7.0 BUSINESS PROCESS REENGINEERING

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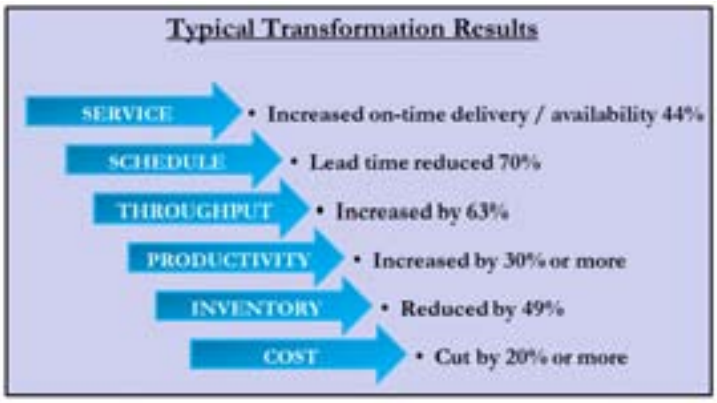
This document provides a description of the Business Process Management (BPM) methodology recommended by the OIMT for use within the State of Hawai'i as business processes are assessed, addressed, and improved.

7.1 SCOPE

This document outlines the BPM methodology using the Theory of Constraints (TOC), Lean, Six Sigma, and integrated TOC, Lean, Six Sigma (iTLS), which is a combination of the previous three. It provides an overview of the different processes and a framework for the selection of Business Process Projects, the match of project results to the appropriate methodology, and the roles and responsibilities of BPM.



This document introduces the methodology or approaches that have been selected by the CIO for conducting BPR within the State of Hawai'i. The selected approaches are known as TOC, Lean, Six Sigma, and iTLS, and have been used effectively to reengineer processes in both the public and private sectors.

Transformation must begin with re-evaluating the processes that deliver services to internal and external customers. Only through investigating the purpose, outputs, assumptions, and constraints along with the business rules that are associated with a process can transformation begin. Transformation is to change what is now into something different. If we expect different results from the State of Hawai'i in the quality, timeliness, cost, and productivity of our services, and then evaluating, reengineering, and managing the business processes is an integral step in the development of a government aligned to service the people of Hawai'i.

Note: This document is a living document that will be maintained by OIMT and the Business Transformation Executive (BTE). The intended audience for this document is anyone within the State who is interested in learning about TOC and how it is used to reengineer a process. This document outlines major methodologies which may be used in future business process initiatives.

7.2 ASSOCIATED DOCUMENTS

- *The Goal,* by Dr. Eli Goldratt
- *State of Hawai'i Business Transformation Strategy and IT/IRM Strategic Plan,* 2012
- *OIMT Project Management Methodology (PPM)*, 2012
- *Overview of the Theory of Constraints,* Viable Vision, 2012
- *Training Presentation,* Viable Vision, 2012
- *Profitability with No Boundaries,* by Reza (Russ) M. Pirasteh and Robert E. Fox, 2012

7.3 SELECTING AND MANAGING A BUSINESS PROCESS REENGINEERING (BPR) PROJECT

The Executive Leadership Steering Group will be engaged in making final decisions relative to BPM activities that have an enterprise or state-wide impact. Department leadership is encouraged to identify and select BPR activities that will improve mission performance and service delivery to constituents. Figure 24 provides examples of considerations for screening BRP activities.

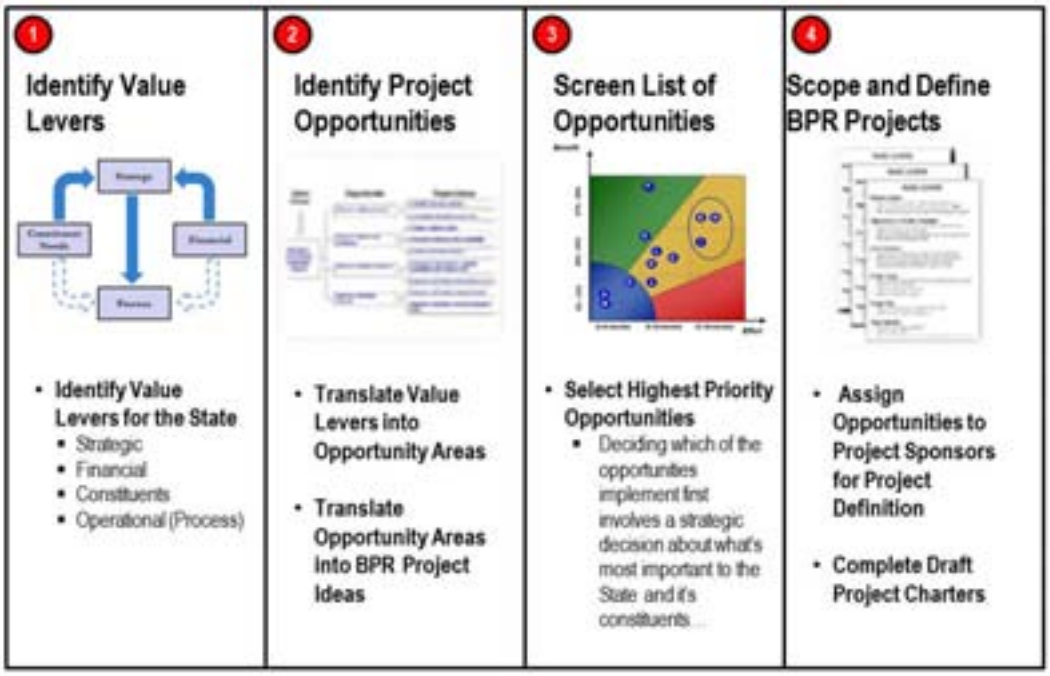


Figure 24: BPR Project Screening Considerations

When undertaking a BPR activity, it is the responsibility of the project sponsor (Department management or BTE) to ensure that a project schedule is created and that the activities, milestones, and deliverables are achieved. The OIMT Office will provide program and project management oversight to any statewide BPR activity or as requested to the extent resources are available. At a minimum, the basic elements of the OIMT recommended PMM should be followed when managing a BPR activity (illustrated in Figure 25).

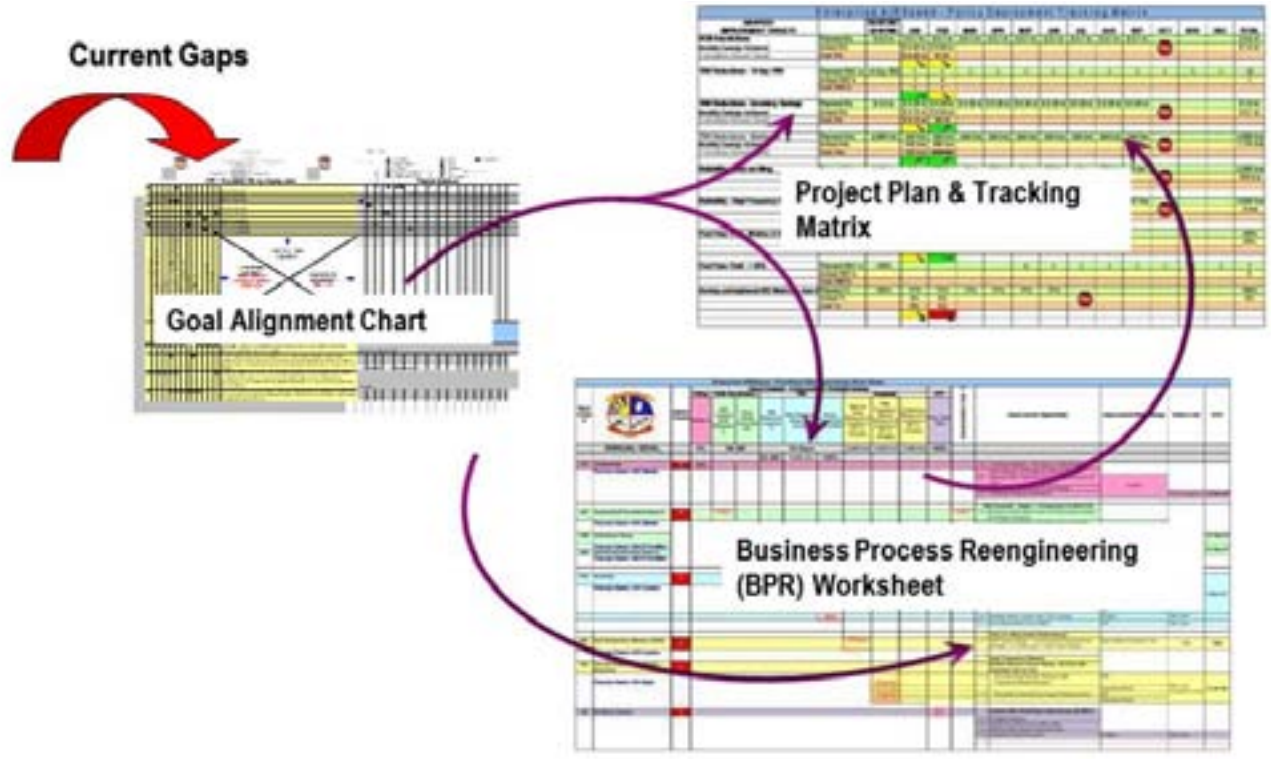
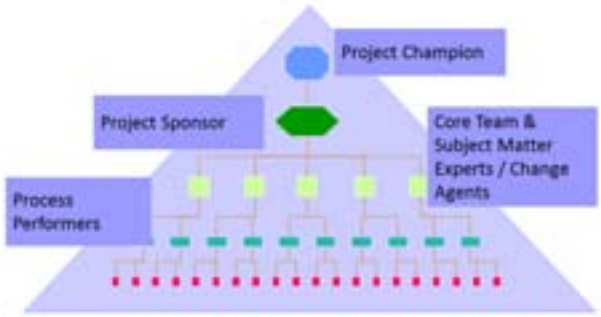


