Successfully deploying Lean in healthcare

Preface

This white paper provides strategic guidance for successfully deploying a Lean Program in your healthcare organization.

The objective of this paper is to better allow healthcare professionals to engage senior leadership (including management and board of directors/trustees) in discussions regarding the successful deployment of Lean. During this transformational period in the healthcare industry, a Lean Program deserves senior leadership attention to assure a quality outcome with fewer resources.

Introduction

With rising pressure on healthcare providers to reduce costs and improve quality, an increasing number of organizations are looking to "Lean" tools and techniques as a breakthrough solution for performance improvement. Over the last four decades, Lean has emerged as one of the most impactful approaches to help increase an organization's competitiveness through improvements in process efficiency and a reduction in operational waste. Today, Lean is used in most global industries and virtually all organizational sectors including healthcare. In 2010, the Institute of Medicine of the National Academies (IOM) in an article titled, *The Healthcare Imperative: Lowering Costs and Improving Outcomes: Workshop Series Summary*, explored the sources, implications and solutions necessary to address the waste and excess cost in the U.S. healthcare system. The IOM studied the application of Lean to inefficiencies in hospitals and physician offices. While estimates of possible annual savings resulting from the successful application of Lean varied depending on assumptions used, the IOM concluded "the waste and inefficiency in the current delivery system is substantial" and there are strategies, including Lean, to "lower expenditures over the short- and long-term *(Young, P.L. & Olsen, L., 2010, p.617)*…"

What is Lean?

Lean is a customer-centric methodology focused on continuously identifying improvement opportunities by eliminating "non-value added" (or wasteful) activities and creating value. In a Lean process, a customer is any individual or entity that benefits from the Lean Program. For example, consumer/patients and physicians benefit from improving the turnaround time of critical laboratory tests. Value is defined as any activity within a process that is essential to delivering what a customer will pay for.

By focusing efforts on reducing wasteful activities, healthcare organizations can more efficiently attain organizational objectives. As described in Table 1, waste in healthcare has many forms. Attention to these seven high-level areas will better enable healthcare organizations to begin using Lean to more effectively identify potential causes of waste.

Excessive motion	• Incorrect floor layout (e.g., inefficient emergency department patient flow) • Searching for information (e.g., lack of operability of EMR)
Waiting time	• Waiting for paper work • Waiting for response/approvals/beds
Over production	• Planning full utilization of assets/labor • Large batches of material and supplies inventory
Unnecessary processing time	• Fragmented workflow • Unnecessary processing steps
Defects	• Cost of patient readmissions • Hospital acquired conditions
Excessive resources	• Non-optimized resource leveling • Redundant activities (e.g., excess administrative costs)
Unnecessary/ ineffective handoffs	• Verification loops • Unnecessary approvals

Table 1 – Seven critical wastes in healthcare that are addressed by Lean.

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Adoption of Lean in healthcare delivery

Many healthcare improvement groups have described Lean as a critical methodology for healthcare providers to adopt. The Institute for Healthcare Improvement (IHI) states that there is growing agreement "among healthcare leaders that Lean principles can reduce the waste that is pervasive in the U.S. healthcare system... Adoption of Lean management strategies — while not a simple task — can help healthcare organizations improve processes and outcomes, reduce cost, and increase satisfaction among patients, providers and staff *(Miller, D., et. al., 2005, p.3)*."

While Lean has proven successful in reducing healthcare waste and increasing provider profitability, surveys of hospital leaders continue to find full deployment of Lean in healthcare very low. In a March 2009 survey by the American Society for Quality (ASQ), the same organization that administers the prestigious Malcolm Baldridge National Quality Award, disclosed that only 4 percent of U.S. hospitals reported a full deployment of Lean. However, 53% of the 77 hospitals responding reported some level of use of Lean in their organization. So why is the full deployment of Lean within healthcare so low? According to ASQ respondents, the key reasons are:

- Lack of resources (59% of respondents)
- Not enough information (41% of respondents)
- Lack of buy-in from leadership (30% of respondents)

The results of this survey stand in stark contrast to the successful implementations of Lean in healthcare organizations throughout the world.

