Recall: The 5 Phases of Project Management

FEASIBILITY
Finance Evaluation
Organization Estimation Planning

DESIGN, PLANNING

DEVELOPMENT
Monitoring & Control Project Aberrations Changes & Claims Quality & Reviews, & Audits

CLOSEOUT

OPERATIONS

Reporting
Project Reporting
Main Focus on Reports: Performance

- Main categories of performance metrics:
  - Scope
  - Time
  - Money
  - Quality
  - Productivity
  - Safety

- Performance Metrics typically are defined in preparation for project monitoring before project control.

- Must facilitate the project control process as well as the reporting functions of project monitoring
## More on Performance Metrics

<table>
<thead>
<tr>
<th>Categories</th>
<th>Performance measurements</th>
<th>Targets</th>
<th>Units of measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope</strong></td>
<td>Amount of work accomplished</td>
<td>Amount of work to be accomplished</td>
<td>$M, M^2, M^3, Tons, $</td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td>Completion dates</td>
<td>Milestones, Deadline</td>
<td>Day, Week, Month</td>
</tr>
<tr>
<td><strong>Money</strong></td>
<td>Cost, Cash flow</td>
<td>Budget, Profit, Cash flow</td>
<td>$, Net Present Value (NPV)</td>
</tr>
<tr>
<td><strong>Quality</strong></td>
<td>Quality achieved (Appearance, Durability, Strength, Suitability)</td>
<td>Target quality level (Appearance, Durability, Strength, Suitability)</td>
<td>Number of defects, Value of defects, Number of change orders</td>
</tr>
<tr>
<td><strong>Safety</strong></td>
<td>Actual accidents and injuries, delays and economic damages occurred</td>
<td>Goaled accidents and injuries level</td>
<td>Person, $, Day, Week, Month</td>
</tr>
<tr>
<td><strong>Productivity</strong></td>
<td>Actual productivity</td>
<td>Planned productivity</td>
<td>Work unit/worker/time</td>
</tr>
</tbody>
</table>
Reporting

• Often delayed
  – minimizing delay critical in effectiveness of feedback systems

• Selective reporting widely used:
  Example: Some reports contain only problems encountered during project

• Frequent reporting for
  – Important items (e.g. high cost)
  – Uncertainty (Unfamiliar procedure, …)
  – Critical
  – Scope
Kinds of Reports

• Internal reports:
  - Cost control report
  - Risks/Opportunities report

• Contract Reports (Contractor/Owner):
  - Schedule review
  - Schedule of value and certificate of payment
  - Request for extra works
Internal Reporting

• Monthly Cost Control Report
  - Describe project cost at current date:
    • Budget cost
    • Actual cost
    • Accounted cost
    • Cash out
    • Estimates to completion
  - Contains:
    • Variances and indexes
    • Revised schedule
    • Revenues Control Summary (issued invoices)
    • Other select performance indexes
  - Better if represented with graphical S-Curves

• Risk/Opportunity plan
  - Reports on planned activities and anticipated threats/opportunities during the following reporting period
Contract Reports

• Revised schedule
  - Detail of progress report (each activity, total progress)
  - Progress s-curves (actual, scheduled, forecast)
  - Resource use profiles (actual, scheduled, forecast)

• Schedule of values and certificate of payment
  - Quantities book
  - Account register
  - Main summary account - after approval
  - Certificate of payment of work done - amount of money the contractor can charge (value-retention-guarantees/liabilities).