Figure 25: Managing BPR Projects

7.4 BPR ROLES AND RESPONSIBILITIES

This section describes BPR roles and responsibilities.

7.4.1 BPR PROJECT CHAMPIONS FOR THE STATE



The Executive Leadership Steering Group provides guidance; oversees policy, validates resource requirements, and serves as the point of contact and BPR Project Champion. The Project Champion monitors all BPR Projects. It is imperative that Champions promote BPR within the State through consistent words and actions. They ensure that the necessary resources are available to the project sponsors, support teams, and work groups while monitoring the implementation and sustainment of BPR improvements across the State.

Champions continually perform an organizational scan to identify emerging BPR challenges and opportunities. They prioritize available resources to sustain progress and encourage a cultural environment of continuous improvement. Specific responsibilities of the Project Champion include:

- Support the prioritized efforts of all BPR-related projects.
- Conduct periodic reviews of BPR-related resource allocations with the support teams.
- Assess BPR projects' effectiveness via progress against aligned metrics and encourage sharing of ideas and lessons learned across the organization.
- Promote the exchange of BPR knowledge both inside and outside the organization and remove barriers or inhibitors to improvement opportunities.
- Remove fear of failure (punishment) to encourage appropriate risk taking.
- Publicly recognize BPR successes.
- Continually convey a sense of urgency and dissatisfaction with the status quo.

7.4.2 BPR PROJECT SPONSOR

Of all the project roles illustrated above, the Project Sponsor is the key role in the BPR deployment. The Project Sponsor integrates the strategic guidance and direction provided by the Executive Leadership Steering Group with the tactical efforts of the project teams. The Project Sponsor is the organizational leader who owns the process and resources under consideration. He/she has the responsibility to ensure that the project core team understands the expectations of the leadership and is responsible for delivering project results that meet the strategic objectives of the organization. Specific responsibilities of the Project Sponsor include:

- Working with the Subject Matter Experts/Change Agents to determine the baseline data and status of the process being examined and developing specific metrics or targets for improvement
- Identifying organizational gaps and opportunities and nominating potential opportunities to the organization senior leadership or steering committee for prioritization
- Approving the project charter that provides initial guidance to the core team
- Providing resources and guidance to the core team to ensure project success
- Removing or mitigating obstacles that the core team may encounter
- Overseeing the project status reviews
- Reviewing and validating the financial, operational, and process improvement benefits and results at the appropriate phases
- Reviewing and approving solutions derived by the project teams
- Recognizing team successes
- Capturing and sustaining the improvement results to include assessing control metrics (output metrics) after project completion to ensure that performance improvement gains are maintained
- Supporting the strategic communications efforts of the organization

7.4.4 SUBJECT MATTER EXPERT/CHANGE AGENT

The Subject Matter Expert (SME)/Change Agent coordinates the Strategy, Design, Analyze, Improve, and Sustain (SDAIS) phases and provides leadership for Core Team's BPR Project. He/she serves as the deployment lead under the direction of the Project Sponsor and with the support of the Project Champion. Specific responsibilities of the Change Agent include:

- Leading Transformational Change. The SME/Change Agent serves as the catalyst for the BPR within the organization. He/she provides the necessary training, coaching, and mentorship to spread understanding to the project sponsors, core team and process performers to ensure a successful transformation effort.
- Major Project Leadership. The SME/Change Agent leads the BPR deployment, ensures the deliverables in each of the phases are met and coordinates multiple subordinate elements within each phase. He/she must coordinate the BPR project with the Project Sponsor and the various Core Team

members. SME/Change Agent leadership includes identifying opportunities; defining and justifying improvement initiatives; negotiating resources; launching improvement activities; managing deployment activities; training, coaching, and mentoring of team members; leading teams to execute action plans; tracking project status and results; anticipating and removing barriers; and developing team members.

- Technical Leadership. The SME/Change Agent provides direction on the application of BPM tools and methods to the organization's leadership, process leads, project sponsors, and team members.
- Measuring Results. The SME/Change Agent provides the Project Sponsor and Champion with project improvement results versus baseline measurements and recommends corrective action, as required, if overall results do not meet expectations. The SME/Change Agent is also responsible for validating the operational benefits of the BPR project before completion of the Sustain phase.

7.4.5 CORE TEAM

The Core Team is composed of five to seven team members facilitated by the SME/Change Agent. These team members include Department supervision and process performers with expertise in the processes under examination. They are the individuals who have ultimate responsibility and authority for the performance and results of the processes being improved.

The Core Team is ultimately responsible for studying and changing processes to improve their effectiveness and efficiency in accomplishing the organization's goals. The most important task for Core Team is to align the goals and activities of their respective processes with those of the organization. The team accepts process ownership and employs applicable tools and methods in each phase to analyze the current situation, identify ways to improve operations, seek approval for change, and execute business process transformation. These groups utilize the know-how and experience of the individual members and consult, as necessary, with peer groups and other stakeholders to accelerate process improvement. Specific responsibilities of the Core Team include:

- Leading individual projects that can be conducted within their level of expertise
- Supporting more complex projects by leading specific efforts within their functional area of responsibility
- Advising Project Sponsors on the selection of team members
- Managing the administration and daily work assignments of team members
- Assisting the Project Sponsor in implementing approved process improvement recommendations
- Ensuring projects are integrated with other organizational activities and the overall mission and strategic objectives
- Coordinating and facilitate team activity
- Implementing continuous process improvement activities using BPR tools, techniques, and processes
- Seeking simplified and/or new ideas and ways to perform their jobs
- Participating in ongoing education and training to continuously improve their performance contributions
- Participating in regular team meetings to identify, analyze, and select possible solutions to problems
- Implementing solutions under the supervision of Process Leads and/or Project Sponsors
- Identifying other project opportunities that fit within the organization's priorities

7.4.6 CRITERIA FOR IDENTIFICATION OF BPR PROJECTS

The criteria for identifying a BPR project are described in the Business Transformation Strategy as part of the IT/IRM Strategic Plan. Once a candidate initiative is identified, the following should also be added to the selection process:

- Willingness of the organization's leadership to spearhead and promote the reengineering process
- Urgency to complete a BPR activity to improve services to constituents, support management decisions, and/or reduce costs
- Opportunity for success

7.4.7 DOCUMENTING THE ORIGINAL AND IMPROVED PROCESS

To support the implementation of this methodology, the original and improved process is documented (based on Gartner's "just enough" recommendations, thus avoiding analysis paralysis). Microsoft Visio and the standard Business Process Model and Notation (BPMN) typographical and illustrative conventions will be used until the State identifies a specific tool for creating the BPMN and Business Process Execution Language (BPEL)[11]. The Visio-based documentation allows the State to take advantage of the ultimate goal for BPMN which is to provide a simple means of communicating process steps and throughput information to other business managers, users, process implementers, and system developers, as appropriate.

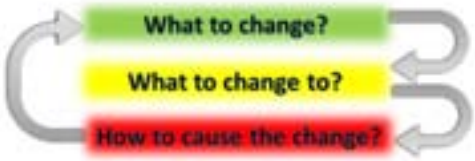
7.4.8 IDENTIFYING AND RECORDING IT CHANGES OR REQUIREMENTS

Throughout the process IT changes and/or requirements that are logical outflows from the TOC BPR process are captured in a Systems Requirements Document (SRD) that includes full traceability to processes. The resulting SRD can be used to improve existing systems, if appropriate, and/or in the acquisition of new systems.

