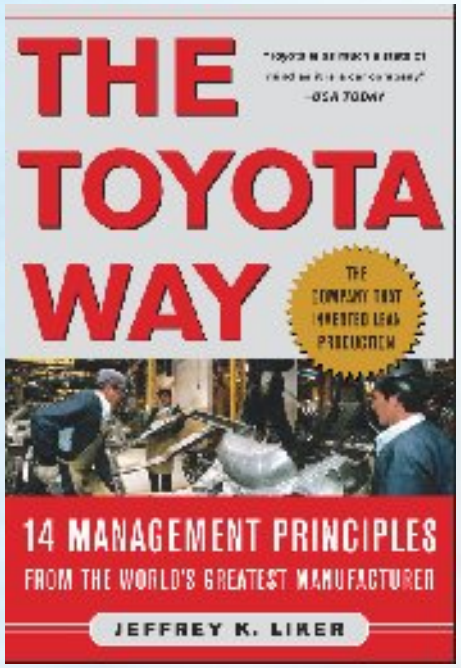
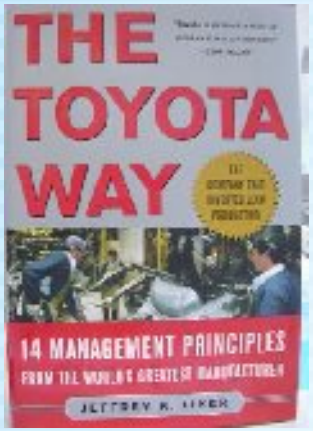
Dr. Jeffrey Liker

- Professor of Industrial & Operations Engineering at the University of Michigan
- President of the Toyota Way Academy – an organization that teaches and certifies Toyota Way practitioners.
- He is a frequent keynote speaker and consultant.
- Authored 75+ articles and 9 books.
- His articles and books have won 7 Shingo Prizes for Research Excellence.

  - *"The Toyota Way"* 2004
  - *"The Toyota Way Fieldbook"* 2005 (with David Meier)
  - *"Toyota's Product Development System: Integrating People, Process and Technology"* – 2006 (with Jim Morgan)
  - *"Toyota Talent"* 2007 (with David Meier)
  - *"Toyota Culture"* 2008 (with Michael Hoseus)





The Toyota Way

(A Summary of the book written by Jeffrey K. Liker)

Words from Publisher

“It is not the strongest nor the most intelligent of the species that survives, but the one that is most adaptable to change”

-Charles Darwin-

Part One

I

The World Class Power of The Toyota Way

The Toyota Production System

“All we are doing is looking at the time line from the moment the customer gives us an order to the point when we collect the cash. And we are reducing that time line by removing the non-value-added wastes.”

-Taichi Ohno,1988

The 14 Principles of the Toyota Way:

An Executive Summary of the Culture Behind TPS

"Since Toyota's founding we have adhered to the core principle of contributing to society through the practice of manufacturing high-quality products and services. Our business practices and activities based on this core principle created value, beliefs and business methods that over the years have become a source of competitive advantage. These are the managerial values and business methods that are known collectively as the **Toyota Way.**"

-Fujio Cho, President Toyota,2001

It’s about People

In the Toyota Way, it’s the people who bring the system to life: working, communicating, resolving issues, and growing together.

The Toyota Way goes well beyond this; it encourages, supports, and in fact demands employee involvement.

It’s A Culture

It’s a **culture**, more than a set of efficiency and improvement techniques.

The workers will reduce inventory, identify hidden problems, and fix them.

The workers have a sense of **urgency**, **purpose**, and **teamwork** because if they don’t fix it there will be an inventory outage.

This effort requires a combination of **committed management**, **proper training**, and a culture that makes **sustaining improvement a habitual behavior** from the shop floor to management.

The World-Class Power of the Toyota Way

"We place the highest value on actual implementation and taking action. There are many things one doesn't understand and therefore, we ask them why don't you just go ahead and take action; try to do something? You realize how little you know and you face your own failures and you simply can correct those failures and redo it again and at the second trial, you'll realize another mistake or another thing you didn't like so you can redo it once again. So by **constant improvement**, or, should I say, the **improvement based upon action**, one can rise to the higher level of practice and knowledge."

-Fujio Cho, President, Toyota Motor Corporation, 2002

How Toyota Became the World's Best Manufacturer

The Story of Toyoda Family and
the Toyota Production System

"I plan to cut down on the slack time within processes and in the shipping of parts and material as much as possible. As the basic principle in realizing this plan, I will uphold the "just in time" approach. The guiding rule is not to have goods shipped too early or too late."

-Kiichiro Toyoda, founder of Toyota Motor Company, 1938

Toyota's Spirit of Challenge

"We accept challenges with a creative spirit and the courage to realize our own dreams without losing drive or energy. We approach our work vigorously, with optimism and a sincere belief in the value of our contribution. We strive to decide our own fate. We act with self-reliance, trusting in our own abilities. We accept responsibility for our conduct and for maintaining and improving the skills that enable us to produce added value."

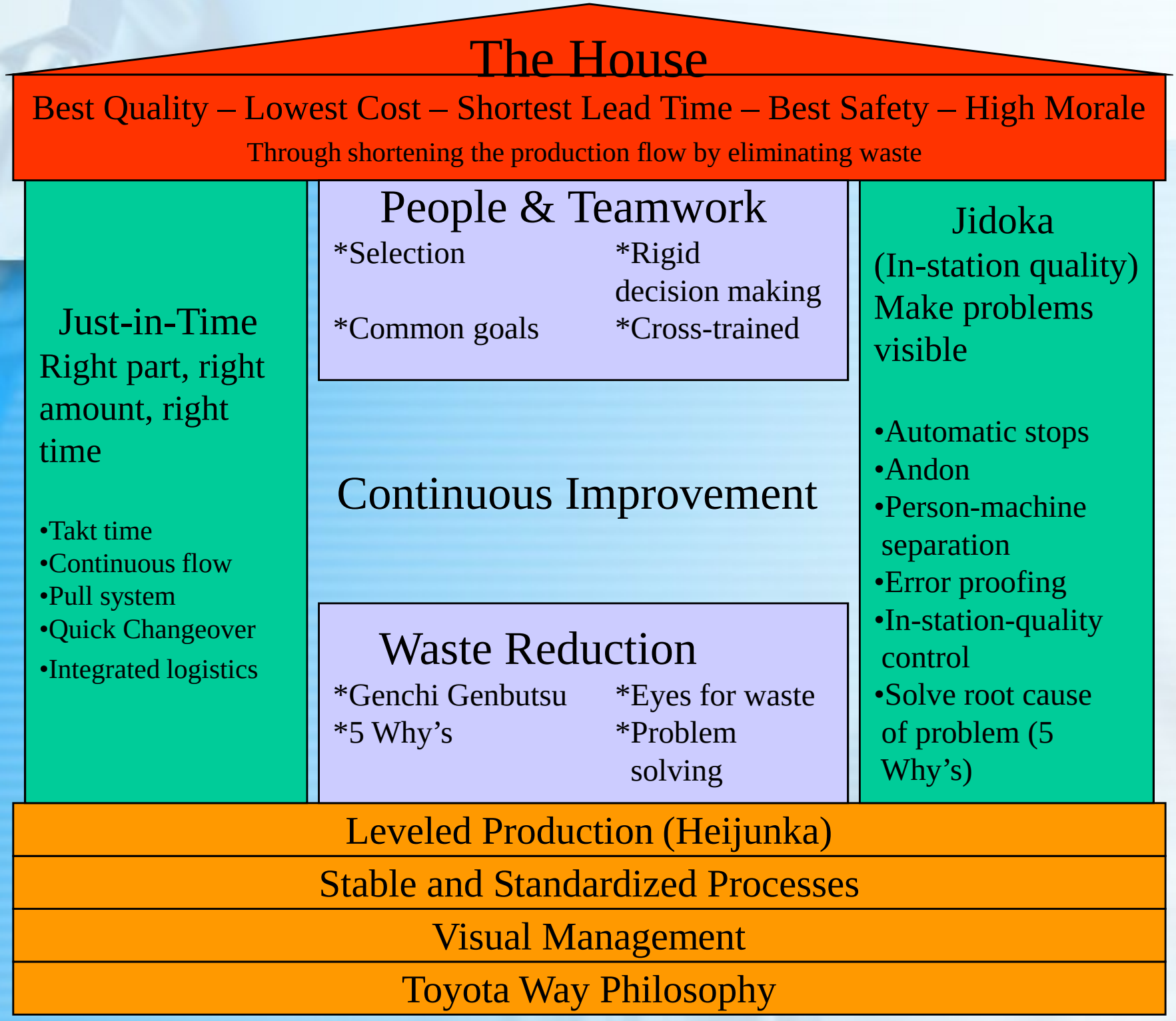
The Heart of the Toyota Production System: Eliminating Waste

"Many good American companies have respect for individuals, and practice kaizen and other TPS tools. But what is important is having all the elements together as a system. It must be practiced every day in a very consistent manner-not in spurs-but in a concrete way on the shop floor."

-Fujio Cho, President, Toyota Motor Corporation

The Wastes

1. Over-production
2. Waiting
3. Conveyance
4. Over processing
5. Excess inventory
6. Unnecessary movement
7. Defects
8. Unused employee creativity


The House
Best Quality – Lowest Cost – Shortest Lead Time – Best Safety – High Morale
Through shortening the production flow by eliminating waste
Just-in-Time
Right part, right amount, right time
•Takt time
•Continuous flow
•Pull system
•Quick Changeover
•Integrated logistics
People & Teamwork
*Selection
*Rigid decision making
*Common goals
*Cross-trained
Continuous Improvement
Waste Reduction
*Genchi Genbutsu
*5 Why's
*Eyes for waste
*Problem solving
Jidoka
(In-station quality)
Make problems visible
•Automatic stops
•Andon
•Person-machine separation
•Error proofing
•In-station-quality control
•Solve root cause of problem (5 Why's)
Leveled Production (Heijunka)
Stable and Standardized Processes
Visual Management
Toyota Way Philosophy

How Managers Can Dramatically Improve Their Business Process

- Eliminating wasted time and process
- Building quality into workplace systems
- Finding low-cost but reliable alternatives to expensive new technology
- Perfecting business processes
- Building a learning culture for continuous improvement

Safety is First

"Every method available for man-hour reduction to reduce cost must, of course, be pursued vigorously; but we must never forget that **safety is the foundation** of all our activities. There are times when improvement activities do not proceed in the name of safety. In such instances, return to the starting point and take another look at the purpose of that operation. Never be satisfied with inaction. Question and redefine your purpose to attain progress."

