Improving Cost Efficiency and Customer Service for the Phoenix Water Services Department

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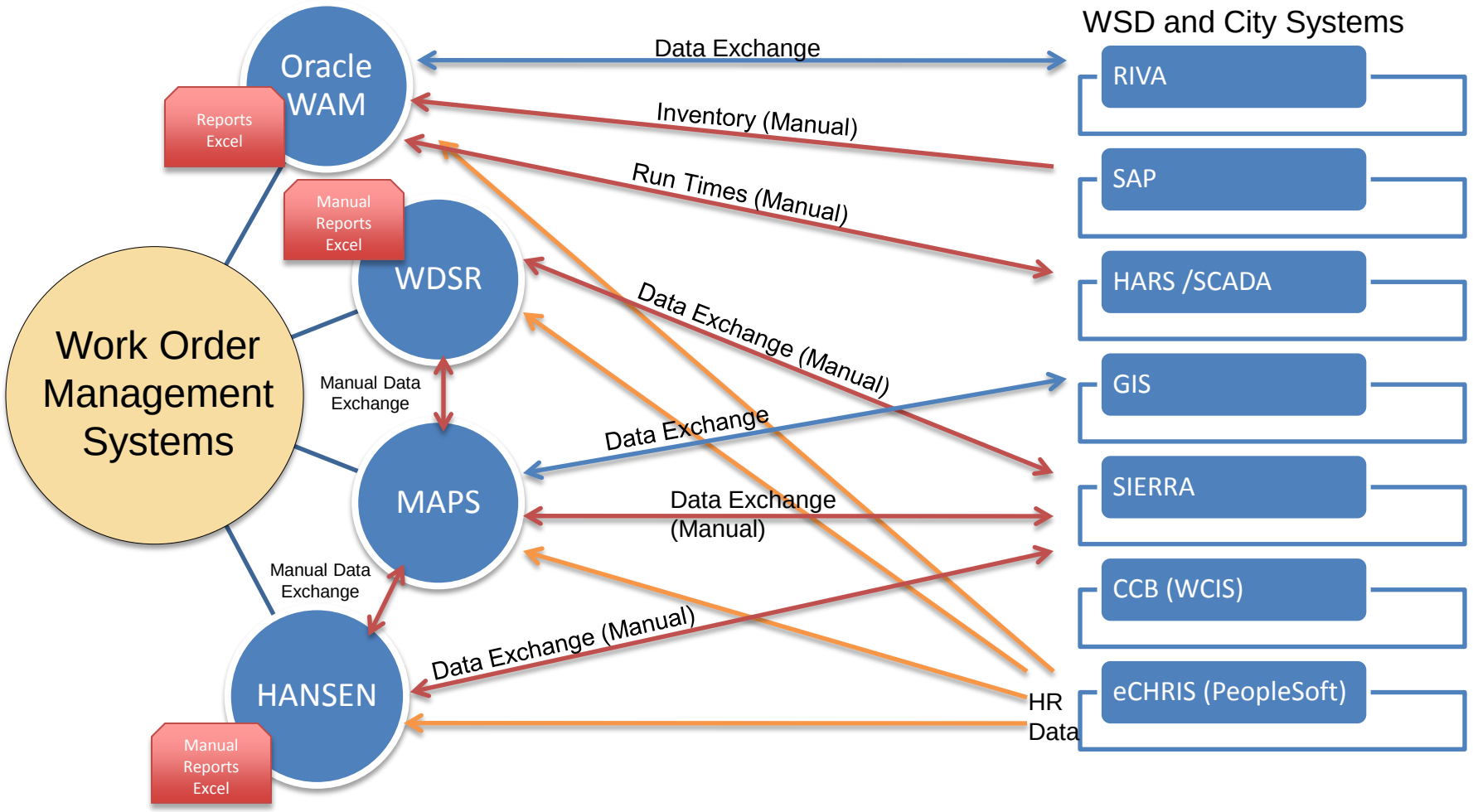
IT Governance

- New Deputy CIO position created in 2006 for Water Services Department
- Reports to City CIO and Assistant Water Services Director
- Joined the City in 2006
- All of my prior work experience was in private sector

Business Issues

- Limited view of deployed assets
- No consolidated view of spare parts inventory
- No real-time work order scheduling
- Limited preventative maintenance
- Limited long term replacement cost forecasting
- Numerous manual data entry tasks resulted in inaccurate or inconsistent data
- No end-to-end view of customer service requests

Technology bottleneck…

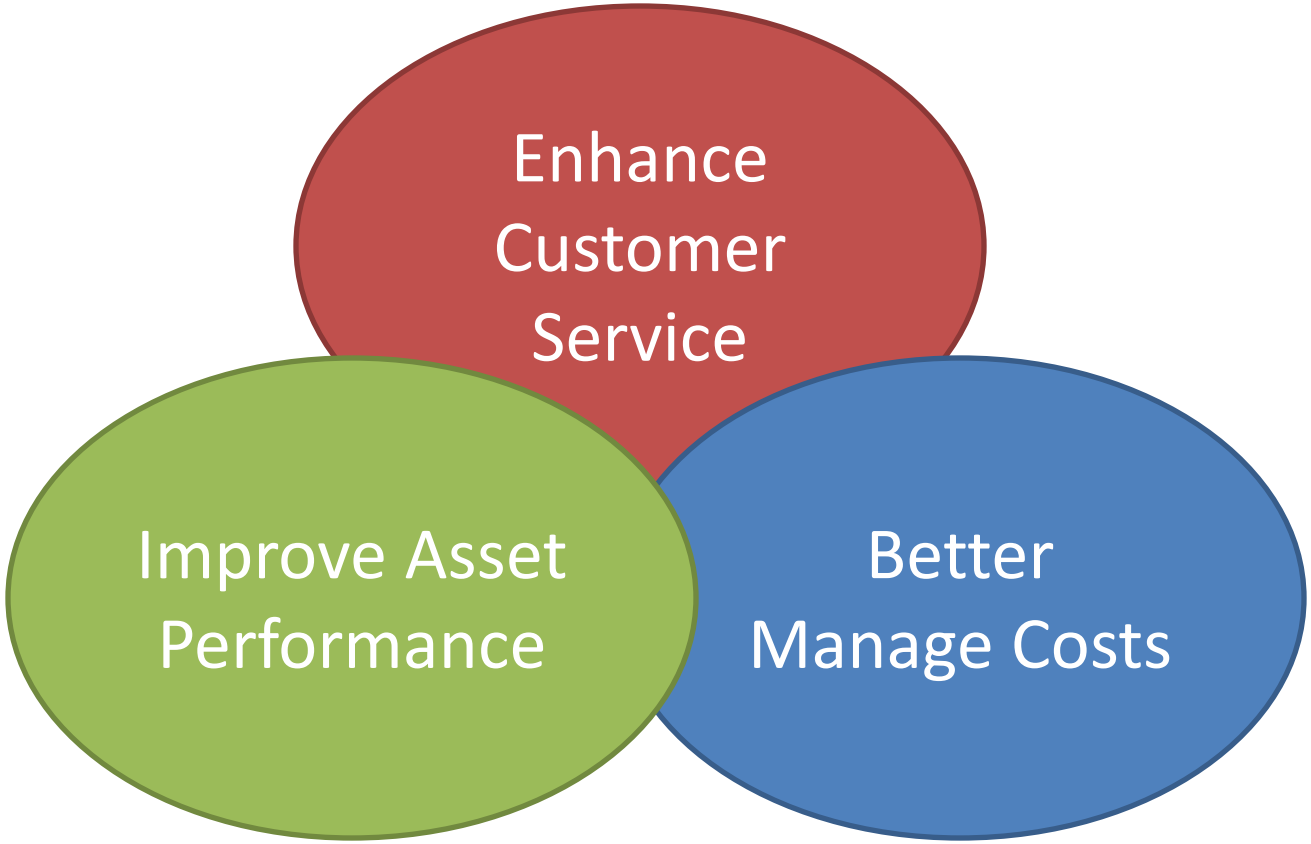


Why did this happen?

