2005 Lean Management Solutions Conference

Session: Methodology & Case Studies

Paper #1006

Management Systems Diagramming:

Moving Toward a Lean Management System
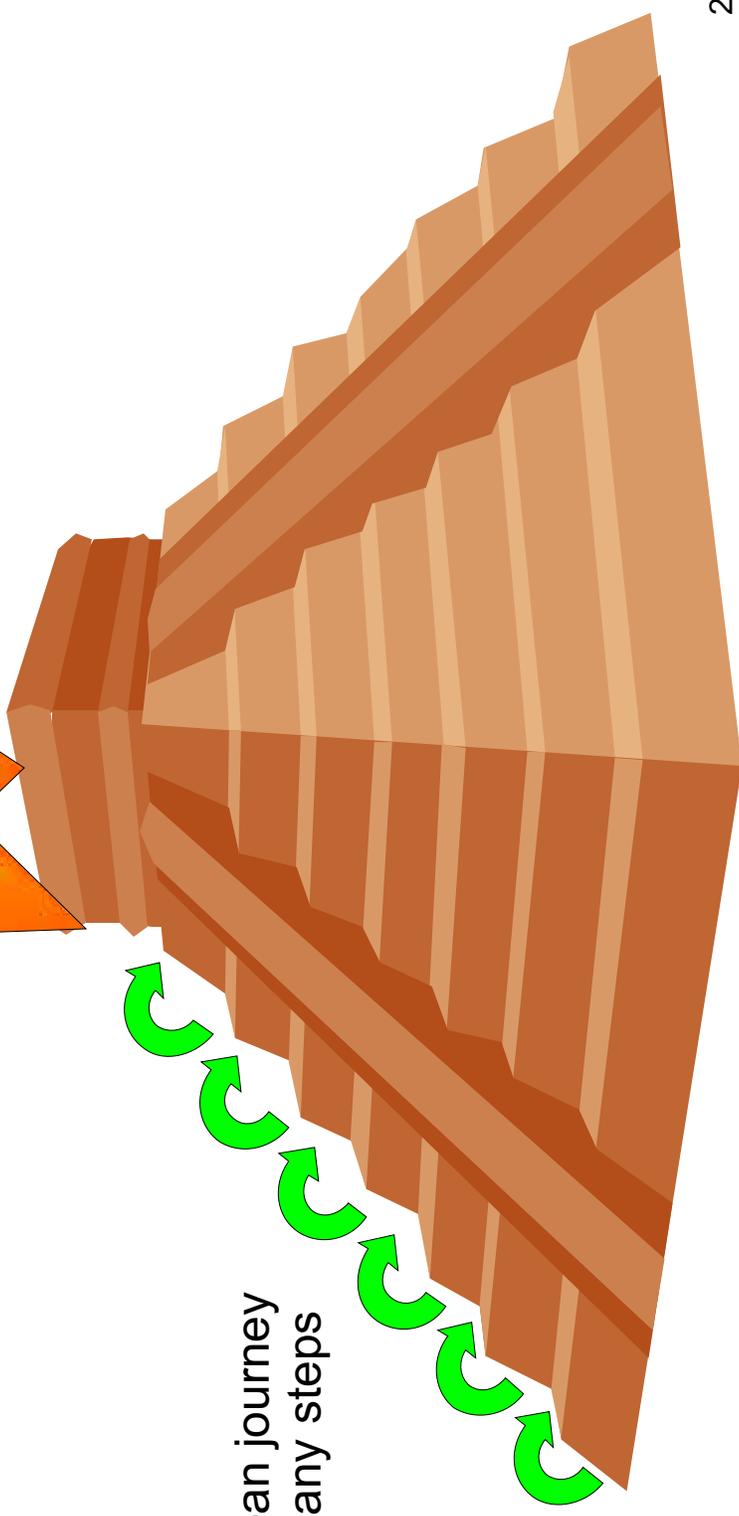
Presented by
George A. Shinkle
Vice President
DIRECTION ASSOCIATES, INC.
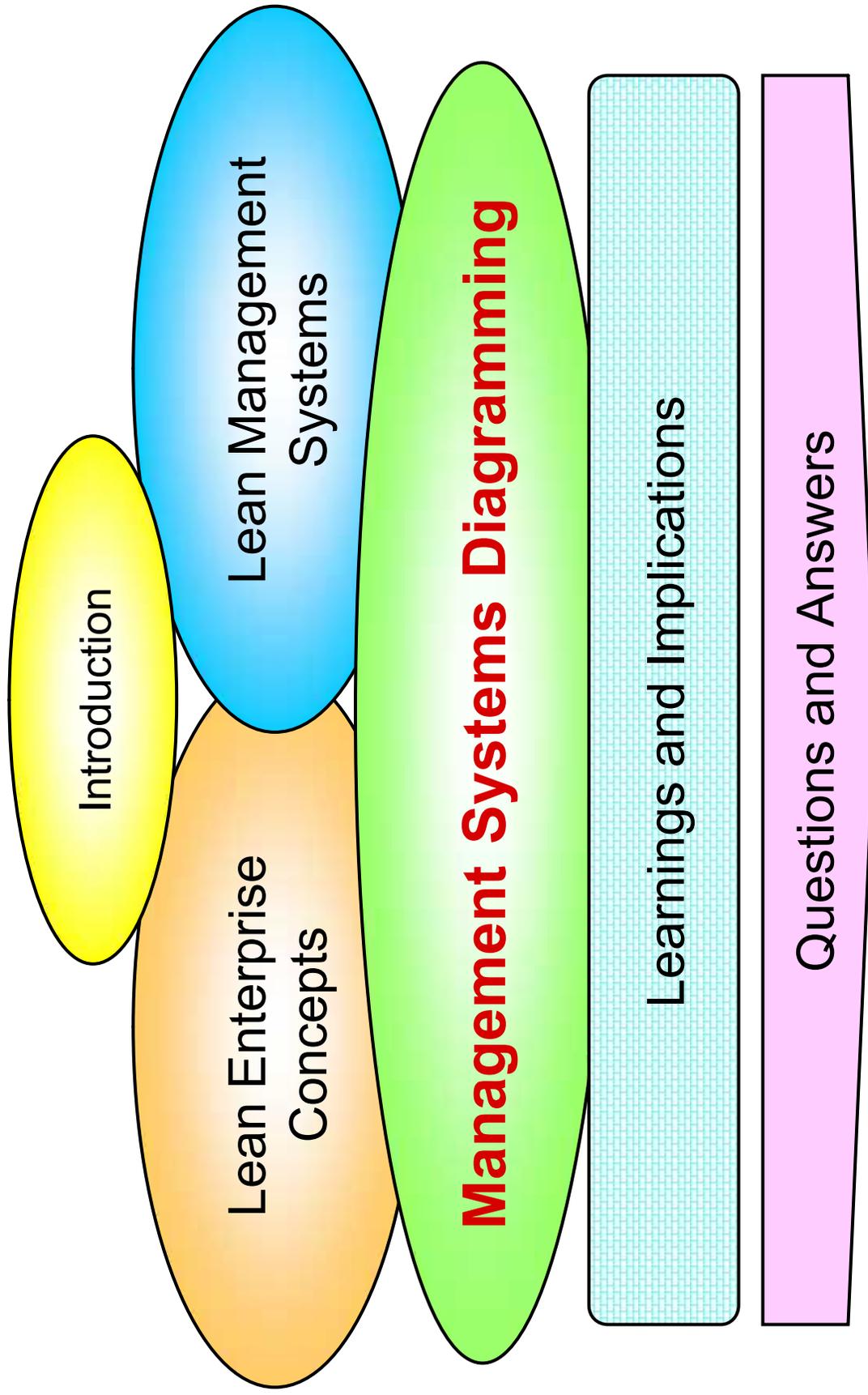
Supporting Authors: Reb Gooding and Michael L. Smith