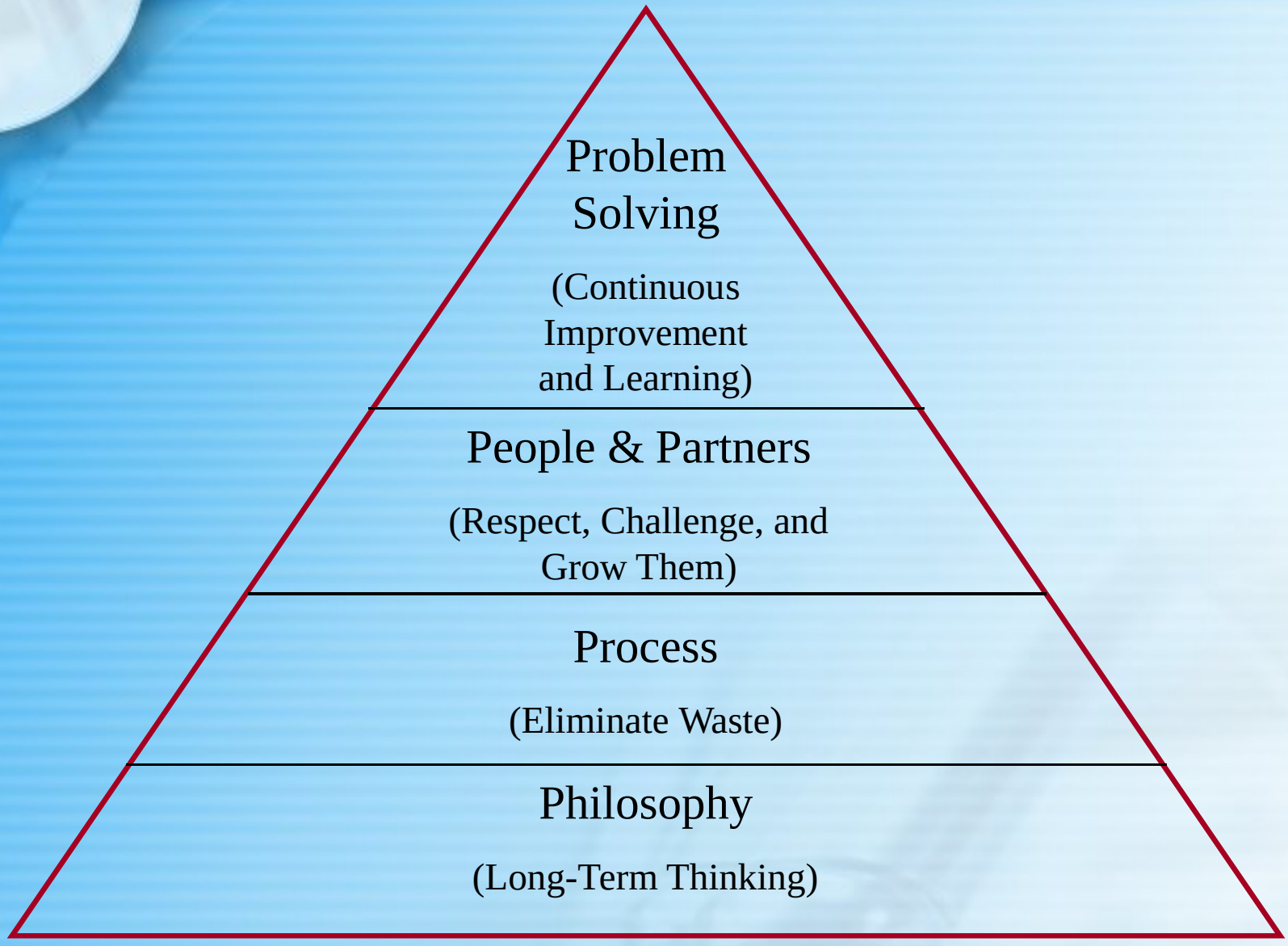
Part Two

II

The Business Principles of the Toyota Way

-14 Management Principles

The Toyota Way: Using Operational Excellence as a Strategic Weapon



Philosophy

Long-Term Thinking:

1. **Base management decisions on a long term philosophy, even at the expense of short-term financial goals**

Principle One

1

"The most important factors for success are patience, a focus on long term rather than short-term results, reinvestment in people, product, and plant, and an unforgiving commitment to quality."

-Robert B. McCurry,former Executive V.P., Toyota Motor Sales

Base management decisions on a long term philosophy, even at the expense of short-term financial goals

1

1. A mission greater than earning a paycheck
2. Do the right thing for the company, its employees, the customer, and society as a whole
3. Building trust with employees
4. Don’t let business decision undermine trust and mutual respect
5. Use self-reliance and responsibility to decide your own fate
6. Create a constancy of purpose and place in history

Base management decisions on a long term philosophy, even at the expense of short-term financial goals

1

Toyota mission:

- Contribute to the economic growth of the country in which it is located (external stakeholders)
- Contribute to the stability and well being of team members (internal stakeholders)
- Contribute to the overall growth of Toyota

Base management decisions on a long term philosophy, even at the expense of short-term financial goals

1

Toyota Mutual Respect and Trust Principles:

- Honor the language and spirit of the law of every nation and undertake open and fair corporate activities to be a good corporate citizen of the world.
- Respect the culture and customs of every nation and contribute to economic and social development through corporate activities in the communities.
- Dedicate ourselves to providing clean and safe products and to enhancing the quality life everywhere through all our activities.
- Create and develop advanced technologies and provide outstanding products and services that fulfill the needs of customer worldwide.

Base management decisions on a long term philosophy, even at the expense of short-term financial goals

1

Toyota Mutual Respect and Trust Principles (cont'd):

5. Foster a corporate culture that enhances individual creativity and team work value, while honoring mutual respect and trust between labor and management.
6. Pursue growth in harmony with the global community through innovative management.
7. Work with business partners in research and creation to achieve stable, long-term growth and mutual benefits, while keeping ourselves open to new partnership.

Base management decisions on a long term philosophy, even at the expense of short-term financial goals

1

Basic Thoughts

1. Have a philosophical sense of purpose that supersedes any short-term decision making. Work, grow and align the whole organization toward a common purpose that is bigger than making money. Understand your place in history of the company and work to bring the company to the next level. Your philosophical mission is the foundation for all the other principles.
2. Generate value for the customer, society, and the economy-it is your starting point. Evaluate every function in the company in terms of its ability to achieve this.
3. Be responsible. Strive to decide your own fate. Act with self-reliance and trust in your own abilities. Accept responsibility for your conduct and maintain and improve the skills that enable you to produce added value.

Process

Eliminate Waste:

2. Create process “flow” to surface problems

3. Use pull system to avoid overproduction

4. Level out the workload (*heijunka*)

5. Stop when there is a quality problem (*jidoka*)

6. Standardize tasks for continuous improvement

7. Use visual control so no problems are hidden

8. Use only reliable, thoroughly tested technology

Principle Two

“If some problem occurs in one-piece-flow manufacturing then the whole production line stops. In this sense it is a very bad system of manufacturing. But when production stops everyone is forced to solve the problem immediately. So team members have to think, and through thinking team members grow and become better team members and people.”

-Teruyuki Minoura, former President,
Toyota Motor Manufacturing, North America

Fact:

Most business process are 90% waste and

10% value-added work

Takt Time:

The heart beat of one-piece flow

Traditional Mass Production Thinking:

- Economics of scale. First and foremost, mass production thinking was about squeezing the most production possible at the lowest cost per unit out of every piece of equipment or every worker in a manual operation.
- Apparent flexibility in scheduling.

Benefits of one-piece flow:

- Builds in quality
- Creates real flexibility
- Creates higher productivity
- Frees on floor space
- Improves safety
- Improves morale
- Reduces cost of inventory

Create continuous process flow to bring problems to the surface

Why creating flow is difficult:

> In 1947, we arranged machines in parallel lines or in an L shape and tried having one worker operate three or four machines along the processing route. We encountered strong resistance among the production workers, however, even though there was no increase in work or hours. Our craftsmen did not like the new arrangement requiring them to function as multi skilled operators. They did not like changing from one operator, one machine to a system of one operator, many machines in different process. Their resistance was understandable. Furthermore, our efforts revealed various problems. As these problems became clearer, they showed me the direction to continue moving in. Although young and eager to push, I decided not to press for quick, drastic changes, but to be patient. (Ohno, 1988)

Basic Thoughts

1. Redesign work processes to achieve high value-added, continuous flow. Strive to cut back to zero the amount of time that any work project is sitting idle or waiting for someone to work on it.
2. Create flow to move material and information fast as well as to link processes and people together so that problems surface right away.
3. Make flow evident throughout your organizational culture. It is the key to a true continuous improvement process and to developing people.

Principle Three

"The more inventory a company has,…the less likely they will have what they need."

-Taichi Ohno-

The Principles:

- Customer pull and replenishment
- Flow where you can, Pull where you must

Basic Thoughts

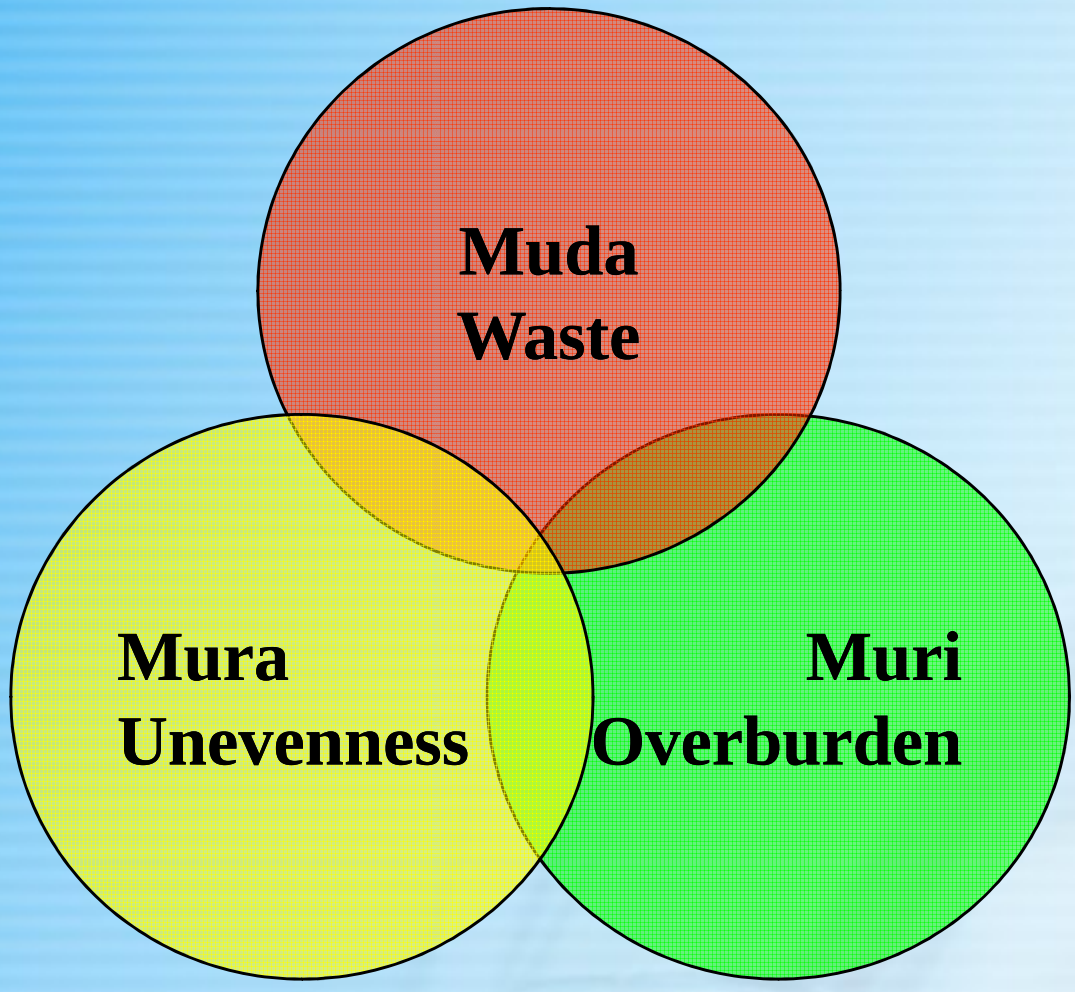
1. Provide your down line customers in the production process with what they want, when they want it, and in the amount they want. Material replenishment initiated by consumption is the basic principle of just-in-time.
2. Minimize your work in process and warehousing of inventory by stocking small amounts of each product and frequently restocking based on what the customer actually takes away.
3. Be responsive to the day-by-day shifts in customer demand rather than relying on computer schedules and systems to track wasteful inventory.