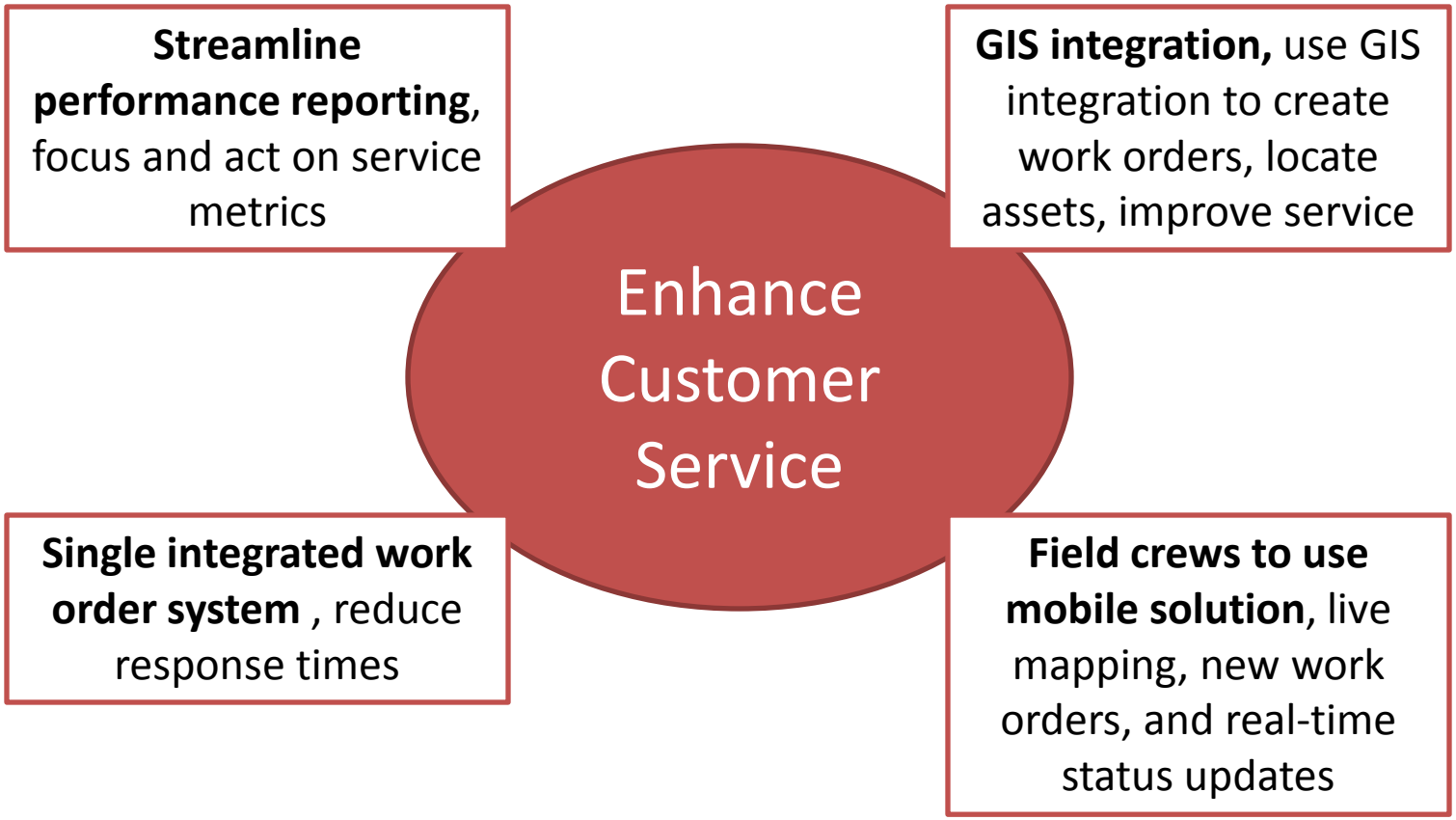
- No defined strategy for work order and asset management
- Water Services did not think department wide, technology decisions were made at division level
- Didn’t rely on citywide IT infrastructure

We needed a vision!

