



## White Paper 2014-13

### Understand Project Forecast Variances: Why it is Important Not to Confuse Actual Changes, Productivity Issues and Materialization of Risks

*We have found repeatedly in our consulting interventions that Project-driven organizations often confuse a number of causes for variances to the Project forecast. Astonishingly this happens even in established and recognized organizations. This results in misunderstandings as to the reasons for deviations of the project forecast outcome. As a result, corrective actions taken by Project Management can be significantly delayed and have a very poor effectiveness.*

#### Different causes of Project forecast variances

When executing a Project, a number of situations can lead to changes of the project outcome – either in terms of cost or schedule:

- Changes - to the project scope or even simply to the project execution plan, due either to internal choice or to external request,
- Materialization of (external) opportunities or risks,
- Variances that are not due to either changes or risks, and that are simply the result of differences with the expected productivity of resources, bid estimation errors, the result of mistakes or unexpected rework, external market conditions, duplicate ordering of material etc.

Many organizations unfortunately confuse the causes of forecast variance by allocating all variances to Changes. This results in great confusion and misunderstandings regarding the analysis of variances.

#### Consequences of allocating all variances to Changes

This practice often leads to inadequate variance recognition processes whereby the organization requires management to approve each variance as a change, resulting in delays in the recognition of forecast variances. These delays can sometimes be significant, in contradiction with the principle of immediacy (variances need to be recognized as soon as the project is aware of them, so as to found an effective project management decision making process – refer to our [White Paper 2014-04 Cost Control Golden Rules](#), rule #5). In some instances we have even observed that justification of variances was happening after the cost had been spent, creating a bureaucratic justification exercise of no added value. Additionally, allocating all variances to changes dilutes the Project team focus towards effectively managing such events and efficiently minimizing their impacts.

#### Forecast variances do occur irrespective of Changes or Risks

It is important to recognize that project forecast variances can happen irrespective of any change to project execution or materialization of any external risk. Production of engineering can require more or less resource implication than expected; the cost of supplies can change compared to the initial estimate; the productivity of construction activities can be different from the expected, commissioning can require more time due to unanticipated access and availability issues, inaccurate bid estimates, etc.

#### Management of Change and project forecast variance

As is well known in the field of Project Management, it is essential that Projects implement a proper Management of Change process. This is mandatory in particular, to avoid any scope creep and also, make sure that any Change is properly assessed and approved prior to its implementation.

The main characteristics of such processes thus include:

- Widest identification possible of all Changes (which requires to make it easy to raise a Change by any member of the project team),
- Thorough analysis of the consequences of a Change, prior to its implementation, including potential impacts on the project cost or schedule, as well as on safety, quality, interfaces with other entities, consequential impacts on project execution and the business as a whole, etc. This analysis must be done quickly and qualitatively, based on experience, due to the time constraints for decision-making and possibly, contractual time bars for raising Changes to the Client,
- Decision prior to its implementation on whether or not to implement a Change, based on the anticipated impacts and possible mitigation actions and other considerations (e.g. contractual), and inclusion of related variances (orders of magnitude) in the project forecast immediately after this decision.
- Monitoring actual impacts of Changes, and the overall benefits of the Management of Change process.

Overall, it is good practice to have a Management of Change process that leads to decision-making within 2 weeks of identifying a Change.

**Proper categorization of forecast variances and segregation of those due to Changes is essential to proper Project Management**

There is not necessarily a direct, one-to-one linkage between changes and forecast variances: changes can be identified and implemented without necessarily resulting in significant forecast variances. Still, once approved, variances due to Changes can be implemented immediately in the project forecast, and in any other business forecast in case of consequential impacts.

It is important to note that Management of Change needs to be an internal process, independent of whether Changes might be compensated by a Client or would need to be compensated to a supplier through a Change Order.