[11] The BPMN tool requires funding, acquisition, implementation, and a certain amount of training. MS Visio is an easy-to-learn, easy-to-use tool that is fairly prevalent within the State. Files can be saved as in .PDF format for viewing by non-Visio users.

7.4.9 ORGANIZATIONAL CHANGE MANAGEMENT

Managing the change process is an integral element of a successful BPR implementation. The over-arching structure for organizational change management is a three-step process of identifying:



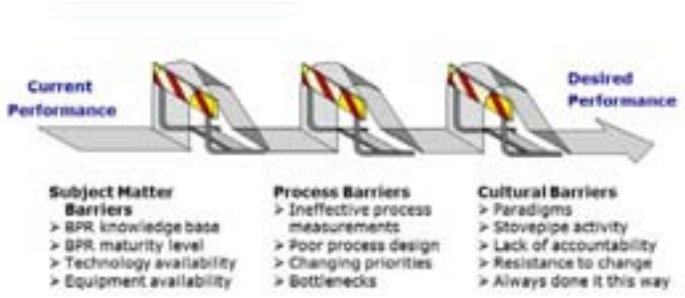
1. What to change?
2. What to change to?
3. How to cause the change?

Organizational change management begins with reviewing current performance and measuring it against the standard set by the organization's management. It is not possible to improve what is not measured. This measurement gauges the current level of performance against the desired future performance level. The resulting analysis can highlight a variance that needs to be corrected, as well as performance that is inconsistent with achieving the overall goals.

At the heart of the change process is the third element of "How to cause the change." BPM incorporates an effective set of change management tools directed at overcoming the barriers to change, whether they are subject matter barriers, process barriers or cultural barriers.

Overcoming the barriers to change involves deploying effective means for project management of the BPR, knowledge transfer, coaching and facilitation, and managing people. One of the big challenges in any type of change initiative is people issues.

Managing the change process is an integral element of a successful CPI implementation. In the SDAIS approach, the following are considered keys to systematic change management:



1. **Educate leaders.** Educate key organization leaders on the concepts of TOC, the roles and responsibilities during the BPM, initial and long-term decisions critical to successful change, and why the change is important.

2. **Challenge presumptions.** Challenge the status quo, empirically demonstrate the competitive benefits of change, and answer the "What's in it for me?" question with a compelling rationale.

3. **Secure agreement.** Secure the agreement of key leaders on the need for change, the objectives necessary to implement that change, and the course of action to begin implementing that change.

4. **Prepare leaders to lead.** Educate and train leaders in defining the new standards for success, and creating the mechanisms necessary to set new expectations and generate results.

5. **Prepare staff to manage the change.** Educate and train the staff to manage the transition from the usual way of doing things to the new business processes, and assume new roles during the change.

6. **Educate the organization's membership.** Educate and train everyone about the new standards and expectations. The investment in this process saves difficulties downstream and helps to ensure a successful process.

7. **Use process to identify and carry through with the business process initiatives.** A formal approach provides the structure for the implementation and execution of the project. Using the deployment cycle creates a model for several important aspects of CPI implementation:

   - Management's input to the process is more predictable and explicit.
   - Management has clearly communicated what is important and who is responsible for what actions.
   - The focus is on coaching and facilitating to achieve successful results.
   - Successes should be celebrated and communicated to reward and encourage continued improvement.

7.5 CONDUCTING A BRP ACTIVITY USING DIFFERENT METHODOLOGY

An organization or Department may decide to use a BPR process that is not based on TOC. When using a different methodology ensure:

- Metrics are identified to document/measure process improvement.
- The As-Is and To-Be processes are documented using BPMN standard notation and that BPEL is achievable.
- The OIMT-selected tool, when available, is utilized for documenting the BPR process.

7.5.1 SELECTION OF THE RIGHT BPR METHODOLOGY

It is important to match the expected outcome of a process change with the methodology that is aligned with producing those results. A quality-focused methodology might not be a match for a process change that is heavily focused on increasing time efficiencies. All process development and reengineering must take into account all aspects: quality, time, resources, and costs. There is usually one of the aspects which is a driving factor by which the other aspects are subordinate, but not eliminated.

Table 16 gives a quick view of some of the features of the various methodologies outlined in this document.

Table 16: Comparison of Methodologies

Program	Six Sigma	Lean Thinking	Theory of Constraints
Theory	Reduce variation	Remove waste	Manage constraints
Application guidelines	1. Define 2. Measure 3. Analyze 4. Improve 5. Control	1. Identify value 2. Identify value stream 3. Flow 4. Pull 5. Perfection	1. Identify constraints 2. Exploit constraint 3. Subordinate processes 4. Elevate constraint 5. Repeat cycle
Focus	Problem focused	Flow focused	System constraints
Assumptions	A problem exists Figures and numbers are valued System output improves if variation in all processes is reduced	Waste removal will improve business performance Many small improvements are better than systems analysis	Emphasis on speed and volume Use existing systems Process interdependence
Primary effect	Uniform process output	Reduced flow time	Fast throughput
Secondary effect	Less waste Fast throughput Fluctuation—performance measures for managers Improved quality	Less variation Uniform output Less inventory New accounting system Flow—performance measure for managers Improved quality	Less inventory/waste Throughput cost accounting Throughput—performance measurement system Improved quality
Criticisms	System interaction not considered Processes improved independently	Statistical or system analysis not valued	Minimal worker input Data analysis not valued

7.6 BPR USING TOC

The five-step TOC process is based on focusing process participants and process managers on the identification of a control point (weakest link) within any process and then understanding how this control point can be enhanced or improved. TOC further enables any process (large or small) to be viewed from the system perspective without necessarily having to dissect it into smaller units. The development of a Throughput Operating Strategy (TOS), which describes how the operation or process should function to maximize both effectiveness and efficiency, serves as the improvement roadmap for the process participants (i.e., process leaders, stakeholders, and/or performers). The TOS also documents how the improvements are measured.

Coaching and counseling the process leadership and performers via throughput rounds as they implement the TOS actions or long levers, in addition to tracking process implementation success through the defined measurements, are the final element in the any TOC.

The benefits of the TOC approach to BPR are the straightforward and streamlined method, training, and engagement of all process participants in reengineering activities and visible measurement of success factors throughout the process. The training of each individual in the TOC ensures that process performers and their management can continue to improve processes themselves going forward.

The TOC methodology was first formulated in the mid-1980s and made popular through the best-selling book The Goal, by Dr. Eli Goldratt. The TOC has been successfully used to reengineer thousands of processes of various sizes and complexities with the Department of Defense, U.S. Navy, commercial clients such as Intel, Pfizer, Kroger, Proctor and Gamble, Hewlett-Packard, and most recently, in the State of Utah (with resounding success).

TOC methodology enables a process (large or small) to be viewed from the system[12] perspective without necessarily having to dissect it into smaller units like other methodologies do, thereby often creating distortions leading to actions which may improve one process at the expense of another. This common failure of most BPR approaches all too often leads to isolated gains at best and at their worst to erosion in the performance of the system as a whole. TOC functions equally well for a large process or system, such as the overall operations of a government department or agency fulfilling its function and on small, sub-processes such as the process to make an eligibility determination on an application for Medicaid or food stamps or to collect revenue from underpaid tax returns.

TOC Methodology's Unique Approach

- Action oriented
- Systems approach that avoids sub-optimization
- Short time to benefit delivery through its constraint focus
- Scalable for department-level BPR initiatives to enterprise wide
- Flexibility to adjust speed of change to fit the organization's needs
- Empowers people to make a difference
- Practical application of the right tools to fix the right problem
- True customer focus
- Knowledge transfer through practice and real improvements.
- Creates sustainment for long term success

Figure 26: TOC's Unique Approach

The TOC methodology as described in Figure 26 has been applied to thousands of processes and organizations of all types, from government to manufacturing, the military, health-care, education, and nearly every type of private industry. The fundamental breakthrough of TOC is generic—that every system (process, organization, etc.) has a control point, constraint, or weakest link, and the best way to maximize that system's performance is to manage it through that constraint.

But every application is customized because it begins with the unique process or organization it is being applied to. This application results in the development of a Throughput Operating Strategy (TOS) which describes how the operation or process should function to maximize both effectiveness and efficiency. The constraint for each system or process might be different and result in a slightly different TOS than another system that has a very similar purpose and flow. The customization comes in the application of the Five Steps of TOC, enabling each TOS to be defined by the unique characteristics (e.g., throughput, process steps, time) of that process.

[12] System is a set of interacting or interdependent components forming an integrated whole.

7.7 THEORY OF CONSTRAINT (TOC)

The TOC views any process as an interconnected system or chain and provides a common-sense focusing approach for optimizing it. TOC is applied using a step-by-step methodology: Strategy, Design, Analyze, Improve, and Sustain (SDAIS).

