FROM ‘TRADITIONAL’ ENTERPRISES TO VIRTUAL ENTERPRISE: A CONTRIBUTION TO THE TRANSFORMATION PROCESSES

Putnik D. Goran, University of Minho, putnikgd@dps.uminho.pt
Hélio Castro, University of Minho, hcastro@dps.uminho.pt
Vaibhav Shah, University of Minho, vaibhav.shah@dps.uminho.pt

Abstract: Enterprises that stays in the market for long periods, decades even centuries, always had the ability to manage new market demands and to transform themselves according to the environment. Some authors affirm that nowadays business environment is turbulent. Our proposal for enterprise in turbulent environment is the Virtual Enterprises approach. In the first part of this paper, we present the differences between the ‘Traditional’ Enterprise and the Virtual Enterprise approach. Then, in the second part, is presented a contribution to Transformation Processes. In the third part, are presented paper conclusion and future work.

Keywords: Virtual Enterprises, Transformation Strategy, Processes.

INTRODUCTION

The main objective of this paper is to contribute to the transformation processes to aid ‘Traditional’ Enterprise (TE) transform in a proposed organisational concept: Virtual Enterprise (VE), aligning with the evolution of the business environment.

This business environment is being one of the key areas for worldwide organisations for research in manufacturing. For example, Intelligent Manufacturing System (IMS) considers that one of five technical Areas (Total Product Life Cycle Issues, Process Issues Strategy/Planning/Design Tools, Human/Organisational/Social Issues and Virtual/Extended Issues [1]) is related with Virtual Enterprise. In the description of this area, IMS refers a crucial aspect of nowadays Virtual Enterprise paradigm and the central point of the contribution of this paper for the transformation processes in enterprises, “However, the main challenge (of Virtual Enterprise) is organisational rather than technological” [1]. Also in the Manufacturing European Technology Platform Manufuture, refers that one of the enabling technologies for competitiveness and sustainability is “new business models” [2].

So if all the stakeholders recognize the advantages of VE, why Enterprises don’t use them? Is there any missing links? There are some disables like trust, transaction costs and intellectual property rights that constrain the development of the VE paradigm. But some literature already refers to mechanisms and specific organisational structure, to minimize these disablers.

In this paper, Enterprises, “an organization created for business ventures”[3], are divided into two approaches: ‘Traditional’ and Virtual. We consider the ‘Traditional’ Enterprise (TE) as a ‘stable’ structure that develops low level of partnerships (only with few customers and suppliers), do not produce high level of dynamic and with a long “life”, if they are capable of. In opposition, some authors mentioned that Virtual Enterprise (VE) is characterised for short “life” and presents a high level of dynamism.

In the first part of this paper, we present the differences between the ‘Traditional’ Enterprise and the Virtual Enterprise approach. Then, in the second part, is presented a contribution to Transformation Processes. In the third part, are presented paper conclusion and future work.

‘TRADITIONAL’ ENTERPRISE VS. VIRTUAL ENTERPRISE

The organisational paradigm proposed is the VE concept. This concept has been developed in the past decades to respond to the needs that companies and markets are now requiring, agility, market alignment, competitiveness, innovativeness and sustainability.

In 1984 the authors Miles and Snow [4] referred what is characterized as VE “…companies must be able to form network of reliable subcontractors … held in temporary alignment by a variety of market mechanisms”. Then labels have born: network organisation [5], value-adding partnership [6], organic network [7], intelligent enterprise [8], and virtual enterprise models, such as virtual value chains [9], virtual enterprise [10], virtual corporation [11], extended enterprise [12], electronic markets and electronic hierarchies [13], Electronic commerce or Electronic markets [14]. There is a broadened terminology to range VE concept, some sharing similarities and sometimes exclusive.
However, unfortunately or not, until today, there is not a universally accepted definition, or model, of the VE. But Putnik et al.[15] refers that there are three fundamental features of the VE concept that make the fundamental difference between the VE and the TE, and that generate a number of consequences, making that paradigm “shift”. These are:

1. Dynamics of network reconfiguration,
2. Virtuality, and
3. External entities (meta- (virtual) enterprise structures) as environment for enabling, or supporting, the VE integration itself as well as a reconfiguration dynamics

In the following table (Fig. 1), a comparison between ‘Traditional’ Enterprises and Virtual Enterprises potentials, concerning the three above-mentioned features, and a number of their consequences, are presented.

