Lean Agility Implementation and Process Optimisation Decisions

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***Abstract*--Organisations face many challenges in their battle to survive in the current economic climate. A major challenge facing an organisation is the need to change and change rapidly to remain competitive. This imperative to change can be categorised as a key to survival.**

A major change agent in the current economic climate is the optimisation of resources and business processes. Consequently, optimisation has become an essential part in the strategy for survival. An important prerequisite in achieving optimisation is the elimination of waste and as a result adding value to business processes, products and services companywide. Recent research postulates that to be successful, organisations must implement strategies to boost process optimisation objectives that achieve customer satisfaction and competitiveness. This paper explores and investigates the interrelationship between lean agility implementation and process optimisation decisions. It particularly focuses on the impact of lean application in terms of speed, flexibility, reliability, quality and cost in an attempt to create value to survive and attain customer satisfaction.

I. INTRODUCTION

The fundamental differences between lean and agility paradigms lie in the ability to reconfigure the business processes focusing on customers' expectations and market opportunities. This implies making dramatic changes in organisational structures, management performance styles, workforce and South African union involvement, rapid product development, supply chain and logistics processes and systems, marketing and sales processes and all other processes impacting on lean and agility. [8] [35] [36] [40]

To align lean and "business competitive priorities" requires agility and business should rapidly adapt and be cost efficient in response to changes in the business environment. This can only be maintained by ensuring that goods and services meet customer demands. Due to economic changes in the business environment, steps should be taken to ensure that agility incorporates competitive advantages and capabilities concepts such as (1) flexibility, (2) reliability, (3) quality, (4) speed and (5) cost effectiveness. [22] [24] [33] [35]

The key requirement in achieving competiveness and success is the identification and utilization of critical factors impacting on a complex business system. Therefore, finding a balance between adaptability, coordination and versatility in a productive and cost-effective way is of critical importance for success. [6] [19] [32]

II. LEAN MANAGEMENT

The objective of lean management is maximising customer value whilst reducing waste. The key is to manage lean principles enabling organisations in achieving their goals from various resources that are available through the process of lean synchronisation. [39] This practice helps to minimise expenditure (cost) and increases the value of manufactured goods or services. It also identifies activities or processes that require optimisation as part of continuous improvement, minimisation of cost and time in order to create value. Therefore, the management of lean objectives becomes the target of the elimination of waste. [1] [9] [10] [30]

Of utmost importance is when organizations undertake process improvement actions, management should institutionalize and empower all employees according to lean principles. In essence organisations in an effort to become more productive, competitive and customer aligned, should focus and rethink how "work" is to be accomplished with particular reference to lean agile operational systems. Furthermore, this calls for continuous improvement teams which should be formed to address quality improvement and institute a process of problem solving. The benefit of these teams includes higher quality, productivity, greater work satisfaction and cost effectiveness. [4] [9] [19] [35]

The ultimate objective is to be competitive and to ensure a smooth, rapid flow of materials and work through a system. This in itself depends on how well lean managed achievable goals aimed at improvement are supported in terms of (1) flexibility, (2) reliability, (3) quality, (4) speed and (5) cost effectiveness. [11] [33] [34]

III. RESEARCH PROCESS

In order to measure how effective lean agility implementation and process optimisation decisions a measuring instrument were developed to measure the effectiveness of lean implementation and process optimisation decision making within organisations through the identification of fourteen (14) critical factors measured according to a Likert scale. Critical analyses of the results obtained identified and assisted in the development of knowledge framework. This framework clearly assisted in establishing an understanding of lean agility and process optimisation.

Furthermore these factors assist in compiling a framework and provided solutions to lean agility and process optimisation. The basis of this 'framework" will also enable organisations to measure an organisational readiness and

capability to implement lean in order to optimise process optimisation.

The primary objective of the research is to develop an analytical measurement instrument evaluating an organisation lean agility and process optimisation capability, and performance based on factors according to:

1. Measure on a specific scale, within identified critical factors an organisation readiness to implement lean agility;
2. Measure on a specific scale, identified factors process optimisation decisions;
3. Measure the variance applying gap analysis to determine optimisation decisions.

The research focused on organisations, immaterial of size from manufacturing and service industries identified claiming to apply lean agile and process optimisation techniques. The main classification being inclusive of all fourteen factors identified in these organisations. It therefore excluded all organisations that do not fit the above profile.

