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## The Virtual Enterprise – Citizen of the European Union

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**Abstract:** *The Virtual Enterprise is a rather young and unclear concept in the business world. A virtual enterprise is a temporary network of companies that share their different resources in order to reach a given goal (the creation of a new product, or the entry on a new market) and is a powerful tool in the hands of the business community. The question this article raises is whether European Union's businesses are able to take advantage of this opportunity within the European Union. We discuss several obstacles towards the creation of virtual enterprises: regulatory uncertainties, operational management that dismisses the advantage of an excellent infrastructure, the orientation of innovation creators towards theoretical research and the European business culture. The article also looks at research on the virtual enterprise in the European Union, the legal framework and technologies for virtualization.*

**Keywords:** *virtual enterprise, European Union, network companies, Internet*

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The birth of the “virtual enterprise” took place in the 1980s, brought on by the information technology revolution. Business Week magazine published an article on the “hollow corporation” in 1986, describing it as an entity void of any material contents<sup>1</sup>. The virtual enterprise represents a natural step in a Darwin-type evolution towards the best organization in a world reshaped by new technologies like long-distance communication, computers and the Internet.

Nowadays the concept of virtual enterprise is used in a number of situations, from companies that use technology to globally coordinate their projects, to companies with electronic-only assets and products. This paper uses the term virtual enterprise to describe networks of companies, often temporary, that share their different resources in order to reach a given goal: the creation of a new product or the entry on a new market. Our first question is when we can consider a company to be virtual in this interpretation. When do we stop talking about outsourcing and start talking about virtualization? When do we stop talking about global coordination and start talking about networks of companies, or virtual companies?

The point where the classical company-function starts to be external in actual companies is unclear. Companies that outsource their manufacturing have been around

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<sup>1</sup> N. Jonas, The Hollow Corporation, *Business Week*, 3 March 1986, quoted in Cristina Cristureanu, *Economia Imaterialului: Tranzacții internaționale cu servicii*, pg. 11

for a long time, even during the golden age of the vertically integrated companies. The real question is about the extent of outsourcing that a company must achieve in order to start discussing about networks of companies.

There are several levels of externalization available for companies in their thrive for efficiency. Starting from a company that coordinates a global network of suppliers for its end-product, passing by a company that coordinates a global network of suppliers to deliver its end-product and limits its activities to leading the network, and ending with a virtual enterprise.

The network configuration's level of flexibility increases as we analyze the different stages above. A company that uses external suppliers for some of its subassemblies usually uses a fixed chain of suppliers.

The network leader does more than the average purchase manager. Without having its own dedicated design, manufacturing, storage or transport facilities, the network manager has the know-how and ability to create its own temporary manufacturing chains based on a pool of selected suppliers. Take the example of Li&Fung, a Hong Kong based company that has a pool of over 8.300 selected suppliers that subcontract in various configurations based on the orders received. Li&Fung has the capacity to divide any order into simple products, manufactured by its pool of suppliers, which can be assembled by third-party companies into finished goods.

The maximum degree of flexibility is achieved by the temporary network of companies. This model is considered the optimum mix of competencies available in the market and can be used to achieve a given objective at a given moment in time. The question is how these networks are created, if they actually exist or they are only a theoretical exercise. Is the virtual company just a concept, is it virtual?

Truth is, virtual companies need a network leader. They need someone to get the ball rolling, to define the overall concept, to coordinate activities. I think it is safe to say the laws of outsourcing no longer apply to such contracts, that virtual companies do exist and will continue to flourish on new technologies, low transport costs and global flattening of consumer preferences provided that business community mentality will accept them. North American and Asian business men and women seem to have embraced our infant. Question is: can the Europeans do the same?

### **The virtual enterprise - citizen of the New World?**

The president of Li&Fung described<sup>2</sup> the virtual enterprise as a Ferrari. A powerful vehicle, capable of reaching its destination fast and safely, provided it runs on flat surfaces. The technological revolution, trade agreements, production globalization, the plunge in transport costs and uniformization of consumers' preferences are all flattening agents. Fung says<sup>3</sup> that while the geographical elements drop in importance, there are now regulations that draw the global business terrain. Regulations and agreements can create mountains that block commerce (by norms, protective measures and other

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<sup>2</sup> Fung, Victor K, Fung, William K, Wind, Yoram, „Concurența într-o lume plată”, Publica Publishing House, 2009, pg 232

<sup>3</sup> Fung, Victor K, Fung, William K, Wind, Yoram, „Concurența într-o lume plată”, Publica Publishing House, 2009, pg 223

constraints) or tunnels and highways to facilitate it (through bilateral trade agreements). Just like the heads of caravans had to choose the optimal route in the past, organizations today have to choose the optimal route for the production and transport of goods based on national regulations.

