

A Framework to Improve Performance of Firms Through Implementing Lean Six Sigma Strategies During Recession

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Abstract : Today's global business environment essential requirement to a company's reduction of wastes, reduction of variations, reduction of lead time and innovative feature quality product with minimum cost. That strives to improve customer satisfaction, breakthrough strategy to solve problems with fastest process speed. Lean six sigma(LSS) methodology is framed on the basis of business and competitive excellencies of companies strategies.LSS Guidelines helps to countries as a preventive tool in recession time and framework focused how to follow the Lean six sigma path to improve performances.

Keywords: Lean six sigma(LSS); LSS Guidelines; recession time

INTRODUCTION

Change of traditional manufacturing business excellence towards lean six sigma practices promulgate to companies in high profit generation, vendor satisfaction, consumer satisfaction, employees satisfaction, productive improvement, wastes reduction substantially improves. When the recession hit local or global market lean six sigma framework can be act as a survival tool. Garrison, 2001 discussed unknowingly underestimating the risk sometimes investors overinvest the return. Individual investor cannot predict future prospect because they work on their economic decision on the basis of current prices .The recession affected countries locally or globally .However time variation and magnitudes of downturn varied substantially around the world. Through this paper attempt has been made to proposed how lean six sigma work will help during recession.

Recession and its implication

Recession is that when in two consecutive quarters national gross domestic product (GDP) of a country decline. The recession affect stock exchange panic and wiped out millions of investors in downturn. Causing steep declines in outputs of firms, financial institutions, severe unemployment, wages fell and buying power decreased. Sometime recession start from a country and highly effect worldwide to other countries market in term of GDP, employments, developments, government policies etc. Tirole J,1985 Observed sometime assets that valued above their intrinsic value without sustainability, rational bubble can be originated. Overvaluation of the assets eventually burst, before gain return basic price.Young, 2009 discussed marketing strategies do not slow down during recession, while customer had shrink in market. Top oil producing countries United

state, Russia, Saudi Arabia and Iran like countries dismal due to continuously decline of crude oil prices worldwide and adverse effect on stock-exchange, productivity and national growth. Kocak and Edwards, 2005 observed pivotal confront of entrepreneurial behavior and inter-firm co-operation for small firms seeking growth in a volatile, recession-hit environment. William patric leonard, 2014 studied failing to recognize the inevitability of the next recession and to prepare for its uncertain arrival is a neglect of fiduciary responsibility. Cinzia Alcidi and Daniel Grossy,2011 observed stematic comparison between the great depression and the great recession ,fiscal policy went to the limit of what was possible under the conditions as they existed then in US banking. Martin Reeves,2009 examines recession-specific strategies designed to drive growth and ensure that a company survives. Scott Latham and Michael Braun, 2011 review distils disparate scholarly works on firm behavior and recessions to provide a systematic appraisal and review of what people know and do not know about managing firms through economic downturn.

Succinct on recession

Recession is severe economic catastrophe .It had been observed by committee of economic experts basis of economic indicators employment , personal income,industrial production, quarterly GDP,capacity utilization,inflation fall, bankruptcies rateand many mores. National bureau of economic research,U.S.A. said that USA had 32 recessions and mostly lasting 10months.Although well known first deepest recession is 1929-1933 when economy downturn 33 percent initially originated from United states and quickly spread out in all over world.The second great recession was 1937-1939 and gross domestic product was decline18.2 percent.United states and other countries faced after a certain period stagflation when economic growth decline and unemployment rate is increases .Therefore, to promote the economic growth central banks of countries, follow theory of

money supply to control the demand and supply without terribly concern to inflation. Early 1990 the great recession of japan was balance sheet recession, causes bursting of economic asset price bubble in that investors ,consumers and industrialist pay down debt instead of purchase or spend. Blinder and Reis, 2005

investigated during crises might be possible to control macroeconomic impact by the federal reserve after the dot com bubble. Brunnermeier et al., 2009 observed financial regulation should be macro prudential. Therefore ,highly rated AAA is very safe respect to financial downturn. Indicator that are responsible for the recession is systematically shown in figure 1.