Studies over many years have shown Lean to have a wide range of applications to hospital operations ranging from:

- Reducing inappropriate hospital stays
- Improving the quality and financial efficiency of trauma care
- Reducing the cost of temporary staff
- Improving operating room and emergency department efficiency
- Improving radiology processes
- Reaching better strategic decisions affecting marketing and capacity management, among other uses of Lean leading to improved hospital profitability

Discussion

Deployment strategy:

There are four key stages of Lean Program deployment as depicted in Figure 1. Each stage is discussed in detail below.

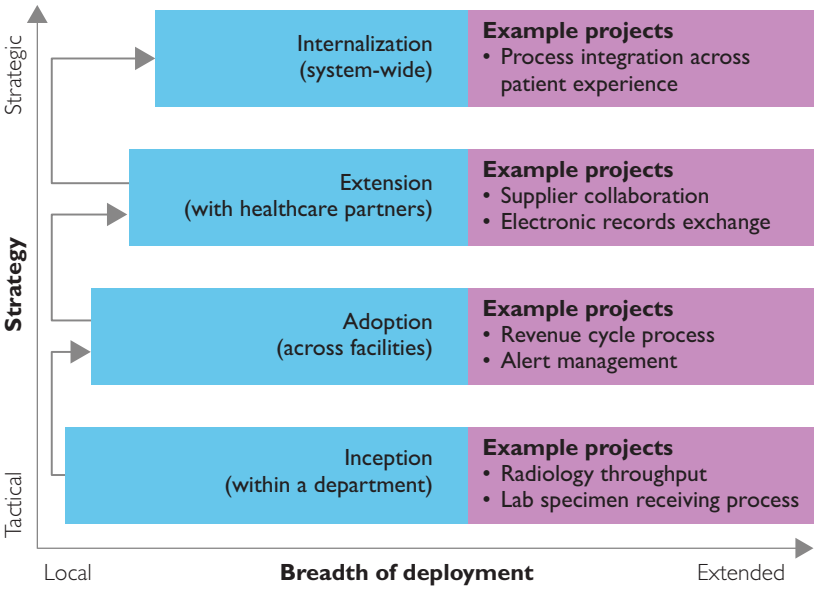

Figure 1 – Lean Program stages of deployment

1. Inception

There are generally two primary internal organizational drivers of Lean Program deployment in the healthcare industry:

- A fundamental need to demonstrate improved operational and/or financial results
- A desire to exploit the advantages of strategic events, including:
  - A computer information technology (IT) implementation
  - The formation of an integrated care organization
  - A new facility build-out

In these situations, change is significant and healthcare organizations should take the opportunity to develop the internal support to introduce new ways of working and addressing challenges.

Develop the initial vision and objectives. Before the Lean Program begins, it is imperative to create a vision and supporting objectives. This allows senior leadership to set realistic expectations for the Lean Program. For example, in this Inception stage, targeted improvements for the Lean Program should focus on quick, visible successes that reduce waste and improve quality within a single department.

That is, broader objectives that are more challenging should be targeted in the later stages of the Lean Program. These more difficult objectives usually require cross-functional or departmental coordination. Personnel and data required to make those efforts successful are better scheduled when the Lean Program has gained momentum within the organization.

