

CONTROL PLANS

Define

1. Identify CTQ

2. Develop PAF

3. Visualize the Process

Purpose: To identify and prioritize the business improvement opportunity, define critical customer requirements, document the processes and build effective teams

Deliverables:

Project Approval Form; Project Team – TRAIL; CT Flow Down (CTs); SIPOC; Process map (current process); Project benefits; Project plan major milestones; Data Collection Plan; Data Integrity Audit (if applicable)

Measure

4. Understand Metrics

5. Validate measurement System

6. Determine Process Performance

Purpose: To determine what to measure, manage the measurement data collection, develop and validate measurement systems and determine process performance

Deliverables:

TRAIL Chart – updated; Detailed Process Map; Cause & Effect Matrix; FMEA; Decision Tree; Operational Definitions; MSA Evaluation; Data Collection Plan; Capability Study with Control Charts; Project Status

Analyze

7. ID potential Sources of Variation

8. Characterize the X's

9. Determine Significant X's

Purpose: To determine the root causes, estimate population parameters with confidence intervals and to construct hypothesis about the data and test them to determine significance.

Deliverables:

Data Collection Plan- updated; Hypothesis Testing; Decision Tree; MSA Analysis; Capability Analysis- updated; Executive Summary- updated; TRAIL- updated; Analysis Summary; Control Charts- updated

Improve

10. Establish level for X's

11. Develop Solutions

12. Pilot and Implement

Purpose: To develop and quantify potential solutions, improve/optimize the process, evaluate and select final solution and implement the pilot.

Deliverables:

DOE; Lean Analysis; Simulation; Optimal settings for X's; Executive Summary- updated; TRAIL- updated; Implementation plan; Control Charts- updated; Capability Analysis- updated

Control

13. Evaluate Process Performance

14. Develop Control Plan

15. Transition to Project Owner

Purpose: Implement final solution, maintain process improvements, ensure new process problems are identified & quickly corrected, disseminate lessons learned. Identify areas for replication & standardization.

Deliverables:

Control Plan; Transition Plan; Capability Analysis- updated; Executive Summary- updated; TRAIL- updated; Control Charts- updated

DMAIC Flow

- Control:
 - Evaluate Process Performance
 - Develop Control Plan
 - Transition to Process Owner

Control

13. Evaluate
Process
Performance

14. Develop
Control Plan

15. Transition
to Project
Owner

Control

- Control Purpose: Implement final solution, maintain process improvements, ensure new process problems are identified and quickly corrected, disseminate lessons learned. Identify areas for replication and standardization..



Control Deliverables

- Control Plan
- Transition Plan
- Updated Capability Analysis
- Updated Control Charts

Objectives

- Discuss the purpose of the Control phase
- Review elements of:
 - Control plans
 - Reaction plans
 - Implementation plans
 - Transition Communication and Training plans
- Introduce common pitfalls encountered in the Control phase

Transition through A-I²-C

- In Analyze, you try to identify the critical X's
- In Improve, you optimize the settings for those X's
- In Control, you identify how to lock those X's at the desired settings and how to know if they vary from those settings
- Control is about holding the gains

Control Plans - Why?

- Control plans exist to ensure the process *consistently* meets customer requirements
- They should provide *predictive* information, so adjustments can be made before defects

Formal control plans are one of the major differences between Six Sigma and other previous quality initiatives.

Example - In Control

This represents a well functioning process!



Example - Out of Control

This does not!



Control Plan Elements

- *Who* is going to be keeping the process functioning properly?
- *When* are they going to do the monitoring of the input variables?
- *How* are they going to monitor the input variables?



Control Plan Elements

- *When* will the plan be updated?
- *Where* will the monitoring be conducted?
- *Where* should the plan reside?
- *What* will be done if the monitoring detects a condition outside of the customer's specifications?

Control Plan - FMEA

| FAILURE MODE & EFFECTS ANALYSIS (FMEA) | | Date: 1/1/2000 | | |
|--|--|--|---|---------------------------------------|
| Process Name: Left Front Seat Belt Install | | Revision: 1.3 | | |
| Process Number: SBT 445 | | | | |
| Failure Mode | A) Severity Rate 1-10 10 = Most Severe | B) Probability of Occurance Rate 1-10 10 = Highest Probability | C) Probability of Detection Rate 1 - 10 10 = Lowest Probability | Risk Preference Number (RPN) AxBxC |
| 1) Select Wrong Color Seat Belt | 5 | 4 | 3 | 60 |
| 2) Seat Belt Bolt Not Fully Tightened | 9 | 2 | 8 | 144 |
| 3) Trim Cover Clip Misaligned | 2 | 3 | 4 | 24 |

- Review the RPN's for the key factors
 - Look at the severity, frequency of occurrence or detectability of each factor
- If the factors identified in the FMEA have an impact on your process, use the control plan to specify the details of the monitoring

Control Plan - Process Mapping

- In *Define*, a simple form of process mapping, typically SIPOC, is used to identify key input and output variables
- In *Control*, detailed process mapping will be used to record the improved process
 - Process mapping clearly shows the sequence of events, handoffs and the job descriptions of people performing all tasks

