



Six Sigma DMAIC Improvement Story

Green Belt Project Objective:
Improve the Percentage of Construction Vendor
Invoices Paid Timely

Last Updated: 11-29-12



Team: *On-Time Payment Services (OPS)*

Aneisha Daniel (Team Leader)

Carlos Maxwell (Co-team Leader)

Marie Brutus

Michael Fernandez

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Rodney McMillian

Ray Scher (Sponsor)

Chris Rose (Sponsor)

Six Sigma Problem Solving Process

The team utilized the 5-Step DMAIC problem solving process.

DMAIC Performance Improvement Process

| Process Step | | Description of Team Activities |
|--------------|---------|---|
| Number | Name | |
| 1 | DEFINE | <ul style="list-style-type: none"> • Select Problem • Identify Project Charter • Develop Project Timeline • Establish Method to Monitor Team Progress • Construct Process Flowchart • Develop Data Collection Plan • Display Indicator Performance “Gap” |
| 2 | MEASURE | <ul style="list-style-type: none"> • Stratify Problem (i.e. “Gap”) • Identify Problem Statement |
| 3 | ANALYZE | <ul style="list-style-type: none"> • Identify Potential Root Cause(s) • Verify Root Cause(s) |
| 4 | IMPROVE | <ul style="list-style-type: none"> • Identify and Select Improvement(s) • Identify Barriers and Aids • Develop and Implement Improvement Plan • Confirm Improvement Results |
| 5 | CONTROL | <ul style="list-style-type: none"> • Standardize Improvements within Operations • Implement Process Control System (PCS) • Document Lessons Learned • Identify Future Plans |



Select Problem

Management reviewed many problems using a selection Matrix.

Project Selection Matrix

| Problem(s) | Customer (Internal or External) | Selection Criteria | | | C=A*B Overall |
|---|---------------------------------|---|-------------------------------------|--|------------------|
| | | A Impact on Customer (Accuracy/ Cost /Timeliness) | B Need to Improve (Performance Gap) | Supports Miami Dade Strategic Goal(s)? Y/N | |
| 1 Too high of waste transfer costs | Diposal Haulers (Int/Ext) | 4 | 2 | Y | 8 |
| 2 Too high of waste collection costs | Rate Payers (External) | 2 | 2 | Y | 4 |
| 3 Disposal: Tipping fees not adequately covering all of disposal costs | Haulers Internal/External | 3 | 4 | Y | 12 |
| 4 Too many retroactive change orders associated with capital | Board | 5 | 2 | Y | 10 |
| 5 Vendors (construction) take too long to get paid | Vendors (External) | 4 | 4 | Y | 16 |
| 6 Capital projects not getting quickly approved (especially length of time to launch project) | Internal/External | 1 | 4 | Y | 4 |
| 7 Poor efficiency of the cart maintenance program | Residential Cust (External) | 3 | 3 | Y | 9 |
| 8 Too many residential developments/households are not being served by PWWM (but that should be served, by code) | External/Internal | 3 | 5 | Y | 15 |
| 9 Efficiency and effectiveness of Mosquito Control needs to improve including accounting for seasonality | R&B Customers (External) | 3 | 4 | Y | 12 |
| 10 Public Works' Road & Bridge op's teams need to be more efficient/effective (e.g. generalist versus specialist teams) | R&B Customers (External) | 3 | 2 | Y | 6 |
| 11 Road & Bridge (Public Works)- pothole routing needs to be optimized. | R&B Customers (External) | 3 | 2 | Y | 6 |
| 12 Public Works' Road & Bridge operations needs to be more efficient/effective | R&B Customers (External) | 3 | 4 | Y | 12 |
| 13 Discipline process takes too long (especially on Waste Mgmt side) | Mgmt & Empls (Internal) | 3 | 1 | Y | 3 |

Rating Scores: 5= Extreme 3= Moderate
4= High 2= Low 1=None

"Vendors take too long to get paid" was the top rated Problem.



Identify Project Charter

The team developed a team Project Charter.

| Project Charter | | |
|-----------------|-----------------------------|--|
| Business Case | <i>Project Name:</i> | Improve the Percentage of Construction Vendor Invoices Paid Timely |
| | <i>Problem/Impact:</i> | Vendors (construction) take too long to get paid. Also, many vendors submit improper invoices which result in longer payment cycle times. CSBE prompt payments require a 14 day payment window per County ordinance. |
| | <i>Expected Benefits:</i> | Improvement will result in an increase in vendor satisfaction with expedited payments. |
| Objectives | <i>Outcome Indicator(s)</i> | Q3- %of CSBE Invoices Paid Within 14 of Initial Receipt |
| | <i>Proposed Target(s)</i> | Target=90% |
| | <i>Time Frame:</i> | July 2012 through Nov 2012 |
| | <i>Strategic Alignment:</i> | Supports departmental Business Plan objective of increasing timeliness of invoice processing. |
| Scope | <i>In Scope:</i> | Construction Related (CSBE) Invoices |
| | <i>Out-of-Scope:</i> | Other non Construction Invoices |
| | <i>Authorized by:</i> | Ray Scher; Chris Rose |
| Team | <i>Sponsor:</i> | Ray Scher; Chris Rose |
| | <i>Team Leader:</i> | Aneisha Daniel; Carlos Maxwell |
| | <i>Team Members:</i> | Marie Brutus; Michael Fernandez; Mayra Morales; Rodney McMillian |
| | <i>Process Owner(s):</i> | Aneisha Daniel |
| | <i>Mgmt Review Team:</i> | Ray Scher; Chris Rose; Kathleen Woods-Richardson |
| Schedule | <i>Completion Date:</i> | 30-Nov-12 |
| | <i>Review Dates:</i> | Monthly and Final Review in November 2012 |
| | <i>Key Milestone Dates:</i> | See Action Plan |



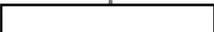
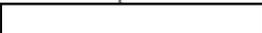
Develop Project Timeline Plan

The team developed a timeline plan to complete the Project.

4.

| Legend: | |
|---|------------|
|  | = Actual |
|  | = Proposed |

WHAT: Complete DMAIC Story Project by Nov 30, 2012

| DMAIC Story Process Step | WHEN | | | | | |
|--------------------------|--|---|--|-------------------|----------|----------|
| | 2012 | | | | | |
| | Jul | Aug | Sep | Oct | Nov | Dec |
| 1. Define |   | | Completed 8/16/12 | | | |
| 2. Measure |   | | Completed 8/31/12 | | | |
| 3. Analyze | |   | | Completed 9/25/12 | | |
| 4. Improve | | |   | | 10/30/12 | |
| 5. Control | | |   | | | 11/30/12 |



Monitor Team Progress

The Team and Management used a Checklist to monitor team progress.

