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IMPLEMENTATION OF ELECTRONIC BUSINESS STANDARDS IN LOGISTICS

The new emerging technologies based on global standards give the possibility to make the flexible supply chains effective. Especially ICT technology implemented in the open Internet solutions will be the next milestone. This article explains the concept of ebXML[2] standard from managing of supply chains point of view, focusing on transportation activity area.

IMPLEMENTACJA STANDARDÓW GOSPODARKI ELEKTRONICZNEJ W LOGISTYCE

Standard ebXML popierany przez międzynarodowe gremia i wdrażany przez światowych liderów gospodarczych, ma szczególne znaczenie z perspektywy zastosowań w obsłudze przepływów informacyjnych wokół łańcuchów dostaw. Będące jego częścią składową Repozytorium, utrzymuje predefiniowane opisy profili partnerów oraz procesów, w których podmioty te mogą uczestniczyć ze wskazaniem ról, właściwych dla ich działalności. Powyższe standardowe opisy uzupełniają definicje wzorów dokumentów elektronicznych, wykorzystywanych w transakcjach realizowanych procesów biznesowych.

1. INTRODUCTION

The objective of this paper is to present the development of logistics systems, including railway transportation, to involve of ebXML Registry & Repository and ebMS messaging system. Especially these tools are made for implementing the solutions automating the construction of an agreement describing possibility to exchange appropriate electronic message through the Internet. The concept described in this paper is to promote new technology ebXML from supply chain perspective of maintaining and exchanging the valuable information on logistics service providers, supply chain processes and safety

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[2] ebXML (Electronic Business XML) – the OASIS standard for business over Internet (BPSS, ebMS, CPP, CPA), endorsed by United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT), ISO approved

exchange of electronic documents. XML[3] scripting, especially ebXML concept brings the modern tools that are in position to describe the logistics system. Any time now we have the contact with document description, transaction using this document and processes. Each of business actors plays properly described role and sends or receives specific messages and business signals. In addition, there are possibilities to search 'Registry' looking for appropriate business partner (CPP) using information exchange technology, as they accept and construct the agreement (CPA).
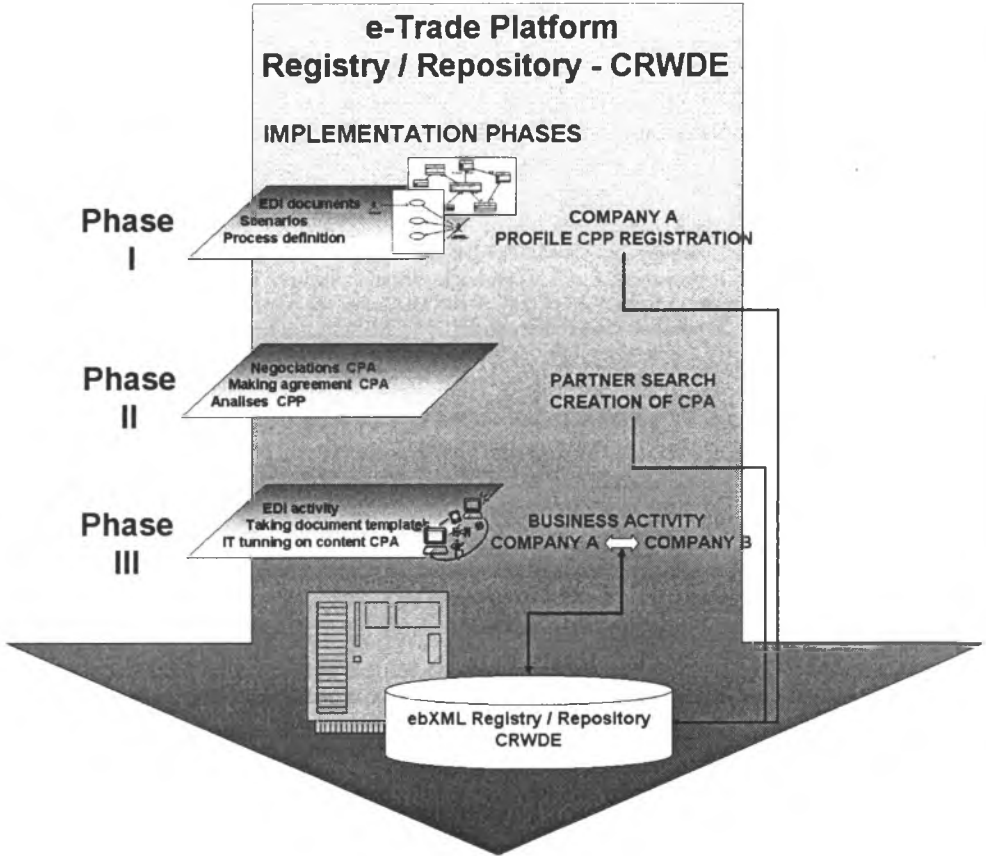

