

The e-skip-gen effect. The emergence of a cybercentric management model and the F2B market segment for industry

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Abstract

The advent of the Internet and Web-enabled communications networks from the factory floor upwards via PC technologies has altered the nature of change within the manufacturing environment. Reliable, generational, technological change common to heavy industry has experienced unprecedented acceleration due to the introduction of innovative software solutions.

The velocity with which the Industrial Ethernet roared through the polite and containable ‘fieldbus wars’ markedly changed the fieldbus protocol world in a few short years. The ‘islands of automation’ legacy schema upon which proprietary manufacturers relied so heavily for their markets and aftermarket has, in recent times, been bridged with the swiftly developing Ethernet/TCPIP interconnectivity technologies such as the ‘open factory’ concept. Internet-enabled change has made it strategically dangerous for firms unprepared to manage advancing e-manufacturing realities. The author identifies factory-based changes and explores the realities of an emerging market segment (F2B) and a management ‘centrism’ to suggest order amid the volatility of the virtually-extending enterprise. © 2002 Published by Elsevier Science B.V.

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1. Introduction

The lethargic shifts in technology growth are what many in heavy industry have relied upon for continued profitability. From the perspective of a slow moving global industrial base anchored in the iron of giant machinery and robotics, manageable change meant prosperity. Accelerated change has brought an end to an era. Ultra velocity change has sprung from the advances in PC and control software technology and the Internet. The indo-

mitable forces of e-commerce start-ups, armed with superior economic alternatives to the costly, cumbersome land-based systems of the last decade, have been invasive, alarmingly competitive, and expressly disruptive to the safety of jobs, antiquated ideas of profitability, and to the reliability of existing business models. The unpredictability of markets has increased in tandem.

Generational change, from the manual toothbrush to electric, from analog to digital, or from coaxial cable to fiberoptic... each had been foreseeable, expected and predictable. The sudden arrival of PC-based Controls that speedily threatened and

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replaced, to some degree, the Programmable Logic Controller (PLC) with software technology, transformed the Controls Industry in less than a decade.

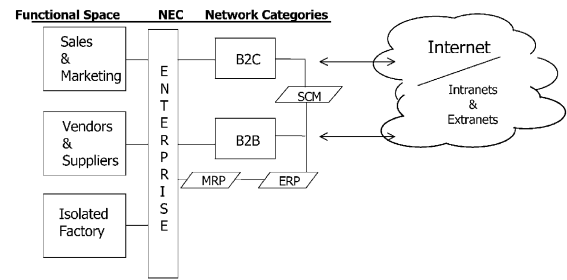
2. The e-accelerated enterprise in trouble

The ‘e-skip-gen’ or e-commerce skip-a-generation ‘effect’ is the phenomenon where segments of technology are perceived by management to outpace the standard rate of growth of established solutions within a manufacturing segment. The ‘skip-gen effect’ is the impact on methods and systems experienced by companies regarding an accelerated technological phenomenon critical to their competitiveness. While some of these effects can lead to advances in production performance, some do not.

E-commerce has been mismanaged at the manufacturing level. The reason is that people have figured out all kinds of ways for customers to order instantly. But they haven’t figured out a way to actually know in advance, on a real-time basis, whether or not they will be able to satisfy those orders. I think it is the sham of ERP companies who have said we can give you one system that will operate throughout your enterprise. These guys sell it in, do a couple of accounting packages, declare victory and are gone. There hasn’t been a successful integration of an ERP installation yet (Caccese, 2000).

Fig. 1 shows the enterprise segment as being made up of useful elements of an IP (Internet Protocol) network and Ethernet networks connecting marketing and sales to supply chain management. This represents a networkable, extended-enterprise model with pre-1997 systems that are considered operational in a B2B environment. The ‘missing link’ was the isolation of the factory floor.

The key factor in analysis of these technologies is the translation of ‘skip-gen effects’ by industrial management within a paradigm shift in the fundamental business model from hardware-based



Legend: MRP = Manufacturing Resource Planning; SCM = Supply Chain Management; ERP = Enterprise Resource Planning; NEC = Networked Enterprise Core

Fig. 1. Pre-F2B: A 2-tier e-enterprise core model (World), 1997.

to software-based control and communication technologies.

The E-Skip-Gen technology phenomenon may intensify and accelerate the following management-centric short- and long-term effects in industry:

- Upsets the ‘accepted’ pace of new technology change.
- Widens the knowledge gap between the ‘haves’ and the ‘have-nots’.
- Deepens the rivalry between IT and Factory Engineering techno-professional factions within the enterprise.
- Levels the playing field (increased accessibility) among competitive contenders in the same marketplace, in some cases.
- Intensifies the resistance by proprietary (legacy) interests to replacement technology.
- Intensifies the fear of job loss in management and worker hierarchies.
- Allows the competitive advantage to shift from proprietary vendors to technology innovators.
- Affects a period of acquisition and competitor realignment (shakeout) in the effected industry segment.
- Redefines occupational roles and company structures (accelerating the advent of Cybercentrism).
- Reconfigures the product value proposition, fostering a new platform based on factory-based, open systems technology application (i.e. F2B segmentation).

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