DATEX II Exchange Specification

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- **The challenge ahead of us**

- **Methodology**

- **The work so far**

- **What's next?**

- **DATEX II provides a good and comprehensive data model for the exchange of traffic and travel information**
  - D2LogicalModel

- **There are several implementations of the DATEX / DATEX II specifications in-place throughout Europe**
  - France
  - Germany
  - Italy
  - Netherlands
  - Portugal
  - Spain
  - Sweden

- **…just to name a few**

- **Using the same domain model does not necessarily mean two entities can, in fact, communicate.**

- **Several factors must be taken into account:**
  - What technical platform to use?
  - What information is available for exchange?
  - How to set up the communication process?
  - What conditions may "trigger" the data flow?
  - How to control the communication link?
  - How can the information lifecycle be communicated?
  - How to deal with large data sets?
  - How to recover from failures?

- **All of these must be part of… DATEX II Exchange!**

- **Although Exchange has been part of the DATEX specification since DATEX I:**

  - ▪ **The Exchange part did not evolve at the same pace the Domain Model has**
    - – Out-dated

  - ▪ **Exchange PIM, Exchange PSM and Exchange Service Descriptors (WSDL) are not aligned**
    - – Lack of a consistent specification

  - ▪ **Does not address all business (and technical) needs**
    - – Implementers often have to come up with specific solutions

- **To revise the Exchange Specification according to the following principles**

  - **Interoperability**
    - allow different DATEX II implementations to successfully engage into a data exchange process.

  - **Support legacy DATEX II implementations and based on the previous specification**
    - in order to maximize investments already made by stakeholders that have DATEX II based systems in place.

  - **Address other user profiles and not only road operators**
    - and thus make DATEX II available to a broader audience.

  - **Reuse of existing standards**
    - in order to reduce implementation complexity and take benefit of proven and already existent solutions for common IT problems.

  - **Clear separation between the *payload content* and the exchange model**

- **Apply the same approach used when elaborating the DATEX II content specification**

- **MDA Approach (top-down)!**

  - **First the abstract principles of Exchange need to be specified**
    - Platform independent

  - **Then concrete mappings to particular technologies are provided**
    - Depends on the platform

- **Step 1 - Identify Business Scenarios**

  - **Data Delivery**

    – Deals with the exchange of traffic and travel information between two DATEX II nodes, as happens in the regular "Centre-to-Centre" scenario.

  - **Transaction**

    – To allow a DATEX II node to act directly on another DATEX II node by explicitly requesting the execution of a service.

- **Step 2 – List all possible Exchange features**

  - **There might be features that are not suitable for different exchange scenarios**

  - **Some of the features may even collide with each other**

- **Step 3 – Define possible DATEX II use cases for each Business Scenario and select the appropriate set of features used to implement each one**

  - The selection of features for each use case form a *FEP – Functional Exchange Profile*

  - During this phase we plan to address 3 different use cases for the Data Delivery business scenario
    - Simple Push Exchange – addresses current Push implementations
    - Simple Pull Exchange – addresses current Pull implementations
    - Full Publish/Subscribe Exchange – the "Nirvana" ☺

- **Step 4 – Produce the Platform Independent Model for Exchange – Exchange PIM**

  - ▪ **The FEPs are modelled in a platform independent way**
    - – As happened with the DATEX II domain model
    - – UML as modelling tool

  - ▪ **Features may be mandatory or optional**
    - – Each FEP should include such information

Methodology – Concrete Implementation

- ## The Goal
  - A real world DATEX II Exchange implementation in a given technical environment

- ## How?
  - Select a FEP suitable for the application scenario
  - Select the target implementation platform

- ## This forms an Interoperability Domain!
  - Interoperability is only ensured for the same FEP-to-technology mapping

- ## …and is specified into a Platform Specific Model – PSM document

- **A Specification for DATEX II Exchange**

- **The foundations of a "framework" that will let us easily extend the Exchange Specification depending on future needs**

  ▪ **New FEPs**

  ▪ **New platforms**

  ▪ **New Interoperability Domains**
   – FEP + platforms

- **A few documents have already been drafted**

  ■ **"DATEX II Exchange Context and Framework"**

    – Details the methodology followed and provides guidance for understanding the other documents that will make part of the Specification

  ■ **"DATEX II Exchange Use Cases"**

    – Introduces the Business Scenarios addressed by the Specification

- **Other documents we plan to have**

  ■ **Platform Independent Model document(s) - PIM**

  ■ **Platform Specific Model document(s) - PSM**

- **The final arrangement of the whole set of documents is yet to be defined**

- **Depth-first approach**
  - **To target one FEP and one platform and produce the end-to-end specification for that**
    - PIM modelling (currently)
    - PSM (next step)

