



Excellence in **the New Normal**

2010 APICS International Conference & Expo

October 18-20, 2010 • Las Vegas, Nevada, USA

LEAN, “A3 Problem Solving” and Supply Chain Management in Health Care

Volunteer Leadership Workshop

October 17, 2010

Las Vegas, Nevada

Presented by: John S. Pennington

“LEAN” in Health Care



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Factory Efficiency Comes to the Hospital



Susanne Matthews, a nurse at Seattle Children's Hospital, uses a supply system **based on factory methods**. In the past, nurses had makeshift stockpiles.

The New York Times, Published: July 9, 2010, By Julie Weed



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Slide 3

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j_aguilar, 10/11/2010

Two Bin System Used in Hospital Setting



- There are two bins of each item; when one bin is empty, the second is pulled forward. Empty bins go to the central supply office and the bar codes are scanned to generate a new order. The hospital storeroom is now half its original size, and fewer supplies are discarded for exceeding their expiration dates.

The New York Times, Published: July 9, 2010, By Julie Weed



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What is Lean and Key Principles?

- Lean Thinking was introduced by Toyota in the 1960's as a systematic approach to identifying and eliminating waste or non-value-add activities in an organization through continuous improvement with the goal of creating value.
- The key principles of Lean are based on identifying 'waste' from the customer perspective, and determining how to eliminate it.
 - Waste is defined as the activity or activities that a customer would not want to pay for, and that do not add value to the product or service from the customer's perspective



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Lean Thinking as Applied to Health Care is to:

- Eliminate waste through understanding the value to the patient and how to deliver that value
- Create an efficient and waste-free continuous flow system built on a pull vs. 'batch and queue' approach
- Continually pursue a perfect system



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Kinds of Waste

Targeted in the TPS

1. Waiting (of operator or machine)
2. Transporting
3. Processing Itself
4. Inventory (raw material)
5. Motion (of operator or machine)
6. Defects(rework & scrap)
7. Over-production

Targeted in Health Care

1. Waiting (employee, patient, machine, and information)
2. Material Movement
3. Processing
4. Inventory (material, or patient)
5. Motion (unnecessary staff movement)
6. Correction
7. Overproduction (unnecessary labs/visit)
8. Underutilization



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The 5 Steps of Lean Thinking

Applied to Health Care

1. Specify value from customer's perspective
2. Identify the value stream for each product and remove the waste
3. Make value flow without interruptions from beginning to end
4. Let the customer pull value from our process
5. Pursue perfection - continuous improvement
– Do this every day in all our activities

Source: Womack & Jones: *Lean Thinking*



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How is it Harder to Use Lean Thinking in Health Care Than Manufacturing?

- Who is “customer” and what do they value?
 - Patient/family vs. Employer, Payer, Government
 - *But* patient and doctor insulated from cost of choices
 - A “distortion of value”
 - As if the driver didn’t pay for the car
- Lots of invisible work
 - Patient encounter often involves a process or decision as the outcome -- not a tangible “product”
 - Examples: decision to operate, clinic scheduling, lab results ordering & reporting
- More privacy issues



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How Does Health Care Differ From Manufacturing?

- Organizational and professional culture issues
 - Physicians, some world renowned
 - Nurses, many irreplaceable
 - Other health professionals
- Professional autonomy
 - versus teamwork and systems thinking
- Mission-driven (at least some)
 - Non-profit orientation
 - Production of social goods



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How is Health Care Similar to Manufacturing?

- Process dependence
- Huge variability, often unjustified
 - Aversion to standardization
- Pressure to innovate and use new technology
- Need for high reliability systems
 - (patient safety leaders learn from airlines, nuclear power industry)
- Lack of embedded testing
 - No “instant awareness of every error”
- Trillion dollar industry
- Continuous Quality Improvement orientation



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What Advantages Does Lean in Health Care Have Over Manufacturing?

- Health care Professionals expect change: new treatments, drugs, devices
- Health care Professionals (mostly) accept standardizing treatment of common conditions:
 - “evidence-based medicine” and practice guidelines
- Health care Professionals accept standardization to improve patient safety
- Health care Professionals use root cause analysis in safety and quality
- Health care Professionals have external pressures for efficiency, safety and quality
 - Pay for performance
 - Public reporting



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Perceived (and Real) Barriers to Application of Lean in Health Care

“Who can lead this?”