<table>
<thead>
<tr>
<th>Nº</th>
<th>Criteria</th>
<th>‘Traditional’ Enterprise</th>
<th>Virtual Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of products by enterprise</td>
<td>Multi</td>
<td>One</td>
</tr>
<tr>
<td>1.1</td>
<td>“Flow” of products through the enterprise</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Organisational reconfiguration dynamics</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>2.1</td>
<td>Enterprise “life” time</td>
<td>Long</td>
<td>Short</td>
</tr>
<tr>
<td>2.2</td>
<td>Inter-enterprise networking</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>2.3</td>
<td>Organization’s reconfiguration “transaction” cost (networking and dynamics disabler)</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>2.4</td>
<td>Trust assurance and management (networking and dynamics disabler)</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>2.5</td>
<td>Organisation reconfiguration time (networking and dynamics disabler)</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>2.6</td>
<td>“Flow” of enterprises through the product</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>2.7</td>
<td>Number of organizational structure instances</td>
<td>One/Low</td>
<td>Very high</td>
</tr>
<tr>
<td>2.8</td>
<td>Leanness</td>
<td>Medium</td>
<td>Maximum</td>
</tr>
<tr>
<td>2.9</td>
<td>Agility</td>
<td>Medium</td>
<td>Maximum</td>
</tr>
<tr>
<td>2.10</td>
<td>Operations management importance</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>2.11</td>
<td>Organisation design / integration complexity</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>2.12</td>
<td>Virtuality (dynamics enabler)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>2.13</td>
<td>Creativity</td>
<td>Medium</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Transformation Strategies

This type of transformation requires a shift in the enterprises. In literature there are some transformation strategies like Total Quality Management (TQM), Business Process Reengineering (BPR) and more recently Chaordic System Thinking (CST) that impulses enterprises to change.

According to the American Society for Quality, “...Total Quality Management (TQM) is a management approach to long-term success through customer satisfaction,”[16] and further “…all members of an organization participate in improving processes, products, services and the culture in which they work.” [16]. This strategy begins in the Japanese manufacturing industry and focuses essentially in the incremental improvements of the enterprise members pointing to customer satisfaction. Some authors consider that TQM involves all organisation and aiming quality as a strategic objective.

The Business Process Reengineering was introduced in 1990 when Michael Hammer introduced the term ‘reengineering’ in an Harvard Business Review article: Reengineering Work: Don't Automate Obliterate [17] and then in his book, co-author with James Champy, Reengineering the Corporation [18], they expressed the need for transformation. The definition the authors set for reengineering as: “the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance…” These authors refer that this definition contains four keywords, but we emphasise three explicit keywords and one implicit in this definition: fundamental, radical, processes and, the implicit, people.

BPR stays up-to-date because environment is still unstable and highly dynamic. This non-deterministic dynamism is called, by some authors, as turbulence. For these reasons it is fundamental to generate mechanisms to support business sustainability. As showed in the previous table, TE does not have intrinsic characteristics to be competitive and sustainable in turbulent markets, as examples, the organisation reconfiguration time and the agility. The shift is
essential and requires a radical change in ‘traditional’ organisations. These changes will affect how enterprises develop their business model and processes will be different. And for the involvement and commitment of these challenges is necessary that people participate actively.

Most recently, Eijnatten presented Chaordic System Thinking (CST) “...a recent, qualitative framework in the domain of Complexity that both combines and generalizes exiting ideas from various disciplines, rather than inventing new concepts.” [19]. CST is based in the Chaos and complexity theory and provides a new strategy for “...uncontrollability, uncertainty and complexity...” [20] in enterprises.

Eijnatten refers to five core properties of Chaordic System: “Consciousness”, “connectivity”, “indeterminacy”, “dissipation” and “emergence”, and puts human in the central of CST strategy.

CONTRIBUTION TO THE TRANSFORMATION PROCESSES

In the strategies we mentioned before about the clear intention of these strategies to transform enterprises, in some cases in a conservative way (TQM) and in other cases in an almost revolutionary way (BPR and CST).