Can the European Union, in this context, provide good soil for the virtual enterprise? Is the European business world open enough and flexible enough to nourish the seeds of such enterprises? Or do the United States, with their generous internal market, lack of linguistic barriers and innovation seeking attitude present a clear advantage? After all, states like Delaware or Vermont have even legislated the limited liability corporation that only exists online, waiving the obligations for physical headquarters or in-person meetings in the boardroom.

Juergen Noll says<sup>4</sup> that virtual enterprises, despite their ability to provide benefits for the collaborating firms and consumers as well, are hampered in Europe due to greater regulatory uncertainties, whereas, for example, there existed some 250 000 cyber businesses in the USA as early as 1997.

Dr Jan Worst from the Maastricht School of Management conducted a study on *Virtual enterprises: the impact of e-business on the European construction industry*<sup>5</sup>. The main question it addresses is: „Is management of the construction industry ready to adopt the virtual enterprise as such?“ The paper „quantitatively analyses the opportunities for the development of virtual networks in the West European construction industry with a focus on increased business performance“. It starts from the idea that a company’s virtuality readiness can be estimated based on four dimensions (independent and dependent variables): business strategy, business culture, technology and performance and tests 3 hypothesis:

“1. General contractors’ and project related participants’ business strategy is positively related to Internet content aligned to virtual enterprises.

2. General contractors’ and project related participants’ business culture is positively related to Internet content aligned to virtual enterprises.

3. General contractors’ and project related participants’ adoption of ICT is positively related to Internet content aligned to virtual enterprises.“

The conclusion is that „currently management has to cope with a gap between ICT strategy and the current options to arrive at the adoption of virtual enterprises. There is distance between operational management and ICT management.“ The most viable model for companies virtual-ready are companies with a strong domestic market and web orientation. However, technology updates are easier for most companies than a business culture update. Managers in the European construction industry look at potential network members as competitors, not partners. They are reluctant to sharing data, to collaborative designing or planning. The management of construction companies is often virtuality-averse.

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<sup>4</sup> Noll, Juergen, *Virtual Enterprise Networks in Europe – Economic Opportunities and Legal Challenges*, 2004, Available at SSRN: <http://ssrn.com/abstract=549001> or <http://dx.doi.org/10.2139/ssrn.549001> on 26 April, 2013

<sup>5</sup> Worst, Jan, “Virtual enterprises: the impact of e-business on the European construction industry” in *Business Leadership Review VI:IV*, 2009, available at <http://www.mbaworld.com/blr-archive/issues-64/3/index.pdf> on 26 April 2013

It is generally agreed that there are two main prerequisites for the mere being of the virtual enterprise: the infrastructure and the human drive towards collaboration, innovation and the pursuit of profits. However basic these traits may be for the regular business person, there are two clusters very hard to identify or to measure for cultural obstacles that will stand in front of the European business person in his evolution towards virtual enterprises: the orientation of innovation creators towards theoretical research and the European business culture.

On the one hand, the European business culture, or better said the lack of European business culture may hinder the creation of virtual enterprises. Although European, the German and the Italian business partners will not think of themselves as European, but as a German doing business with an Italian – who might as well be Asian or American as far as communication goes. Sure, European Union regulations may be useful for gaining advantages compared to non-EU competitors, but as far as business culture goes, our German will not be better acquainted to his Italian partner thanks to their common affiliation to the European Union. I believe Americans have, in their pure pragmatism, understood better than us what the differences between Europe's business cultures are and there are a large number of articles and books available to explain these differences.