| DMAIC Story Checkpoints | | |
|-------------------------|-------------------|---|
| PLAN | Step 1 Define | Objective: Demonstrate the importance of improvement needs in measurable terms. |
| | | 1. The stakeholders' need(s) were identified. ✓ |
| | | 2. The problem can be described as an "object" with a "defect" with unknown cause(s) that need to be identified. ✓ |
| | | 3. A line graph outcome indicator was constructed that appropriately measures the problem (or gap). ✓ |
| | Step 2 Measure | Objective: Investigate the features of the indicator, stratify the problem and set a target for improvement. |
| | | 4. A schedule for completing the five DMAIC Story steps was developed. ✓ |
| | | 5. Data contained or directly linked to the indicator were stratified from various viewpoints (i.e., what, where, when and who) and a significant dataset was chosen. ✓ |
| | | 6. A target for improvement was established based on the stakeholders' need. ✓ |
| | Step 3 Analyze | Objective: Analyze the stratified data to identify and verify the root causes. |
| | | 7. The impact of the target on the indicator was determined. ✓ |
| | | 8. A problem statement that describes the "remaining dataset" was developed. ✓ |
| | | 9. Cause and effect analysis was taken to the root level. ✓ |
| DO | Step 4 Improve | Objective: Develop and implement countermeasures to eliminate the verified root causes of the problem. |
| | | 10. Potential causes most likely to have the greatest impact on the problem were selected. ✓ |
| | | 11. A relationship between the root causes and the problem was verified with data. ✓ |
| | | 12. The impact of each root cause on the gap was determined. ✓ |
| | Step 5 Control | Objective: Confirm that the countermeasures taken impacted the root causes and the problem; and that the target has been met. |
| | | 13. Countermeasures were selected to address verified root causes. ✓ |
| | | 14. The method for selecting the appropriate countermeasures was clear and considered effectiveness and feasibility. ✓ |
| | | 15. Barriers and aids were determined for countermeasures worth implementing. ✓ |
| CHECK | Step 4 Improve | Objective: Confirm that the countermeasures taken impacted the root causes and the problem; and that the target has been met. |
| | | 16. The action plan reflected accountability and schedule. ✓ |
| | | 17. The effect of countermeasures on the root causes was demonstrated. ✓ |
| | | 18. The effect of countermeasures on the problem (or indicator) was demonstrated. ✓ |
| | Step 5 Control | Objective: Prevent the problem and its root causes from recurring. Maintain and share the gains. |
| | | 19. The improvement target was achieved and causes of significant variation were addressed. ✓ |
| | | 20. The effect of countermeasures on the indicator representing the stakeholders' need was demonstrated. ✓ |
| | | 21. A method was established to document, permanently change, and communicate the revised process or standard. ✓ |
| ACT | Step 5 Control | Objective: Evaluate the team's effectiveness and plan future activities. |
| | | 22. Responsibility was assigned and periodic checks scheduled to ensure compliance with the revised process or standard. ✓ |
| | | 23. Specific areas for replication were identified. ✓ |
| | | 24. Any remaining problems (or gaps) were addressed. ✓ |
| ACT | Step 5 Control | Objective: Evaluate the team's effectiveness and plan future activities. |
| | | 25. Lessons learned, P-D-C-A of the Story process, & team growth were assessed & documented. ✓ |

- Team identified an indicator; developed a Flowchart and a Spreadsheet
- Paretos and Histograms
- Single Case Bore; Fishbone ; RC Verification Matrix
- Countermeasures Matrix; Barriers and Aids; Action Plan
- Line Graph
- Process Flowchart; Process Control Chart
- Lessons Learned



Hidden Costs of **Untimely Payments**

The team collected info on costs of untimely payments.

| | <u>Annual Cost</u> |
|--|---------------------------|
| 1. Lost discounts for early payment | |
| a. Estimated Discounts for early payments (est. annual savings)..... | \$2,000.00 |
| 2. Handling Costs for Inquiries/Complaints asking about untimely payments | |
| a. (360 late Payments more than 1 week per month)X(12 Months) X (90% probability) X(.5 Staff Hrs per Call)X(\$26 per Staff Hr)..... | \$50,544 |
| b. (180 late Payments more than 2 week per month)X(12 Months)X (90% probability) X(.5 Staff Hrs per call)x(\$35 per Mgmt staff Hr)..... | \$34,020 |
| 3. Managing Invoices that are being paid in untimely manner | |
| a. (360 late Payments more than 1 week per month)X(12 months) (.05 Staff Hrs per invoice)X(\$26 per staff hr)X(4 times)..... | \$22,464 |

Annual Costs Savings= \$109,028

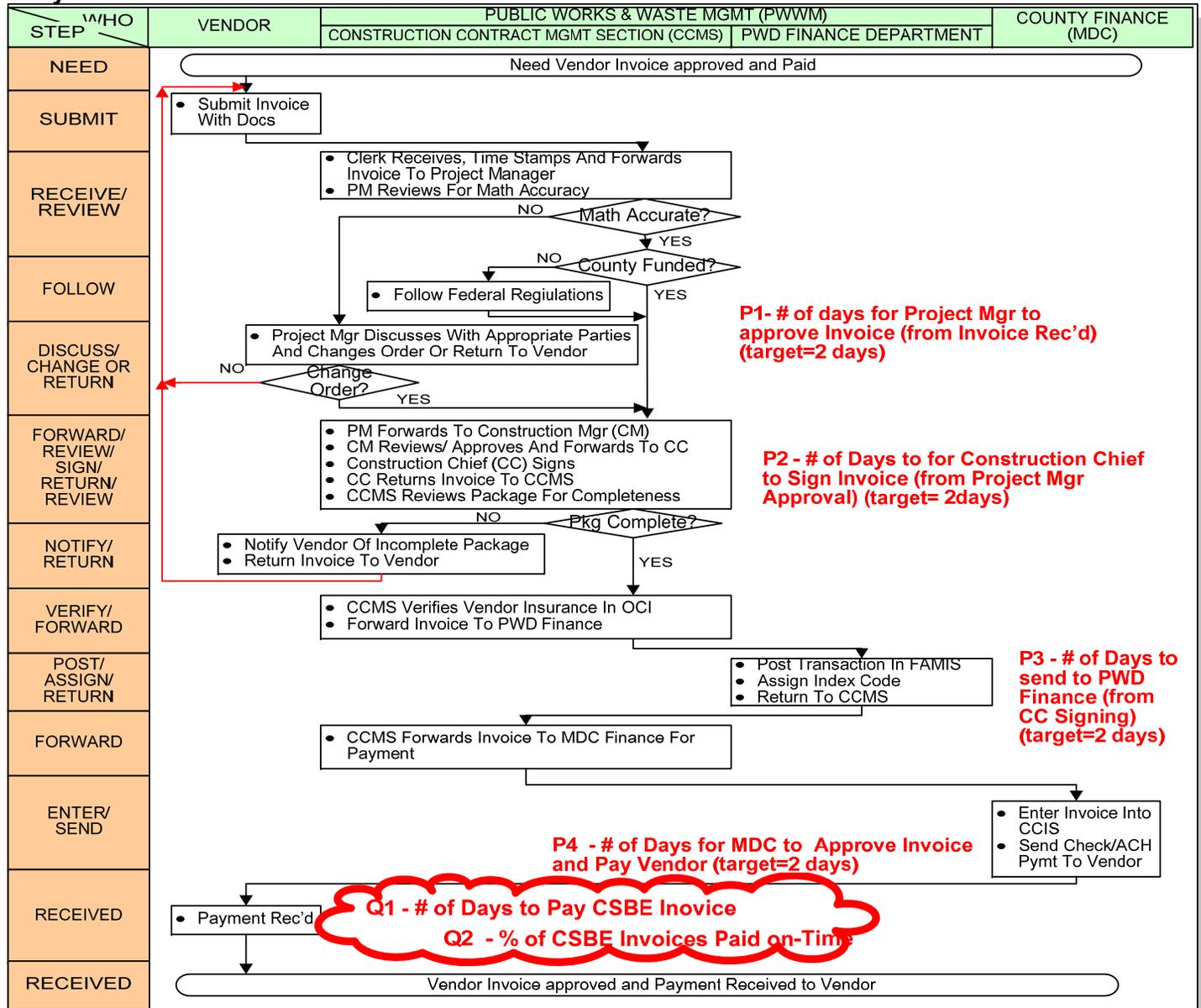


Review Process Flow Chart

The team constructed a Process flow chart describing the Process.