In this paper, we will contribute to the transformation from TE to VE focusing in the following points:

• Preparedness of all Enterprise staff, from blue-shirt to white-collar, to the VE approach.
• To transform ‘Traditional’ Enterprises (and not to manage enterprise changes);

Some other processes should be included but in this paper we contribute with 3 (three) transformation processes:

• Development of supporting tools;
• Raise awareness;
• Provide in-house consultancy in ‘Traditional’ Enterprise.

<table>
<thead>
<tr>
<th>Process</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of supporting tools (A-1)</td>
<td>• Produce demonstrators to simulate the advantages of the VE concept (A-11)</td>
</tr>
<tr>
<td></td>
<td>• Produce a handbook on VE (A-12)</td>
</tr>
<tr>
<td></td>
<td>• Develop of the Meta-enterprise (A-13)</td>
</tr>
<tr>
<td></td>
<td>• Develop of a webpage and videos for broadcasting on Internet (A-14)</td>
</tr>
<tr>
<td>Raise awareness (A-2)</td>
<td>• Encourage awareness of entrepreneurs and SME and Large companies managers (A-21)</td>
</tr>
<tr>
<td></td>
<td>• Promote of VE concept and Meta-enterprise (A-22)</td>
</tr>
<tr>
<td>Provide consultancy in ‘Traditional’ Enterprise (A-3)</td>
<td>• Prepare for the transformations, manage the transaction phase until the desired end state (A-31)</td>
</tr>
<tr>
<td></td>
<td>• Create fundamental shift in the way of thinking, activities and business model (A-32)</td>
</tr>
</tbody>
</table>

Fig. 2. Activities and Transformation Processes

Transformation Processes

For the specification of the transformation processes, we chose a modelling methodology, composed by a modelling language called ICAM Definition Method (IDEF). And the modelling language technique is the IDEF0. The IDEF methodology was selected due to the representation of the transformation activities of the system and because it is accessible to any reader.

The following IDEF0 diagram (Fig. 3) represents the overall operation of the Transformation Strategy that consists on the Development of supporting tools (Process A-1), then Raise of awareness (Process A-2) of enterprise owners, managers and others high-level employees (stakeholders) for the VE approach, and Provide consultancy in ‘Traditional’ Enterprise (Process A-3) of interested stakeholders to prepare enterprises for VE. The preparation and implementation of this Transformation will involve a group of researchers.
Process A-1: Development of supporting tools

This process corresponds to the development of supporting tools to disseminate and corroborate the validity of the concept. Tools are critical to affirm and support the new paradigms.

So, it will be important to: 1) produce simulators to demonstrate the advantage of VE; 2) produce a handbook on VE; 3) support the development of a Meta-enterprise; and 4) develop of a webpage and videos for broadcasting in Internet.

Indeed, this process consists on the creating and spreading of instruments to create general consciousness for VE paradigm.
**Process A-2: Raise awareness**

This process consists on Encourage awareness of entrepreneurs, Small and Medium Enterprises, and large enterprises; and to Promote the Virtual Enterprise concept and Meta-enterprise. The encouragement of the awareness of entrepreneurs and all type of enterprises will require organisation and development of conferences and workshops. To achieve to a higher level of understanding of the VE concept and mechanisms, as Meta-enterprises, it will prepared Training courses, Special Session and use of tools to Promote VE concept and Meta-enterprise.

![IDEF0 representation of Process A-2 – Raise Awareness](image)

**Process A-3: Providing consultancy in ‘Traditional’ Enterprise**

This process represents detailed tailored made work in each TE interested in transform towards a VE. First of all, is necessary to support/help enterprises to prepare the transformations, manage the transaction phase until being prepared to develop VE, the desired end state. Then, create a fundamental mind-set of all staff, a shift in the way of thinking, activities and business model.

![IDEF0 representation of Process A-3 – consultancy in ‘Traditional’ Enterprises](image)
CONCLUSION

This paper contributes to an approach for Transformation Processes to develop in ‘Traditional’ Enterprises for new business challenges. The ‘Traditional’ Enterprise especially Entrepreneurs, Micro, Small and Medium Enterprises are facing the need to shift to a global business dynamics and must be prepared to grab this opportunity applying Virtual Enterprise paradigm. They must be trained to adapt their business models and switch to the proposed organisational model, Virtual Enterprise.

FUTURE WORK

The Future work will be on creating supporting tools to explain and demonstrate the VE paradigm, and presentations to, for example, training courses and special sessions.

References