In order to ensure that the research is focused, systematic and scientific, the following research process is followed: [25]

1. Exploring valid research question(s)
2. Measurement instrument development
3. Data collection design
4. Sampling design
5. Data collection and preparation

The researcher convincingly identified all possible factors that might influence any particular condition or phenomenon impacting on the research.

The research clearly revealed that lean and lean systems affect whole organisations. This consequently requires that organisations should strongly consider their competitive priorities, advantages and capabilities. They should therefore be agile in terms of lean and focus on eliminating continuous internal and external waste and ensure linkages between core and supporting processes and customers as well as their suppliers. [40]

The research involved the identification and determination of the interrelationship between dependent and independent variables impacting on lean agility in terms of competitive priorities and capabilities.

This paper focuses on research results achieved, which convincingly identified the interrelationship (correlation) and effect of the relationship of factors impacting on and influencing lean agile and competitive priorities and capabilities such as flexibility, reliability, quality, speed and cost. [22] [33] [34] [35]

In true research, the researcher manipulates the independent variables and examines the effect it has on other dependent variables. [7] [23] [40]. The research mainly focused on Business Process Capability (BPC). It embarked on a comprehensive formal descriptive study enabling the researchers to draw conclusions from sample data using a quantitative measurement instrument utilising statistical data. The research involved the study of the cause and effect relationship of dependent and independent variables impacting on lean agile and competitive priorities. The research identified possible factors that might influence any particular condition or phenomenon impacting on lean and competitive capabilities and priorities. [8] [40]

IV. RESULT SUMMARY

A. Factor Items - Pearson's and Cronbach's Alpha Results

The research results indicate the importance and interrelationship/correlation (impact thereof) of lean agile and competitive priorities. The study emphasizes the importance of determining the status of an organisation to be able to consider lean agility as a strategy. The assessment and measurement focuses on 14 broad spectrum critical factors and sub-items. See Table 2: Factor Description. Critically analyzing all data by means of Pearson's correlation and Cronbach's Alpha results enabled the researchers to determine if there is any interrelationship, relevancy, validity, reliability of factor items. The following factor items were included in the study: [37] [38] [26] [27]

i. Corporate strategy, business strategy, governance policies and procedure formulation;
ii. Process optimisation, process improvement, as part of process optimisation strategies, process improvement strategies, process performance objectives, customer satisfaction and competitiveness;
iii. Standards and measurements to evaluate and assess business processes against appropriate standards,
iv. Process standards and measures, process and product design. [15] [16] [17]

B. Pearson's and Cronbach's Alpha Result Output

Results obtained from statistics of 14 factor items show a clear global picture. The statistical results using SPSS Output (Table 3) show that all factor items have a high Cronbach's Alpha reliability coefficient indicating a good internal consistency between the factors items measured. It is therefore accepted that all 14 factor items measured according to the underlying (or latent) construct are relevant, valid and reliable. [40]

TABLE 2: FACTOR DESCRIPTION

1	The organization process optimization vision and strategy is in place as part of the BPC strategic plan.
2	The organisation vision and strategy for process optimization is in place as part of the BPC strategic plan.
3	The organization applies process optimization strategies to increase process capabilities.
4	Process improvement strategies are defined from implementation, through the supporting strategy to the driving strategy.
5	Process optimization strategy defines process performance objectives that effect customer satisfaction and competitiveness.
6	Lean process and synchronization strategy as part of business process strategy.
7	Quality – doing things right and providing error-free goods and services that are fit for purpose.
8	Cost of quality measurements are applied from end-to-end processes.
9	All stakeholders understand the "principles" of cost of quality.
10	Speed – doing "things" fast and minimization of time.
11	Dependability – doing "things" on time and keeping of delivery promises.
12	Flexibility – ability to adapt processes to cope with changes.
13	Doing "things" cost effectively.
14	Elimination of waste – under or over utilization of resources.