The team next looked at data needed to display the P and Q Indicators.

Pay Construction Related Vendor Invoices



Identify Data Collection Needs

The team developed a data collection spreadsheet to collect indicator and demographic data...

Construction Small Business Enterprise (CSBE) Invoice Process Status Summary

| Line # | DEMOGRAPHICS | | | | | | | | |
|-------------|-----------------|---------------------------|--------------------|--------|----------------------|----------------|--------------------|----------------------|---|
| | Vendor Info | | | | Contract Information | | | | |
| | B | C | G | H | I | J | K | M | N |
| Vendor Name | Contractor City | Project Description | Contract/Project # | CSBE | Division | Invoice Amount | Open or Site Spec. | Type of Work | |
| | | | | % CSBE | | Total | | | |
| | | | | 100 | | \$7,581,294.56 | | | |
| 1 | ACOSTA TRACTOR | HIALEAH GARDENS, FL 33018 | 20070626 | CSBE | CONSTRUCTION | \$2,007.17 | Site Specific | Road Widening | |
| 2 | ROCK POWER PA | MIAMI, FL 33183 | 20090356 | CSBE | CONSTRUCTION | \$2,425.14 | Open Contract | Safety Improvement | |
| 3 | M & C CONSTRUC | MIAMI / FL / 33183 | 20100447 | CSBE | CONSTRUCTION | \$2,804.41 | Open Contract | Sidewalk Improvement | |

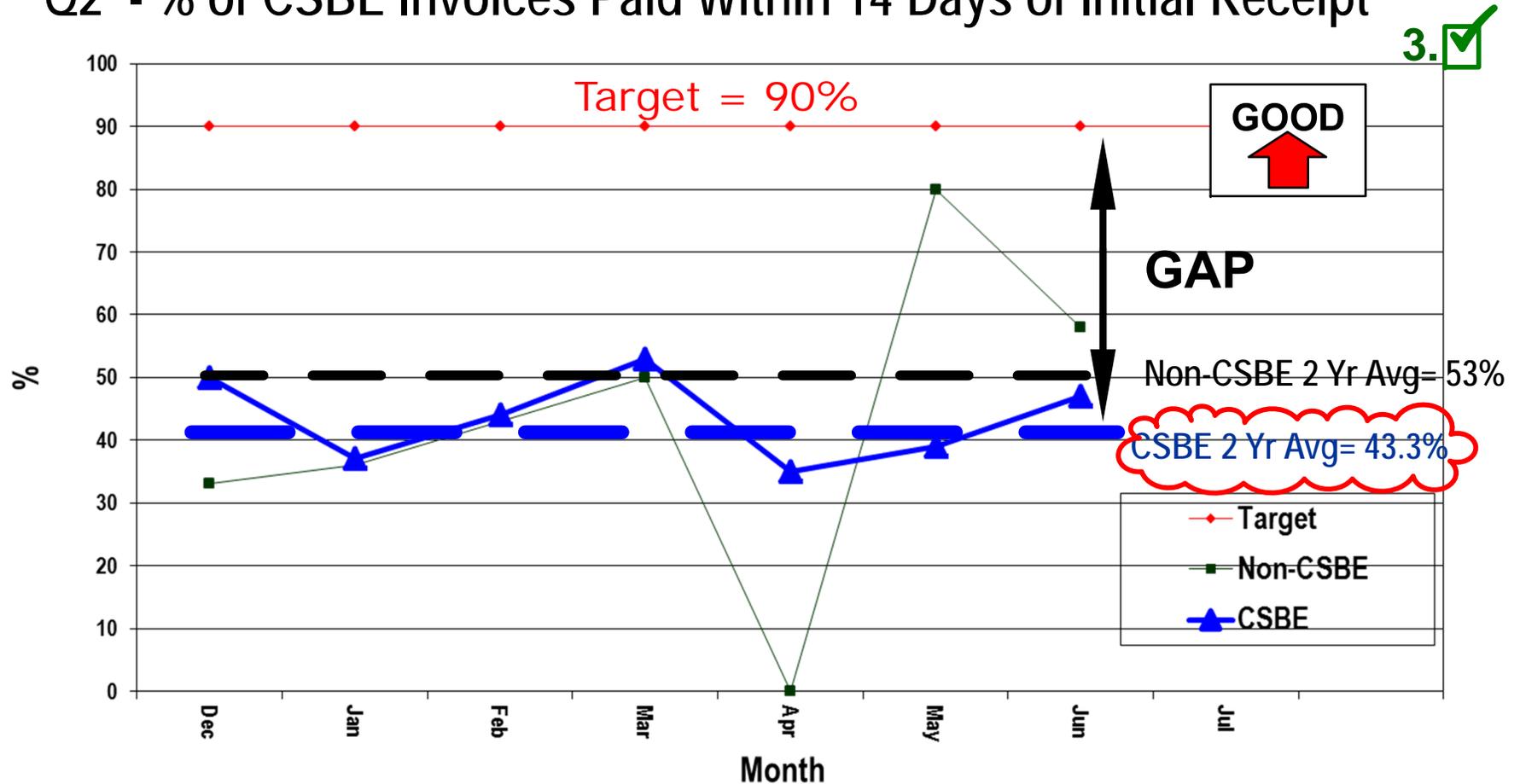
| MILESTONE DATES | | | | | | | | | | DURATION | | | | | OUTCOMES | | | |
|-------------------------|------|-----------------------------|------|------------------------------|--------------|--------------------------|----------------|--|------|----------|-----------------------------------|-------------------------------------|--------------------------------------|--|-------------------------------|------------------------------|-----------------------------|-----------------------|
| PWWM Construction Dept | | | | | PWWM Finance | | County Finance | | | AE= | AF= | AG= | AH= | AK= | AR | AS= | AU= 'Y' if | |
| Q | R | S | T | W | X | Y | Z | AC | AD | S-Q | W-S | Y-W | AA-Y | AC-Q | | AK-AR | AS<=0 | |
| 1-Invoice Rec'd by PWWM | | 2-PWWM Section Mgr Approves | | 3-PWWM Const'n Staff Approve | | 4- PWWM Finance Approves | | 6-County Finance Approved and Check Sent | | | Invoice Rec'd to Sec Mgr Approves | Sec Mgr Approves to Constn Approves | Constn Approves to PWWM Fin Approves | PWWM Fin Approves to County Finance Approves | Invoice Rec'd to Payment Sent | Time Standard to Pay Invoice | # of Days Payment Sent Late | Payment Sent on-Time? |
| Date | Day | Date | Day | Date | Day | Date | Day | Date | Day | %Mo | %Mo | %Mo | %Mo | %Mo | | Avg | %Y | |
| | 18.6 | | 22.0 | | 16.9 | | 18.6 | | 14.4 | 4.9 | 2.9 | 25.2 | 2.9 | 10.4 | | 26.4 | 2.9 | |
| | | | | | | | | | | P1 | P2 | P3 | P4 | Q1 | | Q2 | Q3 | |
| 12/23/10 | Th | 01/03/11 | Mo | 01/07/11 | Fr | 01/13/11 | Th | 01/19/11 | We | 1 | 4 | 6 | 6 | 27 | 14 | 12 | N | |
| 10/19/10 | Tu | 10/22/10 | Fr | 10/26/10 | Tu | 12/27/10 | Mo | 12/29/10 | We | 3 | 4 | 62 | 2 | 71 | 14 | 57 | N | |
| 12/27/10 | Mo | 01/06/11 | Th | 01/20/11 | Th | 02/04/11 | Fr | 02/12/11 | Sa | 10 | 14 | 15 | 8 | 47 | 14 | 33 | N | |