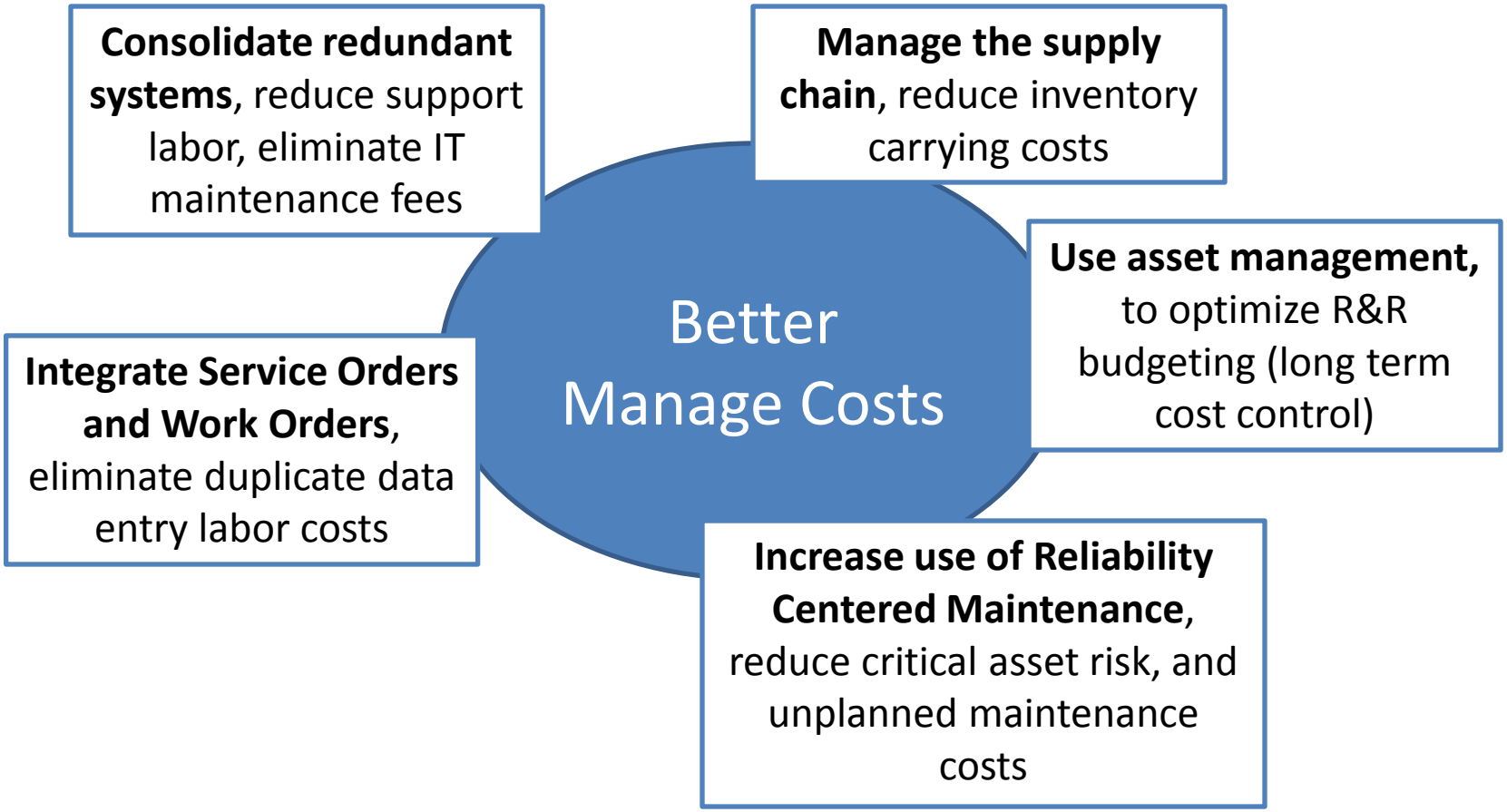
Department Goals in Three Broad Areas



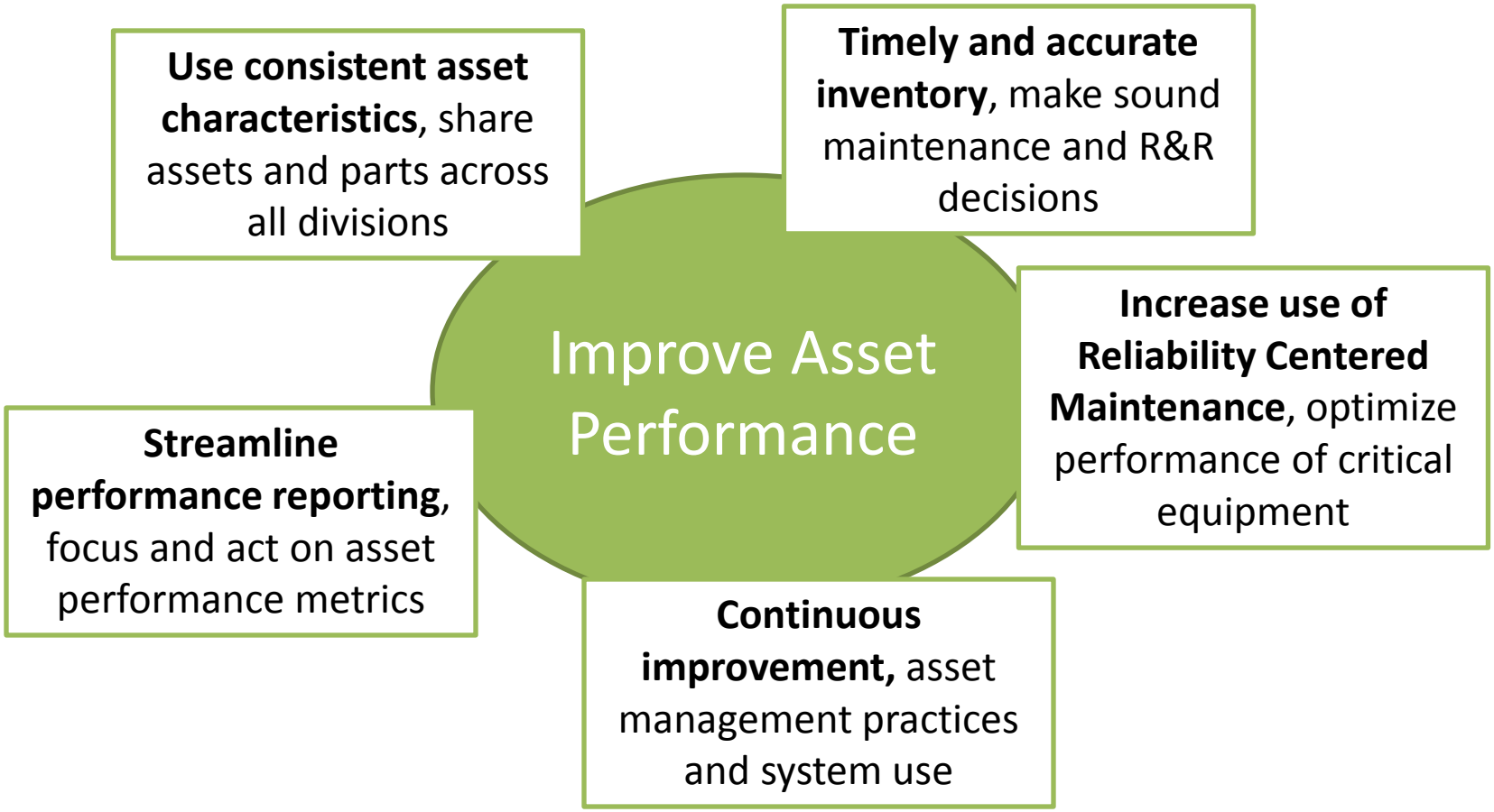
Goals to Enhance Customer Service



Goals to Better Manage Costs



Goals to Improve Asset Performance

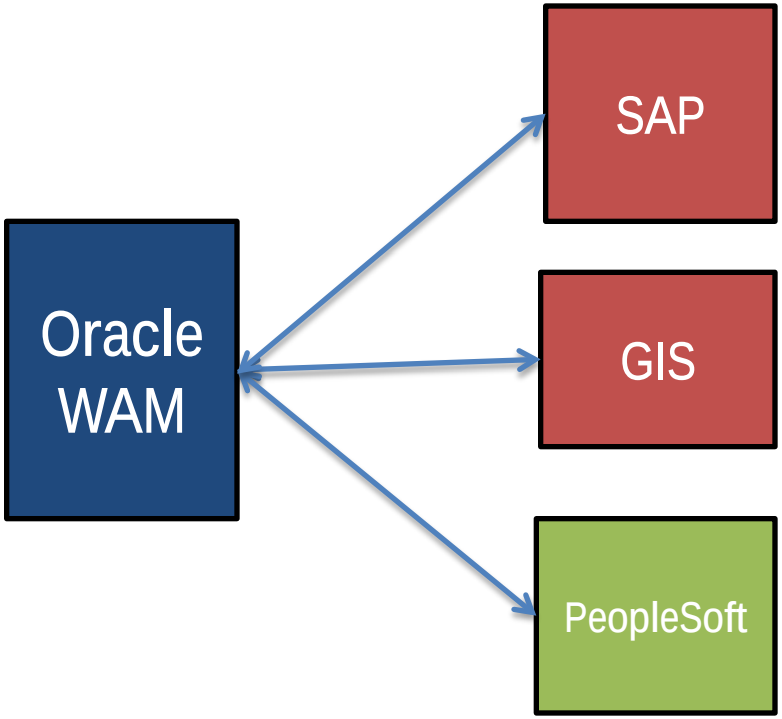


What did we do?