TABLE 3: RESULT OUTPUT

	INTERCORRELATION														Total Inter-Correlation	Cronbach's Alpha N=14
Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
1	1.00	.938	.916	.881	.893	.695	.630	.649	.674	.626	.698	.609	.615	.734	0.853	0.971
2	.938	1.00	.891	.881	.903	.709	.657	.632	.680	.630	.677	.567	.608	.705	0.844	0.971
3	.916	.891	1.00	.881	.894	.659	.604	.634	.635	.604	.648	.528	.545	.704	0.813	0.972
4	.881	.881	.881	1.00	.920	.705	.623	.619	.687	.596	.675	.639	.668	.692	0.843	0.971
5	.893	.903	.894	.920	1.00	.682	.659	.665	.750	.654	.679	.638	.669	.694	0.866	0.971
6	.734	.705	.704	.692	.694	1.00	.785	.859	.755	.650	.665	.698	.665	.734	0.876	0.971
7	.695	.709	.659	.705	.682	.785	1.00	.799	.790	.730	.841	.843	.770	.820	0.800	0.972
8	.630	.657	.604	.623	.659	.859	.799	1.00	.718	.735	.669	.683	.669	.720	0.834	0.972
9	.649	.632	.634	.619	.665	.755	.790	.718	1.00	.765	.821	.799	.768	.784	0.848	0.972
10	.674	.680	.635	.687	.750	.650	.730	.735	.765	1.00	.812	.797	.830	.809	0.833	0.972
11	.626	.630	.604	.596	.654	.665	.841	.669	.821	.812	1.00	.890	.784	.829	0.870	0.971
12	.698	.677	.648	.675	.679	.698	.843	.683	.799	.797	.890	1.00	.831	.879	0.814	0.972
13	.609	.567	.528	.639	.638	.665	.770	.669	.768	.830	.784	.831	1.00	.928	0.851	0.971
14	.615	.608	.545	.668	.669	.734	.820	.720	.784	.809	.829	.879	.928	1.00	0.831	0.972

1. Process Optimisation Cronbach's Alpha

The Cronbach's Alpha using SPSS Output for factor items = 0.971. All fourteen (14) factor items have Cronbach's Alpha values that are greater than $\alpha \geq 0.80$ and are accepted as relevant, valid and reliable.

2. Pearson's Correlation

a. SPSS Output results measuring reliability and internal consistency indicate that all factor items are to be considered consistently internally correlated. The results obtained on all factor items indicate an intercorrelation relationship and no factor item Pearson's coefficient at less than < 0.50. Overall the Pearson correlation results obtained indicate a relatively high correlation amongst all items suggesting that they are measuring the same construct within.

b. However, a concern has been identified as it seems that organisations do not apply process optimisation strategies to do "things" more cost effectively or eliminate waste in terms of under or over utilisation of resources.

V. LEAN AGILE PROCESSES

To become "agile" and supporting, dedicated improvement goals as set out should focus on eliminating all waste. According to the research, lean should ensure the elimination of waste as it aims to meet demand instantaneously and ultimately achieve customer satisfaction. Waste therefore contributes to underachievement of the capability and performance and impacts negatively on flexibly, reliability, speed, quality and cost. [1] [13] [28] [37]. However, the objective is to become agile in such a manner that it ensures the rapid flow of products and services according to customer needs, in exact quantities, when and where needed, at the lowest possible operating cost. It requires that items flow rapidly and smoothly through processes, operations and supply networks. [3][13] Therefore, lean must be able to be applied whenever organisations focus on competitive priorities and capabilities in (1) flexible, (2) reliable, (3) near perfect quality, (4) speedy and (5) cost effective ways. [11] [12] [14] [18] [29] [28] [33] [35]

Of importance is to become agile by means of applying lean principles to all "waste" which must be eliminated. It is of utmost importance that organisations and managers must take corrective measures to reduce, control or eliminate any problems and develop a continuous improvement system focusing on the reduction of operating cost and improved effectiveness of business processes. [3] [5] [13] [35] [36]

For organisations to obtain a competitive advantage, their systems should have unique advantages over the competition.

The key idea is to create customer value in the most efficient and sustainable way. Organisations should therefore focus on competitive factors such as (1) flexibility, (2) low cost, (3) delivery speed, (4) product flexibility, (5) volume flexibility, (6) design quality, (7) product reliability, (8) quality conformance, (9) customer service, (10) new-product introduction/design, (11) innovation and (12) delivery. These factors collectively affect operational and key performance objectives. [14] [16] [20]

Furthermore it is critical that organisations should make strategic decisions regarding competitive priorities and capabilities when implementing lean. This forces organisations to strategically govern activities and the deployment of resources. Of utmost importance is that there should be an interrelationship between competitive capability and operational performance as this is the only way to measure agility against current performance and goals. [22] [24] [39]

A. Standard Setting Process

Lean operations identify customer values by analysing all the activities required to produce the product and service. It then optimises the entire process from a customer perspective by removing waste and delays.

