Cross-Enterprise Collaboration in Value-Added-Networks of the Automotive Industry

Coming together is a beginning, Keeping together is progress, Working together is success.  
Henry Ford 1863 -1947

Information- and Communication Technology
The VDA (Verband deutscher Automobilindustrie) and the Organisation for Data Exchange by Tele-Transmission in Europe (ODETTE) have supported the standardisation for a message- and data-exchange going beyond enterprises in their recommendations. That way the single workgroups VDA and ODETTE help to improve the enterprise-spread cooperation for the Automotive Industry.

The VDA 4914/2-protocol, also known as OFTP- or OFTP1-protocol, has been used for the data transmission, EDI- and file-transfer data-exchange predominantly for the ISDN-network so far.

Since 2001 the European Network Exchange (ENX) has been available for the European-wide, highly secure and highly available data-exchange in the Automotive Industry. Providers are the leading European Telekom-enterprises. ENX is an IP-based Virtual Private Network (VPN) for the highest security requests. Today with about 1000 ENX-users the critical mass has been reached, which does not necessitate that the OEM's operate their own complex and expensive VPN's with their suppliers any more. The availability of T-DSL also offers a cost-effective ENX-access for suppliers. The example of BMW Z4 demonstrates the usage of ENX and DAXware (the ware for the data exchange) with OFTP.

The ongoing globalisation makes worldwide communication with the service providers and suppliers necessary. The requirements were data-integrity, digital signature, signed receipt, secure authenticity, connection-security in the Internet and the automated process attributes of OFTP, e.g. the End-to-End-Response of the protocol and so on. For this purpose OFTP2 was developed by the European workgroup and passed in 2006. Therefore both solutions support the highly secure European-wide and secure worldwide data-exchange. If necessary the technology of the infrastructure-architecture is also available as managed hosting- and web-service.
**PLM: The 3rd Revolution in the Automotive Industry**

“Lean Production” based upon the MIT-study in the year 1991 is called the 2nd Revolution in the Automotive Industry. When we compare the concept “Lean Production” with the Product Lifecycle Management (PLM), we have to ask ourselves if we are in the middle of the “Third Revolution in the Automotive Industry” today. A concept that does not only include the manufacturing, but the whole lifecycle. The PLM-processes comprise the market-analysis, development, engineering, manufacturing, assembly, distribution, service and recycling. Between all these processes an intensive data-exchange is taking place. The most frequent problems in this cooperation are incompatible operations and IT-systems, unclear areas of responsibility and intransparent escalation-mechanisms, as well as many changes on the customer side without timely communication. The OEM’s are trying to realise the PLM-integration to the Tier’s over their portals. Here it means to integrate applications, one’s own and the ones of the suppliers in the development, logistic and manufacturing e.g. ERP-, CRM-, CAD- and PDM-systems. In the last years the trend in the application integration has gone from Point-to-Point Connectivity, over Enterprise Application Integration (EAI), up to Service Oriented Architecture (SOA). Transparency for all participants requires a cockpit for the project management, project rooms for teams, defined processes and among other things monitoring the Engineering Change Management during the supplier-integration.

**Service Oriented Architecture**

On the strategic-level the Service-Oriented Architecture (SOA) is framed by the business architecture and from below by the infrastructure architecture. In most enterprises both architectures build up the secure bracket of SOA. The processes of the planning and the decision of the management on the process architecture define the success of the enterprise by the business- and supporting-processes. Here it is defined what the core-competence of the enterprise is and therefore the strategic profit-generating primary-processes and which cost-causing supporting processes are secondary processes.

Which secondary-processes can be sourced out as service cost-effectively? What can be outsourced as service also applies to the system-level. Here the management has to decide in its application- and integration architecture for which applications and processes the enterprise holds a unique selling proposition in its core-competence. The process frequency and therefore the influence on the process quality are a suitable measure for the “Outsourcing” of processes to a “Service on Demand” with significant saving potentials.

**Process- and Team-Integration**

The cross-enterprise collaboration requires that the teams and the specific members have access to the prepared data-exchange processes. For the data exchange modelised process-steps are prepared, such as conversion, ENG-DAT-generation, quality-check, encryption as well as sending and receiving.

IT-integration and Business Process Management (BPM) take
place on the data-exchange platform of teamDAX. The basis-system in team-DAX and engDAX for the workflow-control is the ProcessEngine. The inner work-processes of the files happen through the ProcessEngine by means of the ProcessCard. Interface-modules are connected to the ProcessEngine via the ProcessCard. The monitoring and the transparent traceability of all data-exchange processes take place standardised for all interactive and automated send- and receive-processes. In order to guarantee the data-security and the tracing for the access on incoming and outgoing data a gradual security-concept – system administrator, local administrator, data-manager and user – is available. All processes run in the background based upon a flexible workflow-configuration. The ProcessCard developed by HUENGSBERG AG to a patent perfection takes over the logging and control of the processing. By means of this XML-based ProcessCard the processing can be tracked back completely.

In order to reduce the complexity of the data-exchange and to increase the transparency teamDAX and engDAX can also be operated as managed DAX-Services.

**Future Prospect: With the Semantic Revolution to the adaptive IT**

The EU has supported semantic projects for 8 years now and will proceed to transform “Information Systems to Knowledge-Resources”. For the exchange of information and knowledge in semantic business processes a Semantic Web will be needed in the future. In 2 years already the
breakthrough of Web 2.0 and the Semantic Web can be expected. Here social developments such as social networks get supported with semantic technologies. If information at this stage is already available in the Internet worldwide today, meta data will then follow which will classify it and display its meaning, analysable for machines. The information-flow and the data-exchange will become ascertainable and controllable. In order to establish flexible linking’s to heterogeneous data-sources, modules and standards for an adaptive IT e.g. SOA, STEP, PDM Enabler, PLM Services & Model Driven Architecture, Ontology & Semantic Web Technologies are necessary. Prerequisite for Semantic Web is a semantic interoperability-framework based on SOA. Therefore the Service Oriented Architecture is the next Step for the cross-enterprise collaboration in value-added networks of the Automotive Industry. For its visualisation coaches and process-tutors are available.

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From the Idea to the Automobile

engDAX SE
the workflow-based communication-server for the data-exchange in the Automotive Industry

- Support of ODETT E and ENGDAT
- Interfaces to existing EDM- and PDM-systems
- Process optimisation through additional modules
- Possibility to connect to the ENX-Automotive Network

HUENGSBERG AG offers consulting to optimise your data-exchange process in the Product Lifecycle Management.

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