# Framework of Training for Lean Service

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**Abstract**

*The direct applicability of human resource activities in Lean service, hitherto, a relatively unexplored field have been focused in this paper. The seven major lean principles have the potential of being applied for significant improvement in organizational performance and creation of congenial environment in the organization. Out of the seven principles, elimination of waste, thereby creating value-added service is one of the major strategic imperatives in the present scenario.*

*Training, one of the constructive subsystems of the HRD system, has the potential of playing an important role in realizing this objective. Lean training, typically characterized as mutual training with a holistic developmental perspective encompassing both trainers and trainees, is different from traditional training approaches. An attempt is made to identify the quintessential features of training initiatives for different levels of employees and propose some guidelines which may be advantageously referred to by senior management to design tailor-made lean thinking module.*

**Keywords:** *Lean Manufacturing, Lean Service, Lean Training, Lean Framework*

## INTRODUCTION

The business environment is changing at a blistering pace, and there is brouhaha amongst organizational leaders for embracing strategies for maneuvering comfortably in the rugged terrain. The phenomenal growth of service sector during the last two decades vis-à-vis the slump of the manufacturing sector led to the preponderance of studies by researchers

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and practitioners alike in search of organizational effectiveness. The development of human resources remain the pivot for sustainable competitive advantage of service sector companies as the employees are in constant and close touch with the customers.

Lean Manufacturing, initiated at the Toyota Motor Corporation (Bremmer & Dawson, 2003; Womack, Jones & Roos, 1991), has continuously improved its version of Lean practice under the banner 'Toyota Production System' (TPS) for world auto market domination (Olsen, 2004). Lean manufacturing is a multidimensional approach to manufacturing which encompasses a wide variety of management practices within an integrated socio-technical system dedicated to minimizing waste (Shah & Ward, 2003, 2007). The inclusion of the terms ''socio'' and ''technical'', support those who claim that it needs to be regarded as a ''culture'' which integrates both its technical tools and management philosophies (Birdi *et al.*, 2008; de Menezes, Wood & Gelade, 2010). The technical tools associated with Lean manufacturing are used to reduce waste in human effort, inventory, time to market, and manufacturing space. As a management philosophy Lean manufacturing is intended to change how people work by giving them more challenging jobs, greater responsibility and an opportunity to work in teams (MacDuffie & Pil, 1995; Womack, Jones, & Roos, 1990). The focus of Lean manufacturing in recent years has broadened beyond shop-floor tools to the Lean principles which incorporate the notion of value and waste elimination into the production system (Womack & Jones, 1994). Furthermore, Lean is a philosophy of leadership, teamwork and problem solving, resulting in a process of continuous improvement throughout the entire organization by focusing on the needs of the customer, empowering employees (Damrath, 2012).

Increased pressure on organizations to remain competitive in terms of their product cost, service, and quality, has led to the establishment of Lean manufacturing as one of the most widely used production systems, as its positive impact on organizational performance and competitive advantage has been widely demonstrated (Brown, Collins, & McCombs, 2006; Cua, McKone, & Schroeder, 2001; Fullerton & Wempe, 2009). As a result it has now extended beyond manufacturing into the service industry (Abdi, Shavarini, & Hoseini, 2006), the public sector and healthcare (Kollberg, Dahlgaard, & Brehmer, 2007), and knowledge work (Staats, Brunner, & Upton, 2011).

## TRANSITION OF LEAN MANUFACTURING TO LEAN SERVICE

Over the period of time, the concept of Lean has been constantly evolving; and according to Hines *et al.* (2004), the development of Lean concept occurred through four stages where every stage broadened the focus of Lean concept. From the '80s to mid '90s, lean concept was practiced within the boundary of assembly lines and shop floors emphasizing methods and techniques along with some vivid culture built around core lean values. Whilst mid '90s until recent years, lean borders are stretched even further to incorporate individual value streams including supplier activities, competitor knowledge and customer needs. The idea of "doing more with less" through lining up value creating activities in the most optimal sequence with as minimal interruptions as possible, attracted attention of manufacturing giants and service sectors alike (Womack & Jones, 1996).