The TOC is an overall management philosophy and continuous improvement approach first introduced by Eliyahu M. Goldratt. The TOC methodology is geared to help organizations continually achieve better performance toward their goals by a continuous improvement cycle of identifying and eliminating the limiting factors or constraints that impede better performance.

Because any organization is comprised of interdependencies between its parts, TOC often uses the analogy of a chain to describe these processes and systems:

> The strength of the chain is dependent upon the strength of the weakest link, and the constraint limits the flow of work through a system in the same way as the slowest vehicle in a convoy sets the pace of all the vehicles.

Since any system has a constraint that limits it from achieving more of its goals, the TOC's ongoing improvement process seeks to identify the constraint and improve the rest of the organization around it through the use of five focusing steps:

1. Identify the constraint.

2. Exploit the constraint.

3. Subordinate to the constraint.

4. Elevate the constraint.

5. Re-evaluate, and then go back to step one.

The continuous process improvement TOC methodology is utilized within an implementation planning framework that can be used by any organization. The business process framework is separated into sections that align with the deployment cycle and is designed to include tasks that are necessary to gain the support and involvement of the organization, identify root causes of current issues in the current state, develop an improved future state for the organization, and to guide the transformation actions to the future state. Appropriate inputs and approval for planning should be obtained from organizational leaders as well as members of the steering committee and support team. Publication of formal plans, where appropriate, will provide an effective means to communicate with each member of the organization and are discussed in more detail below.

7.7.1 CONSTRAINT-BASED (TOC) SYSTEM ARCHITECTURE

In the Strategy or Pre-deployment phase, TOC approaches any process first from the perspective of defining its purpose for existing and its place/function within the larger organization. Utilizing proven tools, TOC allows the organization that owns the process to re-define and re-build it in order to fulfill its purposes in a more efficient and effective manner.

A disciplined and consistent pre-deployment approach to pursuing BPR is an integral part of the leadership required to successfully deliver BPR projects. To succeed, the Strategy phase provides for the application of a project methodology or practice including creation of a formal project charter, communication plans, organizational change management plans, and a plan of actions and milestones (POA&M). The Strategy phase supports the BPR implementation with project management methods, appropriate governance, policy, organizational constructs, and a full complement of the tools required for the deployment of BPR initiatives and the successful completion of the BPR project. This phase is essential to providing a working framework and foundation for integrating the BPR activities within the organizational structure and culture. The pre-deployment activities are shown in the diagram above.

Once the Strategy phase is completed, the TOC Five Focusing Steps are applied in the Design phase to create an operating model for the process or business, or a TOS. The TOS is a common-sense picture of how the process ought to function when operating efficiently and effectively, including an articulation of the key operating metrics or measures for managing it effectively. In other words, "What does good look like today?" and "How is good measured?" The TOS serves as the basis for activating, improving, and sustaining the process in the final three phases.

TOC Five Focusing Steps

- Identify the **constraint** of the system or process (the weakest link in the chain).
- Decide how to **squeeze** the most out of the constraint or improve the activities associated with the constraint.
- **Subordinate** everything else within the process to the constraint (so that all steps in the process are synchronized in their operation and in relation to the identified constraint).
- **Elevate** the constraint (to increase the efficiency of the operation, and lower costs).
- When a constraint is broken, **return to Step 1** and repeat the process (creating a model for on-going improvement or roadmap for continuous business success).

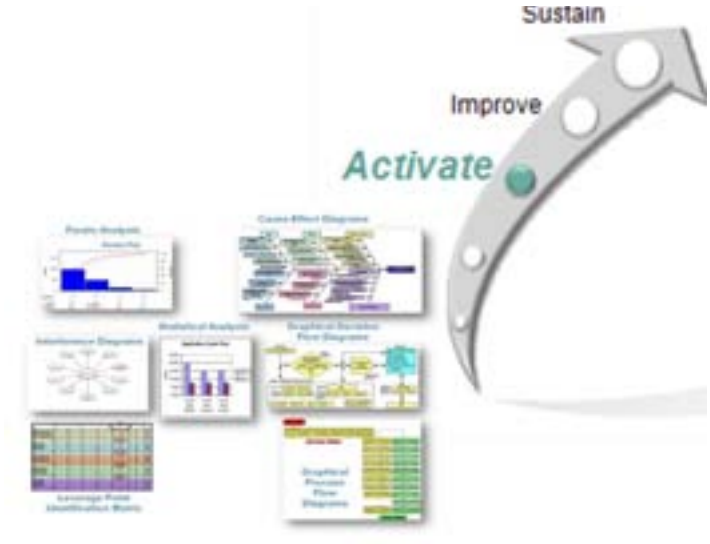
The TOS is a high-level future state process map that represents the combined end-to-end process elements that create or add value as defined by stakeholders, customers, or constituents requesting a product or service. Because it is a high-level map, it is designed to fit onto a single page and only represents the major end-to-end business process linkages. Constructing the TOS as a future-state map describes the vision for the desired future process, and the operational performance metrics for success. The TOC Five Focusing Steps are applied to identify the constraint (control point) at the enterprise level.

After creating the TOS, a gap analysis review with process participants reveals potential leverage points for improving the end-to-end process performance. Typically, this gap analysis follows steps 2 through 4 of the TOC Five Focusing Steps and uncovers issues between the current state and the TOS future state. Because the gap analysis focuses on the overall end-to-end process constraint, it uncovers significant enterprise-level quick win improvement opportunities for the organization. These are called the "long levers" for improvement and drive the next step of the process.

Rapid resolution action plans are developed to address the identified long levers. The execution of the action plan then commences and brings about the first wave of improvement to the organization. This first improvement results are described in more detail below.

To prepare for gap closure, the departmental leadership, supervisors, and process performers are trained in the fundamentals of TOC and the new TOS in a half-day work session. Follow-on training in concepts and tools is conducted through just-in-time, on-the-job training, coaching, and mentoring. This minimizes the organization's classroom training time while permitting an effective knowledge transfer to individuals and teams as needed. This approach to knowledge transfer creates a short cycle between the acquisition of new knowledge, its use, and the delivery of improvement results.

In the Activate phase a more thorough deep dive process mapping and root cause analysis is conducted to fully understand and document the current state (As-Is) processes and sub-processes. A full suite of proven analytical tools are utilized to more thoroughly understand and validate the root causes of process issues and provide a more detailed consideration of the people, processes, materials, and information systems associated with the As-Is process. The Activate phase engages the knowledgeable representatives, process performers, supervision, and other stakeholders to achieve a fully coordinated understanding of the root causes and additional improvement opportunities. This phase is essential to the subsequent Improve and Sustain phases because it is during the Activate phase that process owners and process performers begin to understand the causes of performance gaps at a level aligned to their authority to effect change and take ownership for the improvement process.



The process mapping and root cause analysis conducted during the Activate phase employs only those tools required to develop the current state understanding. This phase may include:

- Process swim-lane mapping
- Interference diagrams
- Fish-bone root cause diagrams
- Pareto analysis
- Process flow charting
- Statistical data analysis
- Process capability analysis
- Capacity analysis
- Variation analysis
- Defects rate

Once the process and root cause analysis is complete, the As-Is process is redesigned and the To-Be process is completed. This redesign establishes a clear vision of "what good looks like" for each of the lower-level processes that is aligned with the higher-level TOS vision. A further gap analysis between the As-Is and To-Be states are converted into actions (small or large) to close the gaps and bring the process more in line with the desired end state. Prioritization of the opportunities by their business impact guides the sequencing of efforts in addressing the transformation and moving into the improve phase.

The Activate phase closes out with a detailed and concrete plan of action to move the transformation effort through the Improve phase on multiple vectors:

- Bottom-up improvement initiatives led by process supervision and process performers to effect improvement on a daily- and weekly-level on initiatives within the span of control of the organization. Examples include the Throughput Rounds improvement process and work-center improvement initiatives.

- Cross-cutting improvement initiatives led by a core team (or a selected individual) that spearheads cross-cutting improvement initiatives with other organizations or functional silos.

- Top-down improvement initiatives led by a more senior sponsor or improvement team that focuses on systemic policy constraints, structural impediments, or initiatives requiring budgetary authorization. Typically, the implementation lead time for these initiatives is the longest of the three types.

7.7.2 SYSTEM IMPROVEMENT ARCHITECTURE

The Improvement phase is where the actual transformation of the organization takes place. Figure 27 identifies the three initiative-types created as an output of the Activate phase. The TOS is communicated broadly within the organization in combination with concise workshops on the TOC principles that help people understand the rationale behind the changes and get them engaged in how they can better support the TOS. A two-pronged approach is utilized, in parallel, to drive rapid local and cross-cutting improvement initiatives and demonstrate tangible results based on the identified measures of success. A crosscutting functional core team is created to address the identified long levers at the system level. Their responsibility is to design and execute changes which cannot be made solely at the front-line level. These may include changes in performance metrics, policies, procedures, and other systemic changes that require organizational shifts.