- Lack of expertise/clinical champions



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Perceived (and Some Real?) Barriers to Application of Lean in Health Care

and,

*People are not
automobiles...*



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A3 Problem Solving

A DISCIPLINED, SYSTEMATIC
REPEATABLE, APPROACH TO
PROCESS IMPROVEMENT



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What is A3?

- Toyota Motor Corporation is famed for its ability to relentlessly improve operational performance.
- Central to this ability is the training of employees in a **structured problem-solving approach** that uses a tool called the A3 Problem-Solving Report.



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What is A3?

- Why is the method called A3? In Europe, the nearest metric equivalent to 11" x 17" paper is designated "A3."
- The A3 problem-solving method and document offers a **standardized approach** to solving problems.
 - At Toyota, it evolved to become the standard format for problem-solving, proposals, plans, and status reviews.



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What is A3?

- What is important is not the format, but the process and thinking behind it, and the conversations it facilitates.
- An A3 lays out an entire plan, large or small, on one sheet of paper.
- It should be visual and extremely concise.
- It should tell a story, laid out from upper left-hand side to lower right, which anyone can understand.



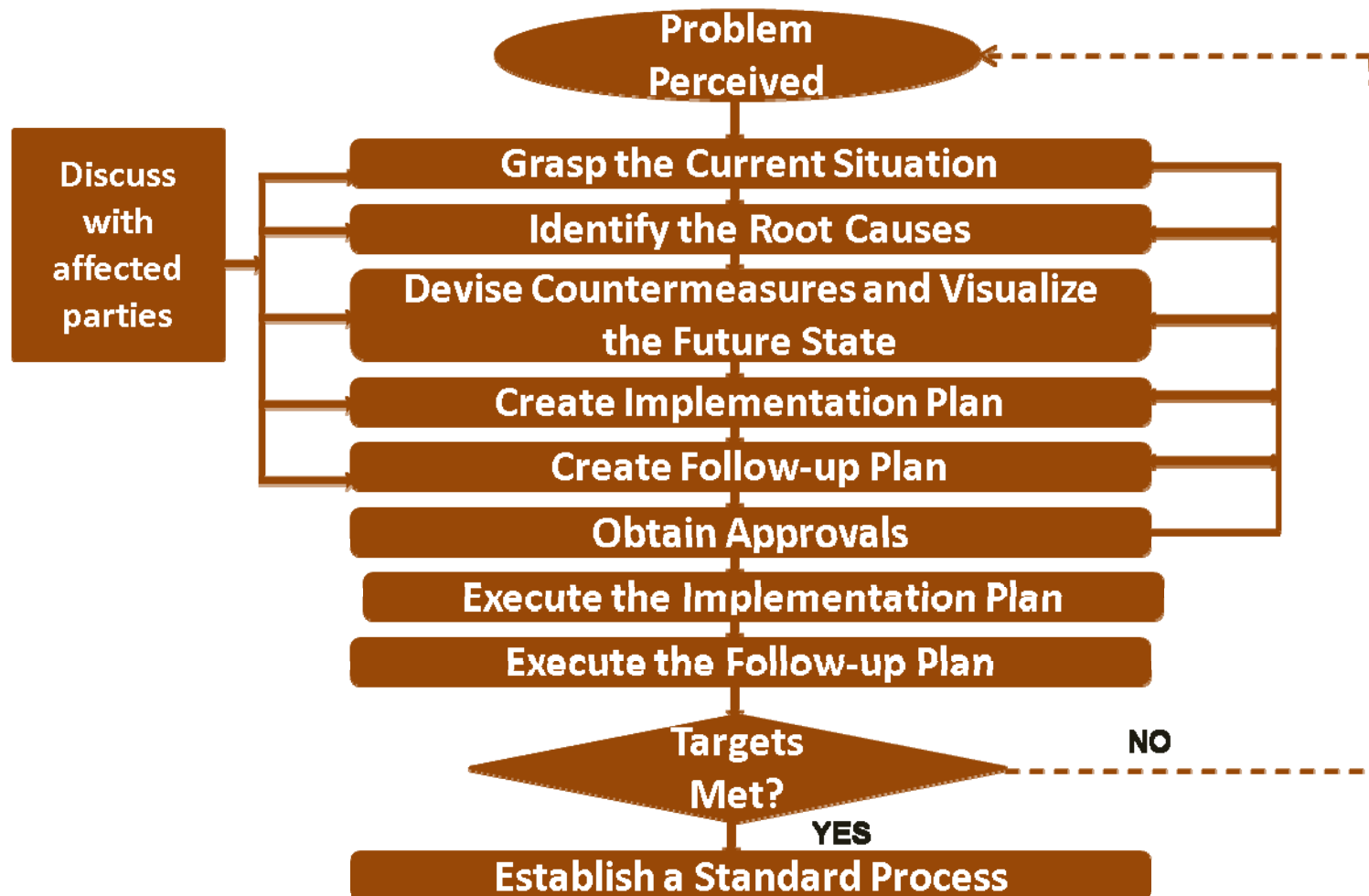
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The A3 Approach

