

Paper for DEEDS – Digital Economy: Policies
Exchange and Development for SMEs,
Workshop 16-17 December 2002

**Pioneering solutions and tools for access and
management of information and knowledge
for SMEs**

Annaflavia Bianchi, TILab
annaflavia.bianchi@telecomitalia.it

Content

Introduction	2
Differences in firm relation within a filière.....	3
Typology of firm relation and information flows	3
Network technologies cost and benefit for small firms.....	5
An industrial system approach	6
Processes and related information flows along the filière.....	8
Tool kits.....	10
A case of entrepreneurial business community aggregator: Joinet	14
Concluding remarks	15

Introduction

Less than a decade after the diffusion of access to Internet for private companies, the potential use of network technologies is now at reach also for small- and medium sized companies. Still, when small firms are concerned, both financial and human resources are always fully utilised. It is therefore quite difficult to divert from the planned use either money or employees in order to examine new opportunities brought around by new technologies. Rarely small firms act in isolation, as they are rather part of one or more industrial filière or value chain governed by medium to large companies. The Italian context, characterised by a number of territorially localised communities of firms contributing to the same production process, represents an interesting arena for experiments of web-based services for small-sized companies which are already part of an industrial community. Industrial districts and local production systems represent the elected pilot context for network technologies and web-based applications.

Web based services and applications, when tailored for specific needs and managed by professional third parties, easy to use and provided in a non invasive way, can be used as an extension of the internal information system of each company. The presence of a third party is providing the possibility of sharing the use of applications by firms cooperating to each other. In this context, also small firms are put in the condition of using web-based applications, maybe as a result of pressures by their business customer. Access to shared solutions on the web represents an opportunity for small firms to work for more than a business customer. On the contrary, for a small firm being part of the information system of a larger company represents a form of external coordination rather than a way of en-franchise.

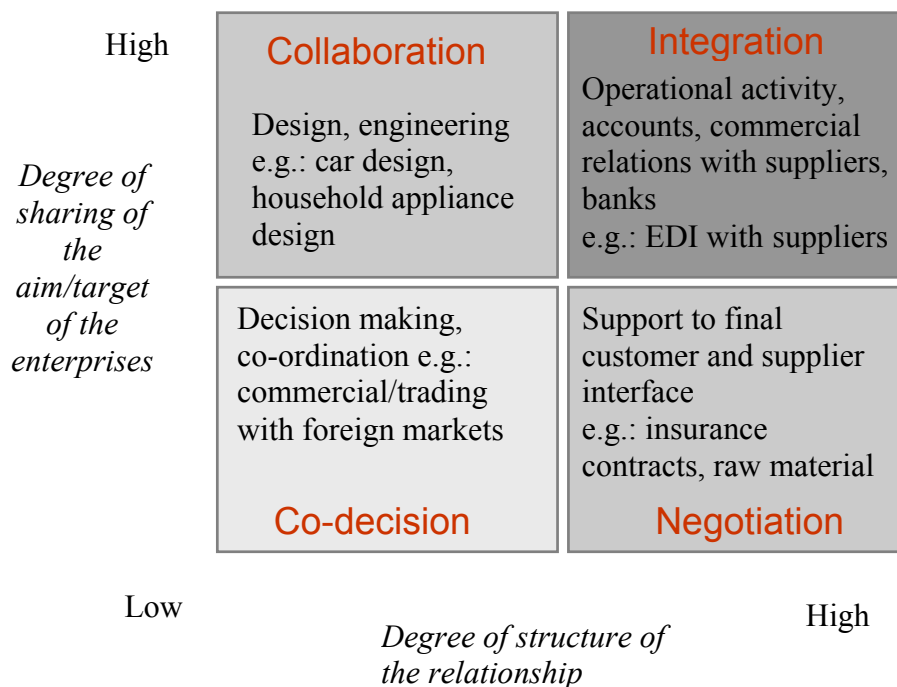
On this first step, additional progress has to be built with the aim of increasing the access to qualified and selected knowledge. This

additional step has just become to be addressed with concern to small firms.