Review Selected Indicator

The team collected indicator data and reviewed performance trends:

Q2 - % of CSBE Invoices Paid Within 14 Days of Initial Receipt

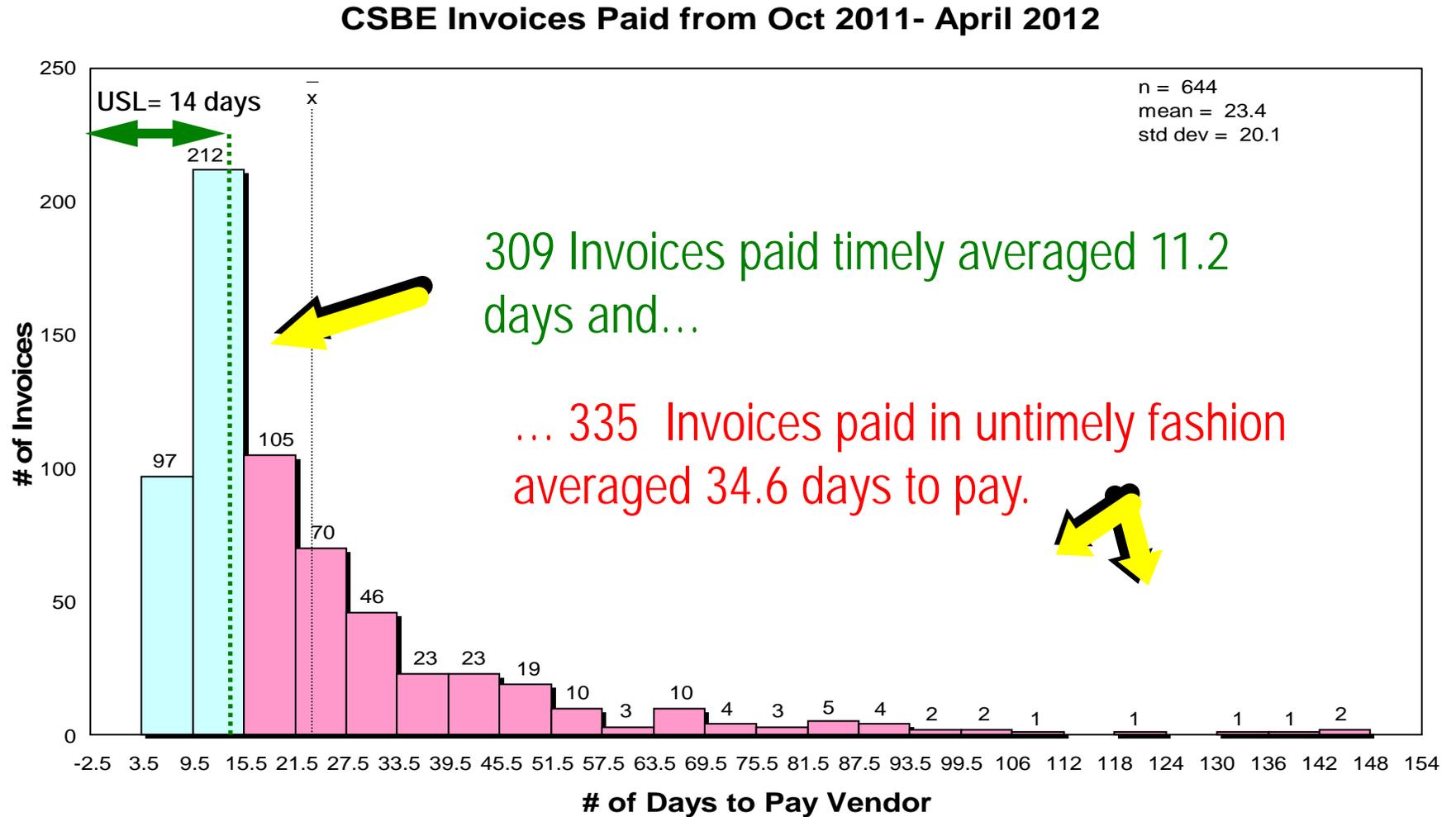


The team looked closer at the CSBE Invoices that were paid within a timely basis and those paid in an untimely fashion from initial received date.



Stratify the Problem

The team stratified 644 CSBE invoices using a histogram and found...



The team looked closer at comparing the **Untimely** to the **Timely** Vendor Invoices.



Stratify the Problem

The team compared the **Untimely** to the **Timely** Invoices and found...

Pay Construction Related Vendor Invoices

| 335 Un-Timely Payments | 309 Timely Payments | Difference | CONSTRUCTION CONTRACT MGMT SECTION (CCMS) | PWD FINANCE | MDC FINANCE |
|------------------------|---------------------|------------|---|---|---|
| | | | Need Invoice Processed | | |
| 5.4 | 3.2 | 2.2 | <ul style="list-style-type: none"> Rec Invoice PM Reviews | | |
| 11.4 | 2.3 | 9.1 | <ul style="list-style-type: none"> CM Approves CC Signs | | |
| 11.2 | 1.2 | 10 | <ul style="list-style-type: none"> CCMS Verifies Payroll / Insurance | | |
| 6.9 | 4.5 | 2.4 | | <ul style="list-style-type: none"> Post Transaction Assign Index Code | |
| 34.6 | 11.2 | 23.4 | | | <ul style="list-style-type: none"> Enter Into CCIS Pay Vendor |
| | | | Payment Rc'd | | |

335 Invoices took 10 days longer than Timely Invoices to Verify Vendor Payroll and Insurance

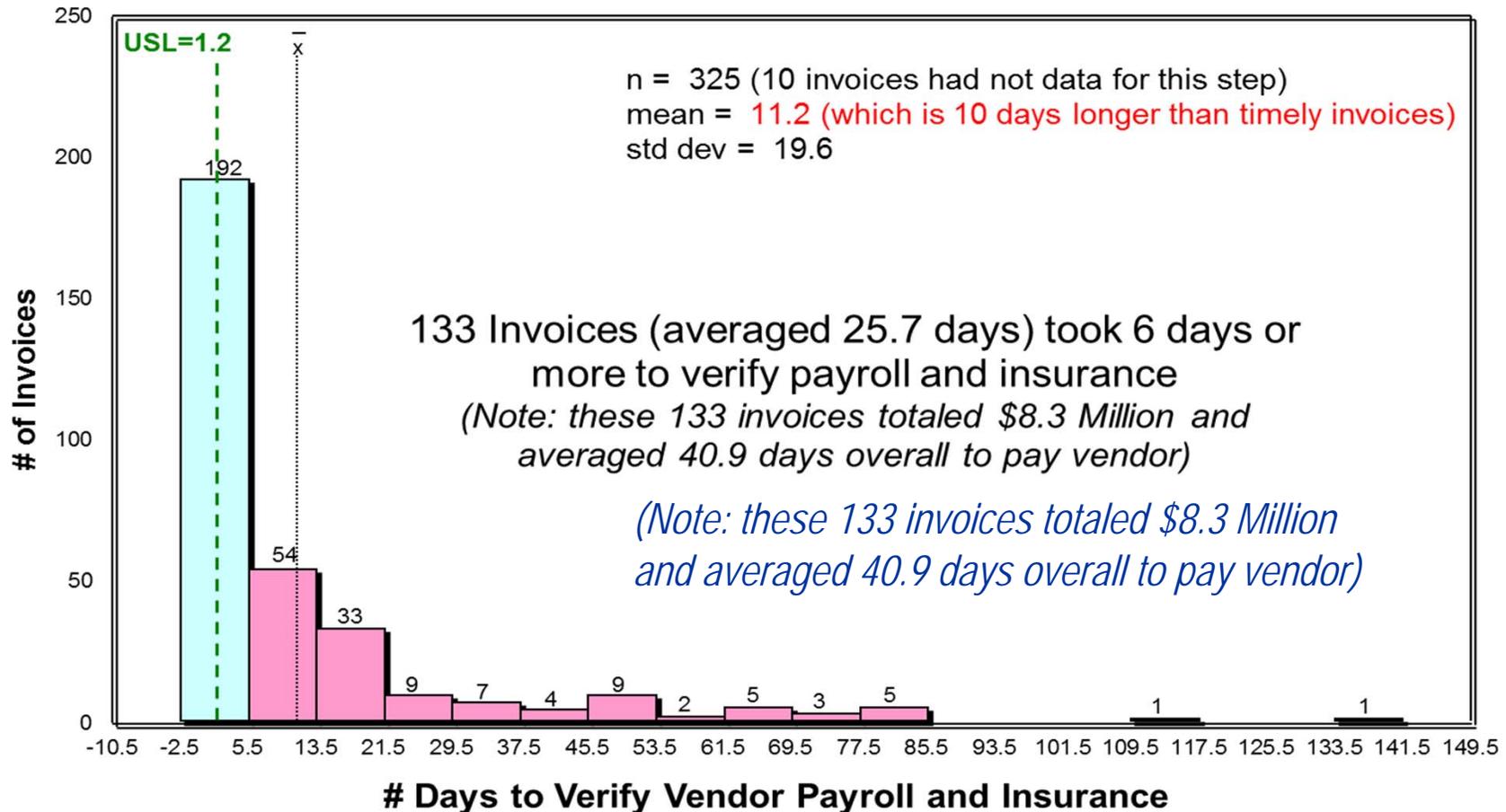
The team looked more closely at the 335 untimely paid invoices taking in step 3: CCMS Verifies Payroll and Insurance.



