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## ADVANCED COMMUNICATION TOOLS TO COPE WITH THE INCREASING NEED FOR INFORMATION EXCHANGE ALONG TRANSPORT CHAINS

*Logistics requirements force operators to enhance their electronic communication abilities. Status information are required to monitor and control supply chains. Operators need communication tools enabling the link between their in-house application systems and the external electronic communication, i.e. the automated generation and reception of messages. One successful example for tools of that kind is the AIM (Application Interconnectivity Management) approach. The paper will present the concept and examples for application.*

### **Background**

#### *Requirements*

The organization, management and monitoring of complex intermodal transport chains and networks increasingly enforce all participants to be flexible and reliable partners. One of the key abilities of those partners is to exchange information in a high quality – always actual, by electronic means, on demand, event-driven or regularly. So, transport networks imply information networks.

Globalization, outsourcing and other logistics trends let the number of partners and the number of interfaces grow.

In a long-term view, operators which do not fulfill these requirements from clients or network managers, will lose market shares.

Integrated solutions are necessary including traditional EDI, interactive WWW-based solutions being open to new and old standards, allowing to include

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additional business logic (in order to interconnect different business models) and keep an eye on security issues.

### *Actual situation*

In contrast to these requirements, the actual situation is quite different and can be characterized in the following way:

- operational and administrative procedures differ e.g. from company to company, from country to country, from port to port
- information bits and pieces are scattered all over the participants
- information pieces are not consistent
- application systems and data contents are not compatible
- EDI standards (such as EDIFACT) are quite complicated; agreements procedures take a long time
- old systems not designed to communicate
- information exchange by fax and phone prevail.

In bigger ports, information nodes (called Port Community Systems) have been built, but these focus on nodes and not on chains or networks. So, bilateral agreements have to be found among the partners – one by one or between the “chain/network” manager and the operators. Even in the latter case, working for different operators makes the thing complicated again.

Thus, the need for cheap and powerful tools for collection, presentation and distribution of information is evident. Such tools shall cover EDI and web, as well as mobile communication (WAP, UMTS, GPRS, ...). In the following chapters an example for such a tool will be presented.

## **The AIM (Application Interconnectivity Management) concept**

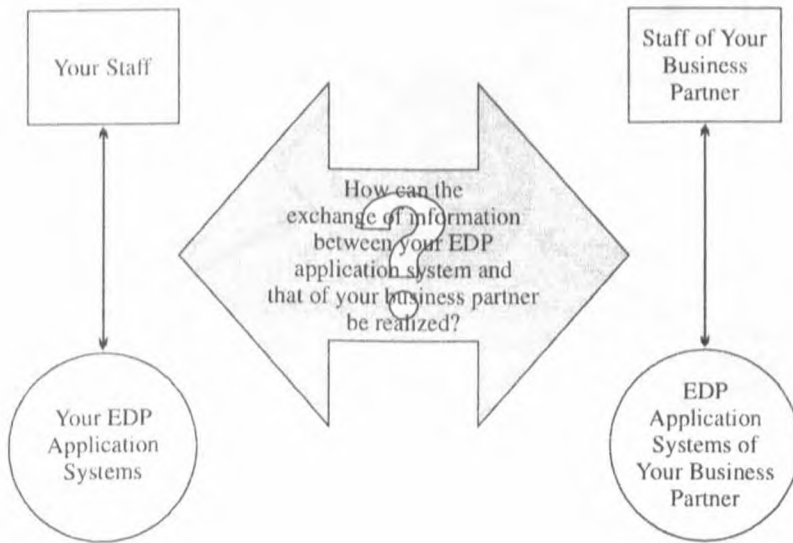
### *From project to product*

Between 1996 and 1998 the EC funded project BOPCom (Baltic Open Port Communication) provided the platform to develop the AIM concept. From this basis the components have been improved and extended in functionality during the past years. Further extensions, e.g. for XML, CORBA, WAP, etc. are in preparation.

The tools have been used in other R&D projects as well as in commercial environments.

### *The problem*

Your staff use various software products to carry out their daily work tasks. Your business also depends upon the exchange of information with your own customers, your suppliers and with the authorities, each of which have their own EDP application systems.



