

Six Sigma Overview for Educators

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What is Six Sigma?

Six Sigma generally refers to a business process originally developed by Motorola.

Raytheon attributes 4.9B in savings to Raytheon Six Sigma™ since this company-wide initiative was developed in 1998

Definition:

Raytheon Six Sigma™ is a knowledge based process we will use to transform our culture in order to maximize customer value and grow our business

- ▶ Ask the right questions
- ▶ Data driven (no opinions)
- ▶ Closed-loop process
- ▶ Focus on customer
- ▶ Draw conclusions from the data
- ▶ Determine a course of action
- ▶ Make sustaining change
- ▶ Capture lessons, share them wisely



R6σ[®] Process



Raytheon Business Excellence, Raytheon Website

Raytheon Company: Business Excellence - Microsoft Internet Explorer

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Business Excellence


With our know-how of the agency operations and regulatory environment, our services turn strategy into reality for high performing organizations. We are realizing your vision to improve agency operations through the smart use of technology.

Our technical expertise and domain knowledge of agency operations make us the ideal partner for your organization. We provide strategic IT consulting and CIO executive support, assisting you with decision-making challenges.

Raytheon's Business Excellence solutions include:

- **Strategic business planning:** Integrating your IT and business visions into a technology course to better achieve your agency's strategic objectives.
- **Business case analysis:** We provide the necessary planning and analysis for IT investment decisions.
- **Business process transformation/continual performance improvement:** We help you transform operations and maximize customer value with Raytheon proprietary tools, such as **Raytheon Six Sigma™**, and help you transform operations and maximize customer value.

Did you know?



- Raytheon supported a complete restructure of a fractional share aircraft ownership company. We assisted the company's leadership with strategy, aircraft operations and maintenance, flight scheduling, customer service, and all business systems including supply chain, finance, IT, and program and risk management.
- Raytheon helped the Defense Finance and Accounting Service (DFAS) achieve over \$38 million in bottom line savings and over \$500 million in cost avoidance in the first three years.
- Raytheon Six Sigma™ projects have seen over \$4.5B in financial benefits since 1999 from the implementation of business reengineering and performance improvements.

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Top of the Page

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Origins of Six Sigma...think \$\$

- ▶ **Six Sigma was initiated by Motorola (pagers), made famous by GE, Allied Signal, Raytheon**
- ▶ **Raytheon estimates \$4.5B savings since 1999. GE as high as several billion dollars per year.**
- ▶ **Six Sigma has roots in quality improvement, but in application Six Sigma is a business strategy.**
- ▶ **Six Sigma has been applied in large and small businesses and institutions resulting in widespread improvements**
- ▶ **Six Sigma is simple, but not “easy” or else “everyone would do it”.**

Overview: WIIFM?

- ▶ **What does Six Sigma mean for me?**
- ▶ **How can I apply this in the classroom?**
- ▶ **In my school system?**
- ▶ **How do I start?**

From EAIA Presentation: What's wrong with this picture?

Based on the statistics for Alabama we have:

100 students entered 9th grade.

60 students completed the 12th grade.

36 students entered college.