Some organizations only consider Changes if related to Change Orders, and this is a limitation that is not useful and causes delays in forecast variance recognition. The Management of Change must separately label Change Orders and other Changes, with well laid practices to manage both these cases. It is important to note that the Management of Change is not a substitution for Change Order registers.

Where most Project organizations fail in terms of Management of Change is also when Changes are approved late and retrospectively. This just means that the piloting systems that were used by the Project Manager in the meantime were skewed. This is not a good practice at all.

**Benefits of proper analysis of project variance types**

Proper analysis of the causes of forecast variances is essential to proper decision-taking, in particular because the control that the Project Manager had on different types of variance can vary very significantly:

- Some variances occur without the Project Manager being able to do anything or occur very remotely from Project Manager actions, such as typically, changes to the cost of commodities or material due to market changes, variances due to inaccurate bid estimates, inclusive unexpected changes to the cost of key resources used by the project; most variances due to the materialization of external opportunities and risks would also fall in this category,
- Other Variances should be fully in control of the Project Manager, i.e. they should not happen without prior identification and approval; these variances are typically caused by Changes,
- Finally, other variances occur due to some issues that can be influenced by the Project Manager, but that occur without an explicit prior decision; however, these need to be monitored so that action can be taken early enough to correct the situation – these are typically productivity issues and other issues such as rework, ordering of excess material, etc. These variances are identified through Earned Value Management and other comparisons of Actual cost spent against the initial budget for that stage of the project.

As such, proper early identification of forecast variances in the second and third category is an essential part of project piloting. Confusion of the above variances with Changes is conducive to poor effectiveness of project decision-making: productivity issues might then be identified too late if identified at all.

The only reliable way to identify those variances is to effectively subtract the effect of the other causes of variance. This reinforces the need to have a proper Management of Change process, as well as a proper analysis splitting between variances of quantities (man-hours, material quantities etc.) which are often very much in control of the Project and the variances of the associated rates, which are often much less in control of the Project.

**Segregating Changes and productivity issues: a simple practical example**

As an illustration, let us consider an engineering scope representing a budgeted 10,000 man-hours of work to produce a certain initial scope. After some time, a physical progress of 50% is achieved; however 6,000 man-hours have been spent

against an expected 5,000 man-hours. What can we conclude? A simple earned value calculation shows that we can expect a 20% excess man-hour consumption, with a final forecast of 12,000 man-hours.

Immature organizations will tend to put the additional work on the back of Changes, getting them approved after the fact with the purpose to find excuses, while the Project Manager should have reacted on the poor productivity of the engineering team, and done something about it before it is too late.

Let us now suppose that for some reason, an additional scope representing 20% of the initial scope has been added early in the project with a budget of 2,000 man-hours, but that it had not been added to the physical progress tracking because of some Change processing issues (e.g. it was not formally approved by the Client). If we now consider this change, and suppose that we have achieved 50% progress on the total scope, we can see now that productivity was in fact normal and that the project forecast is equal to the updated budget of 12,000 man-hours.

Hence, accounting or not properly for Changes (additional or removed scope), and the timeliness of the introduction of the Change consequences in the Project piloting systems will have a direct impact on how productivity will be estimated, leading to inadequate or too late actions from the Project Manager.

**Proper Management of Change process, with approval of Changes prior to their implementation, and subsequent update of project piloting systems, is essential to keep control and take actions in a timely manner**

**Conclusion**

An effective Management of Change practice covering all internal Changes irrespective of their contractual status is critical for project teams to early identify the relevant potential variance

enabling the teams to take proactive measures and efficiently manage the business.

Proper segregation of the causes of forecast variances is then essential to effective action-taking. Confusing all variances with Changes is deeply misleading and adds other issues in particular, frequent lag in the recognition of actual variances, or inability to fully apprehend productivity issues at a time where something can still be done about them.



**Find all these principles of Project Cost Control exposed in a comprehensive manner in our Handbook (2<sup>nd</sup> edition), [Practical Project Cost Control for Project Managers](#)**

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