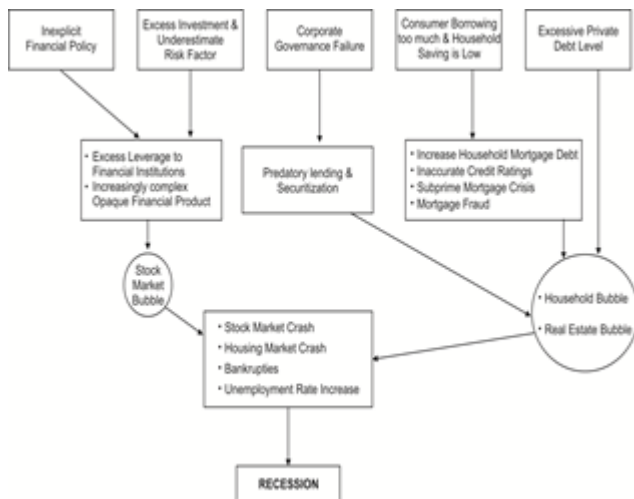


Figure 1. Frame work of recession

Investors around the globe are catching their breath after trading on black monday 24 august 15, that plunge wiped out in many years gains .China is second biggest economy of world , hiccup downturn in shangahi stock exchange 8.5 percent impact inflation on Dow jones 3.6 percent, londons'FTSE-100 down 4.6 percent, Nikkei 4.6 percent, Hang seng 5.2 percent, Australian index 4.1....and many more countries. Downturn stock market starting from china now pondering whether today marks the start of a new and alarming phase of the crisis which began some eight years ago. Rattle widespread investor fears about the terrible drops in stock market globally. Cod U ciprian ,2011, discussed world fiscal crisis focused on the investment activity also focused on how the fiscal crisis forced on the investment activity in local and global level. Mario sarcinelli,2010 analyze that hedge funds may provoke from economical crisis.

OVERVIEW JOURNEY OF LEAN SIX SIGMA

Lean

Lean is a system of measures and methods which are taken particularly competitive state throughout the company (Warnecke and Huser's, 1995).Lean is a systematic approach to identify and eliminate waste through continuous improvement, flowing the product at the pull of the customer in pursuit of perfection (Womack at.al.1990). Lean production introduced with the term “bundles” to capture four categories of inter-related and internally consistent lean practices: Just-In-Time, Total Preventive Maintenance, Total

Quality Management and Human Resource Management (Shah and Ward,2003).Lean production is the combined factors accountable for the superior manufacturing performance and the resulting competitive edge of the Toyota Production System (TPS) over other automobile manufacturers(Holweg,2007).The principle view of lean production is evidenced as a model where the persons assume a role of thinkers and their involvement promotes the continuous improvement and gives companies the agility they need to face the market demands and environment changes of today and tomorrow(Alves et al. 2012). Indicators that made lean environment are as

- Required to implement 5S,Kaizen,poka-yoke etc.
- Synchronize business-to-market
- Reduction in operative costs
- prolonged customer expectations
- Manage the global competition
- Streamline outsourcing processes
- Improve business performance visibility
- Optimum utilize energy equipment and people in the most productive ways.

Six Sigma

The approach is strategic process selection to reduces variations. Brady and Allen, 2006 investigated that six sigma is statistical analysis and its measuring index is defect per million opportunities. Six sigma is originated at Motorola in early 1980,that drastically improve the product quality, process, customer satisfaction and reduces operating cost (Harry and Schroeder, 2000).This technique is statistical method used to reduce waste, improve financial performance, decreases fluctuations and increases customer satisfaction (Revere et al., 2004).Six sigma understand the variation and solve the task problem by using DMAIC(define, measure, analyse, improve, control) approach, that is philosophy of continuous improvement(Shewhart 1931, Shewhart and Deming 1939, Harry and Schroeder ,2000).The comprehensive mapping of tools and methodology applying to lean ,six sigma and lean six sigma is shown fig.2.

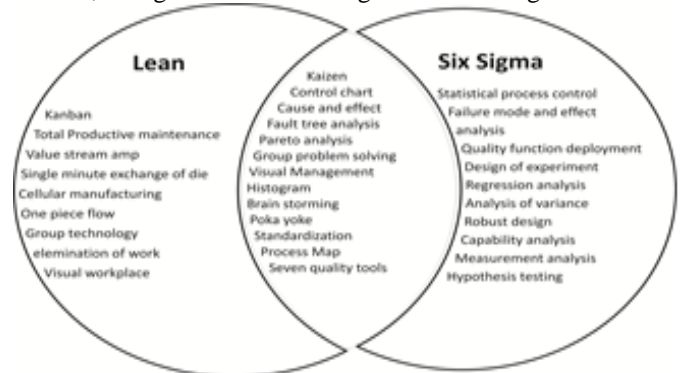


Figure. 2. Specific common tools to implement lean, six sigma and lean six sigma

Lean Six Sigma

Earlier lean and six sigma approach work differently, It had seen in last decade that integration of lean and six sigma leads towards business excellencies in most effective, productive and economical manner.Although literature of lean six sigma are very few, authors trying to extent it in this