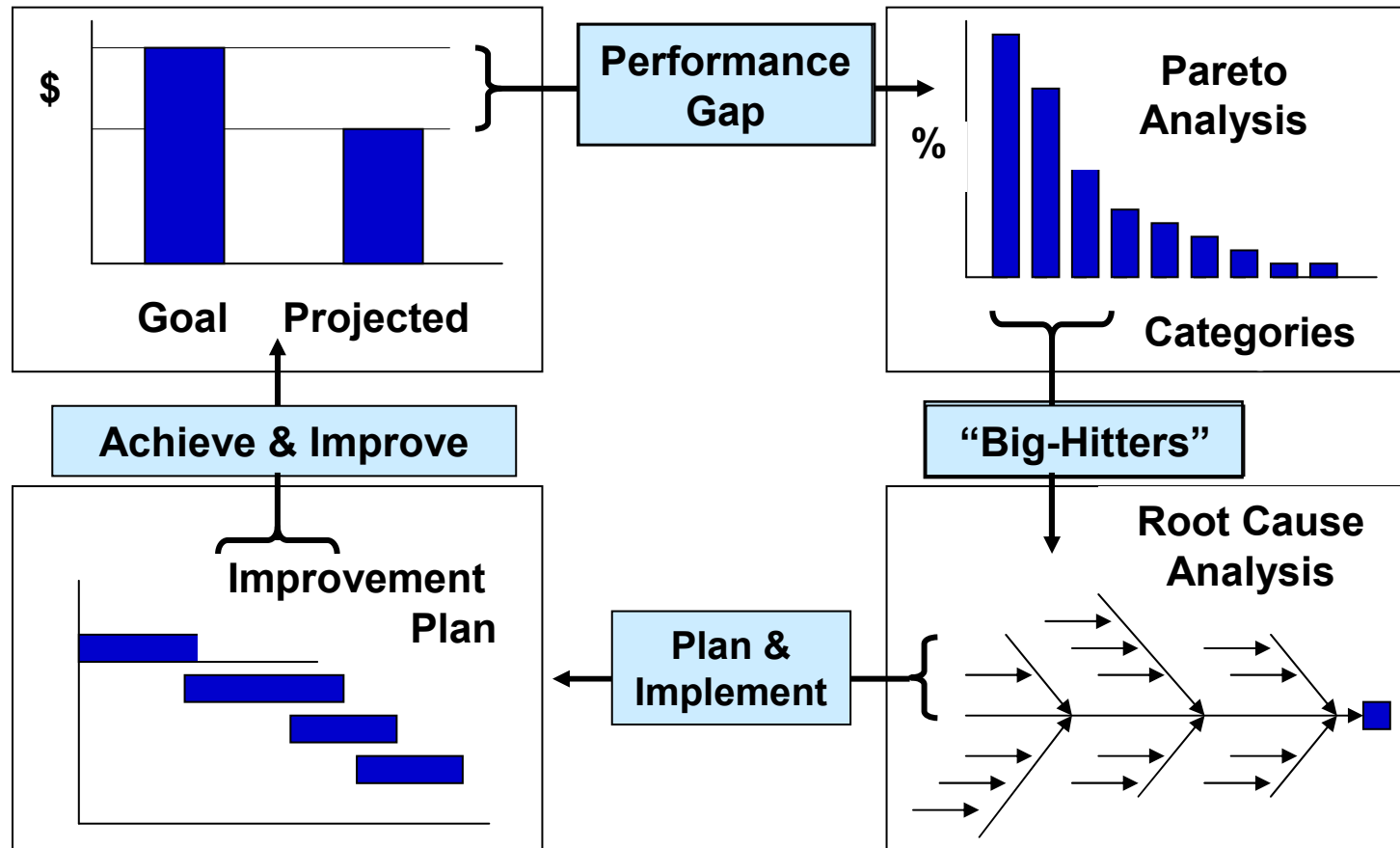
23 were still enrolled in college in their sophomore year.

14 actually obtain a college degree (any degree).

...and in the context of the number of students receiving a HS diploma in Alabama, we can say the following:

- ▶ Four years ago 70,000 students began the 9th grade.
- ▶ **This past May roughly 42,000 (~60%) completed HS.**
- ▶ ~ 25,000 (~36%) will enter college.
- ▶ ~16,000 (~23%) return for their sophomore year.
- ▶ ~ 9,800 (~14%) will obtain a college degree (any degree)

A Good Problem Solving Process



Define the Current State ... Define the Desired End State ... Fill the Gap

Apply Six Sigma

- ▶ **What Vision would you like to see for the future?**
- ▶ **List UnDesirable Effects (UDE's) from the data**
- ▶ **Vote on impact of UDE's: what are the high nails?
Use Pareto chart to visualize this...**
- ▶ **Potential benefits if we can eliminate UDE's?**
- ▶ **Develop Team, List projects to address UDE's**
- ▶ **Characterize processes with more data**
- ▶ **Improve & Celebrate!**

What is Six Sigma, where did it come from?

Sigma (σ) is also called the [standard deviation](#).
It is a measure of variation around the average.

In a Three sigma world	In a Six sigma world
11 Million wrong drug prescriptions a year in the USA	14,000 wrong drug prescriptions a year in the USA
Over 11,000 newborn babies accidentally dropped by nurses or doctors in USA each year	Fourteen newborn babies accidentally dropped by nurses or doctors in USA each year
52 short or long landings at Dallas/Ft Worth Int'l Airport each day	Two short or long landings at Dallas/Ft Worth Int'l Airport in a year
Almost 16,000 incorrect surgical operations each week	One hundred incorrect surgical operation every year

Reducing Variation = NoDoubt™ Mission Assurance

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R6σ[®] Principles

1. Specify **value** in the eyes of the customer
2. Identify value stream; eliminate **waste** and variation
3. Make value flow at **pull** of the customer
4. Involve, align & empower **employees**
5. **Continuously improve** knowledge in pursuit of perfection

R6σ[®] Principles → The Foundation of Six Sigma

Eliminate Waste

- ▶ “COMMWIP” acronym for 7 classic waste categories
 - ▶ These categories apply differently in different environments
- ▶ There are other types of waste: multi-tasking, lack of reuse, ...