In their seminal book *The Machine that Changed the World: The Story of Lean Production* Womack *et al.* (1991), stated that Lean thinking can be applied anywhere and to any kind of business; and that the basic principles of Lean are universally applicable, because Lean methodology is focused on the process itself and not on the process's output (f.e. Catterall, 2008). In manufacturing it is easier to implement Lean thinking due to the complete iteration of the processes, on the other hand, many scholars argue that the character of service businesses is very individual so that Lean principles cannot be implemented in the same way. The majority of the scholars endorse that the principles of Lean need to be adapted and tailored to the specific characteristics of the services to become essentially applicable in Lean service. In addition, Lean attributes in services add emphasis on customer communication, flexible yet standardized processes, quality consistency, and investments in workforce training. Overall, the application of Lean approaches in the services industry remains an appealing possibility.

Approaching Lean in a service environment is slightly different than in a manufacturing environment, but the principles of engaging all staff in identification and elimination of waste, looking at everything through the eyes of the customer, doing everything in a quality manner, standardizing processes and simplification are still valid. The complexity of dealing with multiple customers and with varying needs makes it harder and requires sound thought (Damrath, 2012).

Within the manufacturing industries there are seven principles that define Lean production (cf. (Karlsson, Rognes, & Nordgren, 1995) and (Ahlstrom, 2004) - 1) Elimination of waste, 2) Zero defects, 3) Pull instead of push, 4) Multifunctional teams, 5) Decentralization, 6) Vertical information systems, & 7) Continuous improvement. Other Lean principles are also found in literature, particularly cited from the research of Womack and Jones (1996), Liker (2004) & Dennis (2007). The common theme across principles identified by researchers defining Lean is that of elimination of 'waste'. One of the stumbling blocks to Lean is understanding the concept of waste. Traditionally, waste has been viewed as an object. In Lean Manufacturing, the term waste actually refers not to the physical material but rather the relationship of the resource to the end customer. Hopp and Spearman (2004) brought in clarity to the term 'waste' by explicitly distinguishing between the obvious 'waste' resulting from overproduction, waiting, transportation, inappropriate processing, excess inventory, excess motion, and defects, and the less obvious 'waste' resulting due to variability. The core idea is to maximize customer value while minimizing waste.

Analogous to wastes in a manufacturing environment there are also wastes in service environments. One of the major challenges in service organizations is developing the ability to recognize service waste. The seven types of wastes that can be translated to a service context (Ehrlich, 2006 as cited in Clarberg, & Malmqvist, 2010) are:

1. *Overproduction*: Can be "excessive screens on servicing systems, asking customers for unnecessary proof of claim, asking customers to call back during operating hours".
2. *Waiting:* Any delay occurring when one activity ends and the next activity begins (George, 2003) can be caused by telephone queues, slow response when using online services, waiting time caused by requests in need of authorization, and waiting for approval (Bonaccorsi, Carmignani, & Zammori, 2011).
3. *Unnecessary Motion:* Needless movement of people due to poor layout of service areas (George, 2003), can be physical movements that hinder productivity and also the act of searching for the right information among other employees.
4. *Inappropriate processing:* Can be created through using the wrong technology such as datasystems, but also through manual errors, adding more value to the service than what the customers are willing to pay for; f.e. reviewing results of activities (double checking), re-entry of customer data (Catterall, 2008).

5. *Unnecessary Inventories:* This indicates work in process, examples include back logs on customer requests, call transfers and unnecessary e-mails; any work-in-process that's in excess of what is required to produce for the customer (George, 2003); in services f.e. pending requests, queues (Tepsich, 2010).
6. *Transporting:* Unnecessary physical movements of materials, products or information (George 2003), carrying paperwork and moving materials between departments (Abdi *et al.*, 2006).
7. *Defects:* Concerns wastes generated by delivering the wrong information to the customer, usage of obsolete databases, rework, and errors when using online solutions to serve customers; any aspect of a service that does not conform to customer needs, f.e. data entry errors (George, 2003).

In addition to those traditional wastes some "new wastes" can be incorporated. Bicheno & Holweg (2009) consider the service organization from a more general point of view and include amongst other things waste of untapped human potential, waste of natural resources or waste of inappropriate systems.

All activities that are not directly transforming the product into the form desired by the user can be considered as waste. Like manufacturing, even in services, the core idea of Lean involves determining the value of any given process by distinguishing value-added steps from non-value-added steps, and eliminating waste (or *muda* in Japanese) so that ultimately every step adds value to the process.

