IPAMC - DataTrak Systems Inc

CMMS --
Improvement through Best Practices

November 2017

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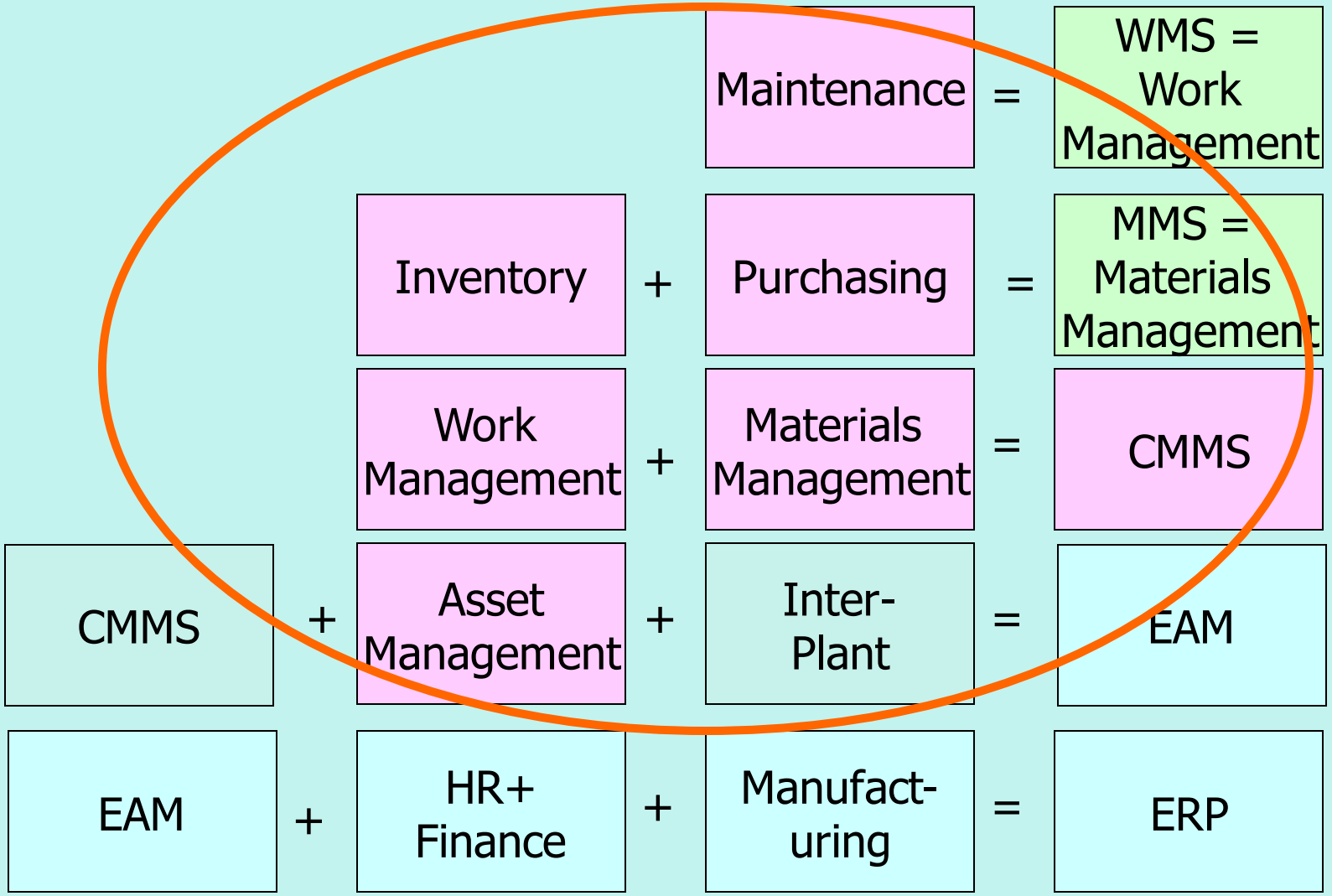
WMS – MMS - CMMS - EAM – ERP



CMMS Evolution

Phase 0 – Manual operation, no CMMS

Phase 1:
Automate Forms:
Work Orders
Purchase Orders
Issue slips
Time cards
Specifications

Phase 2:
Automate Processes:
Work Request/Work Order
Work Order/ Material Issue
Work Order/ Purchasing

Phase 3:
Use of Workflow, Work Management
Emergence of CMMS
Merge and eliminate tasks
Streamline functions

Phase 4:
Analysis, Information, Knowledge Base, Integration with Decision Tools to improve the quality of Maintenance