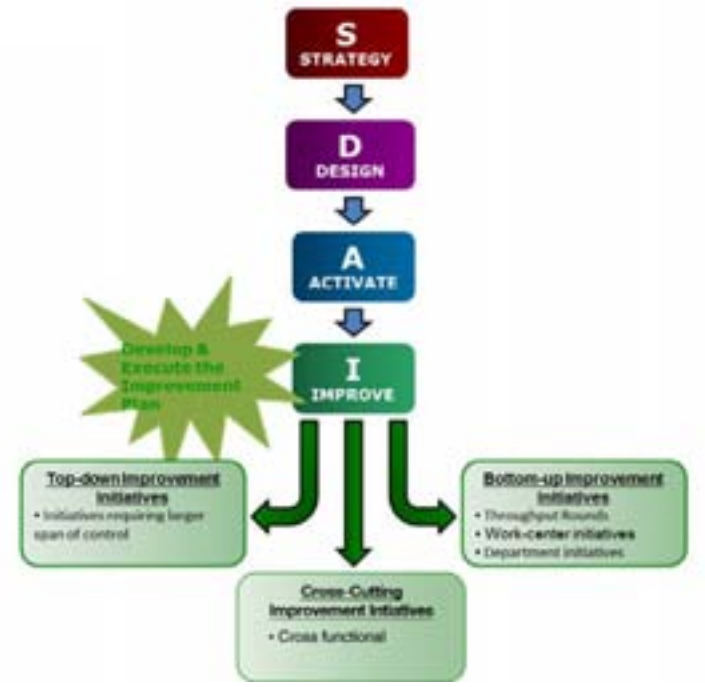


Figure 27: Improvement Phase Initiatives

At the same time, the change process is driven broadly across the organization through a regular (daily or weekly) process known as Throughput Rounds. Throughput Rounds are led by management or supervision and involve the front line staff responsible for executing the various steps of the process. These are short stand-up meetings where the staff compares the TOS to what is actually going on day-to-day to identify areas where things are out of step with the TOS. Fixes to local process issues or course corrections are developed on the spot and, to the extent possible, implemented that day or managed through an action register. Issues that cannot be addressed by the staff themselves are referred to the core team along with useful suggestions or best practices that can then be propagated to other departments for adoption.

The actual changes are designed and executed by the managers and staff of the process. This promotes a high-degree of ownership in the changes and greatly accelerates implementation and results. Great care is taken to ensure that the changes not only improve the process as a whole but also the lives of the people involved in the process. This keeps everyone motivated and ensures incentive for continued improvement.

A third track of improvement initiatives proceeds in parallel with the other two tracks, but it is driven by a top-down process led by leadership and project sponsors to address larger, more systemic issues that require high-level resolution or where the improvement initiatives require budgetary authorization.

Together the three parallel tracks of improvement initiatives drive the BPR and organizational performance to a significantly higher level.

Toward the end of the SDAIS methodology, the focus of all activities shifts to actions that will sustain the new process or mode of operation. The entire BPR using TOC is designed, not as a one-time improvement, but as a methodology for continuous improvement, and the close coaching and mentoring of management and staff are integral parts of the work.

During the Sustain phase, monitoring plans and a measurement dashboard are developed and used to ensure the process gains are maintained. The dashboard metrics provide continuous monitoring capability of the critical process parameters and leading metrics of process performance. If not monitored, improved processes often revert back to what they were before. As soon as processes are changed, it is important to document the changes and standardize the new processes. In conjunction with the dashboard, the Sustain phase develops the response plans for the organization if a problem with the process develops and the metrics indicates degradation in performance. The response plan provides for automatic response to the indicators of sustainment loss (or backsliding).

Two significant components of the Sustain phase are:

1. To ensure there are updated documents and operating procedures for the improved processes. (Note: Failure to document the improved SOPs can be a significant source of backsliding on the improvement gains.)

2. To expand on the organic expertise to apply the next wave of improvement initiatives—a second wave of improve and sustain initiatives—independently.

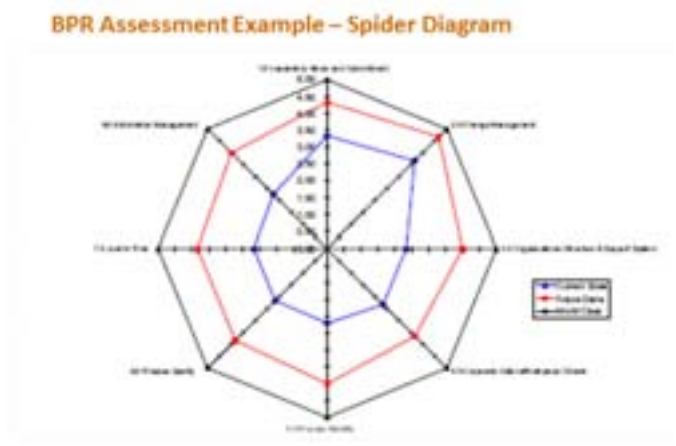
While the above constitute the majority of the time required for the Sustain phase activities, several other important activities take place to promote the sustainment of the BPR activities:

- **Reviews for any replication opportunities.** The replication of successful improvement solutions to similar processes in the organization saves time and effort from unnecessary reinvention and duplication. It can be a force multiplier of the improvement gains. During the Sustain phase, a concerted effort is made to identify those opportunities for replicating successful solutions.

- **Celebrate BPR project success.** Successes should be recognized, celebrated, and communicated to reward and encourage continued improvement.

- **Communicate publicize, and promote results.** Close-out of the Sustain phase includes creating documentation for the BPR, the performance gains, lessons learned, and other project documentation so that the transformation may be communicated as needed.

- **Conduct self-assessment periodically.** Periodically using a tool such as a maturity assessment will keep the organization focused on proper criteria to support the BPR deployment.

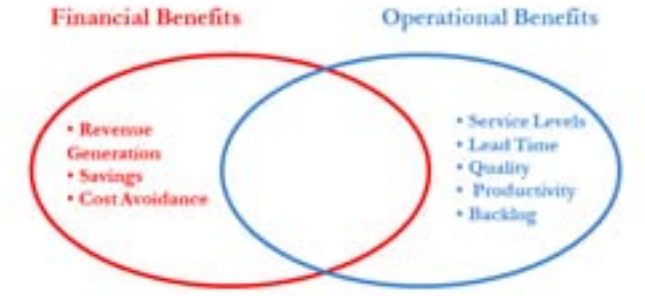


The SDAIS BPR model is one of continuous improvement. Once the SDAIS reaches its end, the process recycles back for a second wave of improvement initiatives to reach for an even higher level of performance. If additional analysis of process issues is required, then the follow-up waves may recycle back to include elements of the Analyze phase.

7.8 MEASURING PROCESS IMPROVEMENT

7.8.1 OUTCOME METRICS

TOC BPR projects yield a wide range of benefits that are categorized as having either financial or operational benefits. Any BPR improvement project must have the potential to generate some type of financial or operational benefit in order to merit the obligation of resources. Financial benefits are those that conserve or produce resources that can be measured and aggregated in dollars.



There are generally three types of financial benefits:

- Revenue generation
- Savings
- Cost avoidance

Operational benefits are normally associated with meeting external critical constituent or stakeholder requirements and/or internal critical business requirements that improve the services to other organizations. Operational performance benefits are measured in non-monetary terms. For example, constituents may want faster service times of a certain service or product where a product or service is delivered faster or more consistently.

Error! Reference source not found. illustrates the fact that financial and operational benefits are ot distinct and independent categories. There is a dynamic relationship between the two. For example, improvements in operational performance will usually produce revenue generation/direct savings/cost avoidance.

While financial benefits are measured in terms of dollars, the metrics for operational benefits can vary greatly, depending upon how the critical constituent requirements and/or critical business requirements associated with a process are articulated.

The several common metrics for operational benefits include:

- **Improvements in process lead time/process cycle efficiency.** If a BPR project reduces lead time, the process cycle efficiency will be improved.
- **Man-hour reductions.** Process improvements often result in the conservation of significant human resources. Man-hour reductions will also generate financial benefits in the form of savings or cost avoidance.
- **Reductions in defects.** If the BPR project reduces the number of defects in a process, the improvement may be measured.
- **Backlog reduction.** When a BPR project improves the constraining process, the average rate of completion increases and there is a corresponding reduction in the workload backlog.
- **Productivity.** BPR improvements often result in improvements in more than one operational factor that can be related in a single measure. Productivity for example, is a measure of the ratio between output and human resources.