Control Plan - Simplified

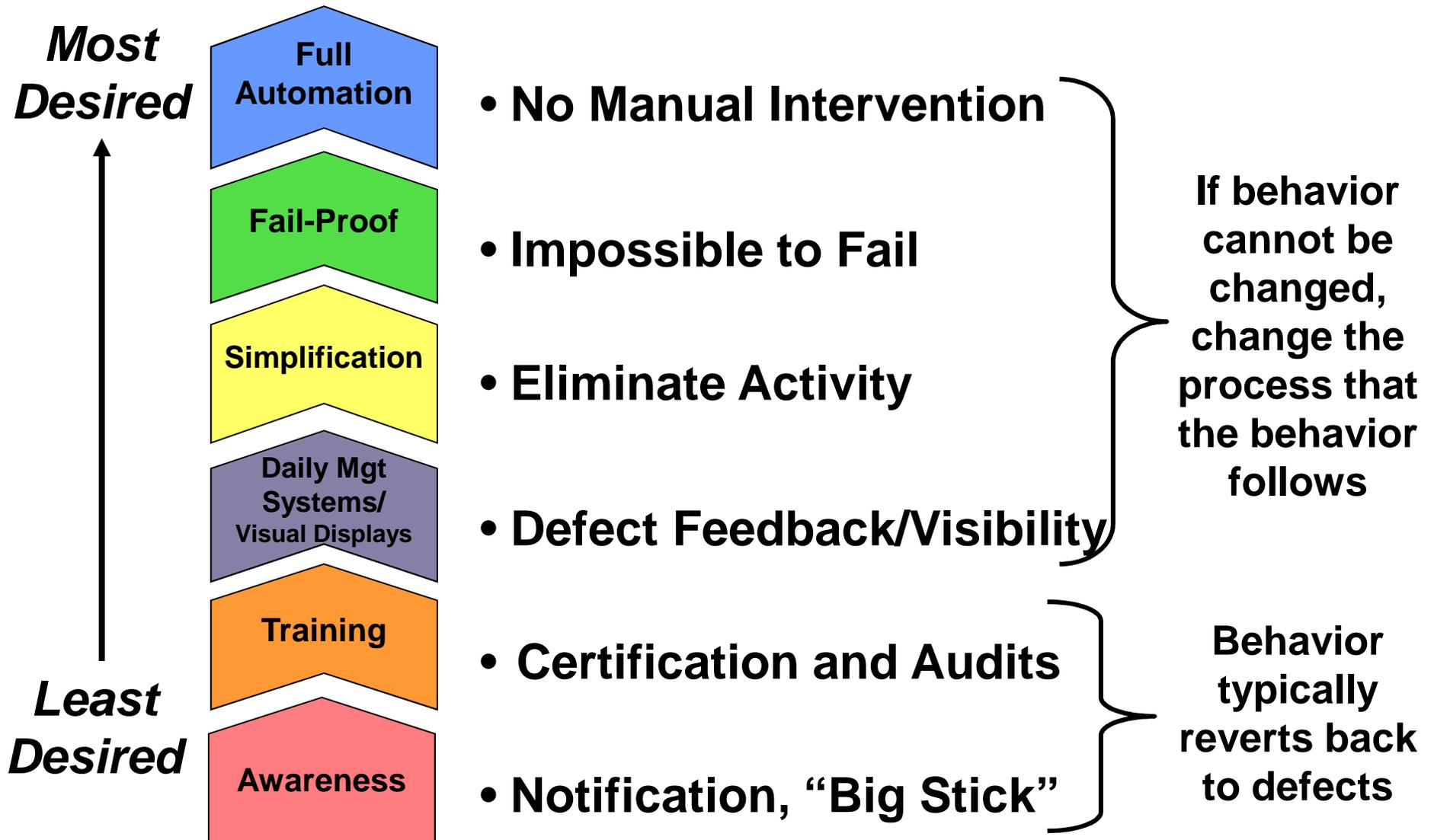
| | What | Who | When | Where |
|----------------|-------------|------------|-------------|--------------|
| Measure | | | | |
| Monitor | | | | |
| React | | | | |
| Revise | | | | |

Control Plan - Simplified

| | What | Who | When | Where |
|----------------|-----------------|--------------------------|------------------|-------------------|
| Measure | Money Collected | Denise | Every Month | SharePoint Site |
| Monitor | Money Collected | Bill Owen | Every Six Months | Email from Denise |
| React | Money Collected | Bill Owen | Every Six Months | Memo |
| Revise | Money Collected | AOS and Attorney General | Once a Year | Meetings |

Control Method

So you don't have to "fix" this again!



Common Red Flag Conditions

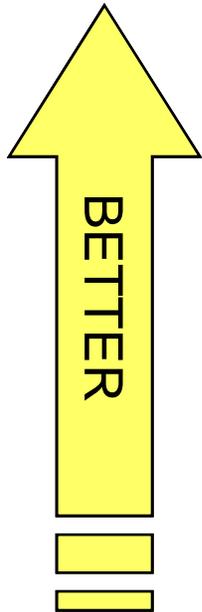
- Adjustments
- Constant equipment changes
- Lots of critical measurements
- Many parts / mixed parts / multiple transactions types
- Multiple steps
- No (or ineffective) standards
- Rapid repetition
- High volume
- Environmental conditions
 - Material / process handling
 - Housekeeping
 - Foreign matter
 - Poor lighting
 - Noise
 - Distractions
 - Rain / snow
 - Cold / Hot

Reaction Plan

- What will be done if one of the variables is out of control or out of specification
- Actions should be the responsibility of people closest to the process
- The reaction plan can simply refer to an SOP and identify the person responsible for the reaction procedure

Reaction Plan

There are better ways of reacting.



- **PREVENT** - Root cause identified and permanently corrected
- **CORRECT** - Root cause is identified and corrected temporarily
- **COMPENSATE** - Making adjustments - without identifying root cause

***Compensating* actions are usually less successful**

***Preventative* actions will last longer**

Implementation Plan

- Project plan for full implementation
- The elements of project planning are:
 - Time
 - Task
 - Resource (Who)
- Look for critical pathways
- Pitfalls
 - Allowing the sponsor/champion to rush the completion to the detriment of establishment of solid control methods
 - Not engaging enough resources to facilitate the broader execution

Implementation Plan

| Task | Who | When |
|--|---|--|
| Assist with project requirements and testing | Compliance Division & ISD | In-Progress until complete |
| Prepare work procedures based on new VTAPS release | Compliance Division Team Lead & Staff | Go Live minus 2 weeks |
| Training staff on new process and system | Compliance Division Team Lead & Staff | Go Live minus 2 days |
| VTAPS Implementation/Go-Live | ISD & Compliance Division | * Go Live Date TBD |
| Monitor process through new reporting tools | Compliance Division Team Lead | Go-Live plus 30 days |
| Evaluate and (if appropriate) change rule to eliminate the need for Clerks to send in paper exemptions | Compliance Division Team Lead & Team Sponsor | Evaluate Go-Live plus 60 days, rule change takes 90 – 120 days |
| Communications to Title Offices, Dealerships, BMV and Taxpayers | Compliance Division Team Lead & Staff | As needed |
| Follow-up Meetings to Monitor New Process | Green Belt Facilitators | 30, 60, 90, 180 days, and 1 year after implementation |



Transition Communication Plan

- Who needs to know and what do they need to know?
- When do they need to know?
- Hierarchy of communication methods
- Key stakeholders to be communicated with
- Transfer of knowledge

Communication/Training Plan

| Message | Audience | What | Responsible Party | When/Where |
|--|--|---|-------------------------------|--|
| Training of new procedures & exemption definitions | Taxation Supervisors and staff of those who process exemptions | Training sessions and Quarterly Meetings/ TAXI / Spectrum | Compliance Division Team Lead | At Northland facility after new system goes live |
| Updated taxpayer educational material | Taxpayers/ Public | Taxation website and updated letters | Compliance Division Team Lead | On-line/on demand/ when letters sent |
| Updated program material | Title Offices, Dealers | Taxation website, bulletins and e-mail messages | Compliance Division Team Lead | As needed/ electronic |

Leverage Opportunities

- Did you find other broken processes?
- Can you take what you learned and apply it in other parts of the business?
- If so,
 - Communicate to Process Owner
 - Draft charters (Blackbelt or Greenbelt)

Control Methods - Finale

- Changes in the process require changes to the control method
- Control methods identify person/position responsible for control of each critical variable and details about how to react to out-of-control conditions
- Control methods include a training plan and process auditing system
- Lengthy methods can be incorporated by reference

Summary

- Discussed the purpose of the Control phase
- Reviewed elements of Control plans, Reaction plans, Implementation plans and Transition Communication and Training plans
- Introduced common pitfalls encountered in the Control phase, specifically the Implementation plan
- Don't expect to control everything
- Focus on the critical X's
- Respond when measures are above/below acceptable