Principle Four

"In general, when you try to apply the TPS, the first thing you have to do is to even out or level the production. And that is the responsibility primarily of production control or production management people. Leveling the production schedule may require some front-loading of shipments or postponing the shipments and you may have to ask some customers to wait for a short period of time. Once the production level is more or less the same or constant for a month, you will be able to apply pull systems and balance the assembly line. But if production levels-the output-varies from day to day, there is no sense in trying to apply other systems, because you simply cannot establish standardized work under such circumstances."

-Fujio Cho, President, Toyota Motor Corporation

Level Out the Workload (Heijunka)



Focusing on *muda* is the most common approach to “implement lean tools,” because it is easy to identify and eliminate waste. But what many companies fail to do is the more difficult process of stabilizing the system and creating “evenness”-a true balanced lean flow of work. This is the Toyota concept of *heijunka*, leveling out the work schedule. Achieving *heijunka* is fundamental to eliminating *mura*, which is fundamental to eliminating *muri* and *muda*.

“The slower but consistent tortoise causes less waste and is much more desirable than the speedy hare that races ahead and then stops occasionally to doze. The Toyota Production System can be realized only when all the workers become tortoises.” (Ohno, 1988)

Heijunka is the leveling of production by both volume and product mix.

There are four benefits of *heijunka*:

1. Flexibility to make what the customer wants when they want it.
2. Reduced risk of unsold goods.
3. Balanced use of labor and machines.
4. Smoothed demand on upstream processes and the plant's suppliers.

Heijunka in service operations:

1. Fit customer demand into a leveled schedule.

2. Establish standard times for delivering different types of service.

Basic Thoughts

1. Eliminating waste is just one-third of the equation for making lean successful. Eliminating overburden to people and equipment and eliminating unevenness in the production schedule are just as important-yet generally not understood at companies attempting to implement lean principles.
2. Work to level out the workload of all manufacturing and service processes as an alternative to the stop/start approach of working on projects in batches that is typical at most companies.

Principle Five

"Mr. Ohno used to say that no problem discovered when stopping the line should wait longer than tomorrow morning to be fixed. Because when making a car every minute we know we will have the same problem again tomorrow."

-Fujio Cho, President, Toyota Motor Corporation

The Principle-stopping the process to build in quality (*jidoka*)

"A method to detect defects when they occur and automatically stop production so an employee can fix the problem before the defect continues downstream."

Jidoka is also referred to as *autonomation*-equipment endowed with human intelligence to stop itself when it has a problem. In station-quality (preventing problems from being paased down the line) is much more effective and less costly than inspecting and repairing quality problems after the fact.

Use *andon* cord if problems occur. *Andon* refers to the light signal for help.

The key concept:

1. Building in quality is a principle, not a technology
2. Using countermeasures and error-proofing to fix problems.
3. Keep quality control simple and involve team members.
    a. Go and see
    b. Analyze the situation
    c. Use one-piece-flow and *andon* to surface problems
    d. Ask “Why?” five times

Basic Thoughts

1. Quality for the customer drives your value proposition.
2. Use all the modern quality assurance methods available.
3. Build into your equipment the capability of detecting problems and stopping itself. Develop a visual system to alert team or project leaders that a machine or process needs assistance. *Jidoka* (machines with human intelligence) is the foundation for “building in” quality.
4. Build into your organization support systems to quickly solve the problems and put in place countermeasures.
5. Build into your culture the philosophy of stopping or slowing down to get quality right the first time to enhance productivity in the long run.

Principle Six

"Standard work sheets and the information contained in them are important elements of the Toyota Production System. For a production person to be able to write a standard work sheet that others workers can understand, he or she must be convinced of its importance…High production efficiency has been maintained by preventing the recurrence of defective products, operational mistakes, and accidents, and by incorporating workers' ideas. All of this is possible because of the inconspicuous standard work sheet."

-Taiichi Ohno

Standardized tasks are the foundation for continuous improvement and employee empowerment

"Today's standardization…is the necessary foundation on which tomorrow's improvement will be based. If you think of "standardization" as the best you know today, but which is to be improved tomorrow-you get somewhere. But if you think of standards as confining, then progress stops."

Toyota President Cho describes:

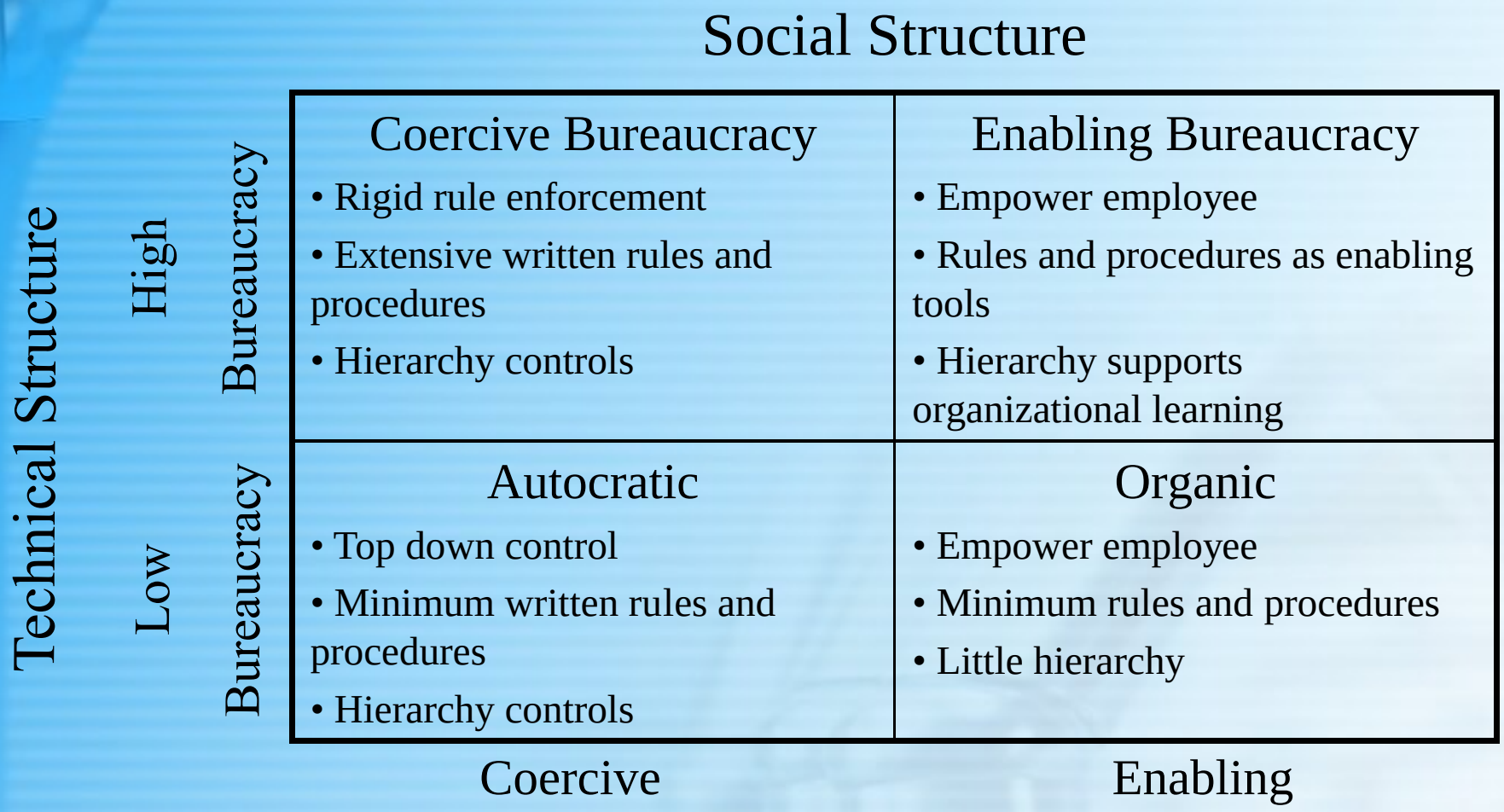
"Our standardized work consists of three elements-takt time (time required to complete one job at the pace of customer demand), the sequence of doing things or sequence of processes, and how much inventory or stock on hand the individual worker needs to have in order to accomplish the standardized work. Based upon these three elements, takt time, sequence, and standardized stock on hand, the standard work is set."

The Principle:

"Standardization is the basis for continuous improvement and quality."

Standardized tasks are the foundation for continuous improvement and employee empowerment

Coercive vs Enabling Bureaucracies-Employee Empowerment



Standardized tasks are the foundation for continuous improvement and employee empowerment

Coercive vs Enabling Design of Systems and Standards

Coercive Systems and Procedures	Enabling Systems and Procedures
Systems focus on performance standards so as to highlight poor performance.	Focus on best practice methods: information on performance standards is not much use without information on best practices for achieving them.
Standardize the systems to minimize game playing and monitoring costs.	System should allow customization to different levels of skills/experience and should guide flexible improvisation.
Systems should be designed so as to keep employees out of control loop.	Systems should help people control their own work: help them form mental models of the system by “glass box” design.
Systems are instructions to be followed, not challenged.	Systems are best practice templates to be improved.