- Engaged Red Oak
  - Develop business requirements
  - Assess current technology
  - Develop strategy
  - Develop high level project plan and phases
  - Develop a staffing and support plan

Recommendation: *Migrate to Oracle's WAM application*

…to an integrated solution



Legend

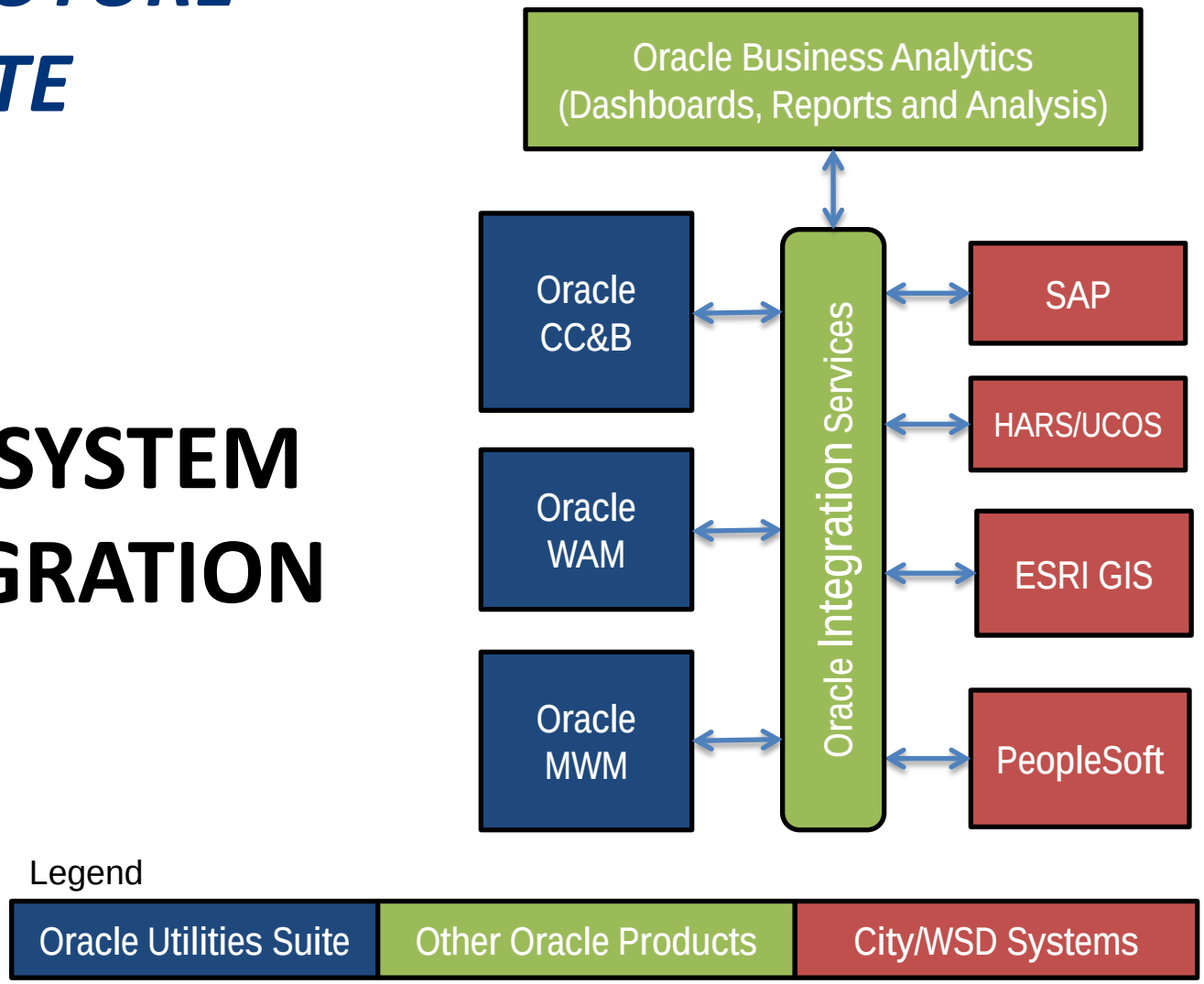
Oracle WAM	Other Oracle Products	City/WSD Systems

Goals
1. Consolidate Redundant IT Systems
2. Consistent WAM Asset characteristics
3. Timely and Accurate Inventory
4. Integrated Service and Work Order Process
5. Managed Supply Chain
6. Reliability Centered Maintenance (RCM) at Plants
7. Streamlined Performance Reporting
8. Field Crew to Use Mobile Solution
9. GIS Integration for WAM
10. Optimize R&R Budget
11. Continuously Improve
12. Establish WAM Roles and Responsibilities

Balancing Goals and Cost

....FUTURE STATE

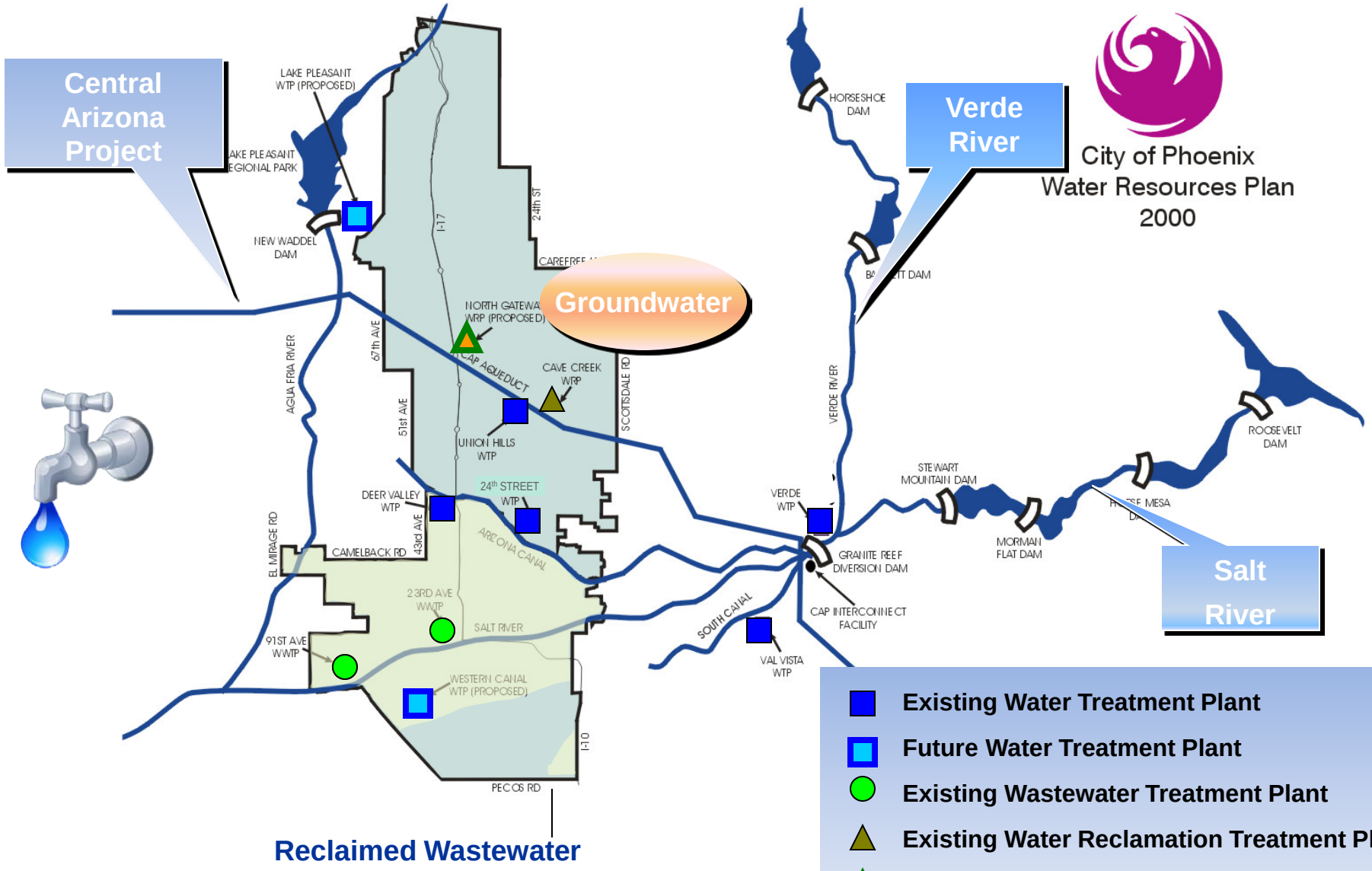
FULL SYSTEM INTEGRATION



Background

- Population Served – 1,507,899 over 540 Sq. miles
- Plants
  - Water Production - 5
  - Wastewater Treatment – 2
- Miles of Linear Infrastructure
  - Water – 6,953
  - Wastewater – 4,984
- Assets
  - Water – 1,570,000
  - Wastewater – 670,000
  - Hydrants – 54,001