## PERSPECTIVES OF LEAN TRAINING

As one of the constructive HRD subsystems, training can be a major driver of strategic initiative for successful implementation of Lean principles in services. Lean training can be utilized to address both identification of waste and also elimination of waste, thereby creating value in terms of proper cost and time management, quality and productivity improvement leading to customer and shareholder satisfaction.

The present article attempts to highlight the necessity and relevance of training as a strategic alternative in successful implementation of Lean approach in service. The focus has been to develop some suggestions for training module incorporating both the trainer and trainee perspectives. The implication of Lean training is conceptualized with the help of a model

to explain how training aspects can lead to organizational effectiveness through incremental improvements.

A successful lean improvement implementation (regardless as to whether it is enterprise-wide, or manufacturing processes, or administrative or service processes) requires three activities: guiding tools (i.e., value stream mapping), practical lean tools, and lean training/education programs for everyone involved in the implementation (Wan, Chen, & Saygin, 2008). Additionally, Lean training is essential in establishing a new mindset and culture that is crucial for a successful Lean implementation and thus serves as the foundation for all successful transformations (Wan *et al*., 2008).

There are many examples of Lean tool implementation without sustained benefit and these are often blamed on weak understanding of Lean in the organization. For successful implementation of lean service it is crucial that the strategies of learning Lean are tailored to requirements of individual service organization. Developing a Lean enterprise requires a strong commitment and in particular the top management and the line workers must be engaged in the implementation process. Unless the need of a change is sponsored (financially and in time and spirit) by the top management and transferred to all the employees, implementing Lean concepts is doomed to be a failure (Holmes, 2007).

An indispensible requirement is to involve the employees of the organization in the process of Lean implementation improvements. Lean concept is designed to develop teaching and learning through unique relationships between managers, supervisors, and employees with the aim of establishing a ‘‘learning bureaucracy’’ (Adler, 1990). Within this ‘‘learning bureaucracy’’ supervisors and managers are instructed to avoid making decisions for their subordinates and to answer questions with questions in order to create implicit knowledge (Spear & Bowen, 1999).

The managers and supervisors should act as change initiators and play a lead role in triggering, maintaining and controlling lean implementation. Being ‘Lean Leaders’ in true sense, they should continuously advise, review, correct and drive the knowledge. On the other hand, the shop-floor employees should focus on applying the Lean principles in the workplace as learned and explained by the managers remaining accountable for its sustenance at all levels throughout the organization as a whole.

Embarking on lean implementation is an endeavor to a new journey altogether – Lean environment requires a different style of management, different style of leadership and performance measurements, different

organizational structures, different thinking and different culture. To introduce and successfully maintain the 'living', 'dynamic' and changing Lean entity, the approach to training the employees with Lean principles and methodologies should also be different from traditional training initiatives.

Training on Lean implementation is a multi-faceted activity. It is not as simple as just creating a list of Lean tools and methodologies, and learning how to use them. It requires a holistic perspective – a total understanding of the Lean practices, philosophies, tools and procedures, adult learning process of theoretical classroom lectures and realistically oriented practical shop floor training, accountability for success or failure of lean implementation at all levels – particularly the group leaders, team leaders, managers and senior executives who are primarily responsible for training and sustaining the knowledge from one generation to the other. (Piatkowski, 2004).

The focus of 'multifunctional' Lean training is to develop a very uniform workforce who understand and interpret all the Lean principles in a similar manner without any disagreements or conflict with the original conceptualization of Lean approach. The emphasis lies with training the operators on minute intricacies of every function, learning through one-to-one hand generated notes or pictorials (popularly called Value Stream Mapping) and developing a systematic approach to problem solving with standardized way of observing, collecting and analyzing a real problem situation, documenting the current position and proposing improvements by identification and elimination of wasteful events.

The fundamental objective of the training initiative should be top driven, grass-roots deployed, and mid-management fueled. The objectives of lean training as enumerated by Marek Piatkowski (2004) are:

1. To create an understanding of Lean theories and principles.
2. To train and to identify roles and responsibilities of individuals responsible for implementing and sustaining specific Lean processes.
3. To develop a certification program of a Lean Practitioner.