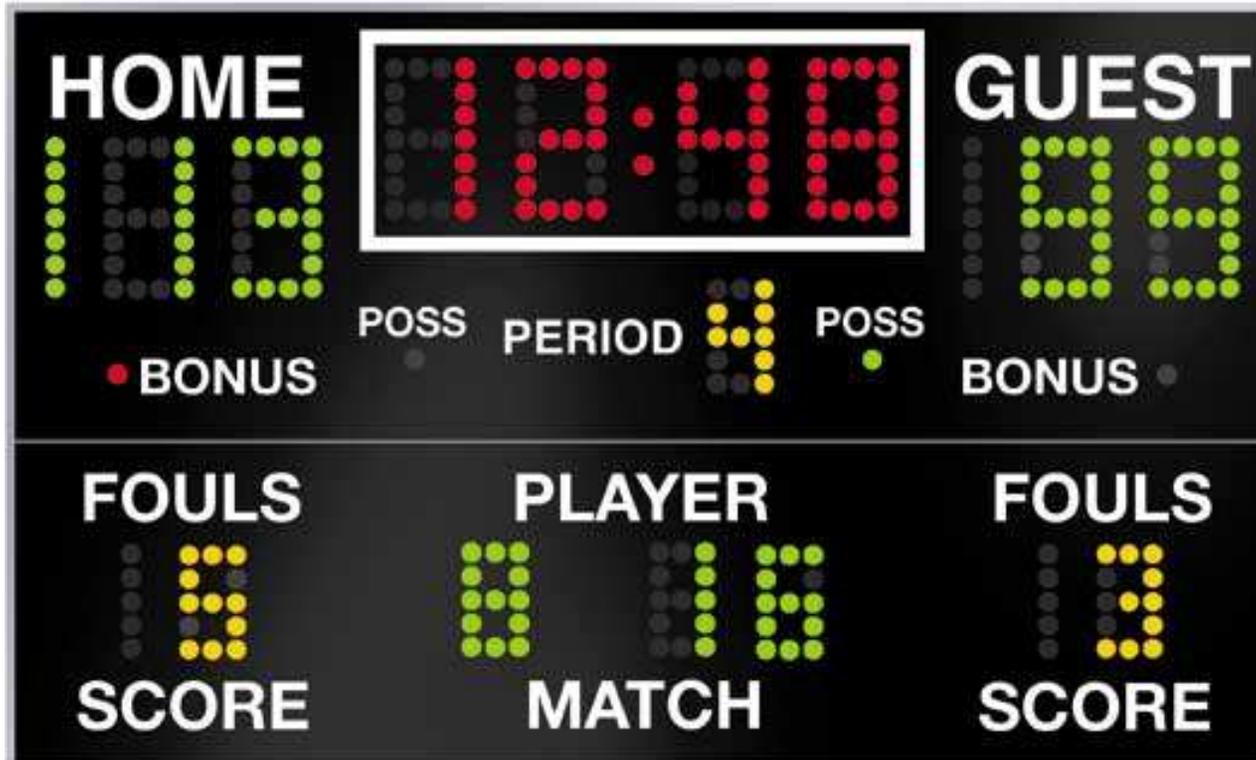
VISUAL MANAGEMENT

Presented by: Cindy Money

Objectives:

- Discuss the purpose of Visual Controls
- Review Task Lists and use of Metrics
- Discuss Value Stream Tracking Centers
- View examples of high tech, low tech and medium tech Visual Management
- Discuss concept of KISS

Think Basketball: Do You Know the Score!



Visual Controls

The workplace is set-up with simple signals, such as signs, labels, color-coded markings, etc.

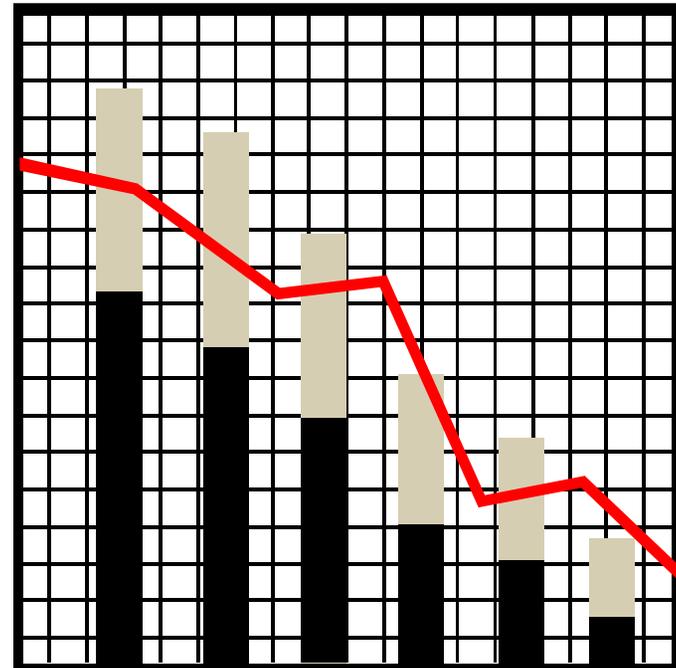
- Describe workplace safety, productivity, material flow, quality metrics, or other information
- Help those unfamiliar with the process get an immediate understanding of the situation or condition
 - What is going on
 - Understanding of the process
 - What is being done correctly
 - What is out of place

Visual Controls

- Supply feedback to an area
- Helps keep production running safely, smoothly, and efficiently
- Allows the people operating the process to stay on target
- Examples:
 - Schedule or status boards
 - Color-coded files / transactions
 - Appropriate signage to direct people to areas

Metrics

- Use Metrics to measure your transformation
- Challenging for office but needs to be done
- Examples:
 - # Calls
 - # of Appeals
 - # Entries
 - % on Time
 - # of Errors
 - \$ Saved



Metrics and Task Lists

- Identify Metrics that can be tracked for Task List items
 - These can be identified and agreed upon by team during the future state mapping session
- All tasks do not have to have Metrics but key tasks should
 - Need to identify if the team is making progress and actually affecting bottom line and lead times

Detailed Task List

Microsoft Excel - H&W High & Detail Task Lists Blank

File Edit View Insert Format Tools Data Window Help

Type a question for help

88% Arial 10 B I U

| Item | Task | Metric | Champion | Target Date | | | | | | | | | | |
|------|---|-----------------------|----------|-------------|--|--|--|--|--|--|--|--|--|--|
| 1 | Standard work for new hire communication and entry process (To check daily audit reports, 48 hour entry into the system, new hire checklist) | # Entries over 48 hrs | Keith | 03/31/11 | | | | | | | | | | |
| 1a | Form HR user-group (2-3 HR Reps) | | Keith | 12/01/10 | | | | | | | | | | |
| 1b | Meet with HR User-Group - define needs vs/ challenges | | Keith | 01/15/11 | | | | | | | | | | |
| 1c | Develop HR Communication - standard work guidelines | | Cathy | 02/01/11 | | | | | | | | | | |
| 1d | HR User-Group Team reviews and edits communications | | Lisa | 02/07/11 | | | | | | | | | | |
| 1e | HR-VP approval - send draft communications to HR-VPs | | Keith | 02/14/11 | | | | | | | | | | |
| 1f | Send Standard Work communication to all of HR | | Kathy | 03/01/11 | | | | | | | | | | |

