Driving change and continuous process improvement
Process improvement or “PI” involves applying tools and techniques to help a company achieve its goals.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aligned around what customers value</td>
<td>At GE, process improvement is aligned around what our customers value, which translates into business objectives that flow from the enterprise level through the organization level down to individuals.</td>
</tr>
</tbody>
</table>
| Utilize proven tools and methodologies  | • At GE, we leverage Six Sigma, Lean and CAP (Change Acceleration Process) as enablers of continuous improvement  
• We monitor a handful of key process metrics to ensure we are making progress toward achieving corporate objectives. |
| Foundation of competitive advantage     | • The ability to embrace change is not only core to continuous process improvement but is indeed a foundation of competitive advantage  
• At GE, we have refined our change culture through the decades, in line with our strategy. |
PI begins with understanding the customer’s values, goals and needs, and answering the following four questions:

- What are the barriers to your goals?
- What processes do you need to improve?
- How will you define and measure success?
- How do you make “big change” across a large, multisite organization?
What are the barriers to your goals?
To achieve goals: Ensure alignment of corporate objectives with customer value, ensure appropriate resource deployment...

<table>
<thead>
<tr>
<th>Corporate Objectives</th>
<th>Energize and focus our commercial efforts</th>
<th>Operate with discipline and excellence</th>
<th>Mitigate risk and reduce cost</th>
<th>Compliance in everything we do</th>
<th>Create a culture that inspires</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Unit Objectives</td>
<td>Build and run outstanding Centers of Excellence and platforms</td>
<td>Simplify the business</td>
<td>Drive a culture of continuous improvement</td>
<td>Compliance in everything we do</td>
<td>Create a culture that inspires</td>
</tr>
<tr>
<td>Specific Divisional Objectives</td>
<td>Operate with excellence</td>
<td>Simplify the business</td>
<td>Compliance in everything we do</td>
<td>Create a culture that inspires and strives for perfection</td>
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<tr>
<td>• Sub-goal 1</td>
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<tr>
<td>• Sub-goal 2</td>
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<tr>
<td>• Sub-goal 3</td>
<td>• Sub-goal 1</td>
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<td>• Sub-goal 2</td>
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<td>• Sub-goal 3</td>
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<td>• Sub-goal 2</td>
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<tr>
<td>• Sub-goal 3</td>
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</tbody>
</table>
GE Capital

...and prioritize areas of focus

Example: GE Capital, Americas, is comprised of multiple business units. Below is an example of how we determined which segments to focus on:

- Which segments of your organization should you focus on?
- Are they the most strategic for achieving your objectives?

Evaluation Criteria

- Leadership Buy-In
- Head Count (FTE)
- Spend (SG&A)
- Front-End Metrics Quality
- Volume Growth Rate
What processes do you need to improve?
To drive improvements in processes, we offer an arsenal of effective tools:

1. **Six Sigma** for defect elimination
2. **Lean** events and projects for cycle time and waste reduction
3. **CAP (Change Acceleration Process)** for alignment, acceleration, and ownership
Driving change and continuous process improvement

Six Sigma
Six Sigma encompasses six key concepts

<table>
<thead>
<tr>
<th>Concept</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical to Quality (CTQ)</td>
<td>Key attributes that are most important to the customer. If a business doesn’t get them right, the customer will react adversely.</td>
</tr>
<tr>
<td>Defect</td>
<td>Failing to deliver what the customer wants. Defects include anything that doesn’t meet customer expectations or customer specifications; defects also can contribute to failing to meet customer expectations in the final product or service.</td>
</tr>
<tr>
<td>Process Capability</td>
<td>The ability of your procedure to reach the same result every time. Repeatability, or how consistently you do something, and accuracy, or how close you get to your desired outcome, are essential to a capable process.</td>
</tr>
<tr>
<td>Variation</td>
<td>Variation is the difference that the customer notices from one item to the next, as well as the differences within processes. Six Sigma aims to reduce variation as much as possible for a repeatable result.</td>
</tr>
<tr>
<td>Stable Operations</td>
<td>Ensuring consistent, predictable processes to improve what the customer sees and feels. Accuracy and repeatability are essential so you can predict what an operation will do in the future.</td>
</tr>
<tr>
<td>Design for Six Sigma (DFSS)</td>
<td>Designing to meet customer needs and process capability. Organizations that follow the DFSS credo implement Six Sigma as early in the product or service lifecycle as possible, especially at the design stage.</td>
</tr>
</tbody>
</table>
Six Sigma practitioners follow analytical steps to measure, monitor and modify a process to make a better product or service – a process known as DMAIC.

**DMAIC – The Six Sigma Process**

1. **Define**
   - What do customers expect from your products and services?

2. **Measure**
   - Why do defects occur?

3. **Analyze**
   - What is the frequency of defects?

4. **Improve**
   - What do we change to improve the defect rate?

5. **Control**
   - How can we sustain improvement?