Project led by IT; KPI's are IT efficiency, database type

30%

Project led by IT; KPI's are IT efficiency, database type, degree of integration

40%

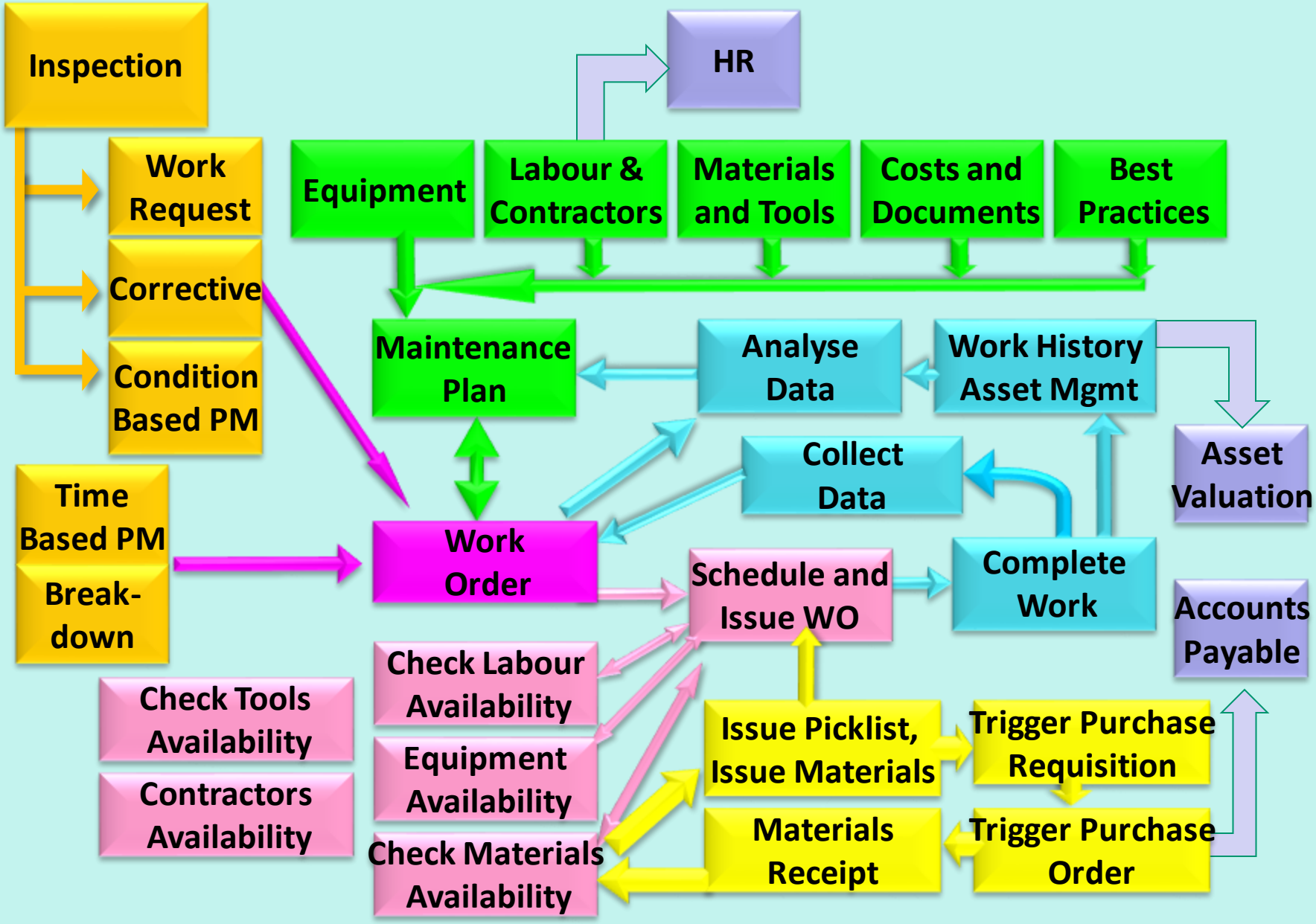
Project led by Business Unit; KPI's are cost reduction, materials usage employee productivity

25%

Project led by Maintenance; KPI's are equipment reliability, number of failures, quality of maintenance, use of best practices

5%

The Anatomy of a CMMS



CMMS Objectives

Rank them 1->11 for your business.

1	To get the work order process under control	
2	To better organize spare parts	
3	To plan procurement around future maintenance demand	
4	To produce better work orders	
5	To collect better data	
6	To act as the basis for measuring performance	
7	To reduce costs	
8	To improve reliability and reduce breakdowns	
9	To improve Physical Asset Management	
10	To increase the ROI/Profitability of the business	
11	Others….	

Here's a CMMS Best Practices Chart
Set your own priorities…..

