



## Article Number 1

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### **Still Ahead of His Time: The Management Philosophy of W. Edwards Deming in the Internet Era**

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#### Abstract

Traditional organizations and young start-ups are being thrust into a revolutionary age that demands a solid management philosophy to grow, succeed and create a new future. The management principles that Deming introduced to the Japanese after WWII extended to renew the American auto industry in the 1980's and today offer organizations the strategic and operational focus necessary to compete in this new Internet Age. Deming's management philosophy, developed decades ago, foreshadowed the evolution of business models and strategies that are important today: the relentless integration of the customer into a more innovative system, the evolution of the modern, information-based supply chain, and powerful, new connectivity within organizations.

#### Introduction

A decade after the height of the quality movement, quality has become a given. It is no longer a goal companies strive to achieve, nor is it a source of competitive advantage. It is the price of admission. Therefore, it is not surprising that the work of W. Edwards Deming (1900-1993), whose name is nearly synonymous with the quality movements of post WWII Japan and of the United States in the 1980s, has been largely relegated to the history books.

What is remarkable, though, is that, more than a decade after the pinnacle of Deming's popularity in the U.S., companies are developing strategies that were strongly foreshadowed by Deming's work, even explicitly advocated by him. In a remembrance of Deming, journalist and business historian Andrea Gabor

distinguishes Deming from the popular quality movement:

Deming pushed beyond scientific method for improving work processes. Cultivating the know-how of employees at all levels of the company was "98%" of the quality challenge, Deming insisted with characteristic hyperbole. He advocated teamwork, cross-department collaboration, rigorous training, and working closely with suppliers--long before empowerment became the e-word of the '80s (Gabor, 2000, p. 292).

In the 1980's, Deming's writings on these subjects were among the most controversial and ground breaking of his management philosophy as were his arguments that the customer is the most important part of the production line, that fear inhibits cooperation and gives rise to false data, and that management by objectives creates organizational misalignment. Today, Deming's management philosophy offers fundamental insight into the changes in structure and strategy that organizations are undertaking as they pursue the strategic imperatives of innovation, speed, flexibility, and value.

#### A Shift in Mind

With *A System of Profound Knowledge*, W. Edwards Deming asserted that the greatest leverage for unleashing the potential for human performance in organizations, and thus for raising organizational performance to new levels, lies in rethinking the way we construct organizational reality (Backaitis, 1995). According to Deming, many of the barriers to improvement and innovation are of our own making, and letting go of the assumptions that underlie prevailing business models is key to removing artificially created obstacles to improvement and innovation. A strong, underlying argument in Deming's work is the failure of prevailing business models to appreciate the degree of connectedness between elements of their organizations — between departmental silos within organizations, between organizations in customer-supplier relationships, between organizations and their consumers, and between measurement systems and behavior.

Today, in the context of a business environment that is changing more rapidly than ever before, Deming's work gains new prominence. Many of the business orthodoxies that Deming called into question are being

overturned. What follows is an examination of the emergence in the late 1990's of three business strategy and business model innovations that were foreshadowed by Deming as early as 1950: the evolution of the modern supply chain, organizational alignment, and the relentless integration of the customer into the organizational system. The prescriptive aspects of Deming's management philosophy with respect to these developments are also explored.

### Deming: A Prophet of Supply Chain Integration

There is currently a strong effort by industrial firms to integrate their supply chains — supply chains being the flow, from start to finish, of product, service, and information needed to deliver a product into the hands of the customer. The goal of supply chain integration is to improve the coordination and flow of information, materials, and financials across functional and enterprise boundaries in a way that benefits all participants. Although this approach is contrary to the traditional view of optimization within functional or corporate boundaries at the expense of the greater supply chain, many companies are embracing this new strategy, as they move from "make-to-stock" to "build-to-order" business and inventory models. As companies continue to abandon their traditionally vertically integrated structures in search of greater efficiencies, flexibility, and responsiveness (Hagel and Singer, 1999, p. 134), they are entering into more tightly integrated relationships with their customers and suppliers. The relevant level of competitive analysis is no longer at the level of the company; it has evolved to the level of supply chain (Bovet and Martha, 2000).

Deming's argument to American business in the 1980s that close, cooperative ties with carefully chosen suppliers could be a source of competitive advantage was highly controversial. (Walton, 1986, p. 141). Conventional wisdom at the time constrained analysis to the business unit level and dictated that customers maintain adversarial, arm's length relationships with their suppliers to minimize the total long run costs of purchasing. Customers were discouraged from engaging in any activity, such as sharing information, that might lessen their bargaining leverage relative to their suppliers because doing so might lead to increased input prices (Porter, 1980, pp. 108-125). It is interesting to note that Porter's concept of *value chain* included functional areas of the organization but did not include

either suppliers or customers as part of the system to be analyzed (Porter, 1985).