Basic Thoughts

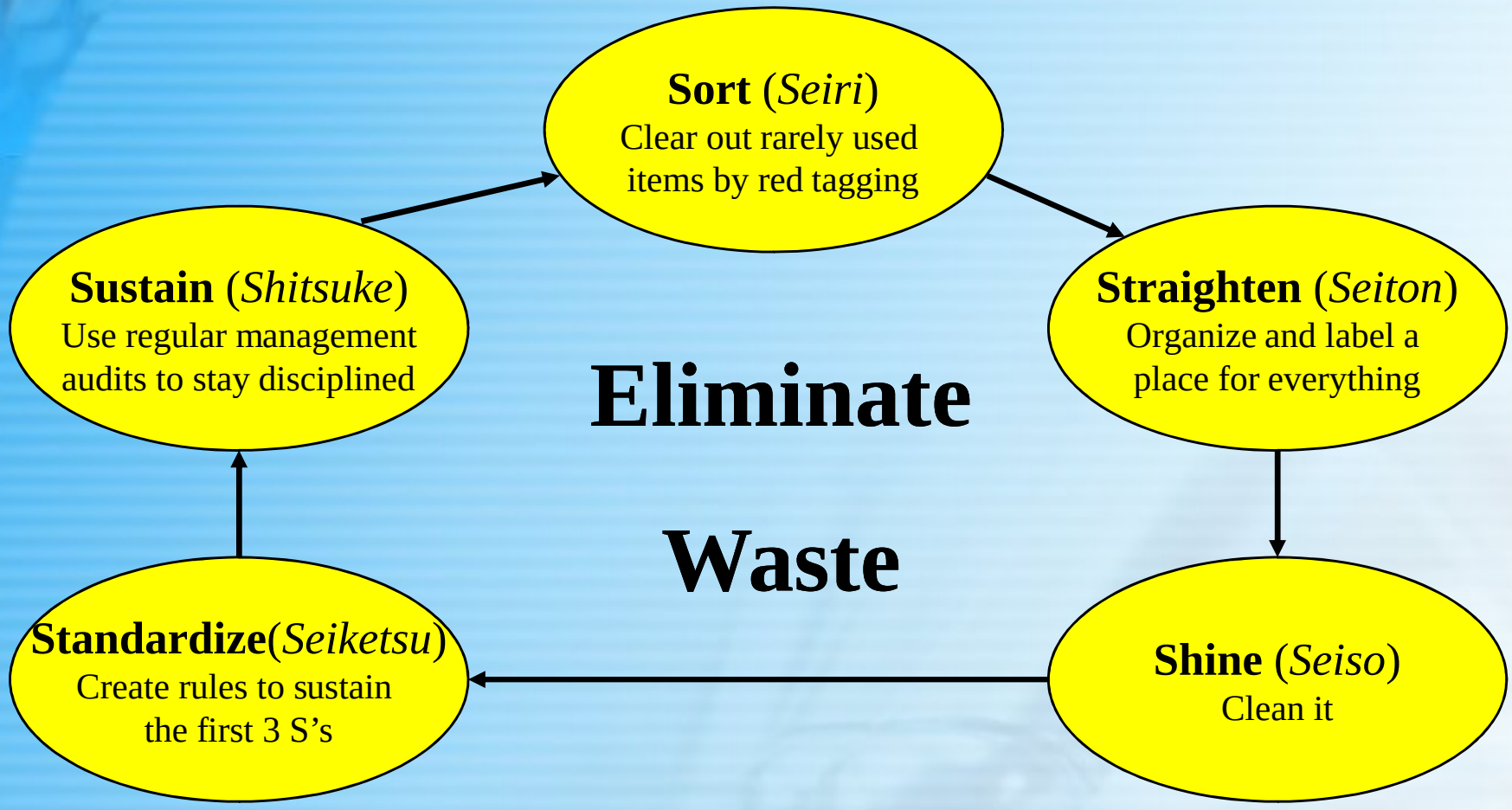
1. Use stable, repeatable methods everywhere to maintain the predictability, regular timing, and regular output of your processes. It is the foundation for flow and pull.
2. Capture the accumulated learning about a process up to a point in time by standardizing today's best practices. Allow creative and individual expression to improve upon the standard; then incorporate it into the new standard so that when a person moves on you can hand off the learning to the next person.

Principle Seven

"Mr. Ohno was passionate about TPS. He said you must clean up everything so you can see problems. He would complain if he could not look and see and tell if there is a problem."

-Fujio Cho, President, Toyota Motor Corporation

The Principle-Clean it up, make it visual



Visual control systems are about improving value added flow

Visual control is any communications device used in the work environment that tells us at a glance how work should be done and whether it is deviating from the standard.

Basic Thoughts

1. Use simple visual indicators to help people determine immediately whether they are in standard condition or deviating from it.
2. Avoid using a computer screen when it moves the worker's focus away from the workplace.
3. Design simple visual systems at the place where the work is done, to support flow and pull.
4. Reduce your reports to one piece of paper whenever possible, even for your most important financial decision.

Principle Eight

8

"Society has reached the point where one can push a button and be immediately deluged with technical and managerial information. This is all very convenient, of course, but if one is not careful there is a danger of losing the ability to think. We must remember that in the end it is the individual human being who must solve the problems."

-Eiji Toyoda, Creativity, Challenge and Courage, Toyota Motor Corporation,1983

The Principle-Adoption of new technology must support your people, process, and values.

At Toyota, new technology is introduced only after it is proven out trough direct experimentation with the involvement of a broad cross-section of people.

The technology has been thoroughly evaluated and tested to ensure it provides added value.

Use only reliable, thoroughly tested technology that serves your people and processes

Toyota steps to analyze new technology:

1. Go and see first hand the nature of the value-added work being performed by the workers for the particular process.
2. Look for new opportunities to eliminate waste and even out the flow.
3. Use a pilot area to improve the process with existing equipment, technology, and people.
4. When it has accomplished as much improvement as possible with the present process, ask again if it can make any additional improvement by adding the new technology.

Use only reliable, thoroughly tested technology that serves your people and processes

Toyota steps to analyze new technology (cont'd):

5. If it determines that the new technology can add value to the process, the technology is then carefully analyzed to see if it conflicts with Toyota's philosophies and operating principles.
6. If the technology violates these principles or if there is any change it may adversely disrupt stability, reliability, and flexibility, Toyota will reject the technology or at least delay adopting it until the problems can be resolved.
7. If the new technology is acceptable, the guiding principle is to design and use it to support continuous flow in the production process and help employees perform better within the Toyota Way standards.

Basic Thoughts

1. Use technology to support people, not to replace people. Often it is best to work out a process manually before adding technology to support the process.
2. New technology is often unreliable and difficult to standardize and therefore endangers “flow.” A proven process that works generally takes precedence over new and untested technology.
3. Conduct actual tests before adopting new technology in business processes, manufacturing systems or products.
4. Reject or modify technologies that conflict with your culture or that might disrupt stability, reliability and predictability.
5. Nevertheless, encourage your people to consider new technologies when looking into new approaches to work. Quickly implement a thoroughly considered technology if it has been proven in trials and can improve flow in your processes.

People and Partners

Respect, Challenge, and Grow Them:

9. Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others

10. Develop exceptional people and teams who follow your company's philosophy

11. Respect your extended network of partners and suppliers by challenging them and helping them improve

Principle Nine

9

"Until senior management gets their egos out of the way and goes to the whole team and leads them all together…senior management will continue to miss out on the brain power and extraordinary capabilities of all their employees. At Toyota, we simply place the highest value on our team members and do the best we can to listen to them and incorporate their ideas into our planning process."

-Alex Warren, former Senior VP
Toyota Motor Manufacturing, Kentucky

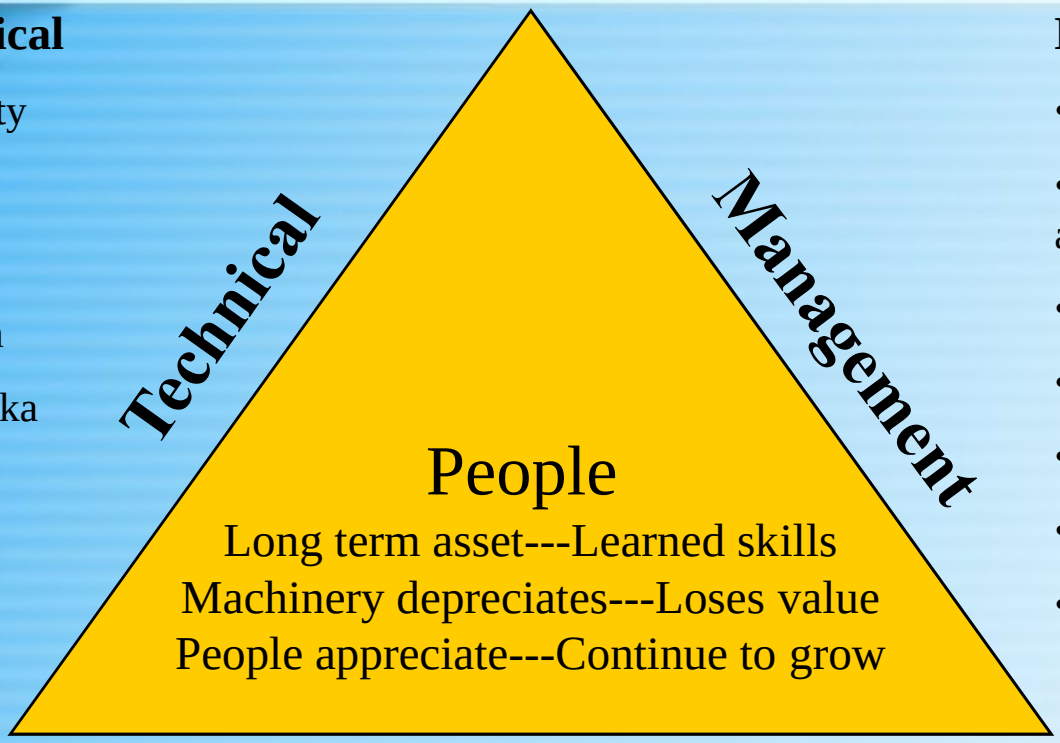
The Principle-Growing your leaders rather than purchasing them

First lesson of management-Putting customers first

Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others

Technical

- Stability
- JIT
- Jidoka
- Kaizen
- Heijunka



Management

- True North
- Tools to focus management attention
- Go and see
- Problem-solving
- Presentation skills
- Project management
- Supportive culture

Philosophical

Philosophy/Basic Thinking

- Customer first
- People are most important asset
- Kaizen
- Go and see---focus on floor
- Efficiency thinking

Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others

Basic Thoughts

1. Grow leaders from within, rather than buying them from outside the organization.
2. Do not view the leader's job as simply accomplishing tasks and having good people skills. Leaders must be role models of the company's philosophy and way of doing business.
3. A good leader must understand the daily work in great detail so he or she can be the best teacher of your company's philosophy.

Principle Ten

10

"Respect for people and constant challenging to do better—are these contradictory? Respect for people means respect for the mind and capability. You do not expect them to waste their time. You respect the capability of the people. Americans think teamwork is about you liking me and I liking you. Mutual respect and trust means I trust and respect that you will do your job so that we are successful as company. It does not mean we just love each other."

-Sam Heltman, Senior VP of Administration
Toyota Motor Manufacturing, North America

The Principle-Developing excellent individual work while promoting effective team work.

The Toyota Way is not about lavishing goodies on people whether they have earned them or not; it is about challenging and respecting employees at the same time.

If you make teamwork the foundation of the company, individual performers will give their hearts and souls to make the company successful.

At TPS, we called this the "respect for humanity system."

Toyota roles and responsibilities:

Team Member (TM)

•Perform work to current standard

•Maintain 5S in their work area

•Perform routine minor maintenance

•Look for continuous improvement opportunities

•Support problem-solving small group activities

Team Leader (TL)

•Process start-up and control

•Meet production goals

•Respond to *andon* calls by TM

•Confirm quality-routine checks

•Cover absenteeism

Toyota roles and responsibilities (cont'd):

Team Leader (TL) cont'd…

- Training and cross-training
- Work orders for quick maintenance
- Insure standardized work is followed
- Facilitate small groups activities
- On-going continuous improvement projects
- Insure parts/materials are supplied to process

Group Leader (GL)

- Manpower/vacation schedule
- Monthly production planning
- Administrative: policy, attendance, corrective actions
- *Hoshin* planning

Toyota roles and responsibilities (cont'd):

Group Leader (GL) cont'd…

- Team morale
- Confirm routine quality and TL checks
- Shift to shift coordination
- Process trials (changes in process)
- TM development and cross-training
- Report/track daily production results
- Cost reduction activities
- Process improvement projects: productivity, quality, ergonomics, etc.
- Coordinate major maintenance
- Coordinate support from outside groups
- Coordinate work with up-stream and down-stream processes

Toyota roles and responsibilities (cont'd):

Group Leader (GL) cont'd…

- Group safety performance
- Help cover TL absence
- Coordinate activities around major model changes

Classic motivation theories and the Toyota Way

Internal Motivation Theories	Concept	Toyota Approach
Maslow's Need Hierarchy	Satisfy lower level needs and move employees up the hierarchy toward self actualization.	Job security, good pay, safe working conditions satisfy lower level needs. Culture of continuous improvement supports growth toward self actualization.
Herzberg's Job Enrichment Theory	Eliminate "dissatisfiers" (hygiene factors) and design work to create positive satisfiers (motivator).	5S, ergonomics programs, visual management, human resource policies address hygiene factors. Continuous improvement job rotation, and build-in feedback support motivators.