This requires that lean operations and production objectives be translated according to process designs. The objectives and benefits of "good" process designs are achieved when progress or flow is achieved through a series of activities. This is achievable through competitive and operational performance according to process design objectives which include quality, speed, dependability, flexibility and cost. [21] [24]

This leads to specific phases of implementation:

Phase 1: Designing and managing processes by means of developing process strategies, analysing processes, managing quality, planning capacity, managing process constraints and designing a lean system.

Phase 2: Designing and managing supply chains by designing effective supply chains, integrating supply chains, locating facilities, managing inventories, forecasting demand, planning and scheduling and planning sufficient resources. [25]

The success of lean agile and improvement strategies lies in the ability of business processes to perform at a desired level of performance and excellence. This can only be achieved if proper measurements of performance were made against defined standards, namely:

1) Performance standards should be determined and included in all business processes during all appropriate stages of business process capability measurements;
2) Performance standards as well as the responsibility and accountability of all stakeholders regarding set standards on all businesses processes are formulated;
3) Performance standards are set and should be properly communicated and understood throughout the entire organisation and supply chain. [25] [26] [35]

B. Process Improvement

Enabling organisations to optimise processes depends on process improvement. The reason for this is that "new" competition occurs. It must be noted that every entity in the organisation has its own identity and is connected to a specific process. Organisations should focus on satisfying internal and external customers and to achieve this requires that competitive capabilities such as cost, quality, time and flexibility dimensions must be complementary. Process capabilities and continuous improvement strategies must be developed to close gaps ensuring that lean strategies are achievable and maintained. [27]

Process improvement is a systematic approach whether the objective is to reduce cycle time, improve product or service quality, or improve productivity and efficiency. If organisations wish to remain competitive they should be visible, proactive and constraints under which they operate must be identified in order to exploit capabilities. [2] [27]

C. Factors Affecting Lean Agility

One of the biggest challenges today is to ensure that overall performance improvement takes place within an organisation. This emanates from improving processes and strategies to ensure survival. When processes are in place and implemented, process performance results enable organisations to determine the capabilities of their processes. It forces organisations to strive towards implementing lean. This leads to the understanding and application of how well the organisation performs. [3] [28] [36] [37]

To ensure lean agility, an organisation**'s** optimisation vision and strategy must be in place. It requires process improvement strategies that define the implementation and supporting strategies to boost process optimisation objectives that achieve customer satisfaction and competitiveness. Strategies identified in the research are as follows and competitive priorities in relation to lean are illustrated Table 1:

1) Quality of doing things right and providing error-free goods and services
2) Cost of quality measurements from end-to-end processes
3) Stakeholders understanding the "principles" of cost of quality
4) Speed of doing "things" right and fast the first time and keeping delivery promises
5) Flexibility and ability to adapt processes to cope with changes
6) Cost effectiveness
7) Elimination of waste of resources
8) Lean process synchronisation strategy is part of BPC strategy. [38][39]

The solution to the above lies in an analytical instrument measuring lean versus competitive priorities and capability performance. Therefore, it requires a measuring instrument that assesses the interrelationship of the above in organisations or business units to establish if they are successfully applying lean agile, continuous improvement in an attempt to achieve capability, performance and excellence. [31]

TABLE 1: DEFINITIONS, PROCESS CONSIDERATIONS AND COMPETITIVE PRIORITIES. ADAPTED FROM [22] [33] [40].