Deming is probably the first to have considered suppliers and customers to be integral parts of the organizational system. This can clearly be seen in Deming's depiction of the Organization as a System (see Figure 1), a schematic that Deming first used in working with Japanese industry after WWII and that is central to his management philosophy (Deming, 1993, p. 60). In Deming's view, optimization of the organizational system includes suppliers because the flow of product, service, and information from suppliers critically affects the quality of the organization's product or service as well as its productivity and competitive position. According to Deming, optimization and alignment of the organizational system, including customers and suppliers, were the job of management: "Anything less than optimization of the whole system will bring eventual loss to every component in the system. Any group should have as its aim optimization over time of the larger system that the group operates in" (Deming, 1993, p. 53).

As early as 1950, Deming advocated tight integration between customers and their suppliers. He admonished companies to "cease the practice of buying on price tag alone," (Deming, 1982, p. 23), and instead advised them to frame sourcing policy around an expanded concept of the total costs associated with purchased supplies. Total costs encompassed the price paid, the cost of using the purchased supplies in production, problems encountered in delivery or production, the effect of the quality of supplies on the performance of the customer's product, as well as the transactions cost and the risks associated with the supplier relationship (Backaitis, 1992, pp. 148-188).

Whereas Deming acknowledged the importance of carefully choosing suppliers to minimize the risks of opportunistic behavior described by Porter (1980), he focused more on the joint benefits to be gained through close cooperation with suppliers: faster responsiveness to changes in demand, better synchronization of processes and engineering change orders, reduced cycle times, reduced levels of raw material, component, finished goods, and in-process inventories, greater predictability of demand, greater speeds of new product introduction, earlier detection of quality problems, improved functioning of processes, better product

quality, reduced variation, and improved customer satisfaction. These improvements, which are also the goals of today's supply chain integration initiatives (Rodin, 1999, pp. 204-209), could be achieved by sharing information on capacity, forecasts, production planning, materials and processes, workflows, and customer preferences. The gains from these improvements were to benefit both customer and supplier, though Deming did not specify how they should be divided (Backaitis, 1992).

Today, the Internet has reduced the costs of cross-enterprise communication. As supply chains move on-line and gain transparency, there is tremendous potential to streamline inter-company processes, eliminate redundancies, reduce complexity, coordinate logistics, and jointly plan for changing market conditions. For these improvements to be realized, customers and suppliers will have to establish unprecedented levels of trust with each other (Lee, 1999), another goal strongly advocated by Deming (Deming, 1986, p. 59-60). Deming suggests that careful choice of partner is imperative in this context and lists criteria that can help establish trustworthiness between customers and suppliers (Deming, 1994, p. 231).

Deming also advised that unless the terms of reference for decision making with respect to suppliers are consistent throughout the customer organization, efforts at cooperation will produce suboptimal results: "The price tag is still easy to read, but understanding quality requires education" (Deming, 1982, p.23). In other words, Deming might warn organizations today that efforts at optimizing the supply chain will be impeded if buyers in the organization are incentivized to minimize price tag when negotiating with suppliers while others are concerned with managing overall supply chain performance.

#### Deming and ERP: Technology alone Cannot Produce Alignment

Much of what Deming advocated in Out of the Crisis and The New Economics focused on creating alignment of effort among individuals and departments in the organization to achieve the organization's aim. This required dissolving artificial boundaries between interdependent parts of the organization — boundaries erected by incentive pay and individual and departmental goals. To this end, Deming advocated the

abolition of incentive pay and of the practice of "Management by Objectives" (Deming, 1993, pp. 29-31.)

Deming argued that, even if the organizational aim were known and espoused by everyone, departmental and individual goals and incentives were far more salient, and would supplant the organizational goal as bases for departmental and individual action (Deming, 1993, p. 85-90). Senge elaborated on the tendency of people to see their responsibilities as limited by the boundaries of their positions, classifying it as an "Organizational Learning Disability" because it hinders the sharing of knowledge, the formation of synergy, and impedes the learning process of the organization (Senge, 1990).

Over the last few years, technology has provided a platform for organizations to unify the data and information that are stored within various functional silos. These platforms are known as Enterprise Resource Planning (ERP) software systems. They held the promise of helping produce organizational alignment through shared information. By streamlining data flows throughout an organization, these commercial software packages also promised dramatic gains in a company's efficiency and bottom line (Taylor, 1998, p. 1).

Unfortunately, implementations of ERP systems have been disappointing (Taylor, 1998; Davenport, 1998). They impose their own logic on a company's strategy, culture, and organization, often forcing employees to change the way they do business. They do not take into account that functional areas, held accountable for their own data, are unwilling to lose control over it. In addition, employees fear others having access to the data for which they are responsible, believing it would be misinterpreted and their performance evaluated out of context. For these reasons, people resisted the very tools that were meant to help them.

