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eBIZ-TCF: an Initiative to Improve eAdoption in European Textile/Clothing and Footwear Industry

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Abstract: This paper presents an European large scale initiative to foster the adoption of eBusiness (and related technologies and standards) in the Textile/Clothing and Footwear sectors that are characterised by a large presence of SMEs. The project, namely eBiz-TCF (eBusiness for Textile/Clothing and Footwear, www.ebiz-ftc.eu), is funded by DG Enterprise and addressed to "Harmonising eBusiness processes and data exchanges for SMEs in the Textile/Clothing and footwear sectors in the Single Market". The key points of the initiative are a) an eBusiness architecture, based on (as far as it is possible) existing standards, b) a large set of pilots and c) the creation of a wide consensus between the stakeholders. The architecture is based on the adoption of sectorial languages (TexWeave/Moda-ML and EFNET/Shoenet) for the networks of manufacturers, on a use profile of UBL (Universal Business Language) for the relationships with the retail organisations and on common communication architecture (with references to ebXML specifications).

1. Introduction

This paper presents a project that is an European large scale attempt to foster the adoption of eBusiness (eAdoption), and related technologies and standards, at sectorial level in the Textile/Clothing and Footwear (TCF) sectors. These sectors are characterised by a large presence of SMEs and by an average level of adoption of eBusiness and interoperability standards that appears to be lower comparing to similar manufacturing sectors [1][2][3].

The project, namely eBIZ-TCF (eBusiness for Textile/Clothing and Footwear, www.ebiz-ftc.eu), is the answer to a call for tender from the European Commission DG Enterprise and Industry (ENTR/2007/027) called "Harmonising eBusiness processes and data exchanges for SMEs in the Textile/Clothing and Footwear sectors in the Single Market" set out in mid 2007. The duration is about 24 months starting from January 2008 and involves the two concerned sectorial European industrial associations, namely Euratex (European Apparel and Textile Organisation) and CEC (European Confederation of the Footwear Industry) together with ENEA, a public research and technology transfer organisation plus other 40 and more companies across Europe.

The paper presents the approach of the project in order to achieve a wide uptake of eBusiness in sectors which are the core of the fashion industry in Europe.

2. The Challenges and the Objectives

To better understand the goals of the project it is necessary to understand the present challenges of the European fashion industry and the status of the eBusiness adoption.

2.1 The Challenge for the Industry

Innovative e-collaboration combined with other new manufacturing and supply chain paradigms can provide some of the answers to the European companies to strengthen or re-gain global competitiveness.

Success in the fast-moving fashion business is increasingly reaped by companies with lowest response time to changing market and consumers requirements by integrating design, consumer feedback, sourcing and manufacturing, distribution and retailing.

Some traditional retailers and manufacturers try to solve the conflict between long lead times and efficient consumer response (no over-stock, fast re-ordering and delivery) with a vertical integration of the value chain, if possible. And if this is not possible, by e-linking and e-collaboration in the value chain to have the same fast answers to consumer demand. The key for such connectivity is the interoperability of systems based on commonly agreed open standards.

2.2 The Problem Addressed in the Project

A lot of efforts have been done in the field of standardisation for Textile/Clothing and Footwear industry in these years.

Euratex and CEC together with their national member federations, as well as the EU Commission, CEN/ISSS, GS1 and others have been involved in e-business standardisation issues for the fashion industry in recent years. Also pubblic administrations are contributing, like the Department for Technological Innovation - Presidency of the Italian Council of Ministers (DDTA project), to the success of the eBIZ-TCF project.

B2B standard specifications have been developed within the framework of ESOs (European Standardisation Organisations): CEN/ISSS TexSpin [4] and TexWeave [5] for Textile/Clothing (TC), CEN/ISSS FINEC[6] for Footwear and other related to initiatives and projects like eTexML, Visit, Moda-ML [7], EFNET2/3, CecMadeShoe, ShoeNet [8]; all these initiatives, with a wide involvement of industry associations, have prepared a background of analysis and specifications that is (almost) ready to be implemented by the industry. Yet so far an overall harmonisation is lacking and in many cases, the results of these activities have not led to a widespread adoption in the user community.

