Better/Best Practices for MAXIMO

MAINTENANCE and **OPERATIONS**

It's all about assets and work force efficiency

CMMS/EAM Software can help

but the real magic is in the surrounding process & procedure


Hey, nice slide!

total resource management
A Consulting *and* Technology Company

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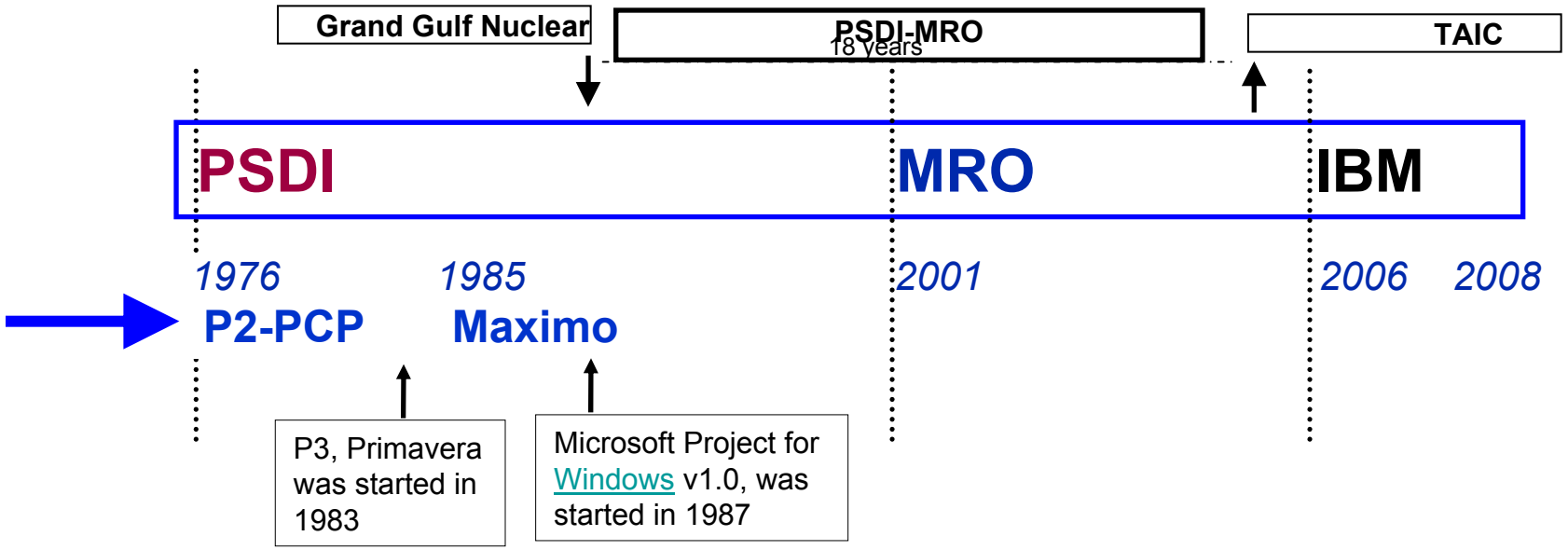
ROCKYMUG
Rocky Mountain Maximo Users Group

8:00 a.m. – 8:30 a.m.	Registration, Continental Breakfast
8:30 a.m. – 9:00 a.m.	Meeting Kickoff
9:00 a.m. – 10:00 a.m.	Preview Maximo 7.1 Mike Stasiewicz
10:00 a.m. – 10:15 a.m.	Break
10:15 a.m. – 11:15 a.m.	Western Area Power Administration Upgrade Update Don Nord (WAPA)
11:15 a.m. – 12:15 p.m.	**Better/Best Practices for Maximo** **John Reeve, Manager Business Process Engineering (TAIC)**
12:15 p.m. – 1:15 p.m.	Lunch
1:15 p.m. – 2:15 p.m.	Development of business standards and deployment of MXES 6.2 at the U.S. Bureau of Reclamation Ken Maxey (BOR)
2:15 p.m. – 2:30 p.m.	Meeting Wrap-up, Committee Election, Next Steps

Background

Significant Field Experience (spanning last 20 years)

- **Bay Area Rapid Transit – San Francisco** – Maximo 6x implementation
- **Carnegie Mellon University** – upgrade 4X to 6X
- **City of Lakeland (Power Plant), Lakeland, Florida** – automated weekly schedule process
- **Virgin Islands Water and Power** – upgrade to 6X
- **PowerGen, Trinidad** – advised on Outage Management in MX
- **Coffeyville Resources, Kansas** – upgrade 4X to 6X; WBS design; cost reporting
- **POSCO Steel, South Korea** – conducted better/best practice training
- **Fitzpatrick Nuclear Plant** – migration to MAXIMO 4X from legacy
- **Santos Oil & Gas, Adelaide, Australia** – 3x-4x upgrade
- **Daya Bay Nuclear Station, Guangdong, P.R. of China** – Maximo Post Implementation review
- **Commonwealth Edison - Quad Cities Nuclear Station** – Outage scheduling assistance
- **Australian Defence Industry – Sydney** -- Scheduling assistance



T A I C

…. reduces O&M costs by **integrating technology with vision** based on better/best practices

We define *future perfect*

and then …

……. let you choose

Better / Best Training

1-day	On-site Optimization Review
3-day	BP Training, standard course
5-day	BP Training with management seminar

Each course includes full set of power point slides.

.

System =

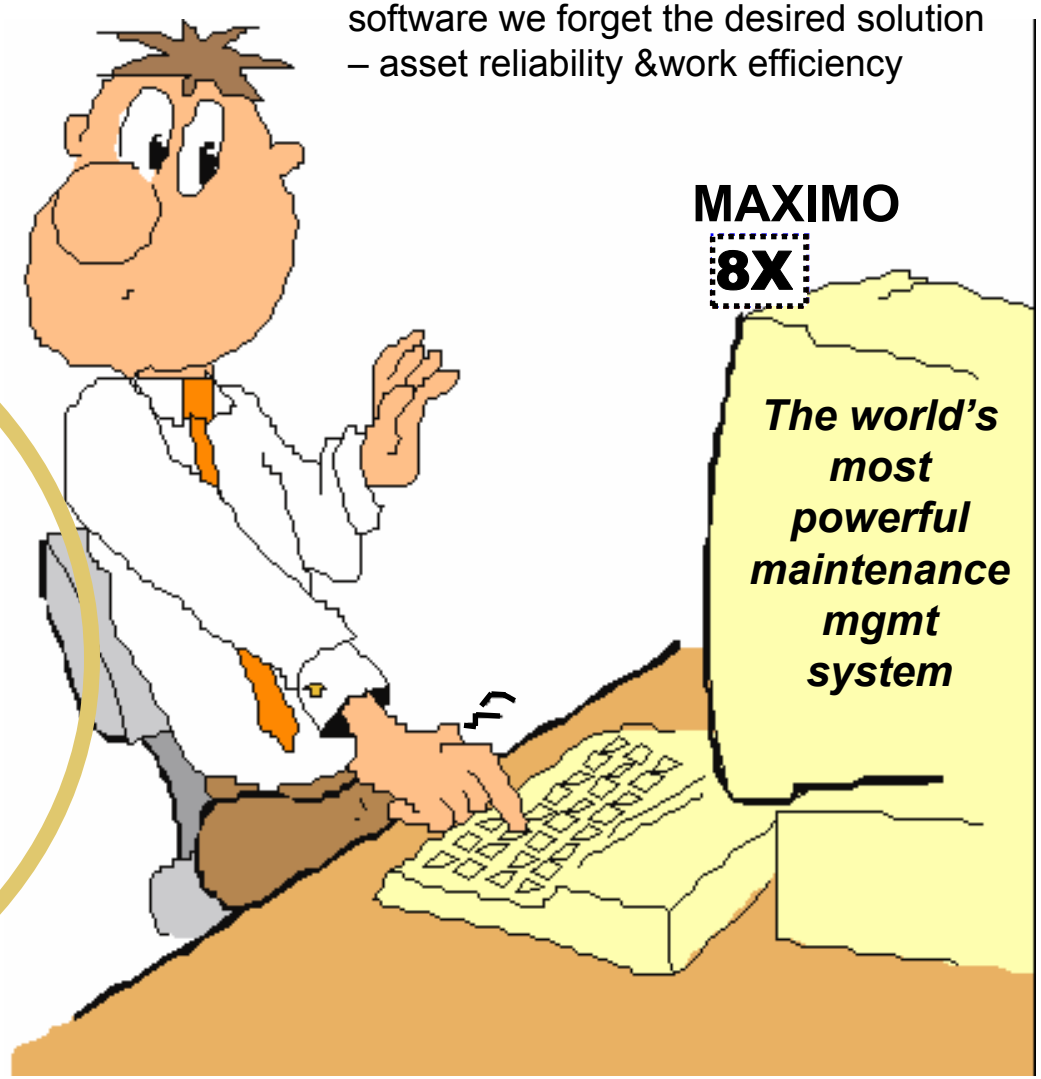
Software + Process + Organization

Software by itself will not fix all your problems.

80% of **all** your potential CMMS improvements could be related to **Process** and **Organization**

and your ability to influence change

Sometimes we get so caught up in the software we forget the desired solution – asset reliability &work efficiency



Software	Process	Organization
MAXIMO base product	Mission & Vision Statement	Project Sponsor / Stakeholder
Software installed	Goals and Objectives	Steering Team and Change control board
Licensing	User Requirements	Core Team
Hardware sizing & setup	Better / Best practice considerations	MAXIMO Administrator
Add-on's	Standardized KPI definitions	MAXIMO Coordinator
Interfaces / Integrations	CMMS/EAM objectives	Report writer
Reporting tools	CMMS/EAM procedures Backlog Management Work Prioritization PM compliance Weekly Scheduling Project Cost Tracking	Screen editor
Backup and recovery	Controls and Audits	Super Users
Change process and test procedure	Roles and Responsibilities	Subject Matter Experts
Problem call tracking	Database Error checking	CMMS visionary and knowledge seeker
Enhancement requests	Analytical reporting	End Users
Go-live procedures	Manage by exception	
	Find the "bad actors"	

#001 M

#002 Access

#003 Asset Problem

#004 Originator

#005 Notification

The requester s
job completion

#007 D

Daily meetings are still important to identify craft coordination, safety issues, key events for the day

#008 I

#009 Analysis

#010 Rework

Tracking of Rework

#012 Equ

If the Equipment rec
automatically brought over to the Wo
Important fields are Priority, Warranty
costs are accumulated.

#013 Duplicate WO

If the originator (or Planner) enters a Problem code
MAXIMO will automatically check the open ba
for like work against this asset.

#014 Review

#015 Completed Work

Review completed work on regular basis. Some studies have shown that up to 50% of repair work could have been prevented.

#016

Come up v
need sched
4 hrs work, no

#017 Use Calculated Priority

#018 Reportdate

#020 Worktype field

This field should not become a huge list of choices. It is important to quickly separate out Emergency breakdown work, versus PM/PdM, versus normal repair work. Other fields on the workorder can be used to break out "types of work", ie Safety.

#024 Delay Codes

k, trades sometimes encounter delays.

#026 Mission statement

A mission statement might be written to clarify the user roles and responsibilities regarding the CMMS. Examples are: All work will be recorded in MAXIMO. Standard repair work shall be planned first. Work orders should be written against one asset (as opposed to multiple).

ors list

Manage by exception. Just because you can print out the entire equipment database by failure codes, doesn't mean you should.

v-up work

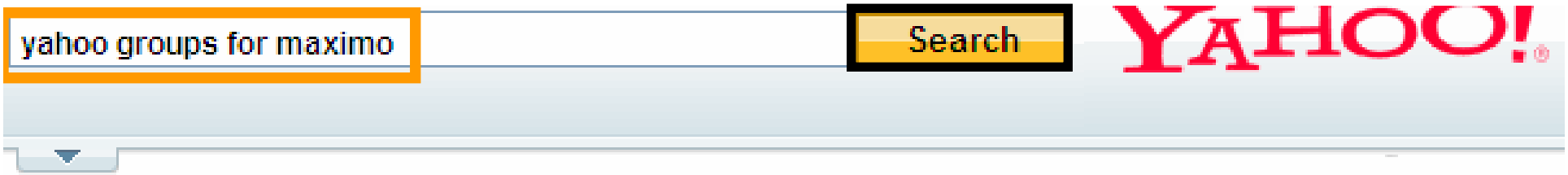
another as
g a PM, a follow-
helps trending of
ted from PM".

Preventive Maintenance # 027
1. Identify & perform routine inspections,lubes,cleaning,tightening
2. Build PMs around past or known

"Bad Actors" list.
This may be the top 10 report for high repair costs. This refers to Pareto analysis, or mgmt by exception.

WORK.
The client may establish time criteria by which additional repair maintenance is performed while doing a PM.

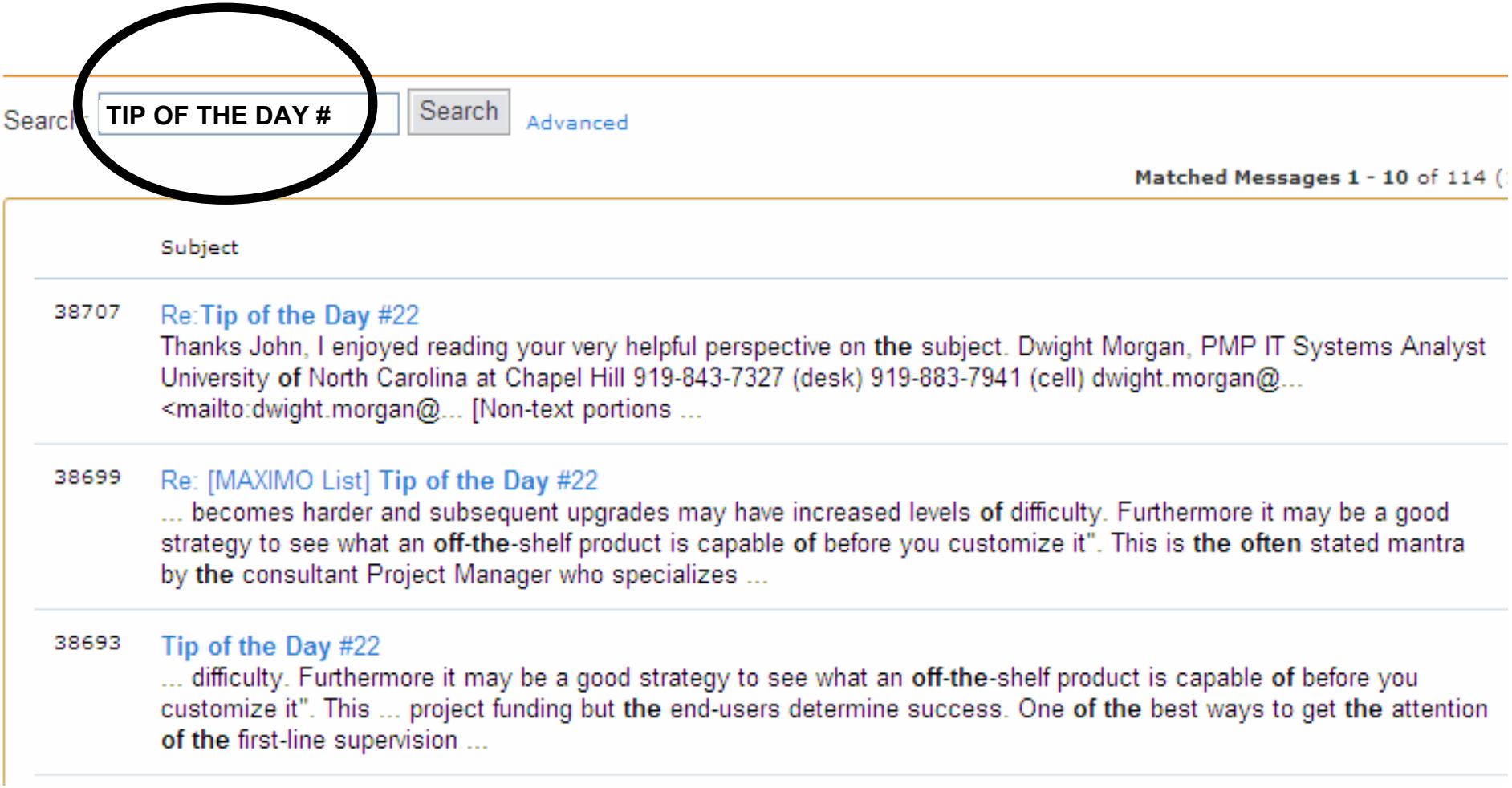
YAHOO GROUPS FOR MAXIMO



MAXIMO : MAXIMO discussions
See how **Yahoo! Groups** impacts members worldwide. Best of Y! **Groups** ... programming, and configuration of the **Maximo** systems and its underlying/ adjunct ...
tech.groups.yahoo.com/group/maximo - as of 5 MAY 2008

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	588	505	620	650	103							
2007	467	425	551	404	496	370	591	844	626	545	646	404
2006	363	376	352	313	344	324	241	390	410	431	376	342
2005	488	604	703	438	366	393	368	411	479	445	347	285
2004	366	347	440	469	327	423	316	379	378	513	490	429
2003	430	376	508	475	507	425	354	309	457	508	358	286
2002	459	569	478	572	480	380	438	423	447	520	416	287
2001	131	188	202	240	277	492	318	349	426	638	436	300
2000	53	68	43	40	100	72	73	102	61	50	122	212
1999												30

How to find TIP OF THE DAY entries



Solicit Audience for next
TIP OF THE DAY *#23?*

- **What is a "TIP"?**
  - any clever use of the system
  - could be an enhancement suggestion
  - Note: there is no wrong answer

Reward…

But before we do this let me show you some examples.

