

METRIC HIERARCHY DISCUSSION

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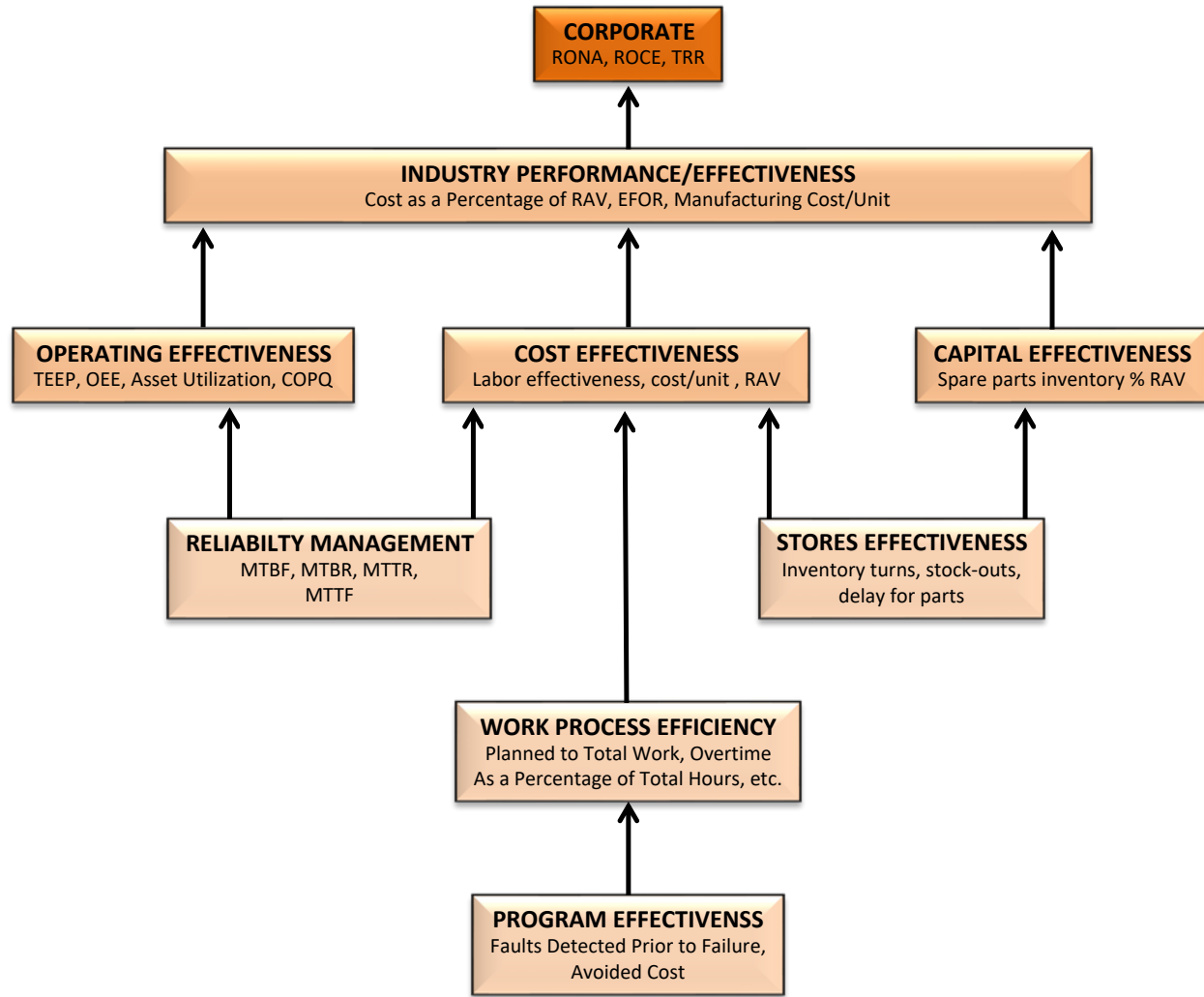
Metric Classification