5S for Management Systems

Management Systems Diagramming Has also Been Referred to as…

The lean journey has many steps

Agenda

- Introduction
- Lean Management Systems
- Lean Enterprise Concepts
- **Management Systems Diagramming**
- Learnings and Implications
- Questions and Answers

Introductory Perspective on
Management Systems Diagramming

- Based on **practical experience**

- Addresses the "**operations aspects**" of the management task and identifies areas for **improvement**

- Applies to any size of organization, to business functional groups, and to all levels of management teams

- May require **tailoring** to specific enterprises and management structures

- Involves top management in lean thinking

- First published in Jan. 2004 in _Transforming Strategy into Success: How to Implement a Lean Management System_

LEAN
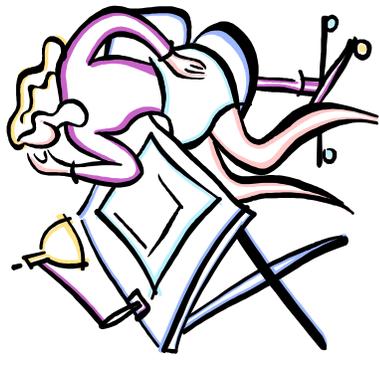
Lean means utilizing people, material, and overhead to achieve the optimum value of the total system.

The Lean Directive: Remove Waste

→ And Increase Value

Value and Waste Definitions

Customer Value Add:

- Anything for which the customer is willing to pay
- Activities which increase the value of the material or service being produced

Business Value Add:

- Activities that build long term business assets
- Anything for which the stockholders _want_ to pay

Waste to Eliminate:

- Anything for which the customer is not willing to pay
- Anything that does not support the needs of the business
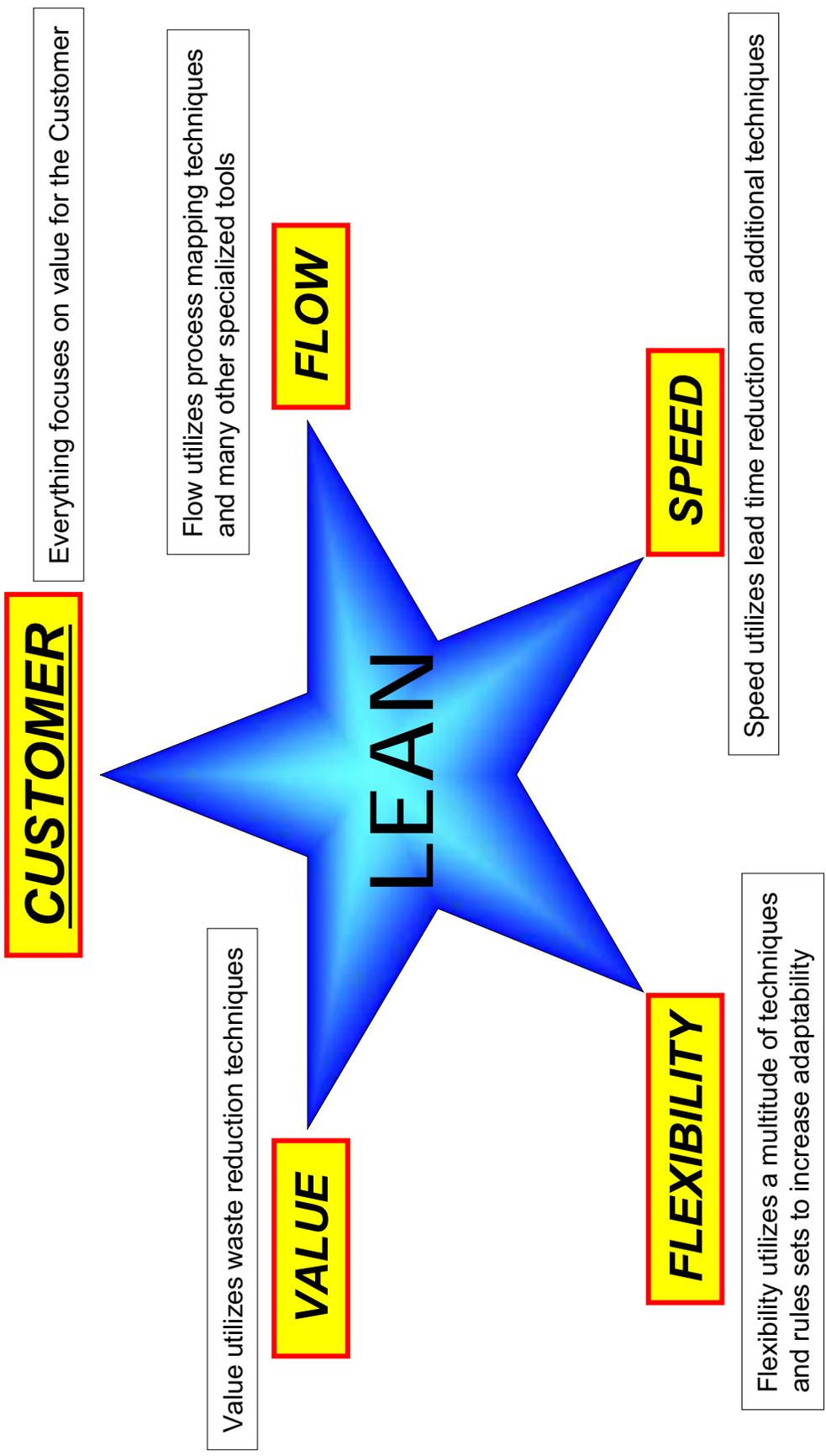- Anything that does not add value to the final product
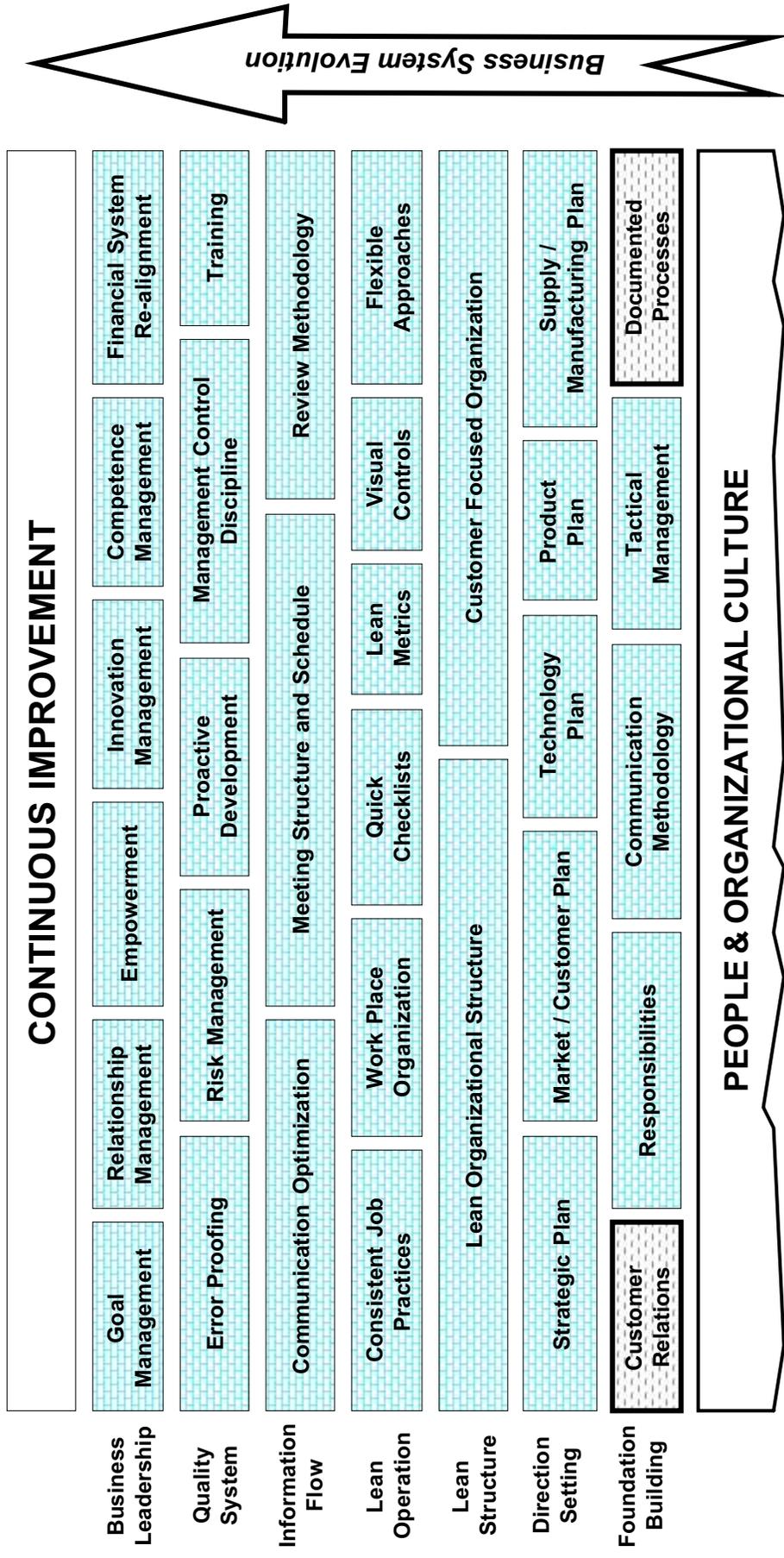
Waste to Reduce:

- Activities that are currently necessary even though they do not add value to the customer or the business . . . until better methods are available

Lean Objectives Focus the Entire Enterprise

CUSTOMER

Everything focuses on value for the Customer

FLOW

Flow utilizes process mapping techniques and many other specialized tools

SPEED

Speed utilizes lead time reduction and additional techniques

LEAN

VALUE

Value utilizes waste reduction techniques

FLEXIBILITY

Flexibility utilizes a multitude of techniques and rules sets to increase adaptability

Business System Building Blocks in a Lean Management Approach

Business System Evolution

CONTINUOUS IMPROVEMENT

Category						
Business Leadership	Goal Management	Relationship Management	Empowerment	Innovation Management	Competence Management	Financial System Re-alignment
Quality System	Error Proofing	Risk Management	Proactive Development	Management Control Discipline		Training
Information Flow	Communication Optimization		Meeting Structure and Schedule		Review Methodology	
Lean Operation	Consistent Job Practices	Work Place Organization	Quick Checklists	Lean Metrics	Visual Controls	Flexible Approaches
Lean Structure	Lean Organizational Structure			Customer Focused Organization		
Direction Setting	Strategic Plan	Market / Customer Plan	Technology Plan	Product Plan		Supply / Manufacturing Plan
Foundation Building	Customer Relations	Responsibilities	Communication Methodology		Tactical Management	Documented Processes

PEOPLE & ORGANIZATIONAL CULTURE

8

"Lean Management Systems"
A Concept that Describes Perfection

- Perfection in an organization's efficiency and effectiveness in every aspect

  – Efficiency by improving the value, speed and flow of all processes (doing things better)

  ### *Lean Process*

  – Effectiveness by improving the direction setting and management control system processes (doing the right things)

  ### *Lean Content*

Management Systems Analysis

The Management System

- The Management Task

  – Approve, communicate, and control the flow of people, information, money, material, and projects/activities
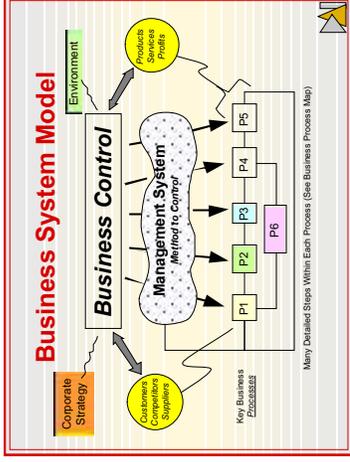
    Summarized as:

    Provide Direction and Make Decisions

    This can be accomplished through **"coaching and facilitating"** or **"command and control"** management approaches

- The Management System

  – The process or processes for achieving the above in an organization
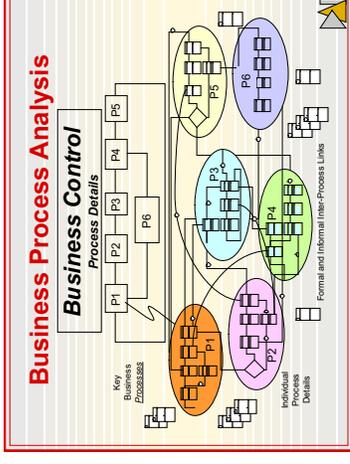
Business and Management System Analysis

Business System Model

Key points

- Macro View
- Process Focus

Business System Model – high level view of how the overall process works

Business Process Analysis

Key points

- Micro View
- Detailed Process Focus

Business Process Analysis – detailed view of how processes operate

The Integrating Activity …

"The Management System"

Often Avoids Improvement Scrutiny

Business and Management System Analysis

Business System Model

Management Control Model
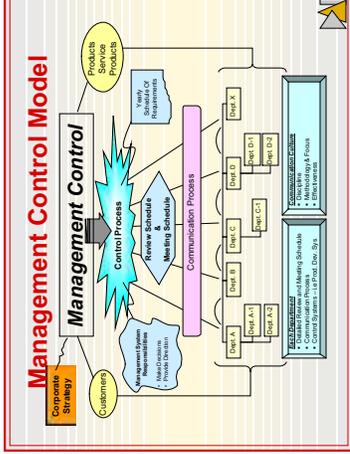
Business Process Analysis