Pick a subject – any subject

Tip of the Day - entries to YAHOO GROUPs for MAXIMO

From	Subject	Received	Size
John Reeve	01 -- Duplicate PM work orders	Tue 1/1/2008 5:5...	4 KB
John Reeve	02 -- Setting Up Error Checks	Tue 1/1/2008 5:5...	9 KB
John Reeve	03 -- Work prioritization	Tue 1/1/2008 5:5...	7 KB
John Reeve	04 -- Delay Codes	Tue 1/1/2008 5:5...	8 KB
John Reeve	05 -- Failure Codes versus Downtime reporting	Tue 1/1/2008 5:5...	7 KB
John Reeve	06 -- Why so many INPRG work orders?	Tue 1/8/2008 12:...	18 KB
John Reeve	07 -- BASIC PLANNING – what is it?	Tue 1/15/2008 9:...	29 KB
John Reeve	08 - Oldest Work Order in the system (plus BACKLOG MANAGEMENT)	Tue 1/22/2008 4:...	12 KB
John Reeve	09 - SELECT-within-a-SELECT...showing Top 2 Levels of Failure/Problem code hierarchy	Tue 1/29/2008 11...	11 KB
John Reeve	10 - Better/Best Practices	Wed 2/6/2008 4:...	6 KB
John Reeve	11 - Identifying Contract work on WOTRACK	Tue 2/12/2008 8:...	6 KB
John Reeve	12 - Clever Failure Coding setup	Tue 2/19/2008 2:...	16 KB
John Reeve	13 - Enhancements/Changes expected in MAXIMO 7X	Tue 2/26/2008 12...	16 KB
John Reeve	14 - Deadline Priorities	Tue 3/4/2008 3:5...	20 KB
john reeve	15 - URGENT WORKTYPE	Thu 3/20/2008 8:...	23 KB
john reeve	16 - DATE FUNCTIONs -- ORACLE and SQLSERVER	Wed 3/19/2008 1...	19 KB
John Reeve	17 -- SQL - structured query language (it ain't all that hard)	Wed 3/26/2008 1...	10 KB
John Reeve	18 -- MAXIMO setup and operation -- difficult or not so difficult	Wed 4/2/2008 9:...	14 KB
John Reeve	19 -- REPAIR / REPLACE CRITERIA	Wed 4/9/2008 5:...	10 KB
John Reeve	20 -- Understanding the various NAME fields on a workorder	Wed 4/16/2008 8...	10 KB
John Reeve	21 -- ADHOC report writer - future design	Wed 4/23/2008 7...	14 KB
John Reeve	22 -- OOB versus customization	Wed 4/30/2008 1...	16 KB

Tip of the Day #01

Many clients are unaware of duplicate work orders in the open backlog - for the same PM number. Except for when the administrator purposefully generates months in advance, they might find open PM-workorders which were either (1) not performed, or (2) performed but not closed.

A simple error check will pull these out.

```
Select PMNUM, count(*) from WORKORDER
where PMNUM is not null
and STATUS not like 'C%'
group by PMNUM having count(*) > 1
order by count(*) desc;
```

> you might be surprised by what you find

Tip of the Day #02

Setting up Error Checks: It is a good practice for the MAXIMO Administrator to occasionally look for "bad data" in the system. The most likely place to look for trouble is in the area of work orders. An accurate database helps you make more informed decisions and allows you to implement more advanced solutions.

Some examples:
>> You may find open workorders with a missing WORKTYPE value
>> Too many blanket workorders currently in the system
>> IN-PROGRESS workorders going back several years
>> Several thousand workorders are currently IN-PROGRESS
>> Closed work orders with no actuals
>> Only 5% of all "repair" work orders have Problem Codes entered
>> 5% of all open work has no WO PRIORITY or value of 0
>> Open work with missing REPORTEDBY field
>> 10% of all Equipment records have no Location value assigned
>> 20% of all Equipment records have no Priority assigned
>> Only 10% of Equipment records have any spare part data
>> 50% of all Equipment records have no Failurecode assigned
>> 20% of all Job plans have no Craft estimates
>> Open backlog is less than 20% planned
>> Too many work orders are tied to the highest level in Location hierarchy
>> Significant number of work orders where length of the DESCRIPTION is less than 16 characters. And the Work order Descriptions are not describing the real PROBLEM. Some examples of this:

- **Box 12**
- **REPAIR MANLIFT**

Tip of the Day #03

WORK PRIORITIZATION: **Some sites utilize the work order Priority field in a manner which helps them manage the open backlog. The Priority field should reflect the relative importance of work to other work within the backlog. Your goal with work prioritization should be to communicate what work is more important than other work - inside MAXIMO. Otherwise, the alternative is just do first-in, first-out.**

Prioritization is also part of the planning process. And the purpose of planning work -- is to -- schedule work. With an accurate priority value then we can consider advanced scheduling techniques.

There is a combined field called CALCPRIORITY located on the workorder table. Note: you may have to unhide it to your screen. Some believe it is a best practice to combine the human entered work priority with the static asset (or location) priority. This technique allows for the creation of a weighted or "normalized" value.

If each EQNUM (or LOCATION) record is given a PRIORITY then this value (automatically) rolls over to the workorder record. This rollover occurs when the user selects the asset record for the work order. This helps the really important work (and assets) to "float to the top".

But at the end of the day, if the general user community feels your system of prioritization is cactus, then ... it probably is. Therein the backlog should be periodically reviewed – and updated - as work can become stale and the database inaccurate.

Tip of the Day #04

Maintenance productivity in most companies is far lower than they estimate. Sometimes it is beneficial to study why (work force) productivity is lower than expected. Everyone is working hard but when interviewed they may come up with a laundry list of impediments. Are these delays being recorded? It may be of value to alter your Labor reporting process such that you can also collect (and report on) any delay time. After training the maintenance staff you can start receiving time (minimum increment of 15 minutes - otherwise we don't care). In my experiences the maintenance staff is all too willing to provide this update.

The following scenario may exist:

1) worker is assigned a job from the Daily Schedule
2) he prints work order - and reviews steps
3) gathers tools - and walks to job site
4) he is at job site BUT is unable to start job.

Most of this lost productivity can be attributed to the following reasons:

**** Waiting on LockOut-Tagout or other Permitting**
**** Waiting on Operator action**
**** "Chasing parts", ie Looking in catalog; processing req. for stock matls; creating PR**
**** Waiting on Information, drawings, or other tech information to be provided before job start**
**** Waiting for the equipment to be shut down.**
**** Waiting on rental equipment to arrive**
**** Waiting on other crafts, ie isolate power**
**** Received call-out from Supervisor to stop current job – and redirect to different job (lost time due to cleanup of job site and travel to other location)**

How can this be tracked in MAXIMO? > probably several ways > but one way is to add a DELAY CODE field and domain (value list) and make this available on the time reporting sheet or on the manhour entry screen. Once the data is assembled management can now pull very meaningful reports (pie chart is good here) and perform necessary analysis. The objective is not to ding anyone but rather, ask the question, how can we improve?

Tip of the Day #05

Question:
What is the difference and/or significance of FAILURE CODEs versus DOWNTIME reporting?

Answer:
[This answer actually came from Dave Sapp, November 1999]
Not all downtimes are a result of failures and not all failures result in downtime. Downtime is the number one measure that maintenance organization performance is evaluated against. They need to know the reasons for these downtimes so that they can put together a strategy for minimizing the cause. If the downtime results in a failure, then the failure code should be used as well as the downtime code. The structure of the codes is very industry + process dependent and there may be some overlap. The key thing to remember is that the downtime is primarily an operational concern whereas failures are for maintenance.

Tip of the Day #06

Why are there so many INPRG work order records in the database?

How many do you have? 100 or 1000 or maybe 4000?

Should this be a concern? With a few thousand work orders listed as INPRG – suddenly this code has no meaning. What if someone needed to know what work was really in-progress at any given moment? Can this be extracted? And how would you mark that information for an end-of-the-week status?

Here are some answers:

In the earlier version of MAXIMO the method for “initiating” work meant you print the work order and change status to in-progress (INPRG). Perhaps the Administrative Assistant routinely used this method. Thus whenever a work order was printed the status was automatically changed to INPRG.

What does IN-PROGRESS really mean?

It could be we are creating Purchase Requisitions, or MRs, or work permits. It could involve drawing research and review. And it could involve contractor assist (phone-calls) – or multishop coordination. Maybe this step should be called “administratively in-progress”. And lastly, why is the trades person doing all of this "parts chasing" when a Job Planner could have pre-planned this job? [Related subject: wrench time]

In some environments there is a style of thinking which says, if we change the status to in-progress, it will appear that we are all very busy and actively working the job. When in reality all this means is the work order has been printed and given to the trades (supervisor, leading hand or trade person). You might just add a status called ‘Printed’.

After this point many shops do not update MAXIMO as to where the work order physically is – or the status. If the ticket is given to a worker, it may just go into a pile. This pile may be at bottom of a locker – or - inside a lunch bucket. The worker is then managing and prioritizing this list.

And what if the worker has maybe 25 work orders in his possession; which one does he work on first? Is it always first-in, first-out (FIFO)? Or is it by work order Priority – which is sometimes assigned by the requestor (who always wants Priority 1)? What if this worker goes on vacation for a couple of

Tip of the Day #07

BASIC PLANNING – what is it?

This is a concept that involves basic entry of data on the MAXIMO work order to store planning information. This basic planning requires location/asset, problem description, worktype, priority assignment, supervisor or leadcraft code, and most importantly, the planning data (where craft estimates are entered). This last step is very important. Planning data gets entered on the PLANNING TAB. If possible, also try to ascertain if any NONSTOCK materials (especially long-lead times) will be required for this work and mark accordingly. The time to enter this basic planning data should be 3-5 minutes per work order. You now have a rough estimate of the job – PLUS - (labor) costing information. Note: After the Basic Planning phase there should be a subsequent review for complex jobs.

Benefit to you

Management can now ask for a breakdown of work by craft. This work can show estimated hours by craft. And sometimes this data can support (increased) staffing level requests. What would be worse is to never enter any basic planning data – and then you only would have a backlog of work orders (maybe thousands) with no idea of what was out there or the magnitude of those jobs.

When do you need to capture Planning data?

Right after a new (repair) work order is created – say in the last 24 hours. If this new work order is not a “fix it now” or emergency scope, then planning data should be entered in MAXIMO.

Note(1): reactive maintenance does not normally get planned (or scheduled)

Note(2): PM work orders should already be planned (as they come from the PM/Jobplan tables)

Who should enter this Planning data?

[In order of preference]

Job Planner – provided this position exists

Leading Hand for the craft

Maintenance Supervisor

MAXIMO gatekeeper

Tip of the Day #08

It is a good idea to periodically review your maintenance backlog. An accurate backlog enhances your ability to make more informed decisions. You might review this data for "stale work" (maybe a design change negates the need), improper priorities, missing values (ie. worktypes), or status values that are incorrect. Whenever you have thousands of records, there is bound to be something wrong.

But here is a neat one - called FIND THE OLDEST WORK ORDER in your system (which is still open). And this type of query can even be stored inside a SAVED QUERY. Some industries force this "oldest work order" onto their schedule - each week.

```
((woclass = 'WORKORDER' or woclass = 'ACTIVITY') and historyflag = 0
and istask = 0 and siteid = 'YOURSITENAME') and
status not in ('CAN','HISTORY','COMP','CLOSE')
and reportdate in
(select min(reportdate) from workorder
where status not in ('CAN','HISTORY','COMP','CLOSE'))
```

~~~~~~

Key Concepts of Backlog Management

Backlog is a collection of open work. It may be planned or it may not be fully planned. It is work that is not yet completed or closed. This work can consist of repair work, PM/PdM work or capital improvement work. You should be concerned with any activity which requires your maintenance department - activity wise. The estimated
manweeks by craft (rule of thumb) can help you judge future staffing levels. But, if the work is not planned then this is a difficult measurement to perform.

Job Planners rely on MAXIMO from which the backlog is very important element. Tip of the Day #07
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Tip of the Day #09

This is a **SELECT-within-a-SELECT**, example SQL script, which could be used inside SQLTALK or TOAD or Enterprise Manager.
Problem Request: You are trying to get a quick extract of the Failurecode-Problemcode relationships from the backend without using the standard report. This output can help you analyze values, make changes and get immediate results. The real importance of the failure hierarchy design is in the top 2 levels.

~~~~~~

```
SELECT t.FAILURELIST, t.FAILURECODE, (select f.FAILURECODE from FAILURELIST f
where t.PARENT=f.FAILURELIST and f.TYPE is NULL ) “PARENT-NAME”, t.TYPE
FROM FAILURELIST t WHERE t.TYPE = 'PROBLEM' order by 3;
```

```
==============================================
FAILURELIST   FAILURECODE    PARENT-NAME    TYPE
==============================================

1242          AIR            CONTROL        PROBLEM
1243          CAL            CONTROL        PROBLEM
1071          POWER          ELEC           PROBLEM
```
~~~~~~

Tip of the Day #10

Definition of Better/Best Practice

Essentially the concept is that for any company or organization there is always room for improvement and that improvement is often best acquired through learning from others, who have already faced the same issues. The concept applies to all companies, whether large or small and regardless of sector or industry. Note: what constitutes best practice will vary from company to company - and is constantly changing.

As a MAXIMO Administrator you can find knowledge many ways.
* Reading related material; visiting this web site
* Attending maximo User Forums / venues
* Visiting another maximo client site (maybe one in town)
* Hiring a consultant

Some say the real magic is in the surrounding process and procedure. This "knowledge of usage" might pertain to creating repair/replace criteria, performing basic failure analysis, creating a Location hierarchy, defining analytical reports, learning how to manage by exception, setting up KPIs and .... establishing a weekly schedule.

Tip of the Day #11

Problem definition:
You have a backlog of work. Most of this work is to be done with internal maintenance staff. But some will be assigned to contractors.
What is the best way to easily mark this work on the main WOTRACK screen?

One technique is to add some additional fields.

A. Yes-No...is this a Contractor Work order?
B. Yes-No...long- lead time materials are needed
C. TypeContractWork. ....with a valuelist(domain) :
CIVIL,CARP,ELEC, NDT,WELDERS, DIVERS,SCAFFOLD, CRANES,WTR TREAT, CLEANING,HVAC, GAS-STM-TURB
D. And on the PLANS TAB you can enter ESTIMATED COST using a CRAFTcode called "CONTRACT"

Note: we are NOT entering an exact VENDOR NAME.

Benefit to users:
The contracts manager can now query on all "possible" contract work from the open maximo backlog. He performs grouping of like work. He
can see the total estimated cost by this grouping. He may then decide to award a contractor for multiple work orders under one SERVICE
CONTRACT. This technique can also be beneficial for outage/shutdown preparations.

Tip of the Day #12

Background: MAXIMO people have designed a 4-level hierarchy for storing the **Failure Code hierarchy**. Some clients set this up and apply these problem codes to work orders. Maximo automatically populates the failurecode from the asset when selected onto the work order.
Problem definition: There is occasional confusion by the Maximo Administrators regarding the 2nd level -- called Problem Code.
Do you enter your “first observation of what the problem is” or do you enter the “Component”, ie Belt.
Note: the Belt may not be known as the "cause component" at time work order creation.
Other points of interest:
(1) The Problem code entry (not cause or remedy) is necessary to identify “duplicate work orders”. If this field is not populated at time of work order creation then there is no duplicate warning feature. Note: the actual cause component may not be known until the job is complete.
(2) The MTBF reports primarily use the Problem code level
(3) Some clients struggle with the overall effort to setup a Failure Code Hierarchy as this is a lot of keyboard work going 4 levels deep.
(4) Whereas the Cause entry could be “HUMAN ERROR” or “CAUSED BY WEATHER”
(5) The important point however is to actually perform failure analysis. This regularly scheduled event helps reduce reactive maintenance, therein reducing maintenance cost. Is your organization doing that? What is the process?
Problem codes get you to the 25,000 foot level. I would then make use of the Failure Remarks tab (actions taken) and analyze that content as I drill down into the problem.
I realize you could enter this “component” information in the 3rd level, ie Cause code. But I believe the better design is as follows.
FAILURE CLASS _____(ie PUMP)
PROBLEM CODE _____(ie NOISE,VIBRATION,OVERHEAT,NOFLOW,LEAK,FROZE)
COMPONENT _____ (ie bearings,belt,coupling,diaphragm,flange,
gasket,gear,impeller,packing,piping,screen,seal,shaft,sheave,valves)
Explanation of this design:
(A) The COMPONENT would be a brand new field.
(B) It is linked to a brand new table -- holding the valid subcomponents of this FAILURECLASS
(C) A new (6x) table domain would be created
The end result is we no longer have confusion by operations & maintenance with reliability engineers.

Tip of the Day #13

From the recent FMMUG 2008 in San Diego meeting the following notes were taken by myself on the next version of MAXIMO - called 7X. Pradeep Nair presenting - Product Strategy Manager Expect MAXIMO 7.1 release/availability to be announced at PULSE

7X - MAJOR CHANGES - SUMMARY:
*** Linear assets
*** work mgmt enhancements
*** Security enhancements
*** reporting (BIRT)
*** Regulatory Compliance
*** Security and Safety
*** Customer (the "green" effect)
*** Profitability & Cost
*** Competitive Differentiation
*** Innovation
*** aging infrastructure
*** embedded computing
*** next generation (asset) sensors
*** system consolidation

RELEASE 2008 SCHEDULE:
LINEAR; BASIC MIDTIER MX (SMB); MOBILE 6.5; MEA; MOBILE 7; MAXIMO FALCON (v8)
~~~~~~~~~~~~~~~~~~~
MAXIMO 8X-- supply chain enhancements (incl. accounts payable)
~~~~~~~~~~~~~~~~~~~

7.1 SPECIFICS

LINEAR ASSETS for EAM,, MIGRATION MANAGER improvements,, RULES capabilities (similar to TRM)

LINEAR means ROADS, PIPELINES, RAILWAY; need to maintain the assets by SEGMENTs.

ROAD SEGMENT attributes: LANES, SPEED LIMIT, SURFACE TYPE, LAST MAINTENANCE SEGMENT OVERHAULED, EXITS

NEW LINEAR SCREEN has SPECIFICATIONS tab and FEATURES tab and RELATIONSHIPS tab