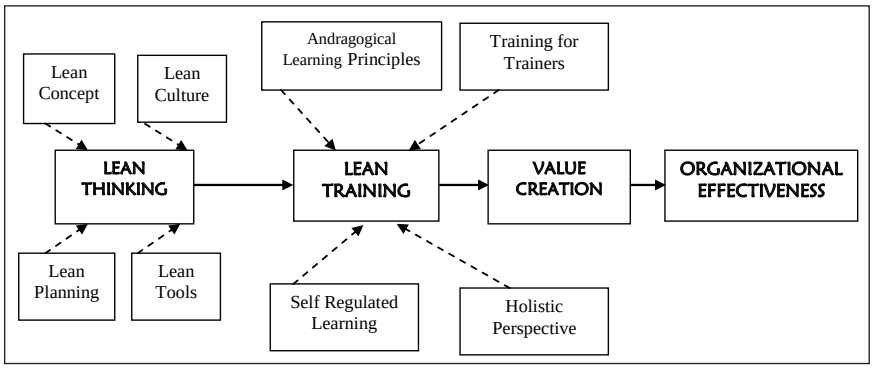
Lean training can take many forms, including lecture, demonstrations, hands-on activities, video clips, case studies, and Lean simulation games. All of these techniques can be effective and should be used in conjunction with other techniques. Traditional classroom teaching methods are not sufficient means to convince employees to truly believe in the new Lean

concepts and practices they are being taught. Simulation games have proven to be one of the most effective tools for teaching Lean concepts. They allow participants to physically see and experience, and thus truly appreciate, the benefits of the tools they have been learning about through lecture and other teaching techniques. Recently, computer-based simulation tools that can facilitate teaching Lean concepts have been introduced (Shannon & Fry, 2003; Yazici, 2006). One such Web-based Lean office simulation game [WeBLOG] was designed to demonstrate the effect of implementing Lean concepts in the office environment and on office processes by Kuriger *et al.*, 2010. Examples of similar lean office simulation games are Lean Zone Office (Visionary Products, n.d.), the Lean Business Simulation Game (Aster Training, n.d.), and the Mainland Simulation Game (NESTADT Consulting, n.d.).

## FRAMEWORK FOR LEAN TRAINING IMPLEMENTATION

In this research article the focus has been to develop a model together with the training module to provide a broad framework for training on Lean principles and ideologies.

**Figure 1: Lean Training Model**




The lean training model attempted to highlight certain training imperatives illustrated in Figure I. The role of andragogical learning principles is of paramount significance in organizations incorporating learning in action (Bloom, 1984) and self regulated learning with self-evaluation and goal setting (Zimmerman & Kitsantas, 2005) focusing on informal learning at work as a key component in continuing professional development (Cheetham & Chivers, 2001).

**Figure II: Training Module**

| Level | Objective | Trainees | Techniques | Content |
|---|---|---|---|---|
| **Level I:** Fundamental Level | Knowledge of Lean | Technical & Support employees, Supervisors, Executives, Team leaders, Senior managers | Class room lectures, case study, presentation | Knowledge of Lean tools & methodologies: JIT & PULL system, waste elimination, 5S, Kanban, Kaizen |
| **Level II:** Intermediate Level | Managing in Lean Environment | Supervisors, Executives, Team leaders, Senior managers | Activity based training, daily walk-about process (Management by Walking Around) | Leadership skills, Facilitation skills, time management, conflict & change management |
| | | Employees | Value Stream Mapping, On-the-Job Training, Job Instruction Method, Demonstrations | Problem solving, documentation & reporting, Visual Management |
| **Level III:** Advanced Level | Sustenance of Lean & Continuous Improvement | Supervisors, Executives, Team leaders, Senior managers | Simulation & Games, Project Management, Monitoring & Attitudinal restructuring | Develop artificial models, process flows, computer based simulated strategic games |
| | | Employees | Simulation games, project management, modeling, Lean Rapid Process Improvement Workshop | Solving simulation & projects management games, TPM |

A generalized training module (Figure II) indicating objective, content, techniques and employees/ trainees of the organization for whom it will be most beneficial has been developed which can be tailor-made as per specific requirements for different types of service organizations.

Using training just for the sake of training is not going to necessarily produce positive results if the training is not correlated to the overall strategy of the organization (Delaney & Huselid, 1996). Because of financial constraints, global competition and increased pressure from the management of the organization, the value of lean training has to be measured with the help of HR Metrics (hard measures) to test pre and post learning status. It is highly significant to evaluate lean training with the help of return on investment aspect that adds financial dimension to the evaluation process (Phillips, 1996a, 1996b; Swanson, 1998). This is of utmost importance for evaluation of lean training which focuses on minimizing cost and adding value.