A disciplined approach to a perceived problem comprised of steps with concurrent discussions and approvals throughout the process:



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Why Use A3's?

Most problems that arise in organizations are addressed in superficial ways, what some call "first-order problem-solving." That is, we **work around the problem** to accomplish our immediate objective, but do not address the root causes of the problem to prevent its recurrence.

- By not addressing the root cause, we face the same problem or same type of problem again and again, and performance does not improve.



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Why Use A3's?

The method confines a team to what will fit on that size sheet of paper, forcing simplicity and quick communication.

- This assures the work can be realistically completed within this constraint.
- It demonstrates successful change and motivates workers to do even more problem solving.



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The Elements of the A3 Report for Knowledge Sharing

| | | | | |
|---|---|--------------------|--------------|--------------|
| Improvement Focus: What are we trying to do? | Date: _____ PI Team Leader _____ | | | |
| Background: <ul style="list-style-type: none"> • Background of problem • Context required for full understanding • Importance of the problem | Desired Performance Process: <ul style="list-style-type: none"> • Diagram of proposed new process • Value Stream Map • Countermeasures noted as fluffy clouds • Measurable targets (quantity, time, etc.) | | | |
| Assessment Measure(s) Utilized? | Countermeasure(s) Selected to Improvement Process: | | | |
| Current Performance/Process: <ul style="list-style-type: none"> • Diagram of current situation (or process) • Value Stream Map • Highlight problem(s) with storm bursts • What about the system is not ideal? • Extent of the problems(s), i.e., measures | Desired Outcome(s): | | | |
| Root Cause Analysis: | Implementation Plan | | | |
| <ul style="list-style-type: none"> • List problems • Fishbone Diagram • Most likely (or root) cause <p style="text-align: center;">Why? Why? Why?</p> | What? | Who? | When? | Notes |
| Root Cause(s) Selected for Improvement: | Actions to be taken | Responsible person | Times, dates | |
| | | | | |
| | Cost: | | | |
| | Actual Outcomes: | | | |
| | Follow-up Plan (Standardization) <ul style="list-style-type: none"> • How will you check the effects? • When will you check them? • In red ink/pencil • Date the check was done • Results compared to the predicted | | | |



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Tools That Have Been Used to Eliminate Waste and Streamline Efficient Services in Healthcare

- Process maps
- Value stream maps
- 5S methods/Visual Controls
- Kaizen Activities – Rapid cycle
- Mistake proofing
- Control Charts
- Standardized work
- Quick Hand-off/Changeover
- Cellular Layout (Batch sizing and facility layout)
- Kanban
- Fishbone Diagrams
- Brainstorming



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Why Use A3's in Health Care?

- The A3 Process helps people in the practice setting engage in collaborative, in-depth problem-solving.
- It drives problem-solvers to address the root causes of problems which surface in day-to-day work routines.
- The A3 Process can be used for almost any situation, and research has found that, when used properly (i.e., all of the steps are followed and completed), the chances of success improve dramatically.



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Using the A3 to Solve Problems in Health Care

The A3 Problem Solving Method and Document (A3) has **demonstrated to be of value in health care** in every department that wishes to reduce waste and errors and retain good employees when implemented and made an integral part of the organization.