~~~~~~~~~~~~~~~~~~~~~~
WORK MGMT-- supports multiple assets on 1 workorder at Location XYZ
One-step SWAP feature (helps IT staff)
Automated FLOW CONTROL for STATUS. If WONUM with TASKS, when all
TASKS are complete, then auto-change WONUM STATUS to "next status"
~~~~~~~~~~~~~~~~~~~~~~
NESTED JOB PLANS

Tip of the Day #14

Subject: Deadline Priorities - for backlog prioritization

Problem: Is your backlog growing and operations (or customer base) is wondering if priority work is really being performed? Are you sure each craft is fully engaged during the week? Some of us are using the above concept - called Deadline Priorities - and do not know it. Everyone knows the Workorder.Wopriority field on WOTRACK main screen. What is the intent of this field? As a maximo administrator, you can decide of course. But in some cases you may have taken on this job position and assumed the previous owner's design.

Here are two common designs of the WOPRIORITY field:

(A) Deadline Priorities

...Priority-1 means maintenance must react within 24 hours

...Priority-2 means maintenance must react within 5 days

...Priority-3 means maintenance must react within 30 days

(B) Work Priority

...This value is entered by the Senior Planner or Maintenance Supt or sometimes a Gatekeeper who sees all new/incoming work. The value he is entering is a "relative ranking of importance for this job as compared to all other open work in the backlog". Obviously this person must be familiar with the plant, have excellent overall knowledge, plus be familiar with current backlog.

Note: the priority values may range from 1 to 9.

How does one get familiar with the backlog?

...It is a best practice to conduct a monthly meeting and review all open work. Your gain familiarity of course but also discover work that needs higher (or lower) priority, work that is actually done, or work that is no longer needed.

Pro's and Con's of the (A) versus (B):

(A)

When using Deadline Priorities you typically end up with a bunch of 3's. The maintenance backlog develops a disproportionately large spike of 3's. Therein only remaining way to 'rank' this (Pri-3) work is by REPORTDATE (or sometimes called FIFO (first in, first out) - which is not fair.

Just because a workorder has a Priority 2 on it does not mean the maintenance organization has enough staff to do the job that week. The maintenance supervisor may 'defer' the job because he doesn't have staffing available.

The customer eventually figures out that this overall style of work management is flawed and starts creating new categories for marking important work. Or the customer base may also start to assign false Priority 1+2 values.

...Pro's of Deadline management: it helps staff work off a prioritized list of reactionary work (for priorities 1+2)

(B) Work Priority

With each new job coming in, someone is assigning a true ranking of importance. This human provided value can then be combined

Tip of the Day #15

Subject: **Work Types in MAXIMO**
Problem: This field is occasionally misunderstood as to the potential benefit it brings to work management. It can be used in MTBF reporting, KPI reporting and reactive maintenance calculation.
Background:
Out of the box MAXIMO has the standard work types of EM, CM and PM. The training manual says EM is for emergencies and everything else is
CM (other than preventive maintenance) .

When it comes to defining reactive maintenance and MTBF these values are very important. Here is a quote from the Walter Reed facility review conducted last year:
"All facilities managers should track PM Labor Hours and Emergency Labor Hours, and monitor the trend. If PM Labor Hours are low and Emergency Labor Hours are high, either your Preventive Maintenance is not effective or you are not performing PM. It's possible that your people may be going through the actions but not performing them to an acceptable standard."

I wonder if these two categories - PM and EM - are adequate for this measurement (and KPI tracking). We all know the definition of EM work. This should be a rare event which plant management does not want to have happen, and if it does, they study the heck out of it to make sure it doesn't happen again (sometimes called root cause analysis). But you can't afford to do this on every CM job. Corrective maintenance (CM) becomes "all other repair work". Priorities are assigned to this work. In some industries using maximo you have an Operations department. In others, you may just have customers, ie students at a university. When this work request is received it is helpful to quickly assess the need. Is this work an Emergency or is it routine work for the supervisor to assign priority to? Or is it somewhere in the middle? I might suggest a new(worktype) category - called

Tip of the Day #16

--- In MAXIMO@yahoogroups. "jason.verly" <jason.verly@...> wrote:

--- For those of us in the SQL Server world, here's a partial list of the same functions.
Now ..... Getdate()
Next Day ..... Getdate() + 1 Seven days from now ..... Getdate() + 7 One hour from now ..... Getdate() + 1.0/24 Three hours from now ..... Getdate() + 3.0/24 10 minutes from now ..... Getdate() + 10.0/1440 30 seconds from now ..... Getdate() + 30.0/86400 Tomorrow at midnight ..... Select DATEADD(day,DATEDIFF(day, -1, GETDATE()),0) Tomorrow at 8am (1) ..... SELECT DATEADD(day,DATEDIFF(day, -1, GETDATE()), 8.0/24.0) > Note, Oracle has additional functions that SQL Server does not, i.e. TRUNC, which means a user has to get more creative to get the same results.

--- In MAXIMO@yahoogroups "John Reeve" <planschd@> wrote: ORACLE database -- date functions

```
Now.....                          SYSDATE
Next day.....                     SYSDATE + 1
Seven days from now.....          SYSDATE + 7
One hour from now.....            SYSDATE + 1/24
Three hours from now.....         SYSDATE + 3/24
An half hour from now.....        SYSDATE + 1/48
10 minutes from now.....          SYSDATE + 10/1440
30 seconds from now.....          SYSDATE + 30/86400
Tomorrow at 12 midnight.....      TRUNC(SYSDATE + 1)
Tomorrow at 8 AM.....             TRUNC(SYSDATE + 1) + 8/24
Next Monday at 12:00 noon....     NEXT_DAY(TRUNC(SYSDATE), 'MONDAY') + 12/24
Firstday next mon@12 midnight       (LAST_DAY(SYSDATE ) + 1)
Firstday current mon.....         TRUNC(LAST_DAY(ADD_MONTHS(SYSDATE,-1))) + 1
The next Monday, Wednesday or Friday at 9 a.m .....
                                 TRUNC(LEAST (NEXT_DAY(sysdate,''MONDAY'' ), NEXT_DAY(sysdate,''WEDNESDAY''),
NEXT_DAY(sysdate,''FRIDAY'' ))) + (9/24)
```

Tip of the Day #17

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SQL - structured query language

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In addition to learning MAXIMO (any version) this training may provide the most significant benefit in terms of time you spend which will benefit you personally - and your O&M organization.

Example:
As a consultant I spent 2 days showing two maintenance managers (new to maximo) the value of this capability.
Note(1): they had no previous training in maximo prior to this week
Note(2): we did need access to a SQL-query front-end tool

I showed them this USER FORUM. I showed them the IBM MAXIMO Preview page. And I started out by showing them the ALT-F1 field help capability inside MAXIMO 6X. I then did a quick review of MAXIMO table structure and relationships. Plus I pointed out the Database Configuration application which shows all the tables and field names. And I discussed the concept of primary keys and indexes.

This overview was followed by instruction in Basic SQL commands. All up, the total SQL instruction was maybe one day. Teaching by seeing examples against a maximo database helps the student catch on rather quickly.

Tip of the Day #18

Subject: MAXIMO setup and operation -- difficult or not so difficult

New customers may have only the legacy system to compare to. Users on previous versions, ie pre-5X, may find the newer architecture to be more challenging. It definitely requires different skill-sets and more effort to administrate. But that said, there should also be more benefits.

Background:

A. Installing MAXIMO (software) by itself does not guarantee you will achieve return on investment or enhance department efficiency. You have to follow-through on the process side, setting goals which help you identify recurring problems, improve asset reliability and enhance work force efficiency.

B. In the old days, the maintenance department by themselves could run Maximo - and they did. They had absolute control over the setup of the system, tailoring of the product, adding new users and writing reports.

C. Note: 6X version has substantial improvements over 5X. Examples of this are GUI screen editor, tighter Actuate integration, Download to Excel feature and ALT-F1 field help.

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The purpose of maximo is to make your job easier - not harder

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Possible remediation strategies:

1. 80% of all potential improvement is in the surrounding process/procedure development. This should be one of your focus areas.
2. If your IT department is 'thin', you could consider a hosting environment.
3. Utilize a reporting tool which is simpler - or where you have familiarity. You may not want to invest 6-8 weeks of training on developing an Actuate report writer. Many clients make use of Crystal integration. Also note, you can successfully run SQR against 6X. I know of (4x) clients that have close to a hundred legacy system reports, and by using these integration tools, you save thousands of dollars (by not having to convert). Final note: reports never end.
4. Put together a team and perform Benchmarking. Visit other clients in the area. Make note of 'neat designs' they perform.
5. Continue talking to other users, via this forum, and also vendor sponsored meetings.
6. Bring in consultant team for specific purpose of Process Optimization review.

Defining Success:

If you are only using Maximo to collect work orders and close them out, then you may be missing opportunities for improvement. Ask yourself these questions ---

Tip of the Day #19

SUBJECT: REPAIR/REPLACE CRITERIA

This is an extremely valuable concept to the maintenance profession. It is also a subject not commonly mentioned in any (maximo) training curriculum.

PROBLEM STATEMENT:

When an asset breaks down and requires repair, the maintenance staff performs the repair. They may request stock parts or non-stock materials via PR/PO process and/or they may require assistance of outside contractor. When added all up, there is a cost for their internal man-hours, plus materials, and outside services. And if this asset continues to break-down over time and has a short MTBF, then it may be time to replace. But who makes this decision?

Most likely there is a senior staff member in engineering/maintenance who has this history in his head. But what if he is on vacation for a month - or he retires? What guarantee is there that he will use the same criteria each time? And quite frankly, how does one add up all the repair costs and calculate the MTBF in your head - information which is readily calculated within the MAXIMO system?

Also note: there could be external factors causing this asset to have recurring failures. These might relate to environmental issues or operating procedures.

SOLUTION:

For some companies there is value in creating a pre-built set of questions. This list of questions would be linked to the particular asset classification. These questions direct the user to run a report from MAXIMO showing key elements of the asset and repair history (MTBF), as well as the open backlog (estimated repair hours), and perhaps the purchase price (and priority) of the asset. If you put some thought into setting this approach up you will end up with a standardized review/analysis which takes the guess work out of the process. And then when you approach management with a request to replace, there should be very little discussion.

Like anything else it would take time to setup. But once in place imagine the value that could be provided.

Tip of the Day #20

PROBLEM: Prior version of MAXIMO had a field called workorder.LEADCRAFT
In MX 6X this was removed. But they did have a LEAD field.
WORKAROUND:
[Responder #1] … restore this functionality using new feature called COMMODITY GROUPS.
Example:
Enter CRAFT code in the commoditygroup field
Setup worker name in the commodity field.
ie.
MECHANICAL
JohnSmith
Or....more simply...use service group of MAINTENANCE.
and with services of 'Mechanical' ,'Electrical'
~~~~~~
Related Tip:
The various "name" fields need special attention when migrating from older version to MAXIMO 6X. It comes down to who typed in the record, but who really reported it, to who gets first craftcode assignment, to who gets the work. In one previous user post they made a NEW TAB called ASSIGNMENTS - to make a simple 1 to many worker name entry. Note: this was different from the formal ASSIGNMENT screen.
Therein I would look closely at the following fields:
REPORTEDBY
ONBEHALFOF (6X)
SUPERVISOR
CREWID
LEAD (6X)
LEADCRAFT (4X)
PERSONGROUP (6X)
And I would conduct a special workshop with client
just to discuss these mappings. These fields are commonly important in many ways, one being Workflow setup.
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Tip of the Day #21

Subject: ADHOC report writer - future design?

Problem statement:

I'm not sure any CMMS vendor has yet figured out how to provide true adhoc reporting for the end user community. This is my idea for Adhoc report design. The target audience would be first line supervision, i.e. the maintenance supervisors. The primary table of interest is Workorder. The main screen of interest would be WOTRACK. Here is how it might work:

1...Add new icon to screen called HotSpot Reporting
2...Once clicked this screen changes slightly such that all fields become "hot spots"
3...This means they would 'highlight' when the mouse is moved over the top
4...In the lower portion of the screen a new rectangular window appears. This "new window" is see-through meaning you can still see the Wotrack screen behind it.
5...The user selects any field from Wotrack, i.e. the WONUM and drags it to the "new window". It becomes a column.
6..Note: this window (by default) shows the first 10 records in the table in this tabular listing.
7...The user selects DESCRIPTION field and drags it to the "new window". This becomes 2nd column.
8...The user then select ASSETNUM and also the asset DESCRIPTION – making columns 3 and 4.
9...Note: each field has a drop-down option for controlling formatting.
10...User can move the "new window" around to gain visibility to other fields.
11...At bottom of this "new window" there are separate icons for SORT, TITLING, TOTALS and COUNTS, PREVIEW/PRINT.

Is this possible?

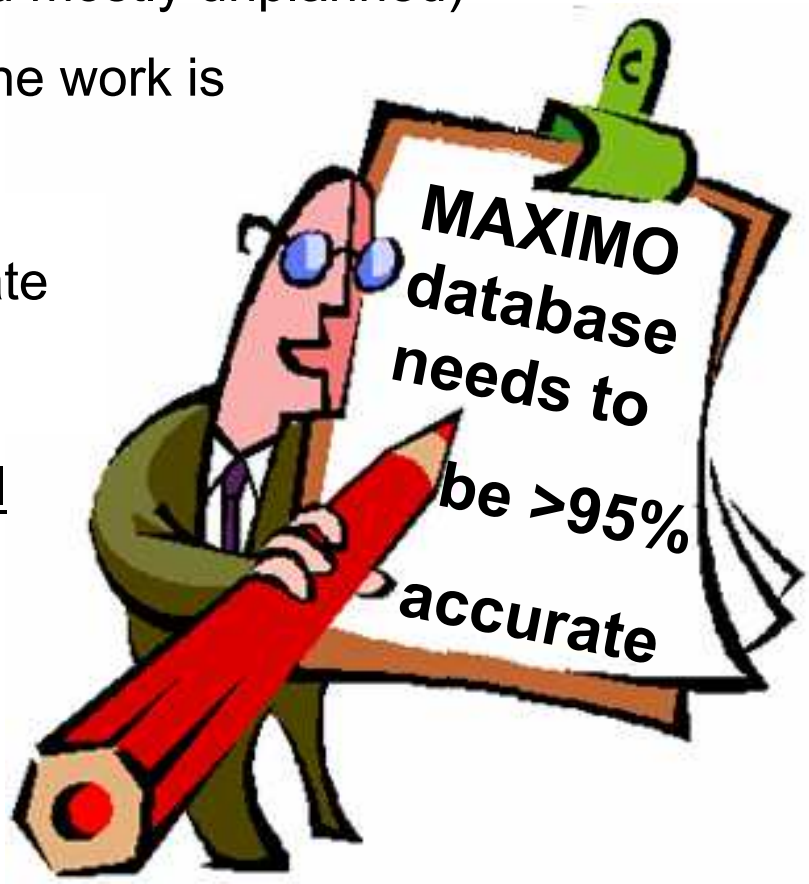
Reporting is important.
Standard reports (that come with every product) are nice.
But reality is clients have their own requirements and will continue to do so.
And lastly, users simply want to be able to create their own reports (and not have to be a programmer).
Anyone know AJAX?

