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## Supply-Chain collaboration in Textile-Clothing supply chain

### 1. Problem definition of the collaboration among enterprises of the Textile-Clothing sector

The Textile-Clothing sector is characterized, on one side, by **fragmentation of the productive chain** in a great number of actors (clothing manufacturers, fabric suppliers, darn service suppliers, dyers, yarn suppliers, etc.) who need to work together for realizing their final product; on the other side, the size of these enterprises and cultural tradition of this sector seem to **prevent to find out a common exchange format**, agreed upon by everyone (i.e. a standard); in fact there isn't any leading company able to impose a common format on the whole sector.

Furthermore, the international vocation of the sector (in terms of target markets but also in terms of disposition to delocalize workings and supplying of raw materials on a worldwide scale) forces to exploit the services offered by Internet by creating international **collaboration networks**.

From a strategical point of view, the Italian, and European as well, Textile-Clothing sector, that focus on product quality compete with low cost labour countries, works on production lots that are becoming smaller, more customized (even towards a single final client) and with shorter timing requirements than ever; this leads to manage an increasing mass of information for every single unit of product and to exchange information more and more detailed and 'critical' with a growing number of partners.

It's clear that the change needed regards essentially business models, so it's almost organizational and managerial, but it's also easy to understand how wastes and inefficiencies due to bad interfacing are becoming less and less acceptable.

From the enterprise point of view, the ability to make different and independent information systems communicate directly, without having to re-input data every time they cross enterprise borders, is a dramatic urgency. Moreover, a channel for automatic exchange of information could consent to activate **new services** by sending information that would be too expensive to exchange in a traditional way and that is already available inside enterprises information systems (think about exchanging information on the status of an order or on the defect map of a piece of fabric).

### 2. The need for a common language: looking for a standard


The technologies aimed to support the collaboration among enterprises using different and independent information systems and organizations are called **interoperability** technologies; at the moment we think that interoperability is one of the great challenges for building an European Information Society and one of its most interesting issues is the definition of the standards suitable for supporting collaborative processes on the infrastructure offered by Internet (see "CEN/ISSS report and recommendations on key eBusiness standards issues 2003-2005", which is available at [www.cenorm.be/sh/eBiz](http://www.cenorm.be/sh/eBiz)).

Without any common standard accepted by a large number of supply chain actors and by their clients, every enterprise must implement as many interfaces as its clients' information systems, with the consequent increasing costs for developing and maintaining them (a fabric supplier, partner of the Moda-ML project, estimated at 40.000 Euros per year the saving on EDP costs obtainable by adopting a common interface).

The adoption of a common exchange standard, as it already happens in other sectors (automotive, for example), is therefore a solution for cutting down these costs and to concentrate more on business models and on the services to implement and less on communication issues and interfaces.

Until some years ago, the only technologies available were the so-called EDI (essentially EDIFACT and ANSI X.12, on private networks), that didn't succeed to spread throughout the whole Textile/Clothing supply chain (except for the big distribution chains) because they were rigid and expensive. With the diffusion of XML on the Internet, now there's a new opportunity for finding a low cost, but still scalable solution, capable to satisfy the needs of small enterprises as well as great organizations.

This is the opportunity exploited by the initiatives presently promoted at a european level by CEN/ISSS (a part of the European Committee for Standardization concerned with initiatives for the "Information Society"), through its TEXSPIN Workshop ([http://www.uninfo.polito.it/WS\\_TEXSPIN/default.htm](http://www.uninfo.polito.it/WS_TEXSPIN/default.htm) or <http://www.cenorm.be/iss>), coordinated by Euratex (european association of the industrial associations of the sector) and comprehending the contribution of MODA-ML and eTeXML experiences.

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The goal of TEXSPIN Workshop is to supply a pre-normative platform of data exchange models, XML messages and dictionaries of terms that cover different aspects of the supply chain, from sales organization to production in its different aspects.

This means that TEXSPIN supplies some suggested models and an exchange language that technological solutions providers and enterprises will be able to conveniently use for implementing their own solutions.

### 3. Application scenarios

Among the activities of the TEXSPIN project, different ways and scenarios of inter-enterprise collaboration were recognized and tried out, all supported by the same set of XML document.

