Pros and cons of the IT support for the business relationships between the enterprises of the textile supply chain

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Abstract

The goal of this paper consists of analysing the growing phenomena of buyer and seller relationship process automation in the textile industry.

As it happened during the 70th, where we have seen, inside the production department, the automation revolution of the manufacturing processes, the 90th have closed with the aim to extend this methodology to the selling world and the buyer and seller relationship too. Information technology, supported by telecommunication, tries to give, nowadays, the right path to get this goal.
In this perspective software solutions and resource management systems should help to simplify the sales department back office activity, improving business efficiency. On the other hand, they should facilitate the market knowledge sharing for a better partner selection and, in this way, improving the system efficacy.

By defining processes, players and related information flows, this paper wants to explore the opportunity and the threats to implement the automation cycle inside the textile supply chain. It will be spotlighted the importance of embedding rules and processes in software, in order to create a codified language for the operational and transactional flow. Further more it will be emphasised the role and the weight of exception management in the sales process and how to handle it without a software routine.

Introduction

This paper is composed by four main chapters. The first, named "**the textile supply chain**" describes the Italian textile industry structure which is mainly represented by the district, a constellation of interdependent enterprises. After a short description of the existing bonds among the textile supply chain players, the paper points out the centric role of mutual adjustment as operating mechanism inside the relationship among the players. The second chapter, "**the system resource management**" is the assessment of Information Technology state of the art in the Italian textile district. Here are described many initiatives promoted with the purpose to digitalise the relationships among the players and boost efficacy and efficiency in the business transactions. The phenomena of rise and fall of Marketplaces are seen as the result of conceptualising IT as tool unlinked to the cognitive process of each member in the district. **Cluster or district evolution** is central to chapter third. The emergent role of a leading company in the district is seen as the answer of coordination need due to a market complexity increasing. This chapter emphasizes the cognitive dimension of the relationship among the textile operators and the process design to get it. In the last chapter is outlined a viable way to digitalise and **automate the relationship** which is based on cognitive process.

Starting from the central role of processes, information and coordination rules in the relationship development, we want to point out the great importance of embedding processes and business rules in software in order to integrate and simplify this information exchange among the members of the district. With the same priority is stated the centric role of defining exception management systems in response to human need of divergence from standard approaches and relationship customisation requirement.

The textile supply chain

The Italian textile clusters

The textile clusters are formed by a multitude of small enterprises which have a unique and well defined specialization towards the external market and a high level of labour specialization among the players belonging to the district.
Today we can identify more than 70 districts localised all over the country and specialised as indicated in the following chart.

Location (Region)	N° of districts	Specialization	Town (*)	Enterprises (*)	Employees (*)
Piemonte	13	Textile	13	466	5.217
Lombardia	8	Textile, shoes, socks, silk, clothing	14	1.478	17.163
Veneto	5	Shoes, textile, clothing	29	3.046	29.516
Emilia Romagna	5	Textile, clothing, leather	4	1.160	9.150
Umbria	2	Textile, clothing	4	615	4.776
Marche	19	Leather, shoes, textile, clothing	6	556	4.238
Toscana	7	Leather, shoes, textile, clothing	10	3.298	21.874
Lazio	1	Furs, clothing	14	726	4.816
Campagna	5	Textile, clothing	15	1.322	7.806
Basilicata	1	Textile, clothing	1	20	70
Abruzzo	2	Clothing	18	1.441	13.497
Puglia	5	Clothing, shoes	11	2.206	12.573
Total	**73**		**11**	**1.302**	**10.622**

(*) Average per district

The average number of enterprises involved in each district are more than one thousand employing around ten thousand people . Generally speaking clusters are based on SME's since each enterprise has on average ten employees.
Since their first appearance, clusters have developed without a formalised strategy. The district business model is the result of a "learning by doing" approach.
A shared value system is a common requirement that can be found in each district. It has enabled the economic and social development of the district (1).
Districts are characterised by an appropriate mix of competition and cooperation among the players. Tacit knowledge (2) is the key for this balance. In the district, tacit knowledge is manipulated through different steps:

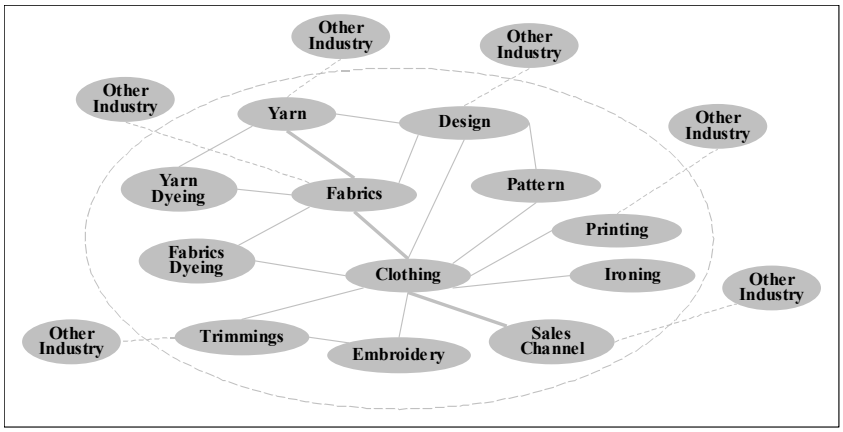
a. the knowledge **socialization** process in the network (as in the student-teacher relationship) strengthens cooperation.
b. The **internalisation** and **combination** process of knowledge helps each enterprise to innovate his offering
c. and **externalisation** of knowledge fosters positive competition.

Thanks to the existing positive climate, these steps can be fruitfully pursued in the network. In this way each member of a district benefits as if it had greater economies of scale or as if it had joined with others without sacrificing its flexibility. The ecosystem of the district is continuously reshaping. Two reasons sustain this tendency: specialization among the players and their performance improvement as a consequence of the three level learning cycle shown above. Further more the attitude of the subcontractor suppliers, who, having the

opportunity to learn to manage third party production, (for example a famous fashion brand), decides to establish their own new brand (3).

The value chain network

The textile industry system is composed of different organisations each operating a specific role to add value to the chain.
Picture 1 shows the entities involved in the textile network.



Picture 1 – The textile network

The representation does not show the typical value chain composed by serial activities (4). Even though there is a main flow in the system (Yarn ➔ Fabrics ➔ Clothing ➔ Sales Channel) (5), we prefer to depict the network like a system. In this way you can see different organisations cooperating for the same purpose. The relationships among the players are multiples.
There is a global experience and knowledge exchange among the members. Communications help to improve not only productivity but also to boost innovation.
Let's take an example. Designers operate in close connection with clothing manufacturers but also help to look for new fabric styles or a new better kind of yarn in accordance with customer needs and the trends of fashion style. As a consequence, every decision taken in one place of the network has potential effect for the other players of the system and can influence meaningfully the entire manufacturing process.
We face clearly this effect when a ready-to-make manufacturer decides to change production process from dyed yarn to dyed fabrics; all the intermediate activities must be re-engineered.
Further more we have to point out that the system itself is not self-referencing but, thanks to each member, enjoys continuous improvement and knowledge sharing via exchanges with external operators outside the network, let's say with other industries.
Positive interference in the network also comes from vertical, horizontal and lateral industry (6). During the last decade, in example, we have seen a lot of apparel innovation based on new products such as synthetic fibre.
The network representation proposed here, actually, simplifies the system complexity because it does not depict other external organizations that provide infrastructures (plants, technology instruments, etc) and services (information technology, MRO, etc).
These system suppliers offer new opportunities to innovate the network (think about process innovation based on a new production equipment), but, in this article, we only intend to concentrate on the operating relationships existing among the players inside the dotted circle of picture 1.

