A technical discussion of IBM Rational® ProjectConsole, a member of the IBM Rational® Team Unifying Platform
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# IBM Rational® Team Unifying Platform: Using IBM Rational® ProjectConsole for Microsoft Project Reporting &Measurements

Doug T. Ishigaki

IBM Rational software White Paper

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## *Introduction*

This white paper is intended for IBM Rational ProjectConsole end-users to help them incorporate Microsoft Project 2002 Professional desktop edition data into a data collection and then be able to automatically generate ongoing up-to-date project progress measurement reports and indicators (charts, gauges, etc.).  Stakeholders want easy access to project progress information and are interested in reviewing measures that indicate that the rate of newly identified work is declining as the end of the project approaches.  Based on where a project stands at any given point in time, there are different data points to see the status of the project.  This paper provides a sampling of key project measurement reports and indicators that can be derived from a Microsoft Project plan.

Key Project Stakeholders include Upper Level Executive Management, Department Managers, Project Managers, Product Managers, Development Managers, Technical Managers, and Project Team Members.  All of these types of stakeholders want an easy and efficient way to gather and disseminate project team status and measurement information.  Key Project Stakeholders are interested in going to a centralized location to view current project status measures.  Project Team Members want an efficient way to report current status to their managers and a centralized location where they can be kept up-to-date on current project status and can access current project artifacts.

The project tracking measures shown in this paper are not meant to be comprehensive, but are meant to serve as an example of the types of measures that can be generated using Microsoft Project data with IBM Rational ProjectConsole.  As you become more comfortable with IBM Rational ProjectConsole, you can expand upon this set of measures. Our experience shows that you typically are much better off starting small and satisfying specific information needs and then expanding, rather than trying to adopt a large number of measures from the beginning.

There are more possible measurable objects and attributes that come from Microsoft Project than can be covered in this paper.  Furthermore, each organization has distinct and different needs with regard to project progress tracking data.

Although tracking your Microsoft Project plan can provide insight into your schedules, cost, and effort, it is highly recommend that you use ProjectConsole to also track additional measures from your underlying software development artifact repositories – for example, defect and change request trends, requirements trends, use case development trends, testing trends, and design and coding trends – to get a more complete status of your project.   In addition, ProjectConsole also allows you to roll-up data from multiple projects to provide an organization or enterprise status views.

This white paper begins by presenting some basic project reporting measures that are typically generated using Microsoft Project to monitor the ongoing progress of a project.   Then, the process of how to create a Microsoft Project data collection using IBM Rational ProjectConsole in order to generate a set of similar, but automatically updated, set of Microsoft Project progress reports and indicators is explained.  Finally, some sample measurement reports and indicators are presented based on a Microsoft Project data collection using ProjectConsole.

**Incorporating Microsoft Project Measurement Reporting into IBM Rational ProjectConsole**

This section describes the process for importing current Microsoft Project data into a ProjectConsole Data Collection and then describe types of Microsoft Project Measures and Indicators that can be automatically generated and published to a ProjectConsole website.

Please note that ProjectConsole v2003 supports collecting and reporting from Microsoft Project Professional edition by processing the .mpp file. Microsoft Project Server is not directly supported, although ProjectConsole can indirectly support Microsoft Project Server through exposing the .mpp file.

**Creating Microsoft Project Web Reports in IBM Rational ProjectConsole**

To create Microsoft Project Web Reports using ProjectConsole, the following steps must be performed:

1. First, you must have a Microsoft Project Plan that has been created with a number of identified tasks from which project data will be collected. Basic planning fields must be identified for each task such as Duration, Resources, Predecessors, Cost Per Resource and Established Baselines. After establishing a Baseline, the plan must be maintained on an on-going basis to reflect current progress in terms of Actual Work Hours Performed and/or Percent Completion of each task. The following is an example of a basic Microsoft Project Plan:

| | % Comp | Task Name | Duration | Work Hours | Start | Finish | Pred. | Resource Names |
|---|---|---|---|---|---|---|---|---|
| 2 | 42% | ⊟ **Project Management** | **68.2 days** | **588 hrs** | **Mon 5/3/99** | **Thu 8/5/99** | | |
| 3 | 100% | ⊟ **Conceive New Project** | **3 days** | **40 hrs** | **Mon 5/3/99** | **Wed 5/5/99** | | |
| 4 | 100% | Identify and Assess Risks | 2 days | 16 hrs | Mon 5/3/99 | Tue 5/4/99 | | Project Manager |
| 5 | 100% | Develop Business Case | 1 day | 8 hrs | Tue 5/4/99 | Tue 5/4/99 | 4 | Project Manager |
| 6 | 100% | Initiate Project | 1 day | 8 hrs | Wed 5/5/99 | Wed 5/5/99 | 5 | Project Manager |
| 7 | 100% | Project Approval Review | 1 day | 8 hrs | Wed 5/5/99 | Wed 5/5/99 | 6FF | Project Reviewer |
| 8 | 100% | ⊟ **Evaluate Project Scope and Risk** | **3 days** | **32 hrs** | **Thu 5/6/99** | **Mon 5/10/99** | **4,3** | |
| 9 | 100% | Identify and Assess Risks | 3 days | 24 hrs | Thu 5/6/99 | Mon 5/10/99 | | Project Manager |
| 10 | 100% | Develop Business Case | 1 day | 8 hrs | Fri 5/7/99 | Fri 5/7/99 | 9 | Project Manager |
| 11 | 75% | ⊟ **Develop Software Development Plan** | **10.2 days** | **104 hrs** | **Mon 5/31/99** | **Mon 6/14/99** | **52SS,8** | |
| 12 | 75% | Develop Measurement Plan | 5 days | 40 hrs | Mon 5/31/99 | Mon 6/7/99 | | Project Manager |
| 13 | 75% | Develop Risk Management Plan | 1 day | 8 hrs | Tue 6/1/99 | Mon 6/7/99 | 12 | Project Manager |
| 14 | 75% | Develop Product Acceptance Plan | 1 day | 8 hrs | Wed 6/2/99 | Tue 6/8/99 | 13 | Project Manager |
| 15 | 75% | Develop Problem Resolution Plan | 1 day | 8 hrs | Thu 6/3/99 | Wed 6/9/99 | 14 | Project Manager |
| 16 | 75% | Define Project Organization and Staffing | 1 day | 8 hrs | Fri 6/4/99 | Wed 6/9/99 | 15 | Project Manager |
| 17 | 75% | Define Monitoring & Control Processes | 1 day | 8 hrs | Mon 6/7/99 | Thu 6/10/99 | 16 | Project Manager |
| 18 | 75% | Plan Phases and Iterations | 1 day | 8 hrs | Tue 6/8/99 | Fri 6/11/99 | 17 | Project Manager |
| 19 | 75% | Compile Software Development Plan | 1 day | 8 hrs | Wed 6/9/99 | Mon 6/14/99 | 18 | Project Manager |
| 20 | 75% | Project Planning Review | 1 day | 8 hrs | Wed 6/9/99 | Mon 6/14/99 | 19FF | Project Reviewer |
| 21 | 25% | ⊟ **Plan for Next Iteration** | **3 days** | **24 hrs** | **Mon 6/14/99** | **Thu 6/17/99** | **11** | |
| 22 | 25% | Develop Iteration Plan | 1 day | 8 hrs | Mon 6/14/99 | Tue 6/15/99 | | Project Manager |
| 23 | 25% | Develop Business Case | 1 day | 8 hrs | Tue 6/15/99 | Wed 6/16/99 | 22 | Project Manager |
| 24 | 25% | Iteration Plan Review | 1 day | 8 hrs | Wed 6/16/99 | Thu 6/17/99 | 23 | Project Reviewer |
| 25 | 25% | ⊟ **Manage Iteration** | **20 days** | **200 hrs** | **Thu 6/17/99** | **Thu 7/15/99** | **21** | |
| 26 | 25% | Acquire Staff | 5 days | 40 hrs | Thu 6/17/99 | Thu 6/24/99 | | Project Manager |
| 27 | 25% | Initiate Iteration | 5 days | 40 hrs | Thu 6/24/99 | Thu 7/1/99 | 26 | Project Manager |
| 28 | 25% | Assess Iteration | 5 days | 40 hrs | Thu 7/1/99 | Thu 7/8/99 | 73FF,2 | Project Manager |

2. The next step is to create Microsoft Project Templates using the ProjectConsole Template Builder for each desired Web report. Each template defines the data and the format for each defined Web report.
3. Each Web report template then needs to be saved in both MS Word format and Saved as a Web Page from within the Template Builder program.
4. Once saved, both the MS Word and HTML document versions need to be moved into the ProjectConsole Microsoft Project Templates directory.

5. After moving the template files into the ProjectConsole Template directory, the ProjectConsole administrator can then add the templates to the navigation tree in the ProjectConsole website. The Project Web Reports can then be generated on an on demand basis by the end-user.

Please refer to the ProjectConsole Template Builder and ProjectConsole website online documentation for details on how to perform each of the steps identified above.

**Creating Microsoft Project Measurement Indicators in IBM Rational ProjectConsole**

To create measurement indicators (charts, gauges, stop-lights) based on Microsoft Project data, a data collection must first be generated. To run a Microsoft Project data collection with ProjectConsole the following steps must be performed:

1. First, you must have a Microsoft Project Plan that has been created with a number of identified tasks from which project data will be collected. Basic planning fields must be identified for each task such as, Duration, Resources, Predecessors, Cost Per Resource and Established Baselines. After establishing a Baseline, the plan must be maintained on an on-going basis to reflect current progress in terms of Actual Work Hours Performed and/or Percent Completion of each task.

2. Use ProjectConsole Dashboard Designer to create a Microsoft Project Source Template defining all of the desired Microsoft Project fields to be collected.

3. Define the desired Dimension and Measure tables into which data is to be collected.

4. Define the data mappings from the created Dimension and Measure tables to the Source Template fields.

5. Create a Scheduled Collection Task.

6. Run the Scheduled Collection Task. Don't forget to run the post-Microsoft Project collection transformation script that is provided by ProjectConsole. This transformation script performs calculation on the collected data to derived additional measures such as aggregating the number of tasks that are complete.

After an MSP Data Collection has been created, the ProjectConsole Dashboard can be used to create the desired Charts and Graphs based on the data that has been collected from the Microsoft Project plan.

Please refer to the ProjectConsole Dashboard Designer, Dashboard, and website documentation for details on how to perform each of the steps identified above.

Additionally, the Rational ProjectConsole Tutorial provides extensive step-by-step instructions on how to collect data from Microsoft Project. These instructions are in *Section 9 – Collecting Microsoft® Project Data* of the tutorial.

## *Sample Microsoft Project Measures using IBM Rational ProjectConsole*

This section describes and shows a wide range of sample Microsoft Project trend analysis measurement reports that can be generated using IBM Rational ProjectConsole.

ProjectConsole can be used to produce current Microsoft Project Web Based Reports, which represent the status of the project at any point in time, Graphical Trend Analysis and Distribution Charts that show the progress of selected project measures over a period of time, and Graphical Gauges and Stoplight indicators that show color status with respect to threshold values.

To produce the desired Web based reports, templates are created using the ProjectConsole Template Builder.  To produce the desired charts, gauges, and stoplight indicators, a data collection source template must be created using the Dashboard Designer component of ProjectConsole.

The difference between these two types of templates is that the ProjectConsole Template Builder creates templates to read data from the Microsoft Project file and produce a formatted report.  Whereas, the Dashboard Designer Source Template creates a template to read data from a Microsoft Project file and puts the data into the measurement warehouse database which the ProjectConsole Dashboard can use to generate Charts, Gauges, and Stoplight indicators based on the collected data.

Examples of current Web Based Reports representing any given point in time include Task Entry Reports, Work Hours Variance Reports, Task Summary Reports, Task Tracking Reports, Task Assignment by Resource Reports, Cost Variance Reports, Earned Value Reports, Late Tasks Reports, Schedule Variance Reports, Late Milestone Tasks Reports, and Milestone Tasks Reports.

Examples of Graphical Trend Analysis and Distribution Charts representing the progress of the project over time include trends of Actual Work Hours vs. Planned Work Hours, Actual Cost vs. Budgeted Cost, % Completion over Time, Actual Duration vs. Planned Duration, Earned Value vs. Budgeted Cost, Actual Cost of Work Performed vs. Budgeted Cost of Work Performed, and Budgeted Cost of Work Performed vs. Budgeted Cost of Work Scheduled, Cost Performance Index, Schedule Performance Index, Cost Variance, and Schedule Variance.