Key points

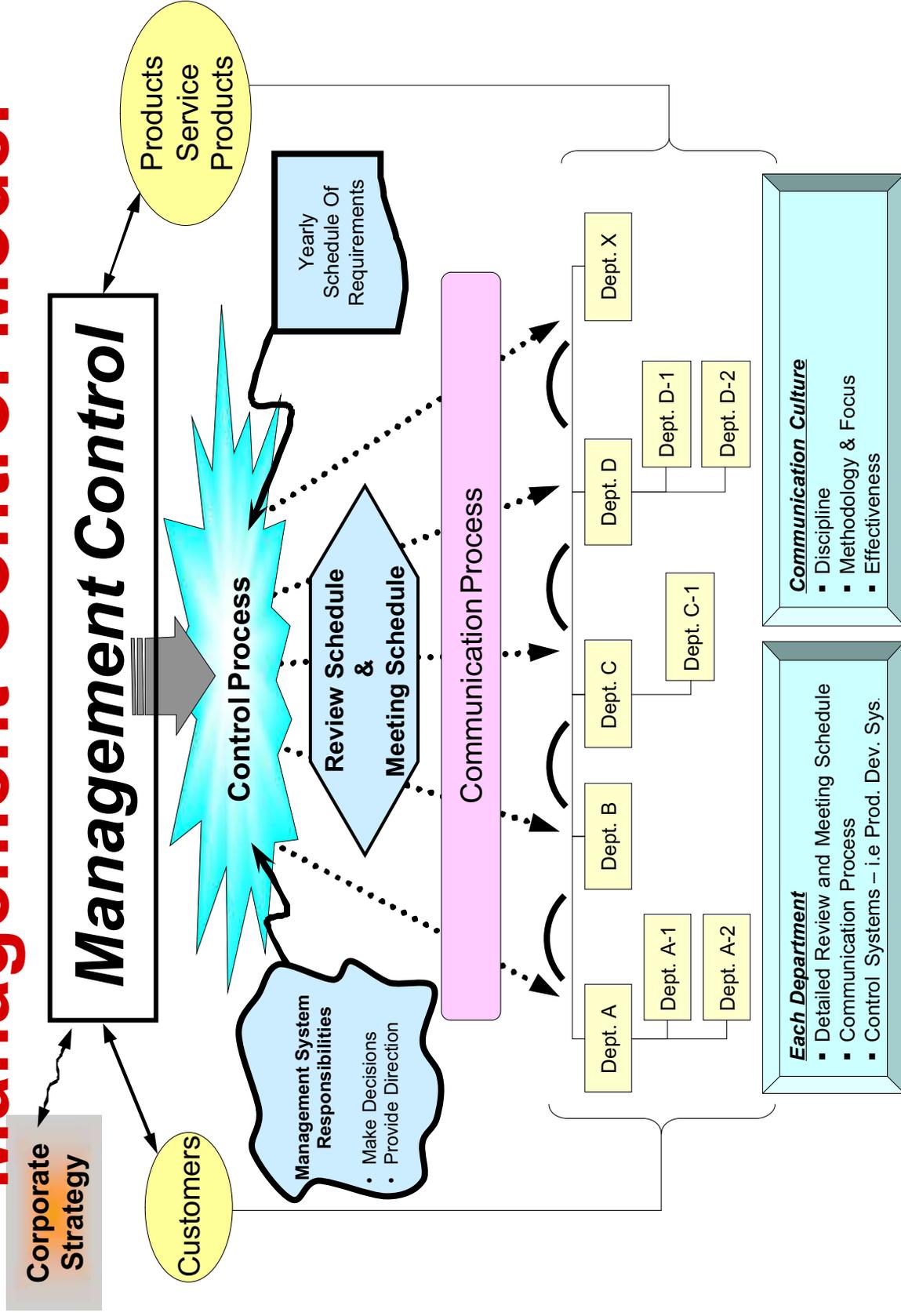- Direction & Control View
- Organization Focus

Business System Model – high level view of how the overall process works

Management Control Model – view of how processes are directed and controlled

Business Process Analysis – detailed view of how processes operate

Management Control Model

Corporate Strategy

Products Service Products

Customers

Management Control

Control Process

Yearly Schedule Of Requirements

Review Schedule & Meeting Schedule

Management System Responsibilities
- Make Decisions
- Provide Direction

Communication Process

Dept. A
- Dept. A-1
- Dept. A-2

Dept. B

Dept. C
- Dept. C-1

Dept. D
- Dept. D-1
- Dept. D-2

Dept. X

Each Department
- Detailed Review and Meeting Schedule
- Communication Process
- Control Systems – i.e Prod. Dev. Sys.

Communication Culture
- Discipline
- Methodology & Focus
- Effectiveness

We Desired a Lean Visual Approach to Analyze the Management System that Would Enable Performance Improvement

Our approach was to:

➢ Utilize a visual technique that would:

- Clarify issues
- Aid in understanding and in explaining to others
- Provide a framework for analyzing potential improvements

➢ Leverage value and flow "thinking" in order to:

- Make it easier to see waste
- Clarify the flow of the system (information, decisions, etc)
- Quantify or qualify improvement ideas
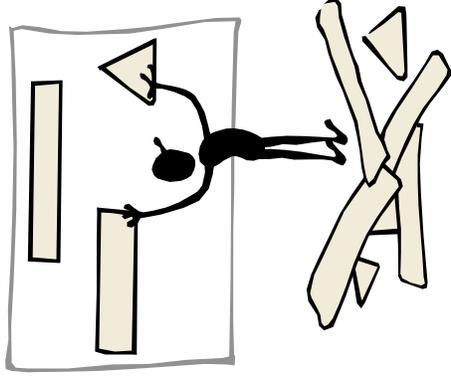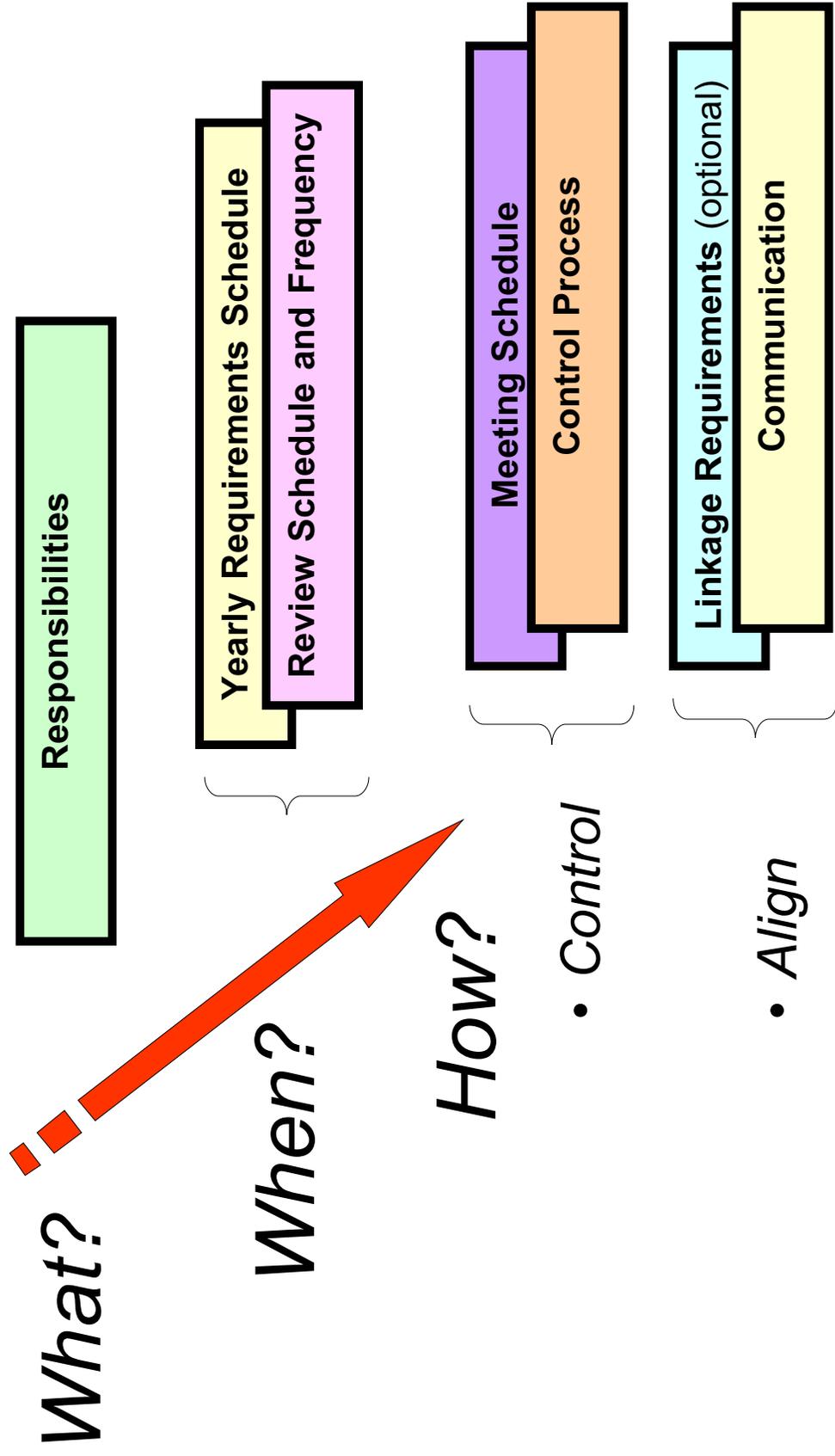
Management System Diagramming
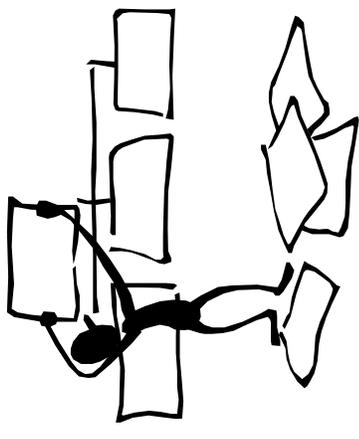
or MSD