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Case Study A3 Form

PI CME A3 Implementation Plan

Date: Anytime

PI Team Leader: Dr. Griswold

Improvement Focus: Diabetes Control

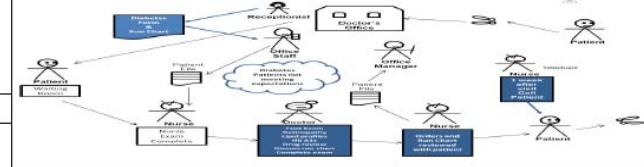
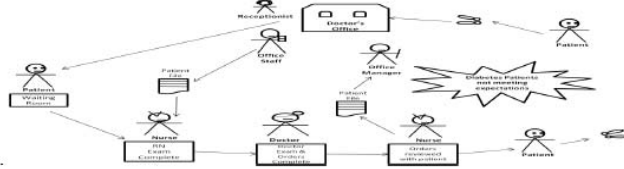
Background: Four person internal medicine practice. Junior partner advocate for standardizing diabetes patient care. Junior partner directs office staff to pull a sample of 30 charts from their adult diabetes patient encounters during the past six months and check the values for HbA1c, lipid profiles, foot and eye exam.

Desired Performance/Process: PICTURE OF new Sub Process. Physician introduction of run chart to patient. Nurse training in run chart. Follow-up call to patients re: questions in run chart.

Assessment Measure(s) Utilized? 30 Medical Records Reviewed Utilizing AMA Consortium Guidelines

Current Performance/Process:

- The average HbA1c is 10.5%. The average total cholesterol is 237 mg/dl. The average LDL cholesterol is 152. The average triglycerides is 245 mg/dl. Inconsistent retinopathy screening, foot exams and patient education.



Countermeasures Selected to Improvement Process:

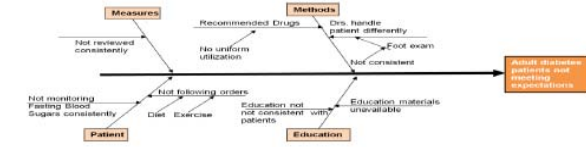
Patient training in use of run chart to record FBS

Desired Outcome(s):

- 75% patient compliance n monitoring of FBS utilizing run chart
- Physician review of data with patient at each patient visit.
- 10% improvement in average HB A1c levels in diabetes patient population

Root Cause Analysis

- Different partners handled similar patents in very different ways. For example one did foot exams on every visit while the others did them when they remembered they should take a look at the patient's feet.
- No uniform utilization of current recommended drugs.
- Hit and miss patient education.
- Little patient monitoring of their own self care.



Root Cause(s) Selected for Improvement: Patient Involvement in monitoring FBS

Implementation Plan

| What | Who | When | Notes |
|---|----------------|------------|-------|
| Develop and print run charts | Office Manager | Week 1 | |
| Train receptionist and nurse | Griswold | Week 2 | |
| Receptionist & Nurse pilot with 5 patients | Nurse | Week 3 | |
| Train patients and follow-up call | Nurse | Months 2-9 | |
| Re-measure patient population from months 2-6 | Griswold | Month 10 | |
| Report results to CME Office | Office Manager | Month 11 | |
| Cost: minimal- printing, Training time | | | |

Actual Outcomes: 90% pt compl. 15% reduction HB A1c at month 9 in 20 of original 30 patients

Follow-up Plan: Mandate run chart protocol for all diabetes patients. Start A3 on common care protocol. Plan for A3 on use of medication in all diabetes patients.



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Health Care Supply Chain



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What is the Health Care Supply Chain?

The health care supply chain is a network of information and logistics within the broad spectrum of U.S. health care. In addition to direct health care providers such as acute-care hospitals and long-term facilities, surgical and diagnostic centers, physicians' clinics, pharmacies and other facilities, the health care supply chain includes laboratories, equipment manufacturers, suppliers and distributors. Group-purchasing organizations, which are businesses within the health care supply chain formed to increase purchasing or bargaining power for bulk supplies, also play an integral role in the health care supply chain.



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Recent Research in Health Care Supply Chain

“The State of Health Care Logistics: Cost and Quality Improvement Opportunities,” a report published by the University of Arkansas and the Association for Health Care Resource and Materials Management. In short, researchers found the health care supply chain to be immature, collaborative, strategic, expensive, information poor, and talent rich.

The study’s authors, Heather Nachtmann, Ph.D., and Edward Pohl, Ph.D., write the following in their foreword: “We do not know where the fundamental inefficiencies and associated costs subsist within the complex supply chain. We also do not know where the opportunities for the greatest increases in quality exist within the health care supply chain. This lack of knowledge contributes to health care supply chain inefficiency.”



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Recent Research in Health Care Supply Chain

The comprehensive survey reveals that the American health care supply chain is an immature and expensive system with significant barriers to efficiency. Specifically, stakeholders - manufacturers, distributors, group purchasing organizations and providers such as hospitals, surgical centers and long-term care facilities - lack good and accurate information because they have not implemented universal standards for data, despite a recent movement in this direction.