*„Just like eating tapas is way different compared to relishing curry wurst; the differences in Spanish and German cultures are just as unique. Germans are known to be extremely business-like, to the point and really into facts and figures. As a business associate please don't expect your client to invite you for beer and sausages at a local restaurant. Instead focus on getting your points across in a crisp manner so there is no room left for confusion. With Germans always plan your meetings at least few weeks in advance; they value their time way too much to accommodate you without a heads up.*

*Outgoing, warm and friendly, these are three words that can best describe Spanish folks. Expect to be invited for lunch meetings, and don't be surprised if the meetings never start on time. Fairly laidback and relaxed, they also take time to know you before finalizing any business commitment. Also, remember that when approaching them to strike a long term deal, dress appropriately – a blend of chic and smart will be highly appreciated.”*

One of the bloggers says and he continues his description with different European nationalities<sup>6</sup>.

European Union's market proved to be an immense advantage for companies, the next challenge is for different nationalities to make even better advantage of the setup. We need to learn to communicate and to construct a true European business culture which will lead way to better business collaboration, networks of companies and virtual enterprises.

On the other hand, virtualisation goes where innovation lovers go. It is a business model one does not expect to find in closed, obsolete, rigidly regulated environments. Can the European Union prove to be a land where innovation never sleeps? It certainly wants to be. The European Commission's Europe 2020 strategy lists as a priority<sup>7</sup>

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<sup>6</sup> <http://www.johanvanhamme.com/archives/european-business-culture>

<sup>7</sup> [http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/priorities/index\\_en.htm](http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/priorities/index_en.htm)

„delivering growth that is: smart, through more effective investments in education, research and innovation...”

According to a study<sup>8</sup> published in September 2012, which looks at the innovative capabilities and market performances of the European Union in comparison to the US and the BRICS, the European Union has great innovation potential. The study uses several indicators listed under 3 titles (Investment and Human Capital, Infrastructure and Research-Productivity) to assess the Innovation Capabilities of the European Union. Its conclusions show that, although having excellent infrastructure and Theoretical Research-Productivity, the European Union does not rise above its international competitors as far as investments or Patent – Productivity go. It is therefore our opinion that good strategies and valuable research (as described in the following chapter) need to be put into practice should we want the European Union to become the land of innovation and virtualization.

### **Research on Virtual Enterprise in the European Union**

The European Union puts both minds and funds to work on research regarding the concept of Virtual Enterprise. There are several research programmes, completed or in execution, funded by the European Commission presented through CORDIS (Community Research and Development Information Service) with regard to the Virtual Enterprise:

- **Development of a virtual reality technology for SMEs in the “virtual prototyping” of components and assemblies**<sup>9</sup>, 1997 – 1999, aimed at developing a Virtual Prototyping System available for European SMEs to use on low cost CAD systems and operated by design engineers instead of real-time programmers. The industrial objective of the research was to help SMEs improve their competitiveness by granting them access to otherwise high cost technology requiring high levels of expertise.

- **Understanding Collaboration in 3D Virtual Environments**<sup>10</sup>, 2010-2012, aimed at understanding virtual teamwork in 3D collaborative virtual environments (CVE) that have gained increasing importance in global organizations and higher education institutions, and are subject to an emerging interdisciplinary field of research. CVE have been developed to facilitate cross-border collaboration and to overcome the issues associated with traditional collaboration tools. Team members are embodied as avatars, communicate via chat and audio channels, and can jointly look at and manipulate objects in a shared virtual space. The purpose of the research is to investigate group interaction processes and outcomes in physical and virtual environments in order to examine how different media affect group behaviour and under what conditions which medium is most effective.

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<sup>8</sup> Kremer, Jan-Frederik and Below, Katharina, *“Innovative Capabilities and Market Performance: The European Union in International Comparison”*, *The Jean Monnet/Robert Schuman Paper Series*, Vol. 12, No. 7, September 2012

<sup>9</sup> <http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=virtual&FRM=21&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=43298>

<sup>10</sup> <http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=virtual&FRM=1&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=96439>

- **Policy-Assessed system-level Security of Sensitive Information processing in Virtualised Environments**<sup>11</sup>, 2010-2012. Although e-Government can benefit from virtualised service platforms and cloud computing the sharing of resources virtualisation is based on raises concerns regarding the security of data as most e-Government applications handle confidential data. 'The PASSIVE project proposes an improved model of security for such virtualised systems to ensure that: adequate separation of concerns (e.g. policing, judiciary) can be achieved even in large scale deployments; threats from co-hosted operating systems are detected and dealt with; public trust in application providers is maintained even in a hosting environment where the underlying infrastructure is highly dynamic'.