Differences in firm relation within a filière

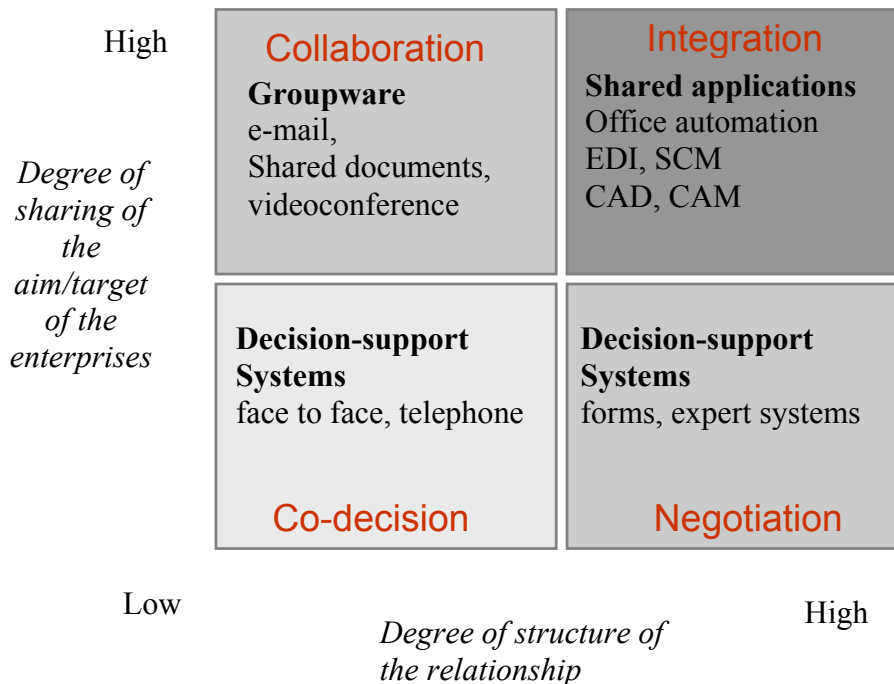
As analysed by Future Centre (2000) for the textile filière, to different typologies of relation between firms correspond different characteristics of information flows and consequently different network and application tools. One of the typical relations between companies which contribute to the same production process – participating with complementary roles to the same filière – is a relatively stable customer-supplier relationship. The more the cooperation is satisfactory, the more both side companies require to reinforce the relationship and to keep it stable.

Typology of firm relation and information flows



When using the proposed classification matrix, the case of customer/supplier relationship along the production cycle within the manufacturing industries is more frequently falling into the “integration” case when strategic suppliers of product components are involved. The relation falls into the “negotiation” type for the raw material suppliers, and into the “collaboration” one whenever the design and co-design activity is involved. Each type of relationship allows to identify groups of firms which share some common interest both in the business management and in the collection and access management of knowledge. These firms are increasingly a target for service centres and consulting companies, and represent a test bed for knowledge management techniques typical of large organisations, and for shared applications tracked and certified by third parties.

Typology of relation between firms and information and communication technologies



Network technologies cost and benefit for small firms

In a dynamic context, each company has to monitor the external pressures, to identify the opportunities in terms of positioning, alliances, and organisational changes. Network technologies can provide support and strength to each company in the process management and also in the relation upward with suppliers and downward with customers. In calculating the cost for implementing a network technology solution, one has to consider first of all the efforts required for collecting information and selecting the adequate solution. Frequently, for small firms which are part of a filière, this cost is quite small, as the solution is proposed/imposed by the industrial system management or by the leading company. Higher is the cost and commitment required to select a solution in an autonomous and individual way.

Additional costs are the direct costs, represented by the purchase of hardware and software applications, the cost of access, the communication cost, the web design, etc., and the indirect costs, which are quite difficult to be calculated. Examples of indirect costs are the back office reorganisation, the training for new skills, and also the slow down of the daily activity caused by the need to learn how to use the new applications.

Expected benefits from the adoption of network technologies, although difficult to be quantified, are:

- Efficiency, less paper, lower transaction costs, lower management costs
- Organisational benefits, synergies with suppliers and customers, time to market, fertilise the market
- Market presence and share, reduce distribution structure costs, customer retemption
- Aggregation benefits, communities of firms which share solutions to common interests, and increase their negotiation power.

Relevant benefits especially for small firms come from the management of the industrial community and from a shared approach. Since the end of the century we assisted to a flourishing of initiatives addressing industrial communities both at the vertical and sectoral level, and at the territorial level. These efforts are accompanied by the attempts to adapt the tools typical of the large enterprise to the peculiarities of the small firm: first of all, the need to act in a flexible way, to involve a limited amount of human and financial resources and to diversify its customers.

An industrial system approach

A frequent context in which small-sized firms find favourable conditions for development is represented by a local industrial system. Various actors with different priorities have to be taken into account in drawing the action lines for a local industrial system development.

When looking at the territorial dimension, the local area competitiveness could be pursued through the management of the specific competences of the local industrial system, through acquisition, classification, of internal and external information. A Watch service shaped along the interests of the industrial community might help companies to position themselves with respect to their competitors. A second field of activity concerns product and process innovation tools, through access to patent databases with a problem solving approach.