In fact it's possible to think to ASP services offered by Web sites (it should be better to call them 'Web applications') as management services of some parts of the enterprise activities or as services for finding partners (market-place, e-procurement, etc.) or managing and integrating processes among companies.

In this case, the availability of a 'standard' interface permits enterprises to not bind themselves to the supplier of those services, who, in turn, offers them to all those companies around the world that presently aren't part of his community of users yet (besides making easier, for both, the effort needed to become a member of the community).

This kind of services, oriented to the branch of the supply chain delimited by manufacturers and distributors, is integrated by the eTeXML project with some instruments that help the conversion towards 'old' EDI formats, that can be preserved and exploited.

However, the great benefit of the adoption of a common standard is that every single enterprise can easily implement its interface to talk directly to its partner, without any intermediary (to make its experimentation easier, there's a free communication software, called MSH and developed by the Moda-ML team, that can be expanded with front-end modules to enterprise information systems for exporting internal data to XML messages).

The architecture developed and tested by the Moda-ML project provides for a direct exchange of information among fabric suppliers, their third parties and manufacturers that proved to fully satisfy the requirements of flexibility and confidentiality of the companies of the italian sector.

## 4. The Moda-ML project

The Moda-ML project was funded by the Take-Up Actions of the IST program (Information Society) in the framework of the V Framework Program of the European Union. It aimed to facilitate the flow of technical and management information between the firms of the Textile/Clothing supply chain thanks to the exchange of XML documents via Internet.

The concrete objective of the project was the definition of a **common data format, suitable for the exchange of information via Internet** along the supply chain: a format that can be easily embedded, at a low cost, inside both legacy information systems and in new solutions provided by technology suppliers.


A protocol of electronic exchange has been created based on the following:

- standardisation of a number of co-operation **models** among firms
- a set of **XML documents** necessary to represent data used in international processes
- a front-end demonstration **software** to forward and receive XML documents based on the electronic protocol which is compatible with the ebXML (MSH) specifications
- a demonstration software to assist in the creation of testing messages (MCM)
- development and easy maintenance **methodology** for “families” of XML exchange documents.

### Modelled Processes and XML Documents

In accordance with the ebXML approach, the textiles supply Process has been represented by Activities and, within each of these, the individual Transactions (XML documents) required for their processing can be identified. This modelling has a merely indication value and it is used by firms to represent possible exchanges with their partners. However, it is also possible for individual firms to establish mutual agreements to implement different or partial sequences.

<b>Process: <i>Fabric supplying</i></b>		
<b>Activity: <i>Fabric Selection</i></b>		
<b>Textile Catalogue</b>	The (price) list of products offered for sale	Textile→Clothing
<b>Fabric Technical Sheet</b>	The technical characteristics and properties of the fabric article	Textile→Clothing
<b>Textile Advance Notice</b>	The anticipation of articles included in the Clothing Manufacturer's collection and of foreseen volumes of production that clothing manufacturer will request (no details about colours and variants)	Textile←Clothing
<b>Activity: <i>Purchase fabric</i></b>		
<b>Textiles purchase order</b>	The order placed by the Clothing Manufacturer	Textile←Clothing
<b>Textiles Order response</b>	The response provided by the Fabric Supplier	Textile→Clothing
<b>Textiles Order change</b>	The order change initiated by the Clothing Manufacturer	Textile←Clothing
<b>Textiles Order status report</b>	The status of the fabric order reported by the Supplier	Textile→Clothing
<b>Activity: <i>Dispatch fabric</i></b>		
<b>Textiles Despatch request</b>	The request/scheduling of the despatch of parcels made by the Clothing Manufacturer	Textile←Clothing
<b>Textiles Despatch advice</b>	The anticipation of the despatch of the parcels by the Supplier	Textile→Clothing
<b>Textiles Quality Report</b>	The report of the defaults and other non-conformities of the goods, as provided by the Supplier or by an independent Quality Controller	Textile→Clothing
<b>Invoice</b>	Invoice for the supplied material	Textile→Clothing

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<b>Process: <i>Fabric production</i></b>		
<b>Activity: <i>Subcontracting fabric darning</i></b>		
<b>Textile darn order</b>	The specifications of the darning operation required for each piece; includes allowed worktime, position and type of faults; it could contain or refer to a despatch advice	Textile → Darning
<b>Textile darn return</b>	The returning information about the darning operations; include the worktime spent, the position and type of faults and the associated information about the position, the initial status, the worktime and the final status	Textile ← Darning

