Kata

Toyota Kata Methodology for Continuous Improvement
Industrial Solutions - ISI

- Colin Reed, Owner
- Consulting firm, based out of Tulsa, OK
- Established in 1997
- Full service lean manufacturing and management consulting firm
- Served hundreds of companies
- www.isiworld.net
Agenda

• Background
• Definitions, theory & purpose
• Kata program – what it looks like
• Wrap up
Lean Building Blocks

Culture of Continuous Improvement

- Pull/Kanban
- Cellular/Flow
- TPM
- POUS
- Quality at Source
- Quick Changeover
- Standardized Work
- Batch Reduction
- Teams
- Visual
- 5S System
- Plant Layout
- Value Stream Mapping
Lean Building Blocks

Culture of
Continuous Improvement

- Pull/Kanban
- Cellular/Flow
- TPM
- POUS
- Quality at Source
- Quick Changeover
- Standardized Work
- Batch Reduction
- Teams
- Visual
- 5S System
- Plant Layout

Value Stream Mapping

Industrial Solutions - ISI
Background

• Traditional reporting styles & relationships
• Traditional management roles
Industrial Solutions - ISI
Background

- Traditional reporting styles & relationships
- Traditional management roles
- Traditional training and development
• What habits does the training break?
• How long does the effect of the class last?
• What culture change has come of it?
• What has TRULY been learned?
Background

- Traditional reporting styles & relationships
- Traditional management roles
- Traditional training and development
- Traditional project management
- Projects come and go
Flavor of the Month
May

Sandwich Cream Cookies in Chocolate Ice cream

Ice Cream Flavor of the month
Background

- Traditional reporting styles & relationships
- Traditional management roles
- Traditional training and development
- Traditional project management
- Projects come and go
- Benchmarking others
Results of Benchmarking
Purpose for Kata

- Develops people
- Reveals people’s true potential
- Coach/Learner role is for guidance
- Forces us to truly understand the current condition
- Gets all involved out of their comfort zone, where we are truly learning
Kata vs. Kaizen Event

• A Kaizen Event is one in which a team of people work towards a specific objective over a compressed period of time
Kata vs. Kaizen Event

• A Kaizen Event is one in which a team of people work towards a specific objective over a compressed period of time

• Kata is daily, built into fabric of management’s daily standard work
Why progress is not consistent

KE 1
What Standard should be
Work Standard

KE 2
What Standard should be
What actually becomes the Standard when people do not sustain the changes?

KE 3
Kata vs. Kaizen Event
Kata vs. Kaizen Event

Vision

KE 1

Work Standard

KE 2

What Standard should be

KE 3

What Standard should be

TC

Standards

Time
Agenda

- Background
- **Definitions, theory & purpose**
- Kata program – what it looks like
- Wrap up
Definitions

- Vision
- Challenge
- Target Condition
- PDCA – Plan/Do/Check/Act
- Learner, Coach, 2nd Coach
Vision

- Where is the company going?
- What does it want to be, to pursue?
- Long term: beyond 2, 5, 10, 20, 50+ years?
Vision
Vision

Toyota’s Vision*
• Zero Defects
• 100% value added
• One-piece flow, in sequence, on demand
• Security for people

*p. 44 Toyota Kata, by Mike Rother
Vision
Vision
Definitions

- Vision
- **Challenge**
- Target Condition
Challenge

• A near term, obtainable goal that is a step towards the future state or vision
Definitions

- Vision
- Challenge
- Target Condition
Target Condition

- A near term, obtainable goal that is a step towards the current Challenge
Target Condition

Examples:
- Balance the cycle times in a work cell
- Establish flow, FIFO and SWIP between work centers for XYZ part family
- Eliminate changeovers where we have 3 fixtures currently
Definitions

- Vision
- Challenge
- Target Condition
- PDCA – Plan/Do/Check/Act
PDCA
Plan-Do-Check-Act/Adjust is a rephrasing of the Scientific Method:

- **Plan** - “Hypothesis”
- **Do** - “Experiment”
- **Check** - “Compare to hypothesis”
- **Act/Adjust** - “Reformulate the hypothesis”

The PDCA Cycle
Definitions

- Vision
- Challenge
- Target Condition
- PDCA – Plan/Do/Check/Act
- 3 Main Roles in Kata:
  - Learner
  - Coach
  - 2nd Coach
3 Main Roles in Kata

Learner, Coach, 2\(^{nd}\) Coach

• Develops mentoring structure with a one-on-one relationship
• Usually based on reporting chain
• Sequence starts with front line process, continues up to top levels
3 Main Roles in Kata

Learner/Coach sequence starts with front line process, continues up to top levels
3 Main Roles in Kata

**Learner**: owner of the process to target
- Conducts the PDCA cycles to experiment on a process to work towards a Target Condition
- Develops new PCDA after examining the cause and effect of the previous experiment
3 Main Roles in Kata

Learner:

- Should be encouraged to try ideas, pushed/challenged to innovate
- It’s okay to fail & have an idea not work – actually expected to occasionally, otherwise not pushing the envelope hard enough
3 Main Roles in Kata

**Coach**: mentor that directs & guides the Learner
3 Main Roles in Kata

**Coach**: mentor that directs & guides the Learner

- Questions the Leaner’s understanding of the current and target conditions, ensures the next step takes those into account
3 Main Roles in Kata

**Coach**: mentor that directs & guides the Learner
3 Main Roles in Kata

Coach:
• Reviews the cause and effect of the Learner’s approach and the gains made towards the Target Condition
3 Main Roles in Kata

Coach:
- Is practicing Coaching, learning how to do it
- Must change how they see their relationship with the Learner
3 Main Roles in Kata

Coach:

- Needs guidance as well: the 2\textsuperscript{nd} Coach
3 Main Roles in Kata

2nd Coach: observes, directs & guides the Coach to be more effective

- Reviews the cause and effect of the Coach’s approach and the Learner’s continued development
- Provides instruction to Coach
- Role may diminish over time, but isn’t eliminated
3 Main Roles in Kata

Key points:

• The role of Learner is the one performing the hands-on experiment, seeing and interpreting the results

• The coach asks questions, doesn’t solve the problem, lets the Learner learn
Management’s Role

• Expectations
• Must be ready to Walk the Walk
• Setting Vision
  • Give goal – no solutions or pre-judgments of how
Agenda

• Background
• Definitions, theory & purpose, roles
• Kata program – what it looks like
• Wrap up
Program Development

- Set the Vision
- Develop the Advance Group
- Establish the program structure
- Learn the Kata Coaching methods
- Set Target Conditions
Program Development Sequence

Set the Vision

- Long term goals – to shoot for, “True North”
  - Ex.: Toyota: to achieve 100% Value Added
- Can be an unattainable goal, can be hard numbers
- Gives a horizon to head towards
Program Sequence

• Set the Vision
• Develop the Advance Group
Program Sequence

Develop the Advance Group

- Update the Org. Chart
- Top and middle management must participate
- Will depend on the companies ability to properly coach all Learners
Program Sequence

• Set the Vision
• Develop the Advance Group
• Establish the program structure
• Learn the Kata Coaching methods
• Set Target Conditions
Program Sequence

• Set the Vision
• Develop the Advance Group
• Establish the program structure
  • Learn the Kata Coaching methods
    • Learn by doing
    • Use the program development as first kata
Program Sequence

- Set the Vision
- Develop the Advance Group
- Establish the program structure
- Learn the Kata Coaching methods
- Set initial Target Conditions
Program Sequence

Target Condition:

- Value Stream / Strategic Plan a good place to first start
- Start with something attainable in 2-3 weeks, progress to greater challenges from there
Daily Kata

- Is performed daily
- Is designed to be a slice of the Learner’s day
- Coaching sessions are sacred & take priority
Learner Story Board