When firm co-operation is concerned, supply stand of specialised production phases is supported in order to attract new production orders from external firms. A second activity is the building of a territorial system of products in order to aggregate product supply and contribute to a territorial brand. Finally, the process integration can be pursued, through the access to shared *erp* (enterprise resource planning) systems supporting the filière processes and its trade relations.

When looking at the firm community, the focus is on the common interests such as the aggregation of MRO (maintenance, repair and operations) and commodity purchase, in order to benefit from the higher bargaining power which comes with a larger demand. Along the same line, the sharing of advanced telecommunications infrastructures and systems – like the outsourcing of highly secure networking – can be pursued for the all community. Other applications which bring value to subsets of the firm community are the process sharing and collaborative working solutions such as Co-design, or the on-line provision of sector and filière specific services, like financial services, firm shop window, common procedures.

In terms of local development, applications of e-learning for personnel training and collection of elements useful for territorial policies are examples of beneficial actions.

The value proposition for each of the stakeholders can be synthesised as follows:

For the enterprises:

- Cost and time reduction in transaction management
- Increase of the bargain power towards trade partners (sale community vs. buy community)
- Widening of the number of potential partners
- Reduction of time to market
- Direct integration with new distribution channels on Internet
- Stock reduction
- Unified management of information and sharing of infrastructure investments

For the service aggregator:

- Value added service provision
- Product/service reselling
- Integration of third party services to complete/enrich the value-chain
- Investment cost reduction

For the local industrial system:

- Creation of a system of enterprises and a network of enterprises
- Increase of the local industrial system competitiveness
- Development of the entrepreneurship

For the local authority and industrial association:

- Territorial and infrastructural development
- Employment growth
- Easy access to public admin services
- Access to funding

Processes and related information flows along the filière

In a local industrial system or along an industrial filière, the range of information service and support service variety include: information and communication within the firm community, distance work and co-operation, certified mail, secure payments, on-line consultancy, audit and training, reselling, etc. Each application refers to a peculiar module of activity within the value chain, either of a product or of a service production process. The analysis of each of the internal and external functions composing the production process and the upward and downward good and service flows is required.

The “process” method

process	Supply and inward logistics	Production process	Distribution and outward logistics (stock, shipment, transport)	Marketing and sales of product and manufacture
services	Goods, materials, MRO services, second-hand tools logistics: Van rental Virtual stock	last minute supply/demand manufacture availability Production planning	Shipment of: –Final products –unfinished and –components Collection of production rejects (waste, exhausted oil, etc.)	Sale and promotion of manufacture outside the local industrial system Management of the unsold: –exchange –Selected wholesalers Second-hand machinery sale

In approaching an industrial community and a local community, several aggregation methods – combined along the main interests and characteristics of the members of each community – can be adopted. Each choice, brings with it a set of tools and a potentially successful set of coordinating actor and organisational form:

- Building of **shared brands** based on complementary product lines addressed to cross-sector customers
- **Resource sharing** using services supported by the network and accessible with a pay-per-use form
- Aggregation of specific interests to reach **economies of scale** and increase the firm bargaining power
- **Supplies and components exchange** to optimise the provision management of single firms
- **Search and supply of manufacture** to optimise production planning and to better the supply proposition of firms
- **Design co-operation**, through which people in different firms co-operation in product and component development

The potential services to a firm community, as a support for knowledge management (KM), can be articulated as follows:

- shared and assisted access to KM tools (in outsourcing)
- natural language query
- semantic engine for on-demand search
- automatic update
- content push
- suggested or assisted paths for information search
- management of groups of interest
- thematic watch, clustering, profiling
- KM sector specific systems (e.g. technical textile)
- internal KM systems for individual companies.

The promoters and managers of these shared applications play a critical role especially as providers or preservers of the required level of trust between the member companies of each community. The trust referred to here is mainly the result of experience, of traced behaviours, of cooperation assessment. It has to be supported, as well as the other operational functions, in order to transfer to the network applications the leverages of industrial cooperation.

Tool kits

An example of software products focused on the knowledge management for SMEs is the range of software products provided by Acp, a company created in 2001 which operates in the management of virtual communities and knowledge bases, developing products with its proprietary technologies.

Its central product is a cheap tool-kit for acquisition, classification, clustering, publication of content, management of information and knowledge. For the knowledge management the main functions and correspondent tools are:

- content capture
- classifier
- key-word classifier

- k-rules (classifier engine)
- k-clustering
- find engine
- interpreter
- hub community

Their philosophy links four basic concepts: “there is no content without knowledge, no knowledge without cooperation, no cooperation without community”.