As a result, the fashion sector remains without globally implemented e-business standards and has not sufficiently succeeded in its efforts to synchronise data and to exchange business documents electronically.

This situation is put in evidence also by the eBusiness Watch reports on ICT uptake for both textiles/clothing and footwear [1][2][3]: IT and e-business uptake is below the average of other sectors in the European Union.

There is a reluctance of many firms and technology providers to implement these specifications (and ICT in general); on the one hand they fear risk of an excessive ‘normalisation’ of the applications that leads to lose their assets towards the customers; on the other hand they rather wait and see which will be the successful initiative and when the risk on investing on it will be lowered to zero.

As a result the landscape of existing B2B applications is extremely varied, spanning from P2P solutions to a variety of Internet based solutions, all characterised by difficulties in achieving a critical mass of participants and in connecting small companies.

Nevertheless data at European level suggest the existence of an unsatisfied demand for a common standard architecture, for instance according to a survey carried out in the industrial districts of Biella, Italy, (survey made by the local industry trading association) 70% of the fabric producers were asked to electronically supply data to the customers; 70% also received such request by more than one customer and in 100% of the cases each customer required a different data model. A further difficulty was that each customer was

asking for few and different documents: one or two out from a wide set of messages (order responses, expected delivery date, despatch advice, defects map, etc), without drawing an holistic design for the future. The result was that the industry did not accepted to invest to satisfy these requests.

2.3 The Project Objectives

Being aware of these issues, both the DG Enterprise & Industry and the industry trade associations Euratex and CEC assumed two objectives.

The first objective was the definition of a reference architecture for eBusiness in Textile/Clothing and Footwear sectors; the target was to tackle the different requisites for both the manufacturer-retail supply chain (downstream part of the architecture) and the manufacturer-supplier network (upstream part of the architecture) with appropriate technological and methodological specifications to cover topics such as data models, communication protocols and product classification.

As main requisite of the architecture, wherever possible, the architecture's specifications had to be based on existing standards; in any case, further standardisation developments have to be realised outside the scope of the project; with the involvement of European Standards Organisations (ESOs) (on this purpose CEN/ISSS is invited to the activities of the project).

The second objective was to achieve consensus between the stakeholders on the architecture and to express this agreement with the ambitious objective to define a Memory of Understanding (MoU) between the stakeholders that could be the basis for a wider diffusion and adoption.

3. Methodology

In general terms, the project does not aim to develop or validate a new technology or a new software but aims to setup an approach to foster eAdoption in two sectors dominated by SMEs through a work of harmonisation that is strongly aware of the standardisation achievements.

Thanks to the large experience gathered with similar initiatives in recent years the project will focus on three key actions:

- Recognition: analysis and evaluation of the existing standards and running experiences and systems.
- Architecture: creation of the reference architecture based on existing standards.
- Pilots: promotion and reporting on meaningful case studies at European scale (involving a large number of actors in many cross-border and cross-sector pilot experiences with the aim to witness the validity of the architecture).

As a first outcome of the project, more than 40 companies have been involved in the pilots, and represent business cases, from Bulgaria, Czech Republic, Croatia, France, Germany, Italy, Netherland, Portugal, Romania, Spain.

They express a wide variety of architectures and actors: some pilots are leaded by final users, others by solution providers with the role of 'facilitators'; the business and the technological scenarios are quite different: some are based on direct P2P message exchange between ERPs (leaded by final users or by ERP providers), others are based on platforms that offer the capability to exchange certified messages (mainly born with the EDI technologies), others on Supply Chain Management service platforms (based on Internet paradigms).

In the project lifetime, beyond a first group of companies that has been selected since the beginning, additional companies will join the project, thanks to a two-stages strategy of the project that foresees a public call for further pilot proposals.