<table>
<thead>
<tr>
<th>Process</th>
<th>Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Condition</td>
<td>PDCA Data</td>
</tr>
<tr>
<td><strong>Metrics</strong></td>
<td></td>
</tr>
<tr>
<td>Current Condition</td>
<td>Obstacles</td>
</tr>
<tr>
<td><strong>Metrics</strong></td>
<td></td>
</tr>
</tbody>
</table>
# Cell Standard Work Breakdown

<table>
<thead>
<tr>
<th>Step</th>
<th>Operator</th>
<th>Task</th>
<th>WIP (max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>Get paperwork, alert QC to next order</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Move boxes into place</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Upper Assembly</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Lower Assembly</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>Cage Assembly</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>Bottom Brace Assembly</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>Chain Assembly</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>2, 3</td>
<td>Lower Assy</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>2, 3</td>
<td>Upper Assy</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>2, 3</td>
<td>Final Assy</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>Band parts to pallet</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>Wrap skid (Op 2 Assist), take to Shipping</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>Remove empty boxes</td>
<td>-</td>
</tr>
</tbody>
</table>
## Cell Standard Work Breakdown

<table>
<thead>
<tr>
<th>Step</th>
<th>Operator</th>
<th>Task</th>
<th>WIP (max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Get paperwork, alert QC to next order</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Move boxes into place</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Upper Assembly</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Lower Assembly</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>Cage Assembly</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>Bottom Brace Assembly</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>Chain Assembly</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>2, 3</td>
<td>Lower Assy</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>2, 3</td>
<td>Upper Assy</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>2, 3</td>
<td>Final Assy</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>Band parts to pallet</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>Wrap skid (Op 2 Assist), take to Shipping</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>Remove empty boxes</td>
<td>-</td>
</tr>
</tbody>
</table>

### Operators Summary

<table>
<thead>
<tr>
<th>Operators</th>
<th>Cycle Time</th>
<th>Takt Time</th>
<th>Std WIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>13 min</td>
<td>15 min</td>
<td>10 sub-assy max</td>
</tr>
</tbody>
</table>

*Inserts*  
*Pallet*  

1. *Get paperwork, alert QC to next order*  
2. *Move boxes into place*  
3. *Upper Assembly*  
4. *Lower Assembly*  
5. *Cage Assembly*  
6. *Bottom Brace Assembly*  
7. *Chain Assembly*  
8. *Lower Assy*  
9. *Upper Assy*  
10. *Final Assy*  
11. *Band parts to pallet*  
12. *Wrap skid (Op 2 Assist), take to Shipping*  
13. *Remove empty boxes*
## PDCA Cycle Record

<table>
<thead>
<tr>
<th>Action</th>
<th>Prediction</th>
<th>Results</th>
<th>Lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coaching</td>
<td>2nd</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## PDCA Cycle Record

<table>
<thead>
<tr>
<th>Action</th>
<th>Prediction</th>
<th>Results</th>
<th>Lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Step</td>
<td>Do I clearly understand what action I should take to improve, am I addressing an obstacle?</td>
<td>How do I think this will help us improve?</td>
<td></td>
</tr>
<tr>
<td>Am I truly experimenting?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Prediction</td>
<td>Results</td>
<td>Lessons</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Have Op. 1 perform Step 1</td>
<td>Will give Op. 3 additional 30 seconds to band pallet.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Coaching Session

The Five Questions

1) What is the Target Condition?

2) What is the Actual Condition now?

----------(Turn Card Over)------------------->

3) What Obstacles do you think are preventing you from reaching the target condition?
   Which *one* are you addressing now?

4) What is your Next Step? (next PDCA / experiment) What do you expect?

5) When can we go and see what we Have Learned from taking that step?

*You'll often work on the same obstacle for several PDCA cycles

p. 247, Toyota Kata, by Mike Rother
Coaching Session

Reflect on the Last Step Taken
Because you don’t actually know what the result of a step will be!