Stratify the Problem

The team stratified the 335 Untimely Paid Invoices in several ways and found...

CSBE Invoices Untimely Paid (and averaged 10 days or more to Verify Payroll and Insurance than timely Invoices) from Oct 2011- April 2012



The team looked closer at these 133 Invoices.

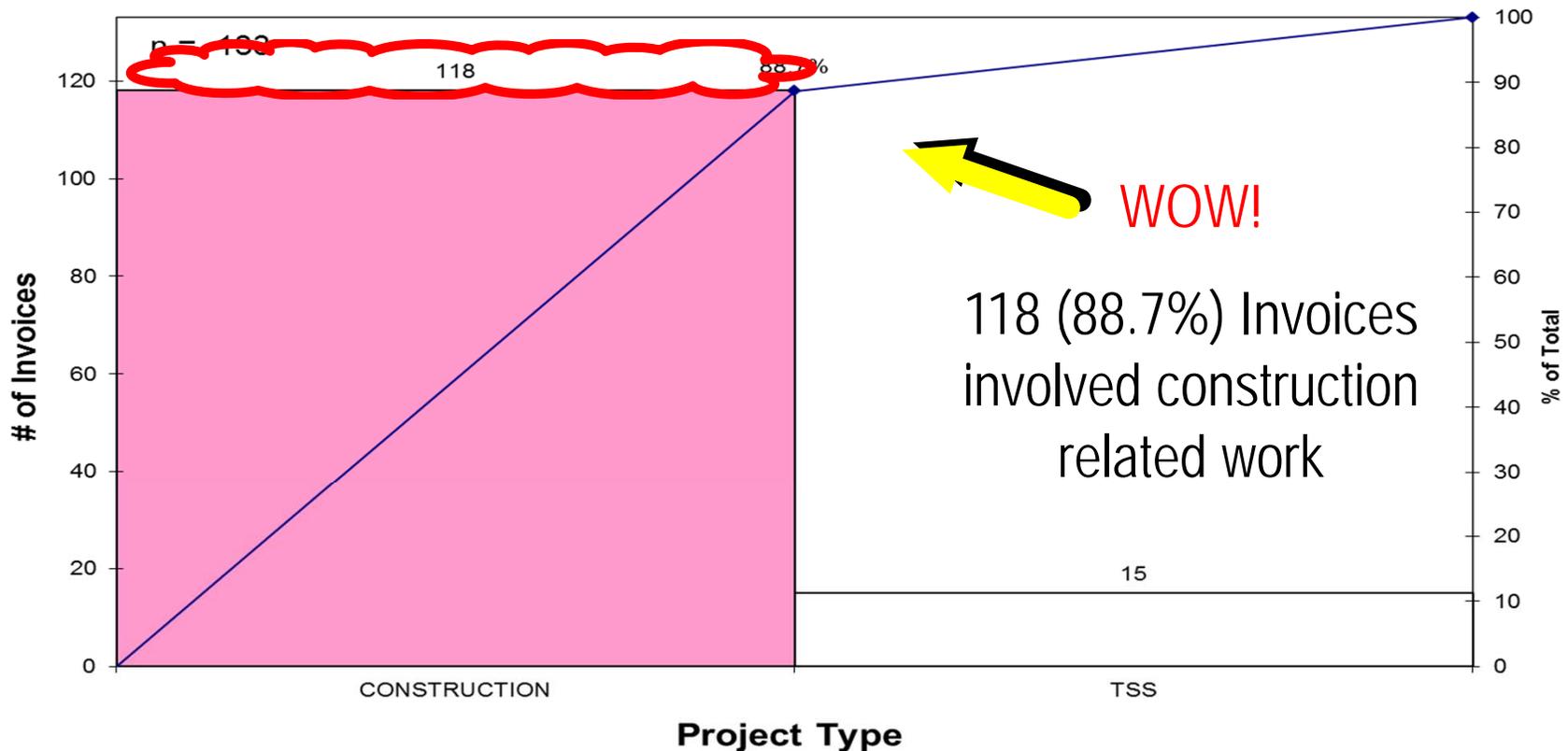


Stratify the Problem (Continued)

The team stratified the 133 Invoices further and found...

5.,6.,7.,8. ✓

CSBE Invoices Untimely Paid took over 6 days and averaged 25.7 days to Verify Vendor Payroll and Insurance from Oct 2011- April 2012



Problem Statement: *118 Construction related CSBE Invoices Untimely Paid averaged 25.7 days (each over 6 days) to Verify Vendor Payroll and Insurance from Oct 2011- April 2012*



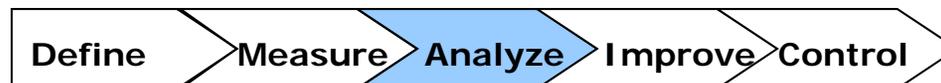
Identify Potential Root Causes

The team sampled 20 of the 118 Untimely Paid Construction related Invoices, reviewed documentation and interviewed involved staff before conducting a Single Case Bore Analysis.