Driving change and continuous process improvement
The statistical objective of Six Sigma is to reduce variation in product quality. Reduce variation and center process — customers feel the variation more than the mean.
## Applying Six Sigma techniques dramatically improves quality

<table>
<thead>
<tr>
<th>The Classical View of Quality</th>
<th>“99% Good” (3.8σ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20,000 lost articles of mail per hour</td>
<td></td>
</tr>
<tr>
<td>Unsafe drinking water almost 15 minutes each day</td>
<td></td>
</tr>
<tr>
<td>5,000 incorrect surgical operations per week</td>
<td></td>
</tr>
<tr>
<td>Two short or long landings at most major airports daily</td>
<td></td>
</tr>
<tr>
<td>200,000 wrong drug prescriptions each year</td>
<td></td>
</tr>
<tr>
<td>No electricity for almost seven hours each month</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The Six Sigma View of Quality</th>
<th>“99.99966% Good” (6σ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seven lost articles of mail per hour</td>
<td></td>
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<tr>
<td>One minute of unsafe drinking water every seven months</td>
<td></td>
</tr>
<tr>
<td>1.7 incorrect surgical operations per week</td>
<td></td>
</tr>
<tr>
<td>One short or long landing at most major airports every five years</td>
<td></td>
</tr>
<tr>
<td>68 wrong drug prescriptions each year</td>
<td></td>
</tr>
<tr>
<td>One hour without electricity every 34 years</td>
<td></td>
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</tbody>
</table>
Lean process design
Lean is a continuous process to reduce waste – executed in five distinct but interconnected steps

1. **Specify Value**
   - Define value from the customer’s perspective and express value in terms of a specific product.

2. **Map the Value Stream**
   - Map all process steps that bring a product or service to the customer and identify which are value-added and which are non-value-added.

3. **Establish Flow**
   - Measure continuous movement of products, services and information end-to-end throughout the process.

4. **Implement Pull**
   - Implement pull strategy (vs. “push”) since nothing is done by the upstream process until the downstream customer signals the need.

5. **Work to Perfection**
   - Complete elimination of waste steps/tasks/elements so that as many activities as possible create value for the customer; ensure ongoing compliance and quality control.

Driving change and continuous process improvement
Waste comes in seven different forms and can be found in any activity.

<table>
<thead>
<tr>
<th>Elements of Waste</th>
<th>Why a Waste?</th>
<th>Related to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation + Motion</td>
<td>• Lower productivity</td>
<td>• Layout (badly designed process)</td>
</tr>
<tr>
<td></td>
<td>• Longer lead times</td>
<td>• Organization</td>
</tr>
<tr>
<td></td>
<td>• Possible part damage</td>
<td>• Poor housekeeping</td>
</tr>
<tr>
<td></td>
<td>• Higher volume of work in progress</td>
<td>• Sharing of equipment</td>
</tr>
<tr>
<td></td>
<td>• Consumes floor space</td>
<td></td>
</tr>
<tr>
<td>Overproduction + Waiting Time + Inventory</td>
<td>• Extra resources to manage</td>
<td>• Poor production planning</td>
</tr>
<tr>
<td></td>
<td>• Hides shortages and defects</td>
<td>• Breakdowns</td>
</tr>
<tr>
<td></td>
<td>• Consumes resources ahead of necessity</td>
<td>• Long setup times</td>
</tr>
<tr>
<td></td>
<td>• Difficult to identify source of quality problems</td>
<td>• Low availability of suitable skills</td>
</tr>
<tr>
<td>Overprocessing + Defects</td>
<td>• Consumes resources</td>
<td>• Poor materials/out-of-date standards</td>
</tr>
<tr>
<td></td>
<td>• Increases production time</td>
<td>• Inadequate training/skills</td>
</tr>
<tr>
<td></td>
<td>• Lower return on capital employed</td>
<td>• Lack of innovation and improvement/poor product design</td>
</tr>
<tr>
<td></td>
<td>• Higher product cost</td>
<td>• Lack of standard operating procedures (SOPs)</td>
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<td></td>
<td></td>
<td>• Incomplete design and engineering information</td>
</tr>
</tbody>
</table>
A key step in instituting Lean process – **Kaizen**

**Kaizen** means “change for the better” and is both a method and a mind-set for continuous improvement.

1. **1st Kaizen**
   - Value stream map
   - Define product and customers
   - Timing & sequence
   - Identify waste
   - Simplify process steps

2. **2nd Kaizen**
   - Fewer ways to do tasks; mistake-proof/standard work
   - Eliminate non-value-added steps
   - Customer pull
   - Visual management: make processes visible

3. **3rd Kaizen**
   - Verify each step
   - Shorten feedback loops
   - Don’t pass defects
   - Single-piece flow

... and so on for the nth Kaizen.

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Driving change and continuous process improvement
Key steps in *kaizen* execution include identifying opportunities, narrowing the focus and prioritizing opportunities.