High Level Parker Detail 1 Parker Detail 2 Parker Detail 3 Parker Detail 4 Parker Detail 6 Parker Detail 7 ACS Det: 4

Draw AutoShapes

Ready NUM

Filling in the Task Lists

- Color (or fill in electronically) the status of YOUR task
 - Complete the status update BEFORE the weekly update meeting

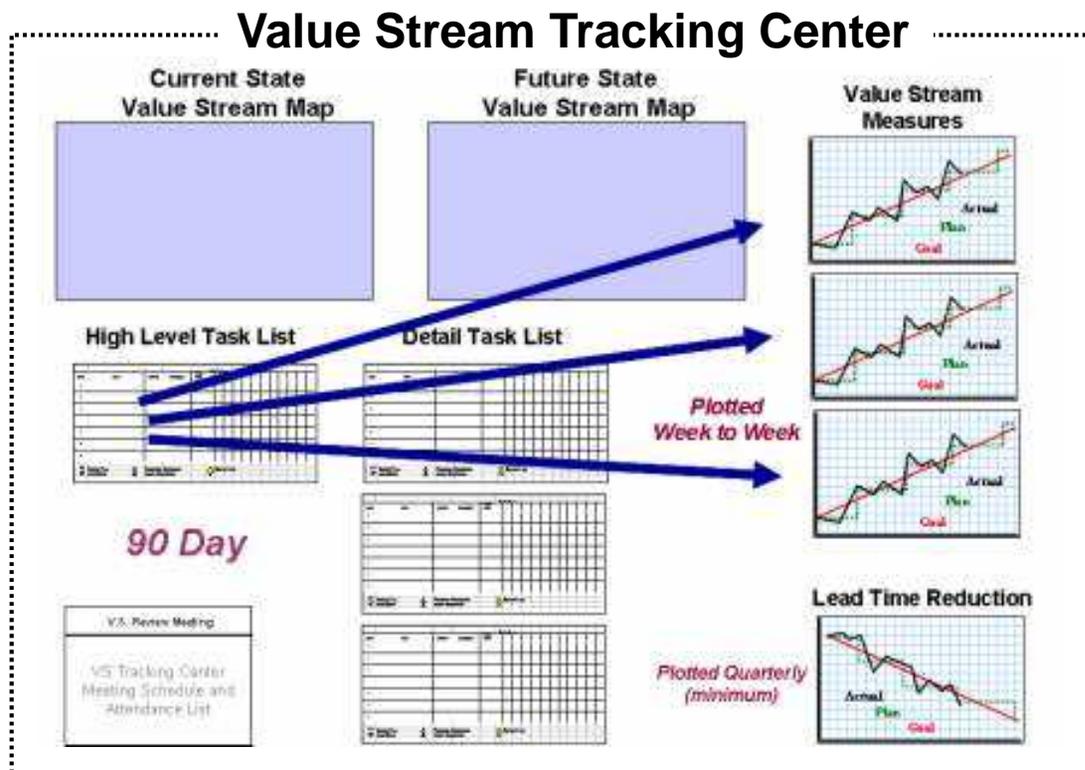
- Proposed Start
- Actual Start
- △ Proposed Finish
- ▲ Actual Finish
- ◇ Review

| |
|-------------|
| On Schedule |
| Slipping |
| Late |

Value Stream Tracking Centers

- Display the process of transformation of a single value stream
 - A current & future state map are shown. The time frame for the future state can vary, however, there should be a significant lead time reduction between the two.
 - Project plans should be displayed for the next 90 day period
 - The metrics should depict if the plan is being effective
- The team should meet at this board regularly (minimum weekly) to monitor progress
 - Value stream Manager sets up the meetings
- Value stream Facilitator makes sure the meetings are agreed to before event ends

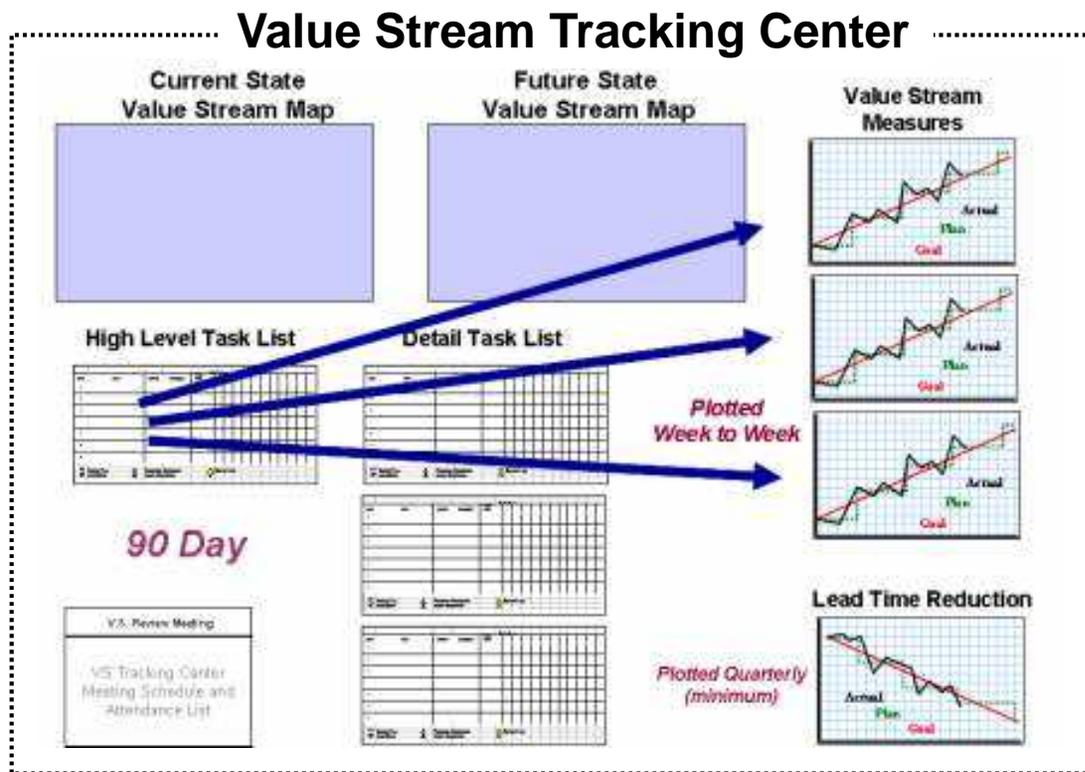
Value Stream Tracking Center



- Review project weekly at Tracking Center - Value Stream owner to lead
- Owners update tasks and metrics by hand prior to review
- Agree with countermeasures for 'off track' items
- Don't remove Tracking Center until results are sustained