There are basically two methods for realizing the exchange of information with your communication partners:

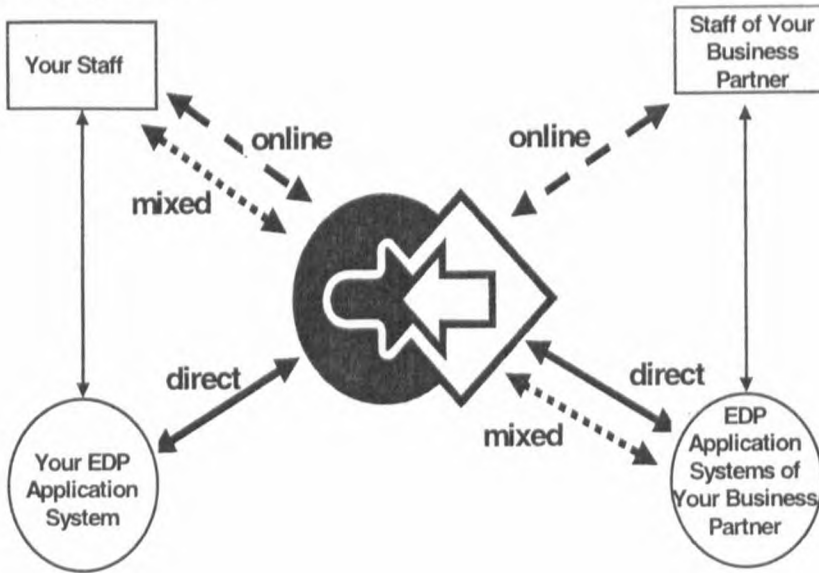
1. You have got an EDP application system which is capable of processing the information to be exchanged, as well as importing and exporting it.

Example: You have got software that is customarily used among freight forwarders, shipping agents, shipping companies and others and which is capable of processing customs declarations and then storing the data contained within as a file in your computer.

2. You haven't got an EDP application system which is capable of processing - as well as importing and exporting - the information to be exchanged.

Example: You have to file a hazardous cargo report with a regulatory agency, however you have no specific software that can do this. You do this with the help of a formula written under Word, which you fill out on your computer and then fax to the agency.

Application Interconnectivity Management (AIM) is a solution for both methods of information exchange with customers, business partners and with regulatory agencies.



AIM consists of a set of tools for integrating EDI and internet communication in transport related application areas offering the following communication alternatives:

#### AIM direct

The “direct” method requires that both you and your communication partner have EDP application systems which are capable of both importing and exporting and processing the information to be exchanged.

It is not, however, necessary that the structures and formats of the files which your software can export and the software of your business partner can import be identical. The required conversion is carried out by AIM. To the extent that there are manual operations external to the EDP application systems that need to be carried out, AIM provides a window for this.

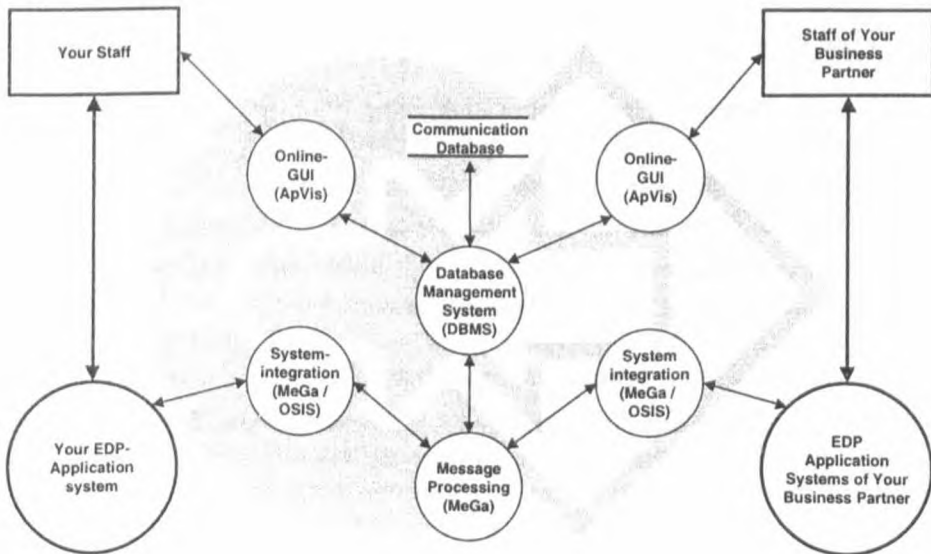
### AIM online

Neither you nor your communication partner have the necessary EDP application systems required for the processing of the information to be exchanged. In this case, AIM provides you with the necessary forms over the Internet (via a WWW browser, such as Netscape Communicator or Microsoft Internet Explorer).