**IBM Rational ProjectConsole Web Reports**

*Project Summary Report*

This report shows a project's key Dates, Duration, Work, and Cost Summary Variance information showing Planned, Baseline, Actual, and Baseline-to-Actual Variance information.  The purpose of this report is to give key project stakeholders a quick summary of all of the key indicators of the project's progress.

# Project Summary Report
**Project Name:** detail_inception_iter

### Dates

| | | | |
|---|---|---|---|
| Start: | 5/3/1999 8:00:00 AM | Finish | 8/5/1999 9:36:00 AM |
| Baseline Start: | 5/3/1999 8:00:00 AM | Baseline Finish: | 8/2/1999 5:00:00 PM |
| Actual Start: | 5/3/1999 8:00:00 AM | Actual Finish: | NA |
| Start Variance: | 0 days | Finish Variance: | 2.2 days |

### Duration

| | | | |
|---|---|---|---|
| Scheduled: | 68.2 days | Remaining: | 30.92 days |
| Baseline: | 66 days | Actual: | 37.28 days |
| Variance: | 2.2 days | Percent Complete | 55% |

### Work

| | | | |
|---|---|---|---|
| Scheduled: | 1985.92 hrs | Remaining: | 980 hrs |
| Baseline: | 1929.92 hrs | Actual: | 1005.92 hrs |
| Variance: | 56 hrs | Percent Complete | 51% |

### Costs

| | | | |
|---|---|---|---|
| Scheduled: | $113,625.60 | Remaining: | $55,768.00 |
| Baseline: | $109425.60 | Actual: | $57,857.60 |
| Variance: | $4,200.00 | | |

*Task Entry Web Report*

This report is used as a basic starting point for reviewing and identifying all high-level and detailed project tasks.   It gives stakeholders a quick status of the progress of each task.  The report shows a list of defined tasks with the following information:

- Task ID – Microsoft Project's identifier number
- Percent Complete – Current status of the task indicated by percentage of the task's duration that has been completed
- Task Name – Name of the task
- Duration – Total span of active working time for a task
- Work Hours – Total amount of time scheduled
- Start Date – Date when a task is scheduled to begin
- Finish Date – Date when a task is scheduled to be completed
- Predecessors – Task ID for the predecessor tasks on which the task depends before it can be started or finished.
- Assigned Resources – List of all names assigned to the task

## Task Entry Report

**Project Name:** detail_inception_iter

| Task ID | Percent Complete | Task Name | Duration | Work Hours | Start Date | Finish Date | Pred. | Resources |
|---|---|---|---|---|---|---|---|---|
| 1 | 55% | Inception Phase | 68.2 days | 1985.92 hrs | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | | |
| 2 | 38% | Project Management | 68.2 days | 588 hrs | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | | |
| 3 | 100% | Conceive New Project | 3 days | 40 hrs | 5/3/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | | |
| 4 | 100% | Identify and Assess Risks | 2 days | 16 hrs | 5/3/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | | Project Manager |
| 5 | 100% | Develop Business Case | 1 day | 8 hrs | 5/4/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 4 | Project Manager |
| 6 | 100% | Initiate Project | 1 day | 8 hrs | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 5 | Project Manager |
| 7 | 100% | Project Approval Review | 1 day | 8 hrs | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 6 | Project Reviewer |
| 8 | 100% | Evaluate Project Scope and Risk | 3 days | 32 hrs | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | 4 3 | |
| 9 | 100% | Identify and Assess Risks | 3 days | 24 hrs | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | | Project Manager |
| 10 | 100% | Develop Business Case | 1 day | 8 hrs | 5/7/1999 8:00:00 AM | 5/7/1999 5:00:00 PM | 9 | Project Manager |
| 11 | 97% | Develop Software Development Plan | 10.2 days | 104 hrs | 5/31/1999 8:00:00 AM | 6/14/1999 9:36:00 AM | 52 8 | |
| 12 | 100% | Develop Measurement Plan | 5 days | 40 hrs | 5/31/1999 8:00:00 AM | 6/7/1999 12:00:00 PM | | Project Manager |
| 13 | 100% | Develop Risk Management Plan | 1 day | 8 hrs | 6/1/1999 8:00:00 AM | 6/7/1999 5:00:00 PM | 12 | Project Manager |

*Task Schedule Report*

This report provides more detail on schedules and is useful in determining whether the project has any slack time in the schedule. The report lists the defined tasks along with the following information:

- Start Date – Date when a task is scheduled to begin
- Finish Date – Date when a task is scheduled to be completed
- Late Start – The latest date that a task can start without delaying the finish of the project
- Late Finish – The latest date that a task can finish without delaying the finish of the project
- Free Slack – The amount of time that a task can be delayed without delaying the start date of a successor task. Or if the task has no successors, this is the amount of time that the task can be delayed without delaying the entire project's finish date.
- Total Slack – The amount of time that a task can be delayed without delaying the project end date. Tasks on the critical path are identified by having a Total Slack equal to zero days. Non-critical path tasks have a Total Slack of greater than zero days. Negative slack values occur when one task has a finish-to-start dependency with a successor task, but the successor task has a Must Start On constraint that is earlier than the end of the first task. In addition, negative slack can also occur when a task is scheduled to finish after its deadline date.

# Task Schedule Report
**Project Name:** detail_inception_iter

| Task ID | Task Name | Start Date | Finish Date | Late Start | Late Finish | Free Slack (Days) | Total Slack (Days) |
|---------|-----------|------------|-------------|------------|-------------|-------------------|--------------------|
| 1 | Inception Phase | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | 0 | 0 |
| 2 | Project Management | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | 0 | 0 |
| 3 | Conceive New Project | 5/3/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 5/3/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 0 | 0 |
| 4 | Identify and Assess Risks | 5/3/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 5/3/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 0 | 0 |
| 5 | Develop Business Case | 5/4/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 5/4/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 0 | 0 |
| 6 | Initiate Project | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 0 | 0 |
| 7 | Project Approval Review | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 0 | 0 |
| 8 | Evaluate Project Scope and Risk | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | 0 | 0 |
| 9 | Identify and Assess Risks | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | 0 | 0 |
| 10 | Develop Business Case | 5/7/1999 8:00:00 AM | 5/7/1999 5:00:00 PM | 5/7/1999 8:00:00 AM | 5/7/1999 5:00:00 PM | 0 | 0 |
| 11 | Develop Software Development Plan | 5/31/1999 8:00:00 AM | 6/14/1999 9:36:00 AM | 5/31/1999 8:00:00 AM | 6/24/1999 3:24:00 PM | 0 | 4128 |
| 12 | Develop Measurement Plan | 5/31/1999 8:00:00 AM | 6/7/1999 12:00:00 PM | 5/31/1999 8:00:00 AM | 6/7/1999 12:00:00 PM | 0 | 0 |
| 13 | Develop Risk Management Plan | 6/1/1999 8:00:00 AM | 6/7/1999 5:00:00 PM | 6/1/1999 8:00:00 AM | 6/7/1999 5:00:00 PM | 0 | 0 |

*Cost Variance Web Report*

This report provides stakeholders with the status of high-level, as well as detailed budgeted vs. actual costs of the project. The report shows a list of defined tasks along with the following information:

- Fixed Cost – Set cost for the task
- Fixed Cost Accrual – Accrual method (Start, End, Prorated) of when the cost is incurred
- Total Cost – Calculated cost over the life of the project
- Baseline Cost – Total planned cost
- Cost Variance – Difference between the baseline cost and total cost
- Actual Cost – Costs incurred for work performed
- Remaining Cost – Remaining scheduled expenses that will be incurred in completing the remaining work

## Cost Variance Report
**Project Name:** detail_inception_iter

| Task ID | Task Name | Fixed Cost | Fixed Cost Accruel | Total Cost | Baseline Cost | Cost Variance | Actual Cost | Remaining Cost |
|---|---|---|---|---|---|---|---|---|
| 1 | Inception Phase | $0.00 | Prorated | $113,625.60 | $109425.60 | $4,200.00 | $57,857.60 | $55,768.00 |
| 2 | Project Management | $0.00 | Prorated | $40500.00 | $36,300.00 | $4,200.00 | $16,980.00 | $23,520.00 |
| 3 | Conceive New Project | $0.00 | Prorated | $2,800.00 | $2,200.00 | $600.00 | $2,800.00 | $0.00 |
| 4 | Identify and Assess Risks | $0.00 | Prorated | $1,200.00 | $600.00 | $600.00 | $1,200.00 | $0.00 |
| 5 | Develop Business Case | $0.00 | Prorated | $600.00 | $600.00 | $0.00 | $600.00 | $0.00 |
| 6 | Initiate Project | $0.00 | Prorated | $600.00 | $600.00 | $0.00 | $600.00 | $0.00 |
| 7 | Project Approval Review | $0.00 | Prorated | $400.00 | $400.00 | $0.00 | $400.00 | $0.00 |
| 8 | Evaluate Project Scope and Risk | $0.00 | Prorated | $2,400.00 | $1,200.00 | $1,200.00 | $2,400.00 | $0.00 |
| 9 | Identify and Assess Risks | $0.00 | Prorated | $1,800.00 | $600.00 | $1,200.00 | $1,800.00 | $0.00 |
| 10 | Develop Business Case | $0.00 | Prorated | $600.00 | $600.00 | $0.00 | $600.00 | $0.00 |
| 11 | Develop Software Development Plan | $0.00 | Prorated | $7,600.00 | $5,200.00 | $2,400.00 | $7,380.00 | $220.00 |
| 12 | Develop Measurement Plan | $0.00 | Prorated | $3,000.00 | $600.00 | $2,400.00 | $3,000.00 | $0.00 |
| 13 | Develop Risk Management Plan | $0.00 | Prorated | $600.00 | $600.00 | $0.00 | $600.00 | $0.00 |
| 14 | Develop Product Acceptance Plan | $0.00 | Prorated | $600.00 | $600.00 | $0.00 | $600.00 | $0.00 |
| 15 | Develop Problem Resolution Plan | $0.00 | Prorated | $600.00 | $600.00 | $0.00 | $600.00 | $0.00 |
| 16 | Define Project Organization and Staffing | $0.00 | Prorated | $600.00 | $600.00 | $0.00 | $600.00 | $0.00 |
| 17 | Define Monitoring & Control Processes | $0.00 | Prorated | $600.00 | $600.00 | $0.00 | $600.00 | $0.00 |
| 18 | Plan Phases and | $0.00 | Prorated | $600.00 | $600.00 | $0.00 | $480.00 | $120.00 |

*Schedule Variance Web Report*

This report provides stakeholders information related to whether or not the project and specific tasks are on schedule and how much variance there is in the schedule. The report shows a list of Tasks along with the following additional information:

- Start Date – Date when a task is scheduled to begin
- Finish Date – Date when a task is scheduled to be completed
- Baseline Start Date – Planned beginning date for the task at the time you baseline your plan
- Baseline Finish Date – Planned end date for the task at the time you baseline
- Start Variance – Difference between the baseline start and the currently scheduled start date
- Finish Variance – Difference between the baseline finish and the currently scheduled finish date