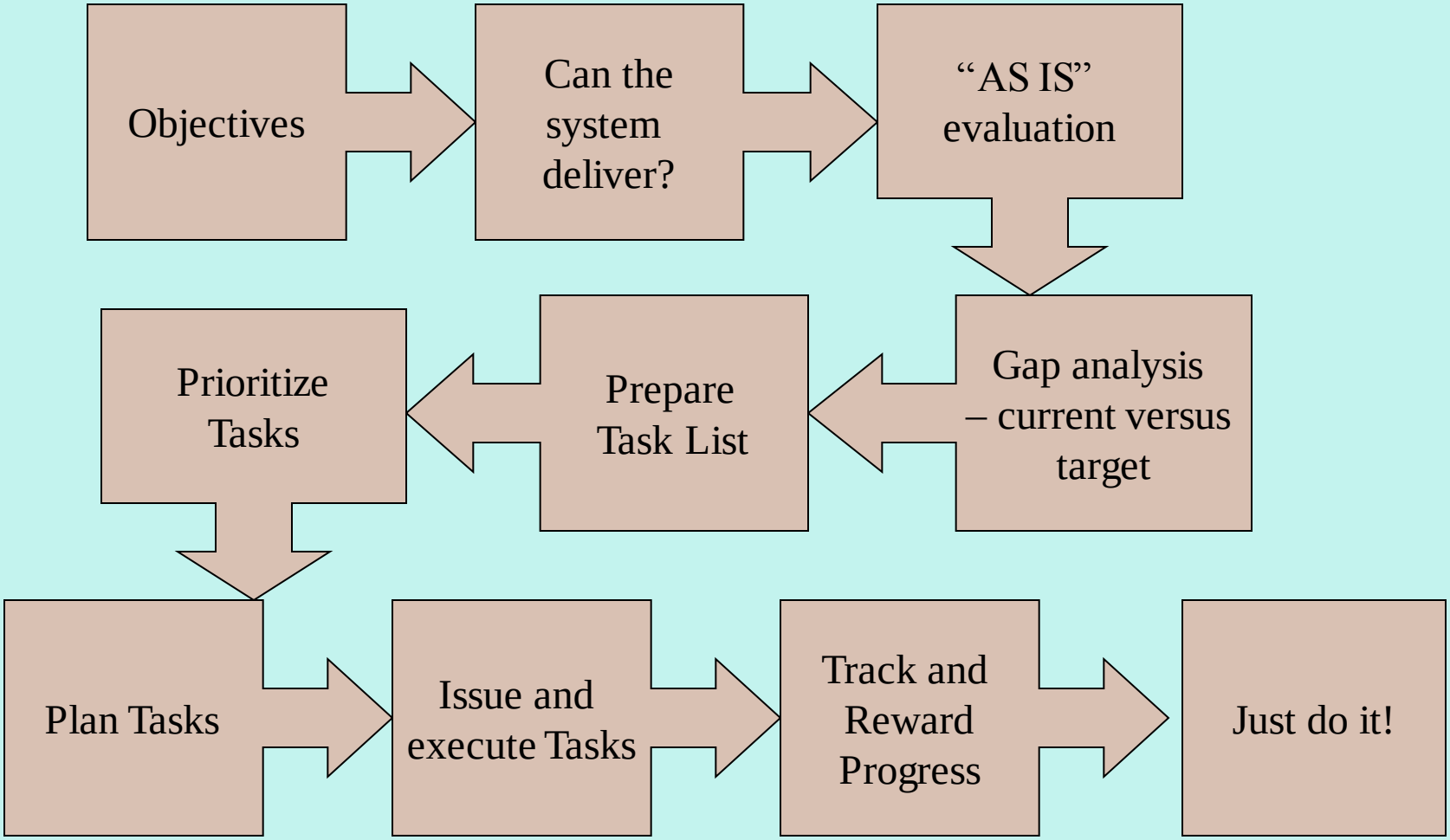
1	**All critical equipments are in the system**	
2	**All critical spares are in the system**	
3	**All the data is accurate and reliable**	
4	**All non-critical equipment and parts should be in the system**	
5	**70+% of your work is done against PM WO's**	
6	**All PM's are reviewed annually for relevance and accuracy**	
7	**All corrective work is done from WO's**	
8	**All breakdown work is recorded on templated WO's**	
9	**WO's collect data on material and hours used, equipment condition and failure causes**	
10	**All WO's make sense (according to the technician)**	

Part 2 of the CMMS Best Practices Chart –

11	**95+% of your work is scheduled**	
12	**Parts pick-lists are prepared automatically from WO's**	
13	**Parts replenishment is driven by automatic ordering**	
14	**Overdue WO's are reviewed weekly**	
15	**All breakdowns are scrutinized to update the PM program**	
16	**The system prompts regular ABC counts**	
17	**Reports are useful and accurate**	
18	**The system ties into your performance management system**	
19	**The system prompts maintenance improvement**	
20	**Someone is specifically responsible for generating more value from the system**	