Organize roles and responsibilities. In the Inception stage, an interim Lean Program Champion should be appointed by senior leadership. The interim Lean Program Champion is usually at the Director level within the organization and understands both the importance and the temporary nature of the role. Based on a clearly written business case for the Lean Program, the interim Lean Program Champion then defines roles and responsibilities to allow senior leadership to identify which resources are needed, for how long, and with what required capabilities/competencies. In conjunction with this process, it is important to have internal resources weigh current time requirements against those of the Lean Program. Then the interim Lean Program Champion can better determine the manner in which specific human capital resources can be allocated to deliver on the Lean Program's business case. Decisions can be made as to when existing resources can be used and where gaps requiring outside resources may exist. After completion of their designated roles and responsibilities, assigned staff members then return to their existing organizational roles with newly acquired skills and an increased sense of empowerment and motivation.

Identify, select and prioritize projects and resources. In the Inception stage, it is necessary for the interim Lean Champion, under the direction of senior leadership, to formalize a process to determine how individual projects for the Lean Program are identified, selected and prioritized. This process includes an agreed upon selection criteria of project ideas which allows for a consistent comparison among potential projects. Due to the limited maturity and scope of the Lean Program, it is not necessary to institute more complex concepts such as Project Portfolio Management (PPM) unless already in place. Advanced concepts such as PPM should be considered in later stages when the number and complexity of projects become more difficult to manage.

Establish contact and build awareness. Effective communication is essential not only to prevent negative interpretations of operational efficiencies, but also to foster ground level participation and enthusiasm in departmental improvement efforts. To provide an effective communication channel, it is beneficial to first understand what the commitment (baseline) to the Lean Program is within the organization. As depicted in Figure 2, the Communication/Commitment chart not only indicates the level of understanding which exists, but also what type and how much communication is needed to meet the vision and objectives of the Lean Program throughout the four stages of Lean deployment. Once the level of commitment has been determined, it is necessary to build and utilize the appropriate communication tools and techniques. Typically, at this level, the best tools/techniques include the distribution of promotional materials or the delivery of awareness briefings.

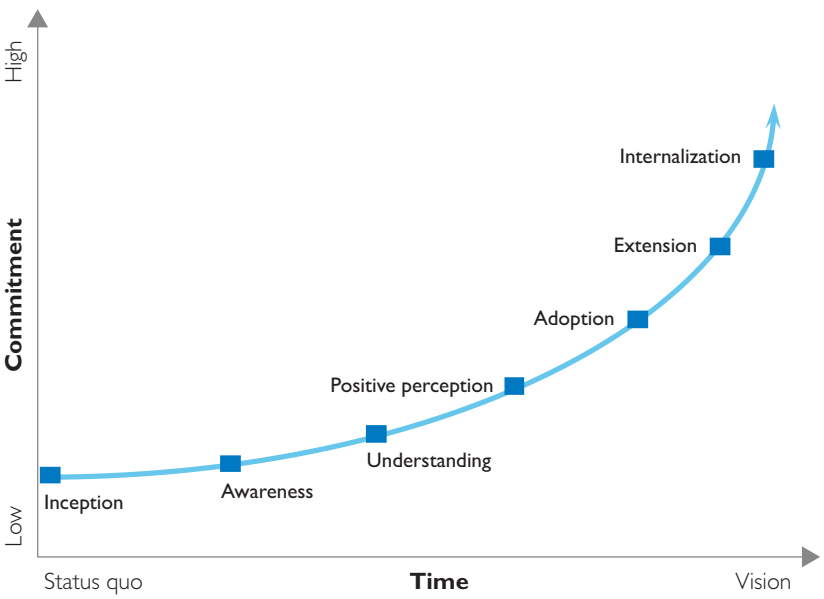

Figure 2 – Communication/Commitment chart.

2. Adoption

With department level financial and operational benefits realized in the Inception stage, senior leadership efforts can be expanded to broaden the implementation of Lean Program activities. As part of this expansion, solidifying senior level buy-in and ownership of the Lean Program is required. As Lean Program activities expand across departments, project execution and success require changes that may at first be perceived as negative by the individuals or groups involved. These matters can be quickly resolved through further education, communication, and guidance from senior leadership.