Classic motivation theories and the Toyota Way

External Motivation Theories	Concept	Toyota Approach
Taylor's Scientific Management	Scientifically select, design standardized jobs, train, and reward with money performance relative to standards.	All scientific management principles followed but at the group level rather than individual level and based on employee involvement.
Behavior Modification	Reinforce behavior on the spot when the behavior naturally occurs.	Continuous flow and andon creates short-lead time for rapid feedback. Leaders constantly on the floor and providing reinforcement.
Goal Setting	Set specific, measurable, achievable challenging goals and measure progress.	Sets goals that meet these criteria through *hoshin kanri* (policy deployment). Continuous measurements relative to targets.

Basic Thoughts

1. Create a strong, stable culture in which company values and belief are widely shared and lived out over a period of many years.
2. Train exceptional individuals and teams to work within the corporate philosophy to achieve exceptional results. Work very hard to reinforce the culture continually.
3. Use cross-functional teams to improve quality and productivity and enhance flow by solving difficult technical problems. Empowerment occurs when people use the company's tools to improve the company.
4. Make an ongoing effort to teach individuals how to work together as teams toward common goals. Teamwork is something that has to be learned.

Principle Eleven

"Toyota is more hands-on and more driven to improving their own systems and then showing how that improves you…Toyota will do things like level their production systems to make it easier on you. Toyota picks up our product 12 times per day. They helped move presses, moved where we get the water from, trained our employees. On the commercial side they are very hands-on also—they come in and measure and work to get cost out of the system. There is more opportunity to make profit with Toyota. We started with Toyota when we opened a Canadian plant with one component and, as performance improved, we were rewarded, so now we have almost the entire cockpit. Relative to all car companies we deal with, Toyota is the best."

-an automotive supplier

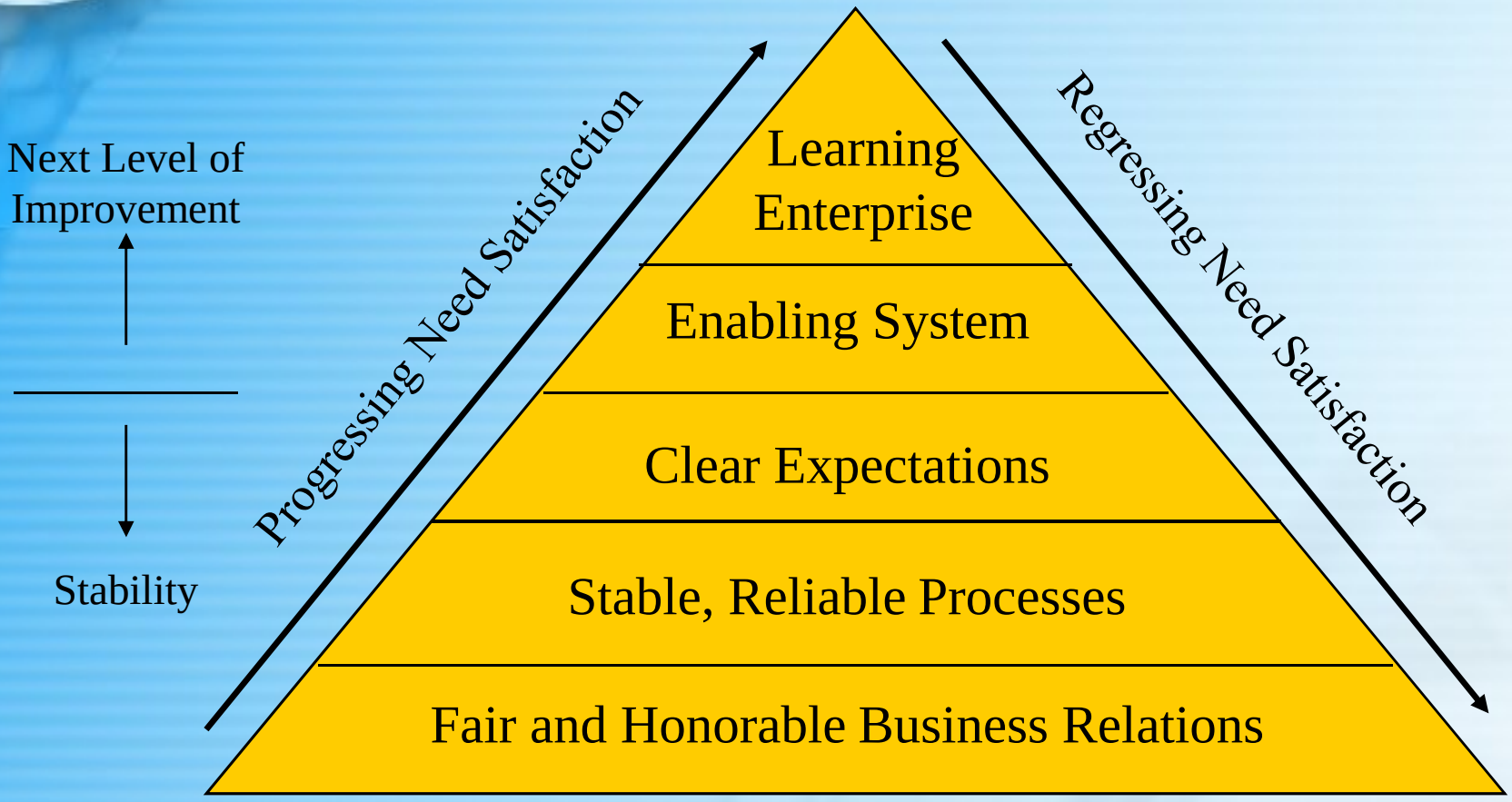
The Principle-Find solid partners and grow together to mutual benefit in the long term.

Toyota perspective: having high expectations for their supplier and then treating them fairly and teaching them is the definition of respect.

Achievement of business performance by the parent company through bullying suppliers is totally alien to the spirit of the Toyota Production System.

Respect your extended network of partners and suppliers by challenging them and helping them improve

Supply Chain Need Hierarchy



Respect your extended network of partners and suppliers by challenging them and helping them improve

Basic Thoughts

1. Have respect for your partners and suppliers and treat them as an extension of your business.
2. Challenge your outside business partners to grow and develop. It shows that you value them. Set challenging targets and assist your partners in achieving them.

Problem Solving

Continuous Improvement and Learning:

12. Go see (*gemba*) for yourself to thoroughly understand the situation (*genchi genbutsu*)

13. Make decisions slowly by consensus, thoroughly considering all options; implement rapidly (*nemawashi*)

14. Become a learning organization through relentless reflection (*hansei)* and continuous improvement (*kaizen*)

Principle Twelve

"Observe the production floor without preconceptions and with a blank mind. Repeat "why" five times to every matter."

-Taiichi Ohno (as quoted in The Toyota Way document)

The Principle-Deeply understanding and reporting what you see.

Genchi means the actual location and *genbutsu* means the actual materials or products.

Genchi genbutsu is interpreted within Toyota to mean *going to the place to see the actual situation for understanding*.

Gemba is a term that has become popular, it refers to “the actual place.”

Go and see for yourself to thoroughly understand the situation (*genchi genbutsu*)

Employees and managers must “deeply” understand the processes as well as have the ability to critically evaluate and analyze what is going on, this may include some analysis of data.

In addition, they must know how to get to the root cause of any problems they observe and communicate it effectively to others.

Genchi Genbutsu philosophies:

1. Think and speak based on verified, proven information and data
    - Go and confirm the facts for yourself
    - You are responsible for the information you are reporting to others
2. Take full advantage of the wisdom and experience of others to send, gather or discuss information

Ohno circle-Watch and think for yourself

“Data is of course important in manufacturing, but I place the greatest emphasis on facts.”

-Taiichi Ohno

***Hourensou*-Rapid *genchi genbutsu* for executives**

Hourensou is a japanese word made up of three parts: *hou* (*hou koku*-to report), *ren* (*ren raku*-to give updates periodically), and *sou* (*sou dan*-to consult or advise).

Basic Thoughts

1. Solve problems and improve processes by going to the source and personally observing and verifying data rather than theorizing on the basis what other people or the computer screen tell you.
2. Think and speak based on personally verified data.
3. Even high-level managers and executives should go and see things for themselves, so they will have more than a superficial understanding of the situation.

Principle Thirteen

"If you've got a project that is supposed to be fully implemented in a year, it seems to me that the typical American company will spend about three months of planning, then they'll begin to implement. But they'll encounter all sorts of problems after implementation, and they'll spend the rest of the year correcting them. However, given the same year-long project, Toyota will spend nine to ten months planning, then implement in a small way-such as with pilot production-and be fully implemented at the end of the year, with virtually no remaining problems."

-Alex Warren, former senior vice president,
Toyota Motor Manufacturing, Kentucky

The Principle-Thorough consideration in decision making.

How you arrive at the decision is just as important as the quality of the decision.