As part of the Design stage described above, and in concert with the organizational leadership, the operational outcomes that have value in supporting the process mission are articulated: constituent-oriented, outcome-based operational metrics. A set of agreed-upon relevant, meaningful, and quantifiable baseline metrics are then developed for the BPR project. These baseline measures are utilized throughout the duration of the BPR to monitor and communicate the BPR project's value delivery in terms that matter to the leadership and are relevant to constituent's needs.

A measurement system analysis, conducted in the Design phase, of the process ensures that relevant measurements and metrics meet the criteria for baseline measurements and the validity of the data used.

BPR financial and operational baseline metrics must meet five key characteristics:

1. **Valid** metrics that actually measure what they are intended to measure.
2. **Obtainable** metrics that can actually (and practically) be gathered in a timely manner.
3. **Accurate** metrics that can be trusted to give the right information.
4. **Repeatable** metrics that give the same answer under the same conditions every time.
5. **Actionable** metrics that allow us to do something with the information they provide, which requires both relevance and timeliness.

7.8.2 LEADING METRICS VERSUS LAGGING METRICS

To effectively measure the BPR, an XY Matrix process is used to develop both leading and lagging metrics. Measures are called lagging metrics because they are collected and reported after something has happened. They are results-oriented and fine for tracking overall performance trends, but by the time a lagging metric reflects a problem, it may already be having a major impact.

Leading metrics help predict what will happen, allowing at least some problems to be anticipated and avoided. A leading metric might be a frequently recorded basic process metric coupled with a defined set of expectations or limits. Process performers need leading metrics to minimize problems.

As part of the Design stage described above, the management of the process articulates what the key metrics or measures should be in order to motivate the right actions from the process performers and the organization as a whole. Measures are documented as part of the one-page process definition and TOS. The TOS succinctly describes how the process ought to function when operating efficiently and effectively, including the key operating metrics or measures for managing it effectively.

7.9 NOTIONAL TIMELINE FOR A BPR USING THE TOC METHODOLOGY

The TOC five-phase SDAIS Methodology delivers a rapid launch-to-benefit realization through its focus on the key constraining processes. Unlike other BPR processes, the SDAIS process does not involve spending months in planning, defining, and development phases before delivering on the promise of improved results.

Long BPR project cycle times, such as the typical eight or nine months needed for Define, Measure, Analyze, Implement, and Control (DMAIC) Six Sigma projects, is opportunity lost. Relative to other BPR methodologies, SDAIS provides a significantly compressed timeline for benefit realization.

The disciplined and focused SDAIS process results in a two-pronged benefit delivery pattern (illustrated in Figure 28). The first wave of improvements is launched at the completion of the Design phase, usually one to two weeks after initiation of the BPR project. The next waves of improvements result from the multiple initiatives launched in the Improve phase to be carried forward through to the Sustain phase. Since time to execute the different initiatives will vary, a mixture of both short- and medium-range improvement initiatives is combined to produce an accelerated benefit realization curve.

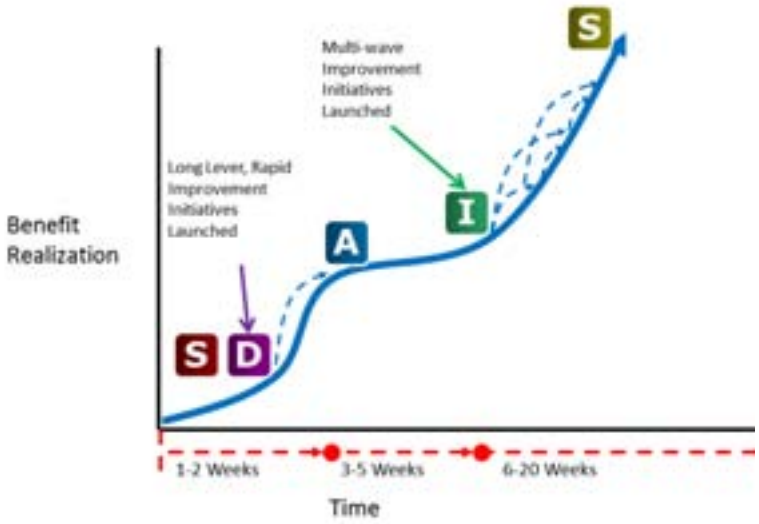


Figure 28: SDAIS Improvement Curve

Table 17 - Notional Schedule and Time Commitment for a BPR Activity Using TOC

SDAIS Stage	Schedule and Milestone	Activities
S	One week or less	• Half-day kick-off and TOC training for Organizational Leadership • Project charter development • Structuring roles and responsibilities • Project Plan of Action and Milestones (POA&M) • Communication Plan
D	One week or less	• Half-day workshop to document a simple diagram of the process flow and TOS and the As-Is process in standard BPMN notation • Half-day kick-off and training of all process performers (trained in groups) • Capture IT/IRM requirements, as appropriate • Calculate baseline performance measures • Identify and define key process performance indicators • Apply five-steps process to identify long-leverage, quick-win opportunities
A	Three-five days Long levers milestone	• Less than a half-day: Long-levers milestone workshop • Gain concurrence on the long levers for improvement with Organizational Leadership and establish teams to address each • Launch improvement plans to address long levers
A	Three-five weeks	• Process and root cause analysis; document and understand the As-Is process and sub-processes • Redesign the process based on its purpose and true business requirements, including "what good looks like" for each local area (To-Be) • Document To-Be process in standard BPMN notation • Perform gap analysis • Capture IT/IRM requirements • Implement new process-level metrics
I, S	6-20 Weeks	• Implement throughput rounds to engage everyone in the improvement process and address issues • Generate solution ideas to close performance gaps • Prioritize and implement improvement waves • Project manage the improvement waves to completion • Measure and quantify results versus baseline performance • Coaching and mentor the organization • Provide over-the-shoulder training • Meet with Organizational Leadership as a Steering Committee • Capture IT/IRM requirements • Develop process monitoring, Control and Response Plan (dashboard) to sustain improvement gains • Document and standardize process solutions (SOPs) to sustain improvement gains • Implement process review/operational reviews to sustain improvement gains • Identify replication opportunities • Training to expand the organization's expertise • Prepare next wave of improvement initiatives
S	Deliverable	• Complete BPR and document results to date • Sustain and build on initial results • Deliver SRD

7.10 LEAN

Over the years, Lean has been adopted, modified, changed, and in many ways mashed to a point where now it is often seen as an almost Zen-like experience for an organization to strive toward. At a very high level, Lean systems give people at all levels of a Department common skills and a shared way of thinking to systematically drive out waste through designing and improving activities, connections, and process flows. Commonly seen as being created and fine-tuned by Taichi Ohno and often referred to as the Toyota Production System, Lean has changed from Ohno's original intent of improving internal activities so that an organization can process at a greater flow.

Essentially, Lean is an all-encompassing process that requires the involvement of all functions of a Department within the State. Lean is highly disciplined approach that, while it can product revolutionary results for a Department, does take a considerable amount of time, effort, and persistence to implement. Lean is best suited for high-volume operations within the state where they are repetitive activities required to achieve service to citizens or other government functions. Focus is on improvement processes and implementing discipline, practice, tools (both IT and non-IT) and strongly emphasizes developing and fostering a culture of looking to eliminate wasted movement.

Lean focuses on the elimination of wasted (the Lean word for this is muda) activities in the following areas:

- Transportation—the movement of items
- Waiting—how long does something sit idle with no activity being performed
- Overproduction—producing more of something or service than required by the end user
- Defects—doing something wrong
- Inventory—creating something or performing a service so it will be waiting
- Motion—movement that does not provide value to the end user
- Extra processing—functionality that is not required by the end user

The Lean Methodology for the State attempts to remove waste and non-value added activities from a system or process. The goal is to either eliminate this waste from the process or system or to transform the process into a value-added process to either citizens or to the government.

7.11 LEAN PRINCIPLES TO PRACTICE

The following principles are applied when attempting to perform a Lean reengineering project. It is important to note that for Lean to reach its full potential for a State Department, the concept of performing Lean needs to be based on what can be considered a value chain. A value chain can be described as what are all the different processes that are linked together to create the entire system that provides service to citizens or support for service to other Departments. A simple analogy is to think of each link in a chain as an individual process with all the various links intertwined together making the entire chain. Lean should work with an entire chain view.

7.11.1 SPECIFY VALUE

A value-added activity can be described as an activity that satisfies an end-user's requirement that the user would be willing to pay your organization a service fee. These activities need to be the focal point and are what delivered with maximum efficiency. Value-add is the core contribution that a Department provides to the citizens of Hawai'i or to other Departments in the State and are what are to be delivered with high quality, high availability.