paper. Where lean manufacturing is focuses on process improvement through removal of wastes, six sigma emphasizes reduction of variation in system. LSS approach are not only reduces cost and system performance but optimizes the organization capability and furthermore, improve effectiveness(George et al.,2004).Authors (Everton D. et.al.,2014) has discussed distinction in model of lean,six sigma and LSS relation to the importance of the decision area to achieve best performance in competitive environment.

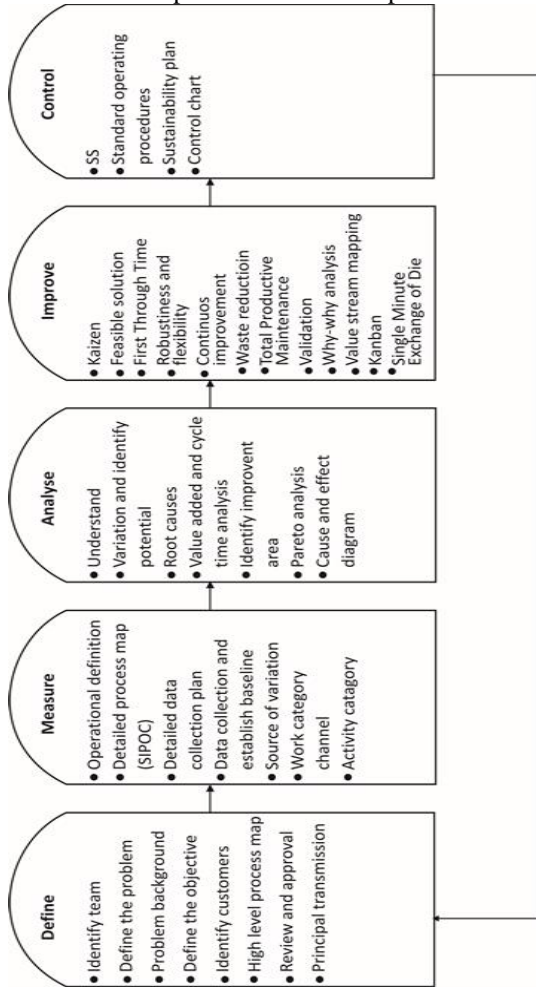


Fig.3.Framework of Lean six sigma approach
 Lean six sigma implementation strategy in airlines(Alexandros G. & Loukas T.,2012),telecom manufacturing (Roy Andersson et.al.,2014) has been discussed and found LSS offers a general direction for organizational leaders, managers and employees and lead towards effective improvement in all manner. A comprehensive framework incorporated with Lean sigma is shown in the figure 3.Lean Six Sigma have business process capability to resolve the ongoing economical uncertainty and challenging market conditions and may be the upcoming recession or depression problem of countries .They can achieve first time right(FTR) quality performance ,better bussiness relationship in control way and to reach excellency in bussiness. Dell, Amazon, Motorola ,bank of America, Xerox Corp.,Johnson & Johnson, Chevron, Aramco, Texaco, IBM, Baker Petroilite and Halliburton, Reliance Petroleum, Oil and natural gas corporation,India

and Indian oil corporation accelerate their business performance through Lean Six Sigma tools and improve manufacturing quality to no more than 3.4 defects per million opportunities.A comparative key factor in table 1 that shows the basic differences between Lean and six sigma approaches.