The pilots perform both local and cross-border eBusiness activities that the project supports and monitors in order to obtain meaningful reports that will be the basis to write and diffuse a final Guide to eBusiness in TCF sector at the end of the project.

The key point of the pilots programme is that each pilot is based on the implementation of eBusiness starting from existing IT solutions and with limited adaptations in order to support the standard specifications; thus there will not be a 'unique' solution but a patchwork of collaborating indipendent solutions.

The project supplies pilots with technological assistance, training and specifications, but does not offer a technological solution, a software or a service; the aim is to urge solution and service providers to improve their own offer, without annoying them by delivering yet another rival solution.

According to the mission of the project, the case histories and the technical documentation of the architecture are public and their use is free of charge.

To multiply the impacts, the project also aims to deliver a proposal for the development of any missing standards and, on this purpose, works closely in contact with CEN/ISSS, and organisations like GS1 and others that made the history of the standardisation in both the sectors in these years (like ENEA, INESCOP and others).

4. Outcomes of the Activities

Within the project, the activities of analysis of the status of art has concerned business to business data exchange in the supply chain (both upstream and downstream), with the inclusion of the mass customisation and B2B Internet based services (like for example, respectively, customised garment provisioning and stock services); the issues related to Internet access, ERP implementation and eCommerce implementation (B2C) were not considered.

4.1 Two Areas

The work of analysis leaded to identify two different challenges related to the different requisites of the different rings of the supply chains of the TCF industry (see also [4]).

A first challenge arises from the highly specialised networks of manufacturing enterprises (upstream area): the producers of final goods rely on complex networks of enterprises (large as well as small) with highly specialised processes; these relationships require a strong integration between the actors and cannot be hampered by rigid or poor models; the keywords are flexibility and completeness. Specific languages (and data models) have to be provided. The collaborations involve a 'reduced' number of actors that know and trust each other with a strong partnership and are extremely '*customised'* to fit the organisation of the partners. In the past we had local networks, now, increasingly, transnational.

A second challenge regards the retail channels for the Textile/Clothing and Footwear final goods (downstream area): based on large organisations as well as small shops, the retail organisations need to achieve a common and efficient connection with the producers; the keywords are efficiency and normalisation. Uniform ways of coding have to be provided. The collaborations involve large numbers of actors that do not know too much each other with an '*anonymous'* partnership that is based only on obligations deriving from purchase contracts and that expire with the goods delivery.

4.2 The Standardisation Path

An aspect that emerged from the analysis is an original path to standardisation in the TCF sectors (see [9]), quite different from the process that usually sees few stakeholders to drive (and, sometimes, fight in) the standardisation processes. In the TCF sector the efforts in the development of the standard specifications were conditioned by the difficulties, for a sector

dominated by SMEs, to manage a process of creation of standardised specifications [10][11]; the result has been an original path of standardisation that mixed standardisation initiatives in collaboration with ESOs (mainly CEN) with specific national or European initiatives leaded by 'willing' organisations that attempt to exploit standardisation achievements and to improve them in order to meet the real industry businesses. The result has been a large common background of analysis and a set of outcomes not completely harmonised and only partially recognised as standard specifications.

For example, in the upstream area, the CEN/ISSS TexSpin [4] and the successive CEN/ISSS TexWeave specifications [5] for the TC industry were published but their effective development was supported by a number of initiatives (Moda-ML mainly) and projects that were the laboratory that improved them in order to fit the industry needs. The same, in parallel, happened for the Footwear industry with the CEN/ISSS EFNET [6] specifications that were adopted and improved by the Shoenet community.
Different is the situation in the downstream area where the focus is on company and product identification that are pursued through the adoption of GS1 global coding (GLN and GTN) rather than on sector specific issues. The specifications emerged from different initiatives (CEN/ISSS TexWeave again, CecMadeShoe, for example) demonstrated that the data models and the processes are quite similar between the TCF sectors.