Strategic

Operating

Effectiveness
(Tactical)

Metric Hierarchy



Ref. The Physical Asset Management Handbook 4th Edition
John S. Mitchell

SMRP Metrics

Pillar 1 -Business and Management

- 1.1 -Ratio of Replacement Asset Value (RAV) to Craft-Wage Head Count
- 1.2 -Maintenance Unit Cost
- 1.3 -Stocked Maintenance, Repair, and Operating (MRO) Inventory Value as a Percent of Replacement Value
- 1.4 -Total Maintenance Cost as a Percent of Replacement Asset Value (RAV)

Pillar 2 -Manufacturing Process Reliability

- 2.1.1 -Overall Equipment Effectiveness (OEE)
- 2.1.2 -Total Effective Equipment Performance (TEEP)
- 2.2 -Availability
- 2.3 -Uptime
- 2.4 -Idle Time
- 2.5 -Utilization Time

Pillar 3 -Equipment Reliability

- 3.1 -Systems Covered by Criticality Analysis
- 3.2 -Total Downtime
- 3.3 -Schedule Downtime
- 3.4 -Unscheduled Downtime
- 3.5.1 -Systems Covered by Criticality Analysis
- 3.5.2 -Mean Time Between Failures (MTBF)
- 3.5.3 -Mean Time to Repair or Replace (MTTR)
- 3.5.4 -Mean Downtime (MDT)
- 3.5.5 -Mean Time to Failure (MTTF)

Pillar 4 -Organization and Leadership

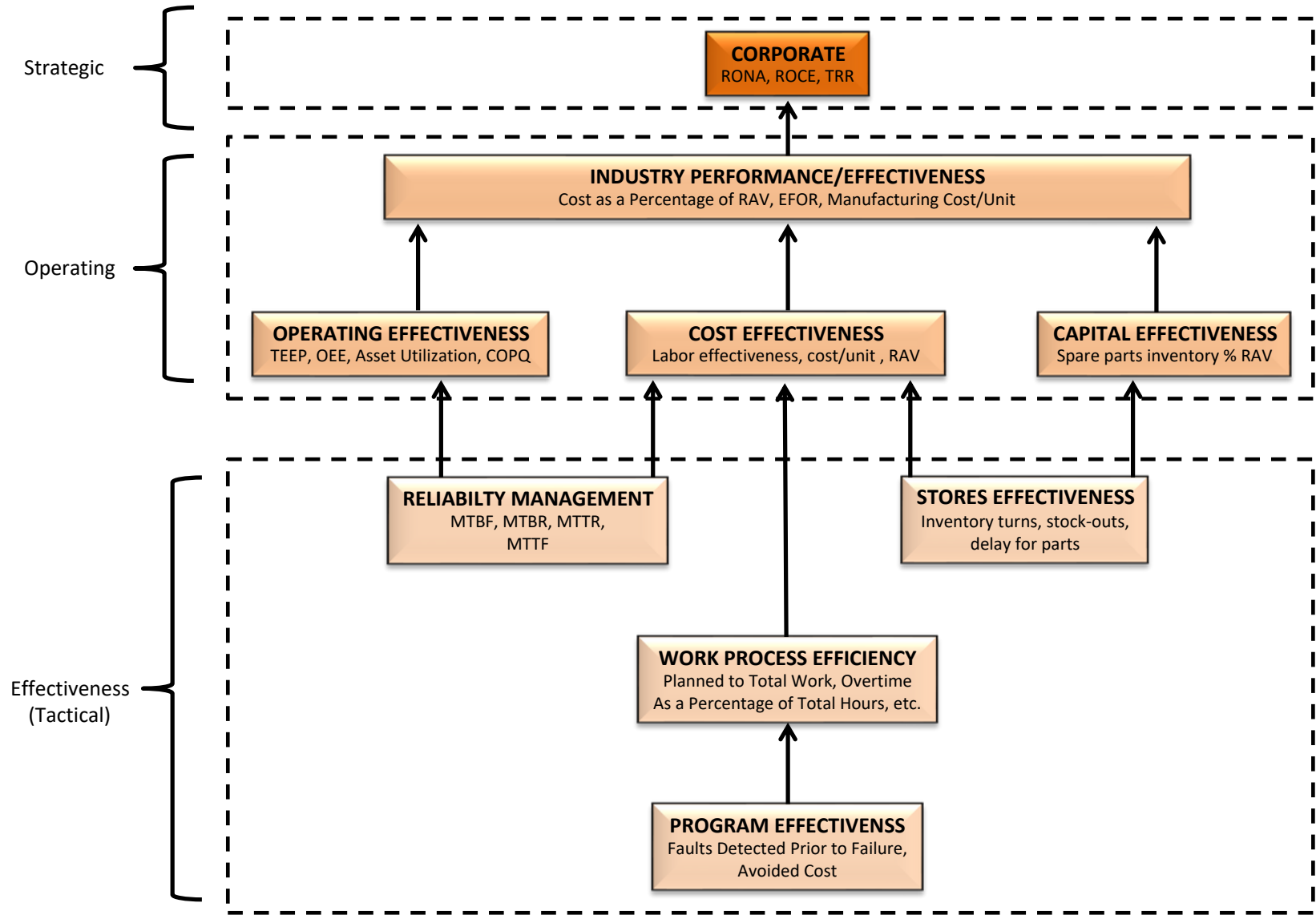
- 4.1 -Rework
- 4.2.1 -Maintenance Training Cost
- 4.2.2 -Maintenance Training Hours
- 4.2.3 -Maintenance Training Return of Investment (ROI)

