if the current one will be missed. If traffic conditions change – for example, if a problem on a motorway arises – the system can offer the driver a more advantageous route around the traffic snarl-up – see Figure 3.
- **Proof of delivery/collection** An interface is provided to input information about the delivery/collection of the container and an interface is provided for the customer to sign. The time of customer’s signature is automatically recorded – see Figure 4.
- **Defect reporting** The smartphone provides a checklist to be filled in by the driver before the start of the journey (or at any time). This is stored electronically and a report sent to the depot.

- **Arriving/leaving confirmation** The shipping lines need information on time containers spend at the port waiting to be picked up or the time taken to be returned to the port. This is to measure port performance and also to calculate charges for demurrage or detention that could be levied under the contract.

To summarise, the driver gets assistance at all stages of a standard import or export job and the requirement for paper is eliminated by exchanging all documents electronically.

Need for user evaluation and feedback

The application aims to provide benefits to the haulier in delivery or collection of containers. Hauliers are being given the opportunity to improve efficiency and customer service while reducing costs with no need for capital investment. However, there are too many examples in the development of applications that have to reduce the workload of an operator, only to become little used in practice because the human interface is too complicated or unwieldy. User evaluation therefore is an important part of the application’s development.

ContainerPort is seeking the co-operation of interested hauliers whose drivers, working at UK ports would be willing to use the application free for 12 months and thereafter based on achieved cost savings, if deemed satisfactory, and who will give feedback.

Further information on taking part in this evaluation, contact: Neil Garland or James Douglas, ContainerPort. Tel: 0845 643 5150. Email n.garland@containerport.co.uk

About the authors

Neil Garland MILT is a consultant to the European Space Agency Project: *The optimisation of freight throughput in European ports.*

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