# Schedule Variance Report
**Project Name:** detail_inception_iter

| Task ID | Task Name | Start Date | Finish Date | Baseline Start Date | Baseline Finish Date | Start Variance | Finish Variance |
|---|---|---|---|---|---|---|---|
| 1 | Inception Phase | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | 5/3/1999 8:00:00 AM | 8/2/1999 5:00:00 PM | 0 days | 2.2 days |
| 2 | Project Management | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | 5/3/1999 8:00:00 AM | 8/2/1999 5:00:00 PM | 0 days | 2.2 days |
| 3 | Conceive New Project | 5/3/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 5/3/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 0 days | 0 days |
| 4 | Identify and Assess Risks | 5/3/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 5/3/1999 8:00:00 AM | 5/3/1999 5:00:00 PM | 0 days | 1 day |
| 5 | Develop Business Case | 5/4/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 5/4/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 0 days | 0 days |
| 6 | Initiate Project | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 0 days | 0 days |
| 7 | Project Approval Review | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 0 days | 0 days |
| 8 | Evaluate Project Scope and Risk | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | 5/6/1999 8:00:00 AM | 5/7/1999 5:00:00 PM | 0 days | 1 day |
| 9 | Identify and Assess Risks | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | 5/6/1999 8:00:00 AM | 5/6/1999 5:00:00 PM | 0 days | 2 days |
| 10 | Develop Business Case | 5/7/1999 8:00:00 AM | 5/7/1999 5:00:00 PM | 5/7/1999 8:00:00 AM | 5/7/1999 5:00:00 PM | 0 days | 0 days |
| 11 | Develop Software Development Plan | 5/31/1999 8:00:00 AM | 6/14/1999 9:36:00 AM | 5/31/1999 8:00:00 AM | 6/9/1999 5:00:00 PM | 0 days | 2.2 days |
| 12 | Develop Measurement Plan | 5/31/1999 8:00:00 AM | 6/7/1999 12:00:00 PM | 5/31/1999 8:00:00 AM | 5/31/1999 5:00:00 PM | 0 days | 4.5 days |
| 13 | Develop Risk Management Plan | 6/1/1999 8:00:00 AM | 6/7/1999 5:00:00 PM | 6/1/1999 8:00:00 AM | 6/1/1999 5:00:00 PM | 0 days | 4 days |
| 14 | Develop Product Acceptance Plan | 6/2/1999 8:00:00 AM | 6/8/1999 12:00:00 PM | 6/2/1999 8:00:00 AM | 6/2/1999 5:00:00 PM | 0 days | 3.5 days |
| 15 | Develop Problem | 6/3/1999 | 6/9/1999 | 6/3/1999 | 6/3/1999 | 0 days | 3.1 days |

*Late Tasks Web Report*

This report shows a list of all tasks where the Finish Date is now beyond the originally Planned Baseline Finish Date.  This report provides stakeholders information related to tasks that are currently behind schedule along with the current variance of the late tasks.   Refer to the previous Schedule Variance Report for an explanation of the columns.

## Late Tasks Report

Project Name: detail_inception_iter

| Task ID | Task Name | Start Date | Finish Date | Baseline Start Date | Baseline Finish Date | Start Variance | Finish Variance |
|---|---|---|---|---|---|---|---|
| 1 | Inception Phase | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | 5/3/1999 8:00:00 AM | 8/2/1999 5:00:00 PM | 0 days | 2.2 days |
| 2 | Project Management | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | 5/3/1999 8:00:00 AM | 8/2/1999 5:00:00 PM | 0 days | 2.2 days |
| 4 | Identify and Assess Risks | 5/3/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 5/3/1999 8:00:00 AM | 5/3/1999 5:00:00 PM | 0 days | 1 day |
| 12 | Develop Measurement Plan | 5/31/1999 8:00:00 AM | 6/7/1999 12:00:00 PM | 5/31/1999 8:00:00 AM | 5/31/1999 5:00:00 PM | 0 days | 4.5 days |
| 13 | Develop Risk Management Plan | 6/1/1999 8:00:00 AM | 6/7/1999 5:00:00 PM | 6/1/1999 8:00:00 AM | 6/1/1999 5:00:00 PM | 0 days | 4 days |
| 14 | Develop Product Acceptance Plan | 6/2/1999 8:00:00 AM | 6/8/1999 12:00:00 PM | 6/2/1999 8:00:00 AM | 6/2/1999 5:00:00 PM | 0 days | 3.5 days |
| 15 | Develop Problem Resolution Plan | 6/3/1999 8:00:00 AM | 6/9/1999 8:48:00 AM | 6/3/1999 8:00:00 AM | 6/3/1999 5:00:00 PM | 0 days | 3.1 days |
| 16 | Define Project Organization and Staffing | 6/4/1999 8:00:00 AM | 6/9/1999 3:24:00 PM | 6/4/1999 8:00:00 AM | 6/4/1999 5:00:00 PM | 0 days | 2.8 days |
| 21 | Plan for Next Iteration | 6/14/1999 9:36:00 AM | 6/17/1999 9:36:00 AM | 6/10/1999 8:00:00 AM | 6/14/1999 5:00:00 PM | 2.2 days | 2.2 days |
| 22 | Develop Iteration Plan | 6/14/1999 9:36:00 AM | 6/15/1999 9:36:00 AM | 6/10/1999 8:00:00 AM | 6/10/1999 5:00:00 PM | 2.2 days | 2.2 days |
| 23 | Develop Business Case | 6/15/1999 9:36:00 AM | 6/16/1999 9:36:00 AM | 6/11/1999 8:00:00 AM | 6/11/1999 5:00:00 PM | 2.2 days | 2.2 days |
| 24 | Iteration Plan Review | 6/16/1999 9:36:00 AM | 6/17/1999 9:36:00 AM | 6/14/1999 8:00:00 AM | 6/14/1999 5:00:00 PM | 2.2 days | 2.2 days |
| 25 | Manage Iteration | 6/17/1999 9:36:00 AM | 7/15/1999 9:36:00 AM | 6/15/1999 8:00:00 AM | 7/12/1999 5:00:00 PM | 2.2 days | 2.2 days |
| | Acquire Staff | 6/17/1999 | 6/24/1999 | 6/15/1999 | 6/21/1999 | 2.2 days | 2.2 days |

*Milestone Tasks Web Report*

This report provides stakeholders information related to the status of milestone tasks.  The report shows a list of tasks that are defined to be milestone tasks along with the following information:

- Milestone – Boolean field to indicate whether the task is a milestone
- Percent Complete – Current status of the task indicated by percentage of the task's duration that has been completed
- Duration – Total span of active working time for a task
- Work Hours – Total amount of time scheduled
- Start Date – Date when a task is scheduled to begin
- Finish Date – Date when a task is scheduled to be completed

# Milestone Tasks Report
Project Name: detail_inception_iter

| Task ID | Milestone | Percent Complete | Task Name | Duration | Work Hours | Start Date | Finish Date |
|---|---|---|---|---|---|---|---|
| 1 | True | 55% | Inception Phase | 68.2 days | 1985.92 hrs | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM |
| 4 | True | 100% | Identify and Assess Risks | 2 days | 16 hrs | 5/3/1999 8:00:00 AM | 5/4/1999 5:00:00 PM |
| 5 | True | 100% | Develop Business Case | 1 day | 8 hrs | 5/4/1999 8:00:00 AM | 5/4/1999 5:00:00 PM |
| 6 | True | 100% | Initiate Project | 1 day | 8 hrs | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM |
| 7 | True | 100% | Project Approval Review | 1 day | 8 hrs | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM |

*Late Milestone Tasks Web Report*

This report provides stakeholders information related to the status of late milestone tasks that are not yet finished along with their % Completion status.  The report shows a list of milestone tasks that are late along with the following information:

- Percent Complete – Current status of the task indicated by percentage of the task's duration that has been completed
- Start Date – Date when a task is scheduled to begin
- Finish Date – Date when a task is scheduled to be completed
- Baseline Finish Date – Planned end date for the task at the time you baseline
- Finish Variance – Difference between the baseline finish and the currently scheduled finish date

# Late MilestoneTasks Report
**Project Name:** detail_inception_iter

| Task ID | Milestone | Percent Complete | Task Name | Start Date | Finish Date | Baseline Finish Date | Finish Variance |
|---------|-----------|------------------|-----------|------------|-------------|----------------------|-----------------|
| 1 | True | 55% | Inception Phase | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | 8/2/1999 5:00:00 PM | 2.2 days |
| 4 | True | 100% | Identify and Assess Risks | 5/3/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 5/3/1999 5:00:00 PM | 1 day |

*Work Hours Variance Web Report*

This report provides stakeholders with information related to the current status of the work effort involved in completing the project and individual tasks. The report contains a list of defined tasks along with the following information:

- Work Hours – Total amount of time scheduled on the task
- Baseline Work Hours – Total planned hours scheduled for a task
- Actual Work Hours – Amount of work that has already been performed
- Work Hours Variance – Difference between the task's baseline work and the currently scheduled work
- Remaining Work Hours - Amount of time still required to complete the task
- Percent Complete Work Hours – Current status of the task expressed in percent of the task's duration that has been completed

## Work Hours Variance Report

**Project Name:** detail_inception_iter

| Task ID | Task Name | Work Hours | Baseline Work Hours | Actual Work Hours | Work Hours Variance | Remaining Work Hours | Percent Complete Work Hours |
|---|---|---|---|---|---|---|---|
| 1 | Inception Phase | 1985.92 hrs | 1929.92 hrs | 1005.92 hrs | 56 hrs | 980 hrs | 51% |
| 2 | Project Management | 588 hrs | 532 hrs | 233.6 hrs | 56 hrs | 354.4 hrs | 40% |
| 3 | Conceive New Project | 40 hrs | 32 hrs | 40 hrs | 8 hrs | 0 hrs | 100% |
| 4 | Identify and Assess Risks | 16 hrs | 8 hrs | 16 hrs | 8 hrs | 0 hrs | 100% |
| 5 | Develop Business Case | 8 hrs | 8 hrs | 8 hrs | 0 hrs | 0 hrs | 100% |
| 6 | Initiate Project | 8 hrs | 8 hrs | 8 hrs | 0 hrs | 0 hrs | 100% |
| 7 | Project Approval Review | 8 hrs | 8 hrs | 8 hrs | 0 hrs | 0 hrs | 100% |
| 8 | Evaluate Project Scope and Risk | 32 hrs | 16 hrs | 32 hrs | 16 hrs | 0 hrs | 100% |
| 9 | Identify and Assess Risks | 24 hrs | 8 hrs | 24 hrs | 16 hrs | 0 hrs | 100% |
| 10 | Develop Business Case | 8 hrs | 8 hrs | 8 hrs | 0 hrs | 0 hrs | 100% |
| 11 | Develop Software Development Plan | 104 hrs | 72 hrs | 100.8 hrs | 32 hrs | 3.2 hrs | 97% |
| 12 | Develop Measurement Plan | 40 hrs | 8 hrs | 40 hrs | 32 hrs | 0 hrs | 100% |
| 13 | Develop Risk Management Plan | 8 hrs | 8 hrs | 8 hrs | 0 hrs | 0 hrs | 100% |
| 14 | Develop Product Acceptance Plan | 8 hrs | 8 hrs | 8 hrs | 0 hrs | 0 hrs | 100% |
| 15 | Develop Problem Resolution Plan | 8 hrs | 8 hrs | 8 hrs | 0 hrs | 0 hrs | 100% |
| 16 | Define Project Organization and Staffing | 8 hrs | 8 hrs | 8 hrs | 0 hrs | 0 hrs | 100% |
| 17 | Define Monitoring & Control Processes | 8 hrs | 8 hrs | 8 hrs | 0 hrs | 0 hrs | 100% |
| 18 | Plan Phases and Iterations | 8 hrs | 8 hrs | 6.4 hrs | 0 hrs | 1.6 hrs | 80% |
| 19 | Compile Software Development Plan | 8 hrs | 8 hrs | 7.2 hrs | 0 hrs | 0.8 hrs | 90% |
| 20 | Project Planning Review | 8 hrs | 8 hrs | 7.2 hrs | 0 hrs | 0.8 hrs | 90% |
| 21 | Plan for Next Iteration | 24 hrs | 24 hrs | 20.8 hrs | 0 hrs | 3.2 hrs | 87% |
| 22 | Develop Iteration Plan | 8 hrs | 8 hrs | 6.4 hrs | 0 hrs | 1.6 hrs | 80% |

*Task Summary Web Report*

This report provides stakeholders with a summary view of cost, effort, and percent complete to date for the project and individual tasks.  The report shows a list of tasks along with the following additional information:

- Duration – Total span of active working time for a task
- Start Date – Date when a task is scheduled to begin
- Finish Date – Date when a task is scheduled to be completed
- Percent Complete – Current status of the task indicated by percentage of the task's duration that has been completed
- Cost – Calculated total cost over the life of the project
- Work Hours – Total amount of time scheduled