Fig.1. Diagram of implementation scheme (source: ILiM)

This way we have the possibility to manage the group of logistics service providers at the same time from application running at e.g. Rescue Center. That information will support the ITS systems combined with EPL4 with support of CRWDE5.

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[3] XML (Extensible Markup Language) – the standard of Word Wide Web Consortium (W3C)

4 EPL – Electronic Logistics Platform developed in Poland

5 CRWDE – ebXML Registry/Repository developed in Poland by Institute of Logistics and Warehousing

2. THE ebXML STANDARD

International Standards Organization (ISO) has approved an ebXML OASIS Standards that enable business partner to conduct their activity by the means of the Internet. The general title of this standards is "Electronic business eXtensible Markup Language" with the new ISO 15000 designation. At this point we have had four parts of documentation:

a) ISO 15000-1 ebXML Collaborative Partner Profile Agreement,
b) ISO 15000-2 ebXML Messaging Service Specification,
c) ISO 15000-3 ebXML Registry Information Model,
d) ISO 15000-4 ebXML Registry Services Specification.

The ebXML standards are described in the ebXML Technical Architecture Specification[6].

2.1. COLLABORATIVE PARTNER PROFILE AGREEMENT

The new concept of managing of supply chain collaboration needs that we have a clear description of processes with identified role of involved parties. This description is made in XML notation under control of standard Business Process Specification Schema (BPSS). All process descriptions are stored in ebXML Registry/Repository. In addition, the possibility to exchange the electronic messages should be defined in Phase I of implementation and stored in specific object of Repository named Collaboration Protocol Profile (CPP).

The structure of CPP consists of five type of elements:

a) PartyInfo – identification of organization whose capabilities are described in this Collaboration Protocol Profile
b) SimplePart – element provides a repeatable list of the constituent parts, primarily identified by the MIME content-type value
c) Packaging – element provides specific information how the Message Header and payload constituent(s) are packaged
d) Signature – element enables the CPP to be digitally signed
e) Comment –free text information

The elements of PartyInfo give the identifier of process specification -1 (Fig.2), actions binding and can send and/or can receive possibility - 2 (Fig.2). There is a description of transport protocols and security level - 3 (Fig.2), too.

These parameters clearly describe the possible collaboration activity (specific role in the Business Collaboration) and, because of XML representation, it may be the part of Collaboration Protocol Agreement constructed and negotiated in Phase II (Fig.1).