Set and track KPI's for your main priorities

Extracting Value from CMMS

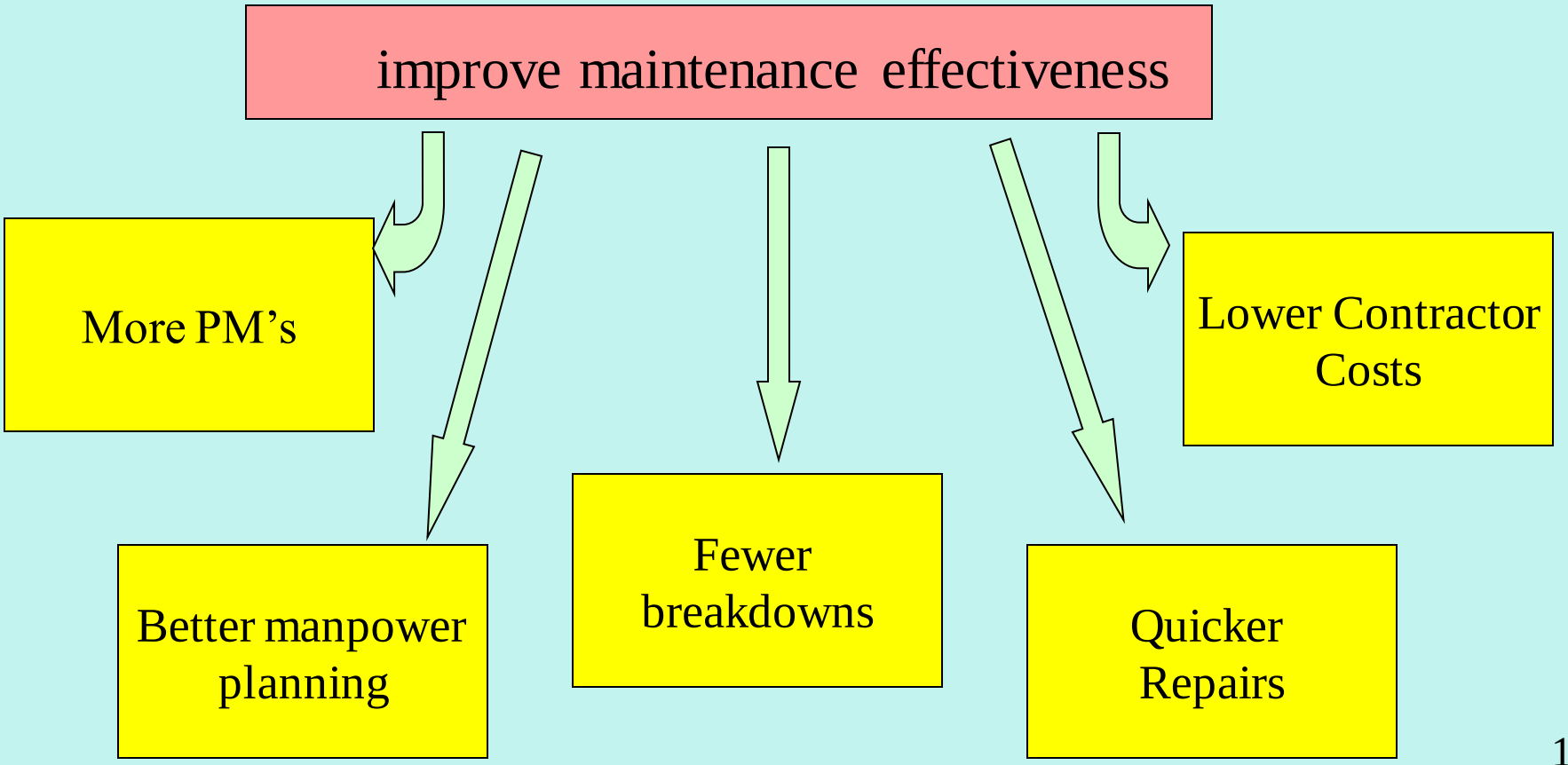


Step 1: Decide what you want to get out of the system

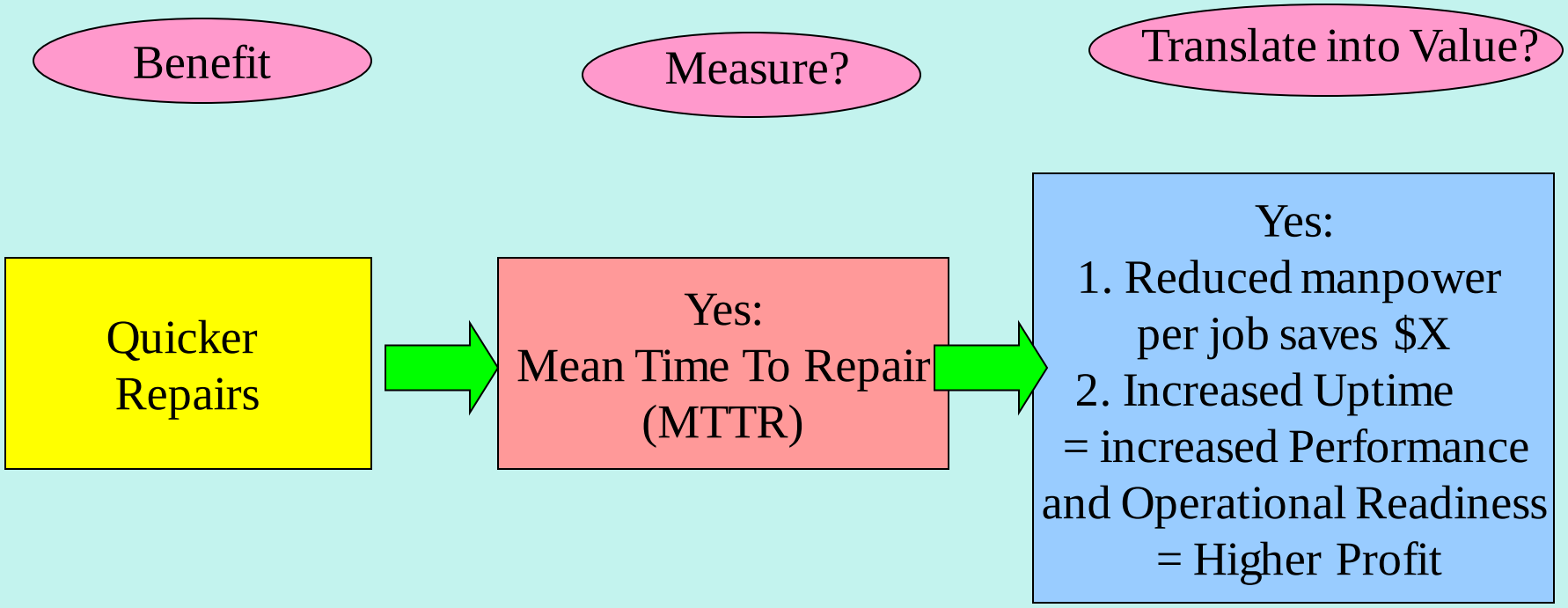
- may need to get senior managers involved.
- need a common understanding between Senior Executives and Maintenance Management.
- Set it up as a project
  - Set objectives and targets
  - Plan and cost the resources
  - Identify the benefits
  - Detail the steps and the timing
  - Establish the reporting process
  - Monitor progress

For each objective….