Pillar 5 -Work Management

- 5.1.1 -Corrective Maintenance Cost
- 5.1.2 -Corrective Maintenance Hours
- 5.1.3 -Preventive Maintenance Cost
- 5.1.4 -Preventive Maintenance Hours
- 5.1.5 -Conditioned Based Maintenance Cost
- 5.1.6 -Condition Based Maintenance Hours
- 5.1.9 -Maintenance Shutdown Costs
- 5.3.1 -Planned Work
- 5.3.2 -Unplanned Work
- 5.3.3 -Actual Cost to Planning Estimate
- 5.3.4 -Actual Hours to Planning Estimate
- 5.3.5 -Planning Variance Index
- 5.3.6 -Planner Productivity
- 5.4.1 -Reactive Work
- 5.4.2 -Proactive Work
- 5.4.3 -Schedule Compliance Hours
- 5.4.4 -Schedule Compliance Work Orders
- 5.4.5 -Standing Work Orders
- 5.4.6 -Work Order Aging
- 5.4.7 -Work Order Cycle Time
- 5.4.8 -Planned Backlog
- 5.4.9 -Ready Backlog
- 5.4.11 -Preventive Maintenance (PM) & Predictive Maintenance (PdM) Work Orders Overdue
- 5.4.12 -PM & PdM Yield
- 5.4.14 -PM & PdM Compliance
- 5.5.1 -Craft Worker to Supervisor Ratio
- 5.5.2 -Craft Worker to Planner Ratio
- 5.5.3 -Direct to Indirect Maintenance Personnel Ratio
- 5.5.4 -Indirect Maintenance Personnel Cost
- 5.5.5 -Infernal Maintenance Personnel Cost
- 5.5.6 -Craft Workers on Shift Ratio
- 5.5.7 -Overtime Maintenance Cost
- 5.5.8 -Overtime Maintenance Hours
- 5.5.31 -Store Inventory Turns
- 5.5.32 -Vendor Managed Inventory
- 5.5.33 -Stock Outs
- 5.5.34 -Inactive Stocks
- 5.5.35 -Storeroom Transactions
- 5.5.36 -Storeroom Records
- 5.5.38 -Maintenance Material Cost
- 5.5.71 -Contractor Cost
- 5.5.72 -Contractor Hours
- 5.6.1 -Wrench Time
- 5.7.1 -Continuous Improvement Hours