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Recent Research in Health Care Supply Chain

"In short, the health care supply chain is starved for accurate and accessible data, which are the primary barriers to efficiency, collaboration and standardization. Perhaps, needless to say, this is an extremely expensive problem. In our survey, the average health care provider spends nearly one-third of their annual operating budget on supply-chain functions."



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Projected Supply Chain Trends for the U.S. Health Care Sector:

1. Continued growth in overall supply chain costs.
2. Increasing focus on supply chain costs from payers.
3. Competition surrounding services will increase between organizations such as Group Purchasing Organizations (GPOs) and distributors.
4. More attention will be paid to the return on investment (ROI) supply chain information technologies.
5. Supply chain metrics will be redefined.
6. Role conversion will continue within the supply chain department in organizations from transactional to strategic.
7. Executive suite focus and involvement.

Opinion by Eugene Schneller, director of the Health Sector Supply Chain Research Consortium at the W. P. Carey School of Business, Arizona State University



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Change

Supportive structure

- Effective supply chain management structures are extremely rare across the industry. Most health care organizations still have materials management and purchasing departments. While some have changed the name to 'Supply Chain', they are still acting like a traditional materials management operation. Few materials management departments are positioned well to take advantage of leading supply chain practices.



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So Where Does APICS Fit In and Can It Add Value In Healthcare

Do we have the Foundation?

YES!!!!!!!!!!!!!!!!!!!!



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APICS Can Assist in Solving These Issues

APICS has the tools, resources, and expertise to identify and overcome these challenges. Consider the drivers of supply chain performance, which are excerpted here from the *APICS Operations Management Body of Knowledge Framework* (OMBOK):

- Facilities—Supply chain performance is often affected by the design and location of facilities.
- Inventory—Can improve supply chain flexibility by acting as a buffer to decouple supply from demand when appropriate.
- Transportation—Decisions can make major differences in both benefits and costs.
- Information—Another major influence on supply chain effectiveness is the ease with which information is shared up and down the chain.
- Sourcing—Decisions are important within the supply chain and rely on standards and policies being maintained.
- Pricing—Is perhaps the most important strategic decision. Whether price is set high, low, or in the middle sends a strong message to all members of the supply chain, competitors, customers, suppliers, and potential new entrants.