Value Stream Tracking Center

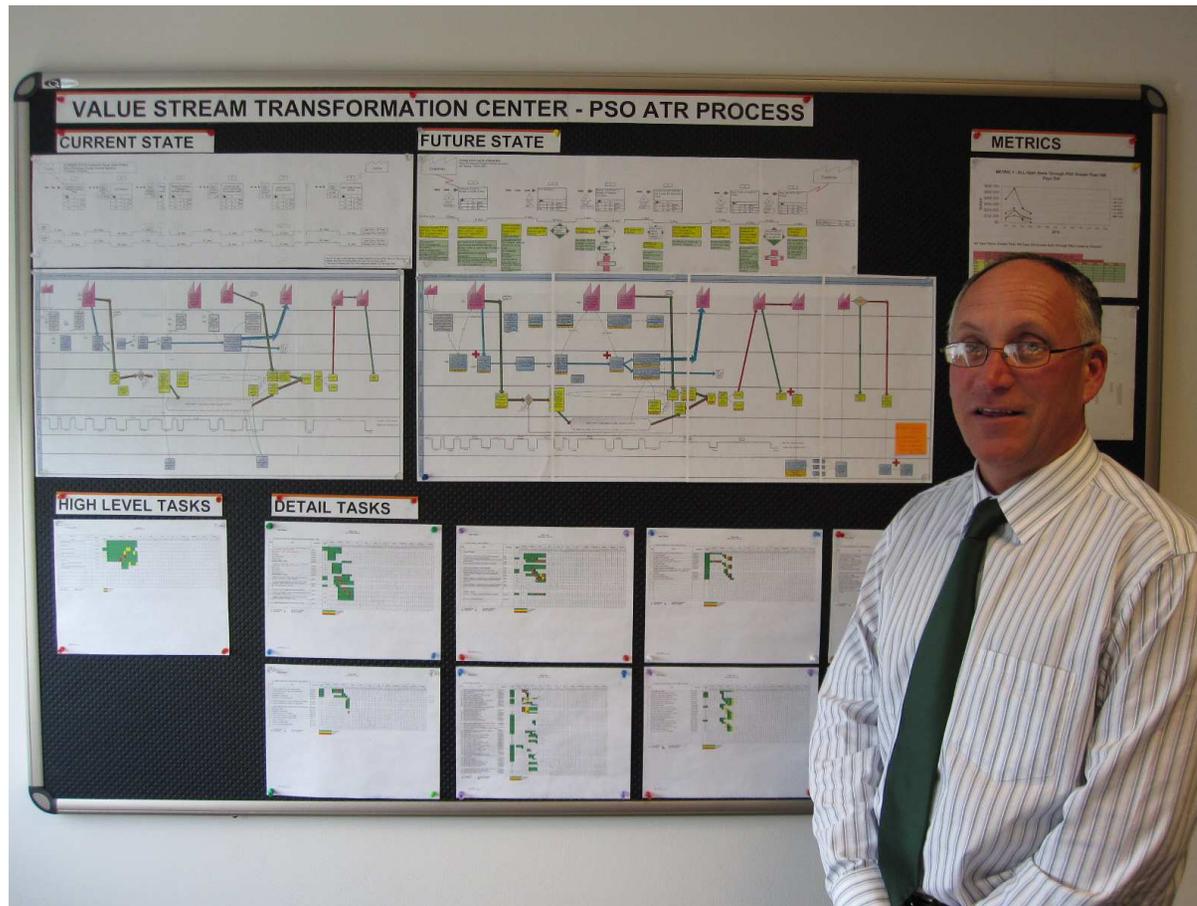
How to Create One



- Post the board in a prominent position
- Select metrics tied to the action plans
- Display 90-day increment plans
- Ensure tasks are not assigned to one person or department
- Establish meeting review schedule and post

Value Stream Tracking Center

Parker Hannifin Corporate - Tom Wright's Office



Value Stream Tracking Center- Lessons Learned

- Should not be 'hidden away' in office of project leader
- Key metrics should be defined at a low enough level
- Resource planning needs consideration
- Detail action plans on board to aid review

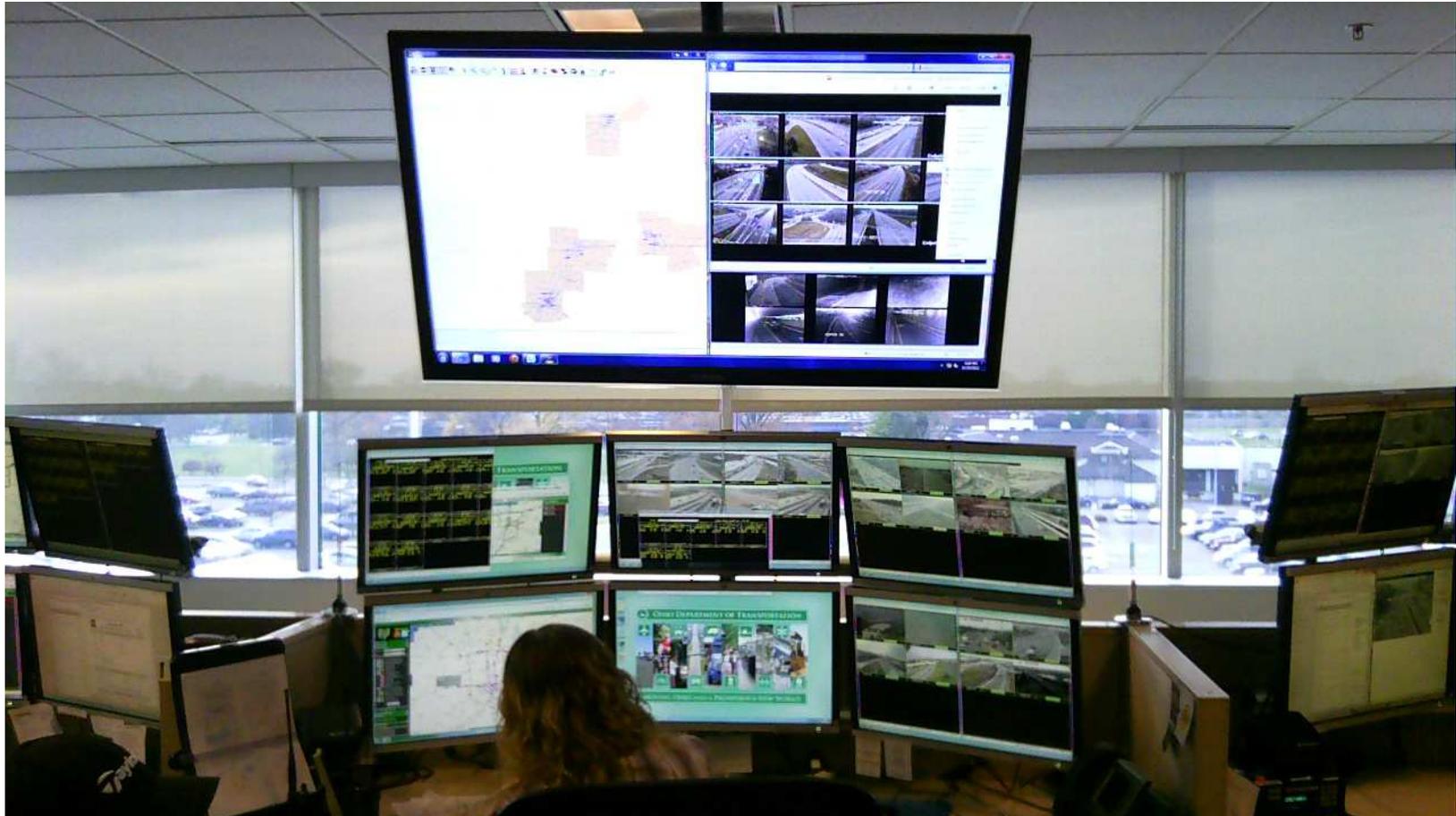
Lessons Learned in Project Management

- Ensure Tracking Center is used as project management tool
- Review of board should be standardized in terms of timing and agenda
- Metrics tracked at same frequency of review
- Documents should be updated by hand
- Ensure we say we're on track only when we are
- Corrective actions required if action plan or metric is off track
- No follow-up period once action plan is completed