Thus, while technology can provide connectivity of data and informational platforms within the organization, Deming's philosophy suggests that it cannot force connectedness and alignment in an organization where recognition of the human factors that give rise to barriers between departments is absent. The organization itself must first be managed with policies that encourage alignment of people and processes with the organizational aim, "An important job of management is to recognize and manage

interdependence between components. Resolution of conflicts and removal of barriers to cooperation are responsibilities of management" (Deming, 1993, p.65). Building on Deming's work, Whitney elaborates further the costs of fear and mistrust of measurement in organizations and how these factors discourage individuals from sharing accurate data during joint decision making efforts (Whitney, 1993).

### Relentless Integration of the Customer into the Organizational System

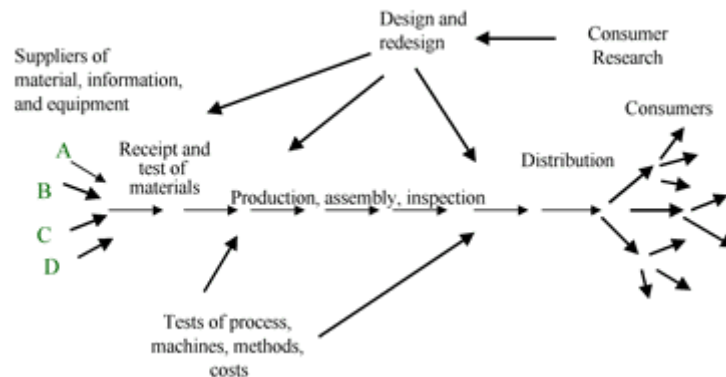
Customers are driven by a need for connection in the age of the internet revolution. Given the nearly instantaneous vote of the customer today, being obsessed with and understanding the needs of the customer — whether articulated or unarticulated - has become a strategic imperative.

Integrating the customer into the organizational system is a strategic choice, not a technology decision. Success in this area cannot be duplicated without first designing the infrastructure and interface to infuse the voice of the customer into every corner of the business (Rodin, 1999, p.33). It takes a solid infrastructure, based on management principles, to deliver an environment where customers can collaborate and create with their suppliers. "In the age of revolution, there is simply no way to stay ahead of the innovation curve unless your customers are your co-developers. The larger the community of co-developers, the quicker problems and opportunities for improvement are identified" (Hamel, 2000, p. 296).

Deming introduced the same focus in his work with the Japanese as early as 1950, clearly represented in his diagram of Organization as a System (see Figure 1). Deming challenged organizations to align with their customers and to ensure that the customer play an active role in providing input to the organization so that the design of new products and services and even the design of the organization itself would meet the needs of current and future customers and markets. Deming evangelized that "the consumer is the most important part of the production line" (Deming, 1982, p.5).

Figure 1. Production viewed as a System. Improvement of quality envelops the entire production line, from incoming materials to the consumer, and redesign of product and service for the future. This chart was used in Japan in August, 1950. Copied from Deming, W.E. (1993). The New Economics for Industry, Government,

Education, p. 60. Second edition. Cambridge, MA: MIT Center for Advanced Engineering Study.



Deming taught that customer surveys and focus groups provided at best an incomplete understanding of the customer, because they reflected only the current, articulated needs of known customers. Deming's teachings guide organizations to study the customer's lifestyle and design products and services that would serve the customer and that the customer is willing to pay for. This is not to minimize the importance of timely feedback. Some organizations respond quickly to feedback. However, in some organizations, by the time the management team hears the feedback, the customer is already sitting in the airline seat, restaurant booth, or clothing store of the competitor!

As organizations today strive to be increasingly responsive to the customer, Deming might warn them not to base their decisions solely on customer feedback. It is important not to let the customer entirely "drive" the organization. Instead, organizations should also be focused on creating products and services that incorporate innovations and will meet future customer needs.

### Conclusion

Deming brings unique insight to the challenges that companies face today as they transition to the business models of the new economy in the pursuit of competitive advantage. Far from belonging in the history books, Deming's theory of management provides firm grounding for organizations attempting to do business in new ways, at new speeds, with new technologies, and with new strategies. Deming's work provides powerful perspective on organizational issues that might otherwise be obscured today in the torrent of

technologically-induced change.

Deming clearly warns that the use of technology, in and of itself, will not deliver the results that organizations anticipate until human issues are addressed, and that, in fact, human factors can render technology investments nearly useless. Deming's teachings marry the human, business, and technological sides of the organization. Deming calls for us to lead in the Internet era by creating an environment for people to contribute, thereby creating evolutionary improvement and revolutionary change and innovation.

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