# Task Summary Report
**Project Name:** detail_inception_iter

| Task ID | Task Name | Duration | Start Date | Finish Date | Percent Complete | Cost | Work Hours |
|---------|-----------|----------|------------|-------------|------------------|------|------------|
| 1 | Inception Phase | 68.2 days | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | 55% | $113,625.60 | 1985.92 hrs |
| 2 | Project Management | 68.2 days | 5/3/1999 8:00:00 AM | 8/5/1999 9:36:00 AM | 38% | $40500.00 | 588 hrs |
| 3 | Conceive New Project | 3 days | 5/3/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 100% | $2,800.00 | 40 hrs |
| 4 | Identify and Assess Risks | 2 days | 5/3/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 100% | $1,200.00 | 16 hrs |
| 5 | Develop Business Case | 1 day | 5/4/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 100% | $600.00 | 8 hrs |
| 6 | Initiate Project | 1 day | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 100% | $600.00 | 8 hrs |
| 7 | Project Approval Review | 1 day | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 100% | $400.00 | 8 hrs |
| 8 | Evaluate Project Scope and Risk | 3 days | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | 100% | $2,400.00 | 32 hrs |
| 9 | Identify and Assess Risks | 3 days | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | 100% | $1,800.00 | 24 hrs |
| 10 | Develop Business Case | 1 day | 5/7/1999 8:00:00 AM | 5/7/1999 5:00:00 PM | 100% | $600.00 | 8 hrs |
| 11 | Develop Software Development Plan | 10.2 days | 5/31/1999 8:00:00 AM | 6/14/1999 9:36:00 AM | 97% | $7,600.00 | 104 hrs |
| 12 | Develop Measurement Plan | 5 days | 5/31/1999 8:00:00 AM | 6/7/1999 12:00:00 PM | 100% | $3,000.00 | 40 hrs |
| 13 | Develop Risk Management Plan | 1 day | 6/1/1999 8:00:00 AM | 6/7/1999 5:00:00 PM | 100% | $600.00 | 8 hrs |
| 14 | Develop Product Acceptance Plan | 1 day | 6/2/1999 8:00:00 AM | 6/8/1999 12:00:00 PM | 100% | $600.00 | 8 hrs |
| 15 | Develop Problem Resolution Plan | 1 day | 6/3/1999 8:00:00 AM | 6/9/1999 8:48:00 AM | 100% | $600.00 | 8 hrs |
| 16 | Define Project | 1 day | 6/4/1999 | 6/9/1999 | 100% | $600.00 | 8 hrs |

*Task Tracking Web Report*

This report provides stakeholders with actuals information.  This report shows a list of the tasks along with the following additional information:

- Actual Start Date – Date when the task actually began
- Actual Finish Date – Date when the task actually completed
- Percent Complete – Current status of the task expressed in percent of the task's duration that has been completed
- Actual Duration – Span of actual working time for a task so far
- Remaining Duration – Amount of time required to complete the task
- Actual Cost – Costs incurred for work performed
- Actual Work Hours – Amount of work that has already been performed

# Task Tracking Report

**Project Name:** detail_inception_iter

| Task ID | Task Name | Actual Start Date | Actual Finish Date | Percent Complete | Actual Duration | Remaining Duration | Actual Cost | Actual Work Hours |
|---|---|---|---|---|---|---|---|---|
| 1 | Inception Phase | 5/3/1999 8:00:00 AM | NA | 55% | 37.28 days | 30.92 days | $57,857.60 | 1005.92 hrs |
| 2 | Project Management | 5/3/1999 8:00:00 AM | NA | 38% | 25.86 days | 42.34 days | $16,980.00 | 233.6 hrs |
| 3 | Conceive New Project | 5/3/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 100% | 3 days | 0 days | $2,800.00 | 40 hrs |
| 4 | Identify and Assess Risks | 5/3/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 100% | 2 days | 0 days | $1,200.00 | 16 hrs |
| 5 | Develop Business Case | 5/4/1999 8:00:00 AM | 5/4/1999 5:00:00 PM | 100% | 1 day | 0 days | $600.00 | 8 hrs |
| 6 | Initiate Project | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 100% | 1 day | 0 days | $600.00 | 8 hrs |
| 7 | Project Approval Review | 5/5/1999 8:00:00 AM | 5/5/1999 5:00:00 PM | 100% | 1 day | 0 days | $400.00 | 8 hrs |
| 8 | Evaluate Project Scope and Risk | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | 100% | 3 days | 0 days | $2,400.00 | 32 hrs |
| 9 | Identify and Assess Risks | 5/6/1999 8:00:00 AM | 5/10/1999 5:00:00 PM | 100% | 3 days | 0 days | $1,800.00 | 24 hrs |
| 10 | Develop Business Case | 5/7/1999 8:00:00 AM | 5/7/1999 5:00:00 PM | 100% | 1 day | 0 days | $600.00 | 8 hrs |
| 11 | Develop Software Development Plan | 5/31/1999 8:00:00 AM | NA | 97% | 9.89 days | 0.31 days | $7,380.00 | 100.8 hrs |
| 12 | Develop | 5/31/1999 | 5/7/1999 | 100% | 5 | 0 | $3,000.00 | 48 |

*Task Assignment Web Report*

This report is useful in identifying what tasks have been assigned to which resource.  The report shows a list of assigned tasks grouped by Resource Name along with the following information:

- Work Hours – Total amount of time scheduled for the resource for the assigned task
- Actual Work Hours – Amount of work that has already been performed by the resource for the assigned task
- Remaining Work Hours  - Amount of time still required to complete the task by the resource for the assigned task
- Budgeted Cost – Total scheduled cost for the resource for the assigned task
- Actual Cost – Costs incurred for work performed by the resource for the assigned task
- Remaining Cost – Remaining scheduled expenses that will be incurred in completing the remaining work for the resource for the assigned task

## Task Assignment Resource Report

**Project Name:** detail_inception_iter

**Resource Name:** Architect

. Currently, no tasks have been associated with this resouce.

**Resource Name:** Architecture Reviewer

. Currently, no tasks have been associated with this resouce.

**Resource Name:** Business-Process Analyst

| Task ID | Task Name | Work Hours | Actual Work Hours | Remaining Work Hours | Budgeted Cost | Actual Cost | Remaining Cost |
|---------|-----------|------------|-------------------|----------------------|---------------|-------------|----------------|
| 122 | Develop Business-Modeling Guidelines | 8 hrs | 8 hrs | 0 hrs | $440.00 | $440.00 | $0.00 |

**Resource Name:** Business Designer

. Currently, no tasks have been associated with this resouce.

**Resource Name:** Business-Model Reviewer

. Currently, no tasks have been associated with this resouce.

**Resource Name:** Code Reviewer

. Currently, no tasks have been associated with this resouce.

**Resource Name:** Configuration Manager

| Task ID | Task Name | Work Hours | Actual Work Hours | Remaining Work Hours | Budgeted Cost | Actual Cost | Remaining Cost |
|---------|-----------|------------|-------------------|----------------------|---------------|-------------|----------------|
| 137 | Establish CM Policies | 8 hrs | 8 hrs | 0 hrs | $560.00 | $560.00 | $0.00 |
| 136 | Write CM Plan | 8 hrs | 8 hrs | 0 hrs | $560.00 | $560.00 | $0.00 |
| 141 | Setup CM Environment | 8 hrs | 8 hrs | 0 hrs | $560.00 | $560.00 | $0.00 |
| 156 | Create Deployment | 48 hrs | 9.6 hrs | 38.4 hrs | $3,360.00 | $672.00 | $2,688.00 |

*Earned Value Web Report*

This report provides stakeholders with insight into the current Earned Value of the project. Earned Value analysis is useful in that it focuses on schedule and budget performance as compared to baseline plans. The purpose of earned value analysis is to measure the project's progress, and help predict its outcome. Earned value analysis addresses the question: For the current performance results we are getting on the project, are we getting our money's worth? Earned value analysis allows stakeholders to determine two important things: 1) the true cost of project results to date, and 2) the performance trend that is likely to continue for the remainder of the project.

The report shows a list of defined tasks along with the following information:

- Baseline Cost – Total planned cost for a task. Also known as Budget at Completion (BAC).

- Budgeted Cost of Work Performed (BCWP) – Cumulative value of the task's time-phased percent complete multiplied by the task's time-phased baseline cost. It is calculated up to the status date. Also known as Earned Value (EV).

- Budgeted Cost of Work Scheduled (BCWS) – Cumulative time-phased baseline costs up to the status date.

- Actual Work Hours – Amount of work that has already been performed

- Actual Cost – Costs incurred for work performed

- Actual Cost of Work Performed (ACWP) – Costs incurred for work already done on the task, up to the status date.

- Cost Performance Index (CPI) – Ratio of budgeted to actual cost – CPI = BCWP / ACWP. The Schedule Performance Index (SPI) column is the ratio of performed to scheduled work – SPI = BCWP / BCWS.

- Schedule Performance Index (SPI) – Ratio of budgeted to actual cost – CPI = BCWP / ACWP. The Schedule Performance Index (SPI) column is the ratio of performed to scheduled work – SPI = BCWP / BCWS.

**Earned Value Report**
Project Name: detail_inception_iter

| Task ID | Task Name | Baseline Cost | Budgeted Cost of Work Planned (BCWP) | Budgeted Cost of Work Scheduled (BCWS) | Actual Work Hours | Actual Cost | Actual Cost of Work Performed (ACWP) | Cost Performance Index (CPI) | Schedule Performance Index (SPI) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Inception Phase | $109,425.60 | $53,657.60 | $109,425.60 | 1005.92 hrs | $57,857.60 | $57,857.60 | 0.927408 | 0.490357 |
| 2 | Project Management | $36,300.00 | $12,780.00 | $36,300.00 | 233.6 hrs | $16,980.00 | $16,980.00 | 0.752650 | 0.352066 |
| 3 | Conceive New Project | $2,200.00 | $2,200.00 | $2,200.00 | 40 hrs | $2,800.00 | $2,800.00 | 0.785714 | 1.000000 |
| 4 | Identify and Assess Risks | $600.00 | $600.00 | $600.00 | 16 hrs | $1,200.00 | $1,200.00 | 0.500000 | 1.000000 |
| 5 | Develop Business Case | $600.00 | $600.00 | $600.00 | 8 hrs | $600.00 | $600.00 | 1.000000 | 1.000000 |
| 6 | Initiate Project | $600.00 | $600.00 | $600.00 | 8 hrs | $600.00 | $600.00 | 1.000000 | 1.000000 |
| 7 | Project Approval Review | $400.00 | $400.00 | $400.00 | 8 hrs | $400.00 | $400.00 | 1.000000 | 1.000000 |
| 8 | Evaluate Project Scope and Risk | $1,200.00 | $1,200.00 | $1,200.00 | 32 hrs | $2,400.00 | $2,400.00 | 0.500000 | 1.000000 |
| 9 | Identify and Assess Risks | $600.00 | $600.00 | $600.00 | 24 hrs | $1,800.00 | $1,800.00 | 0.333333 | 1.000000 |
| 10 | Develop Business Case | $600.00 | $600.00 | $600.00 | 8 hrs | $600.00 | $600.00 | 1.000000 | 1.000000 |
| 11 | Develop Software Development Plan | $5,200.00 | $4,980.00 | $5,200.00 | 100.8 hrs | $7,380.00 | $7,380.00 | 0.674797 | 0.957692 |
| 12 | Develop Measurement Plan | $600.00 | $600.00 | $600.00 | 40 hrs | $3,000.00 | $3,000.00 | 0.200000 | 1.000000 |
| 13 | Develop Risk Management Plan | $600.00 | $600.00 | $600.00 | 8 hrs | $600.00 | $600.00 | 1.000000 | 1.000000 |
| 14 | Develop Product Acceptance Plan | $600.00 | $600.00 | $600.00 | 8 hrs | $600.00 | $600.00 | 1.000000 | 1.000000 |
| 15 | Develop Problem Resolution Plan | $600.00 | $600.00 | $600.00 | 8 hrs | $600.00 | $600.00 | 1.000000 | 1.000000 |
| 16 | Define Project Organization and Staffing | $600.00 | $600.00 | $600.00 | 8 hrs | $600.00 | $600.00 | 1.000000 | 1.000000 |
| 17 | Define Monitoring & Control Processes | $600.00 | $600.00 | $600.00 | 8 hrs | $600.00 | $600.00 | 1.000000 | 1.000000 |
| 18 | Plan Phases and Iterations | $600.00 | $480.00 | $600.00 | 6.4 hrs | $480.00 | $480.00 | 1.000000 | 0.800000 |

*Resource Web Report*

This report provides stakeholders with a list of all resources that have been assigned to the project along with how much has been spent and how much is remaining to be spent for each resource. The report shows a list of available Project Resources along with the following information:

- Baseline Cost – Total planned cost for a resource. The Baseline Cost is also referred to as budget at completion (BAC), and earned value field. The formula for calculating Baseline Cost = (Work * Standard Rate) + (Overtime Work * Overtime Rate) + Per Use Cost.
- Baseline Work – Planned person-hours scheduled for a resource
- Remaining Cost – Remaining scheduled expenses that will be incurred in completing all remaining work for the resource
- Remaining Work – Sum of all remaining work values in person-hours for all of the resource's assignments
- Per Use Cost – Set fee for the use of a resource

Resource Leveling should be done to resolve any resource over-allocations. Resource Leveling is important to insure that the project plan is realistic.