ACP stands for Acquisition, Classification, Publication, and its basic technology – acp Content Capture – is oriented towards the acquiring of non structured information from heterogeneous sources such as web sites, ftp folders, email box, news group, wrapper, file systems.

Out of its products, one can also find:

- Multi-protocol intelligent spider
- Entropy classifier
- Neural network based clustering
- Dynamic publishing

In the management of the community – with acp Hub4Comm – it provides a hub of services, a single sign-on environment, document management, Information delivery, intelligent spidering, management of news, events, forum, magazine, mailing list, links, contacts, tailored interface, Multilanguage support.

All services and applications are provided with the support of an application service provider, and so they can be adopted by any firm with very little initial investment, and with a full training assistance.

Three axes for action lines

Competitiveness on global markets

Territorial brand
Markets
Innovation
Qualifying information

- Watch
- Branding
- Innovation DB
- Connection to MKTP

Business services
Process integration
Co-operation

Extended enterprise

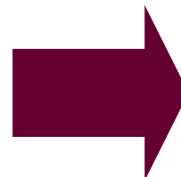
- Extended enterprise
- Service aggregation
- Co-operative working

Information on labour and industrial policies
Training
Infrastructures

Local development

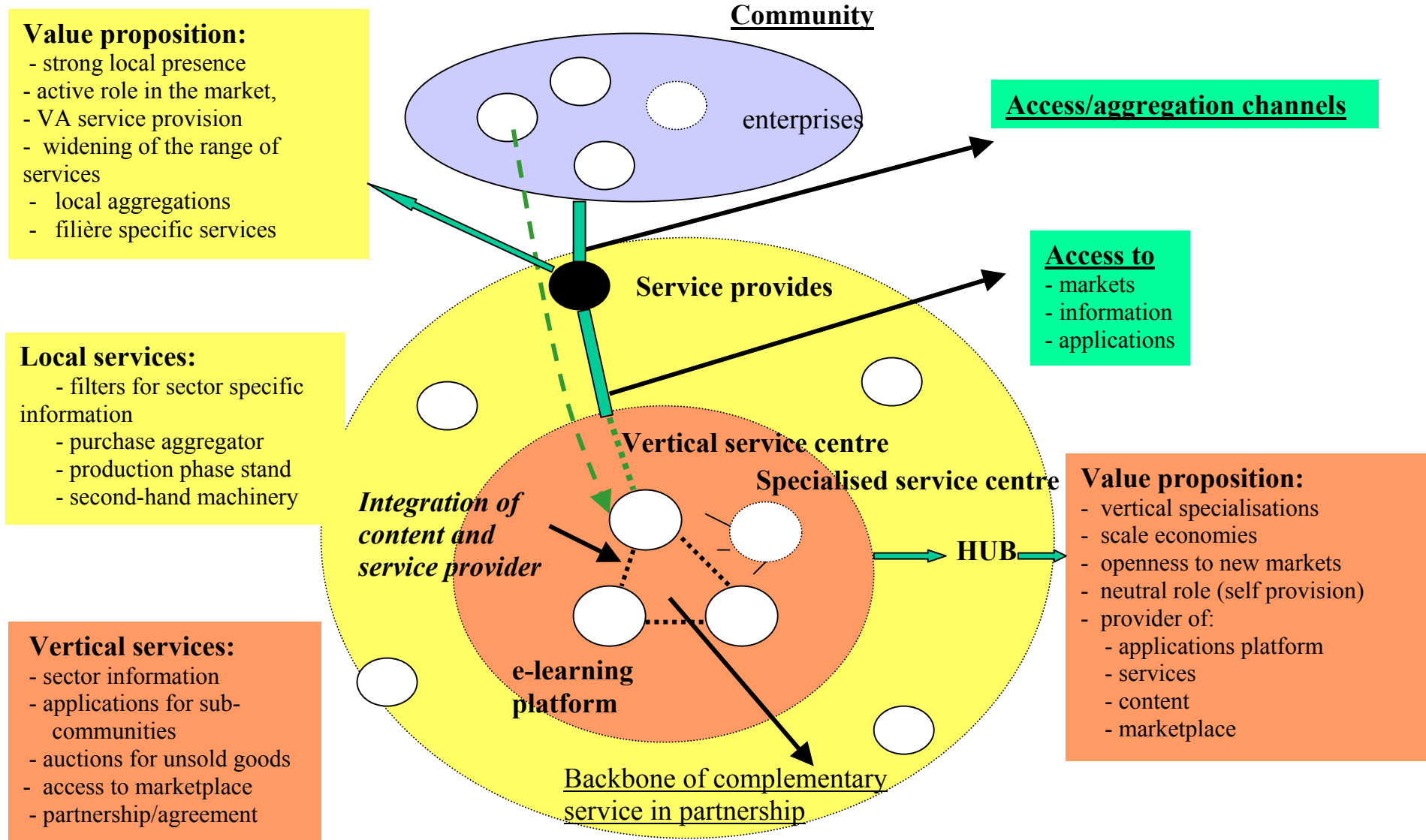
- Territorial knowledge management
- Competitive map
- e-learning
- Access to PA