MSD Is **5S** for the Management System

Management System Diagramming Process Relationship

What?

Responsibilities

When?

Yearly Requirements Schedule

Review Schedule and Frequency

How?

- *Control*

Meeting Schedule

Control Process

- *Align*

Linkage Requirements (optional)

Communication

Management System Diagram Overview

What?
Requirements

When?
Cadence

How?
Alignment

Responsibilities

What are our management responsibilities?

Schedule of Reviews

What reviews need to be held to deliver on our responsibilities?

Control Processes

How will we control that our good intentions are fulfilled?

Major Tasks Schedule

What are our major required tasks and their timing throughout the year?

Meeting Schedule

What meetings are required to accomplish our responsibilities?

Communication

How will we communicate to the organization?

Organizational Linkages

What linkage and coordination with other parts of the organization need to be accomplished?

Management System Diagram Overview

What?
Requirements

When?
Cadence

How?
Alignment

Responsibilities

What are our management

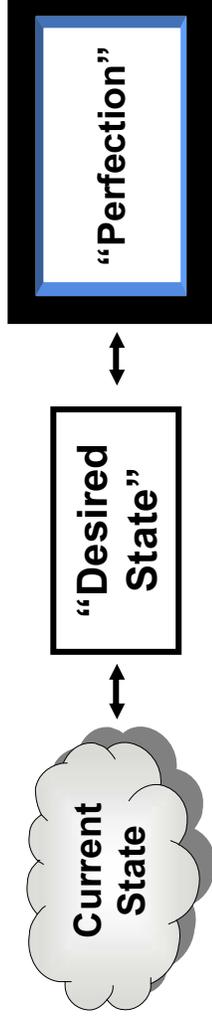**Schedule of Reviews**

What reviews

Control Processes

How will

parts of the organization need to be accomplished?

How do we approve, communicate, and control the flow of people, information, money, material, and projects/activities ?

➢ **How do we run the business?**

Recommended MSD Process

```
  Current
   State   ⟷  "Desired   ⟷  "Perfection"
               State"
```

1. Define current state
2. Create the concept for "Perfection" (a world without waste)
   – Train on Lean Concepts as needed
3. Distill a desired state for the organization
4. Check for coherency of the desired state to assure that each responsibility has an approach or a process to address it and that the control mechanisms are adequate – yet not wasteful
5. Consider risks and system implications of the desired state and address major issues
6. Complete a lean design review of the desired state in a detailed, rigorous manner with knowledgeable people
7. Communicate and implement the new system
8. Check progress and continually search for further improvements

Management System Diagram Element Worksheet

This worksheet provides questions to support defining the elements of the Management System Diagram

Management Responsibilities
What are our management team responsibilities?
Are there some required and some desired responsibilities?

Major Tasks Schedule
What are our major required activities throughout the year?
What are the key milestones (business plan, budget, etc.)?

Schedule of Reviews
What reviews need to be held to deliver on our responsibilities?
Which reviews require our participation to assure we meet our obligations?
How often are these reviews needed?

Meeting Schedule
What meetings are required?
What events drive the requirement for meetings?
Which meetings are we expected to attend?
What meetings do we need to call?
Which meetings are called as needed and which are regularly scheduled?
How do we make these meetings meaningful, effective, and efficient?

Control Processes
How will we control that our good intentions are fulfilled?
See control process concepts that follow.

Communication
How will we communicate to the organization?
See communication hints that follow.

Organizational Linkages
What linkage and coordination with other parts of the organization need to be accomplished?
What do we need to share and with whom across the organization?
When is linkage communication required (prior -- to gather inputs or afterwards -- to communicate results)?

The two areas that usually need additional clarification are control processes and communication processes. The questions shown may be helpful in building understanding.

Control Processes (How will we control that our good intentions are fulfilled?)

- Identify methods used to verify:
  – Processes are being used
  – Metrics (goals) are being achieved
  – Responsibilities are being met
  – Projects are on time
  – Budget and target communication is effective
- Identify controlling methods
  – Approval requirements and signatures
  – Management reviews
  – Paperwork requirements
  – Controlling procedures and policies
  – Audits (multi-level)
- Identify decision-making processes
  – Decision drivers
  – Controlling authority
- Evaluate feedback system
  – Timeliness
  – Effectiveness

Communication (How will we communicate to the organization?)

- Determine what is communicated
  – Data
  – Information
  – Decisions
  – Direction
- Determine when communication is required
  – Regular and planned
  – Special events
- Identify the methods used to communicate
  – Meetings (frequency, attendance, level of empowerment)
  – In-person / video / phone
  – Paper / e-mail / fax
  – Pager / voicemail
- Determine the level of communication effectiveness desired
  – Stakeholder impact
  – Absorption and retention level
  – Sustainability of decisions
  – Organizational alignment around an established direction

Hint: Consider risk assessment and escalation processes

Current State Assessment

- Be honest and document what is really happening in the current system.

- Management groups with a penchant for action will typically want to jump right to designing the improved state.