## Resources Report

**Project Name:** detail_inception_iter

| Resouce Name | Baseline Cost | Baseline Work | Remaining Cost | Remaining Work | Per Use Cost |
|---|---|---|---|---|---|
| Architect | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Architecture Reviewer | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Business-Process Analyst | $440.00 | 8 hrs | $0.00 | 0 hrs | $0.00 |
| Business Designer | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Business-Model Reviewer | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Code Reviewer | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Configuration Manager | $11,760.00 | 168 hrs | $8,736.00 | 124.8 hrs | $0.00 |
| Course Developer | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Database Designer | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Deployment Manager | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Design Reviewer | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Designer | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Implementer | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Integration Tester | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Performance Tester | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Process Engineer | $3,120.00 | 48 hrs | $0.00 | 0 hrs | $0.00 |
| Project Manager | $29100.00 | 388 hrs | $17,400.00 | 232 hrs | $0.00 |
| Requirements Reviewer | $2,880.00 | 64 hrs | $0.00 | 0 hrs | $0.00 |
| Stakeholder | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| System Administrator | $1,920.00 | 48 hrs | $1,344.00 | 33.6 hrs | $0.00 |
| System Analyst | $13,085.60 | 237.92 hrs | $0.00 | 0 hrs | $0.00 |
| System Integrator | $9000.00 | 200 hrs | $6,480.00 | 144 hrs | $0.00 |
| System Tester | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Technical Writer | $280.00 | 8 hrs | $0.00 | 0 hrs | $0.00 |
| Test Designer | $640.00 | 16 hrs | $0.00 | 0 hrs | $0.00 |
| Tool Smith | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Use-Case Specifier | $2,880.00 | 64 hrs | $1,080.00 | 24 hrs | $0.00 |
| User-Interface Designer | $3,960.00 | 72 hrs | $1,320.00 | 24 hrs | $0.00 |
| Project Reviewer | $7,200.00 | 144 hrs | $6,120.00 | 122.4 hrs | $0.00 |
| Architectsys | $0.00 | 0 hrs | $0.00 | 0 hrs | $0.00 |
| Change Control Manager | $7,280.00 | 104 hrs | $5,040.00 | 72 hrs | $0.00 |
| Any Worker | $4,200.00 | 168 hrs | $3,000.00 | 120 hrs | $0.00 |
| Software Architect | $10400.00 | 160 hrs | $4,992.00 | 76.8 hrs | $0.00 |
| Tool Specialist | $1,280.00 | 32 hrs | $256.00 | 6.4 hrs | $0.00 |

**Microsoft Project Trend Reports Using IBM Rational ProjectConsole**

All of the trend charts and gauge indicators shown below were generated using IBM Rational
ProjectConsole from a Microsoft Project Data Collection.

*Actual vs. Budgeted Costs Trend Analysis Indicator*

This indicator shows the trend of Actual Costs (MSPActualCost) vs. Budgeted Cost (MSPBaselineCost)
over the life of the project.  As the project progresses, the trend of Actual Costs should get closer but not
exceed the original Budgeted Costs if the project is to remain within budget.
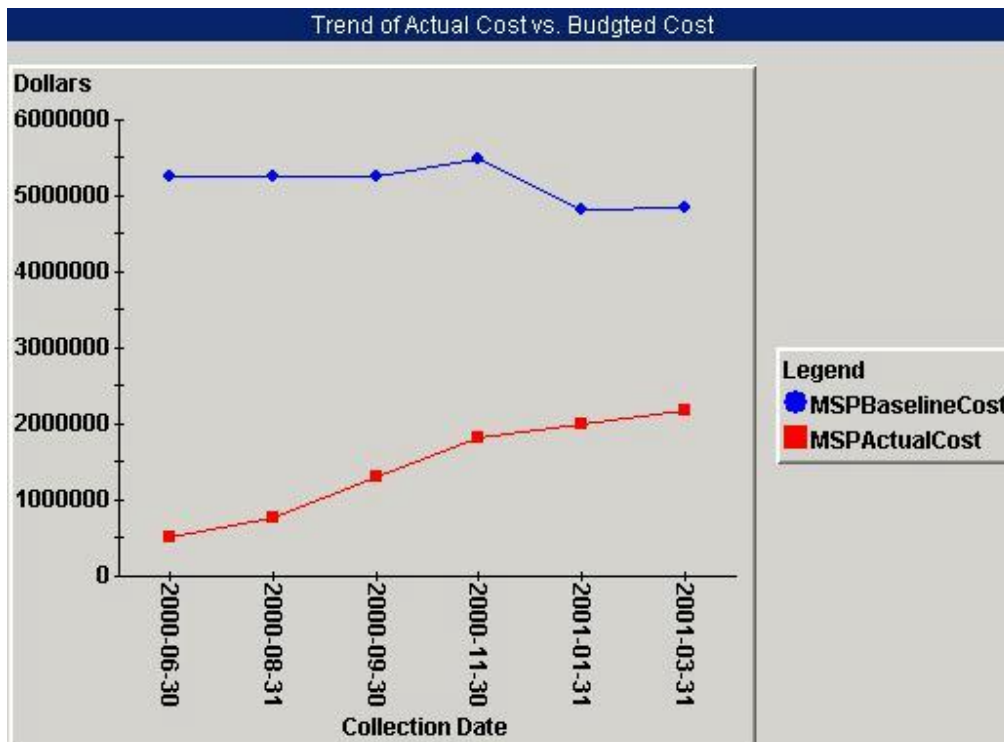
*Actual vs. Planned Duration Trend Analysis Indicator*

This indicator shows the trend of Actual Duration (MSPActualDuration) vs. Planned Duration (MSPBaselineDuration) over the life of the project. As the project progresses, the Actual Duration will get close to, but should not exceed the Planned Duration if the project is to remain on schedule.
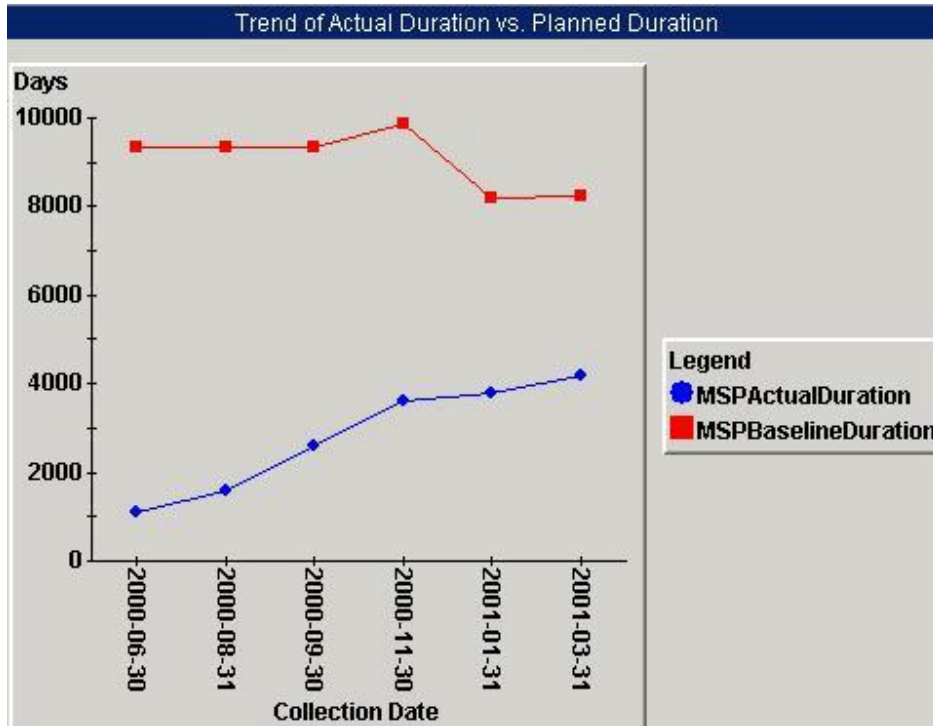
*Actual vs. Planned Work Hours Trend Analysis Indicator*

This indicator shows a trend of Actual Work Hours (MSPActualWork) vs. Planned Work (MSPBaselineWork) Hours over the lifetime of the project.  As the project progresses, the number of Actual Work Hours will get close to, but should not exceed the number of originally Planned Work Hours if the project is to remain on schedule and within budget.  If the Actual Work Hours begin to exceed the number of Planned Work Hours, this would signal that a Change Order is required in order to continue the project.
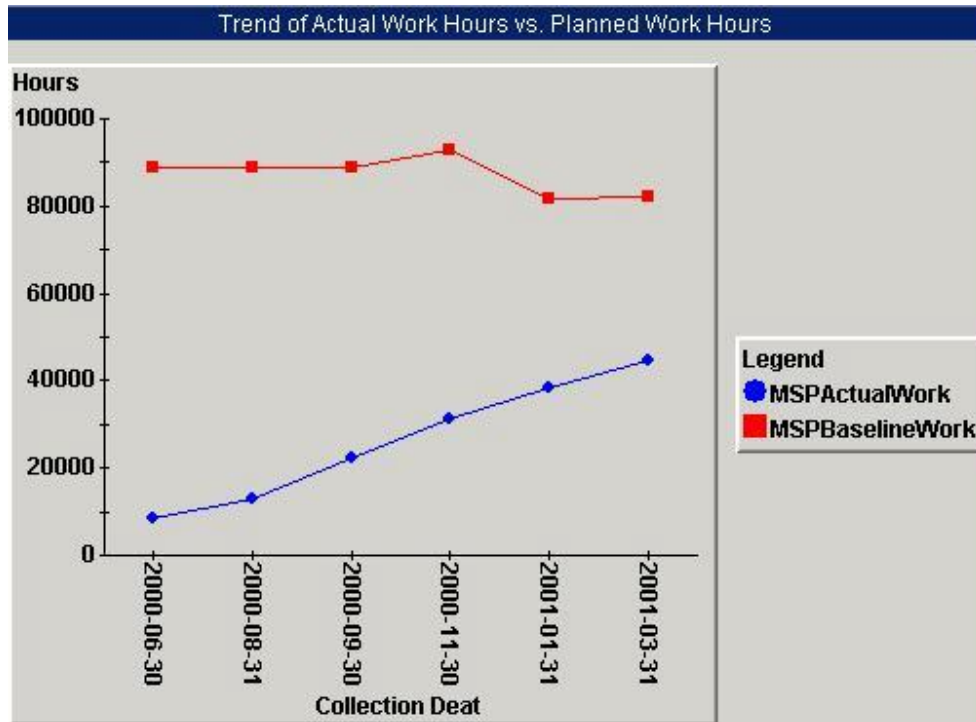
*Actual Cost of Work Performed vs. Budgeted Cost of Work Performed Trend Analysis Indicator*