Tip of the Day #22

An often used quote by senior level consultants:
"**Customizing a CMMS/EAM product can be an invitation for trouble. Support becomes harder and subsequent upgrades may have increased levels of difficulty. Furthermore it may be a good strategy to see what an off-the-shelf product is capable of before you customize it**".
This is the often stated mantra by the consultant Project Manager who specializes in maximo implementation. Being a bold statement that it is, the consultant comes across as being all-wise. Yes, the client should first study the product to learn it's capabilities and understand the system before undertaking massive changes.
On the surface I agree with this. But surely he did not mean NO CHANGES – EVER. And surely we aren't requiring every field-width change to go before the Steering committee?
Definitions:
<1> Tailoring uses the built-in tools of the product, i.e. (6x) Application Screen designer, or Database Configuration
<2> Customization involves Java or similar coding and requires additional effort during upgrades.
Therein the person making this presentation should not casually use the word "customization" unless he really means it. For one thing it confuses the audience (when you really meant tailoring).
This rigid interpretation of this implementation strategy can cause harm. From my experiences, there can be increased levels of risk when rolling out software to large organizations with complex business process and forcing process change to match the OOB standard product and not allowing any system/software changes. The unfortunate part of this technique is that most completed projects have some level of tailoring when finished. And for larger and more complex sites, it is imperative that the system meet the basic requirements for the business. MAXIMO is best of breed and well regarded in the industry but most clients come to like it because of it's power to be tailored. As good as MAXIMO is, the OOB design is not always going to be a perfect match.
Lessons learned:
<1> It is important to document any changes to your system.
<2> Tailoring requires approval by Core team
<3> Customization requires approval by Steering team. And large changes may require a cost benefit analysis.
<4> Some add-ons, such as Rules Mgr, provide for advanced tailoring capabilities, but involve no customization
<5> The larger the client and the more sites they have, the higher the probability that system tailoring will be needed
What defines success?
There are many elements which make a successful project, and one is end-user "buy-in". Stakeholders and sponsors help acquire project funding but the end-users determine success. One of the best ways to get the

Common CMMS Discoveries

- Work is performed but not entered into CMMS
- Work is not tied to correct Asset
- Actual man-hours (or parts) are not captured – or linked to work order
- Backlog is growing – and not trended (and mostly unplanned)
- Failure analysis is not possible because the work is not properly coded
- No systematic data reviews. The backlog contains stale data and sometimes duplicate work; work order status codes say 'Open' when the work is really done
- No one is really concerned with the overall accuracy of database; "not their job"; no error check process/routine



Common Data & Process Problems

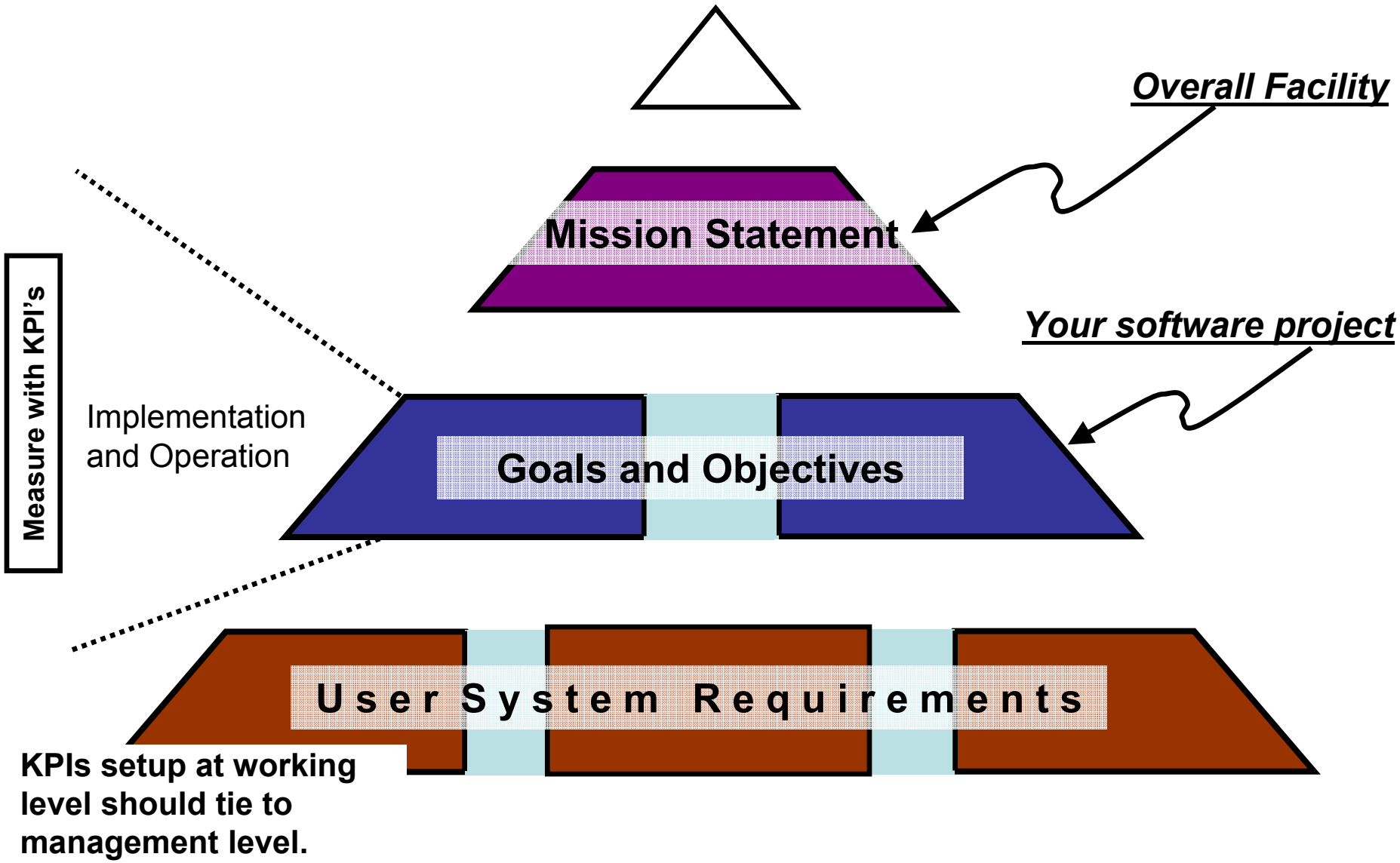
Client Sites:

- 25% - **consider PM's as optional or "fill-in" work**
- 30% - **have poorly designed Work types** (not mutually exclusive)
- 35% - **fail to make use of or understand the Saved Query feature**
- 35% - **are not always linking work order to correct asset**
- 40% - **have not used Failureclass coding on Equipment records – thus no crossover to Workorder, and therein no Problem code choice selection for repair workorders**
- 50% - **are not planning routine CM work**
- 50% - **are not ranking new work based on "relative ranking of importance", and not aware of CALCPRIORITY which combines EQ/LOC priority with Workorder priority**
- 60% - **are making improper use of INPRG status** (how many do you have?)
- 60% - **have poorly worded work order descriptions** (no problem defined)
- 70% - **have not assigned specific responsibility roles to their CMMS**
- 80% - **have no Analytical reports**
- 80% - **do not perform or understand concept > Error Checking**
- 95% - **do not create a** resource leveled **weekly schedule**

Why did you buy MAXIMO?

Are you making more informed decisions using this software?

Hierarchy of Goals



Your mission statement might say:

(1) Reduce unplanned ***breakdowns****,*

(2) Reduce ***recurring failures*** *and*

(3) Eliminate ***emergency*** *events*

(4) plus enhance work force ***efficiency***

Reduce Reactive **and** ***become more Proactive***

1. Just how is reactive maintenance defined and, how **can it be reduced**?
2. Why **aren't spare parts identified** – especially those for PM work?
3. Why are parts **so hard to find** in our own warehouse?
4. Why doesn't management give us a **weekly schedule**?
5. Where can I get one report which shows **all repair history** for one asset?
6. We enter problem codes but nobody does **failure analysis**, i.e. recurring failures
7. If Maximo is so good why can't we generate **Repair/Replace** criteria?

Cost Avoidance Techniques

Operations & Maintenance

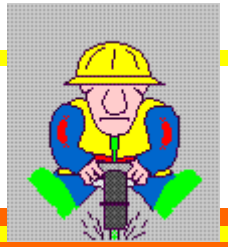
Finance Manager manages actuals from quarter to quarter but who is managing/<u>reviewing opportunities</u> where we could have done better?

Done better in what?

- Reviewing Delay codes
- Tracking stock-outs
- Performing basic failure analysis
- Evaluate worse offenders:
  - PM compliance
  - Schedule compliance
- Review Backlog for accuracy
- Perform Root Cause Analysis on Emergency events
- Read/review Maximo User Forums
- Attend Maximo User meetings
- Get input from maintenance staff; conduct brainstorming sessions

Step #1: Maintenance Vision

- It is important to first have a clear picture of what your maintenance needs are. Interview all the management teams. Identify problems – ask for suggestions.
- The maintenance system should be designed to help evaluate recurring breakdowns and improve work force efficiency. Make this your goal.



Maintenance is ...*to FIX THINGS ??*

- Maintenance is *more about* **preserving, protecting, safeguarding**, and looking after the very machines that make business possible.
- The company vision might be how to **prevent maintenance failures** as opposed to seeing how fast you can perform the repair.
- Some mechanical failures can lead to major unplanned shutdowns. A well-run maintenance department should see this as an opportunity to prevent these breakdowns from occurring and therein increase reliability going forward – which enhances public trust – and profit - for the company.
- Operations needs systems that work. Maintenance wants to provide that service, but must do so in an efficient manner.

Plain and Simple

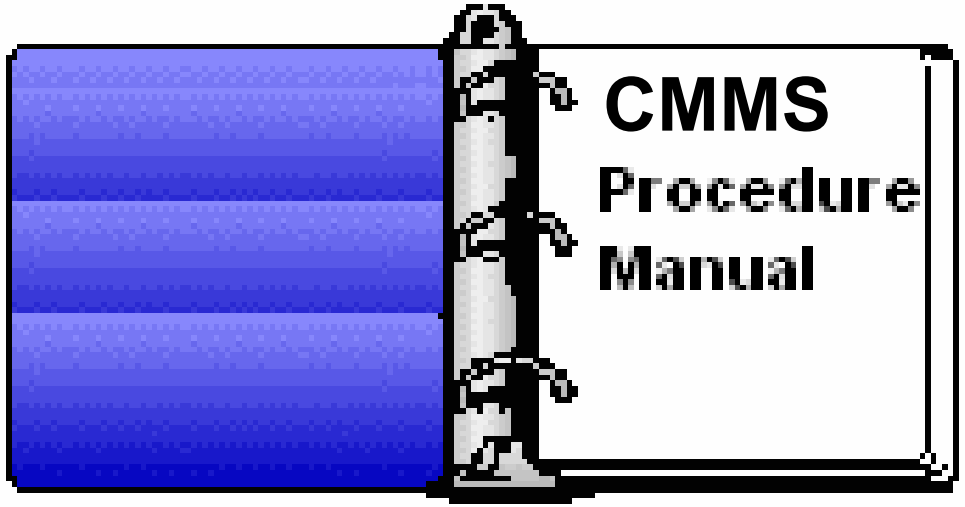
The <u>main objective</u> is to make more informed decisions regarding assets, system reliability, failure prediction **and** workforce utilization.

Reduce unplanned breakdowns and optimize use of labor resources

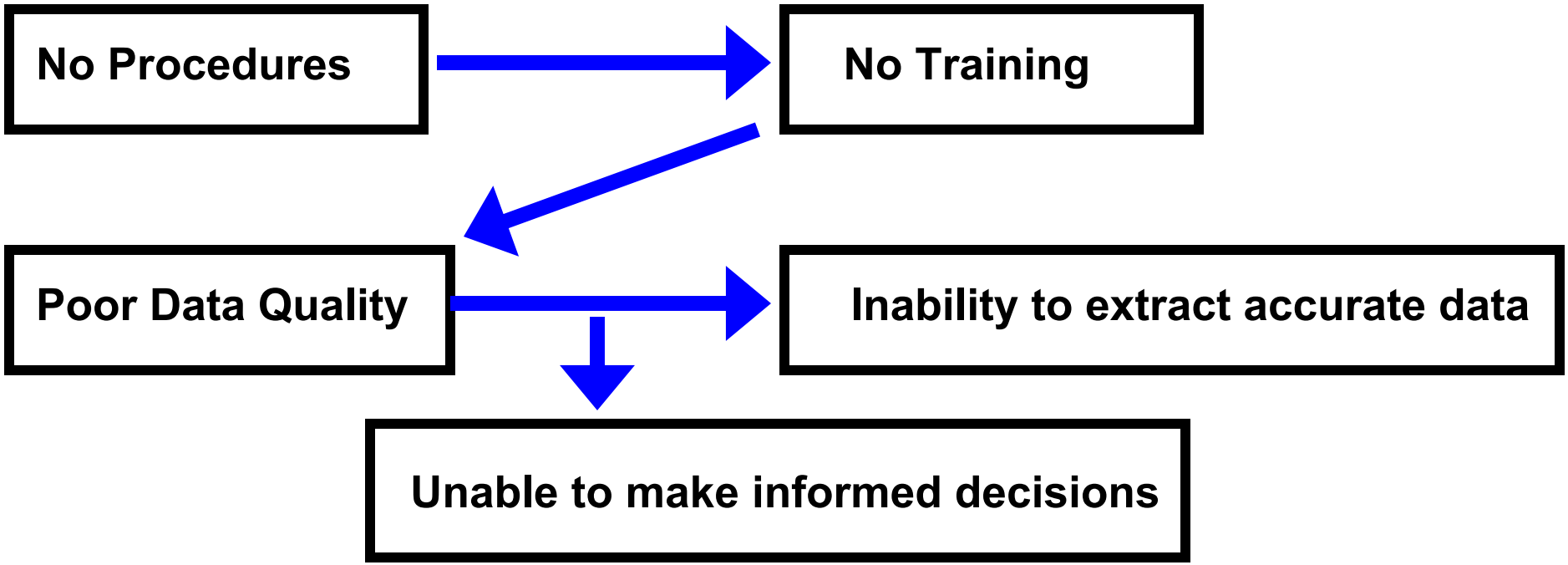
By enhancing asset reliability

+ Improving workforce efficiency

because
Reactive maintenance has a cost $


CMMS
Procedure
Manual

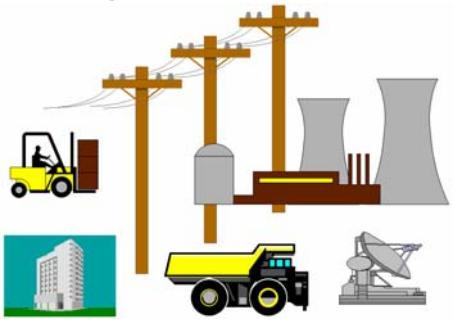
Got one?