For the example of a hazardous cargo report, you receive a window for the entry of data, which is then recorded by AIM. AIM also sends a window to your communication partner, which may be different from the one that you receive. The required data is entered and processed and the new information is again recorded by AIM. You now have access to this information, and so forth.

### AIM mixed

Only one of the communication partners has a suitable EDP application system with which information can be generated and then recorded by AIM. The other partner, the one who does not have a suitable EDP application system, uses the "online" method. He accesses the data by using the forms accessed by the standard WWW browsers, processes the information and records it again with AIM. From here, it can be imported into the application system of the other communication partner, processed further, and so forth.



AIM consists of several components which may be combined to meet the exact requirements and conditions in your company. You may possibly need only one, single component: OSIS – and that would be in the situation where your EDP application system, as well as that of your partner are capable of importing and exporting ASCII files with the required data and no manual processing of file contents is required.

Components	Short Description
CoDaBa	Communication database for the intermediate storage of data between sender and receiver
MeGa	“Message Gateway” for the import of data in ASCII files into the communication database and, vice versa, for the export of ASCII files out of the communication database
OSIS	“Open Systems Interconnection Software” for the transmission and logical conversion of information available in the form of ASCII files, for the handling of the various protocols and services and for the handling of the interfaces of the EDP application systems for the control of the importing and exporting of files
ApVis	“Graphical User Interface” in the form of Java Applets, which can be started from within the WWW browsers and enables access to the data in the communication database

### AIM Application areas/Examples

Four completely different application areas show the potential of AIM to support electronic communication in transport and logistics:

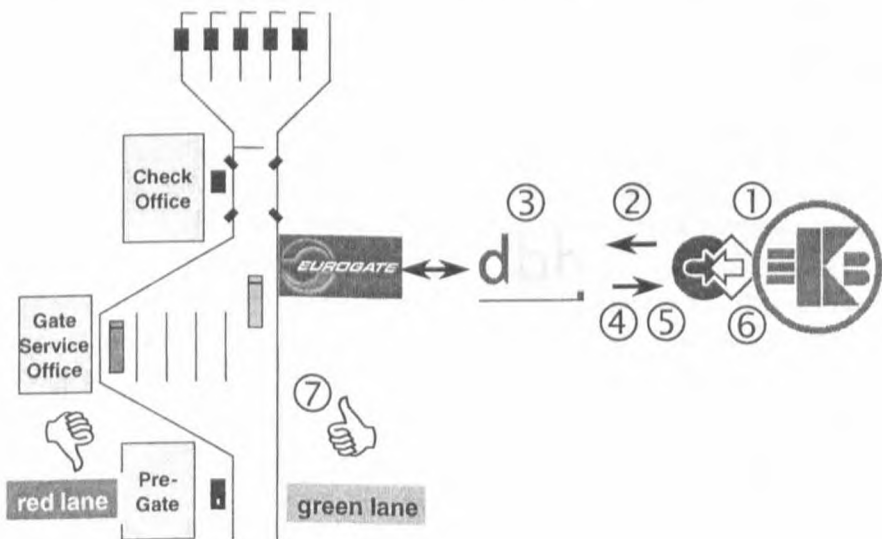
- Linking truck and port operation in container transport
- Connecting a terminal with the outside world
- Providing an eBusiness platform for goods import and distribution
- Implementing a tracking and tracing solution

#### *Example 1: Truck pre-notification in ports*

In the container terminal Bremerhaven, new procedures for enhancing the co-operation between the terminal operator EUROGATE and truck operators calling at that terminal have been implemented containing the submission of transport pre-notifications with qualified responses e.g. on availability.

Truck operators can now clarify beforehand, if the containers they want to pick up or deliver are ready to be processed by the terminal, i.e. if they have been discharged, released, if dangerous goods information is available, etc. So, unsuccessful trips can be avoided in the future - planning can be optimized. On the other hand, the terminal operator can optimize his resource planning and operation if knowing in which period of time he will expect which amount of trucks to be processed.