From process re-engineering, focused on cost reduction and product quality enhancement



To creation of a community of partners aimed at improve efficiency and supply quality

Service integration model for SMEs



A case of entrepreneurial business community aggregator: Joinet

Joinet is a company created in 2000, aimed at increasing efficiency in the communication between firms with the use of network technologies and web applications. The company presents itself as a subject which plays the role of aggregator and coordinator of business communities and manager of applications hosted in ASP (Application Service Provision). It designs, creates and manages web-based applications mainly oriented at supply chain management in the production cycle. Joinet business model is based on the typical production model of the Italian companies, characterised by strong partnership relations with production direct goods suppliers.

The software applications support the management of those activities and information flows which exist between manufacturers and their suppliers of products, services and technology related to production. The services have been identified and shaped on the basis of the operational needs of Italian industrial districts and local industrial systems – structurally shaped as clusters – and of their leading medium sized companies.

Examples of the activities supported are:

- management of the order outputs from the manufactures
- request for supply and delivery time
- information exchange on forecast
- suppliers performance assessment
- lead time reduction and stock minimisation
- non conformity management on the web.

The business-to-business services do not duplicate the internal information systems of each of the business customers, they rather integrate with them, supporting the Production Direction and the Purchasing Office and freeing the companies from heavy internal organisation projects. Joinet solutions – on top MaNeM Manufacturing Network Manager - integrate with the more diffused international ERP (e.g. SAP, Baan, JDE, etc.).

The value proposition can be synthesised in the following benefits: a range of services which well fit into the existing industrial community organisation; a higher financial flexibility thanks to the easier control on fixed costs, service and up-to-date costs and to the reduction of financial locking in hardware, software and specialised employees; high performance applications with high quality and rapid implementation; and finally, as a sort of byproduct which turns out to be a critical service, the full recording of all activity and information flow, adjustments, changes and negotiations between the manufacturer and its strategic suppliers, which allows for statistics, comparisons, assessments.

Leading Italian companies of packaging, machinery, engineering industries were first in choosing to use the web-based application with their strategic suppliers. Now other industrial communities are gradually addressed.

Joinet is a successful example of the role which can be played by a third party, with entrepreneurial approach, which acts as aggregator of interests and coordinator of subsets of business communities. Its “neutral” role, its mirroring function and the professional management of the application software are the basement for reliability and trust. Trust results from reciprocal knowledge built on shared experience and positive cooperation. Application services which help keeping track of cooperation contribute to rationalise and to “measure” the roots of trust.

Concluding remarks

Small- and medium sized industrial firms are exposed to growing opportunities and pressures. Their need for networking to survive increases. The main pressure comes from the business customers which are constantly looking for higher quality, lower lead times, competitive price and especially on time delivery of the products and services they have ordered. Most manufacturers would immediately subscribe for a service which is able to show the production status of their order at the supplier. To face these pressures and the competition in the international arena, industrial companies are object of the support from old and new intermediaries, some of which base their activity on the

web. One of the more analysed forms of intermediation on the web is represented by the electronic marketplaces, whose customers are mainly large and medium sized companies.

Small firms might take advantage of network technologies especially if web-based applications managed by third parties and provided with ASP. In this case, the access to web solutions is easier as it requires less financial and human resources devoted to the implementation and the management of the application. In an increasing number of cases, communities of firms along value-chains, vertical communities and local industrial systems receive support from service providers which focus their activity on the specific interests identifiable in each subset of these communities.

Industrial companies - and among them also small and medium sized firms - are looking for increase in efficiency and at the same time for expansion of the activity and of the market shares. They are trying to obtain cost reduction as well as sales increase. How to reach these objectives? Should the companies along the value chain give priority to coordination or to flexibility? As for the partnership between manufacturers and suppliers, should leading companies look for stronger stability or for easier selection mechanisms and access to new partners?

At a system level, what do we expect: business as usual with strong competition and niche success, or a more networked world based on cooperation and characterised by an increasing presence of actors aggregating communities with common interest? Both cases will coexist, and web-based services and applications to support both strategies will be developed.