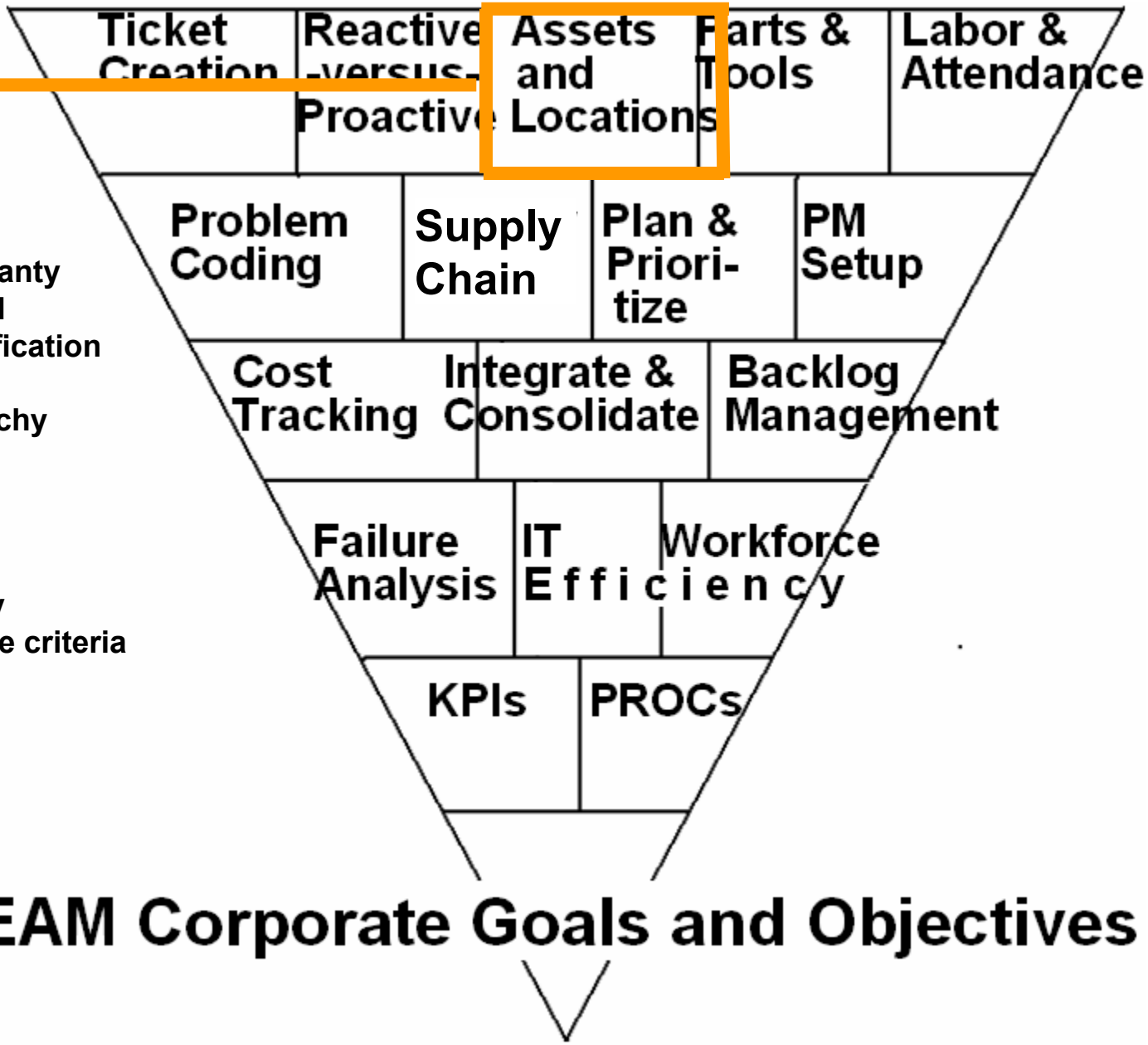

No Procedures
No Training
Poor Data Quality
Inability to extract accurate data
Unable to make informed decisions

Why do we need stinkin procedures?

Procedures - - examples

- New Asset Setup
  - Entering Priority
  - Install date, price, warranty
  - Spare part data and PM
  - Entering Failure classification
  - Specification data
- Creating the Location hierarchy
  - Use of Drilldown
  - Priority
  - System code
- Rotating asset setup
- Showing asset repair history
- Establishing Repair / Replace criteria
- Moving assets





EQUIPMENT DETAIL REPORT

11430

Equipment

Equipment	11430	Centrifugal Pump 100 GPM/60FT HD	
Belongs To	11400	NEW JERSEY	
Location	BR430	Condensate Return Pump- Centrifugal/100GPM/60FTHD	
Item	PUMP100	Centrifugal Pump 100 GPM, 60 FT-HD	Bin
Vendor	IR	Ingersoll-Rand Company	
Manufacturer	IR	Ingersoll-Rand Company	

Details — Critical Equip = 9

Calendar		Priority	1
Asset	6491	Failure Class	PUMPS
Serial	377-9A	Model #	TH

Downtime

Up ?	Y
Date	Feb 23 2000 11:09AM
Total Downtime	40.97

Costs

Total	$8,413.75
YTD	$524.75
Budgeted	$0.00
Inventory	$0.00

Purchase Information

Installation Date	03/31/91
Warranty Date	03/30/92
Purchase Price	$3,790.00
Replacement Cost	$6,200.00

Modified

Modified By	MAXIMO
Date	02/23/00 11:11 AM

Asset Repair History

LastCompleted(non-PM)		WType	Status	Pmnum	Jpnum	T-start	T-finish	Act.Finish
1173	new work	CM	COMP					02/23/00
7721	Condensate Return Pump Leaking	CP	CLOSE					06/02/95
7551	Check Low Flow on Condensate Return Pump	CP	CLOSE					05/12/95
6951	Condensate Return Pump Stopped	EM	CLOSE					05/10/95
6727	Condensate Return Pump Leaking	EM	CLOSE					01/05/95
6259	Check Low Flow on Condensate Return Pump	EM	CLOSE					09/10/94
5856	Condensate Return Pump Stopped	EM	CLOSE					09/10/94
5256	Check Leaking Condensate Return Pump	EM	CLOSE					09/05/94
4557	Check Condensate Return Pump Pressure Problem	EM	CLOSE					07/13/94

This work is done but shows you last completed repairs - as FYI.

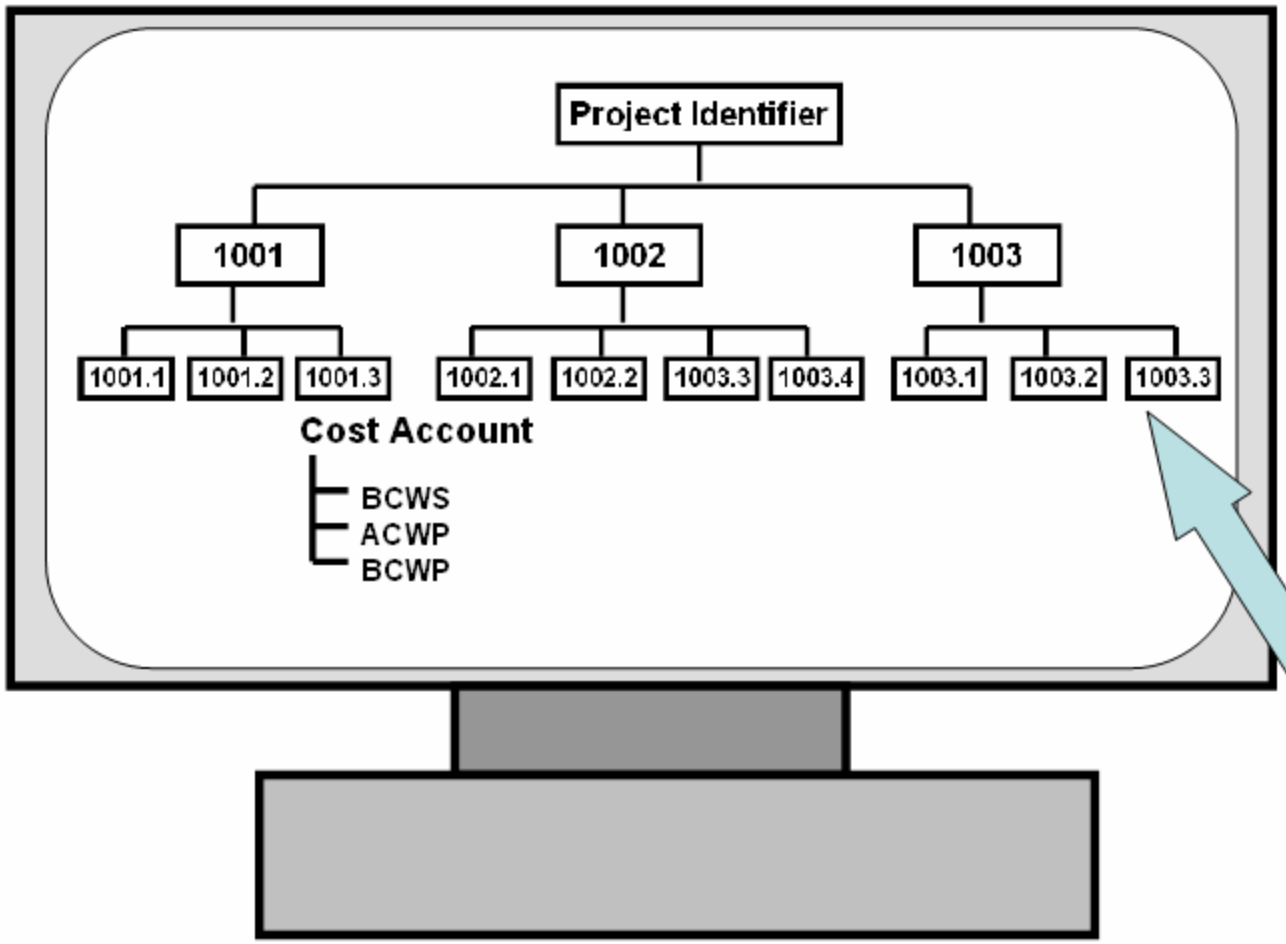
Stopped at 9

OPEN WOs		WType	Status	Pmnum	Jpnum	T-start	T-finish	Act.Finish
1024	Condensate Return Pump Quarterly Service	PM	WSCH	PM-PUMP	JP11430	01/28/98	01/28/98	
1042	DESCRIPTION FOR 1042	CBM	APPR					
1043	JR TEST WORK ORDER	CBM	APPR					

This is work is currently open

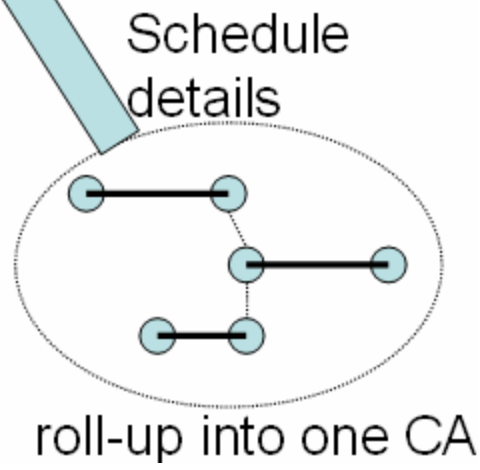
Lets discuss some more clever ideas…. tips and tricks

WBS Management screen



CAPABILITIES

1. **Dynamically build** the WBS structure
2. **Store budget** values at cost account level (lowest) –or-
3. Receive detailed budget from Work Orders through relationship



4. Push schedule detail to MAXIMO Work Orders

PROJECT COST REPORT – inside Maximo

Cut Off Date: 27-JAN-2006 REF05021

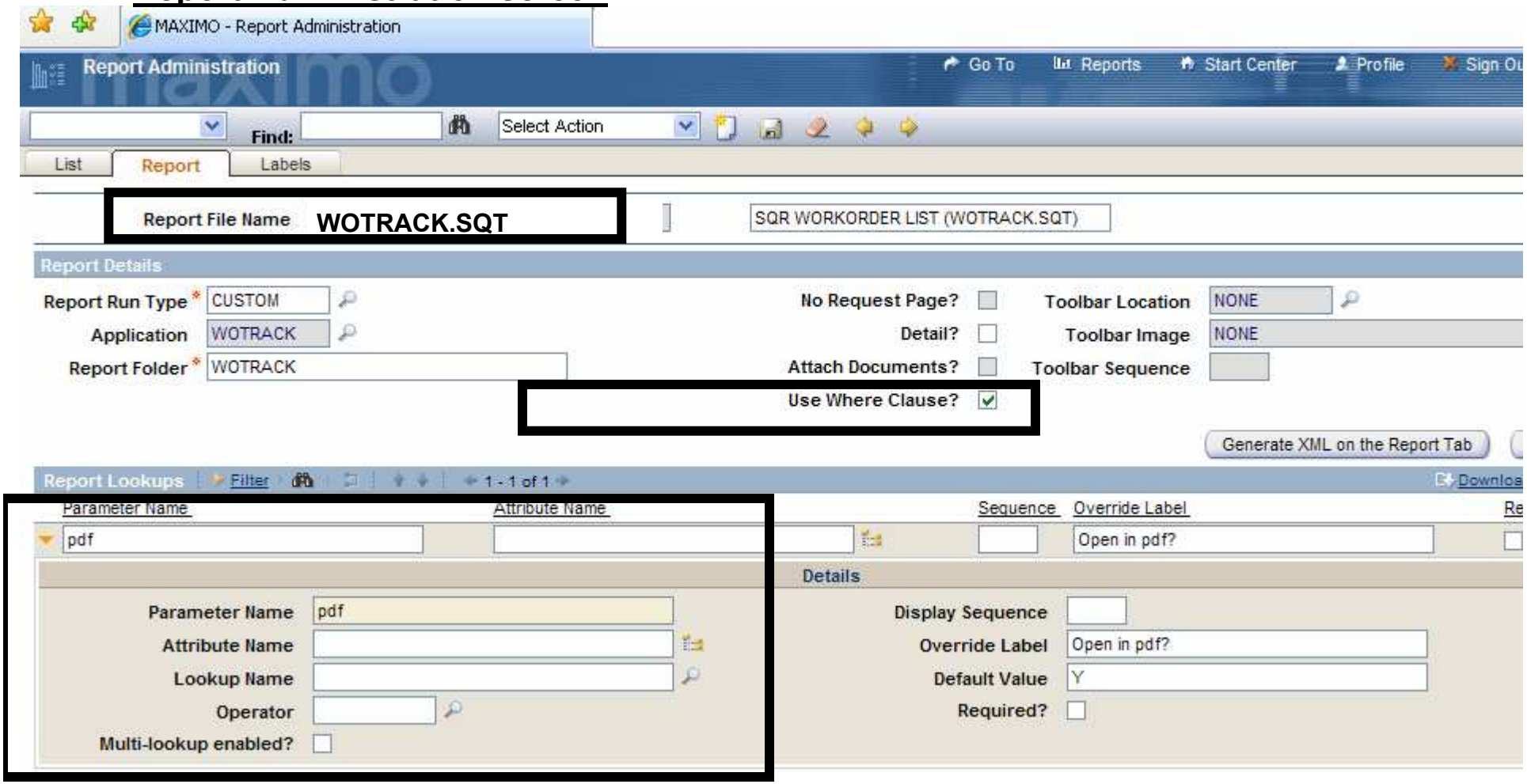
DETAIL COST REPORT - CCR PLATFORMING UNIT PROJECT
Coffeyville Resources, Coffeyville Refinery

Report Date: 01/27/2006 04:21 PM

ACCT	ITEM DESCRIPTION	ORIGINAL BUDGET	CHG ORDERS and APPR XFERS	CURRENT BUDGET	COMMITTED TO DATE	EXPENDED TO DATE	ESTIMATE TO COMPL	CURRENT FORECAST	OVER / (UNDER)	CHANGE THIS MONTH	PREVIOUS FORECAST
100	ENGINEERING										
110	ENGINEERING-ISBL	$9,281,234	$569,453	$9,850,687	$9,688,491	$854,846	$162,196	$9,850,687	$0	$0	$9,850,687
120	ENGINEERING-OSBL	$1,170,360	$0	$1,170,360	$1,050,800	$14,053	$79,560	$1,170,360	$0	$0	$1,170,360
	ENGINEERING SUBTOTAL	$10,451,594	$569,453	$11,021,047	$10,775,291	$868,899	$241,756	$11,021,047	$0	$0	$11,021,047
200	EQUIPMENT & MATERIAL										
210	REACTORs	$2,795,252	$70,410	$2,865,662	$2,815,652	$53,565	$50,010	$2,865,662	$0	$0	$2,865,662
215	DRUMS	$1,223,040	$0	$1,223,040	$0	$0	$1,223,040	$1,223,040	$0	$0	$1,223,040
220	EXCHANGERS	$3,232,450	$0	$3,232,450	$1,507,000	$527,450	$1,263,450	$2,770,450	($462,000)	$0	$2,770,450
225	TOWERS	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
230	COMPRESSORS & DRIVERS	$9,506,352	$48,584	$9,554,936	$0	$0	$9,554,936	$9,554,936	$0	$48,584	$9,506,352
235	CCR MODULES	$12,545,000	$0	$12,545,000	$4,390,000	$4,390,000	$8,155,000	$12,545,000	$0	$0	$12,545,000
240	HEATERS	$4,876,800	$0	$4,876,800	$4,821,700	$0	$0	$4,821,700	($55,100)	$0	$4,821,700
245	PUMPS & DRIVERS	$670,696	$0	$670,696	$0	$0	$670,696	$670,696	$0	$0	$670,696
250	MISCELLANEOUS	$1,101,858	$0	$1,101,858	$0	$0	$1,101,858	$1,101,858	$0	$0	$1,101,858
255	TOTAL FREIGHT ALLOWANCE	$968,903	$133,262	$1,102,165	$0	$0	$1,102,165	$1,102,165	$0	$0	$1,102,165
260	REFORMER STABILIZER	$36,000	$0	$36,000	$0	$0	$36,000	$36,000	$0	$0	$36,000
265	PSA MODULES	$6,439,000	$0	$6,439,000	$0	$0	$6,439,000	$6,439,000	$0	$0	$6,439,000
270	CCR STRUCTURE	$1,773,747	$0	$1,773,747	$0	$0	$1,773,747	$1,773,747	$0	$0	$1,773,747
275	PLATFORMER	$8,110,957	$0	$8,110,957	$0	$0	$8,110,957	$8,110,957	$0	$0	$8,110,957
280	OSBL/INTERCONNECTS	$740,604	$0	$740,604	$0	$0	$740,604	$740,604	$0	$0	$740,604
285	OFFICE/FIRE HOUSE	$80,000	$0	$80,000	$0	$0	$80,000	$80,000	$0	$0	$80,000
	EQUIPMENT & MATERIA SUBTOTAL	$54,100,659	$252,256	$54,352,955	$13,534,352	$5,445,015	$40,301,503	$53,835,855	($517,100)	$48,584	$53,787,271
300	CONSTRUCTION COST										
310	ISBL	$22,545,054	$0	$22,545,054	$0	$0	$22,545,054	$22,545,054	$0	$0	$22,545,054
350	OSBL	$5,328,000	$0	$5,328,000	$0	$0	$5,328,000	$5,328,000	$0	$0	$5,328,000