- **FEP**
  - **Full Publish/Subscribe Exchange**

- **Platform**
  - **Web Services**

- ## Context Diagram

  - ### Definition of the layers that are relevant for Exchange

  - ### Identification of functions that should be addressed by the Specification

  - ### How do the functions fit into the different layers
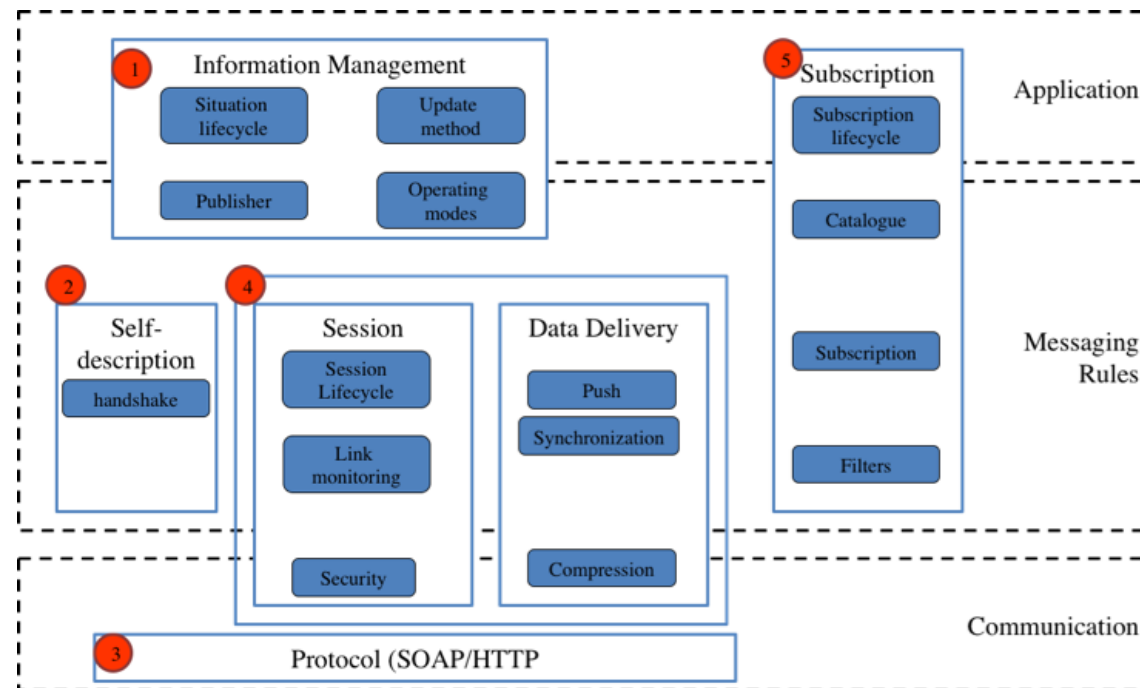
- **Publish/Subscribe architecture example**
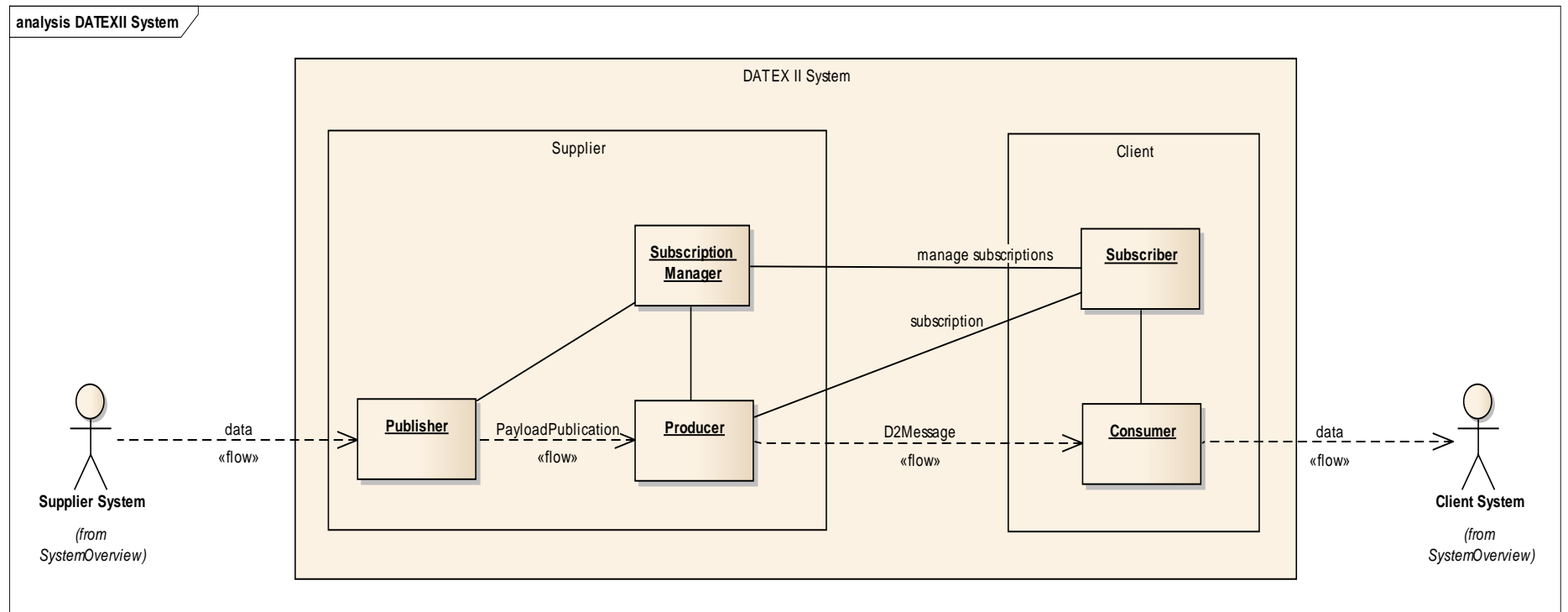
- **We are delivering but at a slow pace**
  - Achieve consensus is a difficult task!
  - The Exchange model is very complex and requires more effort then we anticipated

- **It is difficult to say anything about timing at this stage**
  - We hope to have a better insight on the effort behind this after the first PIM-to-PSM round is done

- **We are close to deliver the first PIM draft (during 2Q of 2012)**

- **We will then start working on the first PSM draft**

- **Thank you!**