Solidifying senior level support and buy-in. In order for a Lean Program to be successful, senior leaders need to support and buy-in to the idea that Lean can benefit the entire organization. In a September 2002 editorial in The Journal of the American Medical Association, current Administrator of the Centers for Medicare & Medicaid Services (CMS), Dr. Donald M. Berwick, stated that "On the one hand, all improvement is change, and human systems resist change. Therefore, improvement requires a source of tension, discomfort with the status quo, sufficient to overcome this inertia *(Berwick, 2002, p.1523)*…" Accordingly, senior level support and ownership of a Lean Program is a prerequisite for achieving Lean operational and financial gains. That said, it is one thing to know that senior leadership should support a Lean Program; it's another to have solidified that support.

To gain senior level support and buy-in, organizations must first educate senior leadership on executive level Lean concepts and how these concepts support the organization's strategic objectives. This educational process needs to cover methodologies such as Total Quality Management (TQM), Six Sigma, and Theories of Constraints (TOC) to help leadership understand terms and concepts which may be used in a complementary or interchangeable manner with Lean. Then the Lean Program's vision, objectives and expectations can be thoroughly discussed.

Once expectations for the Lean Program are set, the organization's senior leadership will identify the Lean Program Champion. This individual, who succeeds the interim Lean Program Champion, should be a senior leader interested in fostering change. This senior leader must have a reputation within the healthcare organization of being decisive and driving critical decisions. This is important when situations arise during the Lean Program deployment where the overall benefit of the organization may require difficult changes.

The Lean Program Champion works with other senior leaders and staff and is principally responsible for:

- Continued refinement of the Lean Program vision and objectives
- Guiding the identification, selection and prioritizing of Lean projects that align with the organization's strategic objectives
- Supporting the leveraging of the organization's health information technology (HIT) system backbone
- Supporting program development and change to enhance organizational understanding and positive perception

A more detailed explanation of the Lean Champion's selected areas of responsibility is summarized below.

- **Continued refinement of a Lean Program vision and objectives.** As the Lean Program matures, the original vision and objectives may need to be revised and aligned with the organization's overall strategic objectives. This process requires various departments or groups to develop a vision that is focused on reducing waste and improving quality. It must address the greater good of the overall healthcare organization and not necessarily the improvement of individual departments.

- **Guiding the identification, selection and prioritizing of projects that align with the organization's strategic objectives.** Following the initial project identification, selection and prioritization process defined during the Inception stage, it is necessary to broaden this process to integrate a Lean infrastructure. This may include a formal Lean governance committee to not only review and select projects with structured Lean principles, but to perform in-depth matching of project resources. This integration of a Lean infrastructure helps manage the complexities of cross-functional cooperation alluded to earlier.

- **Supporting the leveraging of the organization's HIT system backbone.** The complexity of an expanding Lean Program is characterized by a transition from projects where information is readily available to projects that require data to be pulled from various sources. As a result, the Lean infrastructure relies upon cohesiveness between operational groups and the IT department so that the supporting data can be obtained in a timely manner.

- **Supporting program development and change to enhance organizational understanding and positive perception of the Lean Program.** The Lean Champion needs to be concerned about whether the organization is maturing as the Lean Program moves forward. It is important to periodically poll members of the healthcare organization to understand their commitment to Lean. Based on this information, the Lean Champion can determine if additional or different communication techniques should be employed to encourage the renewed commitment of members of the organization. The Lean Champion may consider engaging the organization's members in activities such as classroom sessions or developing poster boards to reinforce messaging. These forms of media communicate the Lean Program's vision and objectives as well as provide an opportunity to update organization members regarding recent Lean Program successes.