Phoenix Area Water Sources



Reclaimed Wastewater

Preliminary Observations

Organizational

- No single individual or organizational unit responsible for work and asset management oversight
- Division-level organizations to support Work and Asset Management (WAM) are inconsistent
- System administration and enhancement support for “WAM” is minimal
- Most interviewed employees want change

Preliminary Observations

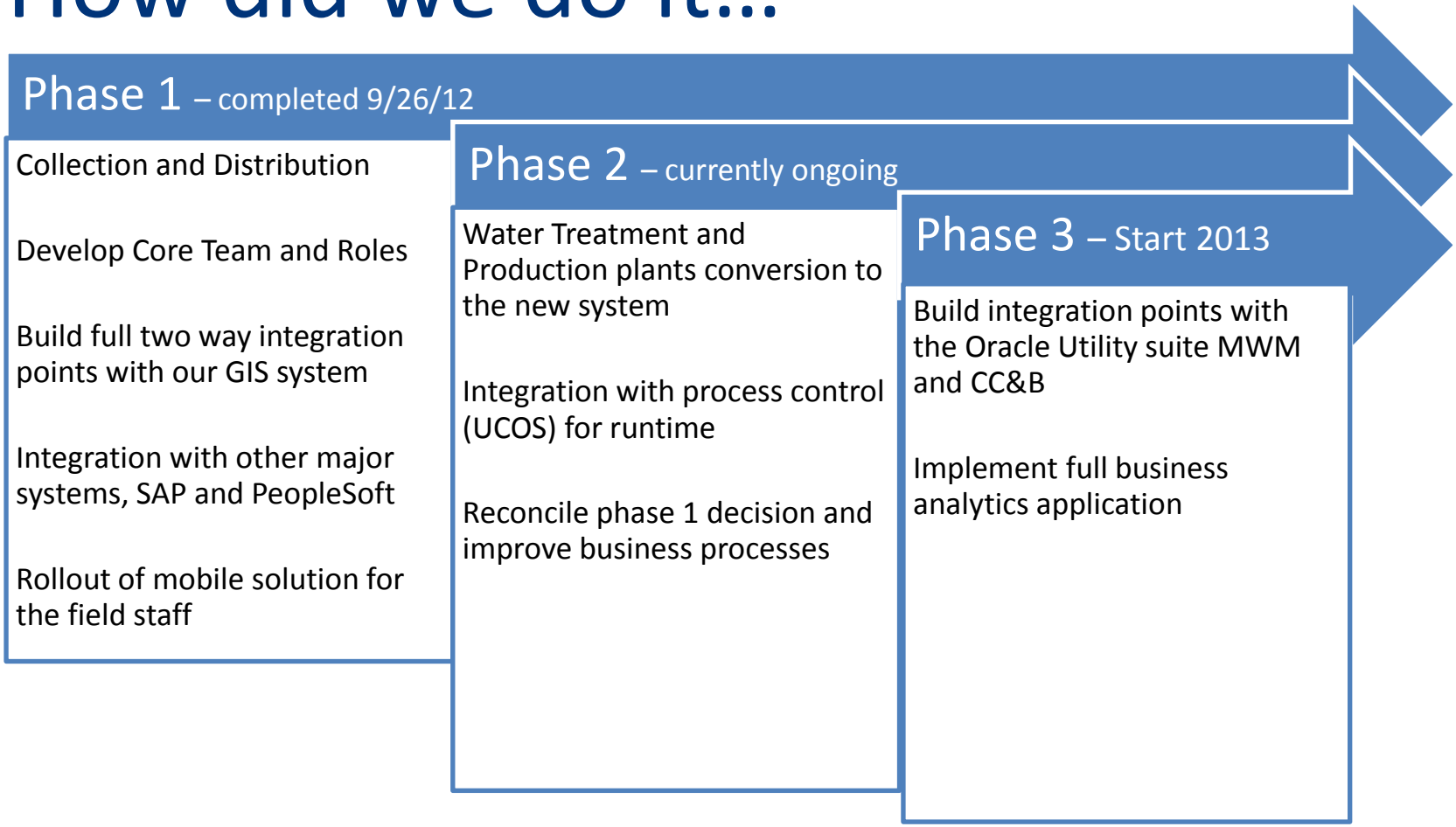
Work Process

- Many “WAM” processes are disjointed
  - Service request and work order coordination
  - After-the-fact work orders; duplicate data entry
  - Condition assessments separate from work order management
- Asset Inventory is not complete or consistently applied
- Asset Hierarchy is geography-based and may not facilitate desired queries or reporting
- Work orders are not labor-costed
- Limited coordination of CIP/R&R planning and “WAM” processes

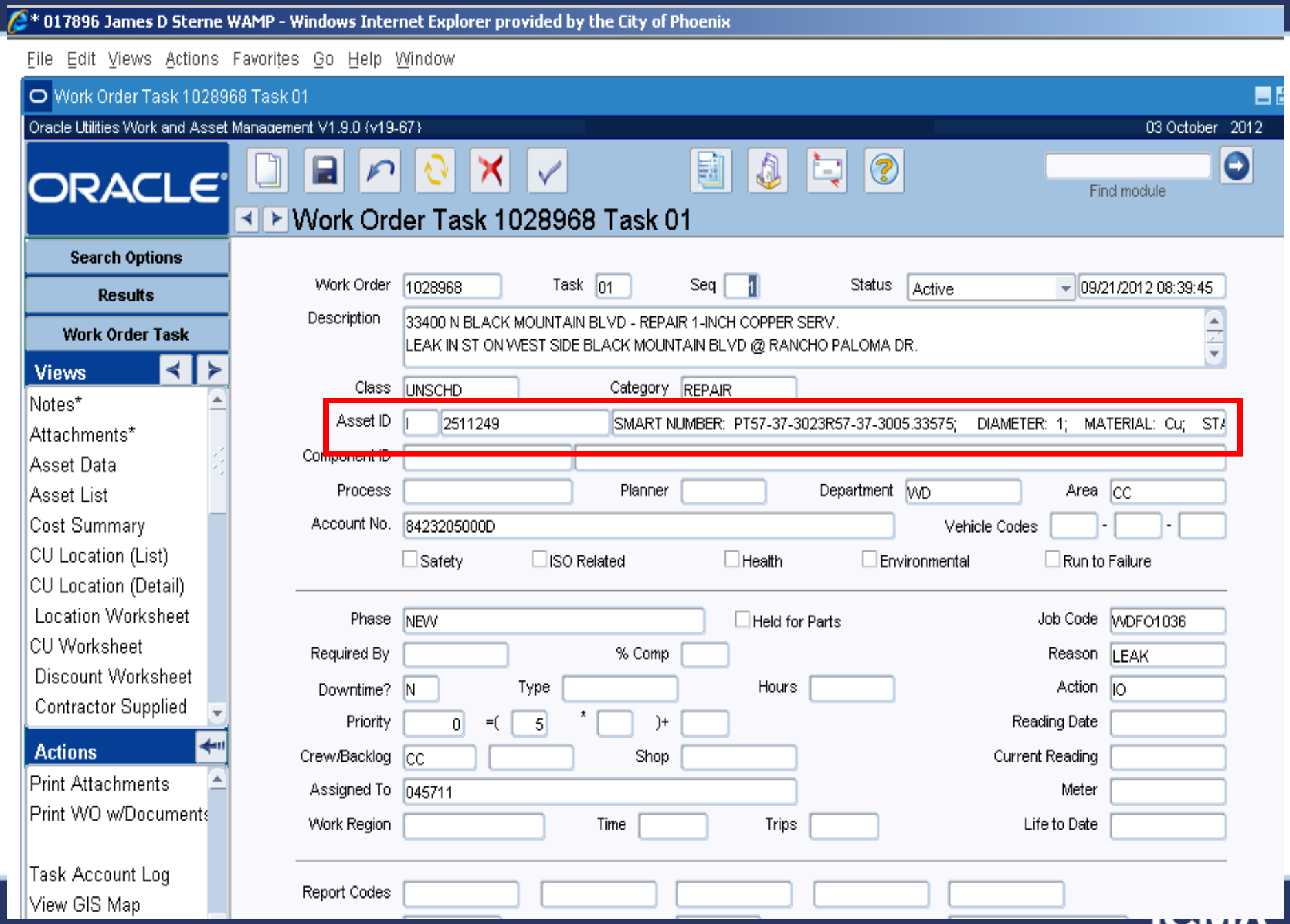
Preliminary Observations
Information Systems