**Identify opportunities**
- Come from value stream map; identify the actions required to move from the current state to the future state

**Narrow the focus**
- Use root-cause analysis so that each *kaizen* is actionable and targeted at the true underlying problem
- Compare the future and current state maps to ensure that all required actions are captured

**Prioritize opportunities**
- Logically sequence each opportunity based on:
  - Impact (from the customer’s perspective)
  - Ease of implementation
  - Other business/organization considerations
  - Always looking for early wins that can be executed now
Change Acceleration Process (CAP)
The Change Acceleration Process or CAP is:

- A flexible/nonlinear model used throughout a change process
- A strategy for influencing choices and behaviors
- A way to facilitate commitment and behavioral change through team dialog and action
CAP includes a list of steps for successfully leading and managing change.
Identifying committed leadership – who can balance a technical strategy with an engagement strategy – is key to realizing the benefits of CAP

### Key Questions

- What impact does leadership have?
- How can leaders invite others to make the choice for change?
- What actions and behaviors will leaders of change need to consistently model during the change initiative?
- How should leaders be challenging themselves to take personal initiative and appropriately challenge the status quo?

### Key Mind-sets

- Change is life – all that lives must change/adapt
- In all change there is some loss
- Resistance is natural, normal, and necessary
- All change is a matter of individual choice
- Each individual must find his or her own way
How will you define and measure success?
Define metrics to track results and to measure success against stated objectives

Questions to ask yourself:

- **What are your key customer-facing metrics?**
- **Can you link them to your organization’s results?**

### Sample key metrics

<table>
<thead>
<tr>
<th>Sample key metrics</th>
<th>Your key metrics?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Cycle time (Median)</td>
<td>• TBD</td>
</tr>
<tr>
<td>• Cycle time (Span)</td>
<td>• TBD</td>
</tr>
<tr>
<td>• Win rate/lost deals</td>
<td>• TBD</td>
</tr>
</tbody>
</table>

*Explained in detail on next slide*
Example of a metric: Monitoring cycle time progress

Cycle Time

Days – 24/7, includes weekends

- Median
  - n = 594
  - 99 days
  - 76 days
  - 53 days
  - 36 days
  - 21 days
  - 18 days
  - 15 days

Span

- 120
- 100
- 80
- 60
- 40
- 20

Median

- 0
- 20
- 40
- 60
- 80
- 100
- 120

Jan-10, Feb-10, Apr-10, Jun-10, Jul-10, Sep-10, Oct-10, Dec-10

Reducing variation while reducing overall cycle time

Measurement/Reporting
- Weekly Aging Report
- Core Metrics Dashboard

Communication
- Staff & Operating Meetings
- All Employee Rollouts
- G&Os Reflect Performance Goals

Projects
- Portfolio Management Team
- Action Workout
- Systems Reduction
- Doubled Field Credit Authority
- Monthly Survey to Customers

Driving change and continuous process improvement
How do you make “big change” across a large, multisite organization?
Lastly, successful execution of a process improvement program relies upon empowering employees, communicating frequently and openly, and building a culture of continuous improvement.

**Description**

1. **Empowerment**
   - Empower employees through targeted company-wide training programs

2. **Communication**
   - Use multiple channels to communicate importance of the process improvement program throughout the organization

3. **Culture**
   - Use both a top-down approach led by the quality team and a bottom-up approach through the Lean program to enable change across the organization
Empowering employees

Do “more with less”

Getting everyone involved through organized training programs:

- 3-hour training class
- ~15 students per class, mentored by Six Sigma Black Belts
- Project selection (scoped for <3 weeks)
- Report-out to leadership

Amplifying impact through a company-wide training program
Communication is key

- Make a big deal about it
- Consider branding the initiative
- Tie it to goals and objectives

Multiple channels to communicate (use them all)

- Employee newsletters
- Operating reviews
- Internal portals
- Best-practice sharing
- Staff meetings
- Presentations
Create a culture of continuous process improvement

In the first year...

Top-Down Approach
Quality Team Deployment

- Create Metrics
- Establish Lean Processes
- Design Communication Rhythm
- Continuously Improve

Examples of Goals
- 1,000 employees trained
- 800 projects completed
- 3,000 steps removed
- 54,000 hours eliminated
- 46% average cycle time reduction per project

Bottom-Up Approach
Training Program, Mentoring and Goal Setting
Key takeaways
Key takeaways

• Process improvement is a set of tools that can help your organization achieve its goals
• GE starts its business transformation program with a focus on what customers value, which it translates into business objectives that cascade throughout the organization
• At GE, we leverage a number of tools and methodologies – including Six Sigma, Lean and CAP – to implement continuous improvements
• We monitor a handful of key metrics to ensure that we are working toward achieving corporate objectives
• Lastly, we have built a culture of continuous process improvement consistent with our view that the ability to embrace change is a strategic and competitive advantage
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