Bayplan Progress toward International Standards in Communication

by Dirk Steenken and Ulrich Spindel

In September 1991, the Working Group Trade/WP.4 of the United Nations declared 34 EDI messages to have achieved the worldwide unique EDIFACT standard. Among them were two messages for the shipping branch called BAPLIE and BAPLTE. Arriving at the EDIFACT standard is an important step to uniform communication between shipping lines, stowage coordination centers, and terminal operators with respect to bayplan data about container vessels.

What is EDIFACT? EDIFACT stands for Electronic Data Interchange For Administration, Commerce and Transport, and is the international, unique standard of data communication using EDI. It consists of a worldwide set of rules, a syntax or "language" for designing EDI messages between commercial partners. It is a "transfer language" which describes the message content in a unique format on the application level of the open system interconnection (OSI) reference model. The EDIFACT standard was defined in 1987 by the United Nations (UN) and the International Standards Organization (ISO) and accepted by several national standardization organizations. It is the *first worldwide standard for EDI*.

Based on the United Nations Trade Data Element Dictionary (UNTDED), and on the ISO 646 (7-bit) and the ISO 6937/8859 (8-bit) character sets, EDIFACT contains a set of syntax rules and message structure conditions to generate a valid EDI message.

Data Elements (single or in *Data Element Groups*) form a so-called *Data Segment*. A *Message* consists of several well-defined segments. There are several conventions for separating and/or terminating elements or segments, thus allowing data compression. Nesting and repeating segments and elements are permitted. Figure 1 illustrates a general EDIFACT structure.

The hierarchical structure of EDIFACT corresponds to the structure of a MUMPS database. This makes it relatively easy to implement EDIFACT message data using a global array.

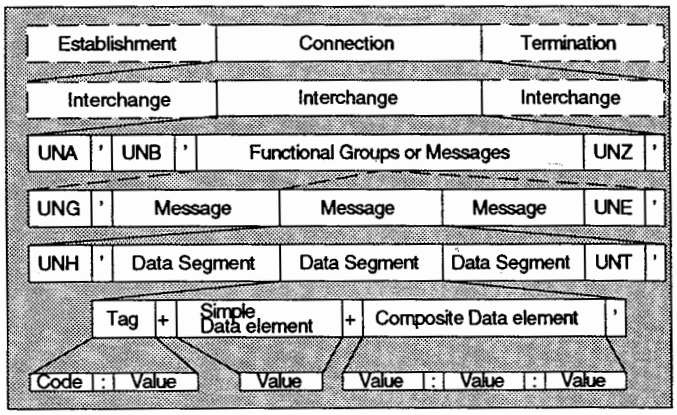

Figure 1. EDIFACT structure: UNx—service segments,
' —segment terminator,
+ —element terminator,
: —element separator within a group.

The main advantages of EDIFACT are:

- Universal validity (independent of bilateral agreements);
- Portability (independent of special computer hard- and software); and
- Electronic transmission and direct processing by recipient's computer applications of documents, shipping lists, etc.

Bayplan Messages

BAPLIE stands for BAyPLan Including Empties; BAPLTE stands for BAyPLan Total Equipment. Both messages are mainly designed for full container vessels.

Of the two messages, BAPLIE is more important. (Figure 2 shows the EDIFACT structure in detail.) It is used to transmit information about all occupied places onboard a vessel, whereas BAPLTE only allows the total quantity of equipment to be reported. BAPLIE describes the complete loading status and the full and detailed equipment information for all locations of a container vessel. Before arrival of a ship, the mes-