This indicator shows the trend of Actual Cost of Work Performed (ACWP) and Budgeted Cost of Work Performed (BCWP) over the life of the project. As the project progresses the ACWP will get close to, but should not exceed the BCWP. If the ACWP does exceed the BCWP, this would indicate that a Change Order might be required in order to continue the project.
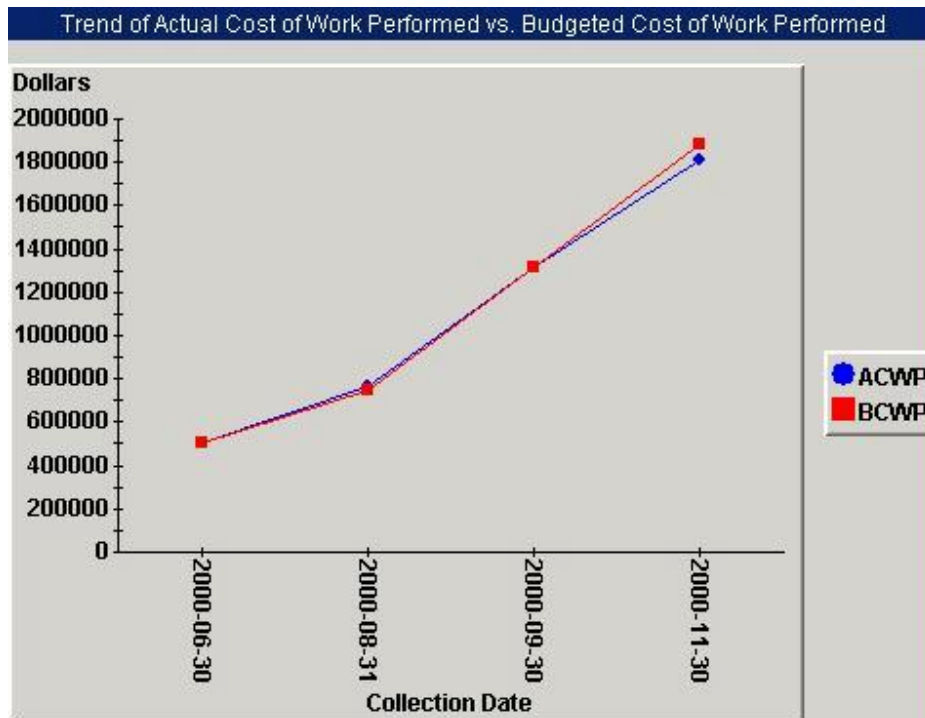
*Budgeted Cost of Work Planned vs. Budgeted Cost of Work Scheduled Trend Analysis Indicator*

This indicator shows the trend of Budgeted Cost of Work Planned (BCWP) vs. Budgeted Cost of Work Scheduled (BCWS) over the life of the project. As the project progresses, the BCWP will become closer, but should never exceed the BCWS. If the BCWP does exceed the BCWS this would be an indication that a Change Order is required for additional budgeted work hours in order to finish the project.
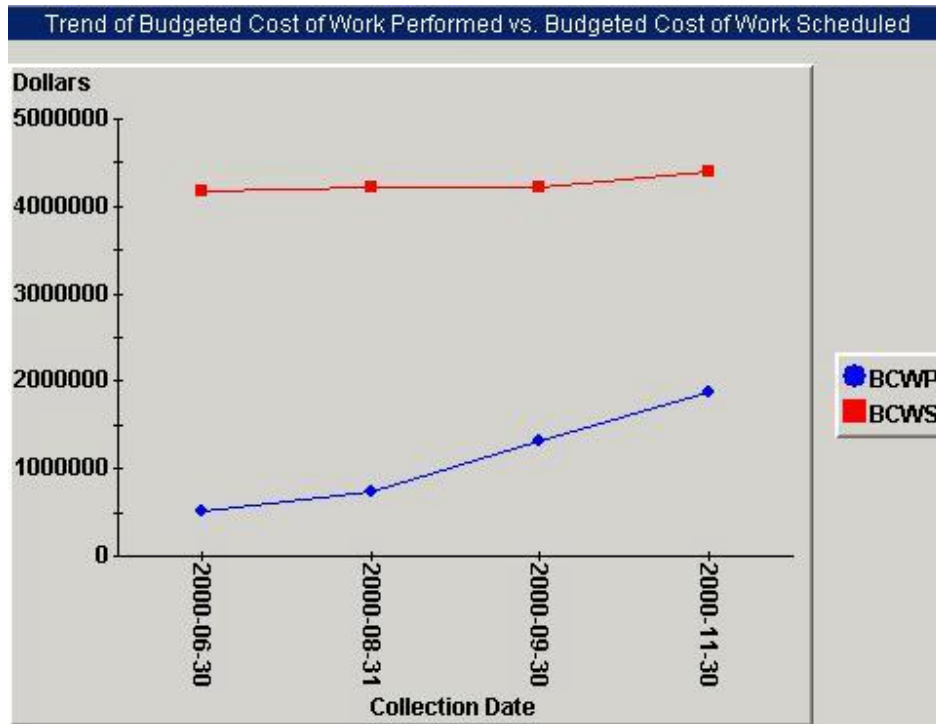
*Earned Value vs. Budgeted Cost Trend Analysis Indicator*

This indicator shows the trend of Earned Value (BCWP) vs. the Original Baseline Budgeted Cost (MSPBaselineCost) over the life of the project. BCWP (Budgeted Cost of Work Performed) is used synonymously with Earned Value. Over the course of the project, the Earned Value will approach but should not exceed the Original Budgeted Cost. If the Earned Value does exceed the Baseline Budgeted Cost, this is an indication that a Change Order is required for additional funding in order to finish the project.
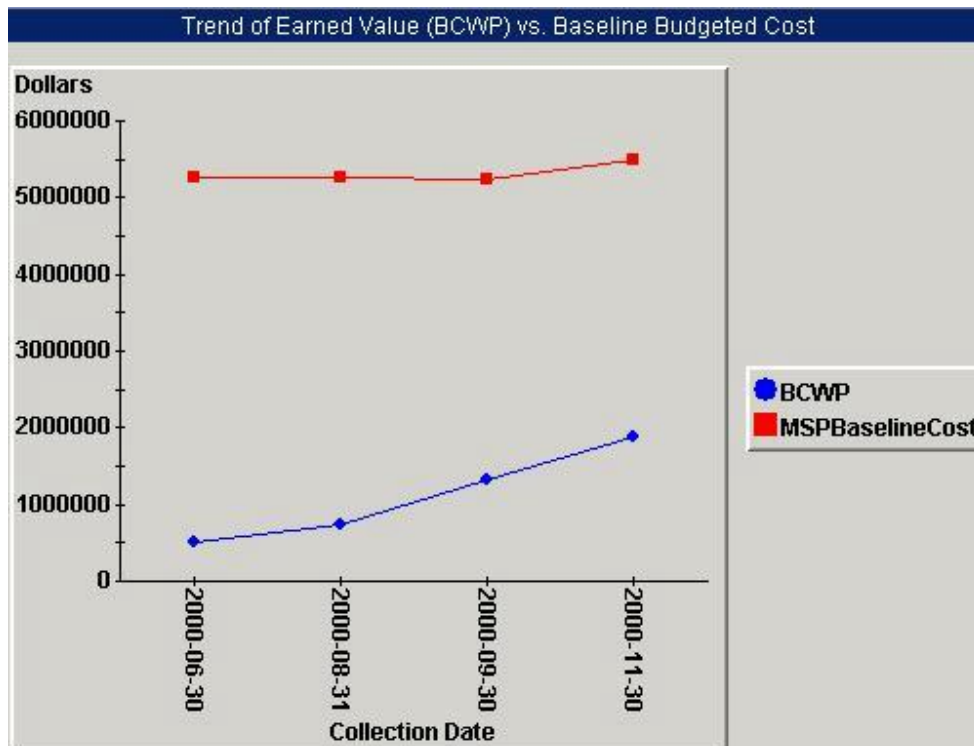
*Completed Milestones by Collection Date Trend Analysis Indicator*

This indicator shows a trend of the total number of Milestone Tasks (Number of Tasks) and Completed Number of Milestone Tasks (MSPTaskComplete) by Collection Date.   Of course, a steady increase in the Number of Milestone Tasks approaching the total Milestone Tasks indicates good progress.
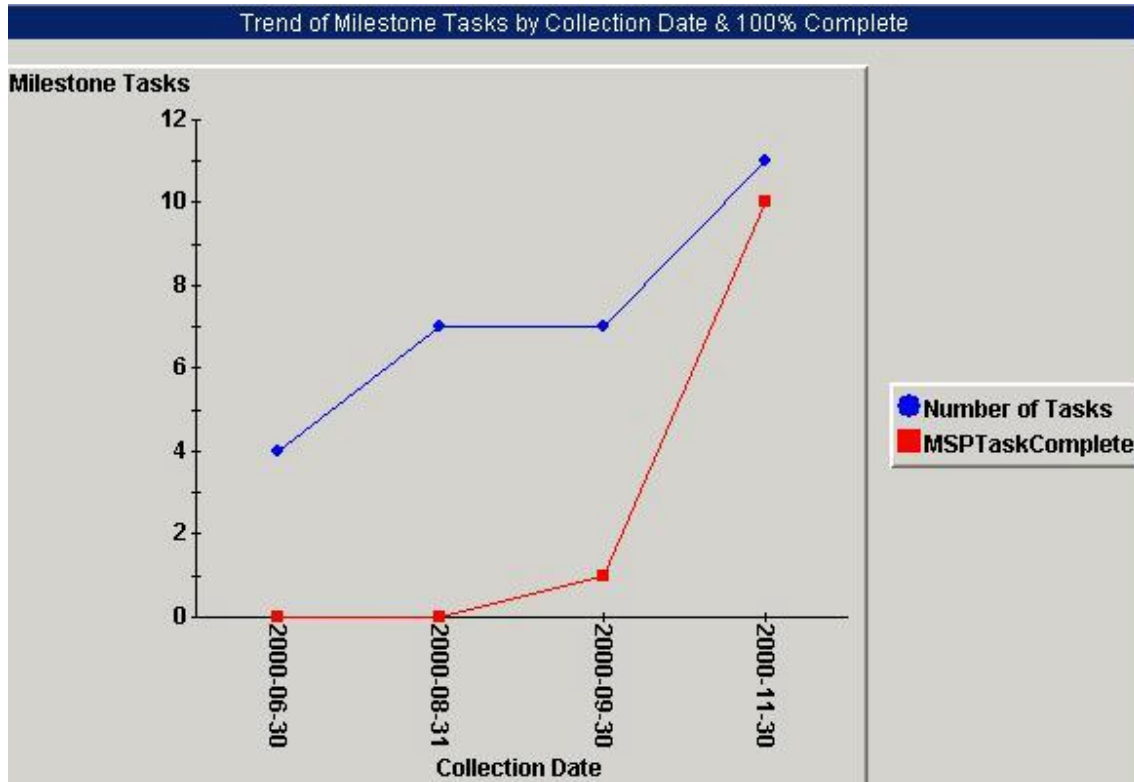
*Completed Milestones by Baseline Finish Date Trend Analysis Indicator*

This indicator shows the number of Total number of Milestone Tasks (Number of Tasks) and Completed Milestone Tasks (MSPTaskComplete) by Baseline Finish Date.  There is a subtle difference between this chart and the previous chart.  The subtlety is that this chart is based on the Baseline Finish Date and projects a trend out into the future, whereas the previous chart is based on Collection Date and shows a trend of historical data only.  Notice that in this chart, the number of completed Milestone Tasks drops to zero with the 11/6/2000 data point.  This trend is showing that all data points after 11/6 are in the future.
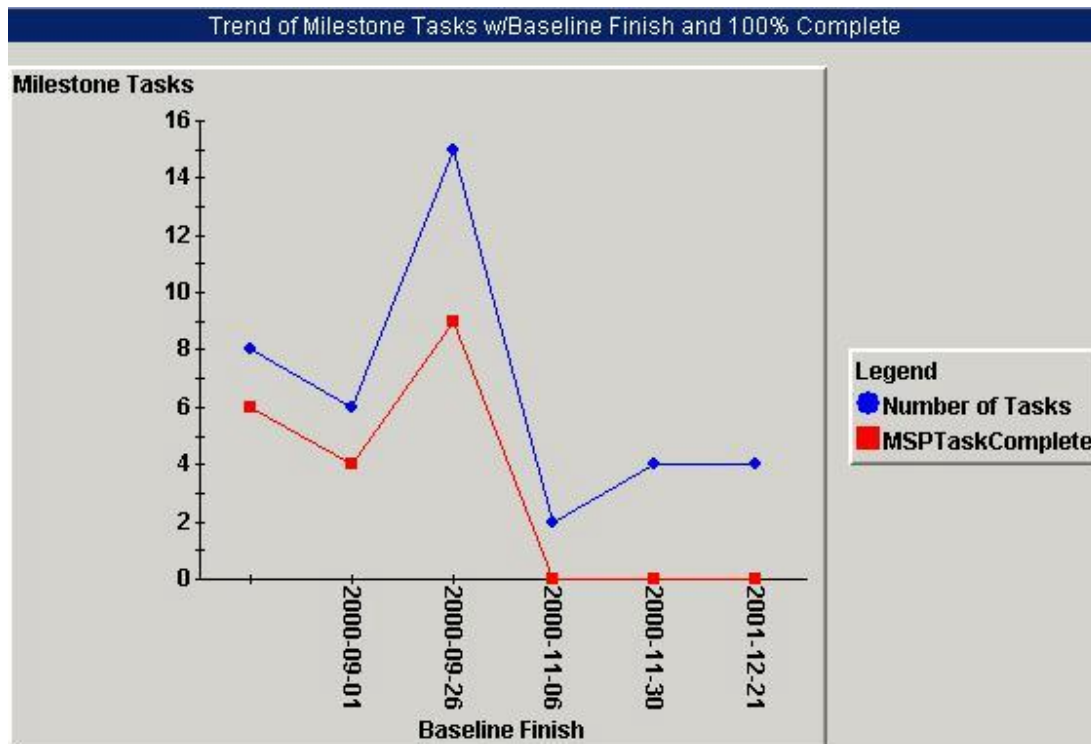
*Completed Milestone Tasks Trend Analysis Indicator*