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[6] ebXML Technical Architecture Specification v1.04 – http://www.ebxml.org/specs/ebTA.pdf
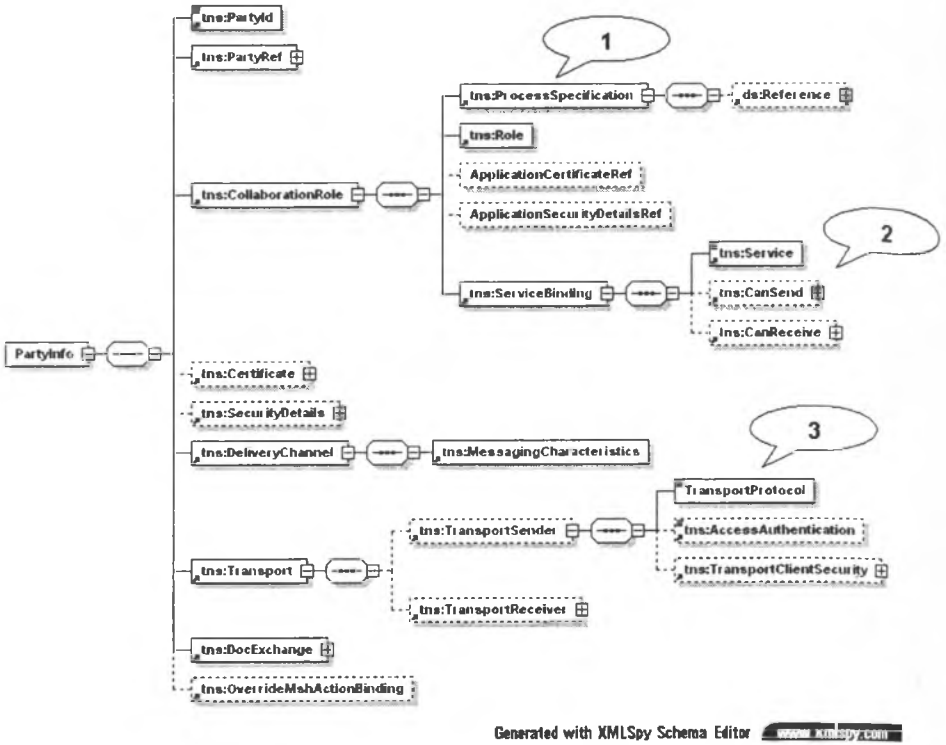
Fig.2. Diagram of PartyInfo element of CPP-CPA-2_0b schema

The Collaboration Protocol Agreement is created basing on a description of CPP stored in ebXML Repository Data Base.
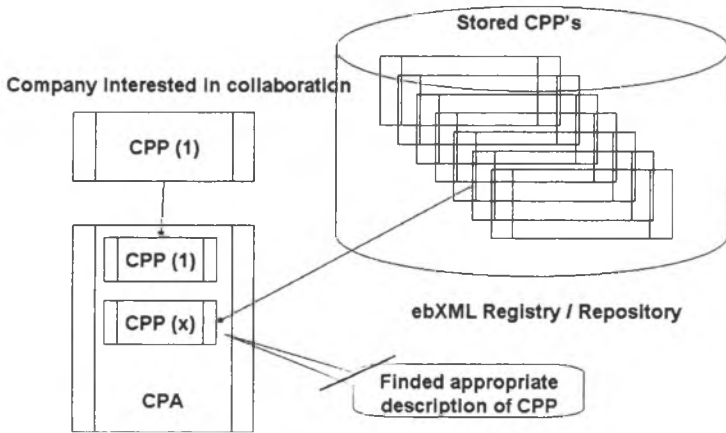
Fig.3. Making an agreement element (CPA) (source ILiM)

This way we have the pool of predefined Collaboration Protocol Agreement descriptions, successfully negotiated before storing it in ebXML Registry / Repository.