High Tech Visual Management

ODOT



ODOT



Visual Management in Office Areas



Customer Service Center

Uses monitors for tracking:

1. Employee 'status' – available, not available
2. Current customers in queue
3. Longest current 'hold' time

Also – Visible 'Escalation' for customers on 'hold' beyond targeted time



*Low Tech Visual Management:
Don't wait for High Tech*

ODOT: Monitor all Traffic



KISS

Visual management can be as simple as:

- Taping binders
- Outlining tools
- Using different colored folders



Resource Key
Ohio Department of Transportation Division of Information Technology

| Color | Role |
|------------|--------------------|
| Pink | Project Manager |
| Lt. Blue | Business Analyst |
| Dk. Blue | Quality Analyst |
| Yellow | Software Developer |
| Orange | Database Analyst |
| Green | Network |
| Lt. Purple | Security |
| Dk. Purple | Server |
| White | Tech Support |

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Accounting Visual Management

Color Coded – Alert Files



ORANGE

ATR > 60 days old

Credits > 60 days old

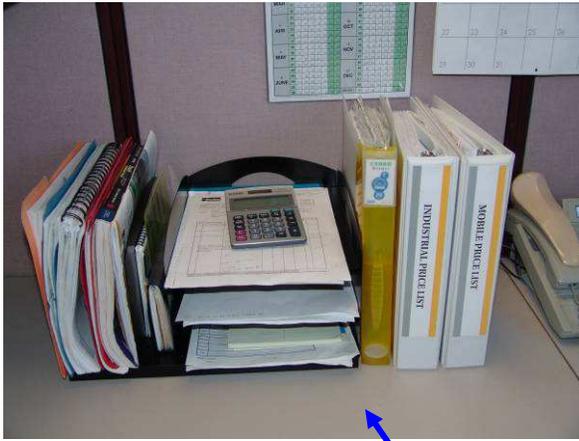
RED

Invoice Issues (3 way match)

Expense and Inventory

Folders

Customer Service Visual Management



Standardized Price List Binders
Misc. Info Binder
Project Specific Folders
Phone List/Distributor Listing



Color Coded Files

Red = Waiting for Answers
Orange – CSR Cust. Specific
Green – Standard Dept Forms

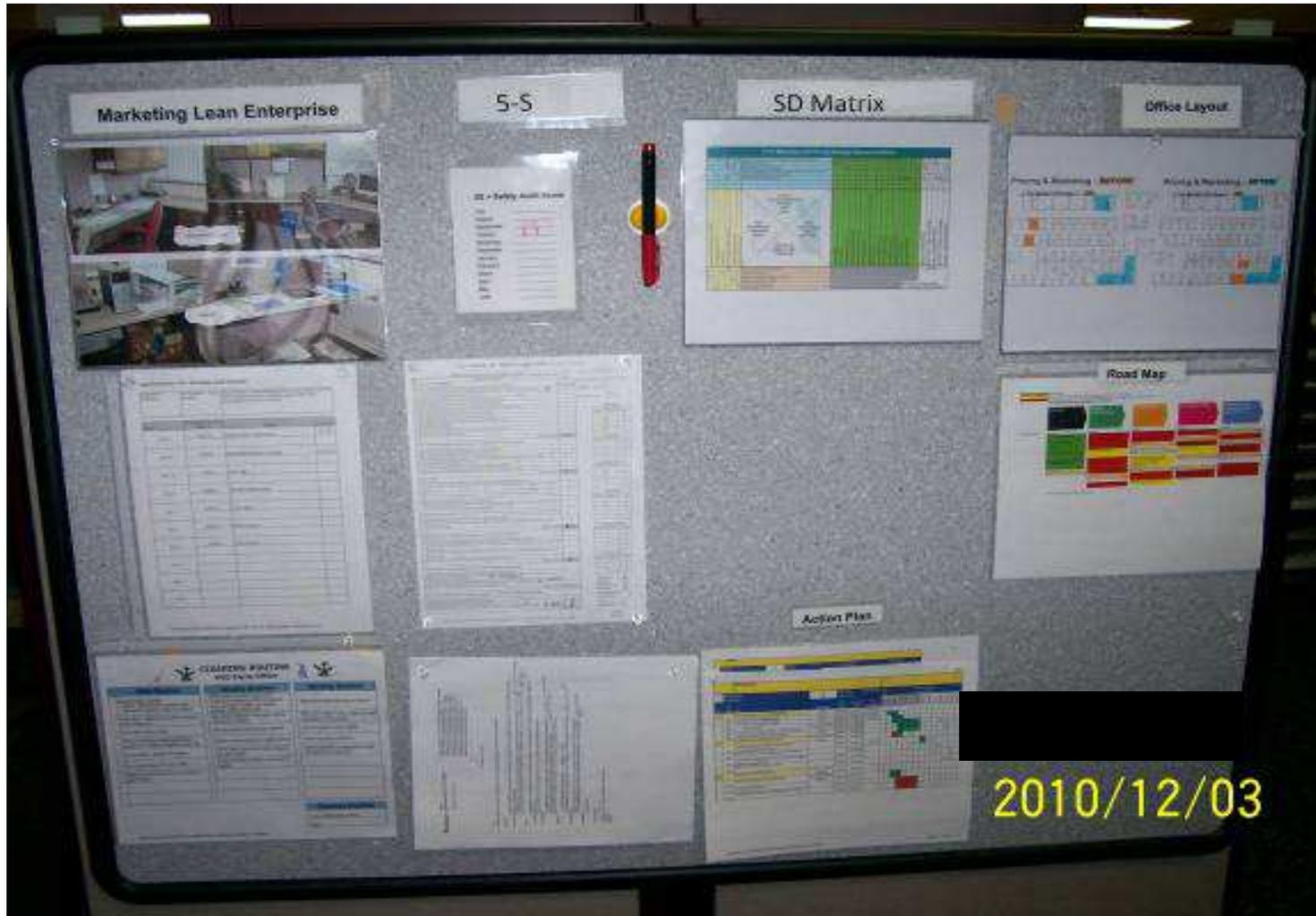
Also. . .