This indicator shows the trend of Completed Milestone Tasks by Collection Date.  The example shown would indicate a problem (possibly rework is being introduced) since the number of completed tasks dropped.   Ideally, the number would increase over time.
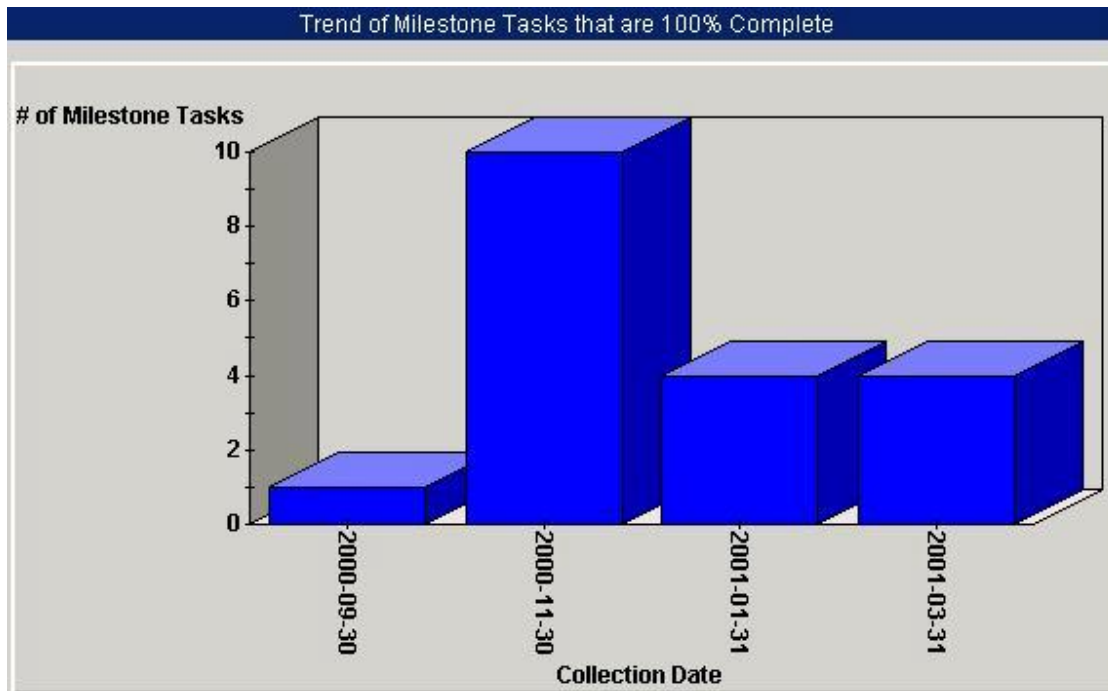
*Number of Tasks vs. Completed Tasks Trend Analysis Indicator*

This indicator shows the trend of the project Total Number of Tasks compared against the total number of Completed Tasks (MSPTaskComplete) by Collection Date.   Over time, the number of Competed Tasks should approach the Total Number of Tasks.
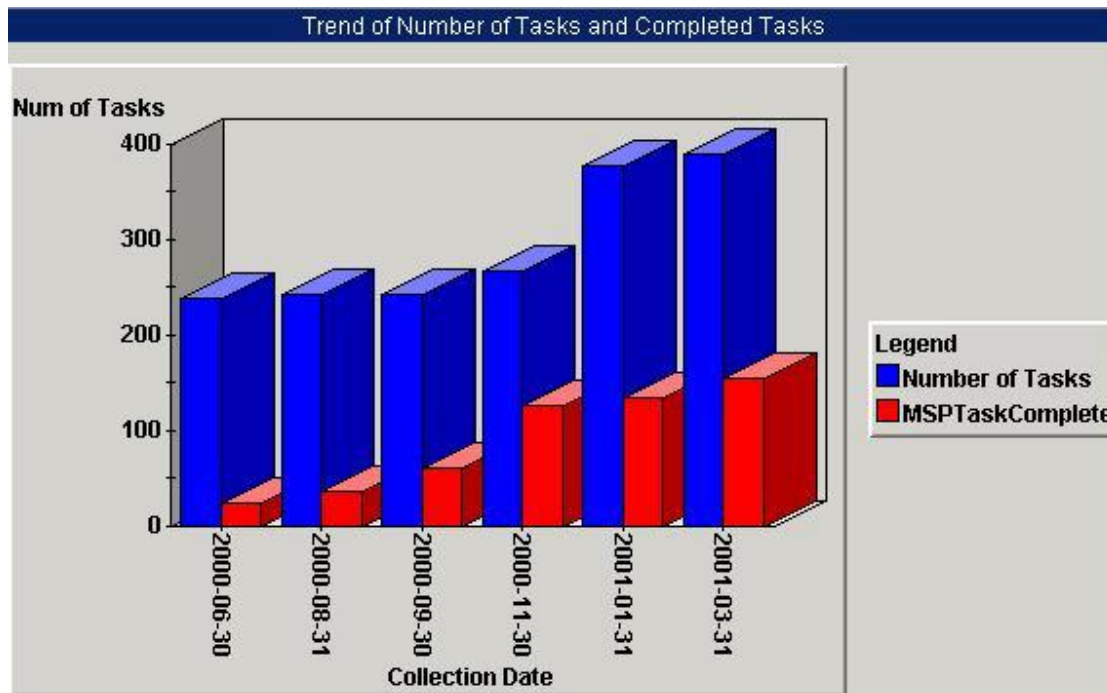
*Late Tasks Trend Analysis Indicator*

This indicator shows a trend of the number of Late Tasks by Collection Date.  A Late Task is defined as a
task in which the current Finish Date is beyond the originally planned Baseline Finish Date.
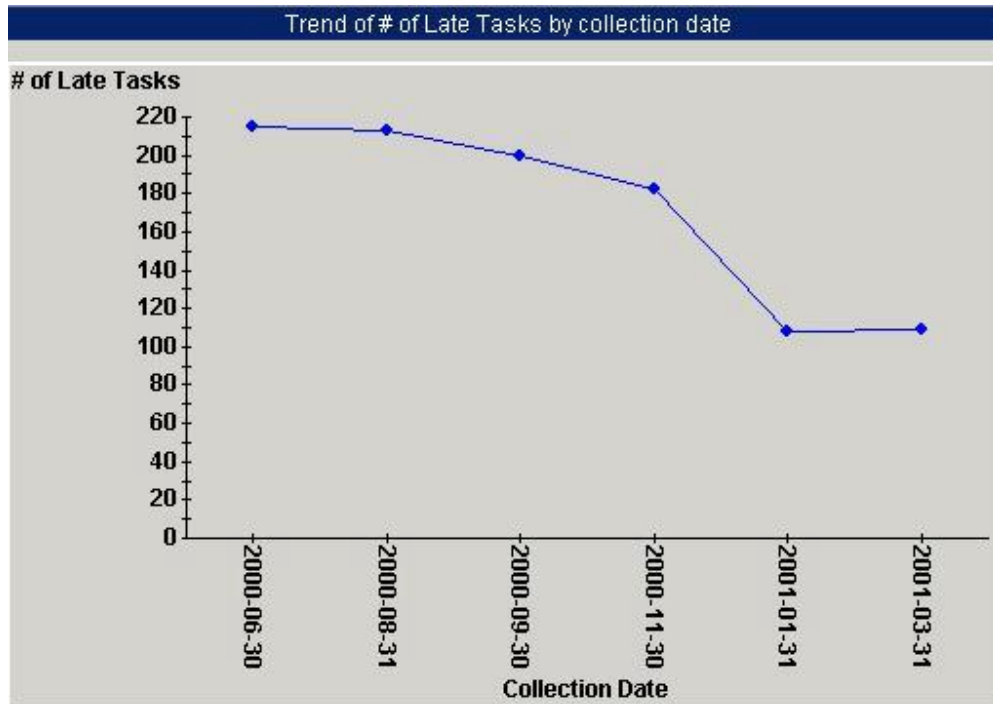
*Late Milestone Tasks Trend Analysis Indicator*

This indicator shows the trend of the number of Late Milestone Tasks by Collection Date.  A Late Milestone Task is defined as a Task that is identified as a Milestone Task where the current Finish Date is beyond the originally planned Baseline Finish Date.
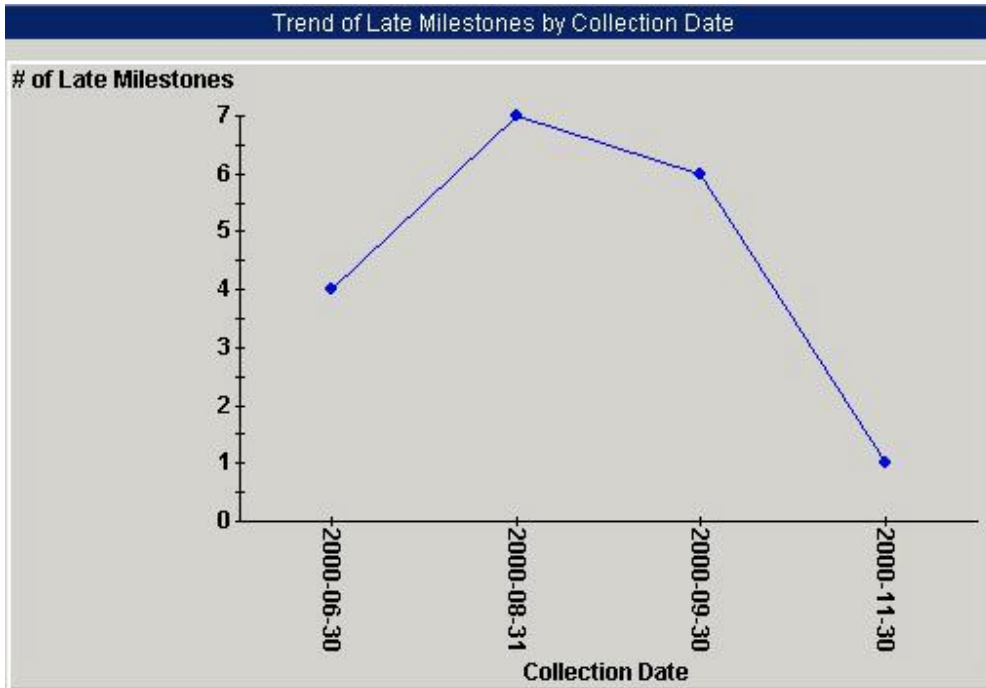
*Cost Performance Index (CPI) and Schedule Performance Index (SPI) Trend Analysis Indicators*

The chart indicator shows the trend of the CPI and SPI by Collection Date. The gauge indicators show a visual color status of CPI and SPI.

The CPI provides an indication of whether the project or activity is currently spending more than the budgeted cost or less than the budgeted cost. The value of CPI should stay close to 1. If the value falls below 1, then the project is spending more than what was budgeted. If the value is above 1, then the project is spending less than the amount budgeted. The measure can be shown in a trend chart to show progress as well as in a gauge to show the current value with respect to the index (1). The formula for calculating CPI is BCWP / ACWP.