3. Extension

At this third level of Lean Program maturity, the healthcare organization ought have a sound understanding of what Lean is and the benefits that can be derived. This is the point at which opportunities for improvement begin to extend outside the four walls of the healthcare organization reaching supplier/partners. For purposes of the Lean Program, supplier/partners are broadly defined as any party the healthcare organization has a contractual relationship with to furnish services and or materials/products. For example, supplier/partners can include, but are not limited to groups such as Philips Healthcare Consulting or outsourced providers of emergency department physicians, nurses and communication technology. In addition, parties that furnish medical equipment and pharmaceutical/surgical supplies purchased under contract can be considered supplier/partners.

To continue the effort to reduce the organization's waste as part of this next level of Lean Program maturity, supplier/partners should be engaged using the following guidelines

- Collaborative, strategic vision and objectives
- Supplier/partner level opportunity assessment
- Supplier/partner governance structure
- Implement supplier/partner supporting IT System architecture
- Institutionalize Lean communication with supplier/partners

- **Collaborative strategic vision and objectives**. As the organization moves forward into the Extension stage, the strategic vision and objectives must be broadened to encompass supplier/partners and how they will help further expand the capabilities of the organization in reducing waste and improving quality. The Lean Champion needs to initiate a process to engage supplier/partners in discussions with senior leaders and department managers to forge a consensus that is aligned with the organization's strategic vision and objectives.

- **Supplier/partner level opportunity assessment**. To better support the expansion of Lean improvement opportunities, it is beneficial to conduct an assessment that engages supplier/partners. Their expertise and perspective can help identify potential Lean Program projects. With identification of these new opportunities, it may prove useful or necessary to offer the supplier/partners resources to support these projects.

- **Supplier/partner governance structure**. As a result of the success of engaging outside supplier/partners in the Extension stage of the Lean Program, it will eventually be necessary to develop a permanent Lean governance model which may involve the creation of a Project Management Office (PMO) and/or tools such as People Performance Management (PPM) to play a key role in all Lean Program project selection efforts going forward. The appointed Lean Program Champion is likely to return to a permanent position within the healthcare organization as the Extension stage nears completion, but can initially take the lead of the PMO. The position of Lean Program Champion is intended to be a temporary, adaptive and creative one, with the purpose of integrating Lean processes and Lean thinking into the healthcare organization. Therefore, during the Extension stage, the Lean Program Champion begins to transition duties and responsibilities to the PMO.

In structuring and staffing the PMO, it is important not to lose the entrepreneurial spirit that resulted in the Lean Program's operational and financial gains. The formation of a governance committee(s) to support the PMO ensures that the PMO will continue to have the expertise and support within the organization to sustain the financial and operational gains achieved by the Lean Program. Members of the governance committee(s) should include representatives from all organization departments and/or groups to ensure a broad range of competencies. However, it is most important to have individuals who can span multiple areas with confidence.

- **Implement supplier/partner supporting IT systems architecture**. IT continues to be a critical component as the organization's Lean Program matures. As the number and complexity of projects increase, the PMO and governance committee(s) requires more real-time and customized data. By reviewing the critical requirements and determining gaps between the current and desired states, the IT department designs and leads the building of capabilities that allow the PMO and governance committee(s) to:
  - Obtain the data needed to identify more improvement opportunities
  - Track and mentor multiple projects simultaneously
  - Provide the reports needed to make informed decisions

- **Institutionalize Lean communication with supplier/partners**. The commitment level and supporting Information and Communication Technologies (ICT) tools and techniques continue to become more advanced as the organization's Lean Program matures. As a result, hardware and software providers are encouraged to provide training tailored to specific Lean roles that offer guidance and possible strategies to resolve any issues that may arise.

4. Internalization

The highest level of Lean maturity, Internalization, requires a healthcare organization to fully embrace the ideology of waste reduction. Once this stage is reached, the organization should be structured to continuously identify, select, prioritize and ultimately implement improvements that eliminate waste, and improve quality and outcomes for the organization's customers. At this stage, the organization has also worked with supplier/partners and customers to share their vision and objectives to better align and drive improved results for all. To accomplish this level of maturity, healthcare organizations need to:

- Standardize supporting IT systems
- Communicate Lean concepts as a way of internalizing the message

- **Standardize supporting IT system**. As activities continue to extend outside the four walls of the healthcare organization, it becomes important to start integrating IT systems with supplier/partners such as medical device and pharmaceutical suppliers, health insurers, private care facilities, clinics, and laboratories. Integration should be done in conjunction with the execution of the Lean Program. Internally, the IT department must focus on simplifying the IT architecture and infrastructure, reducing waste and fostering improved Lean project execution and leadership oversight.