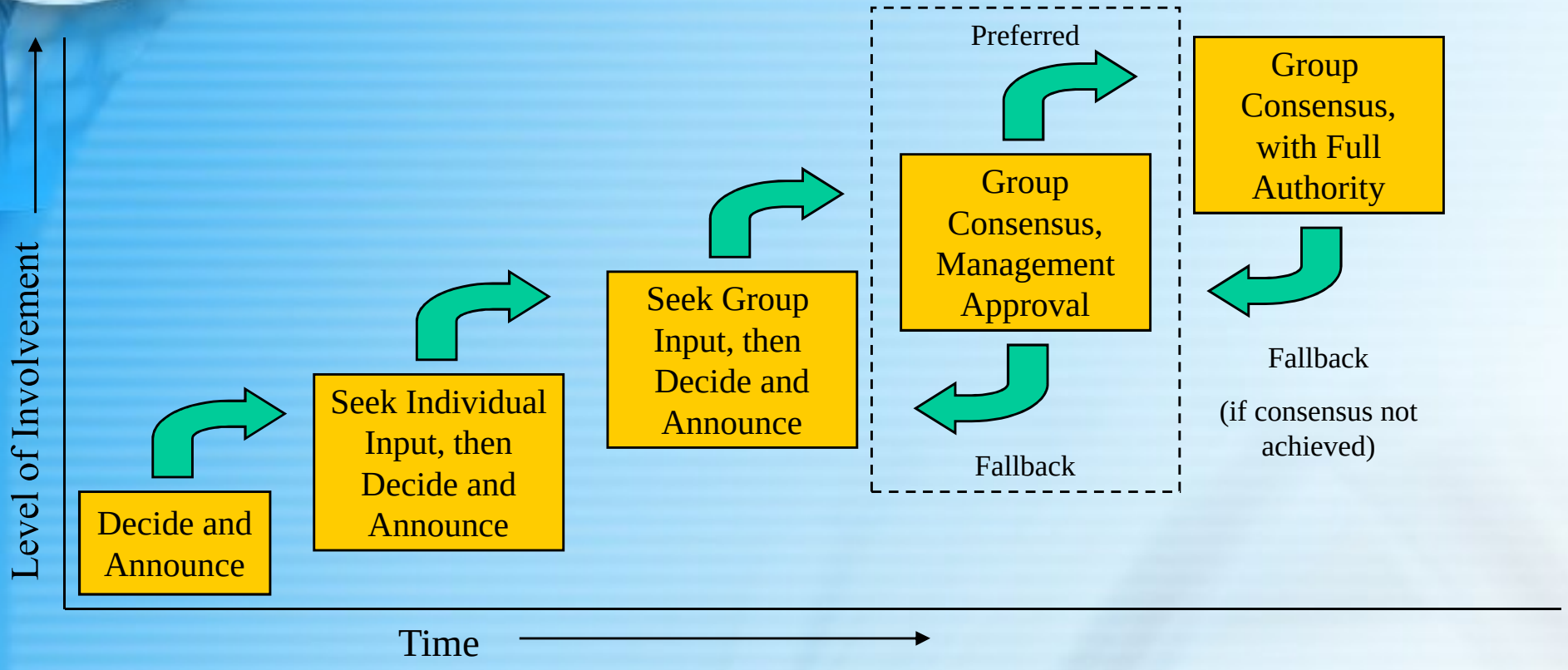
Make decisions slowly by consensus, thoroughly considering all options; implement rapidly (*nemawashi)*

Thorough consideration in decision making includes five major elements:

1. Finding out what is really going on, including *genchi genbutsu*.
2. Understanding underlying causes that explain surface appearances-asking “Why?” five times.
3. Broadly considering alternative solutions and developing a detailed rationale for the preferred solution.
4. Building consensus within the team, including Toyota employees and outside partners.
5. Using very efficient communications vehicle to do one through four, preferably one side of one sheet of paper (A3).

**Make decisions slowly by consensus, thoroughly considering all options; implement rapidly (*nemawashi)*

Toyota Decision Making Methods



- Decision making is highly situational
- Philosophy is to seek maximum involvement for each situation

Make decisions slowly by consensus, thoroughly considering all options; implement rapidly (*nemawashi)*

Communicate visually on one piece of paper to arrive at decisions using A3 format.

PDCA in the proposal process:

Grasp Situation	Title
	Background (Existing Value, Expectation, Policy, Goal, or Plan)
	Current Situation (Analysis of Need and Contributing Conditions)
Plan	Recommendations (Cost/Benefits)
Do	Implementation (Details of the Plan)
Check and Act	Follow Up (Expected Results-When/How They Will be Checked

Make decisions slowly by consensus, thoroughly considering all options; implement rapidly (*nemawashi)*

The benefits of using A3 as communication format for PDCA and run meeting:

1. Clear objectives prior to the meeting.
2. The right people at the meeting.
3. Prepared participants.
4. Effective use of visual aids.
5. Separate information sharing from problem solving.
6. The meeting starts and ends on time.

Make decisions slowly by consensus, thoroughly considering all options; implement rapidly (*nemawashi)*

By going through lengthy and thorough information gathering and analysis in decision making, what does Toyota achieve?

1. It uncovers all the facts that, if not considered, could lead to a great deal of pain and backtracking further down the road. Execution tends to be flawless by most standards.
2. It gets all the parties on board and supporting the decision so any resistance is worked out before implementing anything. The cost of addressing this resistance when implementation begins is likely to be many times the cost of addressing it in the planning stage.
3. It achieves a great deal of learning up front before anything is even planned or implemented.

Make decisions slowly by consensus, thoroughly considering all options; implement rapidly (*nemawashi)*

Basic Thoughts

1. Do not pick a single direction and go down that one path until you have thoroughly considered alternatives. When you have picked, move quickly but cautiously down the path.
2. *Nemawashi* is the process of discussing problems and potential solutions with all of those affected, to collect their ideas and get agreement on a path forward. This consensus process, though time-consuming, helps broaden the search for solutions, and once a decision is made, the stage is set for rapid implementation.

Principle Fourteen

"We view errors as opportunity for learning. Rather than blaming individuals, the organization takes corrective actions and distributes knowledge about each experience broadly. Learning is a continuous company-wide process as superiors motivate and train subordinates; as predecessors do the same for successors; and as team members at all levels share knowledge with one another."

-The Toyota Way document 2001, Toyota Motor Corporation

Become a learning organization through relentless reflection (*hansei*) and continuous improvement (*kaizen*)

A learning organization is *where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together*.

The Principle-Identify root causes and develop countermeasures.

Toyota is process oriented and consciously and deliberately invests long term in systems of people, technology, and processes that work together to achieve high customer value.

“Systems” are not information systems but work processes and appropriate procedures to accomplish a task with the minimum amount of time and effort.

The philosophy of Toyota and its experience support the belief that if it focuses on the process itself and continual improvement, it will achieve the financial results it desires.

Become a learning organization through relentless reflection (*hansei*) and continuous improvement (*kaizen*)

When you make processes stable and have a process to make waste and inefficiencies publicly visible, you have an opportunity to learn continually from your improvements.

To be a learning organization, it is necessary to have stability of personnel, slow promotion, and very careful succession system to protect the organizational knowledge base.

To “learn” means having the capacity to build on your past and move forward incrementally, rather than starting over and reinventing the wheel with new personnel with each new project.

Become a learning organization through relentless reflection (*hansei*) and continuous improvement (*kaizen*)

Ultimately, the core of *kaizen* and learning is an attitude and way of thinking by all leaders and associates—an attitude of self-reflection and even self-criticism, a burning desire to improve.

The greatest sign of strength is when an individual can openly address things that did not go right, take responsibility, and propose countermeasures to prevent these things from happening again.

Become a learning organization through relentless reflection (*hansei*) and continuous improvement (*kaizen*)

Getting to the root cause by asking “Why?” five times.

Most problems do not call for complex statistical analysis, but instead require painstaking, detailed problem solving. This requires a level of detailed thinking and analysis that is all too absent from most companies in day-to-day activity. It is a matter of discipline, attitude, and culture.

Become a learning organization through relentless reflection (*hansei*) and continuous improvement (*kaizen*)

Taiichi Ohno emphasized that true problem solving requires identifying “root cause” rather than “source;” the root cause lies hidden beyond the source.

Keep asking why until the root cause(s) are determined. Take countermeasures at the deepest level of cause that is feasible and at the level that will prevent reoccurrence of the problem.

"Practical Problem Solving" in Seven Steps

Practical problem solving requires you to clarify the problem or, in Toyota terminology "grasp the situation". Grasping the situation starts with observing the situation with an open mind and comparing the actual situation to standard.

To clarify the problem, we must start by going to where the problem is (*genchi genbutsu*). This may include prioritizing a number of different problems in Pareto analysis. At this point we also set targets for improvement.

The we make first attempt at identifying the point of cause (POC). The purpose is to generate and implement a countermeasure and evaluate the results. If the countermeasure is effective, it will become part of a new standardized approach.

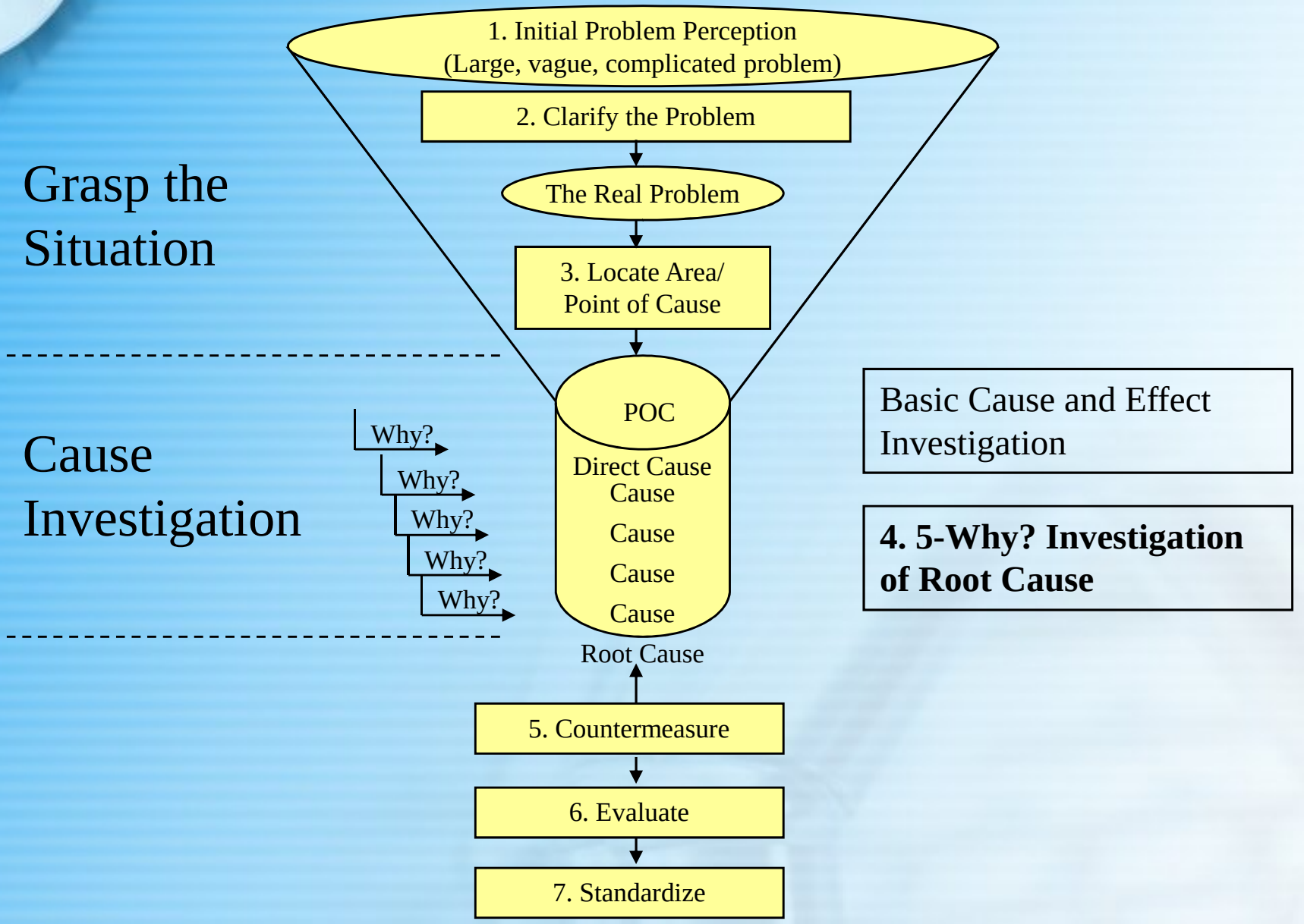
"Practical Problem Solving" in Seven Steps (cont'd)

The seventh step-standardizing the new process-is very important at Toyota. Standardization and learning go hand in hand and are the basis for continuous improvement. If we do not standardize the improved process, the learning up to that point falls into a black hole, lost, forgotten, and unavailable for further improvements.