The faulty market effect

Under this textile network representation, relationships among the members are one of the most important components for the system success. People, enterprises and every player in the system knows and is known by each other. In order to keep themselves updated with the network evolution they foster relationships via communication.
Relationships aren't strictly formal (contract, codified document, etc.) but on the contrary they are based on embedded interrelations (7).
In this context all the rules related to the market transaction theory are not entirely applicable. Buyers do not select suppliers strictly on a quality-price ratio base (like in a perfect market) but assess partners on a relationship base with a high importance to items like: presence and expertise in the network, capabilities in problem handling, flexibility, commitment, customisation attitude, relationship investment mind-set, and so on.
One reason, for this behaviour, is the role played in the process by information and its intrinsic characteristic.
A buyer (i.e. clothing manufacturer) knows that, during negotiation with supplier, a lot of information is required to obtain the best result from the deal (i.e. to buy the best quality fabrics fitting the specific working conditions of the manufacturing equipment) so he will need time and resources to dedicate to evaluate the offering.
This means that usually the relations (at least for the main purchases like fabrics for a manufacturer) are based on a deep exchange of information (8). Frequently this kind of information is so close to the suppliers experience that it is "sticky" (9). Usually this happens when the two firms (buyer and seller) are trying to innovate product o processes.
As mentioned before the members of the network described above are usually committed in project of product/process enhancement. Let's take the company who decides to change the way to manufacture cotton shirts. If the company wants to move from manufacturing procedures, based on dyed yarn or fabrics to a strategy which postpones the dyeing procedure to the finished product, it'll need not only a lot of detailed and complex information from the supplier but probably it'll assess new and different paths to find the best solution (i.e. new suppliers). The way to achieve this goal is a trial and error approach which engages the cognitive attitude of all the parties involved.
Further more, the way the selling process is managed, pushes us to think that the pure market exchange it's not the best way to deal with transactions among the textile firms.
The selling process is very complex in this industry due to the presence of short fashion campaigns. One manufacturer needs a lot of information to launch production scheduling and it needs this information many months before the season comes. It needs information in order to decide on models, range depth, sizes, colours but this information does not exist in one specific place; it must be collected all over the entire sales channel involving many companies which sometimes are medium or small ones.
The manufacturing company (at least the main operator in a group) has to face the problem to define a continuous information flow from the sales net in order to get fresh and reliable forecasting data from the market about the product quantities needed to feed the production and replenishment processes. The solution adopted to contrast this information dispersion (10) consists of sharing with the distributors procedures and devices which enable the real time communication of sell out from the point of sales.

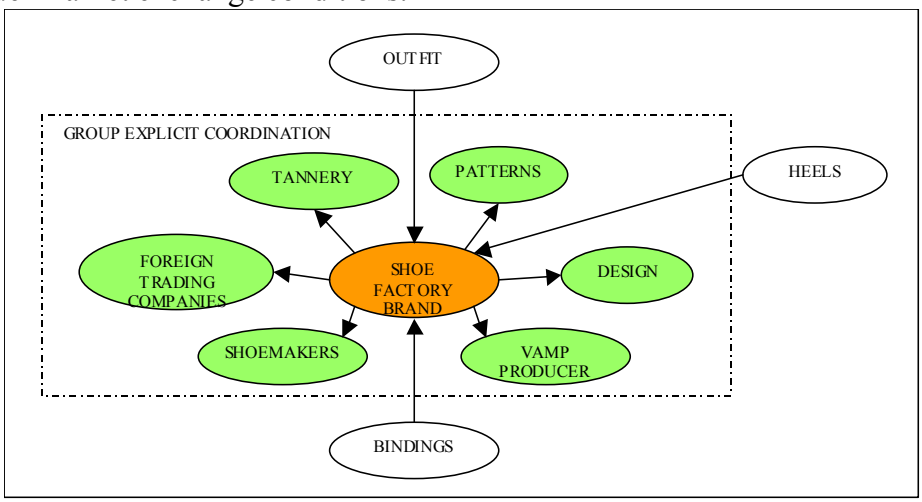
The mutual adjustment

All these reasons push us to think that business transactions among the textile players are only partially managed under a free market approach. Free market rules are encompassed by relationship creation and its continuous improvement after.

This existing link between purchaser and supplier is regulated by mutual adjustment (11). The main players in the textile district have bonds with each other. The win-win approach that drives their relationship is not based on short term balance but can predict long term agreements in which the involved firms make investments in joint projects. These agreements are so closed that usually the companies decide to go toward the vertical integration solution by exchanging capital shares.
The evolution during the last decade has seen, in fact, many concentration initiatives among firms and the creation of many textile groups inside the district network.

Toward the "textile groups"

Competition from Far East producers plus product life cycle shortening has generated an increased market complexity in the textile industry and, by consequence the need to improve the level of interdependence among the firms working in the value chain.
Because coordination and interdependence is difficult to accomplish between several firms, we have witnessed , during the '90, a reshaping of the traditional district model.
Further more the aim of improving the apparel design process, and integrating it into the entire product life cycle have had the effect of converting labour-intensive activities to capital-intensive activities (11). In this perspective the rise of need of explicit coordination inside the district and the growing process of transforming the industry toward a capital-intensive model (12), has pushed one company (the smartest one) to became the leader in the district. This position has been created around (or started from) a well famous trade mark which has become a centre of a constellation of other not so popular manufacturers. As depicted by F. Nuti (13) a leading leather and shoes manufacturer in the Tuscany District (typically a company with a distinct and clear positioned brand), has established strong and coordinated relationships (sometimes reinforced with share capital acquisition) with other manufacturers who operate core activities and processes such as design, tannery, vamp, etc., as shown in picture two.
No core activities (such as Outfit, Heels and Bindings, which do not provide incremental competitive advantage), are outside a specific and explicit coordination and consequently are managed under market exchange conditions.



Picture 2 – Representation of the groups of leather companies in Tuscany.

In this new scenario the network undergoes a radical shift from a "free" evolution model to a managed one in which the main company takes on a "psychological" contract by which, as said by Butera (14) it organizes:

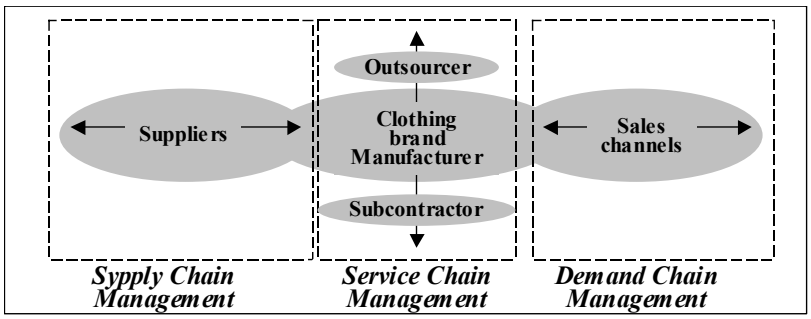
- the value chain and the related network
- the network processes

- the deployment of internal units (where the market model fails to manage the deal) and external bonds with suppliers and partners.
- the imprinting of a common vision and strategy among the players
- the integrated management information system in order to share the most data available

Companies who stay at the centre of a network have to balance between coerce and concede strategies (15).
As said before, in the textile networks innovation and improvement potential is distributed across the members, that's to say that, if the centre wants to get the best commitment from the other companies it has to follow a "concede" strategy.
On the other hand it has to "coerce" and exert the right level of coordination in order to keep the maximum level of system integrity and reduce the entropy forces that drive toward network dissipation.
The balance between coerce and concede behaviours can be obtained by using a multiple strategy. One fundamental aspect is the correct use of the information flow in the system and among the players. In this perspective Information and Communication Technology (ICT) becomes the means of transport and the enabler of the information flow.

The main information flow

Starting from the point of view of the clothing manufacturer (the major brand representing the district) we can distinguish three major information flows in the entire textile value chain.



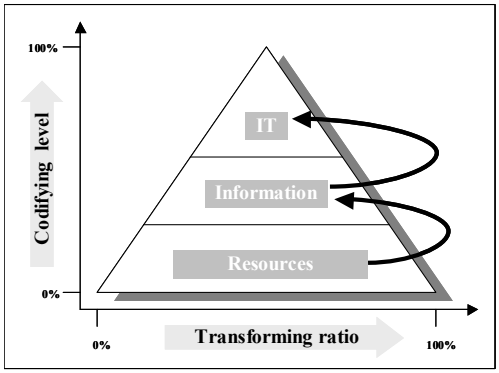
Picture 3 – The three main information flows in the textile domain

Picture 3 points out that communication in the system (among the members) is based on three different processes which represent others closed systems. Notwithstanding they can be defined as "closed" for the specific "languages" they engage, the three processes are strictly linked to each other.
Demand Chain Management consists of understanding and evaluating the need of goods from the final customer via the sales channels. This process is very critical because it feeds the rest of the system, providing the right information for procurement (Supply Chain Management), for coordination of the sub-contractor manufacturers and for processing internal activities (Service Chain Management).
The coordination of the three main flows depends on the specific characteristics of the business. Basically the flow is diametrically opposed if the production is based on "make to order" rather than "make to stock" criteria.
These simple consideration helps us to understand how complex is the coordination of the entire value chain and consequently the network management.