7.11.2 DEFINE THE VALUE STREAM

The value stream is the actual process map that identifies every action required to deliver service to citizens or to another State Department. This map clearly shows the how value being provided flows thorough the organization to the end consumer. The initial objective of this defining and laying out the value stream is to explore the system for elimination of waste or optimization of the process. A valid value steam should begin and end with either a citizen of the State for external systems or with a Department for internal process supporting other State Departments.

7.11.3 VALUE FLOW

Processes that provide service have to be organized in a manner to facilitate a smooth flow of services throughout all the processes that create the entire system. The following principles need to be considered to help in creating an optimized flow:

- Schedule processes for level loads across all the processes. The key component is to synchronize the rate of flow through the system to the acceptable level of the user.
- Physical layout of the office could facilitate the smooth flow of the service being provided to the citizen.
- Statistical process controls at the source to help with monitoring and controlling the processes to reduce rework of service to citizens.

7.11.3.1 THE CONCEPT OF KAIZEN (ONGOING IMPROVEMENT)

Often in an office environment or in a State work area the largest hindrance to process is clutter or lack of standardization in the space. The removal of clutter or arrangement of work items brings the following benefits for the State:

- Improved maintenance—for example, motor vehicles
- Improved safety, better maintenance of equipment—State-owned mowing or leaf removal equipment
- Ownership of workspace—employees will take pride in their work area
- Improved productivity—less waste from workers losing or misplacing equipment
- Improved morale—evidences exists that clean, organized workspaces improve employees' morale

This is where the concept of Kaizen (meaning ongoing improvement) is implemented for an organization. The execution of Kaizen uses specific tools and techniques that a Department in the State would deploy though the entire Department. Successful Kaizen required management attention and commitment, workforce involvement (this includes union and exempt employees), quantifying and communicating the benefits of continuous improvement, and standardization.

7.11.4 END-USER PULL

Lean systems work best with the flow of the process is based upon and driven by citizen or Department demand for service. Department resources will be activated on to perform service when a trigger is activated for work to begin. Additionally end-user pull is ideal when performed in a one-piece flow in which each operation work only on piece at a time and had does not wait for buildup of multiple items such as forms or applications.

By working each item in a one-piece flow identifies problems and addresses quality issues and increases communication within and across Departments in the State. One-piece flow also assists in identifying waste in a system or process more quickly from the elimination of any noise that a system naturally causes from sometimes getting a process right.

7.11.5 KANBAN

Setting up a kanban system for the State of Hawai'i while based upon a kanban system for a manufacturing system represents a reverse order. The primary technique of a kanban system for the State is the use of small lot sizes and the ability to improve communication. The following kanban areas are important for the State:

- All work has a specified content, sequence, timing and outcome.
- Connection points must be direct in an almost yes-no manner for request for service.
- The path to the next step in the process must be simple and clearly understood (workflow).

An item of note: quality assurance is an important element of any Lean process, and a pull system will not function properly in the absence of high-quality work. All kanban systems require:

- Worker responsibility
- Measurement
- Enforcement of compliance
- Automatic inspection of product or service

7.11.6 PERFECTION

The last phase of Lean is to refine the process to remove as much variability in the execution as possible. By this point in the project, the majority of the waste should have been identified and addressed so as to remove the waste from the system or process. The system should contain only activities that add value to the service that is being provided to a citizen or to another Department. This is the phase where standard operating procedures are created and put in place as well as controls for the system to ensure that the optimized system is followed and followed every time.

7.11.7 AGILITY

When waste in a process is identified to be eliminated, it is imperative that speed of elimination of this waste is a priority to position the State to make further advancement in eliminating waste. When followed as designed by Ohno, Lean is a quick method of process improvement by activating all resources involved in the process from primary resources to stakeholders in the removal of waste in the system.

Project management needs to focus on desired results and how to quickly enhance the ability of the project to increase customer satisfaction take into account the human factor of the waste to be eliminated, and any financial or budgetary factors. To achieve the desired goals quickly for a Department, the following must be addressed:

- Kick-off and planning
- The establishment of urgency to improve
- Vision of the desired end result or voice of the customer (VOC)
- Training requirements
- Goal setting
- Identification of roadblocks and barriers that are to be removed to achieve
- Use of the State's project management processes

While developed and refined by discrete manufacturing like Toyota, Lean is a tool that is effective for areas where processing of information is needed. Areas such as accounting, citizen communication, and legislative communication are all areas for consideration for Lean.

7.12 SIX SIGMA

Six Sigma is a disciplined methodology using data and statistical analysis to measure and improve an organizations operational performance. The main focus of Six Sigma is the identification and elimination of defects in a process. Six Sigma's name is derived from the statistical reference to six standard deviations or 3.4 defects per million opportunities.

Originally developed in the 1980s by Motorola to respond to quality assurance standards that did not provide the level of granularity that Motorola needed to keep up with competition, Motorola developed this new methodology to assist in the transformation of the culture. Over time, Six Sigma evolved from a metric to a methodology to a management system for the company. In the 1990s, Motorola saw the positive impact to their organization, and then they began to sell this methodology to other organizations which then allowed for Six Sigma to develop into what it is today.

Six Sigma is a project-oriented approach to quality assurance improvement that typically revolves around two sub-methodologies that have the tools and techniques necessary to achieve sustainable quality improvement. The first is the DMAIC methodology, and the second is Design for Six Sigma or DFSS.

7.12.1 DEFINE, MEASURE, ANALYZE, IMPLEMENT, AND CONTROL (DMAIC)

DMAIC is focused on operational improvement in a process. The DMAIC method is aimed at improving an existing process in the State, and it is a step-by-step method to review and improve the process or system.

7.12.2 DEFINE

The Define phase is typically the most important phase of DMAIC process. It is in this step of the methodology that the problem needing resolution is defined. In addition to defining the issue, this phase of the methodology is where goals are also set in place. The perspective of the end user has to be taken into account and can be understood using VOC techniques. Six Sigma places high importance to identifying and defining the problem with often quantitative and qualitative definition provided to explain the problem.

7.12.3 MEASURE

In the Measure phase, the data necessary for understanding the process is gathered and centralized. The key aspects of the current process are taken into consideration and noted down. In this phase the gathered data is also data is measured against different parameters using statistical tool. This information is used to create baseline performance and put operational performance of the As-Is in place.

7.12.4 ANALYZE

The Analyze phase is where the gathered data is analyzed using different statistical tools. The analysis helps in deeper understanding of the problem. The cause-and-effect relationship of various factors is taken into consideration. Measures are taken so that no factor of the process is left out of the analysis. With the root cause identified, it becomes easier to work on the process and solve the problem.

7.12.5 IMPROVE

During the Improve phase, the process development is carried out using different techniques, such as design of experiments (DOE), which are used in establishing process capability. The data gathered and analyzed has an important role to play in the improvement phase. Different solutions to the problems are first identified, and then after analyzing the pros and cons of each of them, the best of them is adopted.

7.12.6 CONTROL

The last phase is Control. So that changes to processes do not deviate from the set goal created in the define phase, control mechanisms are set up. In case of any variance, the problem is identified immediately and measures are taken to rectify the problem. Various methods such as standards and procedures, pilot and solution results, and training are performed to ensure deviation does not occur.

7.13 DESIGN FOR SIX SIGMA (DFSS)

Design for Six Sigma (DFSS) is similar to DMAIC and is used for the designing of services to be provided to an end user that do not exist. To accomplish the desired goals, design, optimize, and verify (DOV) is used. DFSS is comprised of four phases which have detailed steps with each phase. DFSS phases include Identify, Design, Optimize, and Validate.

7.13.1 IDENTIFY

This phase begins the process of creating a formal tie of the design to specification given or from a VOC exercise. The Identify phase involves developing a team and chartering this team to gather VOC or specifications of what is required for success. Essential steps in this phase include:

- Establishment of the business case
- Identification of the technical requirements
- Determination of roles and responsibilities
- Setting milestones
- Identify and outline customer requirements

This phase also includes specific tools and techniques for accomplishment of the realizing the above items:

- Quality functional deployment
- Failure means and effects analysis
- Integrated product (service) delivery system
- Target costing
- Benchmarking

7.13.2 DESIGN

Design is the second phase and consists of identifying functional requirements, development of alternative concepts, and the evaluation of these alternative concepts and selection of the best concept. The essential steps for this phase include:

- Formulate a concept of design
- Identify potential risk
- For each technical requirement identify the design parameters
- Prepare the procurement plan
- Use DOE or other analysis tools to determine influence of various concepts for technical requirements

The key tool set for this phase includes:

- Risk assessment
- Engineering analysis
- DOE
- Analysis tool
- System engineering tool sets

This phase should be given to the complexity of the process. As steps are added to address this the complexity of the solution increases, and thus introduces more risk; if complexity can be reduced, the potential for success increases.