**The use of the results of Moda-ML gives a double benefit to the enterprises and to the whole sector: it makes it possible to use, at a low cost, XML documents and a messaging software that are the result of a careful work of analysis and design and that contributes to spread the use of a common language among the enterprises of the supply chain.**

The initial ambition of the project was to work at **high-quality levels** in order to use its results for the formalization of **an international standard** for the sector. To this extent, CEN (European Standardization Committee) promoted the **TEXSPIN** Workshop for establishing the base for a common european standard that may become a reference for the sector: Moda-ML has worked together with a group of french partners (eTeXML) to a complete set of XML documents (published in June 2003) that includes the branch of the supply chain directed to distributors, too.

One particular feature of Moda-ML, in respect of many other standard creation initiatives, was that it led from the collaboration of a group of well-known and significant Textile/Clothing firms and research centres, universities and companies that are working long since on the technological support to the integration of the supply chain and that have a consolidated know-how on this topic.

Another peculiarity is that its results are available for free for every enterprise or software house wishing to use them in their software solutions.

Industrial partners: **Corneliani, Successori Reda, Piacenza, Loro Piana, Vitale Barberis Canonico.**

Technological partners: **Enea, Politecnico di Milano, Gruppo SOI, Domina, IFTH.**

The external partners who worked on its activities were **Sistema Moda Italia** and **Associazione Tessile Italiana** (industrial association of the sector), which gave their substantial support to the project.

Besides the group of partners, other actors played a key role in the development of the project, both from the research world (**Università di Bologna, Forum per le Tecnologie dell'Informazione, Università di Lecce**) and from the industrial world as well.

The **focus groups** and the **newsletter** of the project were addressed to the T/C firms and to the technology and solution providers, with the aim to inform and collect feedback and comments to improve the generalizability of the project results (you can subscribe in <http://www.moda-ml.org>).

The MODA-ML project formally ended on April 2003, but the working group (Enea, Politecnico di Milano, Gruppo SOI, Institute Francais Textile Habillement) goes on with new activities, thanks to new fundings, aiming to develop a complete european standard and to promote its adoption.

In the meantime the first experiences of large scale adoption of the Moda-ML messages have started: one of these is the TQR consortium, made up of about sixty enterprises that cover the whole supply chain (distribution, clothing manufacturing, garment supply, yarning, etc.). This consortium is funding the development of some new Moda-ML messages that they need to conduct their business and that can already be discussed on the Moda-ML website.

**Information** [www.moda-ml.org](http://www.moda-ml.org)

## Moda-ML, what impact?

It's worth to clarify that Moda-ML limited its field of action to providing an architecture and a common exchange format (and a software demo, too), leaving the enterprises and their software houses free to use the results of the project for developing and optimizing their own solutions.

The following are some examples of the benefit achievable by using the automatic interchange of data proposed by Moda-ML.

By using Moda-ML messages for those documents (for example, **orders**) usually exchanged via traditional media (fax, mail), you avoid to introduce in your information systems errors due to manually typing data, spending around 10%-20% of the present cost per operation.

If you would use the communication channel for sending and receiving new data, such as those that you can't afford to manage without an automatic support, you could gain new benefits: just think about a fabric supplier, who receives **collection forecasts** or **production options** from the clothing manufacturers before his order is sent, giving him the opportunity to optimize his planning; or a clothing manufacturer, who **traces the status of his orders** of fabric and receives the defects map in electronic form, saving one or two days of work.

The software prototype shows how the exchange protocol can be easily supported by a software module that the enterprise can use for free. It provides the support needed to send and receive messages, without having to directly deal with the Internet technologies used by ebXML to exchange data.


One of the key aspects of the Moda-ML project is the effort to bring Internet technologies (and XML in particular) inside enterprises, as easily as possible, thanks to the free software module that can be used with company's information system in many different ways.

Its flexibility is demonstrated by the fact that Moda-ML messages can be successfully sent and received even by a common e-mail client like Outlook Express.