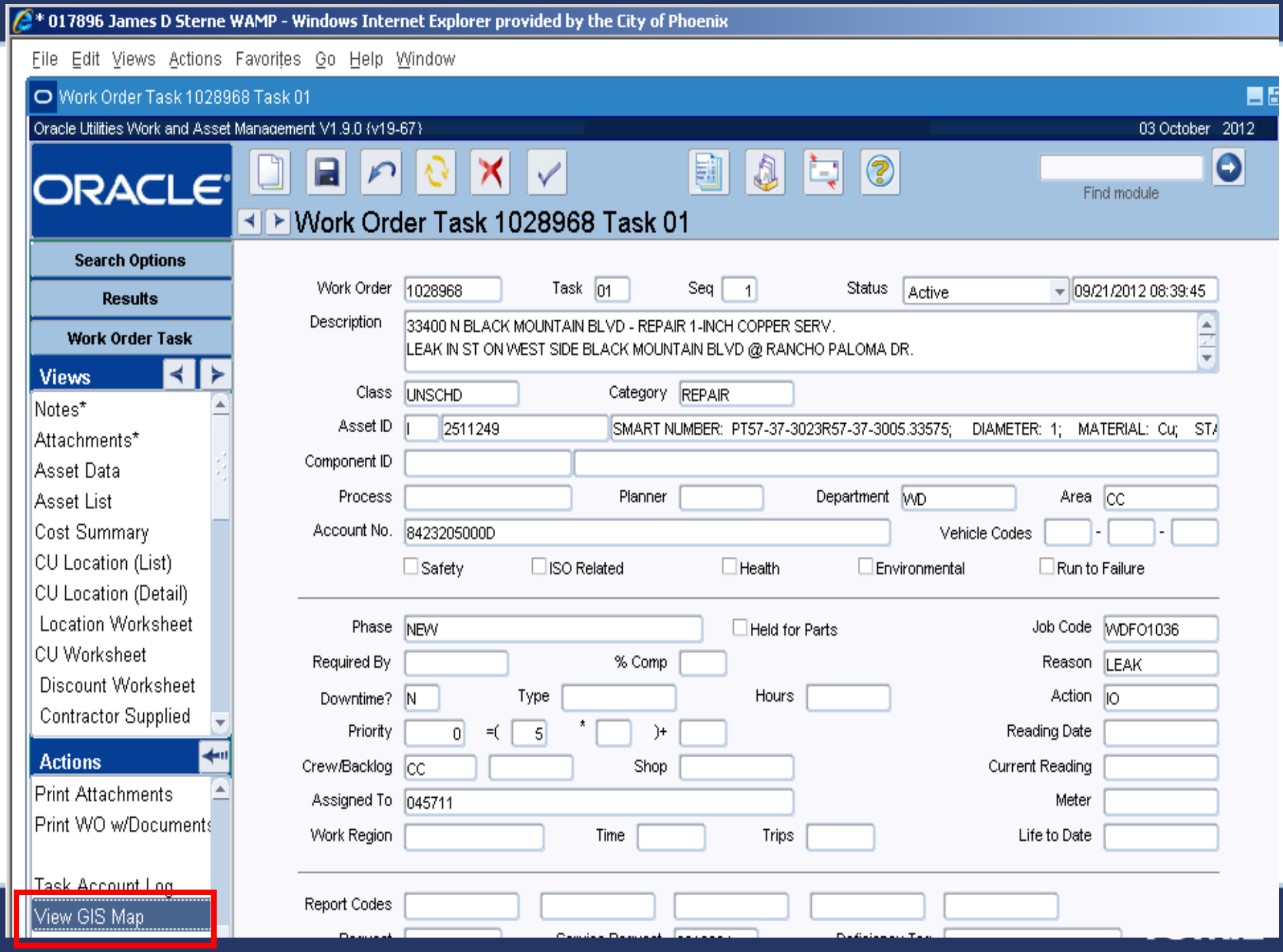
- Current users OK with Oracle WAM
- Very little attachment to legacy work order systems
- Many special purpose, obsolete software tools
- Very little automatic integration of major systems
- Software ease of use a big current and future issue

