Perspectives in Business Culture

Andrea Chiarini

Lean Organization: from the Tools of the Toyota Production System to Lean Office

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For my wife and my children, Rosita, Anna Laura, Pier Francesco and Gian Mattia

Preface

This is a book about the so-called Lean Thinking derived from the Toyota Production System. Nowadays many books and papers deal with the subject, especially books concerning the operative tools of the Toyota Production System. So how will this book try to bring more knowledge to its readers? The book presents a complete journey, top-down and bottom-up, for implementing Lean inside an organization with the scope of achieving economic and financial results. The title of this book, *From the Tools of the Toyota Production System to Lean Office*, indicates that the book intends to propose a complete pattern, starting from the strategic objectives to the production. The pattern includes service processes such as marketing, accounting, design and can be applied in service industry as well.

In this way, the book presents a model developed using an inductive approach based on multiple case studies. The author has taken into account more than 200 companies based in the European Union and Asia, many of which are clients of Chiarini & Associates. This latter is a consulting firm that provides Lean Six Sigma consultancy. Chiarini & Associates has managed projects for companies such as ABB, Barilla, Bulgari, Bridgestone, Continental, Donaldson, Ducati, Ferrari, Fiat Power Train, *Praxair*, Sitel, Technip, Tetrapak, Tyco, Usag Stanley, Vaillant and many others. Projects have also been managed for public administrations. The proposed model in this book has been compared with many practitioners' point of view. Besides it has been compared with papers from international peer-reviewed journals and conferences.

The first chapter is dedicated to the historical evolution of the Toyota Production System. The second chapter discusses the so-called seven wastes and the value-added concept. The strategic system *Hoshin Kanri* is explained in the fourth chapter as the real starting point of the Lean Organization. Hoshin Kanri is the expression of the thoughts of senior management and sets the precise direction for the Lean ship.

The strategic objectives deployed by the means of Hoshin Kanri are matched in the fourth chapter with the wastes found through the *value stream map*. After having mapped the processes and defined the strategic objectives, an organization can launch quick and intensive improvement projects called *Kaizen* w*orkshops*. The fifth chapter discusses how to manage these quick projects and their teams. *Kaizen*

teams in this chapter are compared to other kinds of teams such as Six Sigma teams, and the reader will understand why the roles and rules are very peculiar. Kaizen teams can use several tools inherited from the Toyota Production System. The sixth chapter takes into account the most important tools from the basic *5S*, through *one-piece-flow, Kanban* and *SMED* to *TPM*. After dealing with the tools of the Toyota Production System, a case study applying some of the tools is presented. The famous Italian motorbike manufacturer *Ducati*, owned by *Volkswagen – Audi*, discloses how Lean tools are applied in its shop-floor through some examples.

The results achieved through Kaizen workshops can be measured day by day and managed by the introduced *visual control and management* system. The seventh chapter describes *lean metrics* as well as the accounting systems to measure economic and financial improvements. *Traditional accounting*, *activity-based costing* and *value stream accounting* are compared in order to understand which is better for the Lean Organization.

Last but not least the eighth chapter deals with *lean office* and a new tool for mapping transactional processes, the *Makigami*. Lean Office is the way to reduce wastes and consequently the lead time for processes such as marketing, engineering, accounting, quality management and supply chains as well as processes inside public administrations.[1]

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Chapter 1
From Mass Production to the Lean Six Sigma

A warrior of light who trusts too much in his intelligence will end up underestimating the power of his opponent
By Paulo Coelho

1.1 Once Upon a Time There was Mass Production (and Sometimes Still There Is)

In the first years of the twentieth century the famous entrepreneur Henry Ford used to say, half serious, half joking, that "Any customer can have a car painted any color that he wants so long as it is black" and "What doesn't exist cannot break" (referring to a car's optional features). Considering the interruption of the markets development due to the two world wars, in 1960s and 1970s companies all over the world found themselves doing business in a sort of calm sea where the route wasn't difficult to choose. The consumers requested products they did not have which could significantly improve their daily lives and for marketing managers it was relatively simple to satisfy their needs. The post-war generation, for example, used the moped as means of transport, but for obvious reasons desired a car. As soon as they managed to buy one, it became a Sunday morning ritual to tinker away in ones garage, trying to repair and maintain the product, as it was replacing the broken vacuum valve of the black and white television. The washing machine, the television, the fridge, the dishwasher and other objects that we now take for granted, often remained dreams for years for families in the post-war era. As soon as the financial status allowed it the purchase was automatic, without many demands regarding the quality of the product, from those few companies whose main goal was satisfying a rather large local request. In fact, only very few companies tried expanding to foreign markets due to trade protection and communication barriers. Today every company uses the Internet to complete transactions, but to those times even fax did not yet exist. So the consumer bought a product/service that he had never had before, having to choose between a few competing companies; and this product will have definitely changed his lifestyle. In this context it was quite

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difficult to obtain personalized products, long-term guarantee, immediate delivery and other services that nowadays are ever-present. The production for this market was concentrated on products that scarcely varied, produced by few companies that relied on little competition and relatively low-priced raw materials.

So was it really necessary to strive for excellence through quality and by reducing internal waste?

1.2 The Organizational and Productive Model of Mass Production

Between the nineteenth and the twentieth century F.W. Taylor introduced the so-called *Scientific Management*, reaching the conclusion that the best establishments had to rigidly and scientifically specialize their organizational roles. If the market demanded an increasing quantity of relatively simple products with a constant rhythm, an "organizational clock", which was synchronized with this market, was needed. Rather than having a work forces organized in teams to improve products and processes, it was favored having work forces concentrating on producing at the right speed and with the correct equipment, leaving the task of finding and removing products not up to standard at the end of the chain to quality inspectors. Scientific Management is the organizational model used by Ford to produce the famous model "T", introducing the assembly line. Compared to taylorism, Ford even believed that the worker had to be completely subdued by the mechanism of the chain: the assembly line set the rhythm of production, or, as we nowadays call it, *takt time* (cycle time) and the worker had to comply without questioning. A perfect model, with an uninterrupted *lead-time* would certainly not lead to warehouses with a low inventory turnover. And what about employee management? Concepts like *Team Building*, *Job Enrichment & Rotation* and self-accountability were not applied; in fact, workers often felt alienated in this system, an aspect discussed in Charlie Chaplin's famous film "Modern Times"; even the quality of products was not exactly up to *Six Sigma* standards, since these were checked by production line inspectors.

To be fair, this organization allowed a considerable reduction of the car's unit price, and Ford started selling the cars to the workers, who in the meantime saw their purchasing power rise thanks to the parallel increase of the gross domestic product.

1.3 The Birth of the Toyota Production System

Some authors describe the dawn of the Japanese industrial system almost like a philosophical myth; a concoction of elements connected to the rigid social system, the comparison between Shinto and the western philosophy of Cartesian origin,