

Introduction

Dashboard reporting techniques are being publicized as a primary feature of today's project and portfolio management computer-based systems. These graphically based reports are targeted to high-level stakeholders as a means of providing a highly visible view of project and portfolio performance. Dashboard reporting, as part of a performance measurement and problem mitigation system, can be extremely valuable. I fear, however, that many dashboard systems are being used improperly.

What is an Acceptable Level of Project Failure?

During the five decades of modern project management, we have always sought ways to illustrate and communicate project status. At first, with the advent of critical path scheduling, it was the level of float or slack that served as a primary indication of status, with negative values alerting us to scheduling problems. However, float analysis usually did not give the whole picture. It focused on the critical path(s) and often failed to detect poor overall project performance.

In the area of cost performance, the accountants were measuring actual costs and comparing them to the budget (planned costs). We found this to be flawed, because these measurements did not consider how much actual progress was made on the project.

The emergence of Earned Value Analysis (EVA) methods helped to solve these deficiencies. While originally developed for large, government-funded projects, the essentials of EVA are now being applied to all types of projects, and most PM tools support the EVA process. Measurements of schedule and cost performance via EVA methods are the basis of many of the dashboard performance reporting systems now in vogue.

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Is there an Ideal Dashboard Mix of Red/Yellow/Green?

Recently, I received a question, by e-mail regarding the use of such dashboard data. The nature of the query led me to believe that there are widely held misconceptions about how best to use this performance measurement feature. The question was:

We have recently seen an up-tick in Yellow and Red projects among our portfolios. This has raised an interesting question. "Is there any research that would tell us what the ideal mix of Red/Yellow/Green is on a portfolio?"

In my view, there is no such thing as an ideal mix. It's like asking: "What level of failure is ideal." Is there a standard for levels of failure? This isn't a QA application. We're talking about project investments here. Failure of projects leads to failure of the enterprise. The ideal mix, if there was such a thing, is 100% green.

I'm trying to visualize a situation where certain amounts of yellow and red could be considered tolerable. Let's examine, for example, a portfolio of 20 projects where the dashboard showed five yellows and two reds. For this scenario, let's assume the projects were all of equal value, and yellow and red represented at least a 10 percent and 25 percent deficiency, respectively.

This tells us that 35 percent of the projects are in trouble. Now, if all the overruns are on the cost side, the data indicates that the entire portfolio is at least 5 percent, and possibly more than ten percent, over budget. So where does the extra money come from? And what else is suffering? Are delivery deadlines being missed? Are projects being delivered with less content or performance than specified? Is quality being compromised?

Are you a Spectator or a Player?

Looking at the colors of a dashboard chart as a scorecard accomplishes nothing. It's like being a spectator at a ballgame. You can't influence the outcome of the game unless you are on the field. You need to be a player. The yellow and red markers are a call to action.

The dashboard approach only works if it is tied to a structured action process. You have to do more than just count the red and yellow lights; you have to make them (the red ones, at least) go away.

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Three Suggestions for Working with a Dashboard System

Previously, I had the opportunity to design and implement a dashboard-type performance measurement system. The basic concepts, which incorporated a simplified EVA approach, are still perfectly suited for today's project and portfolio management models. Here are the three essential elements of such a system, aimed at making the data more meaningful and promoting improved performance:

1. Set meaningful thresholds for the yellow and red alarms
2. Establish standardized routines for reporting deficiencies and corrective action
3. Look at trends as well as current data

Setting Thresholds for Yellow and Red Lights

The first step is to define what the warning lights mean. This calls for setting a threshold that triggers the yellow or red alarm. You may want to experiment with this. I feel that different circumstances call for different trigger levels. For instance, a 20% deviation for an individual task may not be a call for major alarm. But a 20% variance for an entire project should certainly be addressed seriously. Likewise, negative performance variances early in a project may not be as serious as those that occur later, when there is less time available to correct the overruns. They act more like an early warning system than a cause for panic.

Set the thresholds so that the yellows and reds are meaningful, and the alarms trigger a corrective action response.

A Structured Response to Red and Yellow Lights

The next step is to make the warning lights meaningful by mandating the proper response. A **yellow light** means that something is outside of target performance. Depending on how you design the system, it may indicate a schedule delay, a cost overrun, a content or technical problem, or a combination of these. The light is just an alarm. It is worthless unless something is done about it. Here is a guide to a response system.

- Determine who should respond. This would usually be the individual who is responsible for the item being reported. The name of this individual will be noted with the item information. I'll use the general term 'Work Package Manager' (WPM) for this discussion.
- The WPM must fill out a "*Yellow Light Deficiency Form*," reporting the details of the deficiency. That is, what triggered the yellow light (schedule, cost, content/technical). The discussion would include:
 - What is the problem (what caused the deficiency)?
 - Is this a problem that was reported before? Is it better or worse?
 - Is corrective action required?

- What will happen if the problem is not corrected?
- What is the corrective action plan?
- What status is being forecasting for the next reporting period? What progress is expected?
- What is the expected impact at the end of the work?
- What other work is affected? Has this been communicated?
- The objective here is to make the yellow light go away and to communicate the situation to other stakeholders. Every yellow light should have a report. Reports go to project or unit managers (or others as appropriate).