4.3 The Architecture

The architecture that has been established is based on four different types of specifications:

- Business processes (that will be represented using UML notation and ebBP templates[12])
- Data models (document template specifications, based on XML but related to the pre-existing EDI specifications)
- Collaboration and communication protocols
- Product classifications
  The domain of application is based on three sub domains (see figure 1):
- Manufacturing networks of TC industry
- Manufacturing networks of Footwear industry
- Production to retail relationships for TCF industry.
  The production to retail relationship is characterised by:
- Business processes and data models based on XML specifications: common contents, an OASIS UBL [13] profile of use derived from CEN/ISSS TexWeave and CecMadeShoe results
- Interoperability with EDIFACT legacy thanks to an intermediate level of data models.
- Anonymous collaborations (large numbers).

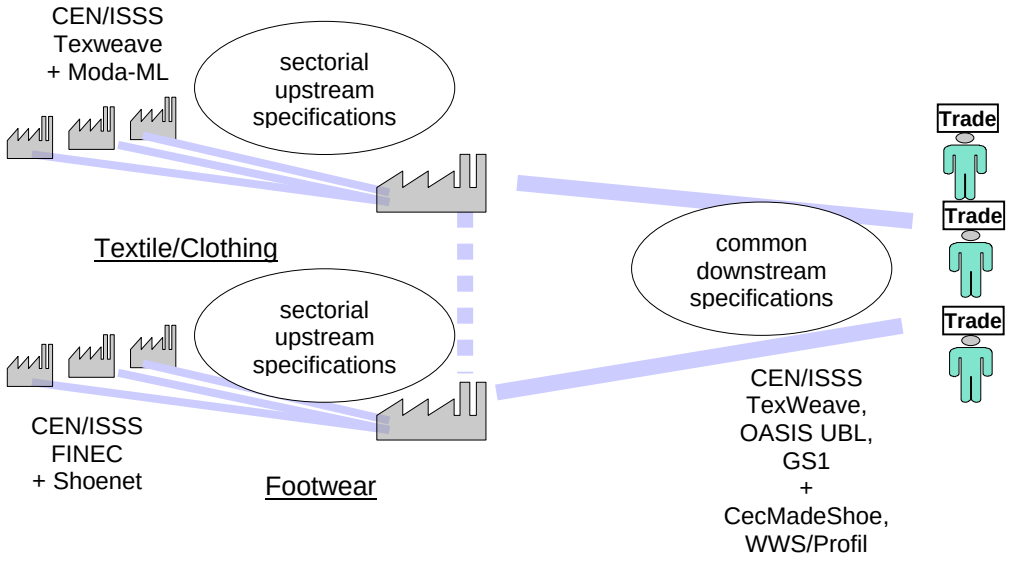

Figure 1. The Domain of the Architecture

The UBL profile of use for the TCF sector will be the first large scale profile of use for UBL in a manufacturing sector in the world (the other larghe scale profile of use of UBL is NES, for the public procurement in North Europe countries). It has the objective to implement:

- Fast and simple connection to hubs and retail organisations
- Use of EAN coding for product and party identification (GTN, GLN)Focus on small & large retail (not huge international) organisations.

The manufacturing networks are characterised by:

- Business processes and data models based on XML specifications specific for business processes: derived from CEN/ISSS TexWeave and Moda-ML for the Textile/Clothing production processes; derived from CEN/ISSS EFNET and Shoenet for the Footwear processes
- Closed collaborations (small numbers; supported at logical level by ebXML CPPA specifications [14]).

It is to note that there is a work to be done to harmonise the different ways to document and represent the specifications that, originally, are quite different and managed by different organisations. The architecture has the objective to:

- Create a favourable environment to setup a collaboration between manufacturers
- Focus on manufacturing industry that has not completely outsorced its production.