Companies like **Corneliani**, a well-known brand in the world of clothing manufacturing actively involved in the project, state that manufacturers will ask for these kind of services more and more to textiles enterprises. On the other side, today textiles enterprises, and their EDP services as well, are asked to open new communication channels, one for each of their clients, so a single common interchange standard allows to solve the problem of exchanging data effectively, saving time and resources for creating newer and more complex services.

Ten years ago, it would have been hard to find at least three enterprise of the T/C sector interested on this topic, but now Internet and ten years of technological innovation made the perception of the problem mature.

Moda-ML was a project funded by UE in the framework of an EUTIST-AMI cluster of projects dedicated to agent technologies and middleware ([www.eutist-ami.org](http://www.eutist-ami.org))

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## 5 TEXSPIN

Started on July 1<sup>st</sup> 2002 at CEN/ISSS, the TEXSPIN (“Textile Supply Chain Integrated Network”) workshop aimed to set up at European level a “pre-normative” platform for the electronic data interchange among the enterprises of the Textile/Clothing supply chain.

Workshop milestones:

- the WS/Texspin started with a plenary session on July 1, 2002;
- on April 11th 2003 in Milano had been held the [second plenary session](#) of the workshop (jointly with the final event of Moda-ML);
- the [third and final plenary session](#) was in Paris, on June 25th 2003 and was concluded with the submission of the final CWA for comments (it collects all the results and the guidelines for the XML based exchanges);
- all the comments on the CWA were collected between June and the end of July 2003;
- at the end of September 2003 the final CWA has been approved (and sent to national standardisation bodies for further comments) and the workshop is concluded. Finally the CWA has been published by CEN/ISSS as **CWA 14948**.

Documentation is accessible on <http://www.cenorm.be/iss/Workshop/TEX-SPIN/Default.htm>.

### Background

The competitive advantage deriving from innovation, creativeness, quality and know-how gives the european industry of the T/C sector the strength to be the leader in international market, provided that its actors would be able to work together more closely and effectively than they actually do.

Contrary to other industries where integration is more and more pursued, the T/C sector has always been fragmented. Furthermore, because of its polimorphical structure, this sector has seen the birth of many small and medium enterprises able to play significant roles.

Nevertheless, a lot of these small and medium enterprises can’t afford to make many investments because of their size, while EDIFACT-based standards for exchanging data require investments on technologies that are real barriers for them.

Another obstacle is that the sector, during last years, has developed a set of messages (EDITEX) that is partially different from the EANCOM set, which, instead, is extremely diffused towards the points of sale of the big distribution.

Meanwhile XML technologies and the Web itself are knowing a strong growth as a cheap and widespread tool for collaboration, so they can break down the barrier that leaves small and medium enterprises out of the so-called electronic Business to Business.


### Goal and results

TEXSPIN Workshop was based on the contribution, in terms of technology, experience and know-how of the parallel TEXSPIN project (developing of EDITEX messages compliant with EANCOM and XML/EDI pilot experiences based on new XML messages) and of two projects realized in Italy (MODA-ML, upstream part of the supply chain, from raw materials to clothing manufacture, IST european financing) and in France (eTeXML, downstream part of the supply chain, from clothing manufacture to distribution, french national financing).

Its aim was to define a common framework for data interchange of the T/C sector at a european level.

The results of the TEXSPIN project were validated by the workshop and produced a CEN Workshop Agreement (CWA), in the form of a “Best Practice” regarding:

- validation of the new framework of XML documents derived from EDITEX (XML/EDITEX)
- requirements and architecture of a collaborative framework based on XML messages
- guidelines for framework implementation

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More in details, the CWA defines two sets of XML documents for the B2B information exchange:

- a) **a set of XML documents for the side of the supply chain dealing with production, from Moda-ML**  
(see previous pages for the list of XML documents)
- b) **a set of XML documents for the final part of the supply chain, dealing with retail, derived from the EEXML experience**

<b>Process: <i>Garment sales</i></b>		
<b>Activity: <i>Garment sales</i></b>		
<b>Product Catalogue</b>	The product catalogue (characterisation of the product)	Clothing → Retail
<b>Pricelist</b>	The (price) list of products offered for sale	Clothing → Retail
<b>Purchase order</b>	The order placed TO the Clothing Manufacturer	Clothing ← Retail
<b>Dispatch advice</b>	The anticipation of the dispatch by the Supplier	Clothing → Retail
<b>Invoice</b>	The invoice	Clothing → Retail
<b>Sales report</b>	Report of sales to the supplier	Clothing ← Retail

Final document approved (CWA **14948**):

<http://www.cenorm.be/cenorm/businessdomains/businessdomains/iss/cwa/textilecwa.asp>

## Participation

TEXSPIN Workshop, according to the rules defined for every CEN Workshop, promoted the participation, comments and contribution from industries and associations of the sector, from technology providers and from other standardizing initiatives.