COMPETITIVE PRIORITY	BASIC DEFINITION	PROCESS CONSIDERATIONS (Brief only)
1. COST	Delivering a service or product at the lowest possible cost to satisfy external or internal customers of the process or supply chain.	To reduce cost, processes must be designed and operated to make them efficient using rigorous process analysis that addresses workforce, methods, scrap and rework, overheads and other factors such as investment in new automated facilities or technologies to lower the cost per unit of the service or product. Appropriate capacity to meet demand Eliminate process waste in terms of - excess capacity - excess process capability - in-process delays - in-process errors - inappropriate process inputs.
2. QUALITY 2.1 Top Quality / Dependability	Provide appropriate resources capable of achieving the specifications of products or services and error-free processing. Delivering an outstanding service or product. Producing services or products that consistently meet design specifications.	To deliver top quality services in accordance with high levels of customer service and products according to product features, tolerances and durability. Processes designed and monitored to reduce errors, prevent defects and eliminate waste consistently over time. Provide appropriate resources capable of achieving the specifications of products or services and error-free processing.
3. SPEED/TIME 3.1 Delivery Speed 3.2 On-time Delivery 3.3 Product and Service Development	Quickly filling a customer order. Meeting due dates. Introducing new products and services.	Design processes to reduce lead time. Processes that reduce lead time, planning processes, scheduling, capacity, etc. Processes to achieve cross-functional integration and involvement of critical external suppliers in the service or product development process. Minimum throughput time. Output rate appropriate for demand.
4. FLEXIBILITY 4.1 Customisation 1.2 Variety 1.3 Volume Flexibility	Satisfying the unique needs of every customer. Handling a wide assortment of services or products efficiently. Acceleration or deceleration rate of services or products to handle fluctuations in demand.	Processes with a customisation strategy in place. Processes supporting variety must be capable of handling large volumes. Processes must be designed for excess capacity and excess inventory to handle demand fluctuations. Provide resources with an appropriate range of capabilities. Change easily between processing states (what, how, or how much is being processed)
5. RELIABILITY/DEPENDABILITY	Provide dependable process resources. Reliable process output timing and volume.	On-time deliveries of products and services. Less disruption, confusion and rescheduling within the process.

VI. LEAN AGILE - PROCESS STANDARDS AND PRODUCT DESIGN

Performance standards and compliance principles must be determined during lean initiatives. This should include every phase of lean and performance standard implementation. The responsibilities of management and other stakeholders with regard to critical business processes must be clearly understood by every stakeholder. It is important that the measurement of process performance should involve all stakeholders and are performed focusing on end-to-end quality of all processes, including financial, operational, customer, supplier and organisational criteria.

Process capabilities of suppliers and requirements of customers must be understood in terms of all aspects of process performance. It is important that supply chain objectives are clear so that each process and product design throughout the chain contributes towards a mix of quality, speed, dependability, flexibility and cost. This ultimately involves risk assessments of supply chain vulnerability and measures operations capacity balancing process variation based on demand and capacity.

Results obtained in the research illustrates that it is critical to the success of lean initiatives that process capacity utilisation and performance measurement results must be achievable in order to achieve competitive advantages. Other critical criteria which were considered are as follows:

1. Resource planning and control systems interface with customers
2. Resource planning and control systems interface with suppliers
3. Resource planning and control information is integrated
4. Capacity utilisation and performance
5. Lean synchronisation is applied throughout the supply network and understood within the organisation
6. Waste caused by variability and quality is calculated for all operational processes
7. Inventory information systems should integrate all inventory decisions
8. JIT principles are explored and applied
9. Methods of reducing waste and inventories are explored
10. Bottlenecks should be identified and their effect on the smooth flow of items through operations and processes be evaluated. [5] [40]

However, concerns have been identified as further analysis of results indicated that limited performance standards and compliance principles had been achieved. In addition it is important that the measurement of process performance must involve all stakeholders, including the end-to-end quality of all processes, financials, operational, customer, supplier and organisational criteria.

Furthermore results obtained highlight serious concerns regarding process capabilities of suppliers and requirements of customers. It is important that supply chain objectives must be clear, enabling every business process and product design to contribute towards a mix of quality, speed, dependability, flexibility and cost. Little risk assessment of supply chain vulnerability is measured in terms of balancing operations capacity process variation with demand and capacity.

A. Research Results

The overall Pearson's correlation results obtained underpin the above statements. It is observed that there is a relatively high correlation amongst all of the above items suggesting that they are measuring the same construct, whilst the overall Cronbach's Alpha value for n = 9 factor items = 0.987. Table 4 illustrates the correlation between these factors. [40]

TABLE 4: PEARSON'S CORRELATION – STANDARDS AND PRODUCT DESIGN

		Pearson's Correlation – Standards and Product Design								
	Sub-item Factor	1	2	3	4	5	6	7	8	9
1	Process optimisation: Vision and strategy	1	.764	.844	.834	.847	.792	.852	.873	.854
2	Process optimisation: Process optimisation	.764	1	.887	.778	.796	.721	.788	.744	.794
3	Process improvement: Process improvement	.844	.887	1	.859	.832	.798	.851	.801	.853
4	Process improvement: As project	.834	.778	.859	1	.827	.774	.792	.807	.805
5	Process improvement: Process improvement models	.847	.796	.832	.827	1	.900	.900	.851	.865
6	Process improvement: Risk management	.792	.721	.798	.774	.900	1	.900	.838	.821
7	Process review cycle	.852	.788	.851	.792	.900	.900	1	.861	.880
8	Process standards	.873	.744	.801	.807	.851	.838	.861	1	.874
9	Process and product design	.854	.794	.853	.805	.865	.821	.880	.874	1