The system resource management

The Information Technology paradigm

In this perspective Information Technology (IT) might help to support these processes simplifying the related information flows among the members of the system. If we start from Baraldi's assumption (16) that human activities (businesses) are based and consist of transforming, transporting and commercialising resources (materials, money, ideas, knowledge, etc) we can say that information is almost always the perfect representation of these resources. Information is easier to transfer and consequently enterprises prefer to work on this rather than on resources, as a cost-effective approach. In the last few decades we have learnt that this information can have a binary representation and dealt with by computers with an increased cost saving effect (17).
Picture 4 tries to depict the relationships among these elements.



Picture 4 - The hierarchy among resources, information and IT

The problem each manager has to face when he tries to support physical resource flows with information and IT, is related to the transformation and codification of the resources into information, and then into IT. Not all the resources can be "loaded" into a PC via codified information.
For instance we all know how complex it is to transform into codified information the customer knowledge existing in the salesmen mind and load it into a customer database (18). Notwithstanding so, each company is trying to pursue this steep path because IT can assure great flexibility in the decision making process and a quicker response to management questions.
On the other hand we have to point out that the risk connected with codifying resources in "bits & bytes" is dependant on the effectiveness and reliability of the information system in respect to the management decision taking process. Sometimes IT gives such a high level of incompleteness or an untruly representation of a problem, that managers do not take involve IT in order to decide a certain strategy. The most clear example is the limit of an e-procurement device which supports the selection of a new raw material which must match a new production plant process.

State of the art of IT investments in the Italian districts

The issue of using IT as a support for business management is also recurrent in the textile companies and more over in every textile network cluster.
Many surveys (19), rolled out within the Italian districts state that the highest spread (more than 80% of the interviewees have answered positively) devices of IT among the companies are e-mail, ISDN, corporate banking and corporate websites.

On the other hand the surveys suggest that other IT applications such as ERP, groupware, EDI, videoconferencing or e-commerce tools are not so common all over the districts as the "IT revolution" would like us to believe.
The analysis of these results tells us that two important phenomena are coming:

- ✓ companies want to innovate the working system introducing IT support and are searching for new ways to manage efficiently and effectively their business
- ✓ the technology applications, nowadays accepted, are the less "invasive" ones (e-mail, ISDN) which can be added to the traditional way of managing the business ("brochure-ware" website) but, these are the ones that are not able to significantly improve a company's economics and working procedures and thus provide strategic and long term benefits.

If the '90^{ies} have been the decade where enterprises have known and have had access to the information and telecommunication technologies (ICT) in the traditional commodities way (20) with the proper aim to improve formal communication with customers and suppliers, the new century will be characterized by a new direction in ICT investment.
Single enterprises and especially the ones involved in networks , will approach ICT in a new perspective in order to reengineer extended process systems and support them with Knowledge Management System, Extended Enterprises Resources Planning and Inter-Organizational Systems.
This is what has been defined by Zaninotto (21) as the "thickening model" in which after a fast access to easy and common IT, the business community (i.e. a district) will drive a slow and complex but growing and continuous process of radical change toward ICT integration, enabling the extension of data and information sharing.
In our opinion this evolution path is nowadays in a "not moving" phase.
On the wave of commodity ICT innovation successes (such as email), enterprises have approached interoperability system issues, such as extended enterprise information systems, in a simplifying way.
Enterprises, IT providers and consultants have emphasised the central role of technology, focusing only on the interface and technology networking areas and giving no consideration to other important aspects such as information status, gathering and origin (that's to say relationships among the players and related processes).
In this way it has been created monsters such as marketplaces or e-procurement systems that have demonstrated a limited impact only on certain peripheral and not strategic areas of business, such as Maintenance, Repair and Operations (MRO).

The raise and fall of marketplaces

Marketplaces were born with the main purpose of reducing transaction costs (22) and allowing the buyer to select the best offer existing on the market. On the other side the seller would be enabled to participate to the offer in an easier way with no need to structure a complex sales department.
Furthermore Marketplaces would have reduced "paper handling and clerical work associated with making purchase" (23) with mutual benefits both for the seller and the buyer.
Summing up, marketplaces would have reduced all the "frictions" (24) connected to the imperfect market theory, improving market efficiency and external economics.
Companies would have not had anymore the need to engage in closer relationships each other to overcome the barriers of uncertainty, frequency of the transaction and asset specificity typical of previous experiences (25).
Under these assumptions and starting from the middle of '90^{ies} , marketplaces have became more and more popular.

E-purchaising	E-marketplace catalogue E-marketplace bid	E-marketplace exchange
One to One	**One to Many**	**Many to Many**
Operators involved in the transaction		

Picture 5 – different kind of marketplaces

In picture 5 we try to represent the different facets of the general term marketplace.
E-purchasing is dedicated to one-to-one transactions or standard relationships driven by procedures. Generally speaking many projects run by buyers with the aim to link suppliers have successfully focused on non core purchase only, such as office equipment or Maintenance, Repair and Operations (MRO), because core supplies, such as raw materials, often need customisation and consequently do not fit with transaction standardisation.
Sometimes enterprises have tried to put on the website their purchase catalogue or to manage deals by bids on the web. In this way the supplier wants to communicate to the market, in one shot, its needs in order to maximise the effort and get the best proposals.
The goal of these solutions (**e-marketplace catalogue and bid**) consists of putting all the potential suppliers in competition in order to get the lowest price given a standardised product. Currently bids on the web do not noticeably differ from the traditional version and are principally used by big companies for massive purchases (i.e. PC renewal).
The third developed marketplace (**e-marketplace exchange**) has been designed in order to link different system operators contextually. The main purpose is the frictionless resource sharing in the system.
One example in the textile system consists of putting the sub-contractor production capacity in a public repository in order to increase the efficiency in the supplier resource planning and buyer as well.
Another application is the repository of the seasonal unsold goods (ready to make apparel). The system allows the reseller distribution net to be informed for last minute offers (huge stocks with low price) or for quick replenishment (size, colours, models, etc. not available from the producers but existing somewhere in the sales channels) (26).
Generally speaking the main features of these marketplaces can be summed up in the following way

- ✓ Administrative services: information system, finance services, transaction security.
- ✓ Baseline service: community knowledge, document management.
- ✓ Purchasing aggregator: centric database and repository for raw material offers
- ✓ Production facility aggregator: centric database and repository for production capacity offers
- ✓ Unsold goods: repository for offers and need for seasonal product.

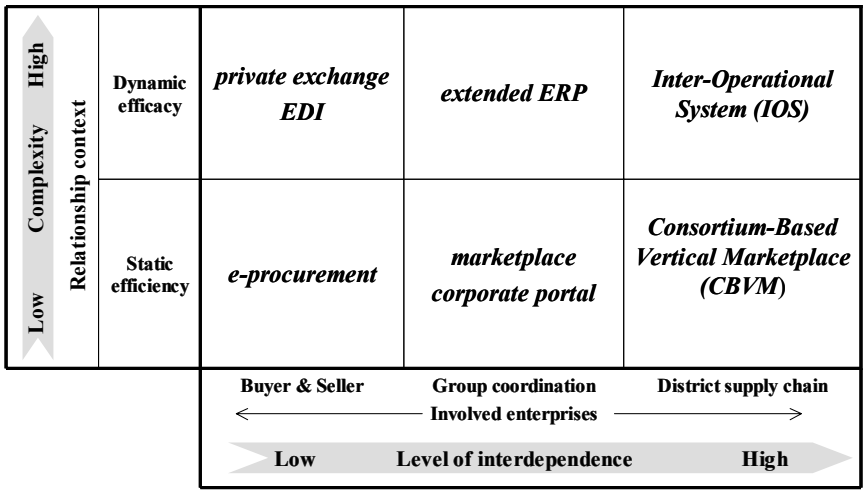
The third marketplace model always need a “pivot”; that is someone who is committed to managing the system and putting the demand and the sell side together. When the owner or administrator of the system is one enterprise belonging to the network (from the sell side or buy side) we say it’s a captive marketplace. Often marketplaces are founded by third parties who gets a commission to link supplier and buyer operating in the system.
Third party marketplaces facilitate exchanges and transactions in a free market condition but on the other hand they are inflexible because their service is usually provided in a standard solution. They can offer and facilitate the intermediation of a wide range of products but with limited customisation feature that can be synthesised to product specifications, quantity, prices and average time for delivery. Usually they are not linked with the supplier’s legacy nor the

buyer's one; in this way they can't integrate with the existing processes of the two parties and can't provide information such as production schedule, time to delivery, etc..
Further more it's difficult to imagine the feasibility of IT connection driven by an external administrator among the players in the marketplace. No company would share detailed and deep information about their business with an external intermediary.
This absence of trust and relationship, leaves a limited operating range of intermediation to third party marketplace only to no core activities.
To tell the truth many surveys (27) have identified in the self-government attitude, in the sharp independence of each enterprise and in the fear of sharing data with competitors, the real limit to the digital innovation inside the districts.
The same surveys tell us another important information. Only a few of the companies belonging to Italian districts (less than 20%) say that digital innovation issues are related to the infrastructure investment expenditure.
These statements confirm other key issues which came out during the TEDIS research project (28); only 5% of the interviewed enterprises think that the investment is too high, but more than 50% think that the great problem of district digital innovation is the inadequacy of internal and inter-organizational processes.