The SPI provides an indication of whether the project or activity is currently ahead of schedule or behind schedule. The value of SPI should stay close to 1. If the value falls below 1, then the project or activity is behind schedule. If the value is above 1, then the project or activity is ahead of schedule. The measure can be shown in a trend chart to show progress as well as in a gauge to show the current value with respect to the index (1). The formula for calculating SPI is BCWP /BCWS.
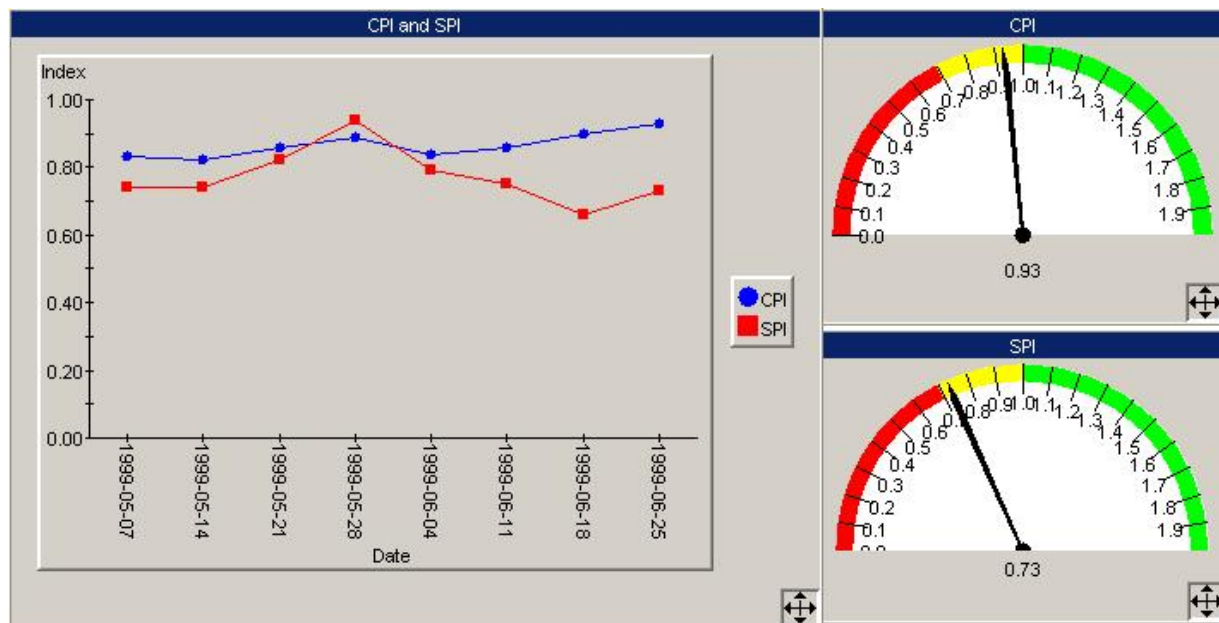
*Cost Variance (CV) Trend Analysis Indicator*

This indicator provides an indication of whether the value of work accomplished is either more or less than what was planned.  The value of CV should stay close to 0.  If the value falls below 0 (negative), you have spent more than you expected to get the work done – i.e., you have a cost overrun.  If the value is above 0 (positive), you have spent less than expected to get the work done – i.e., you are ahead of budget.  The formula for calculating CV is BCWP – ACWP.
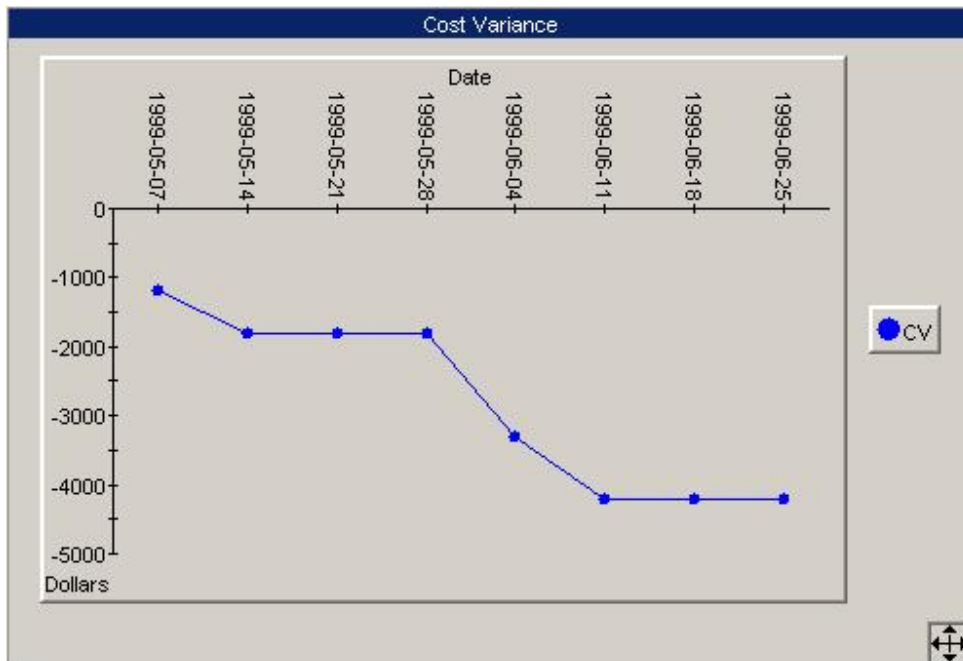
*Schedule Variance (SV) Trend Analysis Indicator*

This indicator provides an indication of whether the value of work accomplished is either more or less than what was planned.  The value of CV should stay close to 0.  If the value falls below 0 (negative), then the value of the work actually done is less than planned and you are behind schedule.  If the value is above 0 (positive), then the value of the work actually done is more than planned and you are ahead of schedule.

The formula for calculating SV is BCWP – BCWS.
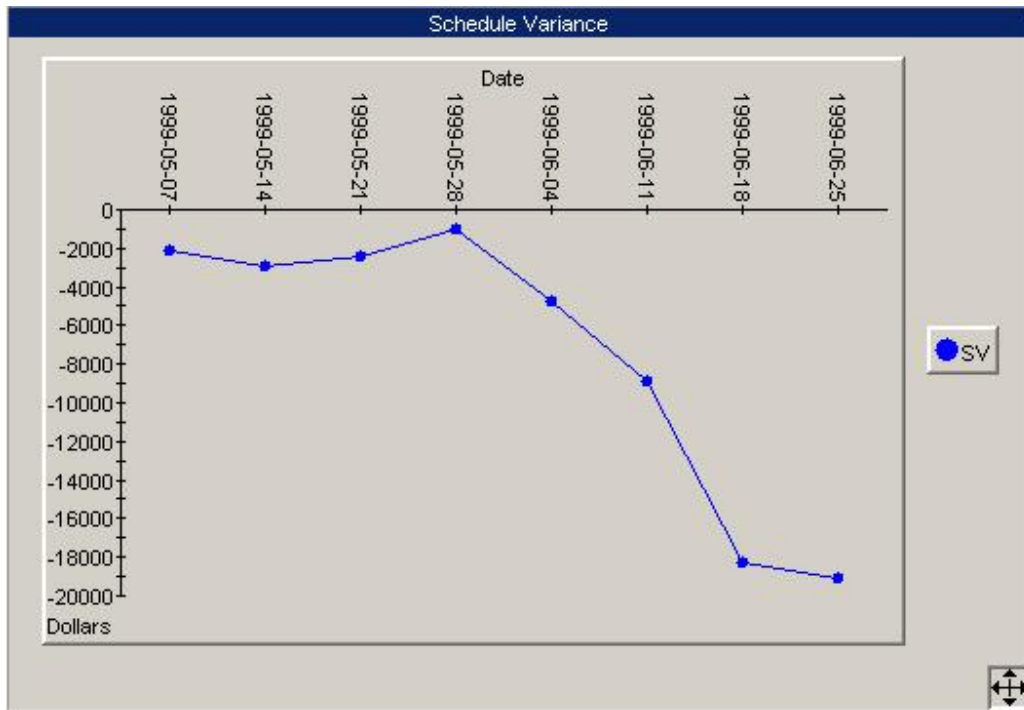
## *Summary*

This paper introduces key measures that can be used to measure the progress of a project using data from a Microsoft Project plan.

Project measurement examples shown within this paper were generated, initially from Microsoft Project, and subsequently using IBM Rational ProjectConsole, which is a member of the IBM Rational Team Unifying Platform.  IBM Rational ProjectConsole can gather information from any IBM Rational Suite tool, from Microsoft Project, and from other third-party tools via text collections (e.g., comma-separated-value files).  Therefore, to achieve the goal of having necessary information visible in ProjectConsole, the information must come from one of those sources.

IBM Rational ProjectConsole enables a software development team to automatically quantify the current project status and assess development trends of their project with up-to-date measures. On a specified scheduled or on-demand basis, measurement data is collected from the IBM Rational Suite's development environment, and from selected $3^{rd}$ party tools, and then stored in the measurement warehouse.  The resulting analysis is then visually presented in graphical charts, gauges, and stoplight indicators to indicate project status at a glance.

By viewing graphical indicators, team members can quickly understand the true status of the progress and quality of their project. ProjectConsole provides all members with the ability to analyze the individual discipline measures, low-level details, planned-versus-actual measures, historic data, trend charts or cross discipline measures to get a better view across the entire project. These capabilities enable the software development team to take prompt corrective actions, realize the cause for late deliverables, set realistic project expectations, forecast future project milestones, and ultimately, put the entire team in a better position to objectively and accurately measure project progress and quality.

## *About IBM Rational software*

IBM Rational software, formerly an independent company and now one of the IBM Software brands, offers a comprehensive software development solution.  The IBM Rational software platform combines software engineering best practices, market-leading tools, and expert professional services, all of which drive rapid and continuous improvement in software development capability for on demand businesses.

In addition, IBM Rational software offers more than 20 years experience in promoting and delivering integrated and open software systems, both of which are key characteristics of the on demand operating environment.

Integrated – IBM Rational software has contributed considerable thought leadership and expertise in the areas of Service Oriented Architecture (SOA), enterprise and software architecture, and heterogeneous platform support.

Open – IBM Rational software has a long history in developing and supporting the goals of open computing.  This includes development of the Unified Modeling Language (UML), now a standard for modeling applications, database designs, and business processes.  IBM Rational software has promoted and participated in the development of a wide variety of open computing standards.  It offers support for major programming languages and operating platforms, and it provides an extensive set of application programming interfaces for third-party tools interoperation.

Thousands of companies around the world have realized the benefits of the approach advocated by IBM Rational software.  Their processes are results-oriented; the artifacts they produce are well designed and reusable; and they are working at higher levels of capability now required by the on demand era.

## *References*

[1] – Royce, W., Software Project Management A Unified Framework, Addison Wesley, 1998

[2] – Chatfield, C. & Johnson, T., *Microsoft Project 2000 Step-by-Step*, Microsoft Press, 2000

[3] – IBM Rational ProjectConsole Software and User Documentation version 2003

[4] – Microsoft Project 2000, 2002 Software

IBM software integrated solutions

IBM Rational supports a wealth of other offerings from IBM software. IBM software solutions can give you the power to achieve your priority business and IT goals.

DB2® software helps you leverage information with solutions for data enablement, data management, and data distribution.

Lotus® software helps your staff be productive with solutions for authoring, managing, communicating, and sharing knowledge.

Tivoli® software helps you manage the technology that runs your e-business infrastructure.

WebSphere® software helps you extend your existing business-critical process to the Web.

Rational® software helps you improve your software development capability with tools, services, and best practices.

Rational software from IBM

Rational software from IBM helps organizations create business value by improving their software development capability. The Rational software development platform integrates software engineering best practices, tools, and services. With it, organizations thrive in an on demand world by being more responsive, resilient, and focused. Rational's standards-based, cross-platform solution helps software development teams create and extend business applications, embedded systems and software products. Ninety-eight of the Fortune 100 reply on Rational tools to build better software, faster. Additional information is available at **www.rational.com** and **www.therationaledge.com**, the monthly e-zine for the Rational community.