Tools, techniques, and metrics aside, Toyota's greatest emphasis is on thinking through problems and solutions.

At Toyota, problem solving is 20% tools and 80% thinking.

"Practical Problem Solving" in Seven Steps (cont'd)

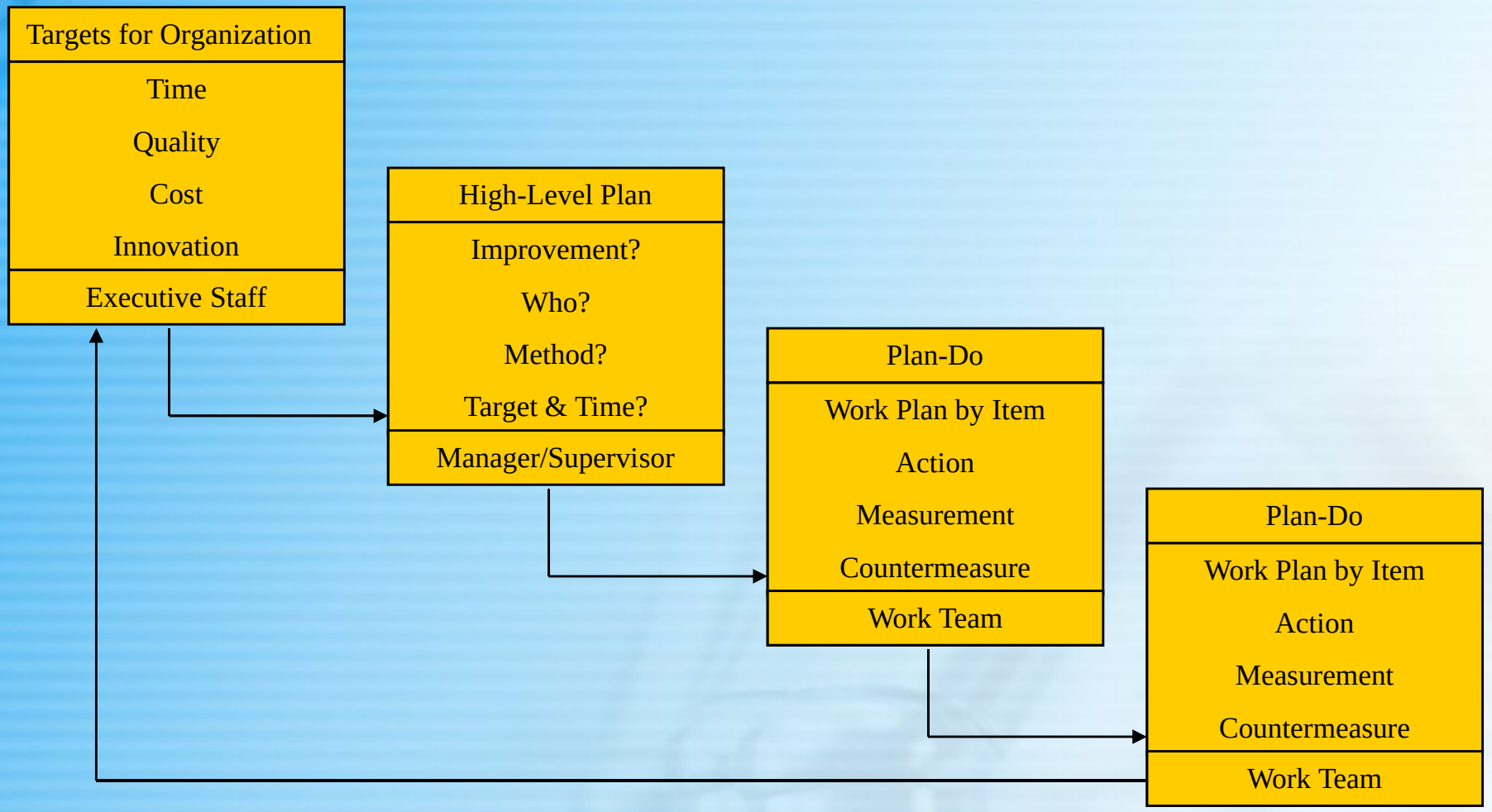


***Hansei*: Responsibility, Self-Reliance, and Organization Learning.**

Without *hansei* it is impossible to have *kaizen*. In Japanese *hansei*, when you do something wrong, at first you must feel really, really sad. Then you must create a future plan to solve that problem and you must sincerely believe you will never make this type of mistake again. *Hansei* is a mindset, an attitude. *Hansei* and *kaizen* go hand in hand.

Hansei is really much deeper than reflection. It is really being honest about our own weakness. If we are talking about only our strengths, we are bragging. If we are recognizing our weakness with sincerity, it is a high level of strength. But it doesn't end there. How do we change to overcome those weakness? That is at the root of every notion of *kaizen*. If we do not understand *hansei*, than *kaizen* is just continuous improvement. *Hansei* is the incubator for change-the whole process.

Hoshin Kanri-Directing and Motivating Organizational Learning



Policy Deployment Process (*hoshin kanri*)

Basic Thoughts

1. Once you have established a stable process, use continuous improvement tools to determine the root cause of inefficiencies and apply effective countermeasures.
2. Design processes that require almost no inventory. This will make wasted time and resources visible for all to see. Once waste is exposed, have employees use a continuous improvement process (*kaizen*) to eliminate it.
3. Protect the organizational knowledge base by developing stable personnel, slow promotion, and very careful succession systems.
4. Use *hansei* (reflection) at key milestones and after you finish a project to openly identify all the shortcomings of the project. Develop countermeasures to avoid the same mistakes again.
5. Learn by standardizing the best practices, rather than reinventing the wheel with each new project and each new manager.

Part Three

III

Applying the Toyota Way in Your Organization

A

Using the Toyota Way to Transform Technical and Service Organizations

"Applying the Toyota Production System outside the shop floor can be done, but this takes some creativity. Certainly, the basic principles can be applied to administrative processes. We sent some associates from our *kaizen* promotion office to dealers to help them. They have been able to reduce the time it takes to inspect the vehicle and do routine repairs, like changing parts or changing oil, in some cases from 60 minutes to 10 minutes. This is very good for us and makes our customers very happy. There are many more opportunities that we need to work on using our creativity."

-Fujio Cho, president of Toyota Motor Corporation

A

Five steps to creating flow in technical and service organizations:

1. Identify who the customer is for the processes and the added value they want delivered.
2. Separate out the repetitive processes from the unique, one-of-a-kind processes and learn how you can apply TPS to the repetitive processes.
3. Map the flow to determine value added and non-value added.
4. Think creatively about applying the broad principles of the Toyota Way to these processes using a future state value-stream map.
5. Start doing it and learn by doing using a PDCA cycle and then expand it to the less repetitive processes.

A

Developing and Implementing Value Stream Maps Through *Kaizen* Workshops

Phase One: Preparation for the Workshop

1. Clearly define the scope.
2. Set objectives
3. Create preliminary current state map
4. Collect all relevant documents
5. Post a preliminary current state map in the team room

Developing and Implementing Value Stream Maps Through *Kaizen* Workshops (cont'd)

A

Phase Two: The *Kaizen* Workshop

1. Who is the customer?
   - Scope of business process
   - What is the value add to customer?
   - Measurable objectives
2. Analyze current state
   - Process steps
   - Process flow
   - Identify value add and non-value add

Developing and Implementing Value Stream Maps Through *Kaizen* Workshops (cont'd)

A

Phase Two: The *Kaizen* Workshop

3. Develop future state vision
   - Eliminate non-value add
   - Challenge NVA-required
   - Question VA Why?why?why?
   - Creative leap
   - Kaizen burst
4. Implementation plan
   - What?when?who?
   - Training and communication plan

Developing and Implementing Value Stream Maps Through *Kaizen* Workshops (cont'd)

A

Phase Two: The *Kaizen* Workshop

5. Do it!
   - Begin during workshop week
   - Continue after workshop
   - Make necessary reorganizations around value streams
6. Evaluate measuring performance
   - Establish process metrics
   - Visually track progress
   - Continuous improvement

Developing and Implementing Value Stream Maps Through *Kaizen* Workshops (cont'd)

A

Phase Three: After the Workshop-Sustaining and Continuous Improvement

1. Review the status of the open action items from the project plan.
2. Review process metric to ensure improvement are being achieved.
3. Discuss additional opportunities for improvements.
4. Continue to improve the process.

Build Your Own Lean Learning Enterprise, Borrowing from the Toyota Way

B

"One man did his part, and the other his, and neither even had to check to make sure both parts were getting done. Like the dance of atoms Alvin had imagined in his mind. He never realized it before, but people could be like those atoms, too. Most of the time people were all disorganized, nobody knowing who anybody else was, nobody holding still long enough to trust or to be trusted, just like Alvin imagined atoms might have been before God taught them who they were and gave them work to do…It was a miracle seeing how smooth they knew each other's next move before the move was even begun. Alvin most laughed out loud in the joy of seeing such a thing, knowing it was possible, dreaming of what it might mean—thousands of people knowing each other that well, moving to fit each other just right, working together. Who could stand in the way of such people."