  – Avoid this tendency

  – Defining the current system and understanding why it exists will be helpful in designing a new system that will work well

➢ **It is "impossible" to design the appropriate improvement plan from a false foundation; therefore, documentation of the current situation is critical.**

Preliminary Improvement Thinking

These few simple questions will aid in the preliminary improvement thinking:

- How well does this management system work?
- How clear are the organization's responsibilities?
- How much of this activity is value adding? How much is waste?
- How can we eliminate or combine the activities?
- What activity can be delegated to a lower level?
- What key policies impact or interfere with what needs to be done?
- How can we improve these processes to make them better and/or faster?

<u>Value Add</u>
Customer Value Add:
- Anything for which the customer is willing to pay
- Activities which increase the value of the material or service being produced

Business Value Add:
- Anything for which the stockholders _want_ to pay
- Activities that build long term business assets

<u>Waste</u>
Waste to Eliminate:
- Anything for which the customer is not willing to pay
- Anything that does not support the needs of the business
- Anything that does not add value to the final product

Waste to Reduce:
- Activities that are currently necessary even though they do not add value to the customer or the business . . . until better methods are available

"Perfection"

- Consider a conceptual system that would not require:
  - Time to make decisions
  - Waiting for approvals
  - Excessive communication
  - Redundant activity
  - Error checking

Note: Creation of the perfect management system diagram can be problematic unless the group is highly knowledgeable in lean thinking.

Hint: Consider the nine types of waste – what would have to be changed to reduce these wastes?

Types of Waste

PHYSICAL
- **OVER-PRODUCTION**
- **CORRECTION**
- **PROCESSING**
- **MOTION**
- **WAITING**
- **CONVEYANCE**
- **INVENTORY**

INTELLECTUAL
- **CREATIVITY**
- **MOTIVATION**

Perfect Lean Management System

- Zero waste in direction setting and decision making
- Zero waste in approving, communicating, and controlling the flow of people, information, money, material, and projects/activities

"Perfection"
Additional Concepts to Consider

- Imagine an ideal state where:
  - The prime focus is on delivering to customer expectations (and company requirements)
  - Your technology is always ahead of the competition
  - Project milestones are always on time (based on what the customer requires)
  - New projects are always launched meeting or beating profit and quality targets
  - Decisions are made instantaneously
  - New knowledge is captured and shared across the organization
  - Approvals are granted at the moment they are needed
  - No errors are made -- so error checking is not required
  - The people are experienced and competent (people at all levels)
  - All the people work together as a true team to meet the customer and business needs (including suppliers and partners)
  - The entire organization works together seamlessly (no chimneys and no walls)
  - Suppliers and customers are true partners in development activity
  - Communication problems have been eliminated -- everybody that needs to know knows automatically and instantaneously
  - The flow of people, material, and information is easily observable (total visual management)
  - The direction is clear, understood, and supported by all

- What changes would we have to make to accomplish this?
- How much of this change could we implement quickly (now)?
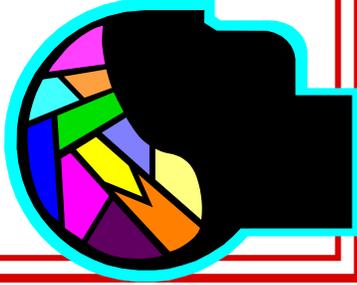
Management System Diagram Examples

- The following examples are of the desired state for three different organizations

  – A large corporate strategic business unit

  – A small business

  – An engineering department

Corporate SBU MSD

Management Responsibilities

- Manage to corporate goals
- Approve projects
- Control finances
- Manage people and training
- Customer relations
- Product planning
- Define and support Customer Plans
- Deliver cost effective designs globally
- Technology plan
- Develop and manage budget
- Benchmark competition
- Manage skill competency
- Continuous improvement plan for quality and profitability
- Assure effective communication process
- Consistent deployment of policies / procedures / information

Schedule of Reviews

- ➤ Annual
  - Customer Plans
  - Product Plan
  - Business Strategy
  - Technology Plan
  - Benchmarking
- ➤ Semi-annual
  - Manufacturing Performance
- ➤ Quarterly
  - Component Quality Reviews
  - Communications Effectiveness
- ➤ Monthly
  - Lean Implementation
  - Product Line Team
  - Cost Reduction
  - Financial Performance

Standard Meeting Schedule

- ➤ Business Team – Wednesday mornings
- ➤ Quality Team – Thursday afternoon
- ➤ Operations Reviews– First Tuesday of each month
- ➤ Personnel Development – every other Friday
- ➤ Section Meetings – Specific to each department – 2 per month

Control Processes

- ➤ SBU Management Reviews
  - Quarterly metrics reviews
  - Risk management planning process
  - Management issue sign-offs
- ➤ Audits / follow-up
  - Open concerns tracking system
  - Layered audits

Communication

- ➤ Communication plan
  - Roll down process
  - IT support
  - Annual state of the business
  - Monthly status review
- ➤ Documentation
  - Initiative tracking
  - Action plan communication

Organizational Linkages

- ➤ Corporate HQ Communication
  - Customer Activities
  - Market Planning
- ➤ Cross SBU Coordination
  - Development Processes
  - Purchasing Issues

Major Tasks Schedule

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Personnel Development												
Business Plan												
Budget Development												
Technology Plan												
Financial Reporting												
Technology Review												
Metrics Review												
Product Plan												
Customer Plan												

Revision Date: DDMMYY

Small Business MSD

EXAMPLE

Management Responsibilities

- Define business plan
- Approve projects
- Control finances
- Manage people and training
- Customer relations
- Product planning
- Develop and manage budget
- Assure effective communication process
- Assure effective policy deployment

Schedule of Reviews

➢ Annual
- Board of Directors – Business plan
- Board of Directors – Budget

➢ Semi-annual
- Lean manufacturing implementation

➢ Quarterly
- Quality reviews
- Project reviews
- Metrics Review

➢ Monthly
- Financial performance
- Customer issues

Control Processes

➢ Weekly staff meetings
- Risk management planning process
- Management issue sign-offs

➢ Audits / follow-up
- Open concerns tracking system
- External audits

➢ Strategy Reviews
- Monitor all long term issues
- Monitor all metrics

Communication

➢ Weekly staff meetings
➢ Action plan posting on central bulletin board
➢ Employee letters only when required
➢ All employee meetings 2x per year

Standard Meeting Schedule

➢ Staff Meeting – Monday 8:00 to 10:00
➢ Quality Team – Thursday 1:00 to 3:00
➢ Strategy Reviews– First Tuesday of each month 8:00 to 12:00

Major Tasks Schedule

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Business Plan												
Budget Development												
Financial Review												
Metrics Review												

Organizational Linkages

➢ Keep Board of Directors informed

Revision Date: DDMMYY

Engineering Department MSD

Responsibilities

- Deliver cost effective designs
- Manage to corporate goals
- Control projects
- Control budget
- Manage people assignments
- Work with other function to accomplish joint tasks
  - Product plan
  - Technology plan
  - Production plan
- Deliver results

Schedule of Reviews

➢ Annual
  - Product plan
  - Manufacturing process plan
  - Technology plan
  - Benchmarking
➢ Semi-annual
  - Program manager reviews
➢ Quarterly
  - Budget status and issues
➢ Monthly
  - Financial performance

Control Processes

➢ Strong program management process
  - Risk escalation
    - Chief engineer issue sign-offs
➢ Program action item follow-up tracking
➢ Rigorous design reviews
➢ Disciplined DFMEA and PFMEA process
➢ Performance metric evaluation

