The Virtual Enterprise in the Future Knowledge Society

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Abstract: This study approaches, from the conceptual viewpoint, the modern enterprise and information and communication technologies, which make the connection with the virtual enterprise. As concerns the virtual enterprise, we are interested in the components of such a enterprise, in the structure of its information system and in the changes that will occur in the life of the virtual enterprise. Here are some questions that we would like to give answers to bellow.

Key words: enterprise, virtuality, information system, knowledge society.

The modern enterprise and information technologies

In the context of technological evolutions, the enterprise, the basic link in the value chain, must perform its activities so that it can achieve its goals and obtain profit in various forms. Such an enterprise cannot be but modern.

There are currently a multitude of factors that determine an agitated behavior of the enterprise, necessary for its economic survival. Among these factors, here are the most important: information technologies, political changes, changes in the client mentality, interests of the various vocational organisms and unions, international terrorism etc.

However, on its way to modernity, the current enterprise is the scene where the transition operations to the future globally information-based enterprise take place. The grounds for this statement are pretty simple, in the sense that information technologies, before being put into practice, go through successive stages of research and implementation. Nevertheless, research needs, first and foremost, funds coming mainly from the production sector of the countries involved in this process. There are also situations when research brings funds after selling the results of the enterprise research in the production field.

In other words, we detect **an evolutionist spiral of research and application of information technologies**, so that it is very difficult to explain, after going through a series of spirals, which is the determinant side and which is the determined side.

In all this factorial and information labyrinth, the enterprise has to become modern, furthermore, on these modern ideas "ready modernized" companies are created, meaning companies that 20-30 years ago were not even envisaged as existing. It is the case, for instance, of the Internet providers that did not exist 20 years ago, but that are now the support of a new network of new, modern companies: from electronic commerce advertisements, to personal business and outsourcing services provided to big companies.

If the existing companies have to accept to survive in this globally information-based environment, it is important to be aware of the characteristics they have to have, in

order to undergo an efficient modernization process. After analyzing a significant number of companies and corroborating the results with the trends of the future globally information-based society, we reached the following set of main characteristics for the future enterprise: *flexibility, opening, receptivity to integration, globalization and intelligism*.

According to the above-mentioned facts, we could say that the enterprise represents a very complex system, with various functional components, which are in a continuous interdependence, represented in a unitary way as compared to the economic environment.

The virtual enterprise – conceptual aspects

Due to the process of continuous information digitization, together with the development of new communication techniques, virtual companies or web companies are more and more numerous.

The virtual enterprise means a group of companies that decide to form a virtual community, that is platforms enabling the sharing of information on the group members. There are situations when some companies address their clients via the Internet, which makes it a virtual enterprise as well. It is the case with electronic notaries, with certain advertising companies, capital market institutions (for instance the National Enterprise for Compensation, Deposits and Settlement, Registry Companies). A concrete example of groups of companies forming virtual communities, is constituted by the RASDAQ/NASDAQ off-exchange market, where all the movable assets companies meet to trade stocks.

Such a virtual enterprise is generally formed on the value chain: suppliers-producers-clients. Figure 1 shows the structure of such a virtual enterprise.
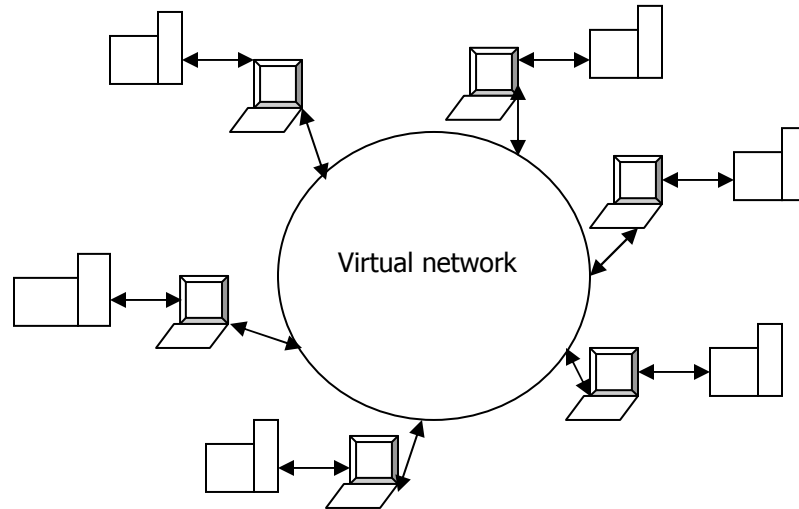

Figure 1. Organization of several companies in a virtual enterprise

A virtual enterprise is made up of: **the cell enterprise**, namely the enterprise joining the group and which places a part of or its own entire information system at the disposal of the virtual network, **the virtual network**, which is not owned by any cell enterprise, and **the network access rights**.

Virtual companies may have a private communication network, as it is the case with RASDAQ/NASDAQ, or it may have a special rights network, as it is the case with the Digital Signature Certification Authority. Figure 2 shows the architecture of such a cell enterprise in a Virtual enterprise.