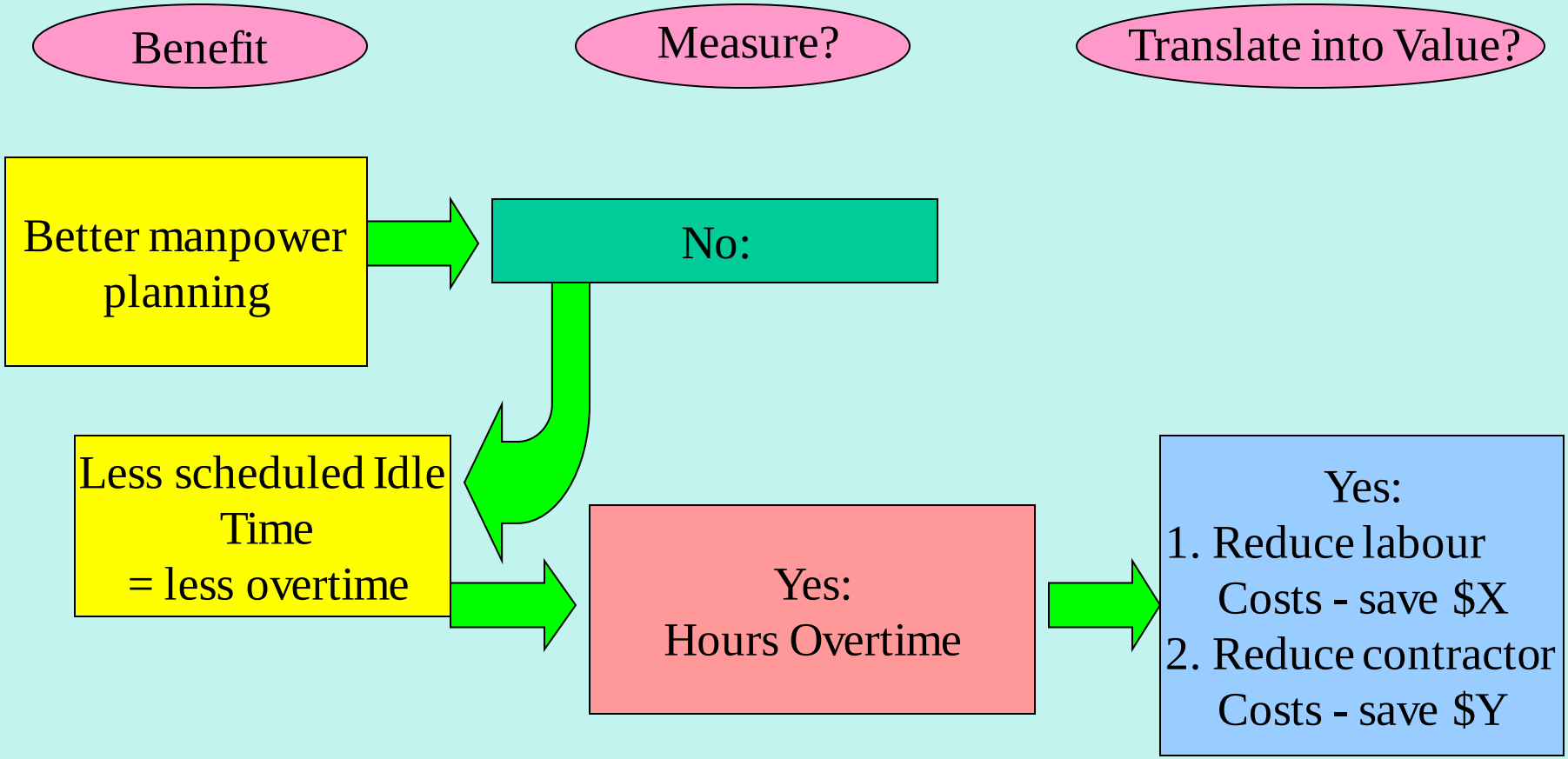
- Define the key benefits

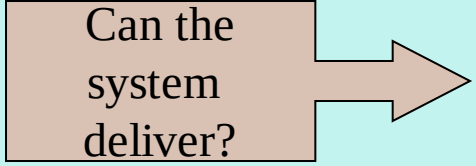


Set Targets


Benefit
Measure?
Translate into Value?
Quicker Repairs
Yes: Mean Time To Repair (MTTR)
Yes:
1. Reduced manpower per job saves $X
2. Increased Uptime = increased Performance and Operational Readiness = Higher Profit

Second Example….





Step 2: Confirm that the system can deliver what you want (it almost always can)

- Typically, CMMS functionality almost always out-performs the capability of the user.
- Assign someone to be specifically responsible as the CMMS user specialist
- You want him to extract more value from the system by first building his knowledge base, then sharing it with users.
  - Provide him with training
  - Review the objectives and targets
  - Link him to the User groups and User Group Meetings
  - Get him talking to the Vendor
  - Help him to meet Users from other companies to share ideas.
  - Challenge him to come up with an idea of the week

"AS IS" evaluation

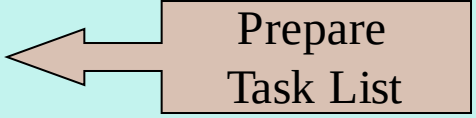
Step 3: Understand what you are currently doing with the system

- Many people will by-pass this step. Don't.
- It frequently provides the basis for a simple modification rather than creating a whole new procedure.
- Talk to current users to understand how they use the system
- Plus what they would like to improve
- Share this knowledge (or at least the good bits!!)