Standard Meeting Schedule

➢ Engineering staff – 8:00 Monday
➢ Program reviews – Wed PM as required for specific projects
➢ Section meetings – Specific to each department – 1:00 Monday
➢ Other specific meetings as required

Communication

➢ Staff and section meetings
➢ Engineering website
➢ Email for information and procedural updates
➢ Email program updates
➢ On-line interactive software for design teams (future)

Organizational Linkages

➢ Corporate staff
  - Customer activities
  - Market planning
➢ Manufacturing
  - Process development
  - Quality planning

Major Tasks Schedule

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Program Planning												
Budget Development												
Technology Plan												
Product Plan												
Process Plan												
Budget Reporting												

Revision Date: DDMMYY

Typical Issues Identified in the MSD Process

- Lack of clear understanding of responsibilities
- Multiple meetings to address the same issues
- Unnecessary meetings
- Yearly calendars with most major activities "crunched into a short timeframe" rather than being paced
- Lack of advanced planning on known requirements
- Haphazard communication processes
- No connection between responsibility and action
- Too many control processes or lack of control processes
- Involvement in linkage and review meetings which were of limited value
- Processes that violate company policy
- Policies that were driving significant unrecognized waste
- Control processes that cost more than the value of what they control

Management System Diagramming is a technique which highlights many opportunities for improvement and identifies management system waste.

All of these reduction findings provide waste opportunities

MSD Application

- The management system diagramming process can be applied at any level of an organization – in functional organizations and in cross functional team structures.

- Multi-level diagramming can be extremely powerful when the various levels are examined simultaneously evaluating redundant, wasteful, and unclear activities.

- In this multi-level analysis, consideration should be given to the way the total management system interacts between the levels and improvement opportunities should be explored.

- Similarly, in functional organizations performing a multi-functional analysis will provide similar benefits
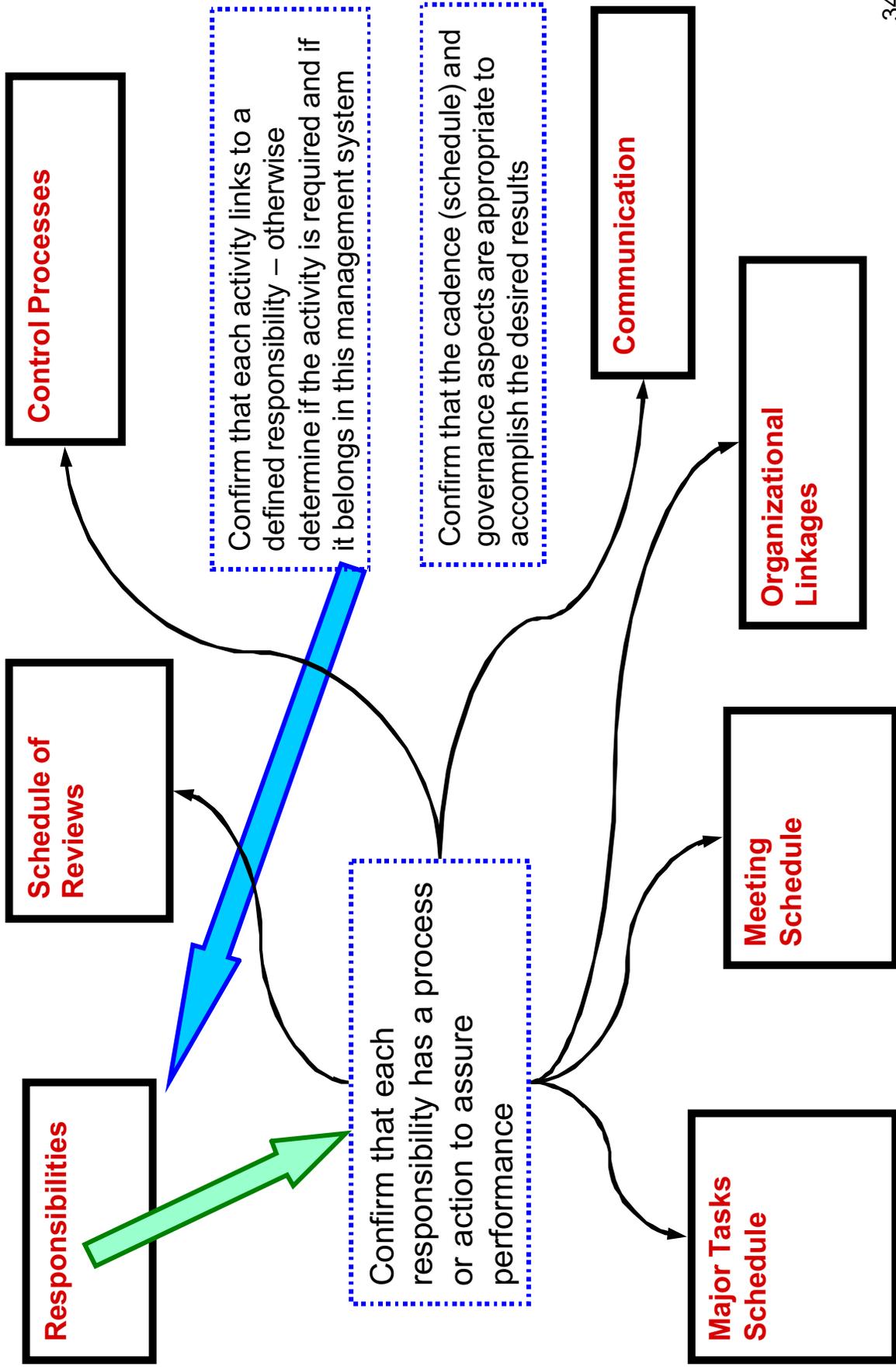
➢ Although it appears simple, management system diagramming can be complex and time consuming.
➢ Once identified, reducing the management system waste requires thinking and implementation effort.
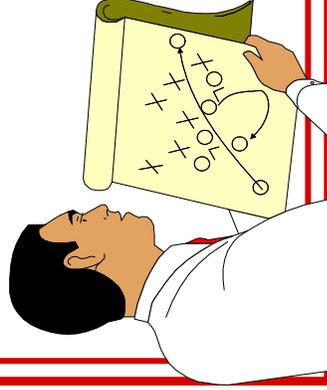
Management System Diagram Coherency Check and Lean Review

- The following two slides may be helpful in completing the coherency check and the lean review of the Management System Diagram

- The key questions to address are:
  - Check for Coherency
    - How well does the MSD fit together as a system to deliver the desired results?
    - How well do the responsibilities and activities match (directly link)?
  - Lean Design Review
    - How can we make the system and processes more effective and efficient?
    - How can we reduce the waste in accomplishing the tasks?
    - How can we increase the value created?

