Aligning TraceCore with EPCglobal XML formats

"Why is EPCIS XML good for TraceCore?"

1 About this document

The TraceCore XML group in Trace WG4 has decided to stop the development of the old TraceCore XML format and instead map the TraceCore *data model* onto the XML format in use by the EPCIS specification developed by the EPCglobal community. The reasoning behind this choice is described in this document.

The (old) XML mapping of the format is still called **TraceCore XML** (TCX) while the data model is called just **TraceCore** (TC).

2 Background

The TCX group in WP4 started late autumn 2007 to discuss what could and should happen with the TCX format after the Trace project ends by end 2009.

Obviously, a project goal and a goal for us would be that the format is being used by the food industry and that there is a user community around it and resources and processes set up to maintain the format and support the users.

Some such resources could probably be provided through new projects, but we strived to identify approaches that were independent of new project funding.

We scheduled informal meetings to further discuss these topics at the yearly Trace conference in Torremolinos in April 2008. An obvious initial conclusion was that we needed to identify a *formal home* for TCX after the Trace project ends. Such a "home" could be a recognized organization with established trust and confidence. We quickly identified some alternatives:

- **ISO**
- **OASIS**
- **GS1**
- **EPCglobal**

The thing common to all these organizations is that they deal with "standards" in one way or another. Scope and associated standardization processes are quite different though.

We spent some time checking out the OASIS alternative. "OASIS is a not-for-profit consortium that drives the development, convergence and adoption of open standards for the global information society" according to their website. The organization is the home for a number of both specialized and generic XML standards that can be used within e-commerce and EDI and within other B2B processes. There is no single standard within the OASIS umbrella that covers everything in the TraceCore data model, but elements can be identified from within both ebXML and the Universal Business Language

(UBL) standard. And by the way, the current version of TCX is using some XML fragments from UBL already.

The process model we intended to follow with the OASIS alternative was this:

- Maritech, TraceTracker and FoodReg become members of OASIS. Maybe SINTEF and NOFIMA too
- We form a technical sub-committee to work with the development of TCX
- We invite other OASIS groups to participate and/or observe our work

What OASIS would provide to us would be infrastructure, tools and well proven processes to follow for the development of the standards. But the important observation made was that the *time and work needed to further work with and maintain TCX would need to be invested by us, the organizations behind TCX*. None of us could guarantee this after the Trace project ends, so in that case the OASIS approach wouldn't bring us any further in reaching the goal stated at the top of this document.

We didn't spent much time checking out the ISO or GS1 alternative, but concluded that both these alternatives would lead us into the same resource dilemma as the OASIS alternative (worth to notice however is that GS1 and EPCglobal now are formally merged and that the name of the merged organization is "GS1 EPCglobal").

Then TraceTracker brought in the EPCglobal alternative, but with another approach than for the OASIS alternative. This was based on the following observation:

Unlike the OASIS XML formats, there is already one ratified standard within EPCglobal that already covers most of the functionality in the TraceCore data model – The EPCIS standard. Furthermore, this standard has well defined extension mechanisms built in.

The suggested approach is therefore to map TraceCore to this XML format and use the extension mechanisms to add the TraceCore model functionality that is not already covered by the standard.

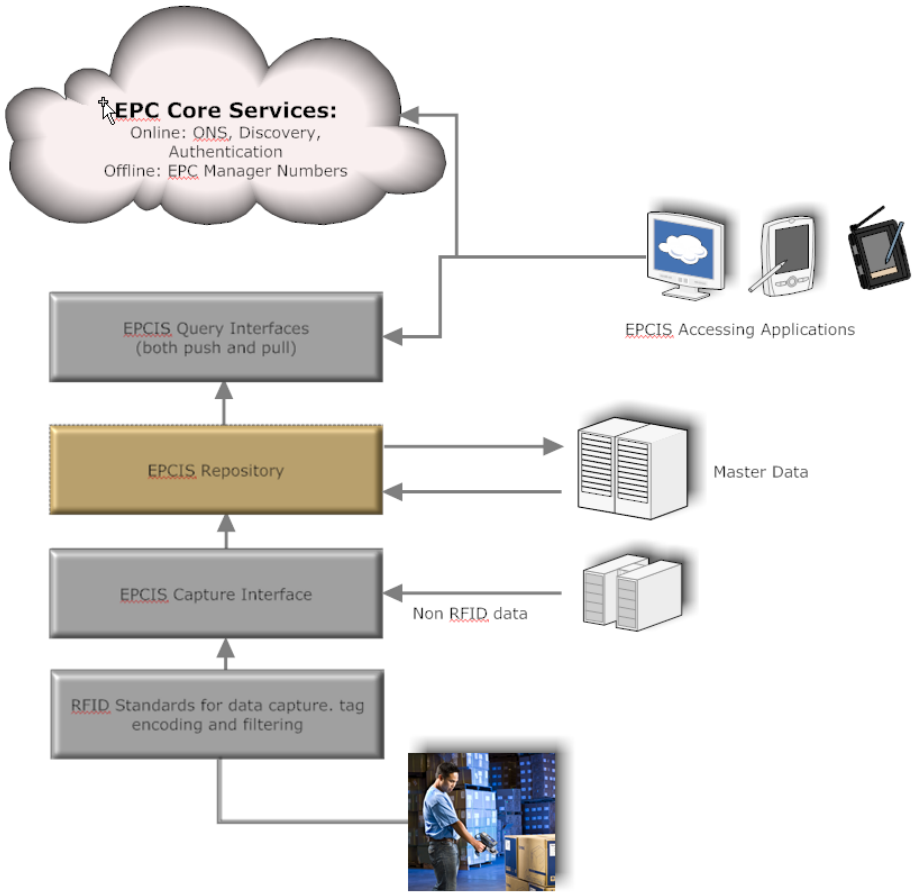
The difference with this approach and the OASIS approach is that we do not try to introduce anything new that requires formal approval and processes. Instead, we embrace an existing standard and use the defined extension mechanisms to add what is not covered by the standard.