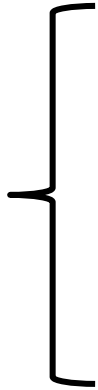
Metric Classification

Metric Hierarchy



Metric Classification

Strategic



Metric Hierarchy



Strategic Corporate Metrics:

- Return on Net Assets (RONA)
- Return on Capital Expended (ROCE)
- Return on Assets (ROA)
- Return on Active Capital Employed (ROACE)
- Return on Average Assets (ROAA)
- Return on Invested Capital (ROIC)
- True Reject Rate (TRR)



INDUSTRY PERFORMANCE/EFFECTIVENESS
 Cost as a Percentage of RAV, EFOR, Manufacturing Cost/Unit

Industry Performance/Effectiveness Metrics:

- 1.1 Ratio of Replacement Asset Value (RAV) to Craft-Wage Head Count
- 1.2 Maintenance Unit Cost
- 1.4 Total Maintenance Cost as a Percent of Replacement Asset Value (RAV)

OPERATING EFFECTIVENESS
 TEEP, OEE, Asset Utilization, COPQ

- Operating Metrics:**
- 2.1.1 Overall Equipment Effectiveness (OEE)
 - 2.1.2 Total Effective Equipment Performance (TEEP)
 - 2.2 Availability
 - 2.3 Uptime
 - 2.4 Idle Time
 - 2.5 Utilization Time

COST EFFECTIVENESS
 Labor effectiveness, cost/unit , RAV

Cost Effectiveness Metrics:

- 1.2 Maintenance Unit Cost
- 1.4 Total Maintenance Cost as a Percent of Replacement Asset Value (RAV)
- 5.1.1 Corrective Maintenance Cost
- 5.1.2 Corrective Maintenance Hours
- 5.1.3 Preventive Maintenance Cost
- 5.1.4 Preventive Maintenance Hours
- 5.1.5 Condition Based Maintenance Cost
- 5.1.6 Condition Based Maintenance Hours
- 5.1.9 Maintenance Shutdown Cost
- 5.5.4 Indirect Maintenance Personnel Cost
- 5.5.5 Internal Maintenance Personnel Cost
- 5.5.7 Overtime Maintenance Cost