## CONCLUSION

Lean is a collection of logical tools, practices and methodologies that have to be implemented in a certain sequence in order for them to work. When Lean implementation is the target of the organization they primarily focus on either changing the style of management or change the work pattern within the organization. Successful Lean implementation depends on the way the workforce is trained to learn the Lean. Some tools and methodologies of Lean can be presented in a classroom; some must include exercises, a practical portion of training and the others can be learned only by applying them - learning by doing. The role of the leaders within the organization is the fundamental element of sustaining the progress of Lean thinking. Lean learning process may be evaluated with the help of mystery customers who may evaluate the service organizations based on overall service attributes and suggest future training endeavors. Experienced Lean practitioners insist that the transferring of an organization's culture down and across the organization can only happen when experienced Lean practitioners continuously coach and guide the less experienced Lean champions. The challenges in implementing Lean management in services could be mastered with detailed upfront planning, transformational leadership, holistic training perspective with its root in andragogical learning principles, and, above all, a shared vision.

The following case study highlights real life convergence between Lean thinking and training ensuring statutory compliance as well as value creation leading to customer delight.

## CASE STUDY

XYZ Co. Ltd is a Multispecialty Healthcare Providing Unit dedicated to achieve new heights in healthcare by providing world-class service to the patients and health customers. The organization applied for certification under NABH (National Accreditation Board for Hospitals & Healthcare Providers) to establish their quality standards in all the services provided by the hospital. Aiming to implement Lean principles the hospital focused on waste reduction using 5S (Sort, Set-in-Order, Shine, Standardize, Sustain) as the Lean tool.

The hospital started with formal introductory meetings with all senior managers, executives and departmental heads clearly stating the intention of being 'Lean'. The organization came up with detailed training plans attempting to encompass all hierarchical levels in walking the lean journey. The hospital planned to go ahead with the first phase of the training programme, i.e. identification of waste; starting with the departments like pharmacy, laboratory, radiology, in-patient focusing departments and critical care units.

The senior managers initially made regular and repetitive visits to every department to observe the wasteful events or operations in the various process flows. With the aid of value stream mapping the hospital moved to the second phase of designing training models for the employees. The training initiative was planned on the basis of certain underlying strategies that can be summarized as follows:

1. Application of 'Sort' sub-practice in the pharmacy section ensuring value creation through better customer satisfaction and revenue gain with zero bounce prescriptions. The training focus is on regular audit of stacks of stock to identify reorder levels, slow moving stocks that need to be mobilized and hundred percent compliance of non-expirees (medicines).
2. Initiating the 'Set-in-order' sub-practice in the laboratory section to ensure best result in medical tests and examinations conducted in the laboratories, quality assurance with compliance to standard medical protocols and health for customers and successfully managing customer retention and revenue generation thereby adding value

to hospital reputation. The training focus is on regular equipment and apparatus maintenance, weekly stock check to speculate business and utilization of all reagents to avoid waste of non-usage and biomedical waste management.

3. Application of 'Standardize' sub-practice in the radiology department to ensure high quality diagnostic clarity through machine maintenance and maximum safety for employees and patients creating value in terms of customer safety and health. The training highlights proper machine documentation and regular maintenance, knowledge of personal protective equipment (LED jackets, TLD badges etc.) for employee and patient safety against radioactivity and compliance to safety standards prescribed by BARC (Bhabha Atomic Research Centre) and AERB (Atomic Energy Regulatory Board) guidelines.
4. 'Standardize' and 'Shine' sub-practices are applied to operation theatres and intensive care units to support urgency for life care with utmost efficiency and creating the competitive edge by providing best quality service and achieving higher survival figures in the most critical area. The training focus is on periodic preventive maintenance, personal and patient safety and emergency handling techniques.

The successful Lean implementation heavily depends on the understanding of core idea of Lean thinking and finding its application in individual work area. Apart from learning the basic tenets of Lean concept, the training should be primarily designed to make the employees identify the non-value adding events in the workplace and develop sense of responsibility to minimize the wasteful events. The senior managers should play the role of 'Lean coach' and lead the entire Lean effort from the front. They should provide support to the process of implementation through regular monitoring and constant motivation to help employees at all levels contribute their best to 'Sustain' the Lean think.

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