Gap analysis
– current vs target

Step 4: Gap analysis between current and target.

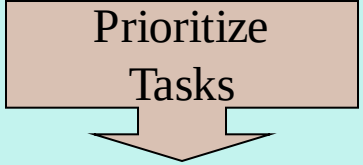
- Objectives and targets versus what we actually do
  - Check against Best Practice standards
  - Equipment records, equipment history
  - Materials inventory, materials transactions
  - Labour and contractor details
  - Work Requests, work orders and PM's
  - Work History
  - Performance analysis, backlogs, equipment failures
  - Reports
  - On-going reviews of Work Order quality



Step 5: Itemize tasks to be done to close the gap.

1. Changes in responsibility and job descriptions
2. Process changes
3. Training required
4. Screen and report redesign
5. Data collection and data analysis change
6. Changes in related utilities and decision tools
7. Additions and changes to CMMS database

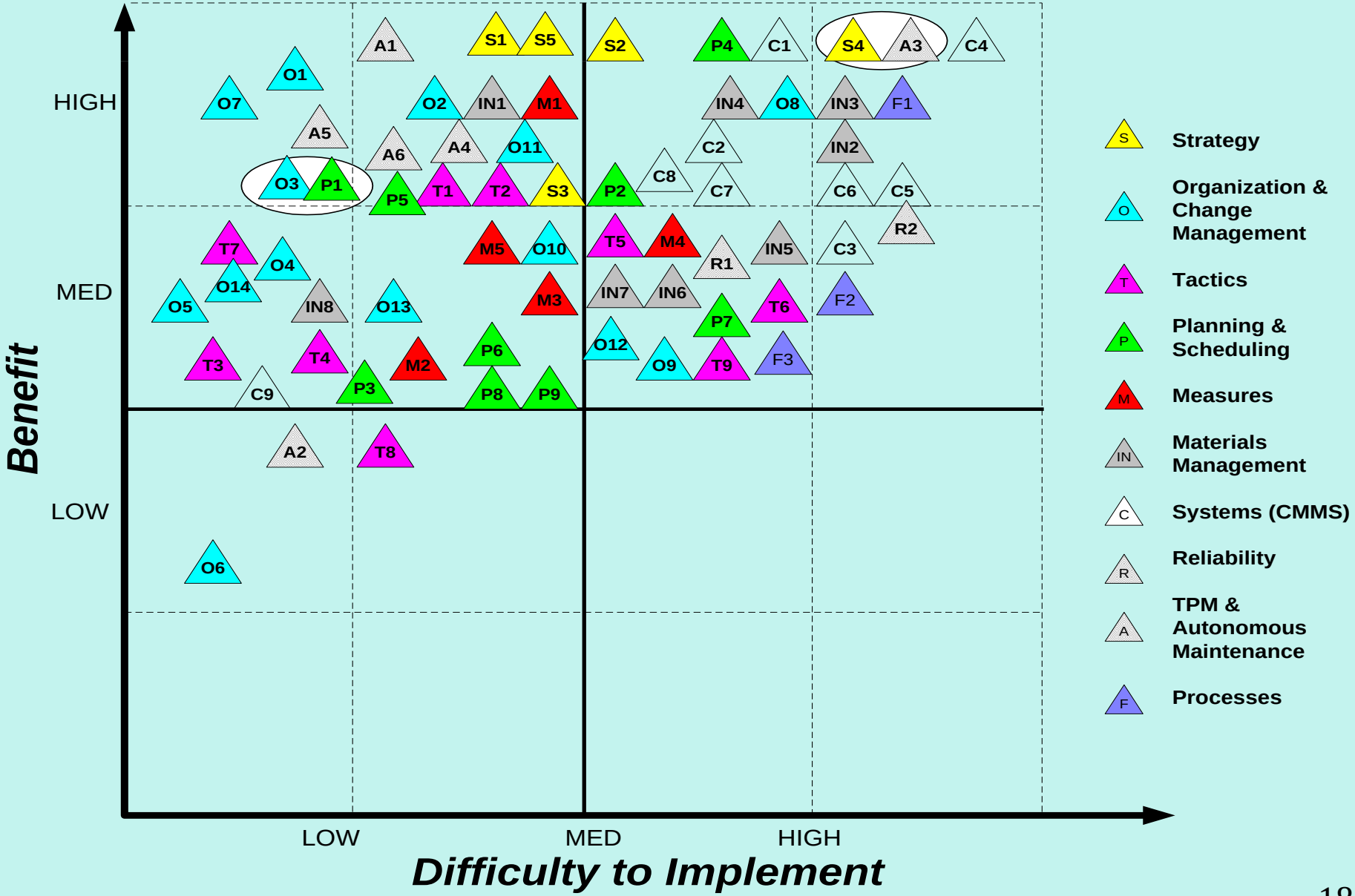
This will likely be a long list!



Step 6: Prioritize tasks based on both payback and cost and difficulty of implementing.