Problem Statement: 118 Construction related CSBE Invoices Untimely Paid averaged 25.7 days (each over 6 days) to Verify Vendor Payroll and Insurance from Oct 2011- April 2012

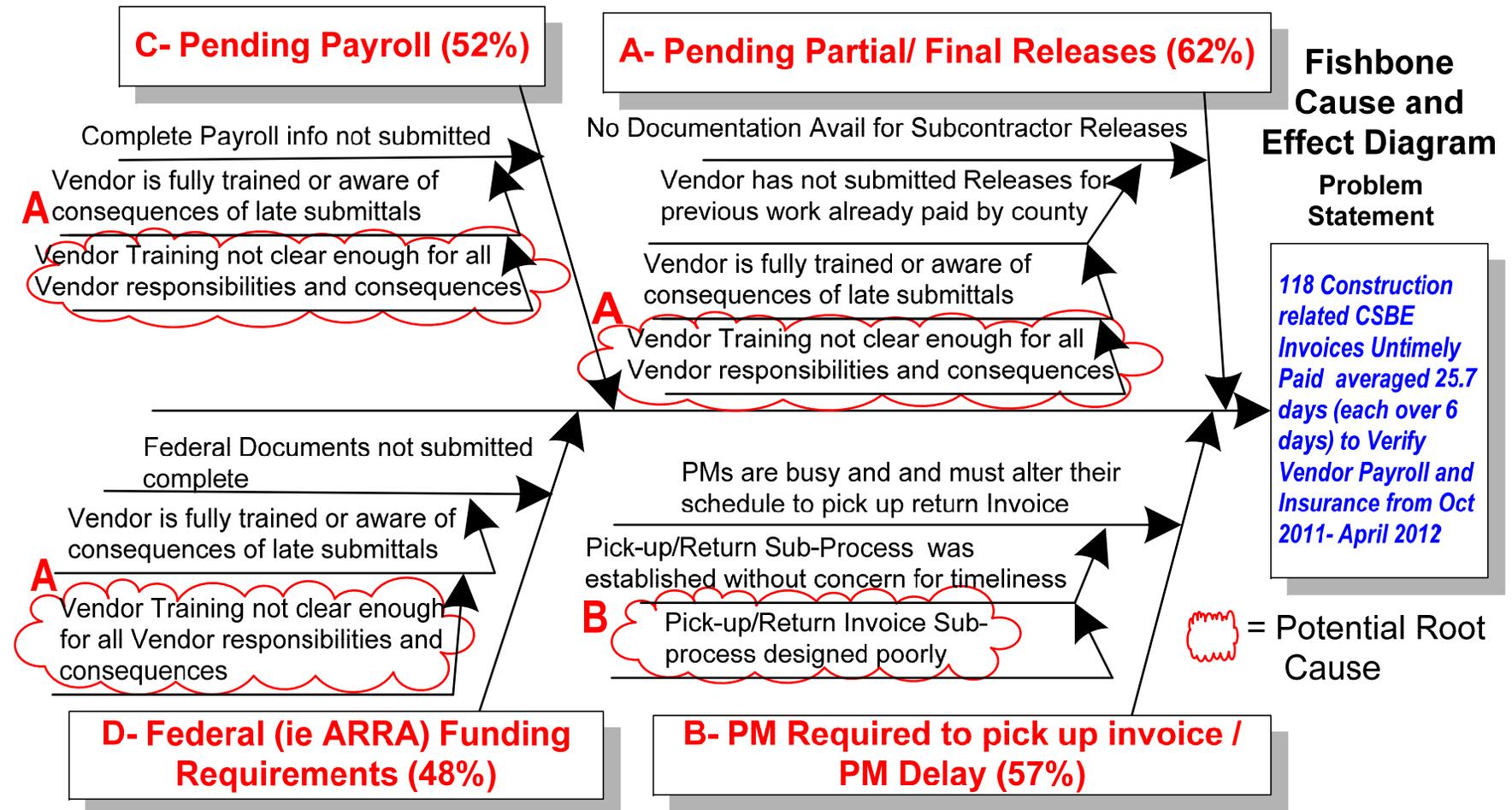
| Reasons or Factors (That possibly contributed to late verification of Payroll and Insurance) | Sampled 20 of the 118 late Invoices | | | | | | | | | | | | | | | | | | | | Total | Percentage |
|---|-------------------------------------|----------|---------|---------|----------|----------|----------|---------|---------|----------|----------|----------|----------|----------|----------|---------|--------|---------|----------|----------|-------|------------|
| | \$53,009 | \$51,706 | \$2,535 | \$1,028 | \$45,967 | \$14,277 | \$34,625 | \$1,270 | \$5,508 | \$19,357 | \$94,932 | \$40,810 | \$21,799 | \$15,826 | \$64,990 | \$9,779 | \$,552 | \$7,921 | \$26,227 | \$24,339 | | |
| 1) Pending Partial/ Final Releases | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | 13 | 62% |
| 2) PM required to pick up invoice/ PM delay | | X | X | X | X | X | X | | X | X | X | X | X | | | | | | X | | 12 | 57% |
| 3) Pending Payroll | X | | | X | X | X | | X | X | X | X | | | | X | X | | | | | 11 | 52% |
| 4) Federal (i.e.ARRA) Funding Requirements | | X | X | | | | X | | | | | X | X | X | X | X | X | | | | 10 | 48% |
| 5) Late Vendor response | X | X | X | | X | X | | | | | | | | | X | X | | | | | 7 | 33% |
| 6) Internal Time Lag/ Communication | X | X | | | | X | | | | | | | | X | | | | | | | 4 | 19% |
| 7) Invoice required (original or revised) | | X | X | | | X | X | | | | | | | | | | | | | | 4 | 19% |
| 8) Certificate of Completion | | | | | | | | | | | X | X | | | X | | | | | | 3 | 14% |
| 9) Process breakdown | | | | X | | | X | | | | | | | | | | | | | | 2 | 10% |
| 10) Problem with dedicated allowance overrun (?) | | | | X | | | | | | | | | | | | | | | | | 1 | 5% |
| 11) Problem with Retainage | | | X | | | | | | | | | | | | | | | | | | 1 | 5% |
| 12) Vacation | | | | X | | | | | | | | | | | | | | | | | 1 | 5% |
| 13) As-Built Drawing | | | | | | | | | X | | | | | | | | | | | | 1 | 5% |
| 14) MUR | | | | | | | | | | | | | | | X | | | | | | 1 | 5% |
| 15) Insurance | | | | | | | | | | | | | | | | X | | | | | 1 | 5% |
| | | | | | | | | | | | | | | | | | | | | | 0 | 0% |
| | | | | | | | | | | | | | | | | | | | | | 0 | 0% |
| | | | | | | | | | | | | | | | | | | | | | 0 | 0% |
| | | | | | | | | | | | | | | | | | | | | | 0 | 0% |

The team next looked closer at these 4 factors.

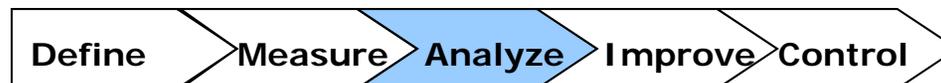


Identify Potential Root Causes

The team completed Cause and Effect Analysis and found...



The team next looked to verify these Potential Root Causes.

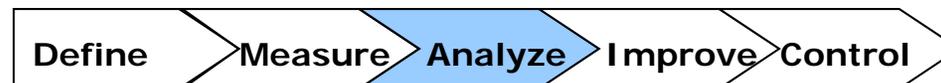


Verify Root Causes

The team collected data to verify the root causes and found.... 11.,12. 

| Root Cause Verification Matrix | | |
|--|---|---|
| Potential Root Cause | How Verified? | Root Cause or Symptom |
| A Vendor Training not clear enough for all Vendor responsibilities and consequences | Reviewed Training Materials and attendance requirements and determined how Vendor friendly and effective at identifying key responsibilities and consequences |  |
| B Pick-up/Return Invoice Sub-process designed poorly | Reviewed written procedures and discuss with PMs and CMS and determined that there is not a timely method to pick-up and return reviewed Invoices |  |

...both were validated as root causes.