The matrix interpretation

The main issues arising from district IT projects can be therefore summarised in these two sentences: 1) fear of loosing decision independence 2) incapability to design an integrated system between the players and inter-processes governance.

We try now to set these two sentences into a matrix in which we define the IT solutions that can help, at different levels, a cluster integration (see picture 6).
On the horizontal axis we put the number of players involved in decision taking and process coordination. If process coordination requires the contribution of many players (such us in a **group or in a cluster**), the level of interdependence is high, and, in order to get common decisions and process coordination, there must be full transparency, openness and commitment (30) among the members. In dyadic relationships (**seller & buyer**), trust and commitment it's easier to get because is the result of a long lasting relationship. When the number of players involved increases, long lasting relationship is no longer sufficient. Trust must be created starting from common projects. These projects must involve the majority of the members in order to reduce the fear of loosing decision independence. If the community decides to follow the path of relationship automation (via IT), the system which has the task to manage the information flow must be designed or at least, accepted by the majority of players and further more must be configured with different authorization and access levels in order to guarantee data privacy.
These characteristics leave us to believe that information systems which support groups or enterprise clusters are destined to fail if they are based on packaged solutions and standardised processes. If interdependence among the players is high the only possible solution can be represented by a Consortium-Based Vertical Marketplace. In CBVM the members of the community agree the idea to pool information and for this reason select a common system which is able to share information.



Picture 6 – Alternative solution to district digitalisation

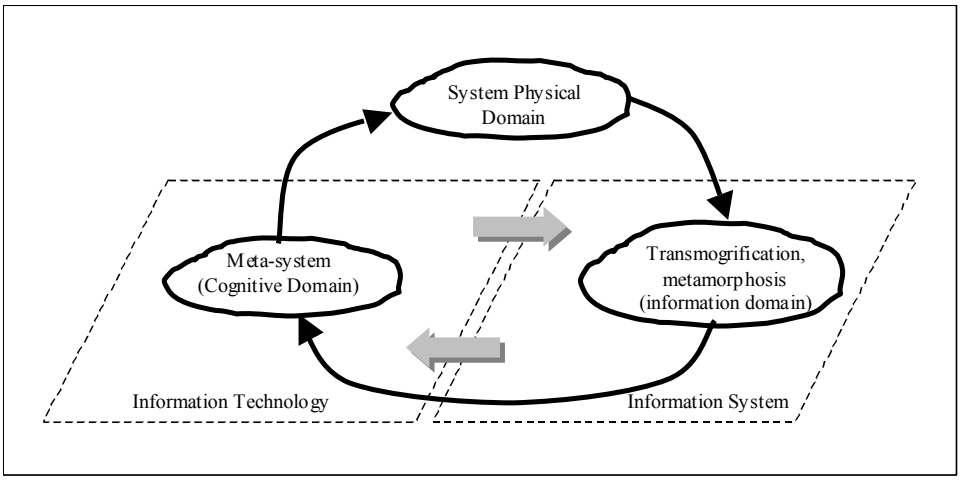
On the vertical axis we put the complexity level of relationship. We can say that the content of the transaction is related to a **static efficiency domain** or, on the opposite, with respect to a **dynamic efficacy domain** (31).
In the first scenario, transactions are always the same and the aim of the system consists of reducing to zero the process latency, improving efficiency and cost saving.
In the latter the players know that they have to cooperate to define the content of the transaction which can be different from the past. Their goal is to define the right path to solve a problem (such as product development, anticipated seasonal sales forecasting, etc.).
Marketplaces, corporate portals and consortium-based vertical marketplace are the perfect ICT solutions supporting low complexity relationships with well defined an standardised transaction, with "thin" information but very cost effective data transfer (32).
In this context we agree with Baraldi (33) who says that ICT solution is a tool that facilitates data collection, and information sharing providing in an economic manner.
Notwithstanding, the essence of the relationships are routine transactions, the value added emerging from partnership is non predictable ex-ante, so cannot be standardised into a pre-configured package. Relationships are based on a dynamic equilibrium which is in continuous improvement.
Communities must understand that to keep pace with the changing environment they need new ICT solutions (totally different from marketplace or corporate portal or CBVM). These solutions can be defined as Private Exchange EDI, extended ERP and Inter-organizational Systems.
These systems differ from the previous ones because they are designed in order to cope with complex processes that are evolving in accordance to the environment and that involve many enterprises. These systems:

- ✓ are tailor made only
- ✓ have a common platform
- ✓ are linked with legacy
- ✓ are value chain process oriented
- ✓ recognised the centric role of the intermediate customer (in a BtoB approach) and the final one (in a BtoC approach) as well
- ✓ are holistic (in a business to business for consumer configuration)
- ✓ are designed in cooperation by the most of the participants

Their success relies on overcoming the main limit of the marketplace represented by being a tool only.

The limit: conceptualising IT as a "tool"

Picture four depicts IT as a mix of a system, processes and methodology that converts resources in the form of information. Due to the intrinsic essence of resources, IT can only partially covers the need of business automation because relationships are based on a certain un-codified knowledge. This point of view shows us the main fault of IT when we consider it as a strategic support. IT is a tool that can help only routine management and operational data gathering and sharing.
If we believe that IOS or extended ERP can seriously help relationship development we'll have to "visualise" IT from a different aspect.
Picture seven conceptualises IT not only as a tool but as a meta-system (34) that together with an information layer improves the cognitive domain which, as a retrofit, can influence and modify the physical domain (resources).



Picture 7 – The holistic representation of Physic, information and cognitive domain

In this perspective IT with the IS (Information System) have an important role because they influence resource allocation and consequently modify the relationship among the players. This benefit cycle loop requires three basic conditions:

1) IT is not a simple tool but represents the cognitive domain of the system
2) IT must be flexible enough to accomplish, at all levels, the integration with IS
3) The holistic system (physical, information and cognitive) only exists if the players decide to overcome the single business limited rationality with mutual adjustment, cooperation and process interchange.

The cluster evolution

As stated above textile clusters are evolving their structure towards a new model that we can define "group centric". One company, typically the most important trade mark in the community (Prada, Gucci, etc.) becomes the centre of the cluster as depicted in picture two. This brand centric model often requires specialization in the cluster. In this context both the trade mark and the other subcontractors invest resources, time and money to align each other as regards strategy, processes, and business rules.
Notwithstanding each company has its individuality, the community is configured as a quasi-group with many bonds and activity coordination systems. Generally the group is characterised by asymmetrical power, corresponding to the entity and level of resources

invested (35). Notwithstanding asymmetrical power, all the members, starting from the smallest or those furthest from the centre take part in decision taking because the success of the entire value chain relies on information and information being spread all over the system. Forced by time to market reduction, continuous product range renewals and increasing competition (especially from "far east" for low market segments), textile clusters are compelled to work more closely linking their processes in order to reduce production costs, improve quality and provide a quick response to market demand.

The cognitive dimension

For the above mentioned reasons all the companies involved in the traditional cluster or belonging to textile groups have to learn and promote the cognitive cycle of interaction. Differing from the stimuli-response theory in which there would be a process of action by one company and reaction by another, the cognitive dimension of network business consists of a large number of *active* and heterogeneous companies each *interacting* with others and seeking *solutions* to their different problems (36).
Since network companies always work individually and as a group, in conditions of incomplete knowledge, the trial & error approach and learning by doing (37) are the best practices to speed up the never ending cognitive cycle.
In order to have a clearer understanding of the cognitive process it's suggested to understand where the knowledge (that is the raw material of the process) is located.
As stated by Blacker (38) knowledge is embedded or encoded in formalised structures such as database, software, documents and so on. But more frequently knowledge is "embrained, embobied and enclustured" in the people experience. The sum of these two sources represents the total knowledge of the system.
The more the network is able to codify "embrained" experience into text or bit & byte the more the cognitive cycle runs quickly, the more the network is able to sustain competition.
For these reasons during the mid '90^{ies} many companies involved in textile value network have jointed cooperative projects like the most popular Quick Response (QR) (39) or Collaborative Planning Forecasting and Replenishment (CPFR) (40). Typical initiatives aimed to short the time response to market stimuli in a network environment are Make to Order flow coordination and Make to Stock flow coordination; both are crucial inside the textile industry.
In order to simplify the flows and get the best result in terms of quality, time and costs, textile enterprises have launched, sometimes with a trial & error approach, many initiatives to streamline the process. Point of Sales Solutions (POS) are an example of how retailers, manufacturers and suppliers adopt initiatives in order to quickly react to demand fluctuation by improving information flow. The crucial issue in these projects is not the technology infrastructure enabling the flow but the focus, for all the involved operators, to sustain a cognitive process to map and design the "to be" system solution.
Many companies have found interesting and helpful the Computer Aided Design (CAD) support system and virtual prototyping system in order to streamline the designing and engineering of new product. This is a new challenge in terms of cognitive process because the deployment of a Make-to-Measure service strategy needs a higher level of coordination among the players and a new set of tools to support it (CAD in example).