7.13.3 OPTIMIZE

For the Optimize phase, the use of process capability information and statistical tolerance must be considered in the approach. Developing detailed design elements, prediction of performance, and optimizing design all take place in the optimize phase. This is where the desired sigma level or quality level is established and then incorporated into the design of the process. The essential steps for this phase include:

- Assess the process capabilities to achieve quality requirements
- Optimize the design to minimize variance to the process
- Design the system for performance and reliability
- Use the Lean technique of error-proofing or poka-yoke
- Establish quality tolerances
- Optimize the cost

The key tool set for this phase includes:

- Process capability models
- Monte Carlo analysis

7.13.4 VALIDATE

The Validate phase consists of testing and validating the design. As increased testing using formal techniques and pilots occur, the feedback of accomplishing the requirements should be shared. The essential steps for this phase include:

- Prototype test and validation
- Assess performance, failure modes, reliability, and risk
- Design iterations
- Final phase review

The key tool set for this phase includes:

- Risk assessment
- Disciplined new process introduction
- Acceptance testing

7.14 INTEGRATED TOC, LEAN, SIX SIGMA (ITLS)

The iTLS method combines various aspects of the TOC, Lean, and Six Sigma processes. This method emphasizes long-term improvement by first identifying the main problem, measuring possible success, highlighting specific aspects, and finally, committing to a solution. iTLS acknowledges that goods and services are network based, with many problems limiting their production. By using iTLS, users can limit some of these major factors.

iTLS takes certain aspects from the TOC, Lean, and Six Sigma methods and combines them into a single unified method which results in better financial results than the three methods done separately. iTLS produces results from basic business understanding as well as various systematic instruments to improve the overall wellbeing of a company. This method can be used for any aspect of the company, ranging from its basic production to its final product or service. By utilizing the iTLS method, a company can keep customers happy, increase profit, and create a stronger core of business leaders.

iTLS uses the main functions of each of the three other practices to produce the best results possible. TOC can identify which problems are the biggest and, when fixed, can result in the greatest profit. Lean methods focus on removing waste from a system, using more efficient and safer practices. Six Sigma techniques aim for the perfection of the system, limiting the variability in it and therefore creating a more consistent environment. By integrating all three, iTLS catalyzes results, obtaining much larger benefits than each would bring separately. To recap, TOC identifies the biggest blockages in a system, and Lean and Six Sigma create solutions to eliminate the problems so the system can run as efficiently as possible.

Figure 29: iTLS Approach

Why choose iTLS?

iTLS is the only solution that has both quantitative and empirical evidence to support its claims. It is the only method that combines the other three approaches, using each one's main focus to create the best possible solution. By only using the most efficient practices from the three methods, iTLS has virtually no holes in its system. By using its seven-step process, one can reap the benefits iTLS has to offer.

7.14.1 WHAT ARE THE ITLS STEPS?

The combined iTLS approach uses the following seven-step process:

1. Mobilize and focus
2. Decide how to exploit the constraint.
3. Eliminate sources of waste from the constraint.
4. Control process variability and error.
5. Control supporting activities.
6. Remove the constraint and stabilize.
7. Reevaluate system performance and go after the next constraint.

7.14.1.1 MOBILIZE AND FOCUS TO IDENTIFY THE CORE PROBLEM

The first step is the most vital. Without identifying where the main problem is, the biggest benefits cannot be obtained. Thus, this step needs to properly identify where effort should be put in to achieve these results. Various tools can help identify the core problem. By identifying what the problem is, the proper tools of use can be identified as well.

If there is a single step that causes the most problems, it must first be identified. This can be done by examining the overall flow of the process, taking it step-by-step to identify the major cause. After identifying the problem, the next step lies in quantifying the possible benefits. Do we expect an immediate increase in throughput? (Throughput is not just how much we can produce, but both how much we can produce and sell.) If we also want future throughput, other actions need to be identified to guarantee we sell and produce more.

If the benefit sought is decreased expenses and overall cost, how much is expected to be saved, and is this a realistic goal? If the solution results in fewer people needed, what will we do with the extra employees? Floor-space represents a similar problem. If less floor-space is needed as a result, will the rent also cost less? What will be done with the savings? These questions need to be addressed so we can focus on immediate versus future benefits.

Once the goals have been properly identified, along with the possible benefits, we can rank the efforts in terms of priority. Afterwards, employees can be organized and a schedule can be created.

When the problem doesn't have an easily identified root, a different method is needed. This situation occurs when various policies prevent the proper action from being identified. When this happens, the cause-effect-cause way of thinking is the best technique for identifying the major problem and finding a viable solution.

7.14.1.2 DECIDE HOW TO EXPLOIT THE CONSTRAINT

When a physical constraint is the main problem, many actions can result in an increased throughput. If the setup is faulty or the technology continues to fail, Lean is the best method for solving the problem. If the problem is a lack of control in the process, Six Sigma techniques will reduce the amount of waste produced due to random variation.

Before breaking a constraint, a time buffer should be implemented so damage is mitigated from feeding operations. Time buffers also help to identify the core problems in a system. Once the constraint is eliminated, the time buffers can be limited or removed.

A number of solutions can be implemented to improve throughput and eliminate constraints. There is a valuable distinction to be made between value-added and non-value-added activities. Although both activities can be viable solutions, a value-added activity can be the better improvement action. Before choosing which method is better, one should analyze both to see which produces better results.

7.14.1.3 ELIMINATE SOURCES OF WASTE FROM THE CONSTRAINT

At this phase, we create various measurements to keep track of our benefits as well as to ensure that although wastes are eliminated; regression doesn't occur. If we are off-schedule and are not able to meet the proposed benefits, improvement efforts should be analyzed to prevent resources from being wasted. Further methods should be identified so that we can continually increase throughput and reduce operating costs. CE-CNX (Cause and Effect with Control, Noise, X-factor characterization), and Failure Mode Effect Analysis (FMEA) can assist in this effort.

7.14.1.4 CONTROL PROCESS VARIABILITY AND ERROR

Improvements tend to regress over time. Controls and measurements should be implemented to limit the regression.

7.14.1.5 CONTROL SUPPORTING ACTIVITIES

In order to coordinate feeding and following operations with constraint activities, a few steps are needed. Actions that are focused on the constraint needs should be prioritized. It is beneficial for the people dealing with these activities to know why these changes are being made.

7.14.1.6 REMOVE THE CONSTRAINT AND STABILIZE THE PROCESS

While various methods (poka-yoke, MBR, and QBR standardization, monitoring dashboards, etc.) can be used to see if the new process is working, the best method is to educate the affected employees in understanding VOC and VOP and the process behavior.

7.14.1.7 REEVALUATE THE SYSTEM PERFORMANCE AND GO AFTER THE NEXT CONSTRAINT

At this point, the results should be analyzed. Did they meet the expectations? Furthermore, the method of measuring the employees must be reevaluated, especially if the constraint has been removed. Finally, we must decide whether additional improvements should be made or whether the focus should be shifted to different problems. 7.15 Conclusion

Each of the continuous improvement methodologies for the State has its specific strengths and weaknesses. But each of the methodologies outlined can complement each other to produce a robust and dynamic approach to transforming how Hawai'i does government.

TOC's primary strength is its focus on where to make improvements in the process and where to devote energy and resources to improving the service to citizens or other Departments in the State. TOC focuses on how much of a constraints time is used to actually deliver service. TOC is a good indicator of available capacity to deliver service to citizens or Department. TOC also offers several thinking process tools that are useful in identifying what to change. While TOC has strengths, TOC's shortcoming lies in the absence of robust tools to solve the specific problems it identifies.

Lean offers an impressive and proven array of tools to reduce waste in a process, but Lean lacks focus to point at the most important waste to eliminate. Often this means that Lean efforts do not produce the desired impact on the first try, leading to future problems in delivering service. Lean is effective in improving everything in the system and the holistic approach is important to delivering results.

Six Sigma brings a variety of statistical tools to any continuous improvement effort. The focus of Six Sigma on the reduction of variation of performance of a sieve or process can contribute mightily to the improvement in quality and reliability of a service provided. The defined stop for the SMAIC process does assist in focusing efforts on higher potential opportunities. However, Six Sigma lacks the global approach to process improving and can lead to the problem of improving one area of a system but the entire system is not functioning effectively.

While results can be accomplished with any one of these methodologies, it the combined use of all these methodologies that can accomplish a transformation with how the State does government. It is the use of each of the strengths of the various methodologies used in unison that will deliver results that matter to the citizens of Hawai'i.