- **Communicate Lean concepts as a way of internalizing the message**. At this stage, considerable emphasis has already been placed on organizational communication of Lean concepts. Using best practices in communication, must be continued. Standardize proven approaches with templates and checklists to educate new organization members regarding the Lean lessons already learned.

5. Effective metrics

As important as metrics are, in many organizations they are often not well defined, measured, or assigned to individuals who are held responsible. As a result, Lean Programs risk incurring more costs and falling short of obtaining expected benefits. To mitigate these risks and increase the success of the Lean Program, it is imperative to follow certain key guidelines, including:

- Defining what should be measured
- Educating the users on how to manage the metrics system
- Establishing accountability and ownership of the metrics system

- **Defining what should be measured**. What is measured is highly dependent on the specific situation of each healthcare organization. Overall, metrics provide the organization with the appropriate information needed to continuously reduce waste and maximize quality.

To validate the metrics selected, the organization must ensure they are:

- Reliable and reproducible
- Not easily manipulated
- Clearly defined
- Supported by data that can be reliably collected

- **Educating the users on how to manage the metrics system**. The success of each metrics system depends on the ability of its users to effectively manage that system. This requires:
  - Developing a shared understanding of what the metric is and how it ties to organization operating results and customer experience
  - Analyzing the metrics to distinguish between signals and noise
  - Scoping improvement efforts and usage of a number of alternative approaches for addressing any metric issue (e.g., process improvement methods)
- Prioritizing and assigning appropriate resources to improvement efforts

- Assessing whether corrective actions were successful and how to hold the organization accountable for sustaining results
- Assessing how changes in Lean processes will impact the metric system
- Customizing education for senior leadership, project teams and key stakeholders to continue to improve team management and performance

- **Establishing accountability and ownership of the metrics system**. This is a critical issue for every metric system deployment and requires those responsible to have the appropriate authority and knowledge to manage the performance of the underlying work processes. To set realistic goals for each of the metrics selected, management must ensure the strategies of each department are aligned with the metrics. Establishing a baseline for each metric and setting realistic goals helps identify gaps in performance the organization must address. Then management can employ scope improvement efforts aimed at closing those gaps and select the appropriate improvement methods. These methods can range from "just do it" efforts to comprehensive process improvement projects using Lean tools. It is vital that management has a good understanding of these methods and be able to scope projects effectively.

As a result of experience gained managing with the new metrics system, management develops a deeper understanding of cause and effect relationships driving selected metrics. They learn what works and what does not. Being able to assess what decisions and actions are successful in closing performance gaps and having a communications system in place to share learning across the healthcare organization is critical to sustaining gains from the Lean Program. For example, the adoption of a Dashboard approach in connection with the metrics system is an effective means for communicating Lean learning throughout the healthcare organization.

While a large number of organization members will undoubtedly see the new metrics system as a valuable tool important to the success of the organization, others will feel threatened by the transparency. An effective change management plan helps anticipate resistance and supports development of countermeasures to ensure a successful launch.

Over time, management will experience the need to add additional metrics to the system or drop some metrics which are less relevant once performance gaps have been addressed. An effective metric system is never set in stone. Metric systems are subject to change based on improvements made and sustained, new insights into cause-and-effect relationships, and changing organizational needs and structure.