The realization with pilot truck operator EKB was based on the integration of existing applications at both sides of the co-operation link. An adequate set of EDIFACT messages (COPINO/IFTSTA) had been agreed upon.



The sequence of actions is as follows:

1. The dispatcher generates pre-notifications for planned truck transports directly from his in-house systems via AIM.
2. EKB submits these pre-notification messages to EUROGATE via dbh, the operator of the Bremen Port Community System.
3. EUROGATE/dbh checks, if the data correspond with the loading/discharging orders, if codes are valid, if import containers are ready to be picked-up, etc.
4. EUROGATE/dbh submits a reply: either a confirmation or rejection. Additionally deviations between order and pre-notification will be reported.

5. EUROGATE/dbh submits additional status messages for pre-announced transports: „gate in“ for export containers, „gate out“ for import containers with time stamp and license plate of the truck.
6. EKB processes these replies with their in-house system again; the dispatcher will be warned if he has to act on a certain transport
7. The EUROGATE gate processing can be automated and accelerated.

The impacts by using this form of co-operation are convincing: intermodal transports become faster, more reliable and predictable and the companies will enhance their productivity and cost effectiveness.

*Example 2: Complete communication solution for a container terminal*

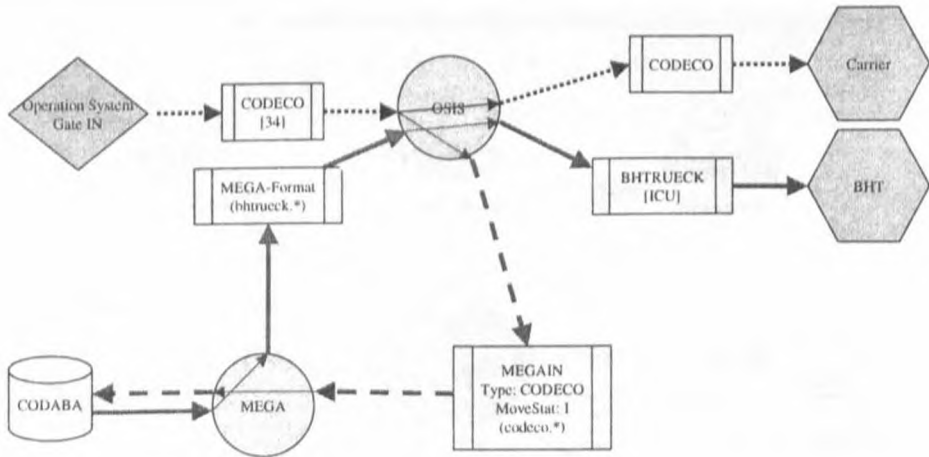
NTB (North Sea Terminals Bremerhaven), a company owned by EUROGATE and Maersk, operates a container terminal in Bremerhaven.

In 2001, a new terminal operation software had been installed. For the Bremen ports it is mandatory that all export containers have to be announced electronically via the Port Community System BHT. Moreover, all actions such as every container move on the yard has to be reported to BHT.

The software supplier refused to build all the “Bremen specific procedures” into his standard product. Therefore, the AIM components were configured to solve this task, i.e. communication with

- Shipping companies (e.g. for bay plans and schedules, loading/unloading reports)
- Port Community System (e.g. for container moves, gate in/out, loading/unloading)
- The “neighbour” terminal on containers to be shifted from one terminal to the other
- The cost accounting system outsourced to a different company.





Moreover, additional functionality for special operations such as processing stop messages from the customs which could not be processed by the operation software, are handled by AIM with special internet based viewers.

In total about 40 EDI messages and procedures have been implemented; the whole system is operational since September 2001.