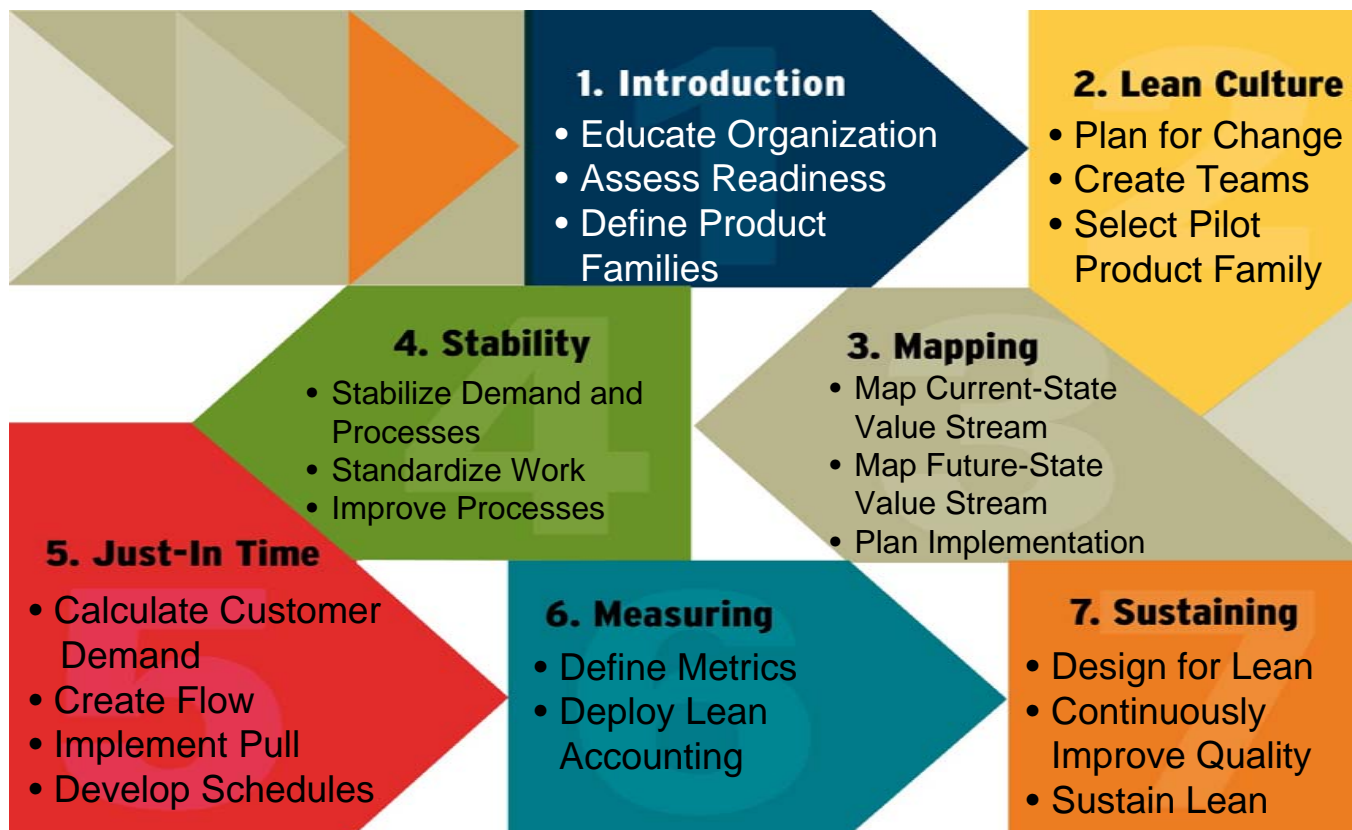


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The APICS Lean Enterprise Series - The Lean Transformation Roadmap



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With a Few Changes

- You can use the existing LEAN Enterprise Series to enter and exploit the health care industry
 - Change examples to health care related
- Learn to speak their language
- Adopt the work already completed and being used
 - A3 Problem Solving
- Develop workshops specifically for health care professionals



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Inventory Control Workshop Series

- Basics of Inventory Management
- Cycle Counting
- Distribution Inventory Management
- Materials Requirements Planning & Bills
of Material
- Physical Inventory



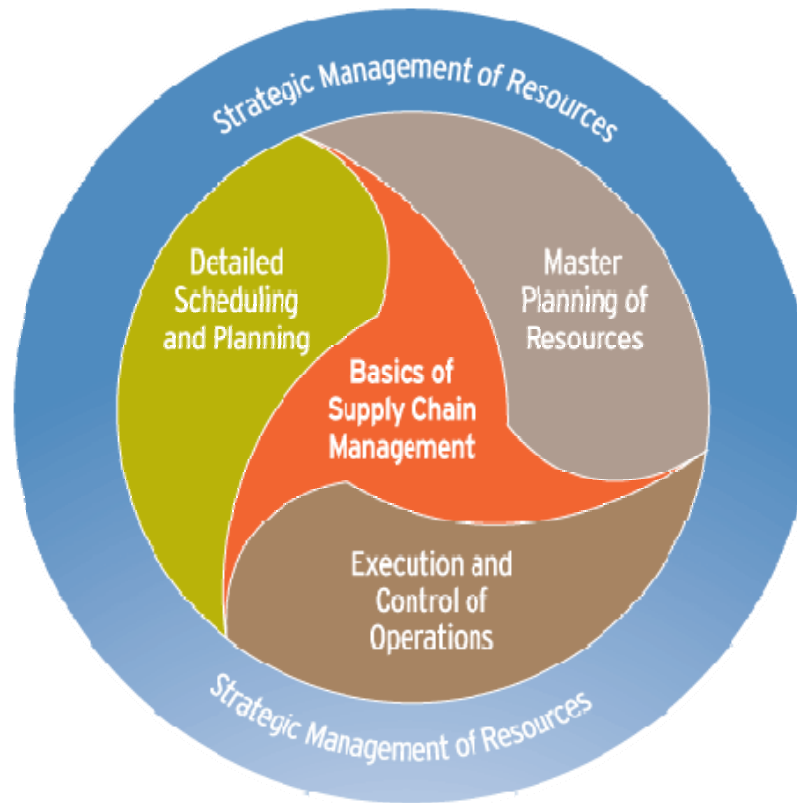
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APICS CPIM

The APICS CPIM has been organized into five modules. Below is the diagram that shows how these modules relate to each other and how they will help you to manage your business resources.