One additional aspect to consider when developing and managing a metrics system is determining how the various metrics tie together and help achieve the organization's strategic objectives. By tying metrics together, it helps organization members better understand how various metrics directly relate to the overall success of the healthcare organization. Figure 3, depicts the idea of cascading metrics in a healthcare organization. The purpose of cascading metrics is to clearly demonstrate how lower level activities and measurements (i.e., process metrics) roll-up into critical value stream metrics and lead to value levers that result in the organization reaching its strategic healthcare objectives.

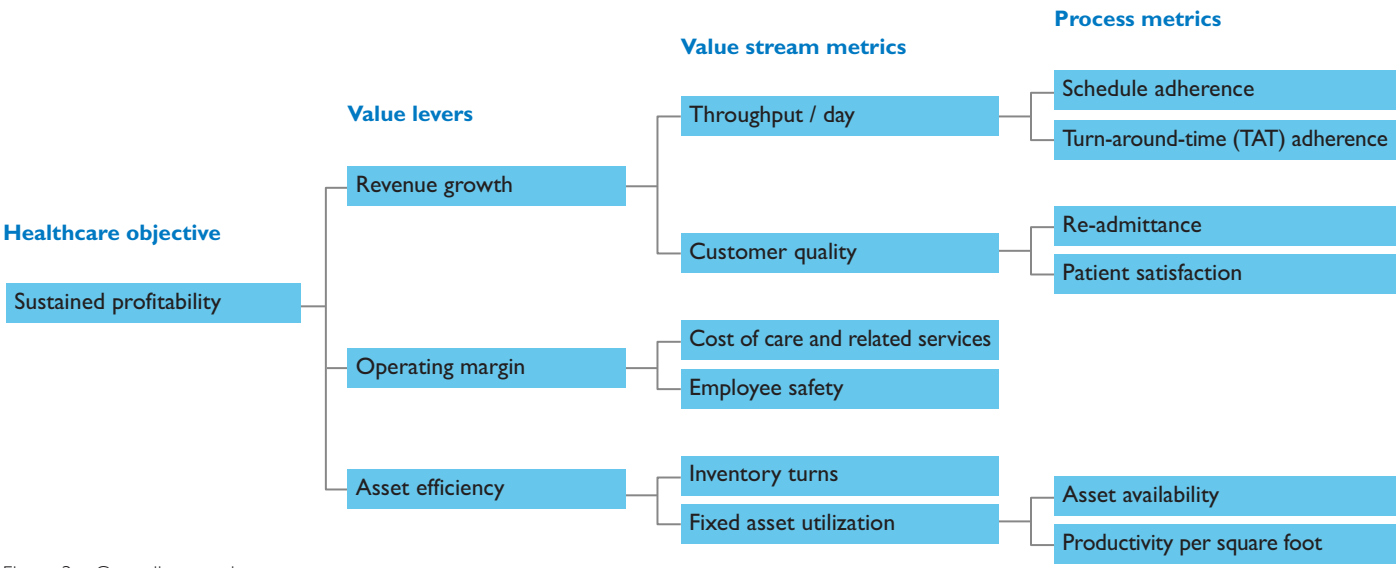

Figure 3 – Cascading metrics.

Conclusion

Lean is a proven methodology that answers the most frequently asked question of the day – how a healthcare organization is going to be able to do more with fewer resources. It is, therefore, important for the healthcare organization to be Lean Ready with a formal Lean infrastructure that can respond to the internal and external challenges coming each and every day. This includes a Lean infrastructure with a PMO responsible for overseeing the continuous search for and identification of Lean Projects that will result in operational and financial gains. A *Lean Ready* healthcare organization will be able to encompass a Lean approach in all strategic initiatives to actualize the maximum benefits from major expenditures. It will be better able to push the organization's strategic plan seamlessly through each and every department and measure the results with a metrics system in which every manager understands the connection between their actions and the achievement of the organization's strategic objectives. There is no better time than now to engage senior leadership in a discussion about becoming a Lean Ready healthcare organization.

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