- From Step 5, evaluate each task for:
  - Ease of Implementation (cost, resources, approval, complexity etc)
  - Expected benefit to the company.
  - (this is a high level review not a detailed cost-benefit analysis)
- Place them on the benefit chart
- Focus on the highest benefit:cost balance

Prioritise the benefits



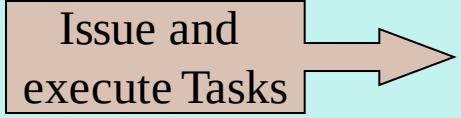
Step 7: Plan the tasks in detail

Select those in the top-left quadrant (easy to implement, high benefit)

- **Identify what has to be done, by when and by whom.**
- **Use MS Project (if complex) or a Work Order**
- **Make sure to include interim milestones, approvals and responsibilities**

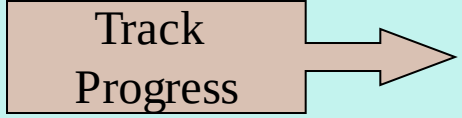
The Action Plan – as of 15 Feb 2017

Priority Concern	**Who/Role**	**Approval**	**Due date**	**Comments**	**Progress**
Add all critical equipment in CMMS	Mtce Tech	Mtce Supr	15 July	Need to co-ordinate with Production	200 eqpts to be entered; 50 done to date
Verify core data for critical equipment	Supervisor	Operations Supr	10 Sept	Major job – need to get more resources	Not yet started – **Problem area**
Mark all critical equipment in operations	Ops Planner	Operations Supr A	As needed		



Step 8: Use the CMMS work order process to issue and execute the tasks

- CMMS work order is not reserved for maintenance work.
- Used for mini-projects.
- Use the work order for:
  - task definition
  - resource allocation
  - materials required
  - Deadlines
  - cost collection
  - Reporting progress
- Late tasks appear on the overdue work order list
- Keeps other maintenance staff informed.



Step 9: Install a progress tracking process

- Develop simple KPI's both for the tasks and the resulting improvements.
- Use the Action Plan as the basis
- Review weekly

The Action Update – as of 15 March 2017

Priority Concern	**Who/Role**	**Approval**	**Due date**	**Comments**	**Progress**	**Benefits to date**
Add all critical equipment in CMMS	Mtce Tech	Mtce Supr	15 July	Need to co-ordinate with Production	50 of 300 completed	Have found many PM's missing
Verify core data for critical equipment	Supervisor	Ops Supr	10 Sept	Major job – need to get more resources	**Only 30 of 400 done - PROBLEM**	Work Order quality has improved – fewer errors
Mark all critical equipment in operations	Ops Planner	Ops Supr	10 Sept	Get spec and order tags	Not started	

Just do it!

Step 10: Get on with it!

- Don't be concerned if the turnaround is not immediate.
- It frequently takes time to work through the system.
- However, the analysis should be prompting you to take specific action with regard to individual equipments or types of equipment.
- Make sure:
  - The action plan targets the root causes of the problem
  - The proper work inspection is being completed
  - The revised work plan is actually being executed
  - The required data is being accurately and consistently recorded
  - The proper analysis is being done
  - The results of the analysis are updating the work plan.

A dozen Quick Fixes using CMMS

1. Equipment
2. Materials
3. Jobs and Tasks
4. Inspections
5. Planned Work
6. Scheduling

7. PM/CBM Compliance
8. Performance Management
9. Backlog Management
10. Maintenance tactics
11. Inventory
12. Procurement

1. Equipment - Quick fix.

- **Breakdowns force you into reactive maintenance**
- **Most breakdowns occur on a small group of equipment**

- **Use the CMMS to select the frequent failure equipment**
- **Hit these poor performance assets with an improvement plan built into CMMS**

- **Use CMMS to measure performance, OEE (Overall Equipment Effectiveness) and track critical failures**
- **Build CMMS tasks to prevent critical failures**
- **Focus on eliminating repeat failures and rework on Critical Equipment**

2. Materials - Quick Fix

In CMMS:

- Standardise names
- Standardise numbering system
- Eliminate Duplicates
- Consolidate Vendors
- Identify obsoletes
- Re-order based on EOQ's

On the Job:

- Sell/junk the obsoletes
- Rationalise warehouses
- Organise storage locations
- Issue picklists from CMMS direct to stores
- Do kit-ups based on planned work orders from CMMS
- Deliver to work site

3- Jobs and tasks - Quick Fix

- Make sure all PM's are in CMMS
- Review current PM's (improve? expand? consolidate? delay? streamline? eliminate?)
- Use CMMS to dedicate staff to PM's as priority work
- Review all work orders on closure as they are entered into CMMS (convert to PM's? Work description, Materials list, Failure modes, Priority, Time required, Materials available, data collected etc? Can we template it?)
- Schedule in CMMS by priority, location, by skill, by equipment hierarchy
- Use CMMS to examine contractor performance (on time, on budget, on quality)– can we replace in-house?

4- Inspections – Quick Fix

- Objectives
  - Measure equipment condition
  - Compare to Potential Failure point and Functional Failure point
  - Predict and Prevent Functional Failures
  - Trigger PM's
- How CMMS can support these objectives:
  - Prepare Inspection sheets to show PF and FF levels, measure Actual data and prompt action
  - Automatic data collection (from sensors, wireless scanners)
  - Use Inspection sheets as input to PM's

5- Planned Work – Quick Fix

- Objectives
  - 90+% of work should be planned
  - Never plan the same job twice
- How CMMS can support these objectives:
  - Build planning into the maintenance process
  - Use smart Work Orders to prompt smart work
  - Measure planning effectiveness
  - Use standard job templates and safety plans whenever possible
  - Choose a similar job and modify it
  - Upgrade based on experience of last job

6- Effective Scheduling – Quick Fix

- Objectives
  - Allocate labour to Work Orders in the order of WO priority
  - Work within the constraints of labour and material availability, equipment availability, etc.
  - Don't release jobs if the resources are not available
- How CMMS can support these objectives:
  - Use the prioritised work order backlog lists
  - Use capacity scheduling tools
  - Use the labour skill-sets tools
  - Use automatic assignment