How did we do it…



Demo


* 017896 James D Sterne WAMP - Windows Internet Explorer provided by the City of Phoenix
File Edit Views Actions Favorites Go Help Window
Work Order Task 1028968 Task 01
Oracle Utilities Work and Asset Management V1.9.0 (v19-67)
03 October 2012
ORACLE
Find module
Work Order Task 1028968 Task 01
Search Options
Results
Work Order Task
Views
Notes*
Attachments*
Asset Data
Asset List
Cost Summary
CU Location (List)
CU Location (Detail)
Location Worksheet
CU Worksheet
Discount Worksheet
Contractor Supplied
Actions
Print Attachments
Print WO w/Documents
Task Account Log
View GIS Map
Work Order 1028968 Task 01 Seq 1 Status Active 09/21/2012 08:39:45
Description 33400 N BLACK MOUNTAIN BLVD - REPAIR 1-INCH COPPER SERV.
LEAK IN ST ON WEST SIDE BLACK MOUNTAIN BLVD @ RANCHO PALOMA DR.
Class UNSCHD Category REPAIR
Asset ID I 2511249 SMART NUMBER: PT57-37-3023R57-37-3005.33575; DIAMETER: 1; MATERIAL: Cu; STA
Component ID
Process Planner Department WD Area CC
Account No. 8423205000D Vehicle Codes
Safety ISO Related Health Environmental Run to Failure
Phase NEW Held for Parts Job Code WDFO1036
Required By % Comp Reason LEAK
Downtime? N Type Hours Action IO
Priority 0 =(5 *)+ Reading Date
Crew/Backlog CC Shop Current Reading
Assigned To 045711 Meter
Work Region Time Trips Life to Date
Report Codes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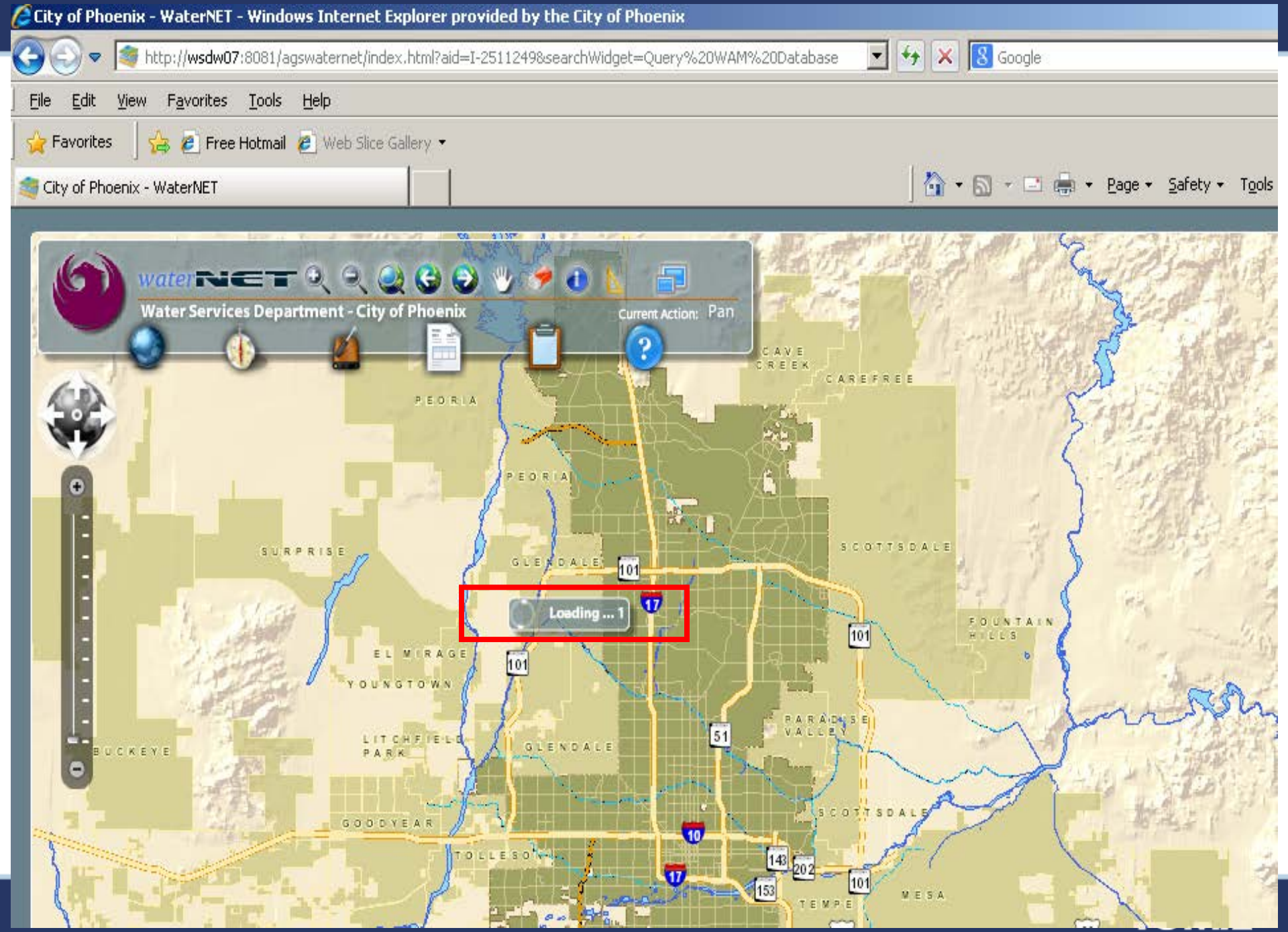
City of Phoenix - WaterNET - Windows Internet Explorer provided by the City of Phoenix
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Google
File Edit View Favorites Tools Help
Favorites
Free Hotmail
Web Slice Gallery
City of Phoenix - WaterNET
Page
Safety
Tools
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Water Services Department - City of Phoenix
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PEORIA
CAVE CREEK
CAREFREE
SURPRISE
GLENDALE
SCOTTSDALE
EL MIRAGE
YOUNGTOWN
FOUNTAIN HILLS
PARADISE VALLEY
LITCHFIELD PARK
BUCKEYE
GOODYEAR
TOLLESON
TEMPE
MESA
101
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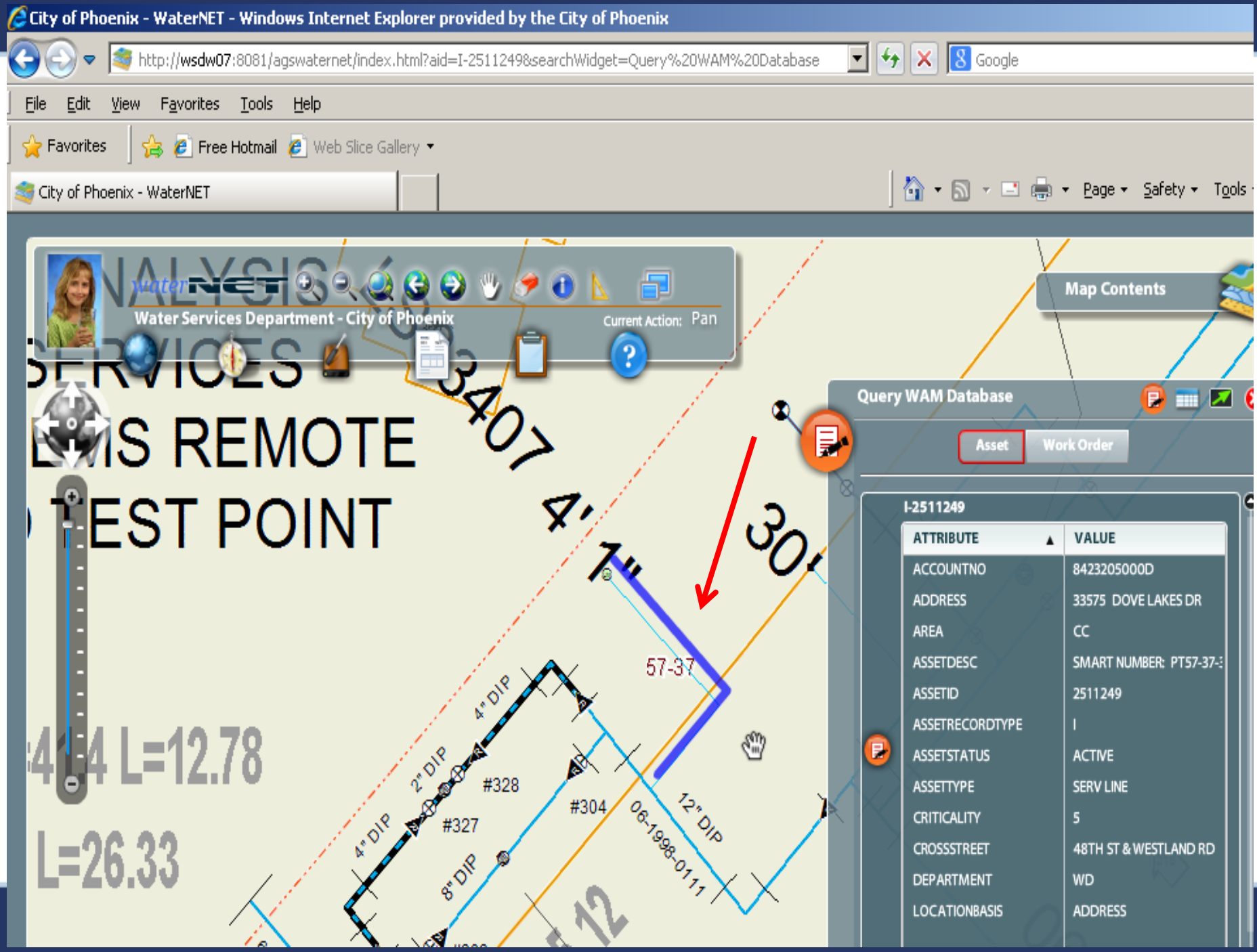
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File Edit View Favorites Tools Help
Favorites
Free Hotmail
Web Slice Gallery
City of Phoenix - WaterNET
Page Safety Tools
waterNET
Water Services Department - City of Phoenix
Current Action: Pan
Map Contents
Query WAM Database
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Work Order
I-2511249
ATTRIBUTE
VALUE
ACCOUNTNO
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ADDRESS
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AREA
CC
ASSETDESC
SMART NUMBER: PT57-37-
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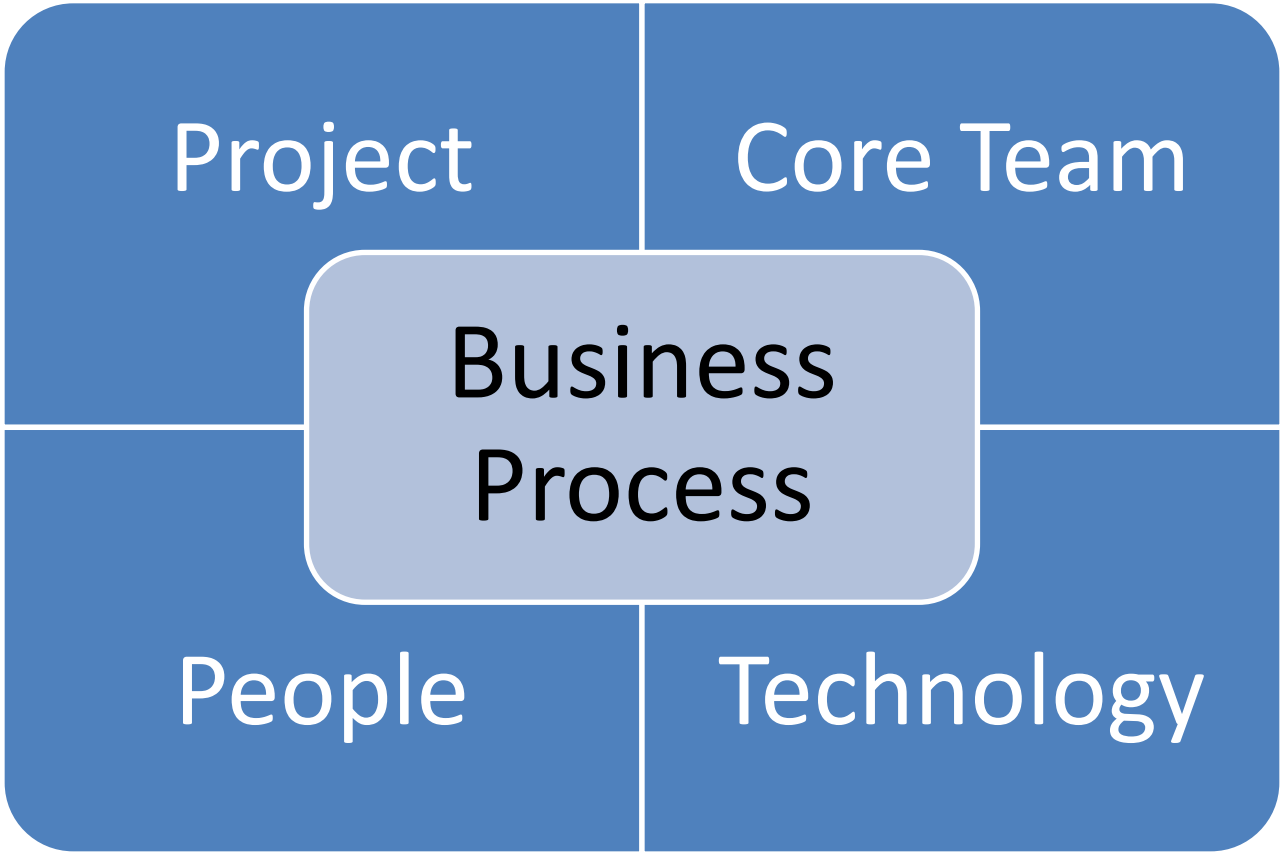
Real Outcomes