Knowledge creation process

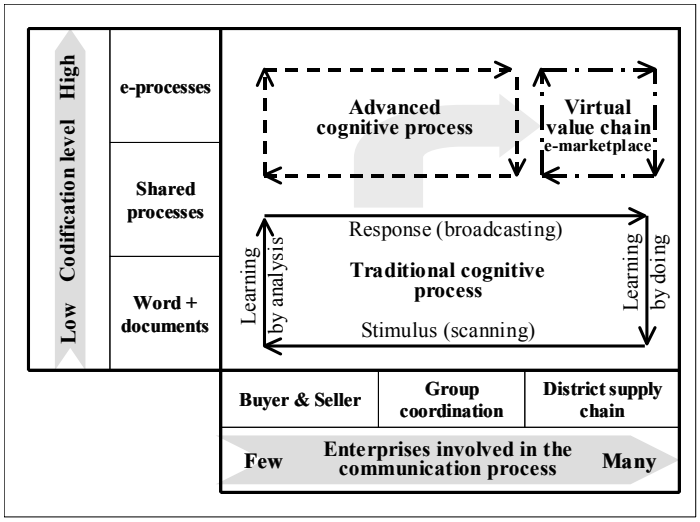
In the previous paragraph we emphasized the role of coordination and the cognitive process inside a cluster industrial environment. In this section we want to understand how this coordination can be achieved. Since coordination is based on information exchange and

communication is the way people and organizations exchange information; the basis of cognitive process analysis starts from the way people communicate (41).
In particular we focus this topic by relating the two dimensions already seen in the previous paragraphs:

1) the information codification level, seen in picture 4 on the vertical axis of the graph
2) the information diffusion represented by the horizontal axis of the graph of the picture 6.

By relating the two dimensions (see picture 8) we illustrate the different ways enterprises achieve coordination within a group.
According to Boisot the cognitive process is represented by 4 steps:

a. a **stimulus** of strengthening competitive advantage, generally coming from the network and that is taken into account by the major player, let's say the initiator.
b. Trial & error, problem solving and **learning by analysis** are the tools to accomplish the conceptualising of knowledge (42). Generally the output of these steps are written procedures, behavioural models or modules.
c. next step consists of broadcasting the solution to all the participant. In this phase procedures, modules and so on, become standardized **responses** to the general question made in the beginning.
d. last step is related to the absorption activity done by every player. This step is time consuming because it relies on the **learning by doing** experience.



Picture 8 - the cognitive process and different deployment paths

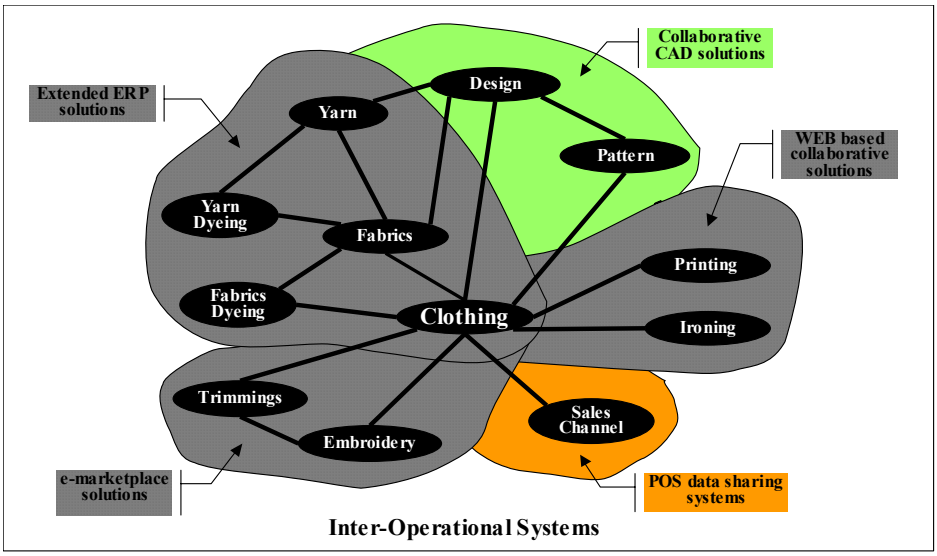
The surface delimited by the two dimensions contains three different cognitive cycles.
The first (the one with the continuous line) is the traditional cycle. This has brought the clusters to become the Italian examples of industrial success. Nowadays the role of catalyser in the system is played by the group who coordinates the cycle as depicted in picture 2. The head of the group (let's say the major trade mark) is working towards the definition and the deployment of standardised processes to link the majority of the members inside the supply chain. In this perspective we can interpret the desire to join electronically the activities of all players under a common e-marketplace (see the dot-line square in picture 8) and before discussed.
This has not been a successful experience because the clusters have skipped one intermediate step represented by the interrupted line square of picture 8 (see grey arrow too).
This is an important step because it requests the system to overcome the growing limits intrinsic with un-codified communication and relationships in order to adopt a new approach which puts ICT as a means to enable the cognitive process, boosts resource efficacy and

increases the system value as stated in picture 7. This intermediate step is not so easy as declared by the marketplace vendors; since it requires strong commitment, an advanced cognitive process involvement of the system participants and the right mix of ICT infrastructure, networking development and investment in Inter-Operational System.
For these reasons we think that advanced cognitive processes can't be spread all over the district supply chain but must be designed for delimited groups, in the cluster existing and operating. May be in the future, we could hope to electronically extend solutions to all the cluster members like in the so called virtual marketplace.
The distance from this desired position is, at present, very far. We have to point out that, first of all, the gap depends more on cultural issues then on technology ones.
There is a persistent and never eliminable dis-alignment between physical time and virtual time. As stated by Baraldi (43) "while information can theoretically be combined, recombined, processed and transferred instantaneously, "at the light speed" or "real-time", especially thanks to new ICT solutions, "real" resources absolutely cannot! Combination, recombination, utilisation, development and transfer of resources usually *require time*: this often creates an unfilled gap between the dynamics and speed of information and those of resources".
That's to say there will be always a physiological latency in replacing resources with bits & bytes in relationship feeding but notwithstanding this, the future direction is towards relationship automation when this brings value for the system.

Towards relationship automation

The network architectural view

Starting from the point of view that IT is crucial for network value creation (44) we have to understand what kind of IT solution can enable the cognitive cycle enanchements.
As stated by Oppel (45), the solution can be found in linking buyers' and sellers' back-end systems providing them with all the advantages of EDI networks but at lower cost.
The same opinion it seems to be presented by Zaninotto (46) who suggests the increasing of information content in the network (clusters) and the consequent capabilities to fit this need by the existing IT systems which are characterised by wide extension (email overall) but low deepness. He points out the need to thicken the net enabling an increased communication density by the creation of connections among the private platforms already existing.
So the question now is confined to the nature of the networking systems linking different platforms.
Inter-organisational systems (IOS) may be the correct answer to this question. Easton (47) defines them as the means by which firms can carry out their (regular) inter-firm interactions, broadly defined, by electronic means.
When we try to solve the problem of extending the electronic dynamic relationships feature of a system (as defined in picture 6) we face a trade off. Extending relationships means complexity increasing because each player involved has its processes and IT architecture and application software, and by the way we must configure a network which take in account the mayor characteristics of these private systems. The so called IOS are less intrusive than EDI systems or extended ERP and can cover a wide number of systems owned by the member the network. Actually the nature of things tell us that the final output is a mixture of the different solutions. The core of the network (called in picture 2 the group) choose an extended ERP solution to share information and business role with the major partners, the other adopters are linked by virtual private network or by other web enabled applications. The sum and the integration of all the provided solutions configures an IOS constellation. In the following picture 9 it is represented a potential architecture of a textile cluster information system.