Items on Cube Wall
Standardized

- Calendar
- Intra Company Phone List
- Mgmt. Std. Work



Marketing & Sales Implementation



Red Tag

- Used to keep areas clean
- Items that need to be removed but cannot be removed right away should be red tagged
- Fill out the red tag information and affix it to the item that needs to be removed

| | |
|--|---------------|
| Red Tag No. | |
| Date | Person |
| Item Description | |
| Quantity | |
| Disposition <input type="checkbox"/> Move <input type="checkbox"/> Scrap <input type="checkbox"/> Return <input type="checkbox"/> Store Offsite <input type="checkbox"/> Other _____ | |
| Comments | |

Visual Layout





Kamishibai Boards:

[http://www.youtube.com/watch?v=
MHf88PH9m3k](http://www.youtube.com/watch?v=MHf88PH9m3k)

Kamishibai Boards

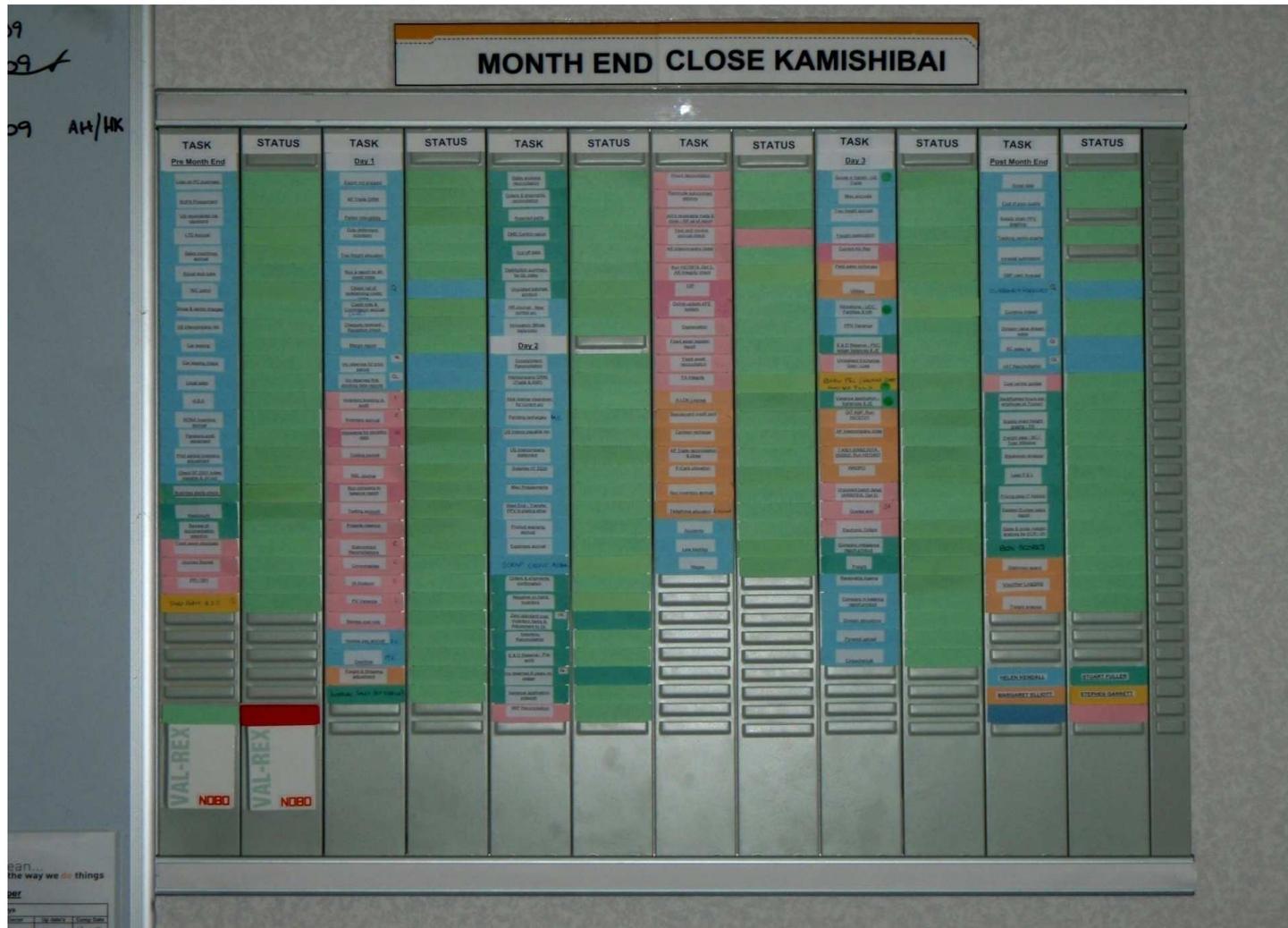
- As part of the Toyota production system, kamishibai boards are used as a visual control for performing audits within a manufacturing process.
- They help to ensure safety and cleanliness of the workplace is maintained and that quality checks are being performed.

Kamishibai Boards

- Kamishibai board is a T-card system that has red cards glued to green cards (so that each T-card has a red side and a green side).
- The red cards are for the incomplete tasks, whereas the green cards symbolize that the work has been done.



Visual Management in Office Areas





Medium Tech Visual Management:

ODT IT Management Example

Project Measurements

| ETC Approved Business Projects | | | |
|--------------------------------|--|--------------|----------------|
| Number | Project Description | Start | Planned Finish |
| 4594C | Key Entry III Replacement - Phase 3 | 10/19/2010 | 2/28/2011 |
| 4615B | Call Center Upgrade Phase 2 | 5/3/2010 | 3/11/2011 |
| 4627 | Tax Discovery Implementation | 6/1/2009 | 6/30/2011 |
| 4661 | IT-SD DQ Assessments Interface | 7/14/2010 | 5/31/2011 |
| 4726 | New Year Prep 2010 | 9/10/2010 | 5/3/2011 |
| 4731 | Confidential Personal Information (CPI) Access Log | 10/26/2010 | 2/1/2011 |
| 4740 | CAT Batch OBG Payment Posting | 11/24/2010 | 1/18/2011 |
| 4743 | Security Updates Required by IRS | 12/9/2010 | 6/30/2011 |
| Approved ISD Projects | | | |
| Number | Project Description | Start | Planned Finish |
| 4634 | WAN Upgrade | 10/1/2009 | 1/14/2011 |
| 4691B | Server 2008 Upgrade Phase 2 | 9/22/2010 | 6/30/2011 |
| 4719 | WebSphere and RAD Upgrade | 7/13/2010 | 9/15/2011 |
| 4730 | Security Infrastructure Enhancement FY11 | 12/1/2010 | 6/30/2011 |
| Approved STARS Projects | | | |
| Number | Project Description | Start | Planned Finish |
| 4513 | County Auditors Interface to STARS | 2/1/2010 | 1/4/2011 |
| 4584 | Employer Withholding Data Capture of FEIN | 3/22/2010 | 12/31/2010 |
| 4595 | OFAST-STARS Interface | 4/22/2010 | 1/4/2011 |
| 4616 | STARS Universal Coupon | 3/22/2010 | 12/31/2010 |
| 4679 | STARS Interface Directories | 3/23/2010 | 1/3/2011 |
| 4692 | STARS eForms | 3/10/2010 | 1/3/2011 |
| 4694 | STARS and IVR | 3/29/2010 | 1/15/2011 |
| 4713 | Batch Release FileNet | 9/16/2010 | 3/1/2011 |
| 4716 | SD Distribution Files to STARS | 7/19/2010 | 10/29/2010 |
| 4741 | STARS Cutover | 11/26/2010 | 6/30/2011 |
| Recently Completed Projects | | | |
| Number | Project Description | Sponsor | Satisfaction |
| 4666 | Splitting of Payment Images from Return Images | Mark Walker | |
| 4708 | Expanded Options for Direct Deposit of PIT Refunds | Mike O'Leary | |
| 4709 | STARS and POD | Chris Ross | |