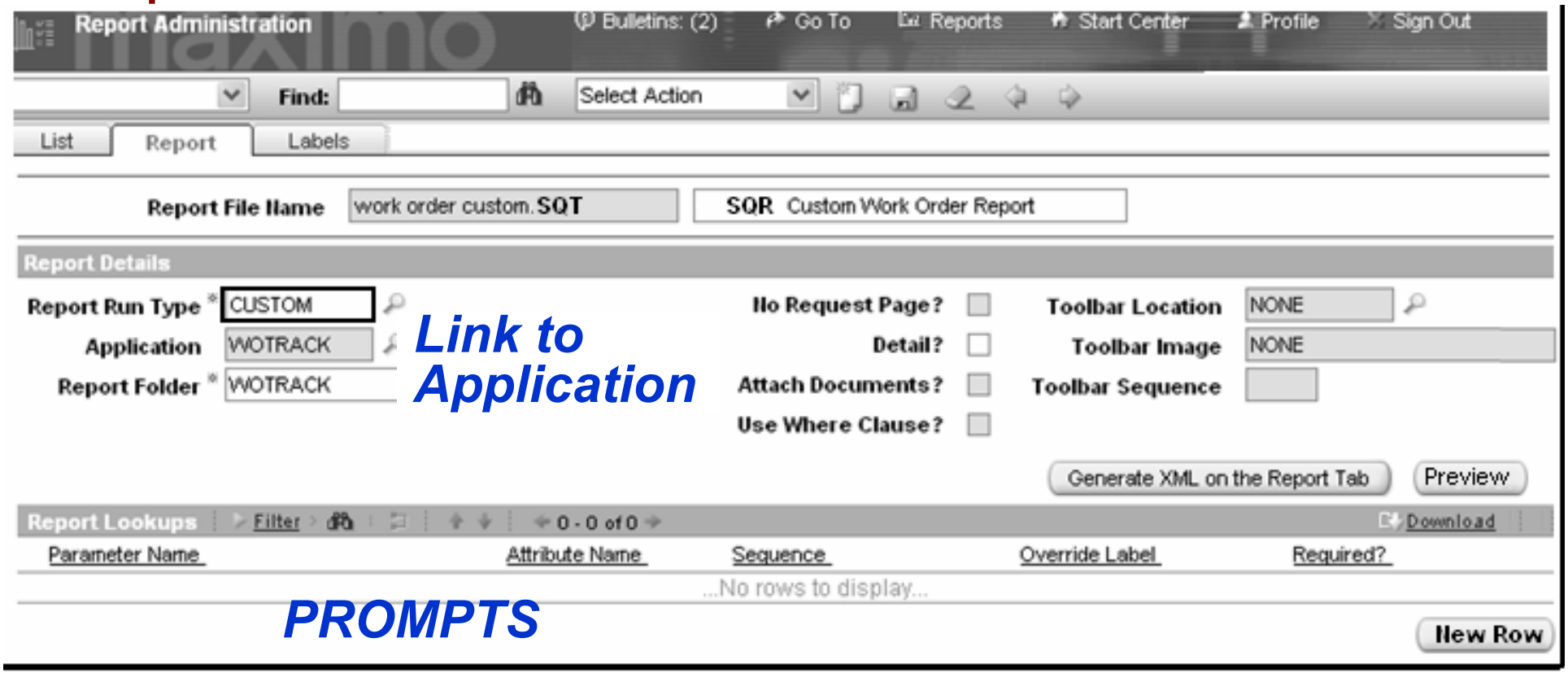
Did you know you can run **SQR on 6X**?

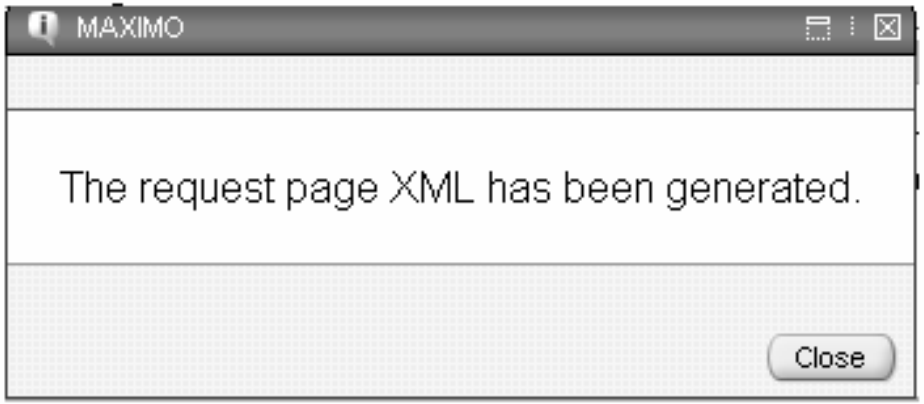
Report Administration screen



Extended Report Integration Setup

6X Report Administration



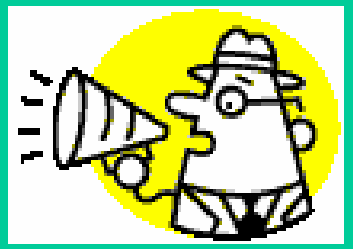


The custom report is now available to Maximo Users from the Work Order Tracking Application.

Maximo will send required report-related information via an HTML form post to the URL specified in the maximo.properties file

Lets discuss some Business Rules

Rules for MAXIMO



- **Rule #1:** All known work must be entered. Workorders should be written to request work - not just close them out. Link workorder to asset.
- **Rule #2:** Emergency work is done immediately and does not need pre-planning. However, a work order is still created. Actual man-hour capture and problem coding must occur. Note: the amount of reactive work load should be closely reviewed.
- **Rule #3:** During the performance of a PM, if additional repair work is identified and craftsperson desires to stay and fix the problem, he should have following limits: 15 min., and no use of non-stock materials, and no other crafts, and no tag-outs.
- **Rule #4:** Crafts should have a weekly schedule. Try to achieve 90% planned on open repair backlog, and 80% compliance on weekly schedule.
- **Rule #5:** Any movement of asset out of operation to a repair shop and vice versa needs to be tracked – in MAXIMO.

Definitions may be required

On the surface these *Rules* may sound clear but the "devil is in the details", so therefore we need to make sure we understand the definitions.

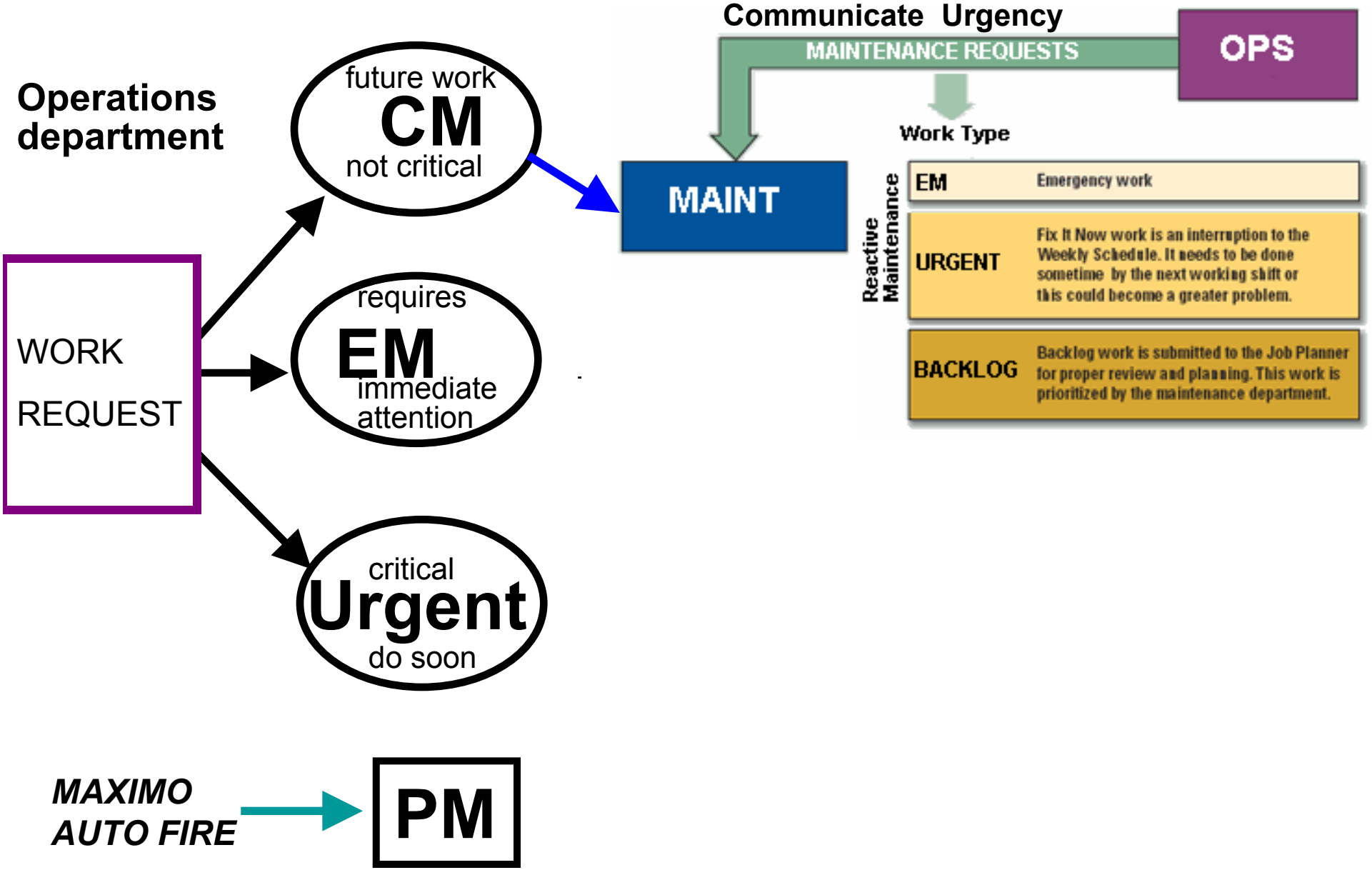
- Best practice
- Critical assets
- Emergency work
- PRIORITY of a work order
- WORKTYPEs
- STATUS synonyms
- PROBLEM codes
- Reactive maintenance
- Fully planned
- Weekly schedule
- Backlog
- Critical spares
- PR versus PO
- Cycle counts
- Turnover ratio

Definition of Best Practice

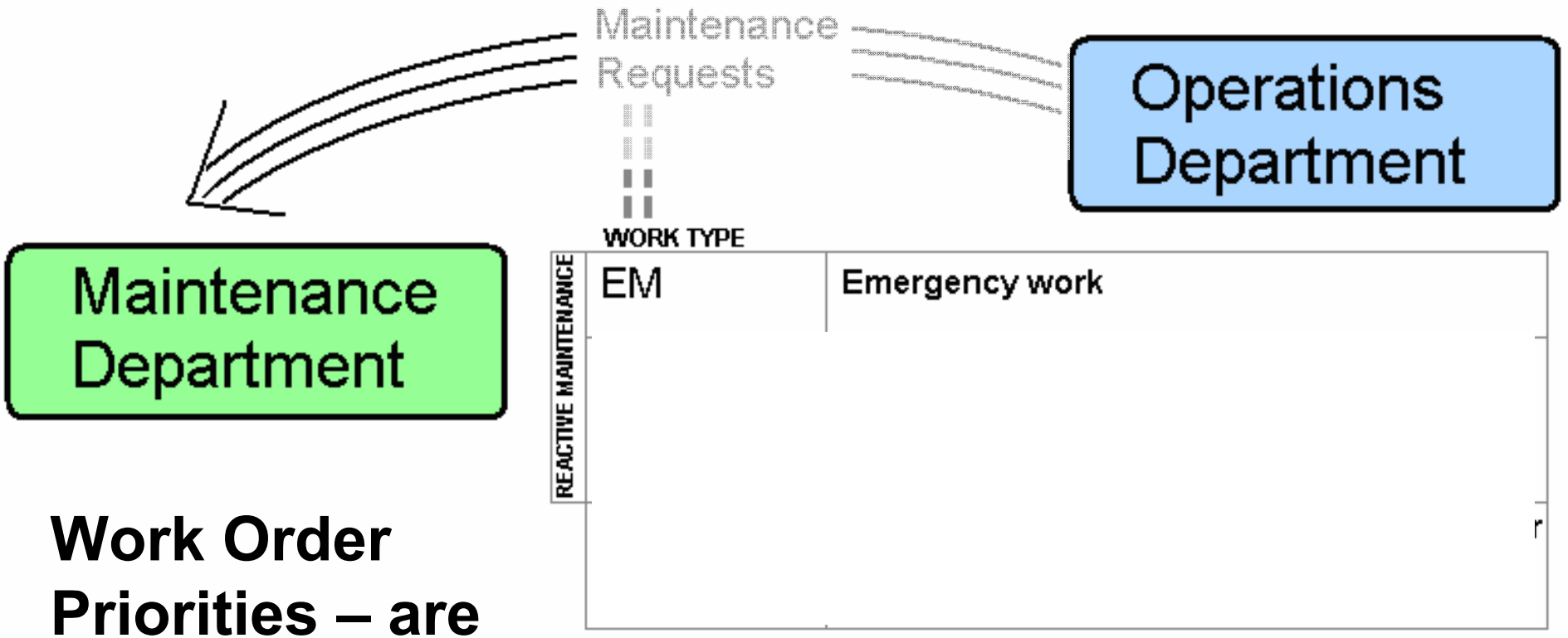
Essentially the concept is that in any company or organization, there is always room for improvement and that improvement is often best acquired through **learning from others**, who have already faced the same issues. The concept applies to all companies, whether large or small, public or private.

What constitutes best practice will vary from company to company - and is **constantly changing**.