VII. FRAMEWORK

The success of any lean strategy lies in the ability of organisations to be agile and perform at a desired level of performance and excellence. This can only be achieved through leadership and only when organisations consider the impact of competitive priorities such as (1) flexibility, (2) reliability, (3) quality, (4) speed and (5) cost effectiveness. This requires that proper measurements of performance are taken against defined standards. [39] [40]

The following are some benefits which can be obtained when agile lean capability is aligned to flexibility, reliability, quality, speed and cost effectiveness.

Evaluating and assessing an organisation's level of agile lean capability does not only rely on a single measurement, but requires continuous improvement. It must provide an organisation with the opportunity to integrate organisational performance and excellence into the normal business activities towards controlling and managing improvements as it enables organisations to understand what their goals are. [24] [35] [38] [39] [40]

Self-assessment should be conducted to establish how "agile" the organisation is when applying lean principles. This contributes to an organisation's performance and success by means of optimising its resources through innovation. It also energetically improves business processes, products and services in an endeavour to solve problems allowing organisations to perform comparative processes and performance analyses.

Organisations have to focus their attention on and invest in resources to revamp critical business processes that will make organisations effective and adaptable to the needs of individuals, customers and the organisation. Through aligning lean (being agile) systems and focusing on a comprehensive integrated business systems approach organisations will be able to optimize competitive priorities.

TABLE 5: COMPETITIVE PRIORITY BENEFITS

COMPETITIVE PRIORITY	BENIFITS
1. COST	Appropriate capacity to meeting demand Eliminating of waste in terms of - excess capacity - excess process capability - in-process delays - in-process errors - inappropriate process inputs Low processing costs Low resource costs (capital costs) Low delay and inventory costs (working capital costs)
2. QUALITY	Products and services produced on-specification' Less recycling and wasted effort within the process
3. SPEED/TIME	Reduce lead time, planning processes, scheduling, capacity, etc Cross-functional integration and involvement of critical external suppliers in the service or product development process Minimum throughput time Output rate appropriate for demand Short customer waiting time Low in-process inventory Delivery speed and on-time delivery
4. FLEXIBILITY	Processes supporting variety being capable to handle large volumes Processes designed for excess capacity and excess inventory to handle demand fluctuations, customisation, variety, volume flexibility Change easy between processing states (what, how, or how much is being processed) Ability to process a wide range of products and services Low cost/fast product and service changes Low cost/fast volume and timing changes Ability to cope with unexpected events (e.g. supply or a processing failure)
5. RELIABILITY / DEPENDABILITY	On-time deliveries of products and services Less disruption, confusion and rescheduling within the process

Organisations should therefore focus on performance standards as well as compliance principles at all stages inclusive of the business processes. It is of utmost importance that all stakeholders involved in critical business processes be well informed in terms of lean objectives and application. Consequently, the following issues must be addressed by organisations to become Lean Agile:

1) Leadership
2) Clear decisive communication which is understood involving all stakeholders
3) End-to-end quality of all processes, financials, operational, customer, supplier and organisational criteria.
4) Supply Chain objectives be clear in terms of lean, therefore linking and enabling every business process and product design contributing towards a mix of quality, speed, dependability, flexibility and cost focusing on lean application.
5) Risk analysis in order to determine supply chain "vulnerability"
6) Continuous improvement
7) Value stream mapping and performance standard(s) be measured in terms of balancing operations capacity processes variation with demand and capacity focusing on customer requirements.
8) Effective workplace environment free of waste.

VIII. CONCLUSION

It is therefore of utmost importance that organisations should know what, how and when to measure lean processes against set standards and measurements and continuously seek methodologies to improve their capability. To achieve this all stakeholders should participate as it allows organisations to identify strengths and weaknesses to exploit as improvement opportunities.

It does not matter how good you are, how well you regarded your products and services, you cannot stop improving. You cannot stand still and if you do, you are slipping backwards because the competition is constantly improving.

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