The Port of Rotterdam in the Netherlands is Europe's largest container port and plays a very important role in the European import and export market. In 2008, some 4.8 million metric tons of cargo passed through the Port of Rotterdam. The port and adjacent industrial area spans forty kilometers and runs from city center to the North Sea.

In order to stay competitive, the Port of Rotterdam must be able to quickly move cargo through its facility while still maintaining extremely high security. The Port's access control system has to be rugged enough to stand up to severe North Sea weather conditions, easy for truckers and stevedores to use, fraud-proof, portable and flexible enough to integrate with the port's logistics systems.

In addition, European ports must establish a process for tracking access by employees and visitors across private terminals under the International Maritime Organization’s (IMO) International Code for the Security of Ships and of Port Facilities (ISPS).

A biometric system met the Port's requirements. Unlike badges or credentials, which can be forged, lost or stolen, and require personnel to man access points, a biometric system uses a unique human characteristic such as finger, eye or hand to verify identity quickly and automatically. Among the biometric options, fingerprint systems, the lowest-cost solution, were less accurate with large populations than hand geometry systems. The port's truckers and stevedores resisted iris scanners. However, they had no problem placing a hand on a reader. With dramatically lower false reject and failure to enroll rates than other biometric technologies, the value of hand readers grows as the number of users and/or transactions increases. They are recommended for outdoor applications.

By using biometric hand readers together with smart chip cards, the Port implemented a fast method of identifying drivers, avoiding costly transport delays while still ensuring the highest security. The Rotterdam system, in use since 1998, gives each driver that enters the port a unique electronic identity.
Each of the Port’s gates, plants, loading docks, staging areas and other critical entry points is equipped with a biometric reader. Ruggedized for outdoor use, even in the harshest conditions, the readers use hand geometry technology to map and verify the 3D size and shape of a person’s hand in less than one second.

Each driver receives a card that looks like a normal credit card but it is actually a smart card embedded with a chip that contains the driver’s photo, personal identification, company information and a biometric template of the driver’s left hand. The driver inserts the smart card and places his left hand on the biometric reader. If the hand matches the template in the smart card, the driver is verified and can pass through the access control point. This also lets the driver pass through some of the secure entries without leaving the vehicle.

As cargo travels through the Port of Rotterdam, the biometric system plays many roles. At the terminal entrances, the system identifies and registers driver and cargo. At each stop along the way, information systems linked into the biometric system instruct the driver where to go and in what sequence. Processing is faster because driver and receiver know arrival times in advance.

When cargo offloads to a ship or plant or loads onto the truck for delivery elsewhere in Europe, the receiver or shipper performs a final check to see that everything has been handled properly. As the driver exits, the biometric hand reader serves as an electronic signature, certifying that the transfer took place correctly.

**Similar system in Antwerp**
The Port of Antwerp (Belgium), Europe’s fourth busiest port with a 2008 throughput of 2.6 million metric tons, has joined the Port of Rotterdam in also using a similar biometric-based system. In Antwerp, up to 20,000 longshoremen, truck drivers and visitors requiring access to one of the port’s 71 individual terminals are validated and recorded using the system. Over 8,000 credentials have been issued.

Using this biometric system, both ports are able to more quickly and accurately verify the identities of authorized employees and visitors at port entrances. The biometric-based solution improves security and safety as well as operating efficiencies.

Of special importance to transportation authorities, the biometrically-enhanced smart card system ensures that information cannot be manipulated or changed, the driver does not have to remember specific information such as a PIN code, the smartcard cannot be transferred to other people and mistakes as a result of typing in incorrect ID numbers are impossible.

**Capabilities of the port system**
Each of the electronic identification cards are equipped with radio frequency identification (RFID) technology allowing cards to be read up to 10 centimeters away by each reader, facilitating fast movement through access points. The system stores information about employee certifications, work experience and access restrictions, as well as biometric identifiers. The cards may be used a variety of RFID readers.

Built with an open architecture, the database enables each of the Ports’ terminals to integrate additional security and safety technologies, such as closed circuit television (CCTV) and time-and-attendance, with their individual systems through an XML interface as well as other open standards.

For instance, at Antwerp, the open-architecture database and supporting technological infrastructure lets the port’s 71 private terminals access and use the card management system to secure their individual access points. Private terminals can also have real-time access to data about all personnel cleared to do business with the port. Port authorities and government officials can obtain up-to-the-minute reporting on all port activity for those access points integrated into the system.
The card management system is built on the latest web technologies. The systems utilize a powerful work flow engine coupled with full web-based interaction, enabling the complex credentialing process to be carried out fast and efficiently across terminals and other systems. The web-based reports can also detail the movement of employees and visitors through the port, among other information.

By using biometric hand geometry readers together with smart chip cards, the Ports of Rotterdam and Antwerp have implemented systems that are predecessors to the “Transportation Worker Identity Program (TWIC)” now being developed by the U.S. Transportation Security Administration, which could ultimately involve 6 million workers at U.S. seaports, airports, railways and other transportation facilities. Such systems could be quickly installed in U.S. ports.

Learn more about HandReaders

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