### *Example 3: eBusiness platform for goods import and distribution*

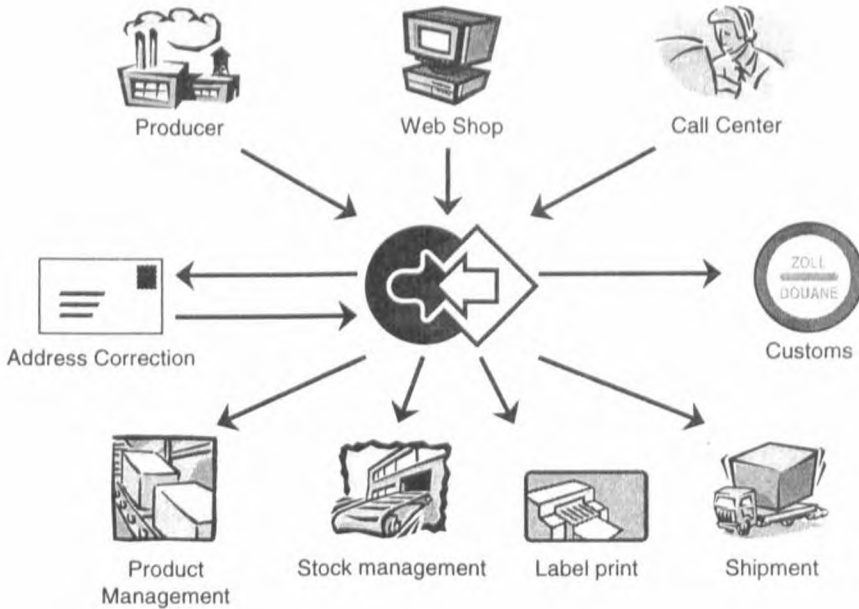
A Bremen based logistics service provider wanted to create a new business in importing cakes from the US and distributing them through whole Europe.

The “before” situation was quite bad: a lot of information pieces existed e.g. in Excel tables and had to be re-keyed for each step of operation. Delivery addresses from different sources did not correspond and made labelling of packages a difficult task with a high percentage of return shipments. Customs clearance procedures were extremely time-consuming.

With the link of the different sources with AIM these drawbacks could be skipped.

Functions are: conversion and import of order lists from the manufacturers in any format, online orders using web shops, submission of addresses for checking to external software or service, automated production of lists for customs declaration, Preparation of shipments on order date, delivery date, delivery addresses etc., integration of product management and stock management, label print, management of return shipments, tracking and tracing. Appropriate viewers exist for order management, customer management, customs declaration, Preparation of shipments, management of return shipments.

The system is operational since end of 2001.



#### *Example 4: Tracking and tracing*

Ports know much about cargo and their details. Why not providing this information to other parties and adding information from different sources? VATT (Value added tracking and tracing) went this way. Status information (based on events) of containers or even consignments can be retrieved per EDI or Internet. Agents in overseas ports are able to enter status information via internet which then can be generated to EDI messages automatically – by it's "heart" AIM (the "mixed" operation presented above).

Customer tailored configuration allow specific events and codes, selection of data sources and media such as EDI, WWW, E-Mail or Fax as well as the transmission at fixed times or immediately (e.g. defining alarm events). The VATT system is in operation for more than 2 years.

**vatt**  
value added transport & logistics

[Suchen](#) [Logoff](#)

**Suchkriterien**

Zielhafen	Transport - Nummer	Avis - Nummer	Lieferschein	Ladeseinheit / Packstück
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**Objektliste**

Zielhafen	Transport - Nummer	Avis - Nummer	Lieferschein	Ladeseinheit / Packstück	Ereignisse
VALPARAISO	85130987	0009	23303819	P 2	Ereignisse
VALPARAISO	85132258	0012	23328724	L 1	Ereignisse
VALPARAISO	85132258	0012	23328724	L 2	Ereignisse
VALPARAISO	85132258	0012	23328724	L 3	Ereignisse
VALPARAISO	85132258	0012	23313232	P 4	Ereignisse
VALPARAISO	85132258	0012	23328723	P 3	Ereignisse
VALPARAISO	85132258	0012	23313232	P 5	Ereignisse
VALPARAISO	85132258	0012	23317718	P 2	Ereignisse
VALPARAISO	85132885	0009	23343831	P 9	Ereignisse
VALPARAISO	85132885	0009	23343831	P 10 15	Ereignisse

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## Summary

AIM is a good example for modern communication tools being required for a lot of tasks in intermodal transport and logistics. Operators being forced to deliver electronic information to their cooperation partners need tools like this in order to stay competitive and in the market.

The four examples showed the variety of application areas:

- a truck operator enabled to communicate along a chain
- a container terminal operator communicating as node
- a logistics service provider solving his eBusiness procedures
- an information service provider collecting and distributing status information.

Additionally, this a good example how results from projects funded by the European Commission survive after the funding period.