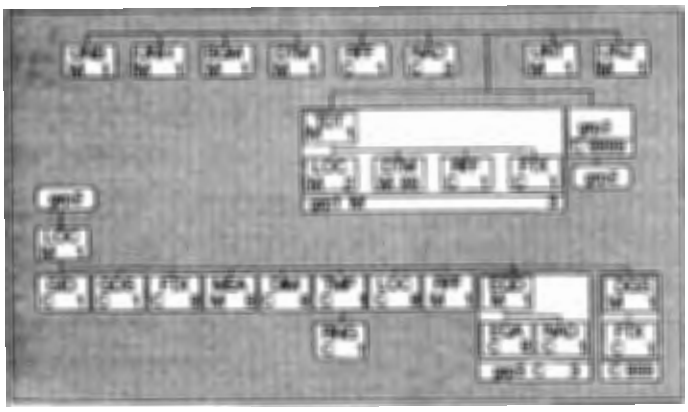

Figure 2. Structure of BAPLIE message:
M—mandatory,
C—conditional segment,
Number—maximal occurrence of segment.

sage is transmitted to the terminal operator in the next port of call, who then extracts the information relevant to operations there. After the loading operation, the actualized bayplan goes to the stowage coordination center and the next port of call (figure 3).

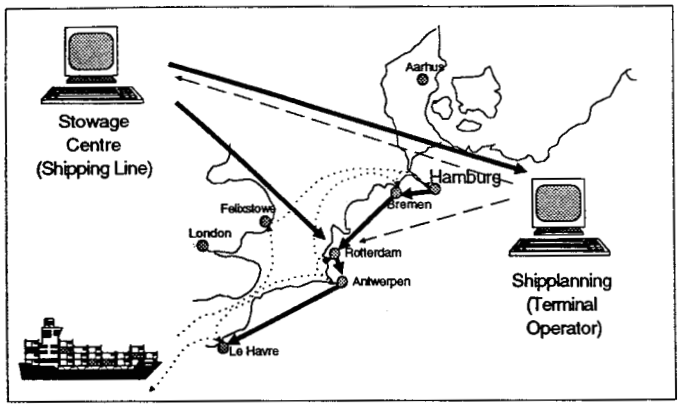

Figure 3. Data flow between stowage center and terminal operators.

The bayplan EDIFACT messages BAPLIE and BAPLTE were designed by a European group of EDI and container operation experts called Ship planning Message Development Group (SMDG). The members of this group are delegates of shipping lines (among them Hapag Lloyd, Sealand, Nedlloyd, P&O, SAECS, and Hanjin, to mention only a few) and stevedores from West European countries and the UK, from Helsinki via Hamburg, Bremen, Rotterdam, Antwerp, Felixstowe to Barcelona or Genoa, who have worked together for more than five years.

The members of the SMDG decided not only to develop an EDIFACT bayplan message but also to regulate its use. This is called the *Users Manual*, which has been developed to avoid different interpretations and uses of the message. One important agreement is that only international codes should be used. Such codes are, for example, the ISO container size and type code, the international call sign to identify the vessel, the BIC (Bureau International des Containeurs) code for the vessel and/or container operator, and the five digit UN-Locode for the identification of ports and locations. Using international codes avoids the numerous code translations that often occur in bilateral agreements.

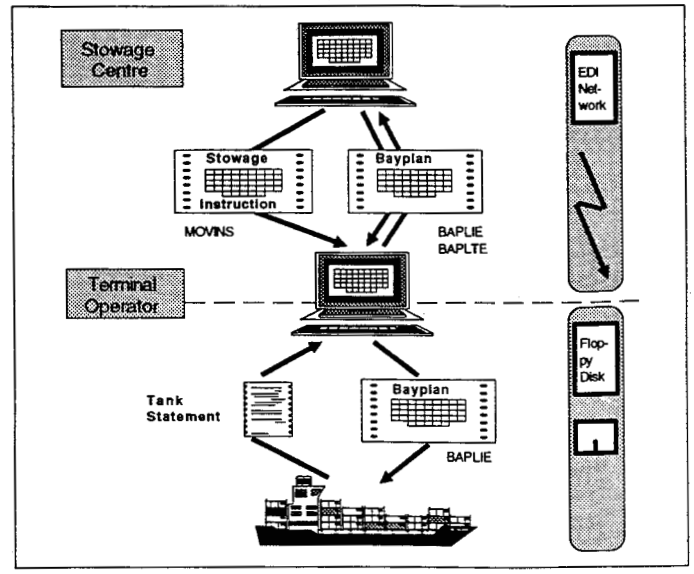

Figure 4. Organizational structure of bayplan communication.