- **European virtual engineering network (EVEN)**<sup>12</sup>, 2002-2003. The creation of a virtual institute focused on product design and development and virtual engineering application, sharing knowledge and making it useable for European SMEs, with a multidisciplinary approach, integrating the various cultures and national characters of European in order to definitely contribute to the improvement of competitiveness. This virtual centre will be focused on exploiting RTD results into industrial applications with a strong market orientation and meeting different needs of research/industrial sectors. In order to do that, the virtual centre will launch and promote dissemination and awareness actions, demonstration projects, tailoring of virtual engineering applications to specific sectors, product categories and type of companies.

- **Business Integrator Dynamic Support Agents for Virtual Enterprise**<sup>13</sup>, 2000-2002. The BIDSAYER Project aims at the assessment and development of a framework for the constitution and operation of Virtual Enterprises, with the participation of SMEs searched through web based information agents, dynamically organised according to best-fit criteria. The objectives are for BIDSAYER to develop a methodological, technological and legal frame to support SMEs' competitive potential through the constitution and operation of Virtual Enterprises (VE), joining geographically dispersed SMEs to catch business opportunities, and managed on the basis of competitiveness-oriented criteria by a new entity, the Business Integrator. BIDSAYER covers the dynamic connotation of VE, with the selection of optimised Partners' sets through Internet-based search, and will develop and validate through two pilot projects: A legal frame for the VE, to regulate co-operation and to provide general contractual terms and conditions A code of practice and technological frame, in view of a "Plug and Play" search for co-operation-ready partners and of rapid customisation of commercial solutions for functions like project management A prototype management system, leveraging on e-Commerce and Internet technology, based on the concept of integrated product, project and organisation views.

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<sup>11</sup> <http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=virtual&FRM=1&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=95251>

<sup>12</sup> <http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=virtual&FRM=11&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=60181>

<sup>13</sup> <http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=virtual&FRM=21&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=54837>

- **Adaptive Virtual Enterprise ManufacTURING Environment<sup>14</sup>, 2011-2014.** In order to cope with the demand for flexibility and fast-paced business innovation, there is a need for an integrated, yet framework, environment which is able to establish, manage, monitor, and adapt virtual factories. This needs to be based on the requirements of the manufacturing processes at a deep technical level to provide easy, flexible interoperability with minimal user skills especially to support SMEs. ADVENTURE will deliver this platform and the accompanying tools by providing a holistic environment for plug-and-play virtual factories based on cross-organisational manufacturing processes.

- **Collaborative Virtual Environments<sup>15</sup>, 1995 – 1999,** COVEN aims at developing a computational service for teleworking and virtual presence. The main objective of the project is to build the infrastructure for cooperative teleworking systems and to demonstrate the benefits networked VR provides.

- **Virtual Organisations Cluster<sup>16</sup>, 2001-2004.** The aim of VOSTER is to collect, analyse and synthesize the results from a number of leading European research projects on Virtual Organisation (VO), i.e. geographically distributed, functionally and culturally diverse, dynamic and agile organisational entities linked through ICT.

- **VIRTUALQ<sup>17</sup>, 1997-1998.** The project's objectives are to identify needs, and potential solutions for five SMEs wishing to implement innovative IT solutions into the supply chain of the virtual enterprises to which they belong. Other areas such as concurrent multisite engineering will also be analysed.

### Legal point of view

The legal background for European Virtual Enterprises is based on the following European Commission directives:

- Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market ('Directive on electronic commerce'): "The Electronic Commerce Directive, adopted in 2000, sets up an Internal Market framework for electronic commerce, which provides legal certainty for business and consumers alike. It establishes harmonised rules on issues such as the transparency and information requirements for online service providers, commercial communications, electronic contracts and limitations of liability of intermediary service providers."

- Directive 1999/93/EC of the European Parliament and of the Council of 13 December 1999 on a Community framework for electronic signatures: This Directive lays down the criteria that form the basis for legal recognition of electronic signatures by focusing on certification services. These comprise the following:

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<sup>14</sup> <http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=virtual&FRM=31&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=100733>

<sup>15</sup> <http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=virtual&FRM=31&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=30484>

<sup>16</sup> <http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=virtual&FRM=51&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=59079>

<sup>17</sup> <http://cordis.europa.eu/projects/index.cfm?fuseaction=app.details&TXT=virtual&FRM=51&STP=10&SIC=&PGA=&CCY=&PCY=&SRC=&LNG=en&REF=35715>