USERS AND PARTNERS OF WEB ENTERPRISE

WEB ENTERPRISE USER INTERFACE

Access Rights Management System

Access to Information

Access to Software

Common Software

Own Software

Global Service System

Enterprise Relation System

Common Service System for Network Communications

Access to Network Enterprise Communications

Manufacturing and Logistics System

Supply, Marketing and Sales System

Financial-Accounting System
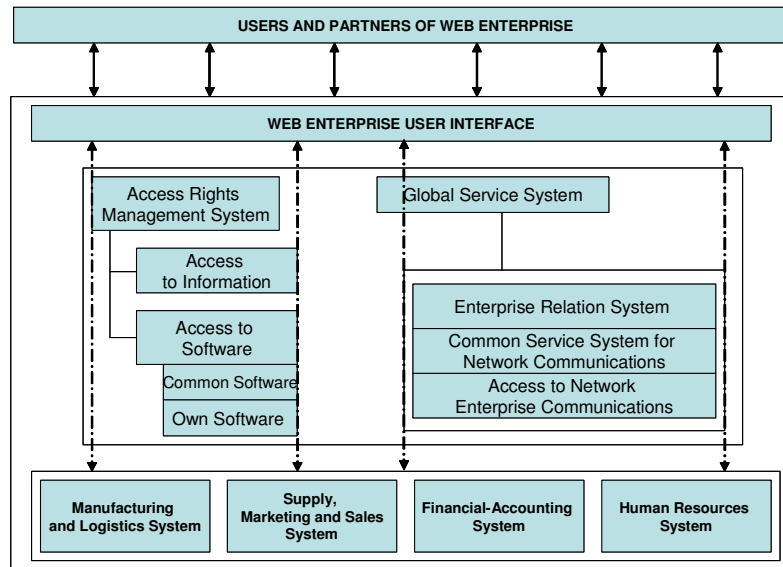
Human Resources System

Figure 2. Information architecture of a cell enterprise

Here are the main particular aspects of such a virtual enterprise:

1. a significant contribution of the information technologies to the performance of various activities;

2. work in common at very big distances;

3. network-like organization for the project, by avoiding horizontal structures;

4. much trust from the participating companies;

5. efficient information sharing and usage;

6. absence of physical borders in the value chain;

7. high quality services;

8. cost reduction;

9. removal of middlemen between producers and consumers, thus obtaining the prosumer.

10. each network participant keeps its independence;

11. in most cases, such companies have highly valuable intangible assets, as compared to their tangible assets, which may be insignificant;

12. their degree of liquidity must be high;

13. the clients of a virtual enterprise may never meet its employees;

14. the circulation speed of the traded goods is very big.

The data flows and their processing require precise information, and their outer understanding requires the understanding of the way the network was formed, of the rules the participants agreed to comply with and the particular aspects of the production processes (whenever the case).

To the data and information flows correspond **money flows**, which usually correspond to bank operations that are mostly electronic. Hence, the necessity of a **settlement enterprise** in the value chain, which would deal with the settlement of the sums of money at their net value.

People's work in a virtual enterprise is the main production factor. The degree of satisfaction of unknown, very demanding clients ultimately depends on the quality of the work done by the people of the virtual enterprise.

Information system of a virtual enterprise

Nowadays, the net-economy we are all headed to emphasizes the virtual enterprise and the organization of the actors in the so-called prosumer networks, where there are no middlemen, there are no time and space barriers and where the only problem is value and material flow fluidity (unless their "teletransportation" will generalize).

The information system of the virtual enterprise shall include a series of information systems of the cell companies, as part of the virtual enterprise. The information system of the cell enterprise shall expand with a **user interface** and **a global service system**, as shown under figure 3.

Both components shall be included either in a communication information system, separated from the existing information systems, or in the information system of the enterprise.

Thus, the information sub-systems of the cell enterprise (logistic-operational, financial-accounting, human resources and marketing) in the virtual enterprise, shall be connected to the two new components. For all the information sub-systems, the problems that will occur will be those of data, application and network access, of ownership and compatibility of the soft used among the cell companies.

One of the problems due to globalization will consist of the occurrence of those chains of virtual companies.

We reckon that in all these discussions, an important role will be played by ownership issues, since at this moment we all know that a first attempt at forming a virtual enterprise could be considered the groups of companies with integrated information systems and a an Extranet-like private communication network. As long as they issue invoices to one another for services and products, this means they make up a enterprise network.

Changes of the modern enterprise in the future knowledge society

As concerns the **future of the virtual companies**, we believe their number will increase with the increase in the volume of transactions. Moreover, in our opinion, in a first stage several virtual companies will be formed, made up of a single enterprise, and afterwards the number of virtual companies made up of more companies will increase as well.

Massive investments in information technologies will lead to the expansion of computer or micro-system use in all fields of activity, at very small prices. The globally information-based society will have a high degree of digitization for most of the human activities. We will reach a point where the analogical information devices will be more expensive than the digital ones, since the former will no longer be used.

People have already begun to talk about the knowledge and intelligence of the modern enterprise, but we could think of the changes that the modern enterprise will have to undergo in order to reach the future knowledge society, after the globally information-based society.

First, all the activities performed by the enterprise must be recorded as digital information. This *digitized recording* is only one aspect of the globally information-based enterprise. From this digitization of flows occurring in a enterprise, we must take the step, whenever necessary, towards the knowledge related to these flows. This may be achieved by using intelligent systems on a large scale.

Second, the employees of the modern enterprise will be the so-called *synthetic workers,* namely robots with human faces. Therefore, the modern enterprise will have to

redesign its processes to avoid possible conflicts of interests among its workers. In other words, the redesign of the enterprise processes will never end.

Third, the modern enterprise of the knowledge society will have to implement *other procedures for the assessment of its results.* The concept of profit will be much more comprehensive than the current concept, since it will also include other elements difficult to define at present. An example may be the increase in the knowledge of the workers during a financial year. On the same line, we predict an extension of the permanent assets of the modern enterprise by registering the human capital of the enterprise in question.

The three changes we mentioned above do not intend to cover entirely the debated subject, we only pointed out some of these changes undergone by the modern enterprise in the future knowledge society. For this reason, this subjected will long be open for discussion.

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