A **red light** indicates a serious deficiency. If not corrected, it signifies a potential project failure. In this case, the reporting gets escalated to the next level.

- For the Red Light Deficiency, the project or unit manager (or equivalent) is responsible for evaluating the effect of the corrective action plan and for analysis of the forecast impacts.
 - What has been done and why isn't it working?
 - Is there some additional action that can be taken?
 - What is the effect on the project if actions are not successful?
 - Is delivery of project benefits at risk? In what way? To what degree?

Projects are investments that are intended to deliver specified benefits. A red light may indicate that one or more benefits are at risk. The Red Light Deficiency report needs to raise these issues and make recommendations. Should the scope of the project be changed? Is additional funding justified (if cost is the issue)? If delays are the issue, is the window of opportunity still open? If performance of the product is reduced, is the project still viable? Can the customer/sponsor still be satisfied?

Senior management must review these reports and consider whether the resources allocated to the failing project can be put to better use on something else.

Examining Trends

Earlier, I said that counting the lights is not what dashboard reporting is all about. However, counting lights to get a sense of trends can be of value. An increase in the number of yellow lights will usually indicate worsening conditions and will lead to more red lights. An increase in red lights will usually indicate that corrective actions are not working and that the project is in jeopardy of failure.

The project manager should periodically report on these trends, together with the red light reports.

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Level of Detail

Previously, I've avoided the issue of level of detail. But this is highly important and at the core of a practical EVA and Dashboard system. We noted at least three distinct areas for reporting project performance. These were: schedule, cost, and content.

The latter item covers such criteria as (1) Delivery of specified features and capabilities, (2) Performance issues, such as sheets per minute (for printers) or transactions per minute (for IT applications), or percent efficiency (for power plants), and (3) Quality.

For the first two areas (schedule and cost) it is essential that a measurement of what has been accomplished be calculated (we call it earned value). The Schedule yellow light will indicate when the actual accomplishment is not keeping up with the planned accomplishment. The Cost yellow light will indicate when the actual costs are running higher than the value of what has actually been accomplished. (This is an improvement over the older accounting practices of comparing actual costs-to-date to planned costs-to-date, which does not take actual accomplishment into account.)

The issue we deal with here is: "What level of detail is needed to assure an accurate measurement of earned value?" I would have little confidence in a report of percent complete at the project level unless it represents a roll-up of measurements taken at a lower level. A dashboard system that illustrates project health without being able to drill-down to the details is of little value. After all, how does anyone calculate percent complete for an entire project without looking at the individual tasks?

A pragmatic answer to the question of level of detail includes two parts – one addressing measurement of accomplishments, the other addressing measurement of costs.

Measuring Earned Value

The easiest way to measure earned value is to determine the completed percent of smaller elements of the plan, such as "tasks," and to roll the EV up based on percent completed multiplied by the task budget. Budget, by the way, can be in dollars, effort hours, or even a specified weight factor (in lieu of costs or hours). You will need to use a Work Breakdown Structure (WBS) approach to build a hierarchy, such as task, work package, deliverable, cost account, project, portfolio.

Each element in the WBS should have a defined responsible individual, who is required to determine status and report deficiencies.

Measuring Costs

While it is easier to calculate EV at the task level, collecting

cost (or actual hours) data at this level of detail is usually not practical. This is not necessarily a problem. Just identify a level of costs/hours data accumulation that is practical for you and make your cost variance computation against the roll-up of EV data at that level.

Obviously, a system such as this will provide schedule variance analysis at a lower level than cost variance analysis. But this approach is both practical and effective.

It is also reasonable to implement a partial EVA system, where costs/hours are not considered. In this case, the computation of earned value will still provide an indicator of the schedule health (earned value vs. planned value). An added benefit of maintaining a computation of project earned value is that it provides a basis for accurate progress billing, where applicable.

Summary

A practical and effective dashboard project health reporting system will be based on accurate computation of schedule (and cost) status, using basic Earned Value Analysis methods.

The usefulness of the dashboard system is not in the display of colored lights, but in the precipitation of action to correct the deficiencies indicated by yellow and red status markers.

The yellow and red conditions will trigger the preparation of standardized performance deviation reports, providing issue details, effect of continued deficiencies, and planned corrective action.

Postscript

I received an update from the author of the question noted at the beginning of this paper.

We were able to get people to understand that no project runs healthy all of the time and each will have occasional bumps causing yellow or red conditions. We were able to get people to understand that if we find the enterprise portfolio to be in a constant state of yellow / red then we have issues, which need to be addressed at the enterprise level. Issues such as too many projects, not enough resources, too much risk at one time need to be dealt with and corrected.

About the Author

Harvey A. Levine has been a project management specialist and consultant since 1962. In addition to contributing to PM journals and web sites, Levine provides applications, system design, and consulting services in project planning and control. He served as president and chairman of the board of directors of the Project Management Institute and is a PMI fellow.

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