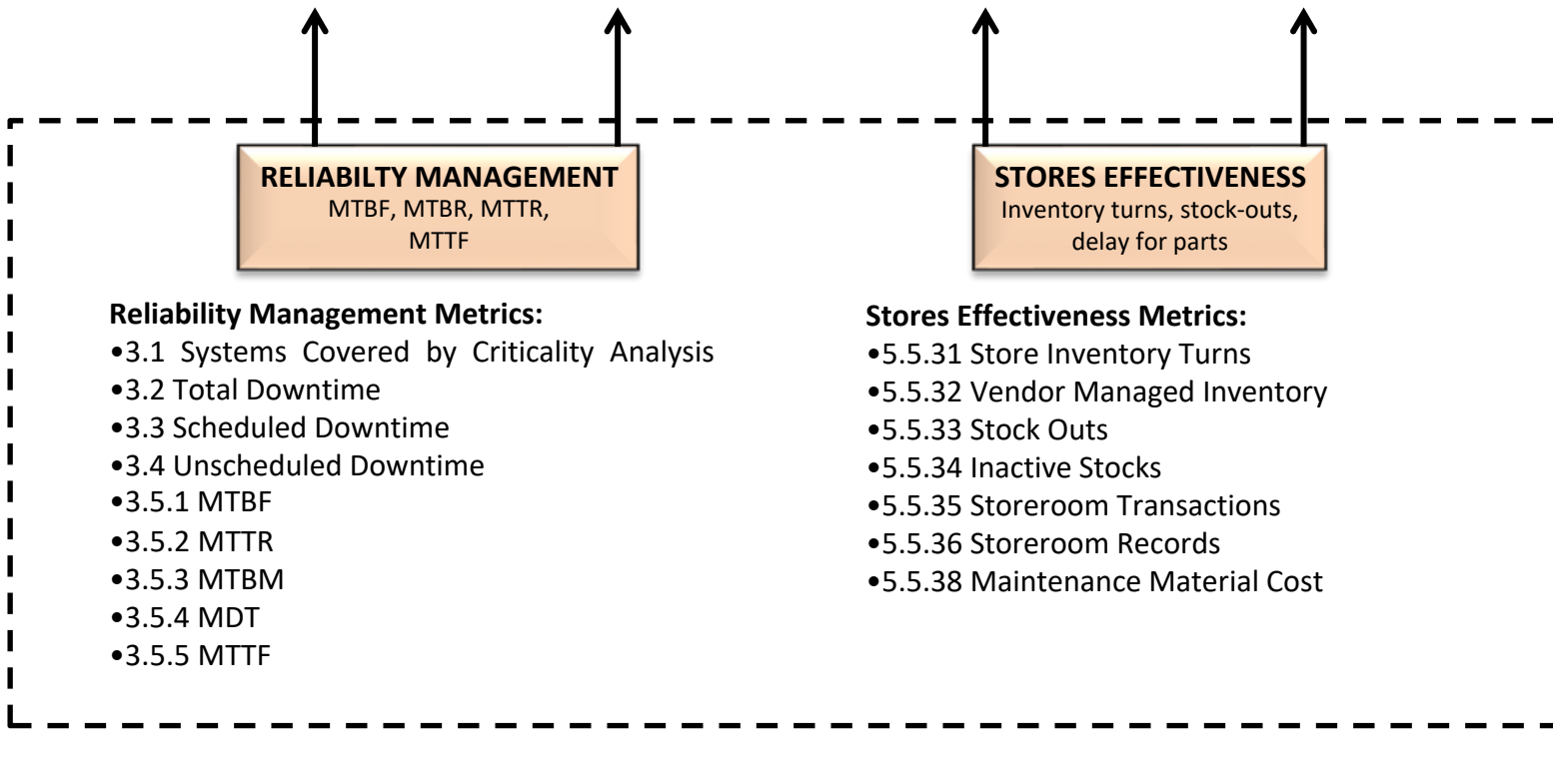
CAPITAL EFFECTIVENESS
 Spare parts inventory % RAV