Waste	Product Development	Administration
Correction	miscommunication, drawing errors	incorrect data entry
Over Production	designing but not making, never gets to launch, no standardization, designing in features that customers don't want	preparing reports that are not acted upon or duplicate efforts
Material Movement	overly complicated data hand-off	extra steps in the process; extra distance traveled
Motion	unnecessary analysis, testing, people involved, coordination of meetings, etc.	steps/data entry
Waiting	for other elements/functions/disciplines	processing monthly, not as the work comes in (closings)
Inventory	design data not organized/not fully utilized	transactions not processed
Processing	redesign/unfocused activities; poorly run team meetings	signoffs, unnecessary reports, etc.

There is waste in every process

Build a Business Case

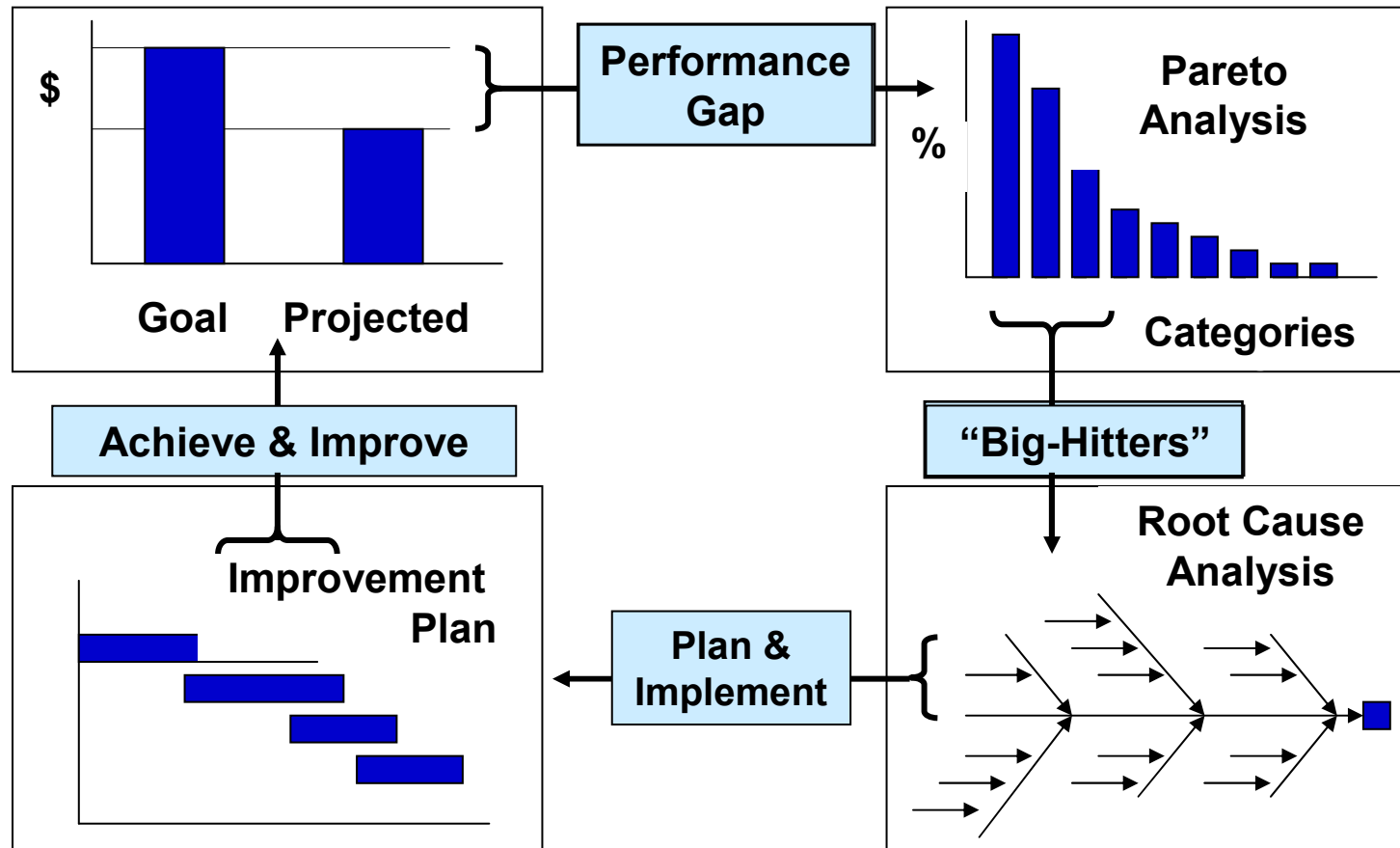
- ▶ A business case demonstrates a compelling cause for action.
- ▶ It includes –
 - ▶▶ Description of the problem or opportunity
 - ▶▶ Benefits of the project
 - ▶▶ Project strategy
 - ▶▶ Time period to get it done
 - ▶▶ Resources required for the project
 - ▶▶ A rough return on investment (ROI)