-Orson Scott Card,

Prentice Alvin: The Tales of Alvin Maker, Book Three

B

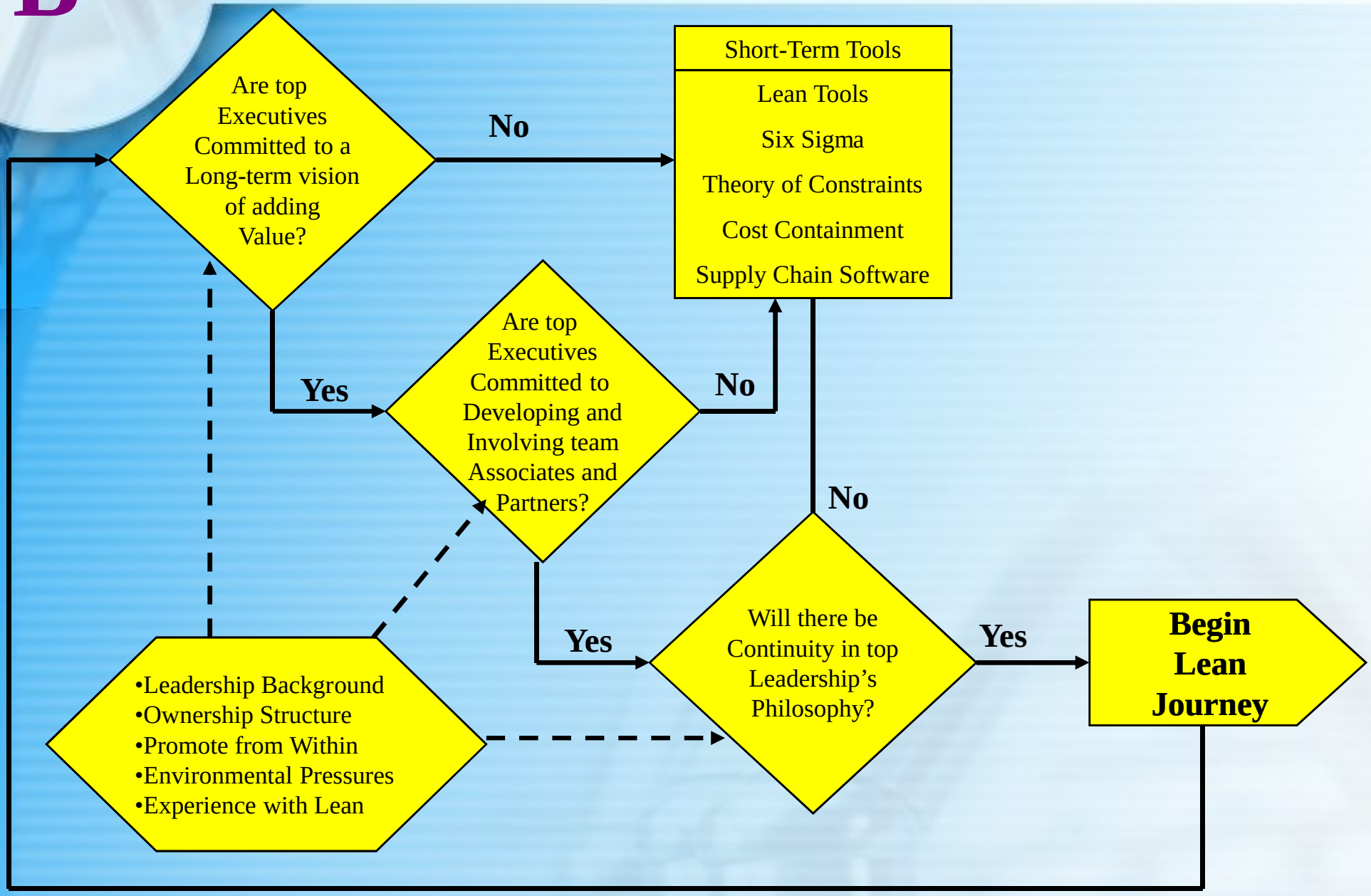
A Commitment from the Top to Build a Total Culture from the Ground Up

What do we know about changing a culture?

1. Start from the top-this may require an executive leadership shakeup.
2. Involve from the bottom up.
3. Use middle managers as change agents.
4. It takes time to develop people who really understand and live the philosophy.
5. On a scale of difficulty, it is ‘extremely” difficult.

Top Leadership's "Commitment to Lean" Journey

B



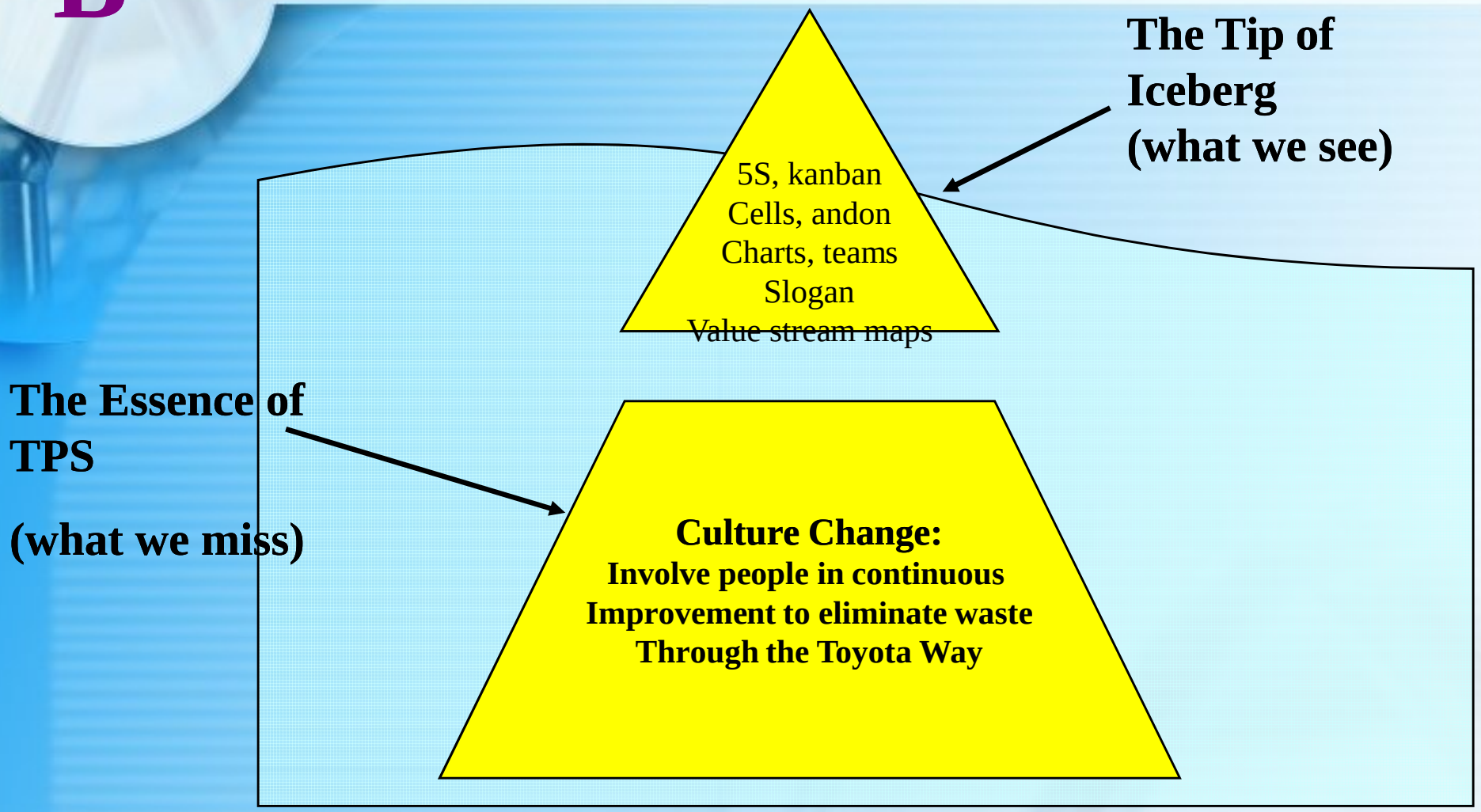
B

Myth versus Reality of TPS

Myth What TPS Is Not	Reality What TPS Is
• A tangible recipe for success • A management project or program • A set of tools for implementation • A system for production floor only • Implement-able in a short-or mid- term period	• A consistent way of thinking • A total management philosophy • Focus on total customer satisfaction • An environment of teamwork and improvement • A never-ending search for a better way • Quality built in process • Organized, disciplined workplace • Evolutionary

Why Changing Culture Is So Difficult

B



Iceberg Model of TPS

Description of The Toyota Way Culture

B

1. The Toyota Way has a depth that goes to the level of basic assumptions of the most effective way to “perceive, think, and feel” in relation to problems. Things like *genchi genbutsu*, recognizing waste, thorough consideration in decision making, and the focus of Toyota on long-term survival are the DNA of Toyota.
2. The Toyota Way was “invented, discovered, and developed” over decades as talented Toyota managers and engineers, like Ohno, “learned to cope with its (Toyota’s) problems of external adaptation and internal integration.”
3. The Toyota Way is explicitly “taught to new members.” The Toyota Way is explicitly taught the way we should transmit culture-through action in day-to-day work where leaders model the way.

B

13 Tips to Transitioning a Company to a Lean Enterprise

1. Start with action in the technical system; follow quickly with cultural change. Mostly a lean transformation focus on the "process layer" of the 4P model, as the technical systems of lean drive the Toyota Way behaviors. Even though, the social and technical systems of TPS are intertwined; if the company wants to change the culture, it must also develop true lean leaders who can reinforce and lead the cultural change. The best way a company can develop this is through action to improve the company's core value streams, supported by committed leaders who reinforce culture change. Leaders must be involved in the value stream mapping and shop floor transformation so they can learn to see waste.

B

13 Tips to Transitioning a Company to a Lean Enterprise

2. Learn by doing first and training second. The Toyota Way is about learning by doing. At the early stages of lean transformation there should be at least 80% doing and 20% training and informing. The best training is training followed by immediately doing or doing followed by immediately training. The Toyota approach to training is to put people in difficult situations and let them solve their way out of the problems.
3. Start with value stream pilots to demonstrate lean as a system and provide a “go see” model. The go-and-see model line should become a singularly focused project with a great deal of management attention and resources to make it a success and an object lesson in management commitment.

B

13 Tips to Transitioning a Company to a Lean Enterprise

4. Use value stream mapping to develop future state visions and help "learn to see." Value stream mapping should be applied only to specific product families that will be immediately transformed.
5. Use *kaizen* workshop to teach and make rapid changes. The *kaizen* workshop is a remarkable social invention that frees up a cross functional team to make changes in a week that otherwise can drag on for months. Selecting the right people for the team is critical, as is setting aside the time for those individuals and giving them a lot of management support.
6. Organize around value streams. Choose someone with real leadership skills and a deep understanding of the product and process must be responsible for the process of creating value for customers and must be accountable to the customer.

13 Tips to Transitioning a Company to a Lean Enterprise

B

7. Make it mandatory. If a company looks at lean transformation as a nice thing to do in any spare time or as voluntary, it will simply not happen.
8. A crisis may prompt a lean movement, but may not be necessary to turn the company around. A sinking ship certainly mobilizes management and the workforce into serious about lean. What is important is that leadership is focused on long-term learning.
9. Be opportunistic in identifying opportunities for big financial impacts. By picking the right product family and with experienced lean expertise, a serious effort has about a 100% chance of making huge and visible improvements that will impress any executive.

B

13 Tips to Transitioning a Company to a Lean Enterprise

10. Realign metrics with a value stream perspective. "You get what you measure" has become a truism in most companies. Metrics are key tools for continuous improvement. First step is eliminate non-lean metrics that are wreaking havoc with those seriously invested in improving operational excellence. The next step is to measure a variety of value stream metrics from lead time to inventory levels to first-pass quality and treat these metrics as seriously as labor productivity and other short-term cost metrics.
11. Build on your company's roots to develop your own way. When Toyota works with companies to teach TPS, they insist that the companies develop their own system. Put them into our own language in a way that fits their business and technical context.

13 Tips to Transitioning a Company to a Lean Enterprise

B

12. Hire or develop lean leaders and develop a succession system. Leaders must thoroughly understand, believe in, and live the company's "way." All leaders must understand the work in detail and know how to involve people. If the top is not driving the transformation, it will not happen.
13. Use experts for teaching and getting quick results. A company needs a *sensei* to provide technical assistance and change management advice when it is trying something for the first time. This "teacher" will help facilitate the transformation, get quick results, and keep the momentum building. But a good teacher will not do it all for you. To develop a lean learning enterprise we need to build internal expertise-senior executives , improvement experts, and group leaders who believe in the philosophy and will spread lean throughout the organization over time.

Closing

"The Toyota Way matches everything that they (team members) do every hour of the day. So they are swimming in this culture and this philosophy. We're always doing *kaizen* projects. It's a part of who we are."

-Jane Baseda, GM and VP North American Parts Operations

Lean is…

“A long journey that needs commitment, patience, long-term thinking, positive mindset and attitude, and continuous improvement which are merged together as operational excellence and as a strategic weapon.”

Let’s start the journey and good luck!