7- PM Compliance – Quick Fix

- Objectives
  - Perform PM tasks on time
  - Execute tasks completely and consistently
  - Do it right first time
  - Eliminate unnecessary PM's
- How CMMS can support these objectives:
  - Prioritize!
  - PM tracked within the overall work order backlog
  - Standard Job Plans define work requirements
  - Review WO's on closure for upgrade or elimination
  - Track rework (same job on same equipment within X days)
  - Set up performance measures and use CMMS to track results

8- Performance Measurement – Quick Fix

- Objectives
  - Set up KEY KPI's to measure the performance of your processes
  - Make the measurements meaningful at all points in the organization
  - Simple to calculate, simple to display
  - Focus on KPI's that prompt a change in behaviour
- How CMMS can support these objectives:
  - Source of data for performance measurement / Dashboard
  - Automatic reports and graphs
  - Create regular WO's to cover KPI data collection and analysis
  - Delete KPI's that prompt no action

9- Backlog Management – Quick Fix

- Objective:
  - To track and prioritise work backlog
  - Keep backlog in front of everyone
  - Make sure it does not overwhelm us
  - Get priority jobs done bu eliminating roadblocks

- How CMMS helps:
  - Updated and Reported weekly
  - Focus on action required to resolve backlogged items
  - Review anything over 30 days - Dump anything over 90 days??
  - Sort by priority and by type
  - Use CMMS to automatically increase the priority?

10- Maintenance Tactics – Quick Fix

- Objective
  - Do the right work to the right equipment at the right time
  - Use RCM thinking for Tactic Selection
- How CMMS can help:
  - Use it to plan time-based, meter-based, and condition-based maintenance activities
  - Standard Best Practice WO's for Correctives
  - Provide historical records of cost, reliability, and failures
  - Analyse for potential improvements

11- Inventory – Quick Fix

- Objectives
  - Provide a high level of service to support maintenance and operating activities
  - Minimize the volume of stock kept on the shelves
- How CMMS can help:
  - Integrating process with maintenance planning prompts forecasting of PM material requirements
  - Use EOQ algorithms, and ABC analysis
  - Use CMMS to identify and eliminate duplicates and standardize parts
  - JIT Delivery from warehouse to jobsite based on pre-released work order

12- Procurement – Quick Fix

- Objectives
  - Smarter Buying
  - Cheaper Buying
  - Just-in-time Buying
- How CMMS can support these objectives:
  - Vendor analysis
  - Delivery times
  - Pricing Agreements
  - Vendor consolidation
  - Spend time thinking rather than pushing paper

Barriers to improved Maintenance Systems effectiveness

- Not enough Management pull
- No one person accountable for driving systems performance improvement
- Inadequate user training
- Poor quality reports mask what is really going on
- Systems used as tool to streamline admin tasks (Phase 1 or 2); no clear initiative to get to Phases 3 and 4

Case Study

CMMS Improvements -1

	Senior Management View	DETAILS	
1.1	**Improved cost and quality of maintenance**	Share Organization's "best practice" through standardized work orders and work procedures	**Values Steps Costs Benefits**
1.2	**Reduced cash investment in spare parts**	Integrated materials management function with work management; just-in-time parts, standardize parts	
1.3	**Reduced breakdowns, increased uptime, higher production predictability**	Improved PM program management, improved data for failure analysis and failure prediction	
1.4	**Reduced problem of replacing retiring technical staff**	Standardized work processes, improved quality of available information	
1.5	**KPI's and Improved Performance Management**	Higher quality, more consist-ent data reports and analysis; inter-plant comparisons	
1.6	**Reduced risk**	Remove concentration of systems knowledge in one retiring person	

Case Study

CMMS Improvements - 2

	Middle Management View	DETAILS	
2.1	**Better matching of information and results**	Higher quality, more consistent reports and analysis; accurate and reliable KPI's; comparisons between production units	**Values Steps Costs Benefits**
2.2	**Improved Asset management**	Improved reliability analysis, reduced downtime, improved failure prediction.	
2.3	**Improved manpower productivity**	Better planning and scheduling reduces overtime and wait time. Use of workflow to merge, consolidate, streamline and eliminate work functions	
2.4	**Improved focus on high cost items**	Integrated costing module tracks costs to equipment or component, and to type of work, breakdowns	
2.5	**Better failure prevention**	Automated analysis and reporting tools provides more time for investigative work. Improved PM program. Improved adoption of reliability methodology through link with RCM	
2.6	**Lower system admin costs**	PC based system versus mainframe	

Case Study

CMMS Improvements -3

	Users View	DETAILS	
3.1	**Better focus on productive work**	The right materials at the right place at the right time; reduced wait time for materials; better scheduling to avoid weekend and evening work	**Values Steps Costs Benefits**
3.2	**Improved work quality**	Better quality work packages, improved access to task instructions, drawings etc	
3.3	**Safer workplace**	Easier access to safety information and scheduling of safety inspectors	
3.4	**More uptime through shorter diagnosis and repair time**	Faster and more consistent analysis, shared data, shared procedures	
3.5	**Less time required running the system**	Faster data search, faster report generation, faster design of new reports, automation of business flows	
3.6	**More time to do more interesting work**	Reduced administrative time means more analysis and investigation time	

Thank you!!
Email me with Questions

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