Using Work Type & Priority together



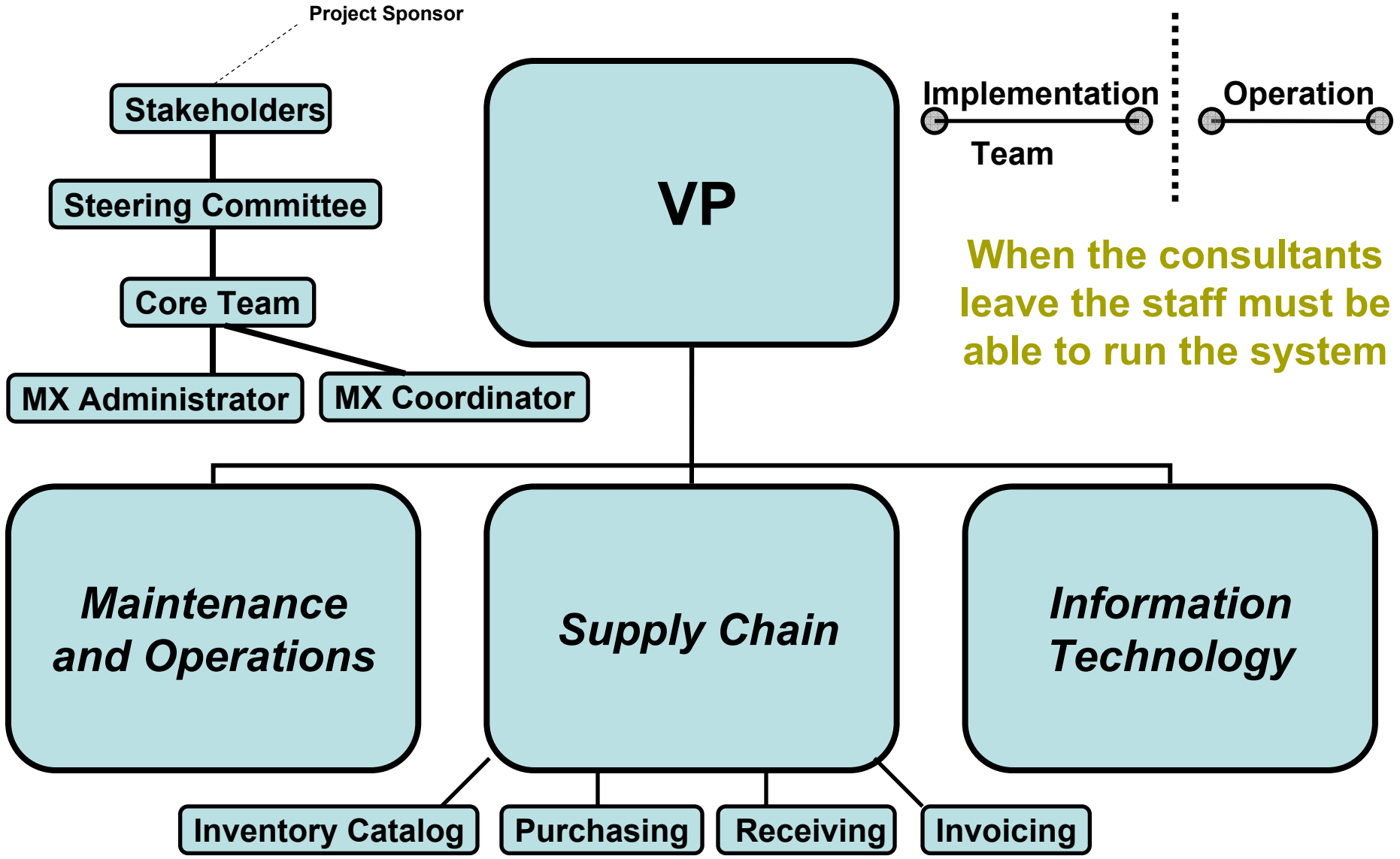
Communicate with Work Types



Work Order Priorities – are entered by Maintenance

Lets discuss some Roles and Responsibilities

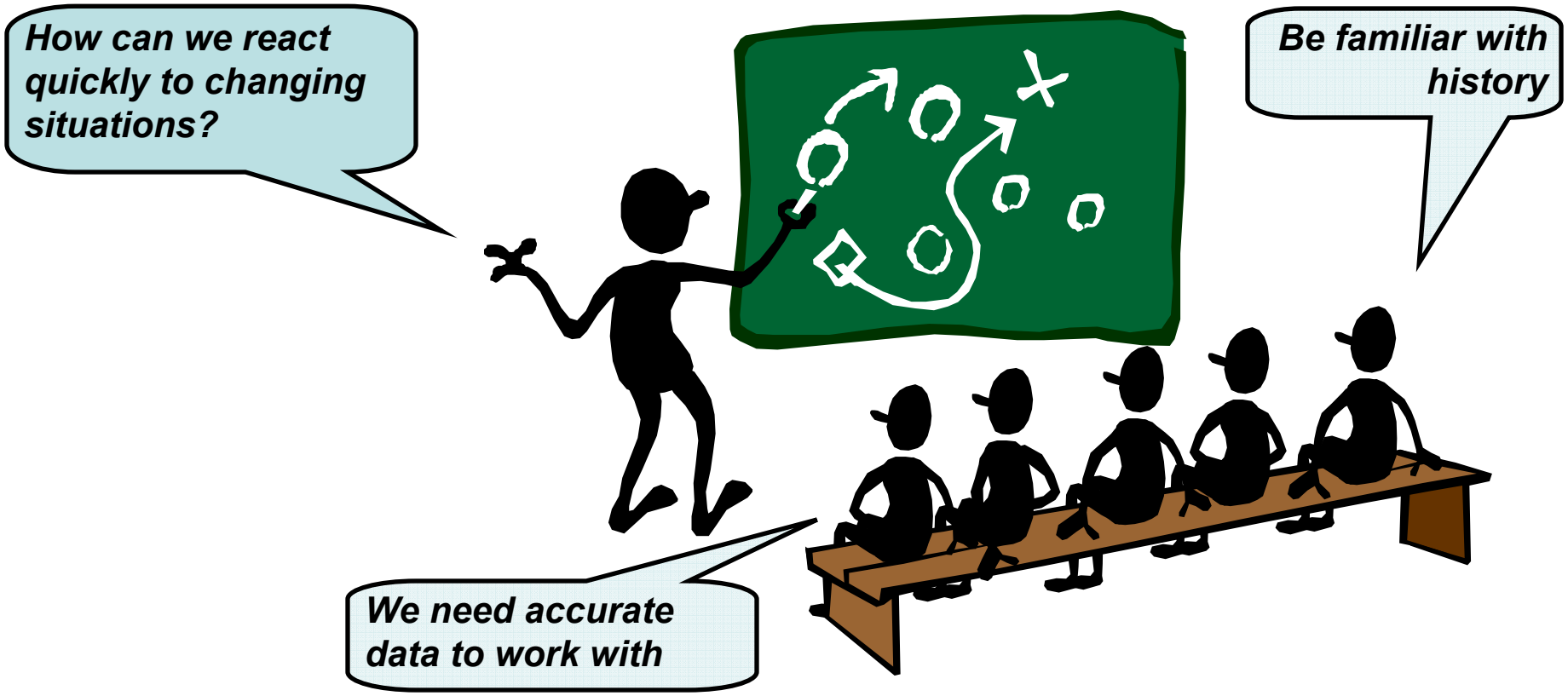
Roles and Responsibilities



What are the roles of MAXIMO Coordinator – process side?

- **Manage all aspects of the MAXIMO system**
- **Coordinates development of CMMS-Maintenance processes and procedures in support of continual improvement. Provides vision in terms of CMMS system & process improvement.**
- **Participate in Core team meetings; perform periodic end-user satisfaction survey**
- **Manages and prioritizes the CMMS action tracking. Capture bugs, track/resolve performance issues, assist with new report requests, facilitate training.**
- **Perform product tailoring plus change management. Makes contact with MAXIMO Support; participate in user groups.**
- **Aggressively pursues data accuracy through error checking.**
- **Shares knowledge internally with Core Team; report to Steering Team; facilitate KPI tracking for management**

Creating a Problem Solving Organization



Creating a Problem Solving Organization

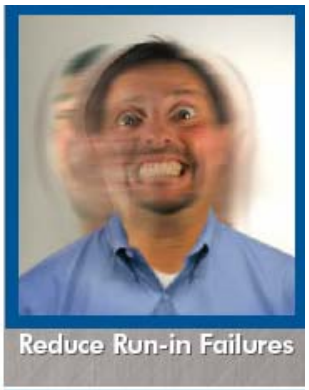
- Figure out a way to become more Proactive
- Record work delays – and investigate further; seek continuous improvement
- Participate in reviews of recurring breakdowns; ask why
- Pursue backlog accuracy
- Establish roles and responsibilities
- Strive for 90% planned
- Integrate all forms of scheduling
- Note: Planning does **not** mean chasing parts.
- Basic failure analysis should be your goal

No Time to Review the Data?

"What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?"

Basic Failure Analysis

versus Root Cause Analysis



Basic Failure Analysis

Using the standard functionality of MAXIMO the reliability engineer can gleam substantial information about asset history and the “bad actors”.

Identify dominant failure modes through quantity and cost-based Pareto analyses.

Manage by exception

Drill-down

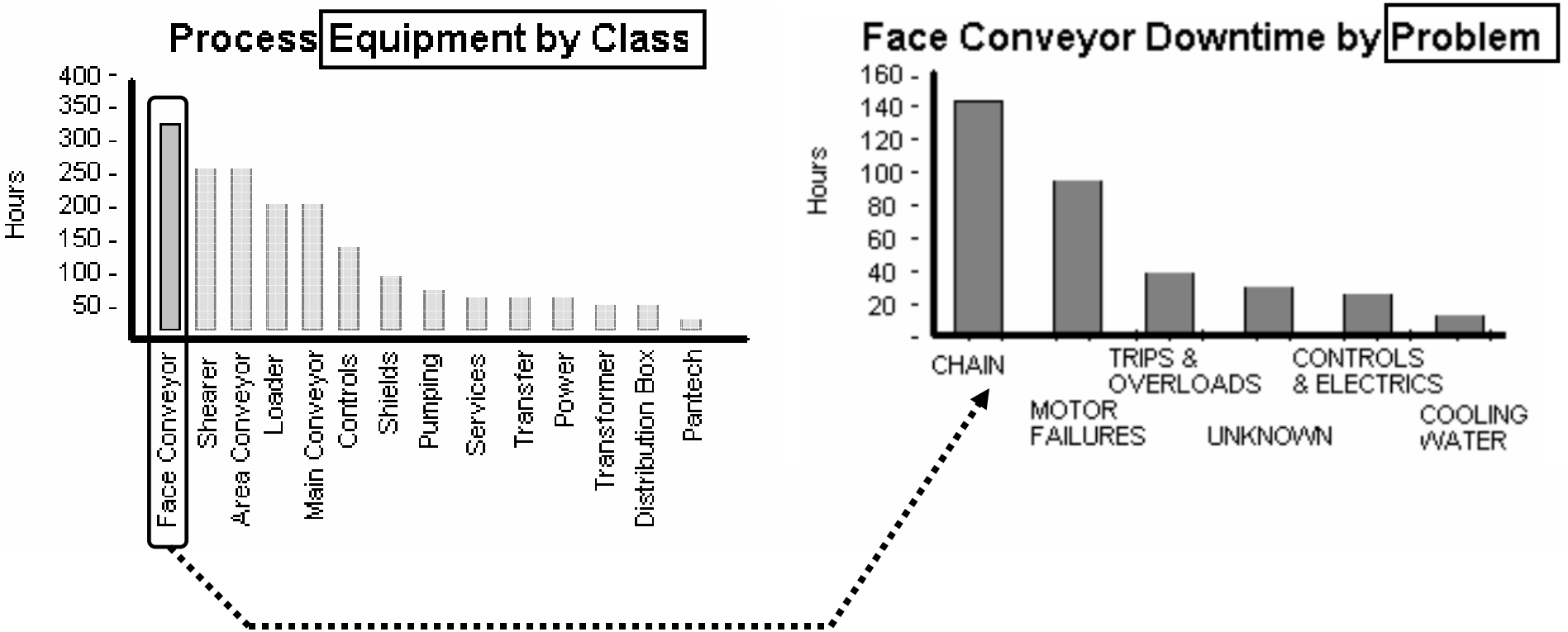
Ask questions – find cause

Implement corrective actions

RCA

should be done on emergency work

Failure Analysis



EQFAIL1.SPF - Brio.Report Viewer

File Edit View Page Help

11-SEP-2003
EQFAIL1.sqr

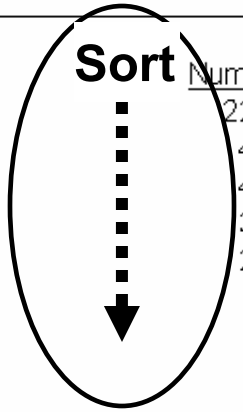
EQUIPMENT FAILURE SUMMARY

Page

01/01/1990 to 09/11/2003

Lists each piece of equipment in query, and provides the equipment number and description.
For each piece of equipment, for the user specified time period, the report lists the
number of failures, the mean time between failures and the average downtime of the failures.
A failure is considered to be the problem code found for the equipment on the work order.
Report is sorted on Highest number of Failures.

Equipment	Equipment Desc	Number Of	Mtbf	AvDownTime
11430	Centrifugal Pump 100GPM/60FT HD	22	99.87	1:50
11400	Boiler- 50,000 Lb/Hr/ Gas Fired/ Water Tube	4	355.00	1:10
11450	Centrifugal Pump 100GPM/60FTHD	4	377.33	0:53
13145	Indexing Drive Assembly	3	0.00	0:00
11460	Burner, Gas Fired- For Boiler	2	1125.00	1:15



Manage by Exception

Lets discuss some Analytical Reports

KPIs are a form of Reports

Focus on:

- **Areas of equipment reliability and maintenance productivity to improve plant operating efficiencies**
- **Core competencies which include planning and scheduling coordination**

Specific goals:

- **Enhance work force efficiency through better planning & (weekly) scheduling, and**
- **Begin eliminating recurring failures by identifying the bad actors; perform basic failure analysis**

Proactive goals:

- **Conduct Core Team sessions to discuss methods for continuous improvement - and develop strategies that are based on solutions to equipment failures**
- **Review CMMS procedures & database – looking for data errors – find ways to improve accuracy going forward**
- **Review asset history – extracting reports from system – make more-informed decisions**
- **Track reactive maintenance**
- **Track stock-outs**
- **Setup spare parts (BOM) for each asset**
- **Track rework – track work delays**

Proof of concept [three years later] :

- **Recurring failures decreasing**
- **More effective reduction in size and accuracy of backlog**
- **Maintenance productivity up – less rework**
- **Maintenance costs going Down**

Analytical Reports - discussion

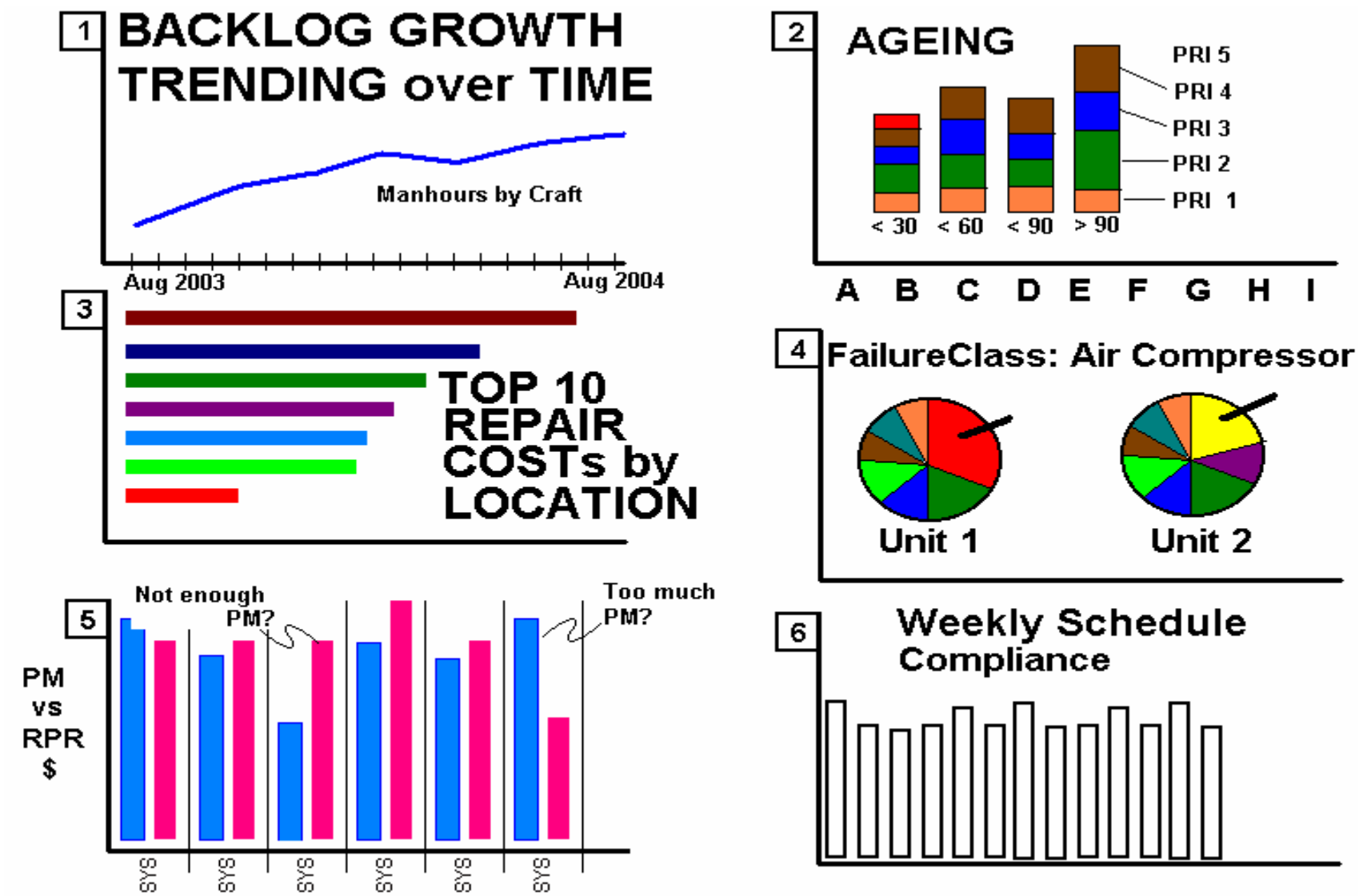
The purpose of putting data into MAXIMO is to pull it out, and analyze it.