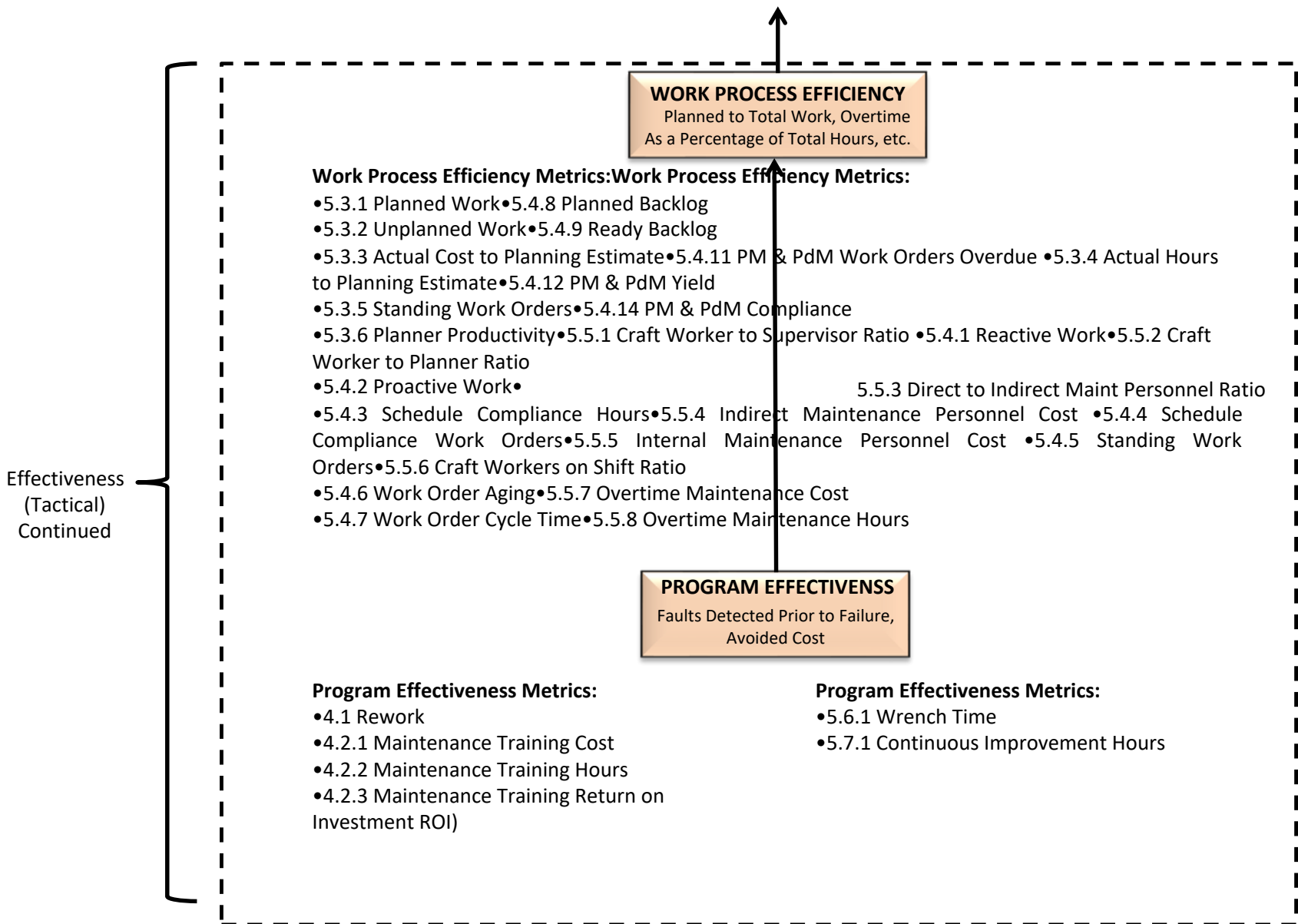
Capital Effectiveness Metrics:

- 1.3 Stocked Maintenance, Repair, and Operating (MRO) Inventory as a Percent of Replacement Value

Operating

Effectiveness
(Tactical)







#1 Software for Maintenance & Reliability Teams

UpKeep is a service-first company that builds software designed to make maintenance easier for technicians and managers everywhere. Reduce downtime up to 18% by switching over to a preventative maintenance solution!

www.upkeep.com

Our Products



Mobile-first maintenance management and collaboration across all location, assets, and teams

"With nearly 340 different machines in our work environment, it's an impossible task to manually assign and track PM's. With UpKeep we can schedule regular maintenance without overlapping tasks with other critical jobs."

★★★★★ Paul D, Health and Safety Coordinator



An end-to-end solution for remote condition-based monitoring

Connected and secure IoT sensors for real-time remote condition asset monitoring



DATAHUB
by UpKeep

Integrated & Centralized Data Ecosystem for World Class Asset Operations

The only purpose built Asset Data Platform. Asset Focused ELT Solution for advanced analytics and integrated, real-time asset data.



The Maintenance Community Coalition was founded on the belief that working together will benefit everyone within our community

Committed to helping each other thrive in our individual professional journeys by sharing resources and expertise, granting scholarships, hosting events, and unlocking knowledge – always at no cost.