1) What was your Last Step?
2) What did you Expect?
3) What Actually Happened?
4) What did you Learn?

------------------------->
Return

Info part of last Coaching Session.
Info hasn’t been covered yet.

p. 247, Toyota Kata, by Mike Rother
The Five Questions

1) What is the Target Condition?
2) What is the Actual Condition now?
   
   ------ (Turn Card Over) -------------->

3) What Obstacles do you think are preventing you from reaching the target condition?
   Which *one* are you addressing now?

4) What is your Next Step? (next PDCA / experiment) What do you expect?

5) When can we go and see what we Have Learned from taking that step?

*You'll often work on the same obstacle for several PDCA cycles

p. 247, *Toyota Kata*, by Mike Rother
Obstacles
<table>
<thead>
<tr>
<th>Process</th>
<th>Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Condition</td>
<td>PDCA Data</td>
</tr>
<tr>
<td>Current Condition</td>
<td>Obstacles</td>
</tr>
</tbody>
</table>

Currently known
The Five Questions

1) What is the Target Condition?
2) What is the Actual Condition now?

------------(Turn Card Over)-------------->

3) What Obstacles do you think are preventing you from reaching the target condition?
   Which *one* are you addressing now?

4) What is your Next Step? (next PDCA / experiment) What do you expect?

5) When can we go and see what we Have Learned from taking that step?

*You'll often work on the same obstacle for several PDCA cycles

p. 247, *Toyota Kata*, by Mike Rother
# PDCA Cycle Record

<table>
<thead>
<tr>
<th>Action</th>
<th>Prediction</th>
<th>Results</th>
<th>Lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Reflect on the data collected.</td>
<td>Did we find or solve obstacles?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Confirms existing knowledge.</td>
<td>or refutes our knowledge.</td>
</tr>
</tbody>
</table>

2nd Step
<table>
<thead>
<tr>
<th>Action</th>
<th>Prediction</th>
<th>Results</th>
<th>Lessons</th>
</tr>
</thead>
</table>
| Have Op. 1 perform Step 1 instead of Op. 3. | Will give Op. 3 additional 30 seconds to band pallet. | Op. 1 was able to do it in the cycle time, but still NVA to walk to QC every time. | - Need better alert method  
- Train Operators on self inspect of hardness tests, 1/3 of orders |
Agenda

- Background
- Definitions, theory & purpose
- Kata program – what it looks like
- **Wrap up**
Take Away’s

• Not just a new project – A total change of management and their style, of the entire organization
• Not just for shop, should be applied in all areas
Take Away’s

- Make part of **DAILY** activities
- Does not get low priority
- Must be a Learner before being a Coach
Success Factors for Kata

- Physical
- Training
- Mental
Success Factors for Kata

Physical:

- Have lean tools have been used to improve on a team basis?
- Do we have work standards established?
- Have we started to flow material?
Success Factors for Kata

Training:

• Does the Learner understand waste elimination, problem solving & the Lean Tools to overcome issues?

• Does the management team understand improvement well enough to effectively create Challenges & Target Conditions?
Success Factors for Kata

Training:
- Is standard work being followed
- 5S, Work Instructions, SWIP, Set-Up Checklists, TWI, TPM, etc.
Success Factors for Kata

Mental:
• Do employees feel empowered?
• Has a culture change started to take place?
• Are there consequences for inaction?
Success Factors for Kata

Mental:

• Does the Management have self-discipline themselves?
• Is the management team ready to live the new lifestyle?
• Is Management ready to hold accountable those that don’t participate?
Success Factors for Kata

Mental: is the management...

• Willing to re-learn how to manage?
• Willing to feel out of your element?
• Willing to let someone fail to learn?
• Willing to not give the answer?
• Willing to (seemingly) give up some control?
Thank you!

WWW.ISIWORLD.NET

Industrial Solutions - ISI