The structure of CPA consists of nine types of elements:
a) Status – the state of the process that creates the CPA
b) Start – the date and time that the CPA goes into effect
c) End – the date and time after which the CPA must be renegotiated
d) ConversationsConstraints – elements that document certain agreements about conversation processing
e) PartyInfo – one description for each Party of the CPA
f) SimplePart – element provides a repeatable list of the constituent parts, primarily identified by the MIME content-type value
g) Packaging – element provides specific information how the Message Header and payload constituent(s) are packaged
h) Signature – element that provides for signing of the CPA using the XML Digital Signature (XMLDSIG) standard
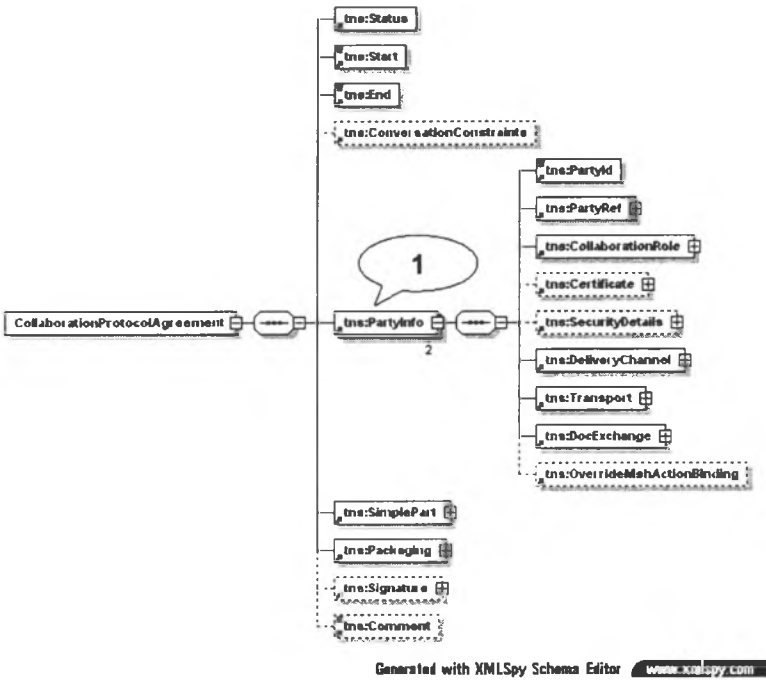i) Comment – free text information

Fig.4. Diagram of CPA element of CPP-CPA-2_0b schema

Two CPP's – *1* (fig.4), attached to the Collaboration Protocol Agreement element, store the negotiated parameters of information exchanging.

2.2. INTEROPERABILITY WITH FLEXIBLE SUPPLY CHAINS

Nowadays, the real world supply chains activity should have a possibility to act as an extremely flexible solution. The main goal is to prevent the gap of communication along of supply chain. Using the CPP description in the negotiation time brings us the possible way of exchanging information. If some transport routing and packaging has no effect, appropriate elements of Collaboration Protocol Profile explain second or next communication channel for establishing a new connection. Doing business using the ebXML standards and other standards of electronic data interchange (EDI) and automatic identification (AI, RFID) dramatically change the effectiveness of collaboration.
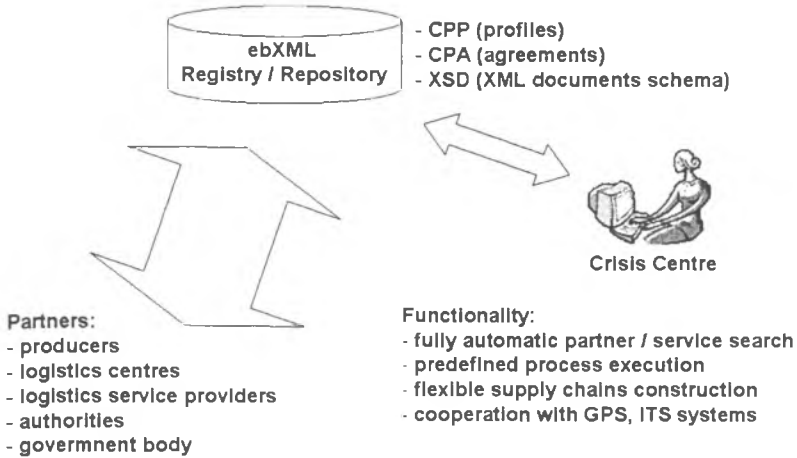
Fig.5. ebXML Registry / Repository implementation

Those systems may be developed basing on road traffic control, railway control and management systems. This way we will have the complex information network with standard communication using EDI messages and operational connection to the telematics systems for supervision of transport assets. The automated using of predefined CPA is setting the actual parameters of communication connections via Internet. If we have some trouble with actual interchange of electronic documents or business signals the agent application search the list of possible communication way defined in CPA to find fully functional collaboration protocol.

The integrated Rescue Systems should be developed using ebXML Registry/Repository standards because of theirs flexibility and global acceptance.

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[2] ebXML Registry Information Model v2,0", OASIS, April, 2002
[3] ebXML Business Process Specification Schema v2.0.1", OASIS, July, 2005
[4] ebXML Collaboration Protocol Profile and Agreement v2.1", OASIS, April, 2005

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