• Change order (for extra scope or works)
  - Request of extra works
  - Extra work report
  - Extra work schedule of values and CoP
## Example 1: Job Status Report

<table>
<thead>
<tr>
<th>Factor</th>
<th>Budgeted Cost</th>
<th>Cost Committed</th>
<th>Cost Exposure</th>
<th>Cost To Date</th>
<th>Estimated Total Cost</th>
<th>Over or (Under)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>$99,406</td>
<td>$49,596</td>
<td>---</td>
<td>$52,746</td>
<td>$102,342</td>
<td>$2,936</td>
</tr>
<tr>
<td>Material</td>
<td>88,499</td>
<td>42,506</td>
<td>45,993</td>
<td>15,139</td>
<td>88,499</td>
<td>0</td>
</tr>
<tr>
<td>Subcontracts</td>
<td>198,458</td>
<td>83,352</td>
<td>97,832</td>
<td>13,920</td>
<td>196,323</td>
<td>(2,135)</td>
</tr>
<tr>
<td>Equipment</td>
<td>37,543</td>
<td>23,623</td>
<td>---</td>
<td>32,076</td>
<td>37,543</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>72,693</td>
<td>49,356</td>
<td>---</td>
<td>113,881</td>
<td>81,432</td>
<td>8,739</td>
</tr>
<tr>
<td>Total</td>
<td>496,509</td>
<td>248,433</td>
<td>143,825</td>
<td>113,881</td>
<td>506,139</td>
<td>5,950</td>
</tr>
</tbody>
</table>
## Example 2: Performance Report

<table>
<thead>
<tr>
<th>WBS Element</th>
<th>Planned Budget ($)</th>
<th>Earned Value ($)</th>
<th>Actual Cost ($)</th>
<th>Cost Variance ($)</th>
<th>Schedule Variance ($)</th>
<th>Cost Variance (%)</th>
<th>Schedule Variance (%)</th>
<th>Cost CPI</th>
<th>Schedule SPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 Pre-Pilot Plan</td>
<td>63,000</td>
<td>58,000</td>
<td>62,500</td>
<td>-4,500</td>
<td>-5,000</td>
<td>-7.8</td>
<td>-7.9</td>
<td>0.93</td>
<td>0.92</td>
</tr>
<tr>
<td>2.0 Checklists</td>
<td>64,000</td>
<td>48,000</td>
<td>46,800</td>
<td>1,200</td>
<td>-16,000</td>
<td>-25.0</td>
<td>1.03</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>3.0 Curriculum</td>
<td>23,000</td>
<td>20,000</td>
<td>23,500</td>
<td>-3,500</td>
<td>-3,000</td>
<td>-17.5</td>
<td>-13.0</td>
<td>0.85</td>
<td>0.87</td>
</tr>
<tr>
<td>4.0 Mid-Term Evaluation</td>
<td>68,000</td>
<td>68,000</td>
<td>72,500</td>
<td>-4,500</td>
<td>0</td>
<td>-6.6</td>
<td>0.0</td>
<td>0.94</td>
<td>1.00</td>
</tr>
<tr>
<td>5.0 Implementation Support</td>
<td>12,000</td>
<td>10,000</td>
<td>10,000</td>
<td>0</td>
<td>-2,000</td>
<td>0.0</td>
<td>-16.7</td>
<td>1.00</td>
<td>0.83</td>
</tr>
<tr>
<td>6.0 Manual of Practice</td>
<td>7,000</td>
<td>6,200</td>
<td>6,000</td>
<td>200</td>
<td>-800</td>
<td>3.2</td>
<td>-11.4</td>
<td>1.03</td>
<td>0.89</td>
</tr>
<tr>
<td>7.0 Roll-Out Plan</td>
<td>20,000</td>
<td>13,500</td>
<td>18,100</td>
<td>-4,600</td>
<td>-6,500</td>
<td>-34.1</td>
<td>-32.5</td>
<td>.075</td>
<td>0.68</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>257,000</strong></td>
<td><strong>223,700</strong></td>
<td><strong>239,400</strong></td>
<td><strong>-15,700</strong></td>
<td><strong>-33,300</strong></td>
<td><strong>-7.0</strong></td>
<td><strong>-13.0</strong></td>
<td><strong>0.93</strong></td>
<td><strong>0.87</strong></td>
</tr>
</tbody>
</table>