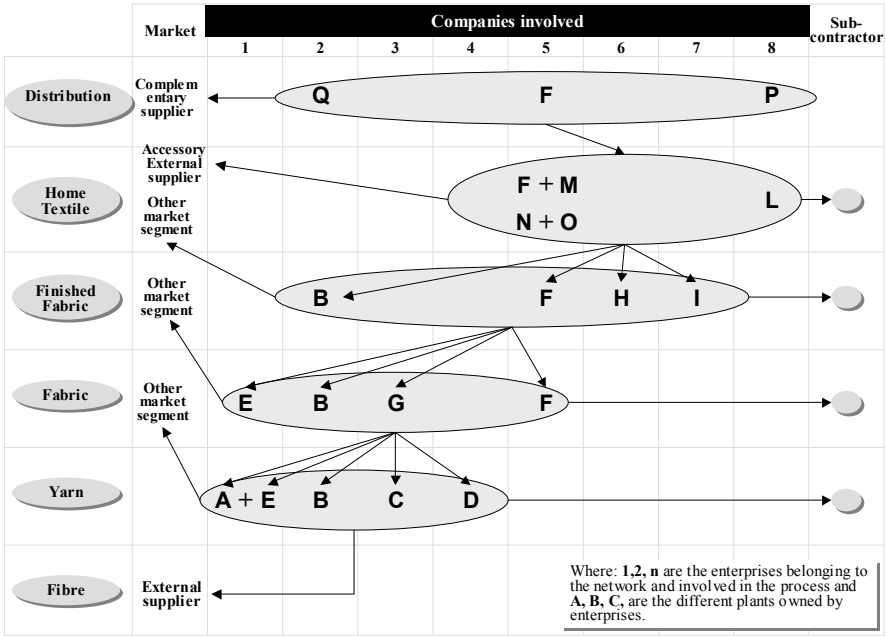


Picture 9 – example of IOS constellation composed by five dedicated solutions

The architecture proposed in picture 9 is "clothing manufacturer" centred. Every electronic information flow is governed by the centre which has the system leadership. The centre is like an hub; gets all the information from the source by a dedicated net and delivers them to the right receiver appropriately connected. The hub has the task to integrate different systems homogenising and aligning the relative information and data flows. This architecture requires a great effort not only in relational agreement with members (common vision, complementary strategy, etc) as told before, but in technology investment too. We are talking about initiatives associated to hardware, networking and software investment. The hub is proprietary of the system and is in charge of the costs and of the maintenance of the infrastructures required by these applications (48). For these reasons the hub becomes the "owner" of the net and normally coincides with the group leader where existing. For Butera the hub centric approach changes the network configuration (49). The district which is characterised to be a natural network must become a managed and planned one with well defined boundaries and clearly segregated tasks for each participant. Out of our opinion and nevertheless web enabled applications have seriously reduced, at least, the cost held by the initiator for deploying an integrated common system within the adopters, we think that the only possible environment to be able to host similar project is a cluster with a strong group leader.

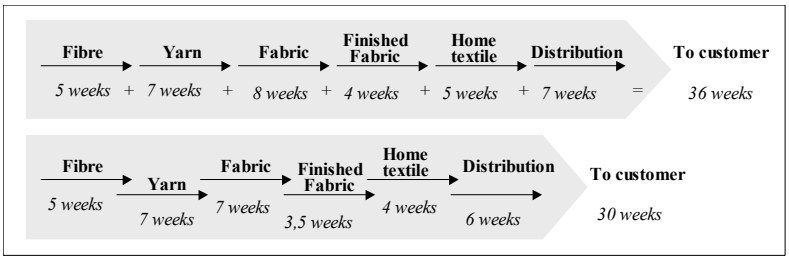
Process integration among the players

As clearly stated by Chatfield and Yetton in their study over the EDI embeddedness in inter-firm relations (50), the success of electronic linking initiatives among enterprises belonging to a network is subordinated to the fit among five different domains: strategy, structure, people roles, processes and technology. Starting from the assumption that the first tree domains (strategy, structure and people) are already aligned and shared, at least inside a living cluster, we want understand how to deal with processes in order to facilitate the IT automation.
In this perspective one of the main step is the "to be" system business process definition.
An example of network bonds and relationships for the home textile manufacturing is provided in picture 10.



Picture 10 – Representation of enterprises involved in the home textile manufacturing and specific role.

The group operating in the home textile manufacturing is composed by 8 companies which has different plants and subsidiaries (from A to Q). Some companies are vertical integrated (n° 5 and 2) but, joining the group, they have decided to share their process and their intermediate demand with the other members. The "to be" system architecture (picture 10) leaves each company the freedom to choose the best supplier belonging to the group. Take as example the company 8; it can decide to replenish its point of sale P directly with the product manufactured by its plant L or to buy homogeneous product from plant F or M belonging to the company 5. In this perspective, relationships among the players are many to many. Each company can choose the internal department (or a owned plant) as supplier or select it among other independent enterprises belonging to the group. Thanks to a combined vertical and horizontal virtual integration (in one word a dynamically integration (51)) the system can get the operational resource optimisation.
In this scenario each company is able to shorten the process time and can have more alternatives in term of quantities and qualities too.
The great benefit in time to market reduction is not only due to the process streamline but is the concurrent result of paralleling the most of the activities. In home textile manufacturing, time saving is up to 20%, from 36 to 30 weeks in delivery to final customer as depicted in picture 11.



Picture 11 – Elapse time to manufacture and sales a bedspread

This is due to inventory synchronisation, forecast sharing, integrated production scheduling, concurrent new product development.
More wisely, many projects (52) run with the purpose of reduce fulfilment cycle time, indicate that the integration of supply chain can improve delivery performance of from 16 to 28%,

reduce inventory from 25 to 60%, improve forecast accuracy from 25 to 80% and in general lower the total manufacturing cost from 20% to 30%.

To get these benefits the group of companies has to reengineer the entire resource flow from fibre to retailing.
Each member becomes a part of a big process where it has to define its main added value activities provided. Picture 12 shows the value added chain for the home textile group earlier depicted. Per each company and plant it has been identified the input material, the production step performed and the output material provided.