The architecture related to collaboration and communication protocols is only partially defined and is characterised by:

- A model of an European TCF logical Network of communication based on three main scenarios: Hub-Hub, Hub-Firm, Firm-Firm (being *hub* is an application connectivity service provider –like EdiCom, eGate, Intesa and others- or an integration service provider –like TXTChain, TextileBusiness,etc-)
- An alternative choice between existing EDIFACT and XML based paradigms
- A strong attention to the issues on security through the network (especially through the hubs of services that must guarantee the identification of the senders)
- Protocols focused on SMTP, while Web Service are foreseen for the future
- ebXML CPPA to model and publish the collaborative reference processes. The objective is to make each participant able to find a path to interoperate with any other, despite the service and solutions they adopt.

The activities related to product classification are still in progress.

5. The Benefits

The effective results in terms of eAdoption will be perceived in a period of two/three years after the conclusion of the project, yet some considerations could be done at this stage.

The adopted approach is expected to achieve two relevant objectives:

1. To offer a clear understanding and a roadmap about the reference architecture together with a strong endorsement by the industry associations and the stakeholders;
2. To offer a smooth 'path' for existing solutions to get involved in a seemless space of information exchange and of inter-company collaboration.

From the perspective of business processes, the project will be concluded with a collection of case histories that witness, in different scenarios and to different targets of enterprises, how the exchange of information about the feedback from the market (the sales data) and the activities in the manufacturing networks can improve the efficiency and flexibility of the whole supply chain.

From the perspective of eBusiness implementation, the most evident advantage of this approach for small and medium firms is lowering the threshold to set-up eBusiness with a public reference architecture that includes all that is necessary to participate eBusiness: the investments are based on an European wide common understanding and more solution providers have the skills to support their work.

The players in the field of services for data exchange and supply chain integration: with small investments they can benefit of an architecture that can widen their market and offer them the opportunity to connect small enterprises to their current customers (large retail organisations and large firms).

The same benefits are, in turn, for the large enterprises that encounter less reluctance from their SME partners to invest to get connected: the analysis in the project put in evidence that large enterprises, when reorganising their supply chains, even when they are the driving force of a chain (and of the business), have difficulties to force eBusiness adoption in countries or companies where there is not a common understanding about these methodologies and tools. It is a problem of costs but mainly a problem of organisation and skills that are difficult to create on a single company proprietary basis.

It is worth to observe that even before the launch of the public call for new pilots, a number of organisations, service and solution providers and manufacturing firms have already asked to be involved in the pilot activities, aiming to join the architecture.

In a long term, the TCF sector is expected to gain competitiveness from more sophisticated models of e-collaboration (see for example Leapfrog IP [15] outcomes) and the creation of flexible models and channels of integration between different organisations is a pre-conditions for a wide take-up of tools based on collaborative product design in the fashion industry.

6. Conclusions

There are some learnt lessons from the project activities at this stage of development:

- There are two different areas of eBusiness with different priorities: the area of enterprise networking and the area of the relationships with the retail organisations; they require different approaches and technical specifications
- There is a plurality of actors and scenarios that cannot be forced to one solution or ignored but that can be harmonised;
- The paradigms from the EDI world and from the Internet eBusiness applications are not mutually exclusive and can complement each other if the focus in on the business processes and in information rather than on technicalities and syntax;

- In sectors dominated by SMEs the creation of standards has its original path that have to be better understood and improved.

This project is the first large scale attempt to foster eAdoption in specific sectors of the European manufacturing industry, it focuses on harmonising existing standards instead of writing 'yet another one'.

The project is build around a sound rational as a starting point and addresses an, existing, key market need. Its large partnership brings together required competences while added value shall be assured by on-the-ground experiences (cross border/sectorial pilots).

The successful cooperation with concerned stakeholders represents a key challenge which is duly pursued for its vital importance to build up consensus. The latter also requires stakeholders openness to achieve the ultimate project goal, namely the durable uptake of results for the benefit of European Textile/Clothing and Footwear companies.

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