Several members of the SMDG, shipping lines, and container terminal operators already have begun to exchange bayplan data electronically using the BAPLIE message. The EDI link replaces the telex and telefax transmissions, thus saving time and costs (figure 4). Links to corresponding ship planning computer systems have been installed and the data of the EDI bayplan are automatically filed in the computer applications on both sides of the stowage centers and the container terminal operator, reducing the manual input of data enormously.

At the HHLA container terminal, a dialog computer system controls the container operation. It is fully developed in MUMPS with modules for equipment control, ship planning,

yard planning, and radio data communication. The bayplan data transmitted in EDIFACT format are converted by a general EDI-converter, also programmed in M, and filed automatically into the data base of the ship planning application using an in-house global format (figure 5). Data then can be processed within the ship planning computer system which uses graphical tools: information about equipment discharged from the vessel is removed, data about equipment loaded are inserted, locations of equipment shifted are changed, and when the vessel sails, the updated bayplan message is then transmitted to the ship owner, the tonnage center, and the terminal operator in the next port of call directly from one computer system via EDI to the next. The bayplan data are also filed on a floppy disk and given to the ship manager where they are filed into the shipboard computer to process stability calculations.

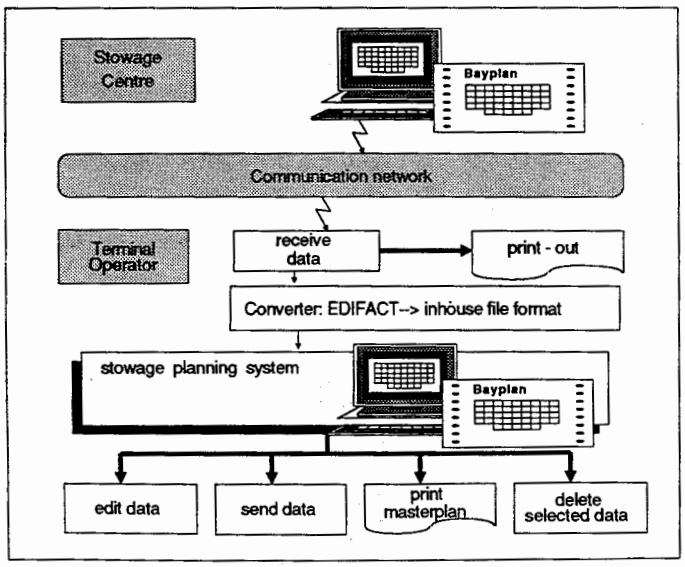

Figure 5. System integration of bayplan communication.

Since the beginning of 1992 when official trials began, the bayplan exchange in EDIFACT standard format has expanded rapidly. HHLA is now exchanging bayplan data with five shipping lines, three of them using value-added networks (the others use direct dial-up links). At the site of HHLA's ship planning system, only one application routine for sending and receiving data is managed directly by the ship planners independent of the transmission medium applied for the communication.

Bayplan communication will grow further: HHLA expects a bayplan communication system with about ten lines in 1993. The development group, SMDG, has been granted the status of an official Pan European User Group of the EDIFACT organization, and members of companies from Saudi Arabia and Singapore are also engaged in SMDG's work. Entities from the USA, Canada, Australia, and Japan participate as observers. SMDG has defined a new message called MOVINS which contains the stowage instruction data sent from the stowage coordination center to the terminal operator. A stowage instruction is the general directive of the shipping line that specifies which ship positions (cells) can be used for the loading of export containers. The formal EDIFACT standard for this message will be expected in March 1993.

At present none of the other companies in the bayplan communication network are using M, for they already had applications in place in their own environment. They only needed to install the interface between these applications and the bayplan network. ❖

Dirk Steenken and Ulrich Spindel earlier reported on M's usefulness in the international shipping arena in the September 1991 issue of *MUG Quarterly*. They are based in Hamburg, Germany, with HHLA (Hamburger Hafen- und Lagerhaus-Aktiengesellschaft).