Company / Location			Input Material		Production steps	Output Material	Information Input Type	Information Input From	Information Output Type	Information Output To
YARN Manufacturer	1	A	Raw cotton	pre-	carding, teasing, ironing, stretching	OE yarns	Annual Supply Chain planning;	All	Yarns Virtual stock	Fabric
				main	Open End spinning,					
				post	Packaging, stocking					
	2	B	Raw yarn	pre-		Dyed yarn	Monthly fabric forecasting;	Fabric	Production Capacity	Fabric
				main	Yarn Dyeing		Virtual access to Fibre SKU	Fibre	NPD Portfolio	All
				post						
	3	C	Cotton Fibres	pre-	Spinning preparing	OE yarns	Product information	Fibre	Lead time per production step	Fabric
				main	Open end spinning					
				post	Weaving preparing		Fibre innovation	FIbre		
	4	D	Raw cotton	pre-	carding, teasing, ironing, combing	Ring yarns				
				main	Ring spinning, reeeling		Home textile Product development	H. Textile	Product detail card	All
				post	Packaging, stocking					
	1	E	Ring yarns	pre-		Ring yarns	POS Data	Distribution	Montly Requirements	Fibre
				main	Stocking of Ring and OE yarns					
				post	Weaving preparing					
FABRIC Manufacturer	1	E	Yarns	pre-	Yarn stocking, drawing in, warping, sizing	Fabric	Yarns Virtual stock	Yarn	Blanket order	Yarn
				main	Weaving					
				post	Shearing, sewing, quality control					
	5	F	Yarns	pre-	Yarn stocking, drawing in, warping, sizing, grouping, impregnation	Grey fabric	Production Capacity	Yarn	On line order status	Yarn
				main	Weaving					
				post	Shearing, sewing, quality control		Yarn Lead Time	Yarn	Defective material adj.	Ennobler
	3	G	Raw yarns	pre-	Weaving preparing	Grey Fabrics	Garment Promotion Announcement	H. Textile	Fabric Virtual stock	All
				main	jaquard and neat weaving					
				post			NPD protfolio	All	Process step elapse	Ennobler
	2	B	Raw and dyed yarn	pre-		neat and jaquard bath-warp				
				main	jaquard and neat weaving		POS Data	Distribution	Capacity plan	All
				post						
ENNOBLER Finishing	6	H	Grey Fabrics	pre-	Bleaching	Finished Fabrics	Detailed production scheduling	H. Textile	Finishing tracking & pipeline	H. Textile
				main	Rotatry printing, Dyeing					
				post	Finishing		POS Data	Distribution	Delivery time scheduling	H. Textile
	2	B	Grey fabrics	pre-	Bleaching	Finished Fabrics	Garment working orders	H. Textile	Virtual design archive	H. Textile
				main	Dyeing, printing (stamp/cylinder), (polymerisation)					
				post	Finishing					
	7	I	Grey fabrics	pre-	Bleaching (two lines)	Finished Fabrics	Monthly Home textile forecasting	H. Textile	Annual production plan	All
				main	Printing, dyeing					
				post	Special finishing				Montlhly detailed plan	Fabric
	5	F	Grey fabric	pre-	Fabric stocking, scorching, bleaching, washing, (stretching before printing)	Finished fabric (Tela e Spugna)				
				main	Dyeing, printing (stamp/cylinder), (polymerisation)		Fabric virtual stock	Fabric	Process and Production enahncement	H. Textile
				post	Washing, (stretching), pressing, quality control					
HOME TEXTILE Manufacturer	8	L	Finished Fabrics	pre-	Carding, embroiding	Home Textiles	POS Data	Distribution	Blanket orders	Ennobler+ Fabric
				main	Clothing					
				post	Stocking, delivering		Virtual stock in the distribution chain	Distribution	Defective material adj.	Ennobler+ Fabric
	5	F	Finished fabric	pre-	Carding	Packaged garment (Tela e Spugna)	Finished fabric to be delivered	Ennobler	New product range development	All
				main	Embroidering, ticking					
				post	Stocking, delivering		Quick finishing design selection	Ennobler	Garment Promotion Announcement	Fabric + Ennobler
	5	M	Packaged garment	pre-	Carding	Packaged garment				
				main	Embroidering, ticking		Sales Forecast	Distribution		
				post	Stocking, delivering					
	5	N	Finished fabric	pre-	Size cutting	Packaged garment	Fabric NPD	Fabric	Price catalogue	Distribution
				main	Automated (and manual) sewing					
				post	Pleating, ironing					
	5	O	Packaged garment	pre-	pattern modeling	Packaged garment	Yarn R&D	Yarn	Inventory availability	Distribution
				main	Confection					
				post	Pleating, ironing					
DISTRIBUTION Chain	8	P	Packaged garment	pre-		Packaged garment	Delivery time	H. Textile	Inventory Plan	H. Textile
				main	Distribution					
				post	Demand analysis		Seasonal product launch	H. Textile	Distribution pronmotion plan (for sale offering)	H. Textile
	2	Q	Packaged garment	pre-		Packaged garment	Garment Promotion Announcement	H. Textile	Price policy customer needs	H. Textile
				main	Distribution					
				post	Demand analysis					
	5	F	Packaged garment	pre-		Packaged garment	Communication & Promotion campaign	H. Textile	POS data	H. Textile
				main	Distribution					
				post	Demand analysis					

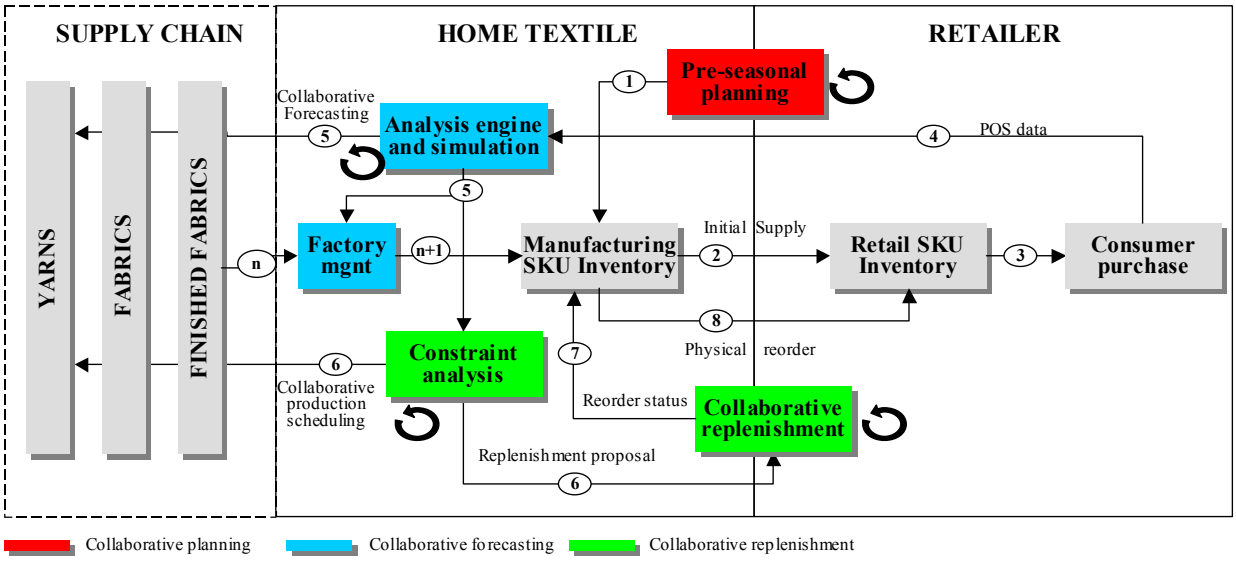
Picture 12 – Integrated supply chain mapping

Inside each main process (fibre, yarn, etc.) there are many companies that perform the same main task. The most important is that these companies are reciprocal to the following company so that we can interpret the system like a complex input-process-output composed by many enterprises.
Market driven transaction alone, is not able to sustain a similar complex structure. Natural latent entropy tends to dissipate this order because each company has to maximise its goal and for this reason do not see the system benefit.

The counteraction to prevent this tendency consist of integrating the physical resources cycles (as defined), translate them into information flows and share the contents among the members in order to feed fast, with qualified information, the decision process of each company. This approach, configuring precisely the cognitive process stated in picture 8, requires the definition of two other elements added to the physical resource cycle: the information input and the information output (see picture 12). The first are related to the data and knowledge provided by someone else in the system that enable the company to efficacy perform its process and the latter are the ones that the company has to provide in order to enable the other members to perform their tasks.
The most recurrent information provided and needed to integrate the system are: business plans, sales forecasting, production capacity and scheduling, inventory availability, product development initiatives and so on as stated in picture 12.
Generally these information are recurrent at different stages. Let's take the examples of collection defining.
The application of the concurrent engineering approach to the fashion process (53) imposes the optimisation of a design and production system to the broader optimisation of the entire industrial system. All the members are involved: retailers has to understand and assess if the new collection meet the existing fashion style, fabric manufacturers has to provide new and fresh ideas to innovate the materials, apparel manufacturers have to design and create appealing patterns, and so on. In this perspective the information flow must be thought to give the right data to the right people in the appropriate period.
The network process information sharing requires a deep analysis of inter-firm processes first of all and consequently the attitude to transfer them into the IT system.
This is more and more important due to the huge quantity of data performed by the process execution. Next step consists of understanding the rules of sharing and transferring data among the players and therefore embedding them in software in a structured way. On the other hand the system must be enough flexible in order to manage the daily exceptions to the same rules and be able to be open to new feature realises occurring when the environment and the associated rules change.
The IOS efficacy is therefore subordinated not only to the right architectural design but to the proper attitude to embed rules in software and manage the exception manually but successfully.

Embedding rules in software

Each enterprise, belonging to a network, must carry out specific tasks to ad value to the entire chain (let's take i.e. the description of the home textile manufacturing described in picture 11 and 12). It deploys processes that can be synthesise as decisions over resources. These decisions must be taken starting from certain qualified information.
The IOS must be able to capture the flow of these information in order to gather, elaborate and deliver them to the decision maker at the right time improving the decision cycle.
Application software is the interface that translates processes and rules of communication and data transmission among the network players and streamline the relevant information required.
Applications are the heart of the system because they have to reproduce precisely the human cognitive process followed to take decisions.
Picture 13 explains the decision flow, translated in process steps, existing between the home textile manufacturer and the retailer as regard sales forecasting and delivery.



Picture 13 – sales forecasting and delivery processes.

The scope of embedded rules activity covers every decision step. The CPFR project (54) has identified three main areas in business relational decision map that are:

Decision process phase	Content
Collaborative planning	Share front-end agreement with retailer, define and deploy formal business plans.
Collaborative forecasting	Create sales forecasting and continuous monitoring system in order to prevent align sales to production scheduling
Collaborative replenishment	Create common order forecast approach in order to guarantee quick delivery to the market demand.

