Virtual Product Development in University-Enterprise Partnership

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ABSTRACT

Development teams involved in product development are often geographically and temporally distributed, and there is a high level of outsourcing in product development efforts. Enterprises give rise to a special type of virtual enterprise, in which each company maintains the greatest flexibility and business independence. This paper presents a vision of next generation engineering working environments and describes a core information technology on which future systems can be built. Cooperative processes are not the automatic results of implementing collaborative, real-time communication technologies, but the result of a carefully designed and systematically maintained virtual team development plan. This paper discusses the critical issues of the virtual product development and builds a general architecture of an experimental platform for training, research and consulting in the new digital economy, located in the PREMINV center from University "POLITEHNICA" of Bucharest.

Keywords: Collaborative Systems, Knowledge Applications, Outsourcing, Small to Medium sized Enterprises, Virtual Enterprise, Virtual Enterprise Network, Virtual Teams

INTRODUCTION

Under the concept of a global economy, enterprises are assigning design and production environments around the world in different areas. The optimization of product benefit must be the focus of all network activities (Niemann, Tickkiewitch, & WestKamper, 2009). A serious issue of information exchange emerges as companies use traditional hardware and very distinct software appropriate to their field of expertise. To overcome the problem of low productivity due to the interruption of information, the concept of simultaneous engineering and concurrent design becomes very significant. Currently, the biggest problem for virtual networks is that the companies which need them the most are not becoming members. If one monitors the activities of companies involved in international trade on the Internet, one would notice rather

quickly that many of the most active companies are very small. We would never speak badly of very small companies, being one ourselves. However, it is probably these companies more than any other who has the most to gain by joining virtual networks. Unfortunately, many of these companies either can not afford or are unwilling to pay for a World Wide Web presence, which is usually a prerequisite for joining an active virtual network. There is also usually a membership fee and in some cases the fees are slightly expensive when one considers that the organizations are very new and have no proven record of success.

Some proponents of the Internet have stated that its real benefit in the current situation is that it will allow small and medium sized companies to be competitive with large multinational enterprises (Guran, 2008; Fink & Ploder, 2006). We do not completely agree with this position. We argue that the market power of large multinational corporations is so great that it dwarfs SME's in comparison. However, we would also point out that SME's using a strategic alliance methodology can achieve greater success in market penetration in global markets thereby affording them new business opportunities. Thus, while we do not view the Internet as giving SME's greater power in head to head business competition, we do see the potential of the Internet as an evolving global marketplace. The importance of the virtual network can not be over emphasized in this context. The ability of companies to form global networks on the Internet will transform the way that we do business in the future. Our view is that the future of global networking is very promising. The recent corporate downsizing which is happening in many countries means that new industries will have to provide employment opportunities in order for consumer demand worldwide to grow (Dragoi, Cotet, & Rosu, 2007). We believe that the Internet will provide the means for companies to associate themselves with one another in virtual networks and begin to develop new business opportunities for each other in global markets. Furthermore,

we believe that many companies who are now considered small will exert tremendous market power with the help of global networks. The ability to share information and resources gives even very small companies an opportunity to pursue larger projects, knowing that other members of a network will provide support and also participate as partners (Fink & Ploder, 2007). Information management should be viewed as the administration of a network of processes that acquires, creates, organizes, and distributes the information (Choo, 2002). The efficient use of information is what Choo calls for adaptive behavior: a selection of actions directed at specific objectives. It analyses each case from the perspective of the information administration whose responsibility is to plan, develop systems, services, processes and information resources (Choo, 2002). Individuals within an organization need the ability to perform their task efficiently by applying information technologies and systems to their work, also defined as end-user computing competency (Turban, Aronson, Liang, & Sharda, 2007). The work comprises components for integration of information systems, visualization of the planning and production situation, communication to enable cooperative decision making under uncertainty, optimization of plans and simulation of the decisions, network diagnostics and performance monitoring among others (Ayers, 2006). This involves a number of challenges such as providing members access to network-wide real time information, enable visualization of the available information, secure the interaction between advanced ICT based decision support tools and human decision making, and creating a coordinated and collaborative environment (Niemann, Tichkiewitch, & Westkamper, 2009) for planning and decision making.

Finally, local or provincial government agencies will be able to assist their local business community by joining virtual networks. The ramifications for local economic development are quite significant. By accessing a virtual network, your agency can now reach more companies and enhance your business attrac-

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