Project

- Phased projects will need to be reconciled after completed implementation
- Survey your users often
- Don’t treat your vertical assets like linear assets
- Listen to the SME in “your” organization
- Start your change management early in the project

Core Team

- Created the role of Asset Manager
  - With the duties of *Business Process Optimization*
  - Asset Organization Linear vs. Vertical
  - Asset specifications consistency and QA/QC
  - Role is similar to a Business Analyst with the focus on Assets
- Larger support staff after go live than you think (consider 24x7)

People

- Steep learning curve for the end users
- Slow adoption to new business processes
- Continuous QA/QC is really necessary
- Continuous training
- Face time with the field staff at their location
- Share your reporting with the users, as well as management

Technology

- Valuable integration with GIS
- Saved duplicate data entry with interface with financial system
- Field use of laptop has reduced travel time
- Easy access to GIS and live system data has provided increased productivity
- Document management
- Keeping vanilla has its drawbacks

Business Processes

- Standardized business processes across the department for asset management and WO processing
- Increase accountability for inventory
- “Real” costing for assets maintenance
- Asset work history is more complete

Goals Report Card

Goals
1. Consolidate Redundant IT Systems
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Financial Outcome

- Operating saving will be $2.7 million dollars over the first five years of this consolidation.

Financial Outcome

- **Comparison of Four Maintenance Programs** :
  - ✓ **Reactive Maintenance (Breakdown or Run-to-Failure Maintenance):** Cost: $18/hp/yr
  - ✓ **Preventive Maintenance (Time-Based Maintenance):** Cost: $13/hp/yr
  - ✓ **Predictive Maintenance (Condition-Based Maintenance):** Cost: $9/hp/yr
  - ✓ **Reliability Centered Maintenance (Pro-Active or Prevention Maintenance):** Cost: $6/hp/yr

Reference: Piotrowski, J. April 2, 2001. *Pro-Active Maintenance for Pumps, Archives, February 2001* .

More reasons we will be more efficient in the future

- ❑ Proactive vs. Reactive Maintenance (increased system reliability)
- ❑ Reduced Asset Maintenance Costs
- ❑ Increased Accuracy of Future CIP Planning
- ❑ Single System Asset Information and History

Final Reason for Success
--------Business Analytics---------

- ❑ Management level reports
- ❑ Ability to drill down to details
- ❑ Speed to develop reports
- ❑ Ad-hoc reporting needs
- ❑ Ability to mash-up data sources
- ❑ Provide end user data analysis
- ❑ Fast user adoption
- ❑ Mobility

Answering key questions on performance for everyone

Asset

Programs & Services

Budgeting & Finance

Operations/ Readiness

Reports, Dashboards, Scorecards...

Query, Trend Analysis, Statistical Analysis...

What-if Scenarios, Plans, Budgets, Forecasts...

Predictive Analytics, Predictive Models...

What happened?

Why?

What should we be doing?

For Smarter Decision-Making & Better Outcomes

Questions/Comments?

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