Figure by MIT OCW.
## Example 3: Progress Report

**PROJECT NUMBER:** 198301  
**PROJECT TITLE:** EXAMPLE CONCRETE BRIDGE  
**PROJECT LOCATION:** STANFORD, CALIFORNIA  
**START DATE:** 04/21/83  
**DATA DATE:** 07/11/83  
**REPORT DATE:** 07/14/83

<table>
<thead>
<tr>
<th>LAB. CODE</th>
<th>ACTIVITY DESCRIPTION</th>
<th>UNIT</th>
<th>EST. TO DATE</th>
<th>ACTUAL TO DATE</th>
<th>EST. TTL @ COMPL.</th>
<th>PERCENT COMPL.</th>
<th>FORECAST VARIANCE</th>
<th>PERCENT VARIANCE</th>
<th>TREND</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFF. 0310</td>
<td>CONCRETE FORMWORK FOR FOUNDATION</td>
<td>SF</td>
<td>34</td>
<td>29</td>
<td>9</td>
<td>76%</td>
<td>4</td>
<td>11.8%</td>
<td>HIGH</td>
</tr>
</tbody>
</table>
| EST START: 06/02/83  
ACT START: 06/02/83  
EST FINISH: 07/18/83  
ACT FINISH: / / | DURATION: 34  
COSTS: $49800  
QUANTITIES: 15860  
UNIT COSTS: $3.14 |
| CRF. 0320 | CONCRETE RE-STEEL FOR FOUNDATION | LB   | 29           | 21             | 9                | 70%            | 1                | 3.5%            | HIGH |
| EST START: 06/09/83  
ACT START: 06/12/83  
EST FINISH: 07/18/83  
ACT FINISH: / / | DURATION: 29  
COSTS: $39400  
QUANTITIES: 82400  
UNIT COSTS: $0.48 |
| CPF. 0330 | CONCRETE PLACING FOR FOUNDATION | CT   | 34           | 16             | 21               | 43%            | 3                | 8.8%            | HIGH |
| EST START: 06/16/83  
ACT START: 06/19/83  
EST FINISH: 08/01/83  
ACT FINISH: / / | DURATION: 34  
COSTS: $73400  
QUANTITIES: 1200  
UNIT COSTS: $61.17 |
| CRW. 0320 | CONCRETE RE-STEEL FOR WALLS | LB   | 34           | 9              | 26               | 26%            | 1                | 2.9%            | LOW  |
| EST START: 06/30/83  
ACT START: 06/30/83  
EST FINISH: 08/15/83  
ACT FINISH: / / | DURATION: 34  
COSTS: $37800  
QUANTITIES: 78750  
UNIT COSTS: $0.48 |

Figure by MIT OCW.
Beware of Reporting Delays

- Financial, time indicators are necessary but not sufficient to alert to problems.
- In most cases of serious problems and “normal” reporting, the problem may be very serious by the time that it is noticed in the formal reports.
- Rapid qualitative judgment is often much more effective than delayed quantitative reporting.
Project Close-out
Project Close-out

- Defines the last set of activities associated with a project.

- Essentially is a small project in itself, sometimes requiring a “close out manager”

- Requires careful planning and logistical management

- May require special attention to emotional issues of the personnel in the project.

- Presents learning opportunities for the organization through the project final review and report.
Close-out Activities

• Project commissioning
• Project termination
• Project feedback
Project Commissioning

- **Closing the contract:**
  - Claims’ resolution (owner and subs)
  - As-built drawings, certificates, paperwork
  - Certificate of final payment
  - Cash flow checked out
  - Maintenance and insurances

- **Commissioning the works:**
  - Final completion review
  - Testing
Project Termination

• Operations
  - Mobilization of resources to some new project
    • Human resources
    • Equipment
  - Logistics, installations and temporary facilities

• Administration
  - Bookkeeping and financial close-out
  - Insurance arrangements
Project Feedback

- **Database updating**
  - Standard WBS (list of work packages)
  - Estimates (unit costs)
  - Duration of activities, productivity rates

- **Process improvement**
  - Methods and tools

- **Final review**
  - Lessons learnt
Questions?