Were established connections with other horizontal CEN Workshops (WS/Electronic Commerce, WS/Ebes) or sectorial (WS/FINEC, footwear), IST projects (e-T Cluster, Tex-Map) and international organizations (OASIS, EAN International).

Participants were able to exchange and receive information and working documents and, if they wished, to attend plenary meetings.


Project website	<a href="http://www.atc.gr/texspin">http://www.atc.gr/texspin</a>
Workshop website	<a href="http://www.uninfo.polito.it/WS_TEX-SPIN/default.htm">http://www.uninfo.polito.it/WS_TEX-SPIN/default.htm</a>
Workshop's site at CEN/ISSS	<a href="http://www.cenorm.be/cenorm/businessdomains/businessdomains/iss/activity/wstexspin.asp">http://www.cenorm.be/cenorm/businessdomains/businessdomains/iss/activity/wstexspin.asp</a>
CEN/ISSS website	<a href="http://www.cenorm.be/iss">http://www.cenorm.be/iss</a>
Pages about Texspin in Moda-ML's web site	<a href="http://www.moda-ml/moda-ml/imple/texspin.asp">http://www.moda-ml/moda-ml/imple/texspin.asp</a>

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## 6 Terminology

### CEN and CEN/ISSS

The CEN, [www.cenorm.be](http://www.cenorm.be), is the European Standardisation Committee, it is the European correspondent to the International ISO, its members are the European national standardisation bodies (UNI for Italy, AFNOR for France, etc etc); **ISSS** (Information Society Standardisation system) is the fast system for the definition of voluntary standards in the field of the Information and Communication Technologies.

CEN proposes this simplified methodology to speed-up and lower the costs of the process of standard creation in the ICT sector, a sector where the obsolescence of the technologies vanishes the traditional standardisation processes that requires some years to be completed (in ISSS the elapsed time of the processes is measured with months).

### CEN/ISSS Workshop

In short a CEN/Workshop defines a processes that, within one (or maximum two) year(s), allows to define and publish a proposal of '*de facto*' standard with the certainty that all the interested European subjects will be able to know and view it, send comments and participate the activities (if interested).

In the business plan of the workshop the time scheduling and the objectives are defined; all the draft documents produced by the Workshop can be published on the Web site (that can be created and maintained by the standardisation body that acts as secretary) and are accessible to all the visitors or to the registered members (membership is open, in some cases a fee is requested); in the public meetings ('plenary sessions') the draft results are discussed and approved and lead to the approval of CWAs (Cen Workshop Agreements) that represent the final result.

### TEXSPIN project

The TEXSPIN project was promoted by Euratex (the association of european industrial associations of the T/C sector).

### CWA

The CWAs (CEN Workshop Agreement) are final results of the Workshop: they are documents containing the standardisation results of the workshop.

The workshop can decide to publish for 60 days on the Web the text of the final 'draft' of the CWA in order to solicitate and receive feedbacks and comments before its approval.

If the feedbacks (of the Workshop participants or of external participants) are relevant, it can be necessary to revise the text, then the CWA must be submitted for a new round of feedbacks to achieve a large consensus. It can be achieved either electronically (through e-mails) or in a new final plenary session.

Usually not all the CWA are available via WEB, only that developed in the framework of the eEurope initiative.

After the approval of the final meeting the CWA (namely 'final candidate CWA') is sent to the national standardisation bodies associated to CEN, they publish them, mainly through their catalogues of publications.

At the end of this process the CWA might be left as is or, on initiative of the industry, it might begin the process of formalisation or new workshop could be proposed to evolve or adapt it to new needs. In any case, the follow up of the workshop will be consequence of the real interest demonstrated by the industrial operators about the results.