Many ongoing EPCIS pilot projects around the world follow exactly the same approach, and EPCglobal will eventually publish results from these projects so that the whole EPC community can use the results and possibly the extensions. If many users see the same need for one specific extension, it could be that this extension finds its way to the standard in future revisions.

But there is a lot more to EPCglobal and EPCIS than what is said above. Some of these elements are of great importance to be able to realize the goal stated at the top of this document. Separate documents dive into these elements in more detail, but we briefly present the most important elements of EPCIS in the rest of this document and explain why they are useful to us.

3 EPCIS in a nutshell – what's in it for Trace?

The full name of EPCIS is "EPC Information Services". EPCIS is one of the high level parts of the official *information stack* defined by EPCglobal. All standards development in EPCglobal relates to one or more parts of this information stack.



3.1 Large and growing user community with ratified standards

EPCglobal represents the community with most traction within global Supply Chain Management (SCM) today. Some of the larger set of activities is

- Standards development inside different working groups inside EPCglobal
- Pilot projects using standards and/or using the extension mechanisms. Results are being shared through the EPCglobal community
- Conferences around the world where EPCglobal standards/products are addressed
- Vendor activities – i.e. product development on top of EPCglobal standards

By aligning TraceCore with EPCIS, all users of the TraceCore data model will benefit from the above. For one thing, consider the results of the product development on top of EPCglobal standards. We must expect that there will be a growing number of both generic and specific integration products and EPCIS query applications available in the market over the next few years.

3.2 Event Data separated from Master Data

In the development of TCX we made no distinction between what is commonly denoted as "transactional data" and "master data". But within the supply chain those terms are well known, and such data often arise, are managed and accessed in different ways. EPCIS does not precisely define what master data is and what event data is, but defines ways to manage the two[1] and link them together. This ensures maximum flexibility and reuse of existing master data repositories.

3.3 EPCglobal and EPCIS is *not* about RFID only

The history behind EPCglobal is tightly tied to RFID, and there is still much activity going on and standards developed or under development that are specifically related to RFID deployment. But as can be seen from the information stack, it is possible to use EPCglobal standards without any RFID infrastructure in place.

3.4 Standardized key schemes

The EPCIS specification and the associated Tag Data Standard (see References) define how the EPC ids (i.e. traceability keys) can be composed and encoded. A number of standard key schemes are predefined, and most of these are composed of elements from within the GS1[2] numbering system. But proprietary key schemes can be used and they can consist of any type of element of proprietary (i.e. not globally recognized) nature. The way the keys are encoded will guarantee global uniqueness.

3.5 Extensibility

The EPCIS data model was built with extensions in mind from day #1. As a result, almost every part of the data model can be added to, and the allowed mechanisms are well defined and documented. When aligning TraceCore with EPCIS we will use these mechanisms to add model elements and dynamics from TraceCore that is not currently covered by EPCIS.

3.6 Not only food

EPCglobal standards are not only for food, they can be applied to nearly any industry. This means that the number of possible users of the standards is nearly unlimited, and that upstream suppliers can reduce the number of data integrations even if they participate in many different types of chains.

3.7 Complete vision and model of the supply chain

EPCIS is not "*only an XML format*", a statement that in some sense could be applied to the old TCX format. EPCIS is part of an information stack with formats, services and APIs that address the needs of all types of supply chain members. Unlike TCX, the standards are designed to work together to form a "toolkit" for applications and systems that exchange data between participants in the supply chain.

[1] The EPCIS specification defines APIs for the query and capture of event data and for the query of master data, but not for *capture* of master data. People can implement master data repositories the way they want.

[2] US DoD numbers are also explicitly defined

4 References

The below list are the most useful reference resources for anything related to EPCIS. More links will be published in the TraceFood wiki at www.tracefood.org later.

- The ratified EPCIS standard. Pay attention to these sections in special: Chapter 6 and 7 and the figure on page 9.

  www.epcglobalinc.org/standards/**epcis**/**epcis**_1_0_1-standard-20070921.pdf

- The ratified Tag Data Standard. This standard is important to understand how traceability keys can be defined within EPCIS. Pay attention to these sections: Chapter 1 and 2 and Appendix B.

  www.epcglobalinc.org/standards/tds/tds_1_4-standard-20080611.pdf

- The EPCIS FAQ

  http://www.epcglobalinc.org/standards/epcis/epcis_1_0-faq-20070427.pdf