Table 1: Comparative key factors of lean and six sigma

Poka-Yoke	Mistake proof tool to prevent error
Kaizen	Focuses on continuous improvement area (Womack et al.,1990)
	Pull system of product rather than push system
Kanban	Literally define,analyze,measure,improve and control the problem proactively rather than reactively
DAMIC process	Measurement of performance to meet customer expectation
Critical to quantity(CTQ)	Process of changing production line in flexible manner quickly(Worley, 2004)
Quick changeover	Process strategy supply material when it needed to reduce inventory cost
Just in time	Sequencing family product to optimize production
Cellular manufacturing	A system that proactively maintain and optimize entire production and quality process
Total productive maintenance	Group of expertise from cross functional department
Mulfuntional team	A step that limit the entire process line
Bottleneck	Assessment to meet performance of a process against its specifications
Process capability analysis	Unnecessary data clouding and clustering in IT network system
Digital waste	To measure processes, product and services for best practices
Benchmarking	Uncertainty involve in process identify and manage
Risk management	Graphical representation of data distribution
Histogram	According to this principle high priority are only few
Pareto analysis	Work flow process provide clear understanding of process
Process mapping	Process for development and implementation as per technical standard
Standardization	Fishbone diagram emphasizes on possible cause of problem
Cause and effect analysis	Quick machine setup time

METHODOLOGY

Author regularly touch with economical data of market and technology through newspaper artical,media,research journals,magzines,internet and industrial personals regarding

research work on “select issues in lean manufacturing”, as he found out hiccup plunge in stock market of United States of America or China impact globally sell-offs in Europe, Korea, India, Hongkong, Australia and many more countries. He has done a brainstorming session with managers, dealers, vendors, consultants and executives of financial houses, state bank of India, Reliance Mutual Fund, Sundram Finance Group, Geojit BNP Paribas, Aditya Birla Finance in Delhi-NCR and Oil and Natural Gas Corporation (ONGC) Dehradun. At the end summarized the collective abstraction view in this paper. The authors depict lean six sigma terminology in table 2.

Table 2: Lean six sigma Terminology

Poka-Yoke	Mistake proof tool to prevent error
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LEAN SIX SIGMA PREVENTIVE GUIDELINES FOR COUNTRIES DURING RECESSION

- Lorenzoni, 2007, depict that collateral drops, forces the firms to reduce their investment in properties, consequently further drop in the value of their collateral. There is a “pecuniary externality” as investor do not identify good or bad time investment. Control chart can be helpful in business strategies to assess control stages and monitoring improvement areas to affirmative sustainable success.
- Kiyotaki, 1998, highlights recession can overwhelm the high productivity firms, because they received most credit before the recession and have minimal debt capacity left. Poka-Yoke is error proofing technique work on principle “prevention” is better than detection it intervene to block undesired outcomes rather than controlling casual factors.
- Design for six sigma (DFSS) can fulfill customer expectation and optimize design processes.
- According to the quantity theory of money, an increase in the money supply tends to cause inflation, while a shrinking money supply tends to cause deflation. It was observed that when any country economy, employment and development strengthen, other countries threaten to drag it down. Because USA has powerful economy Investors have pushed USA stocks to record highs and invest money in USA companies due to expected pace of profit although USA importing product from China and other emerging countries due to glut of underused companies and not consuming their own product. U.S. Census Bureau report said retail sales in the United States decreased 0.90 percent in December of 2014, DAMIC methodology having pace to strive solve problem that may causes to upcoming recession of strong economic power country.
- Lean supply chain can significantly balanced cooperative relationship and competition between countries through synchronized production and delivery by suppliers.
- Pareto’s approach can be helpful to prioritize the possible change due to recession, identify root cause of each problem through brain storming session, 5ways, cause and effect analysis and root cause analysis that can resolve by taken necessary lean six sigma approach.
- Fault tree analysis examines proactively process failure. Approach start with recession background throughput time, breaks down into network series of responsible causes of failure, weaknesses of system, human error, ... and structured into certain logic and rules. Through logic diagram find out combination of causes of failure results are quickly identify the critical path and preventive action can be taken immediately through risk analysis approach.
- Value stream mapping (VSM) approach optimize entire process flow. This can be done in two steps firstly draws current state map through identifying lead time, throughput time and wastes in process. Second step draw future state map by applying Kaizen, Poka-Yoke, total productive maintenance and other lean manufacturing tool. Optimization of production process can revive economical benefits.
- Baldrige criteria helps to improve business excellencies of entire organization that identify non value added wastes, performance results through regular monitoring

of process and improve results and effectiveness of companies so that company straighten and focuses on improvement areas.

CONCLUSION

We propose a framework of lean six sigma that may be helpful to accelerate slack economic growth and improve stagflation in ongoing situation. Typically, countries trust on specialist team opinion and deterministic approach that has its own limitations. Other limitation is that it does not incorporate uncertainties of business strategies during recessionary period. The end results assimilate framework, methodology and guidelines have optimal capability to strengthen the business processes ,share market, gross domestic product, household market and employment rate.

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