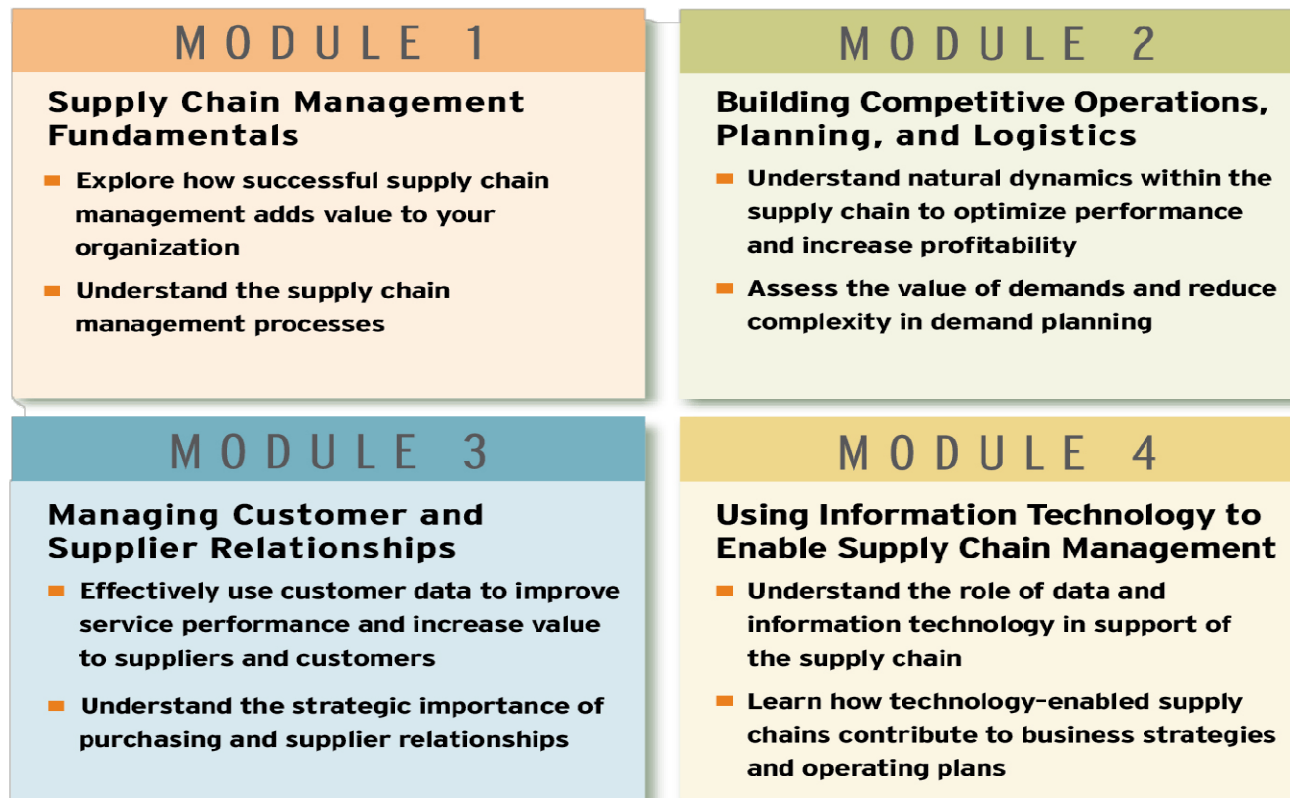


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APICS CSCP

CSCP consists of four modules and provides you with a broad, encompassing view of global end-to-end supply chain management



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Good Books to Read

- Understanding A3 Thinking
 - Durward K. Sorbek II & Art Smalley
- A3 Problem Solving for Healthcare –
A Practical Method for Eliminating Waste
 - Cindy Jimmerson
- Improving Healthcare Using Toyota Lean
Production Methods
 - Robert Chalice



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Good Books to Read

- **The Nun and the Bureaucrat –**
How They Found an Unlikely Cure for America's Sick Hospitals
– Louis M. Savary & Clare Crawford-Mason
- **Managing to Learn –**
Using the A3 management process to solve problems,
gain agreement, mentor, and lead
– John Shook
- **A Lean Guide to Transforming Healthcare –**
How to implement Lean Principles in Hospitals, Medical Offices, Clinics,
and Other Healthcare Organizations
– Thomas G. Zidel



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