System Availability

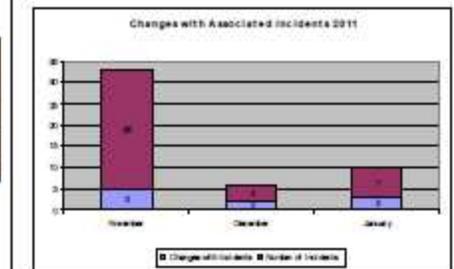
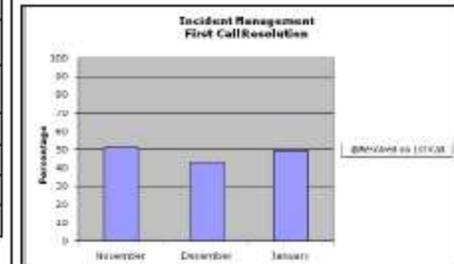
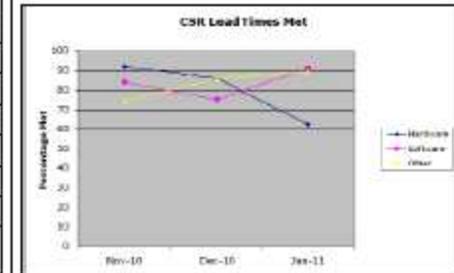
| | Status | Target Availability (%) | Actual Availability (%) | Unavailable Minutes |
|--------------------------------|--------|-------------------------|-------------------------|---------------------|
| TAX ADMINISTRATION | | | | |
| eCommerce | Green | 100% | 99.4% | 77 |
| IFile | Green | 98% | 99.4% | 77 |
| ITAS | Green | 99.5% | 100% | 0 |
| ITMOD | Green | 99.5% | 100% | 0 |
| IVR (phone KeyPad) | Green | 100% | 100% | 0 |
| KANA (Taxpayer eMail) | Green | 100% | 100% | 0 |
| OBG | Green | 98% | 99.4% | 77 |
| Spectrum (Phone Support) | Green | 100% | 100% | 0 |
| Scanning and Imaging | Green | 99% | 100% | 0 |
| INTERNAL INFRASTRUCTURE | | | | |
| Network (LAN/WAN) | Green | 99% | 99.3% | 88 |
| Lotus Notes | Green | 99% | 100% | 0 |
| Access to Internet | Green | 98% | 100% | 0 |

Customer Service

January 2011 Incidents: Ranked by Impact

| Number of Incidents Closed | System Impact Rating | Average Time to Resolution | CRC Service Goal |
|----------------------------|------------------------|----------------------------|------------------|
| 2 | Priority 1 - Emergency | 54 days | 1 day |
| 4 | Priority 2 - Critical | 99 days | 2 days |
| 9 | Priority 3 - Urgent | 8.21 days | 5 days |
| 1151 | Priority 4 - Routine | 4.38 days | 7 days |

Customer Service (con't)



ODT Process Improvement Website

Results Scorecard

The scorecard below identifies the difference between key process measures before the Greenbelt project began and the projected measures once all improvements are in place.

| Process Improvement RESULTS SCORECARD | BASELINE | PROJECTIONS | |
|---------------------------------------|---|---|------------------|
| | Key process measures, gathered before the Process Improvement began | Projected measures once all improvements are in place | PROJECTED CHANGE |
| PROCESS STEPS | 62 | 41 | 34% reduction |
| DECISION POINTS | 11 | 7 | 36% reduction |
| HANDOFFS | 3 | 2 | 36% reduction |
| FTEs | 7 | 5 | 29% reduction |

Steps to the Motor Vehicle Exemption Process Before and After the Greenbelt Project

The graphic below is meant to give you a visual idea of how the process has changed since the Greenbelt project. Multiple steps, decision points and handoffs have all been eliminated making the process much more efficient.



Monthly Common Space Audit Forms

| Copy Room and Kitchen Standards | Checker | Monthly Audit | | | | | | | | | | | |
|---|--------------|---------------|--|--|--|--|--|--|--|--|--|--|--|
| Unnecessary items are removed from the area | Julie Miller | | | | | | | | | | | | |
| Work surfaces & storage areas do not have items in or on them that don't belong | Julie Miller | | | | | | | | | | | | |
| All counter and table tops are clean | Julie Miller | | | | | | | | | | | | |
| Garbage & recyclables are collected and disposed of correctly | Julie Miller | | | | | | | | | | | | |
| Refrigerator is cleaned out from previous month | Julie Miller | | | | | | | | | | | | |
| Bulletin boards are up to date | Julie Miller | | | | | | | | | | | | |
| Supply cabinet is properly stocked | Julie Miller | | | | | | | | | | | | |
| All business machines are properly fueled/online | Julie Miller | | | | | | | | | | | | |
| Print queues are empty | Julie Miller | | | | | | | | | | | | |
| Clock is set to correct time | Julie Miller | | | | | | | | | | | | |



| Conference Room Standards | Responsibility | Monthly Audit | | | | | | | | | | | |
|---|----------------------|---------------|--|--|--|--|--|--|--|--|--|--|--|
| Unnecessary items are removed from the area | Conference Room User | | | | | | | | | | | | |
| Work surfaces & storage areas do not have items in or on them that don't belong | Conference Room User | | | | | | | | | | | | |
| Garbage & recyclables are collected and disposed of correctly | Conference Room User | | | | | | | | | | | | |
| Chairs are put back to standard arrangement | Conference Room User | | | | | | | | | | | | |
| White board is cleaned off | Conference Room User | | | | | | | | | | | | |
| Cords are put back and neatly wrapped | Conference Room User | | | | | | | | | | | | |
| Remotes are put back in caddy | Conference Room User | | | | | | | | | | | | |
| TV and Video Conferencing is off | Conference Room User | | | | | | | | | | | | |
| Lights are timed off | Conference Room User | | | | | | | | | | | | |
| Metrics are updated by 15th of the month | Christa Stewart | | | | | | | | | | | | |



Summary

- Discussed purpose of Visual Controls
- Reviewed Task Lists and use of Metrics
- Discussed Value Stream Tracking Centers and how to create one
- Viewed examples of high tech, low tech and medium tech Visual Management
- Discussed the concept of KISS

Brainstorming