Note:

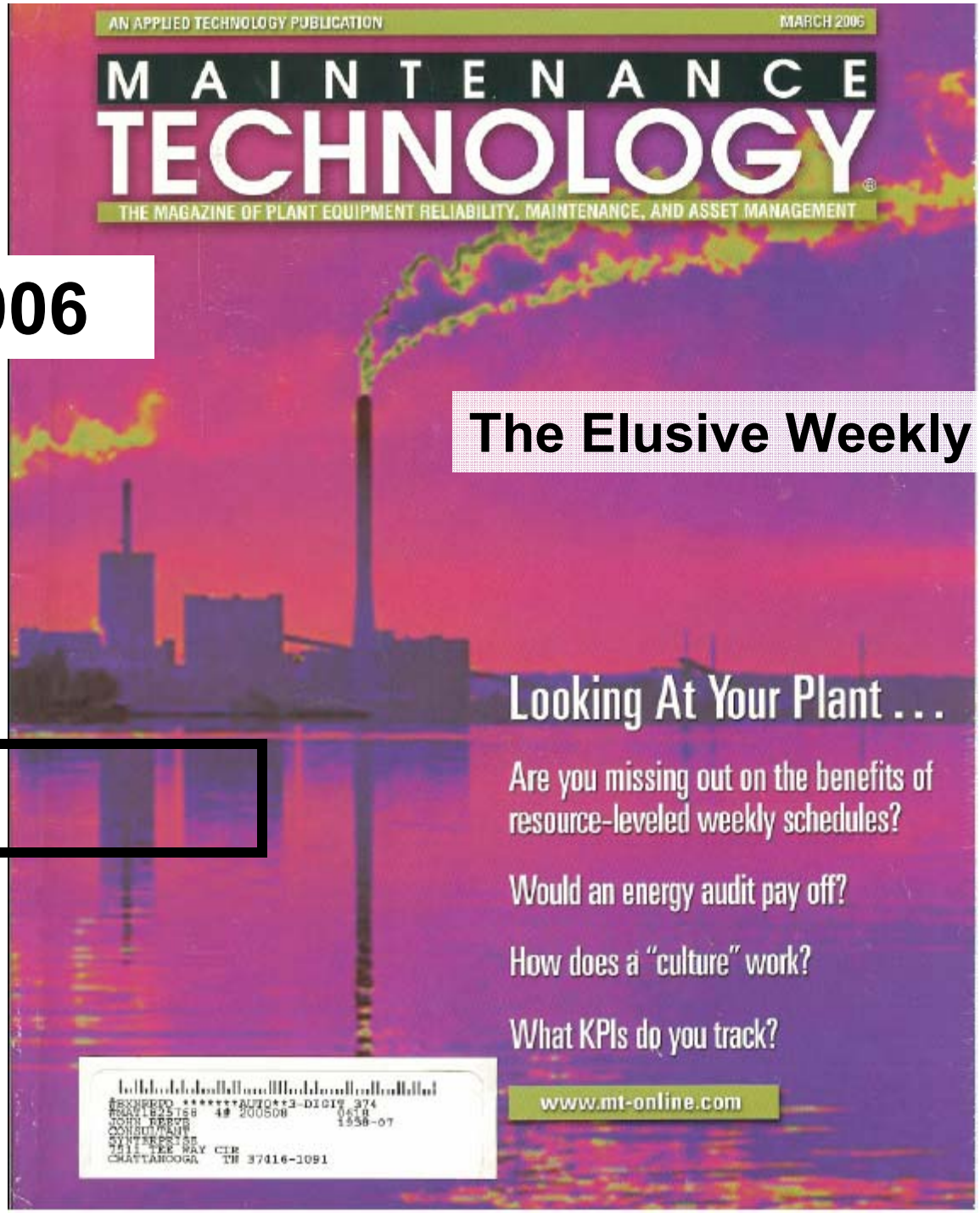
Total Number of Workorders Completed Last Month …..
is not an analytical report

Design analytical reports which help you make more informed decisions

Once the data is there, then what ...



March 2006

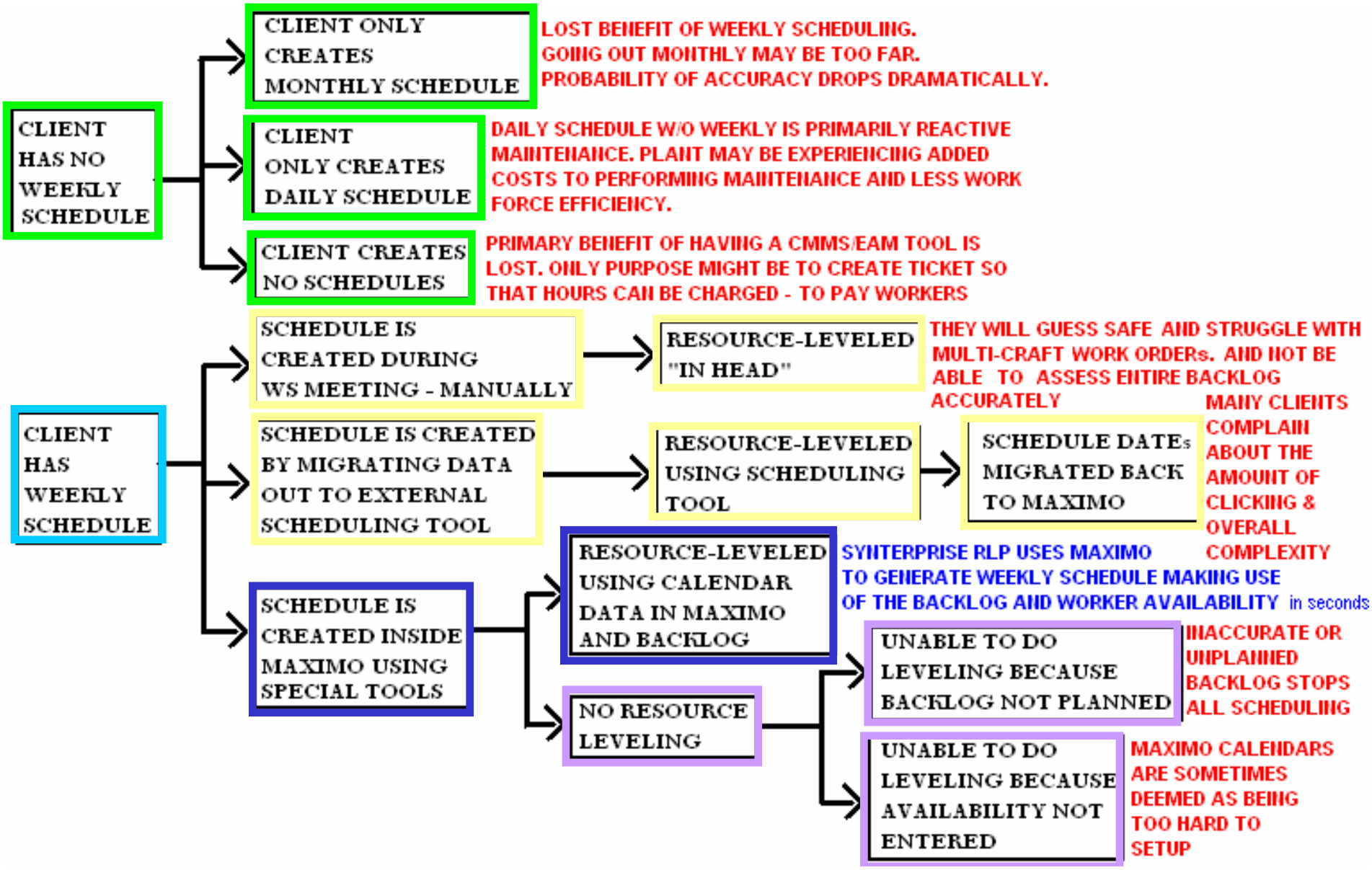


The Elusive Weekly Schedule

Weekly scheduling is the most significant benefit yet to be tapped by the maintenance industry

95% of all client sites are unable to create a resource leveled weekly schedule

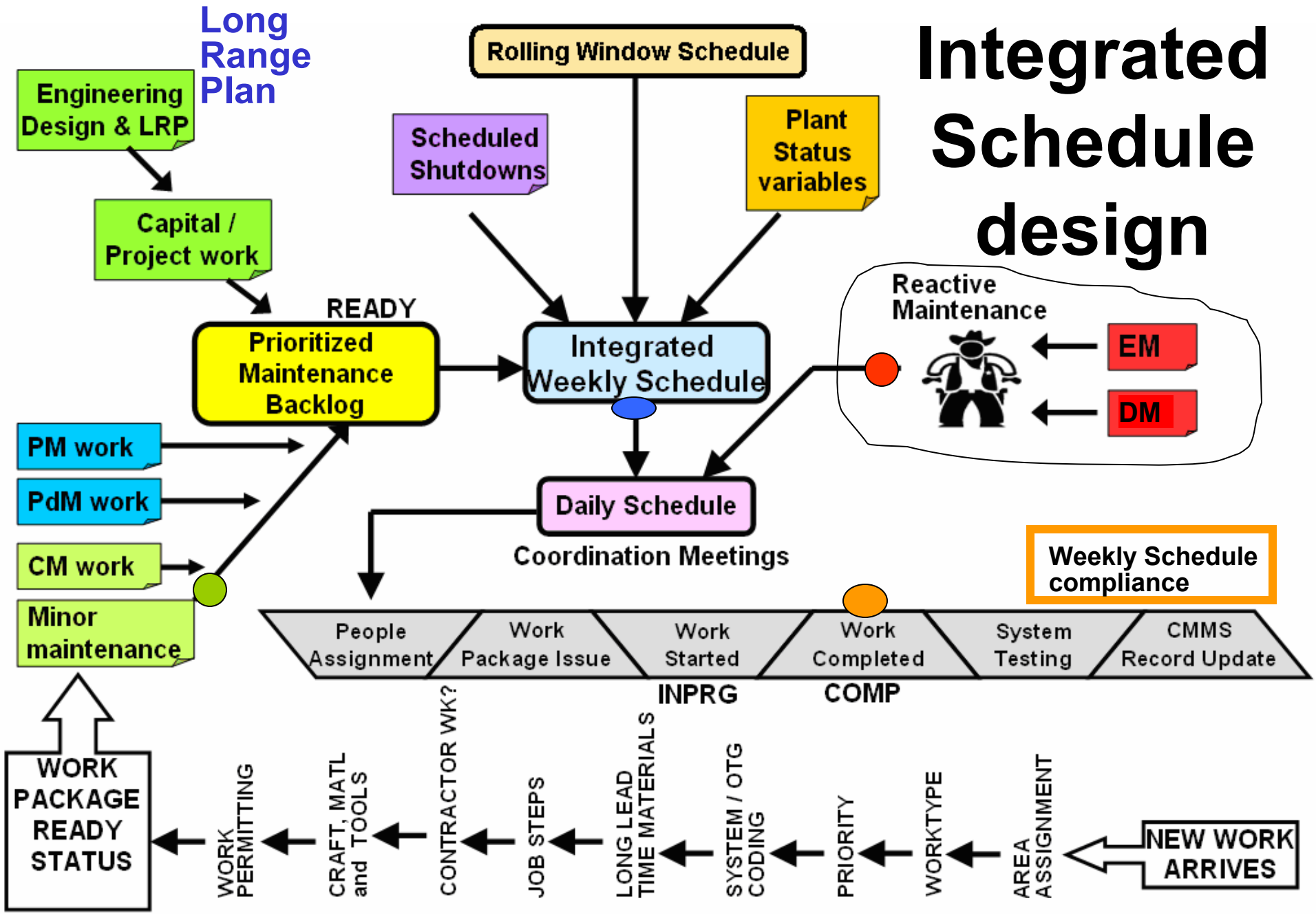
Weekly Schedule Process is Key



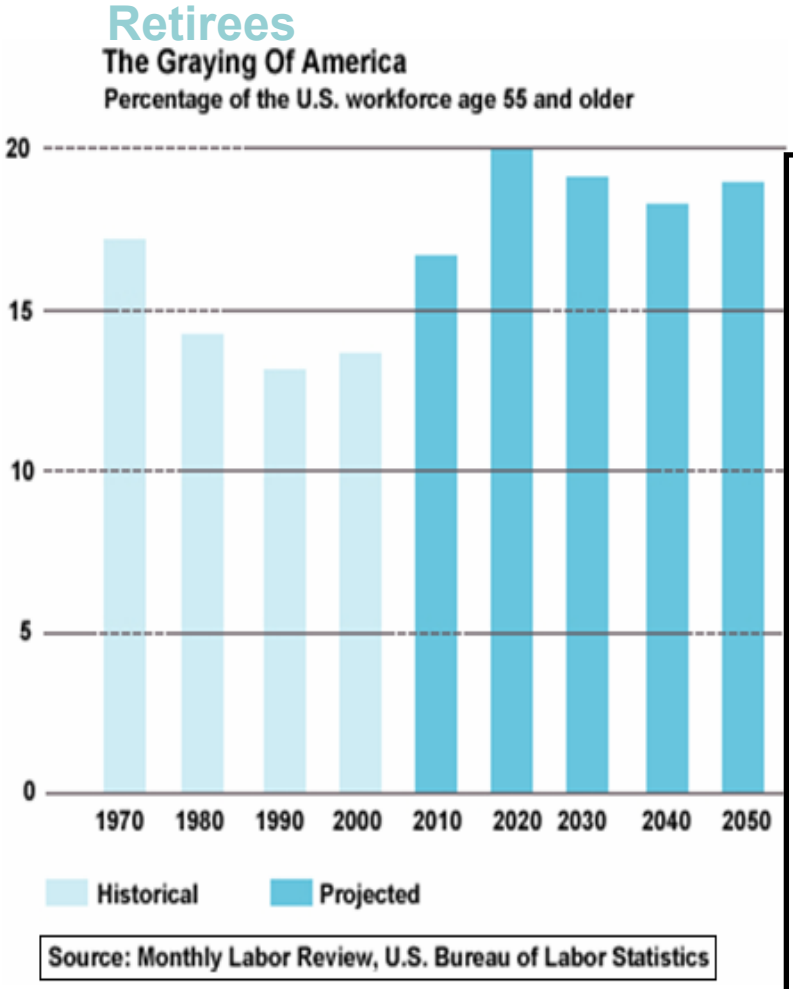
What does Success look like ?

- MAXIMO is **used throughout** the organization.
- Be a **problem solving organization.** Data review teams meet regularly to make more informed decisions using information from the maximo data.
- All **work is recorded**, including problem codes, action taken, status, actual manhours (and actual materials).
- Backlog is 90% planned.
- **Backlog is decreasing**.
- **Reactive work load** is on the decline.
- **PM compliance** is near 100%
- **Weekly Schedule exists** and has 80% (or better) compliance.

Integrated Schedule design



Store Knowledge inside your MAXIMO database – but how?



Answer:

- **Actual manhours – to the job, to the asset**
- **Failure/problem code entry**
- **Actions performed**
- **Review of repair history**
- **Building standard job plans**
- **Building a PM/PdM program – choosing right maintenance strategy and frequency**
- **All work performed is entered as a work order – to the right asset**
- **Maintain accurate backlog – perform error checking**

Imagine future perfect

In Summary

- Challenge yourself. Challenge your peers. Where can we **improve the process** ? The goal is continuous improvement.
- You know the software. You are now familiar with some of our **best practices**, including tips & tricks by our best consultants.
- **Data reviews** help guarantee accurate data. Without accurate data, your ability to make informed decisions based on your EAM/CMMS output is limited.

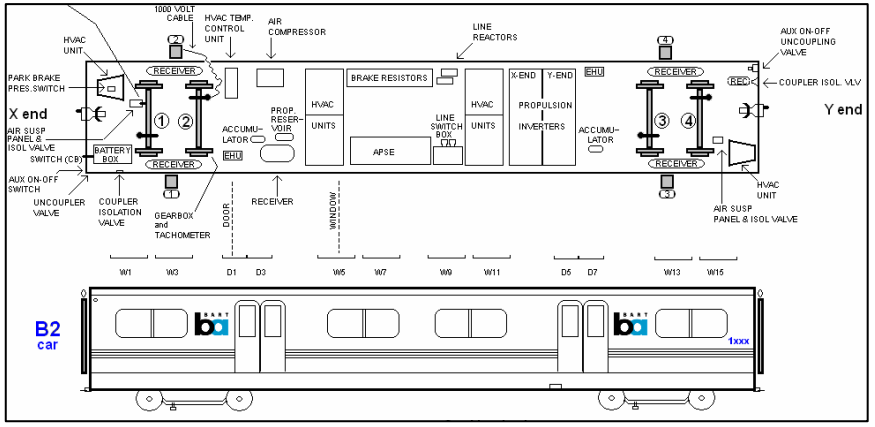
*** Install, Implement and Improve ***


MASON Sts.


16 9:29AM


BART


16 2:27PM


1000 VOLT CABLE
HVAC TEMP. CONTROL UNIT
AIR COMPRESSOR
LINE REACTORS
AUX ON-OFF UNCOUPLING VALVE
HVAC UNIT
RECEIVER
PARK BRAKE PRES.SWITCH
BRAKE RESISTORS
X-END
Y-END
EHU
COUPLER ISOL. VLV
X end
Y end
HVAC UNITS
PROPULSION INVERTERS
PROP RESER-VOIR
ACCUMU-LATOR
LINE SWITCH BOX
APSE
AIR SUSP PANEL & ISOL VALVE
BATTERY BOX
SWITCH (CB)
AUX ON-OFF SWITCH
UNCOUPLER VALVE
COUPLER ISOLATION VALVE
GEARBOX and TACHOMETER
DOOR
WINDOW
W1 W3 D1 D3 W5 W7 W9 W11 D5 D7 W13 W15
B2 car
1xxx

Better/Best Practice Experts

Technology Associates International Corporation

Knowledge is Power