Design application must covers all the three steps and must detail deeply how they are deployed as in example depicted in picture 13
In order to catch and translate these three decision steps and their analytics in eXtensible Markup Language (XML) and specific IT interface it's fundamental to set a common metrics for every information involved (size, colour, model, currency, etc). The many databases existing in the network must be designed to accept the standard metrics to better enable data sharing.
To coordinate each flow and to enable each application to talk each other there must be created an appropriate workflow.

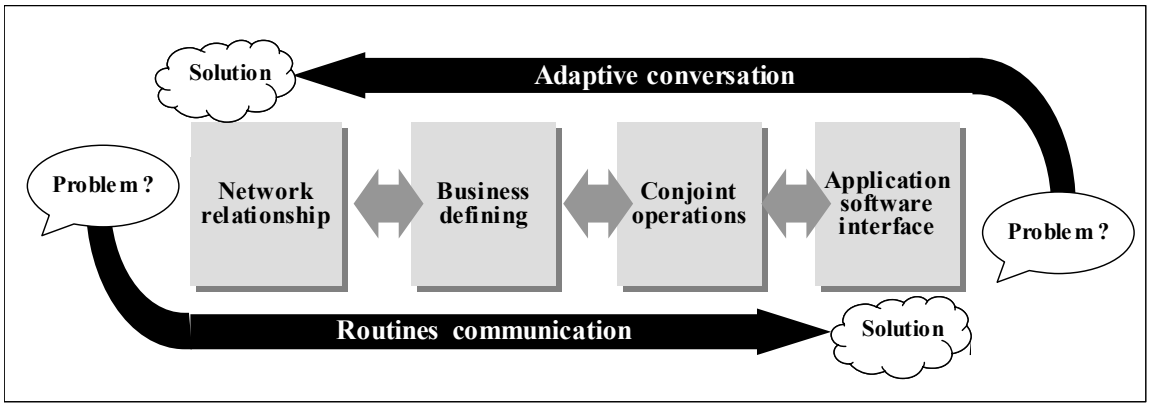
Workflow management

According to Workflow Management Coalition (*W*fMC) (55) workflow is "the automation of a business process, in whole or part, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules".
The workflow components are used to control the sequence of the application's functions, to manage queues and to assist with exception processing.
Let's take the picture 13. The numbers put on the flow lines represent the workflow path that, by definition, runs over the three main steps of collaboration decisions (Planning, Forecasting and Replenishment).
Workflows do not drive processes in a dyad relation only, but they can address information flows and start process activities to other network participants. Referring to the example of picture 13, the analysis and simulation engine step, activated by POS data sharing, invokes, by workflow management, the double direction flow number 5; that's to say constraint analysis

for replenishment proposal and dispatching of information slot to the other chain operators in order to let them understand better future demand scenarios.
Workflow combined with Application Program Interface (WAPI) allows the implementation of front-end devices which task is to manage easily but efficiently communication among partners and link the different system legacies belonging to them.

Exception management

When we define the application software suite with the goal to embed the business in standard rules, we have to take in account that human activities aren't always linear and decision are taken under irrational circumstances and following impulsive approach. Adding these considerations to the fact that our cognitive attitude to transfer reality in a virtual surrounding is always limited, it becomes indispensable to support embedded application software (the routines) with exception management systems.
Exception managements are processes and organizational tasks that can be accomplish by IT but further more by people under formalised procedure or with no constraints.
They must be considered complementary to the software routine and not antagonist.
As depict in picture 14 business relationships can be managed in a double loop flow.



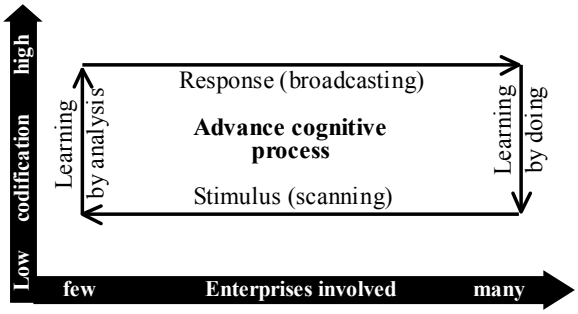
Picture 14 – the symbiosis between adaptive conversation and routines communication

Exception management can be deployed directly in routines operation by ICT devices that imposes the iteration of processes or invoke different workflow paths when an exception is recurring (represented by the iteration cycles in picture 14) or by human interactivity when the system fails and the transaction can't be accomplished due to a consistent procedure looping. In these circumstances "adaptive conversation" can't be seen adverse to "routine communication" approach but as complementary. That's to say that people who interact with the partner in order to facilitate or remove a routine obstacle must know perfectly the system feature and must be able to redirect the interaction toward the system, as, on the other hand, the execution of routine operations have to find a summing up coordination activity (at least in the final congratulation step) which is mediated by adaptive communication.
Exception management tell us, at the end, that the system are not working alone and the their efficacy is related to the holistic vision approach.

Continuous improvement process

One critical thing of IOS consists of the continuous fitting of the information system to the network environment. Yolles describes this situation and defines it as the paradigm of incommensurability (56). Each representation of an existing framework is always something out of total control of the designer who is in charge to take a picture and transfer it into a

virtual (digital) system. Incommensurability is related to the limited cognitive capabilities that is intrinsic to the comprehension and synthesis of the reality into bit & byte. Human relationships and the associated activities have no boundaries and are blurred; consequently they are continuously reshaping.
As stated in picture 8 and shortly reproduced in picture 15 IT is the result and the materialisation of a continuous advanced cognitive process.



Picture 15 – The advanced cognitive cycle

The environment represented by many enterprises belonging to a cluster or a "group" give an input by an explicit or implicit stimulus, which is caught by the leader of the value chain and that must be solved initially in a idiosyncratic way. In order to standardise this solution and consequently open it to the entire value chain, the leader has to codify it and potentially embed it in software. The software solution can be seen as the codified response to the wide stimulus coming from the network. The way this solution can be accepted as the general standard for everyone in the network is learning by doing. It pushes each enterprise to digitalise information and perform processes on the system and, after a period trial and error, to "metabolise" the enhancement.
During the learning period becomes useful the manage the system faults by exception systems such as adaptive conversation before shown.

Conclusion

The theory over relationship management in network context suggests that business transactions among the players belonging to an industrial district (i.e. the textile one) are usually managed outside the classic prescriptions suggested by the free market theory which establishes the central role of price and performance of the product/service as the engine of the business relationships. The "sticky" information needed to close a deal and the intrinsic vagueness of the transaction when it regards future events such as in the collection design in the textile industry or generally speaking, the dynamic efficacy of the long term relationships, suggest that mutual adjustment approach is the real driver of business development inside networks. Mutual adjustment is unpredictable, can't be managed by static routines, floats dependent on the dynamic agreements between supplier's and customer's alternative vision. In this perspective the goal of automating all the information flows related to market transaction seem to be unreachable. The failure occurred in marketplaces built among the district players confirms this assumption. Leaving no doubt as regards the importance and centrality of "digitalising" process of the business transaction with the aim to globalise, extend and speed the business inside the district, improving the system efficiency and related competitive advantage, in this paper we have tried to find a viable approach to match the need of digitalisation of the business assuring, at the same time, the needed flexibility intrinsic to the mutual adjustment relationship approach.

The key drivers are: the IT solutions supporting the business transactions must be designed fitting the business process existing among the players; as a consequence they can't be standardised packages. One solution fits all doesn't work; the system must have different application customized on the operator size and based on the specific transaction but built on a unique platform (probably owned by the main player in the system – the most famous trade mark existing in the district) which is assuring the easy sharing of information everywhere in the system.
Further more the initiatives aimed to digitalize the business must be seen as projects that involve not only the IT department but the entire business. Therefore it becomes crucial to analyse deeply the business, define the main procedure, understand the network organisation, the roles, the strategies, the information flow and the existing rules to share data and knowledge among the players.
Summing up, we define IT not as a tool only but as a support to cognitive process enabling the evolution of business relationship in the mutual adjustment perspective. The IT infrastructure must be able to embed existing rules and processes in software in order to speed up transactions. At the same time it must be designed to manage the exceptions intrinsic to a non-mechanical relationship. Due to the changing environment and consequently the evolving cognitive process the IT system must be sufficiently opened and flexible to accept new feature; this means that, notwithstanding the great investment necessary to build them, management must be ready to change them to improve their functionality in accordance with the environment changes.

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