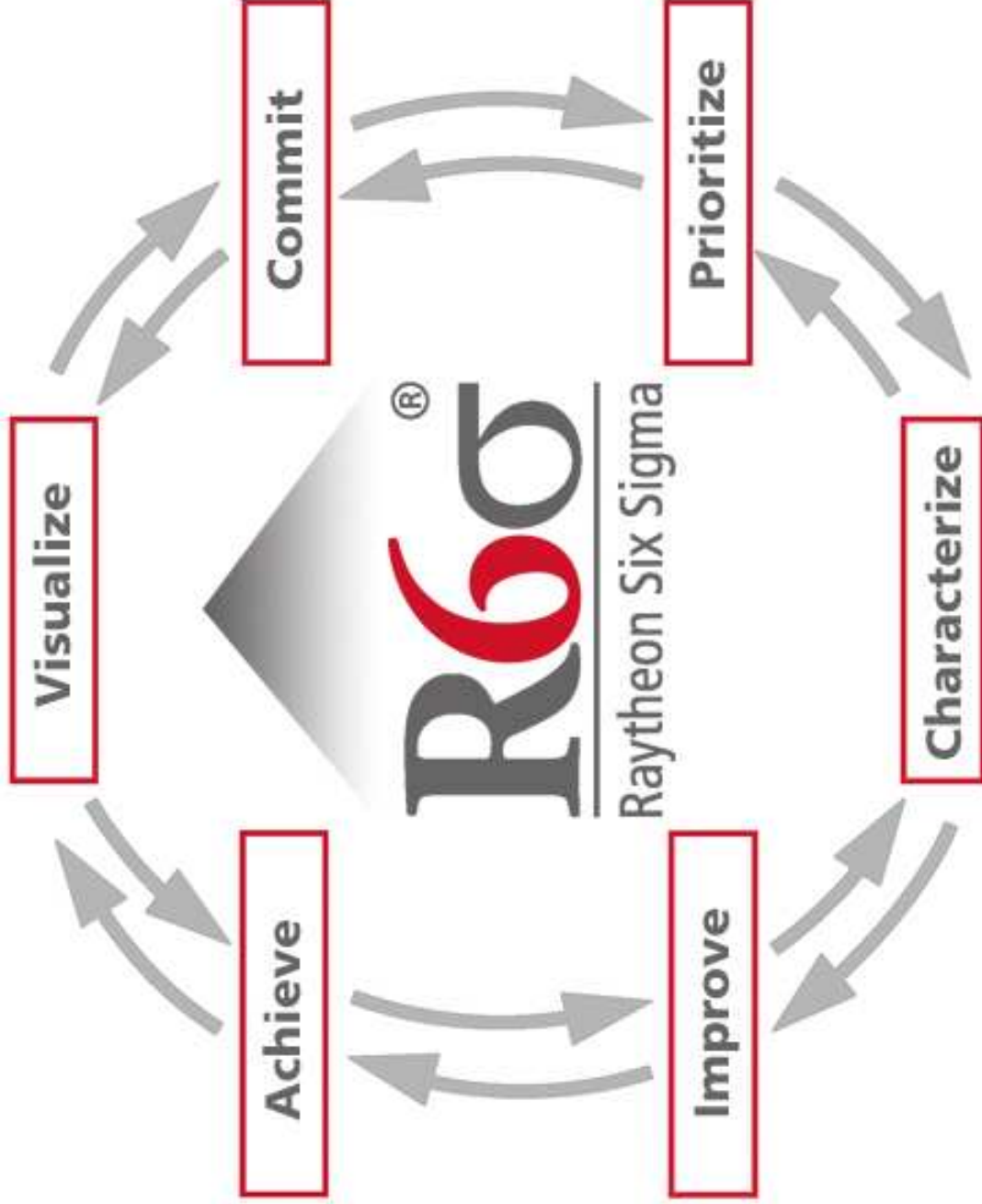
Why a Business Case?

- To answer the question why should we do this project?
- To figure out if the project is worth it (ROI)?
- To gain sponsorship.
- To compare one project to another for priority
- To help you align to the organization's priorities.

A Good Problem Solving Process



Define the Current State ... Define the Desired End State ... Fill the Gap



Q& A

And Finish on Time

(Nobody complains about finishing early!)