Management System Diagram Coherency Check

Control Processes

Schedule of Reviews

Responsibilities

Confirm that each activity links to a defined responsibility – otherwise determine if the activity is required and if it belongs in this management system

Confirm that the cadence (schedule) and governance aspects are appropriate to accomplish the desired results

Confirm that each responsibility has a process or action to assure performance

Communication

Organizational Linkages

Meeting Schedule

Major Tasks Schedule

Management System Diagram - Lean Review Thinking

Control Processes

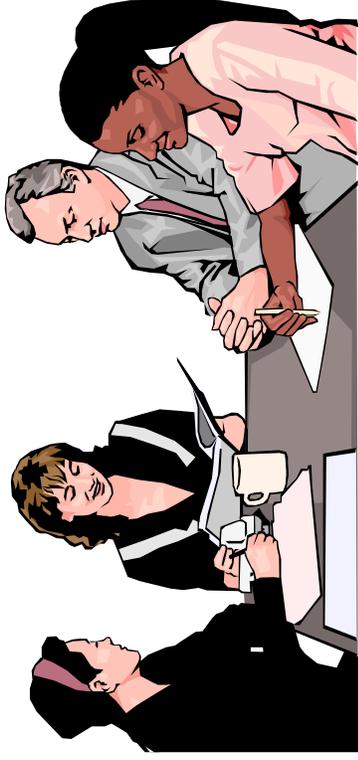Is each control process adequate but not wasteful?

Are communication processes clear, understood, and value adding (not wasteful)?

Communication

Schedule of Reviews

Are the meetings scheduled and structured to be efficient and effective? Are there redundant meetings?

Can we eliminate, reduce or combine any of the activities?

Are there policies that impact or interfere with what needs to be done?

Organizational Linkages

Does the schedule "fit" the needs of the entire organization?

Meeting Schedule

Responsibilities

Can we simplify any of the activities?

Should any of the activities be delegated (up, down, or sideways)?

Major Tasks Schedule

Management System Analysis Hints

| Hint	Implication
∧ **Provide orientation training**	Build understanding on how lean concepts apply to management.
∧ **Assure adequate discussion time**	The discussion and ensuing understanding that evolve from the analysis of the management system is a significant part of its value.
∧ **Select the MSD development team carefully**	It is critically important to ensure that the correct group participates in the analysis and in the creation of design improvements.
∧ **Leverage SME's (Subject Matter Experts on Lean)**	SME's are highly recommended to facilitate the process and provide experienced-based insight and coaching.
∧ **Allow adequate think time and "hypothesis testing time"**	The MSD should be accomplished over several days or weeks.
∧ **Utilize the continuous improvement approach**	Get started and then continue to improve -- based on data, observation, and feedback.
∧ **Concurrently develop the:** • **Strategic direction** • **Business system model** • **Management System Diagram (s)**	This will provide simultaneous, interactive improvement since these three aspects are highly inter-related. These three items will also identify individual processes to improve through lean methodologies.

Summary

Management Systems Diagramming:
Moving Toward a Lean Management System

The Management System Diagramming Process Provides a Framework for Four Key Aspects of the Management System

Responsibilities

Cadence
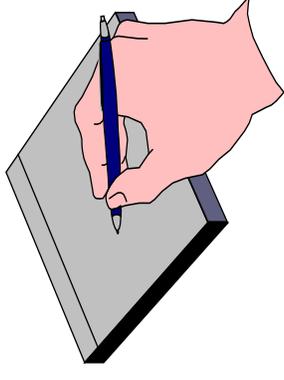
Governance

Communication Channels
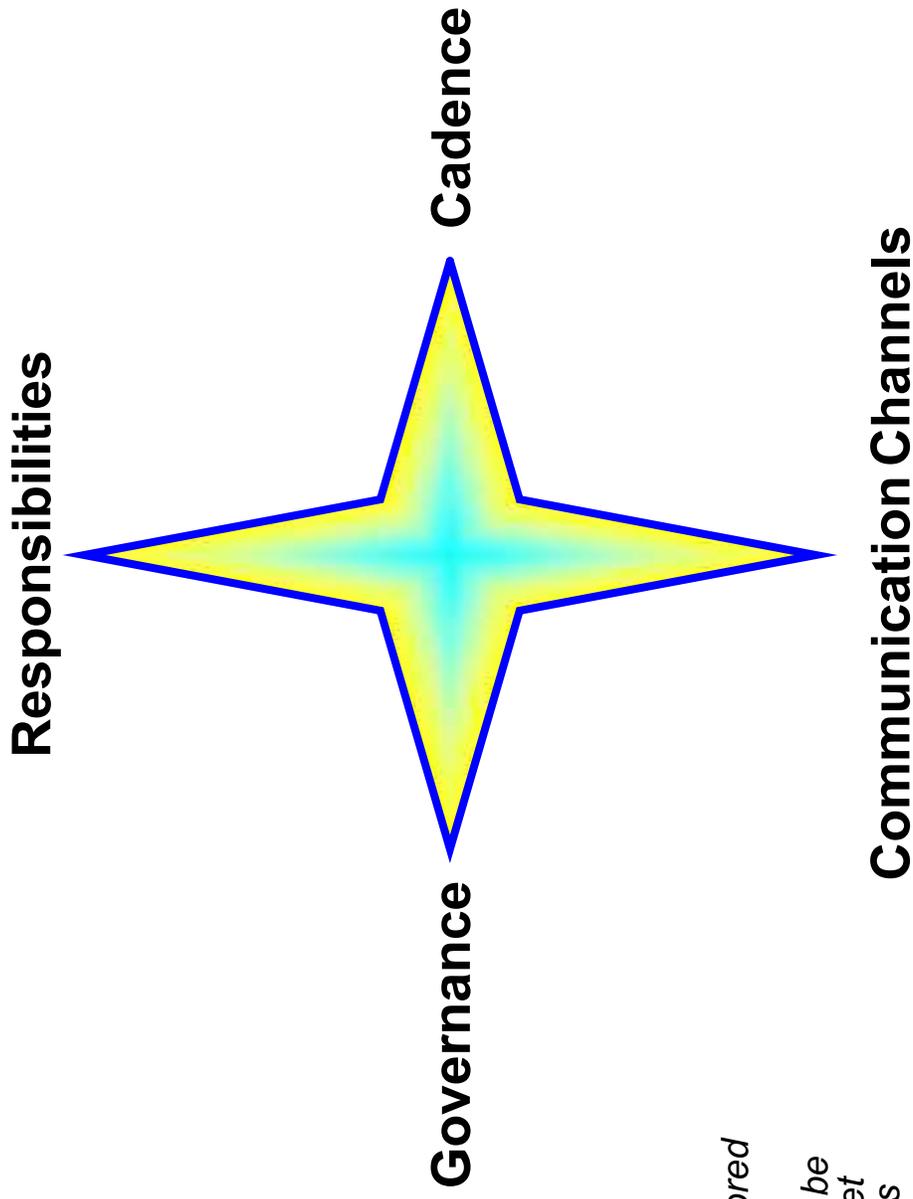
- *It can be tailored*
- *Additional aspects may be added to meet special needs*

Looking Forward

- MSD should be tailored to the specifics of the situation – it is a conceptual framework to build upon

- MSD application may utilize a higher level of "systems engineering" concepts and can be taken to the desired level of detail for the specific situation – it is unlimited

- In future organizations with increased performance pressure, higher dispersion, less hierarchy, etc. → assuring a value adding and clearly understood Management System will be of increasing importance

There is magic in the pen!

Management Systems Diagramming Summary

- MSD has proven to be extremely valuable and enlightening to many organizations

- MSD reduces the waste of management time (and time of the supporting organization)

- MSD increases the throughput of the management system

- 10% to 30% improvement has been observed

➢ Management System Diagramming will lead to substantial operational improvement

Lean Management Systems Diagramming

To Gain Maximum Benefits Implement a Totally Integrated Improvement Approach

Lean Management Systems

Lean Process Improvement

Lean Implementation Management