- common obligations for certification service providers in order to secure transborder recognition of signatures and certificates throughout the European Community;
  - common rules on liability to help build confidence among users, who rely on the certificates, and among service providers;
  - cooperative mechanisms to facilitate transborder recognition of signatures and certificates with third countries.
- Directive 97/7/EC of the European Parliament and of the Council of 20 May 1997 on the protection of consumers in respect of distance contracts: The Directive applies to **distance contracts** between a professional and a consumer, for the provision of a service or goods. A distance contract may be concluded by any means (by telephone, e-mail, catalogue, etc.) which do not require the simultaneous physical presence of the parties to the contract. Besides regulations, in practice there exist the problems of liability and trust. Noll<sup>18</sup> looks at several models for liability: liability of the Virtual Enterprise only, liability of the leading company only, liability of all network companies and proposes a hybrid liability model based on the client's easy access to information regarding his/her claims and liability of all participating firms in the production network in addition to that of the virtual enterprise and of the network leader.

### **Technologies for the virtual enterprise<sup>19</sup>**

New technologies are a prerequisite for the concept of virtual enterprise. The use of the Internet is a minimal requirement for the operations of such entities. However, e-mail and the company web site are implicit to all types of organizations nowadays and do not make a company virtual.

New technologies are neither a must for the existence of the virtual company nor are they sufficient. They represent mere instruments available for all companies that can help our virtual citizen function.

The Internet is the first thing that comes into one's mind when discussing virtualization. An important lesson about the Internet is that the Internet is a technology and not a business model. The birth of the Internet brought on more than new sales strategies as the Internet does more than facilitate communications. It influences and can remodel dramatically all processes from hiring and employee communication to coordinating global production. Michael Porter says that the Internet does not represent a derailing element for most industries and companies. It rarely overrides important competitive advantages for an industry. It often makes them more valuable. Therefore, the "new economy" seems more like the "old economy" with access to a new technology than a new economy.

The impact of the Internet is influenced by the way it is used. According to UNCTAD, there is no available data on the way companies use the Internet. There is however information available for individual countries. These show that in Finland for example,

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<sup>18</sup> Noll, Juergen, *Virtual Enterprise Networks in Europe – Economic Opportunities and Legal Challenges*, 2004, Available at SSRN: <http://ssrn.com/abstract=549001> or <http://dx.doi.org/10.2139/ssrn.549001> on 26 April, 2013

<sup>19</sup> Some of the ideas in this section were presented in the Technologies for the Virtual Enterprise paper at The Eleventh International Conference on Informatics in Economy IE 2012, on 10 and 11 May, in Bucharest



where its penetration rate is very high companies use the Internet for complex purposes, while in countries like Egypt or North Korea it is used less and for primary needs, like email.

However used and although essential, the Internet is to our networks of companies nothing more than water to a human: essential and yet insufficient for survival. A virtual company as such will rely on every new technology for even the simplest of tasks. It will have global coverage and globally distributed production sites. It has virtual offices as part of its employees work at home and remotely connect to their work computers. It has virtual factories as components are produced in facilities all over the world. It has virtual research teams as they can work with several universities, or researchers that can share, correlate their findings and brainstorm from different locations. It has virtual meeting rooms as meetings often take place in airport cafes. And it has virtual meetings as they can take place by video calls with people all over the world. It has virtual software as it uses cloud computing.

Companies that have learned the Internet lesson are now reaching for the next best thing: cloud computing. Cloud computing is a new instrument available to companies who want to deal with IT needs more efficiently. It comes as the natural step in the evolution from classical networks and hardware-based applications to virtualization. It brings to the table an intelligent approach to virtualization and a business-mind.

## Conclusions

‘The virtual enterprise is like a Ferrari: a powerful vehicle, capable of reaching its destination fast and safely, provided it runs on appropriate surfaces<sup>20</sup>.’ The European Union has the potential of providing such business surfaces and of nurturing lucrative virtual enterprises. It has excellent infrastructure, access to state-of-the-art technologies for virtualization, large budgets for research. Working on its regulation and legal framework, its business culture regarding inter EU members collaborating and virtualization and its research being turned into reality will make the European Union a land of opportunity for virtual enterprises.

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<sup>20</sup> Fung, Victor K, Fung, William K, Wind, Yoram, „Concurența într-o lume plată”, Publica Publishing House, 2009, pg 232

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