Identify and Select Countermeasures

13.,14. ✓

The team brainstormed many countermeasures and narrowed them down to these for evaluation:

Countermeasures Matrix

| Problem Statement | Verified Root Causes | Countermeasures | Legend: | | | |
|---|---|--|---------------|-------------|--------------|------------------------|
| | | | 5-Extremely | | 3-Moderately | |
| | | | 4-Very | | 2-Somewhat | |
| Ratings | | | | | | |
| | | | Effectiveness | Feasibility | Overall | Take Action? Yes/No |
| 118 Construction related CSBE Invoices Untimely Paid averaged 25.7 days (each over 6 days) to Verify Vendor Payroll and Insurance from Oct 2011- April 2012 | A - Vendor Training not clear enough for all Vendor responsibilities and consequences | A1- Enhance Vendor training (e.g add Vendor checklists, Web-based, PPT, examples, Contact info, Consequences, Tips) | 4 | 4 | 16 | Y |
| | | A2- Develop a Invoice Aid that includes a Checklist for the Vendor to help ensure all required documents are submitted and contact info. | 5 | 4 | 20 | Y |
| | B - Pick-up/Return Invoice Sub-process designed poorly | B1- Encourage PM to Sign-off on Invoice in the field | 5 | 5 | 25 | Y |
| | | B2- Instruct Vendor to "Email Invoice Copy" to PM | 3 | 5 | 15 | Y |
| | | B3- Encourage Vendors to Enroll in Electronic Invoice Program | 4 | 4 | 16 | Y |
| | | B4- Create Share Point Site for Vendor Invoices | 3 | 3 | 9 | N |

The team selected 5 countermeasures for implementation.



Identify Barriers and Aids

The team performed Barriers and Aids analysis on the selected Countermeasures.

| Countermeasure(s): Implement 5 Countermeasures to improve Vendor Invoice processing | | |
|---|---|---|
| Barriers | | Aids |
| Impact (H, M, L) | Forces against Implementation | Forces For Implementation |
| M | 1) PM Push Back on additional requirements <i>(Supported by Aid:A,C)</i> | A) Management very supportive of team's efforts in saving costs |
| H | 2) Limited resources to develop and deliver training <i>(Supported by Aid:A,B,C)</i> | B) County already does many types of training and training methods utilized |
| | | C) Vendor supportive of efforts |

The team next sought to incorporate this analysis into the team's Action Plan.



Develop and Implement Action Plan

Legend:
 = Actual
 = Proposed

The team implemented an Action Plan for the team's Countermeasures.

16. 

WHAT: Implement 5 Countermeasures to improve Vendor Invoice Processing

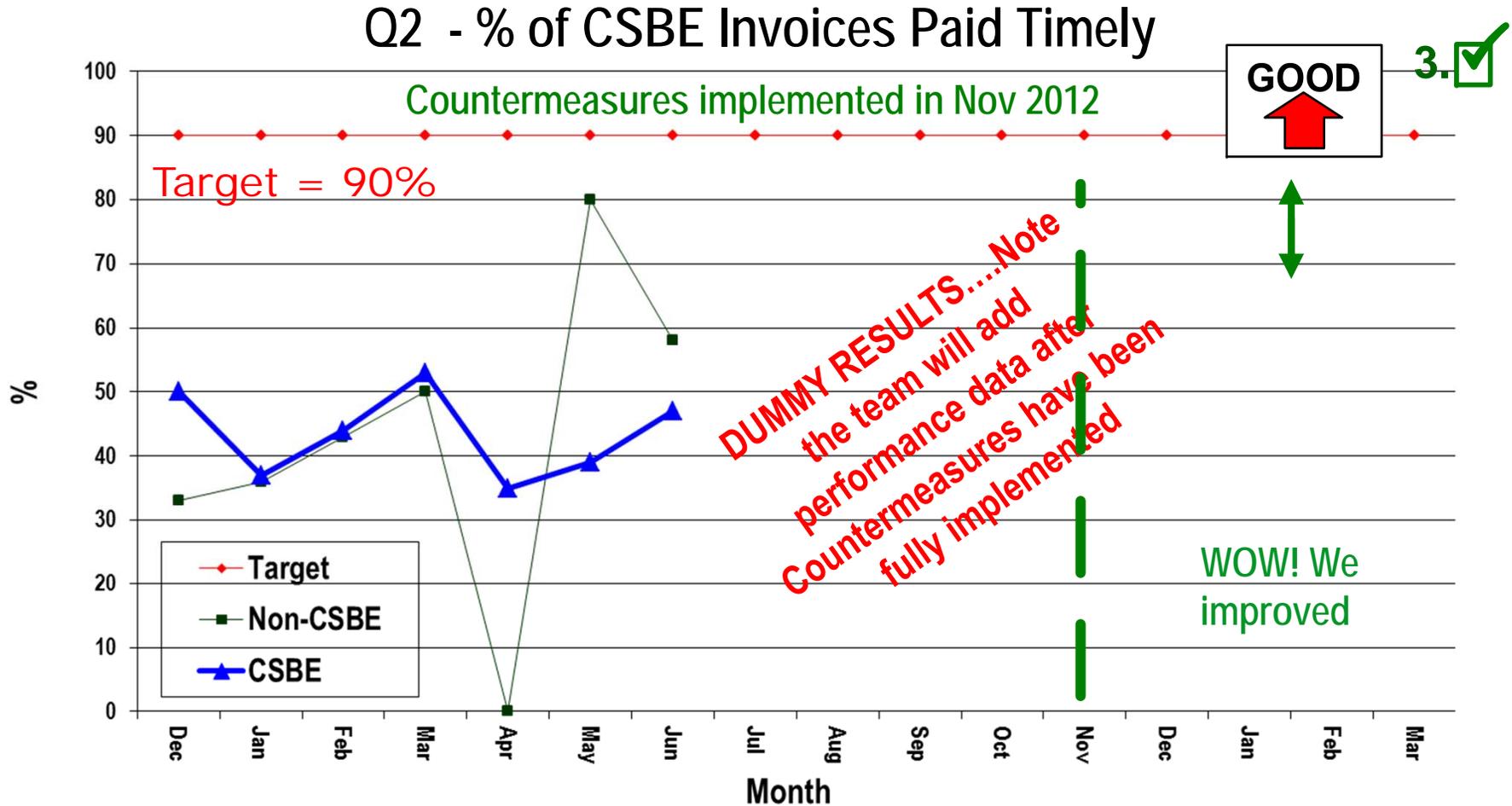
| HOW | WHO | WHEN | | | | | | | |
|---|------------|------|-----|----------|----------|------|-----|-----|----------|
| | | 2012 | | | | 2013 | | | |
| | | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr |
| 1. Develop Countermeasures: | | | | | | | | | |
| A1- Enhance Vendor training (e.g. add Vendor checklists, Web-based, PPT, examples, Contact info, Consequences, Tips) | Team / CMS | | | | 11/20/12 | | | | |
| A2- Develop a Invoice Aid that includes a Checklist for the Vendor to help ensure all required documents are submitted and contact info. | Team / CMS | | | | 11/20/12 | | | | |
| B1- Encourage PM to Sign-off on Invoice in the field | Rodney | | | 10/31/12 | | | | | |
| B2- Instruct Vendor to "Email Invoice Copy" to PM | Rodney | | | 10/31/12 | | | | | |
| B3- Encourage Vendors to Enroll in Electronic Invoice Program | Aneisha | | | | | | | | |
| 2. Secure Management Approval of Countermeasures (share benefits and cost savings) | Team | | | | 11/30/12 | | | | |
| 3. Communicate/Train PWWM Staff in Countermeasures and related policies/procedures (share benefits and cost savings) | Team | | | | | | | | |
| 4. Implement Pilot for Countermeasures | Team | | | | | | | | |
| 5. Review Pilot and determine Benefits and adjust as necessary and present results to management | Team | | | | | | | | 3/31/13 |
| 6. Establish On-going responsibilities and standardize countermeasures into operations | Team | | | | | | | | |
| | | | | | | | | | On-going |



Review Results

17.,18.,19.,20.

The team collected indicator data and reviewed results of it's countermeasures



The team was encouraged by the results and will continue to monitor the countermeasures.



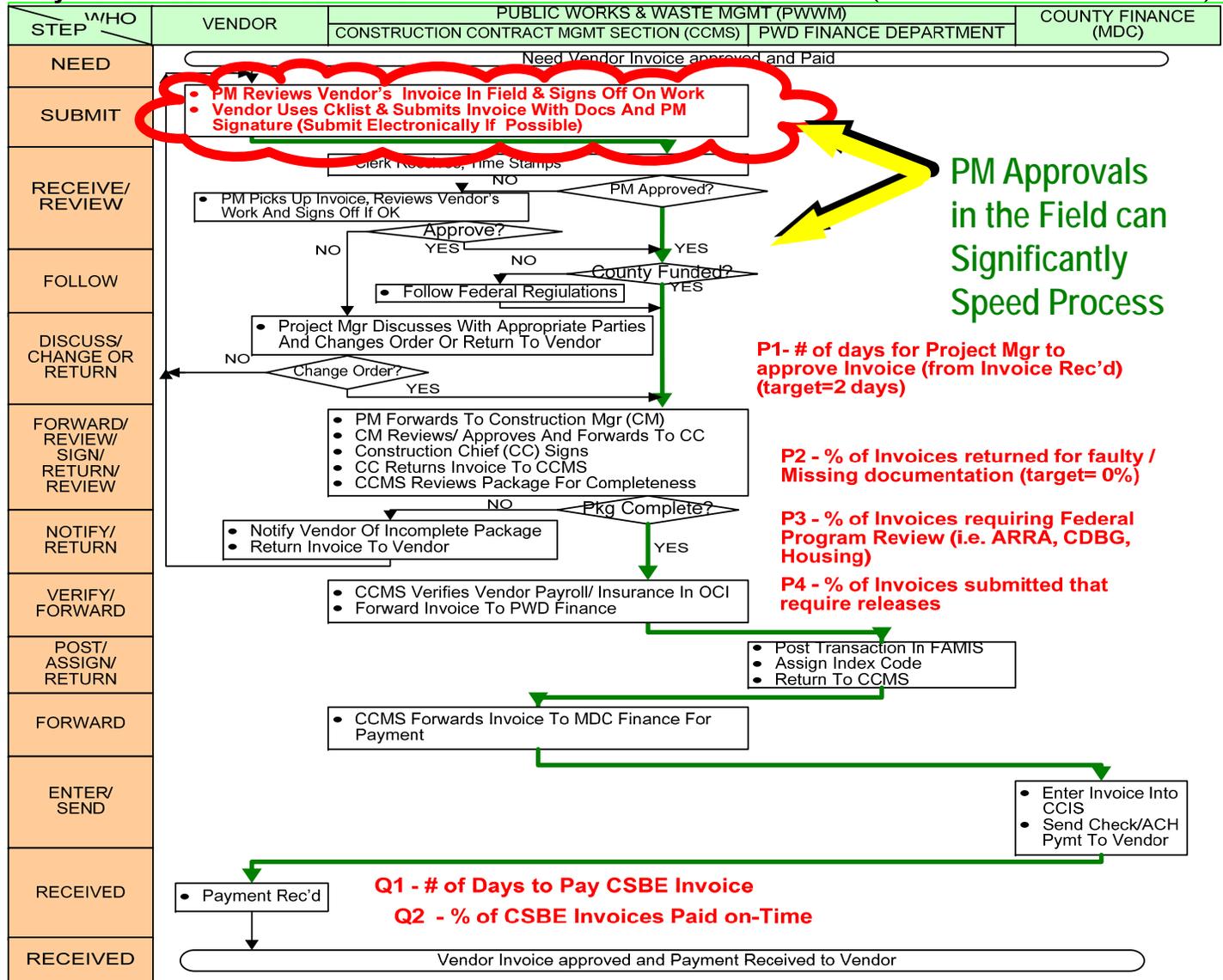
Standardize Countermeasures

21.,22.,23. ✓

The team revised indicators and incorporated the improvements into the Process flowchart.

Pay Construction Related Vendor Invoices

(Process Owner: Aneisha Daniel)



The team looked to standardize the Indicator monitoring



Standardize Countermeasures

21.,22.,23. ✓

The team Developed a Process Control System (PCS) to monitor the process on-going.

| Process Control System | | | | | | |
|---|---|--|---|----------------|-----------------------------------|--|
| Process Name: Pay Construction Related Vendor Invoices | | | Process Owner: Aneisha Daniel | | | |
| Process Customer: CSBE Vendors | | | Critical Customer Requirements: Pay Invoice Accurately and Timely (within 14 days) | | | |
| Process Purpose: Pay Vendors for Services Rendered | | | Current Sigma Level: TBD | | Outcome Indicators: Q1, Q2 | |
| Process and Quality Indicators | | | Checking / Indicator Monitoring | | | Contingency Plans / Misc. • Actions Required for Exceptions • Procedure References |
| Process Indicators | Control Limits | Data to Collect | Timeframe (Frequency) | Responsibility | Who will Check? | |
| And | Specs/ Targets | What is Checking Item or Indicator Calculation | When to Collect Data? | | | |
| Quality Indicators | | | | | | |
| P1 | # of days for Project Mgr to approve Invoice (from Invoice Rec'd) (target=2 days) | TBD | 100*(# of Trips Loaded within Standard Weights)/ (# of Trips) | Monthly | CCMS | • PWS |
| P2 | % of Invoices returned for faulty / Missing documentation | 0% | 100*(# of Invoices returned for faulty/ Missing documentation)/ (# Invoices rec'd) | Monthly | CCMS | • PWS |
| P3 | % of Invoices requiring Federal Program Review (i.e. ARRA, CDBG, Housing) | TBD | 100*(# of Invoices requiring Federal Program Review (i.e. ARRA, CDBG, Housing))/(# of Invoices Rec'd) | Monthly | CCMS | • PWS |
| P4 | % of Invoices submitted that require releases | TBD | % of Invoices submitted that require releases | Monthly | CCMS | • PWS |
| Q1 | # of Days to Pay CSBE Invoice | 14 | # of Days to Pay CSBE Invoice | Monthly | CCMS | • PWS |
| Q2 | % of CSBE Invoices Paid on-Time | 90% | % of CSBE Invoices Paid on-Time | Monthly | CCMS | • PWS |

Approved: _____ Date: _____ Rev #: _____ Rev Date: _____

The team looked ahead to the future.



Identify Lessons Learned

24.,25. 

Lessons Learned

- 1) Root Causes are either “Standards that Fail” or “People Failing Standards”
- 2) Graphs (Paretos, Histograms, etc.) are powerful analysis tools and were very helpful to the team in analyzing the data.
- 3) Identifying Root Cause(s) examining the data using the tools and techniques is better than guessing at what you think are the causes.
- 4) Don't jump to conclusions when reviewing data. Careful examination proved more effective and helped the team follow the pertinent data that led to Identifying Root Cause(s)
- 5) Single Case Bore allowed team to use detail data to better prepare for fishbone

Next Steps

- 1) Continue to monitor the countermeasures and performance results.

