
Earned value management in project and programme management

*Management de la valeur acquise en management de projet et de
programme*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html. (standards.iteh.ai)

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Introduction

The purpose of this document is to provide guidance to those individuals involved in earned value management. It describes practices to provide benefits for project or programme planning and control.

This document provides guidance on concepts, responsibilities, integration and processes for the implementation of earned value management.

It provides information on performance metrics captured by an earned value management system.

It complements ISO 21500 and ISO 21503.

The target audience of this document includes, but is not limited to, the following:

- a) executive managers and those individuals involved in sponsoring projects or programmes;
- b) individuals managing projects, programmes or earned value management systems;
- c) individuals involved in the management of or performance of project management offices or project or programme control staff;
- d) developers of national or organizational standards.

The application of this document may be tailored to meet the needs of any organization or individual, so they may better apply the concepts and practice of earned value management.

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Earned value management in project and programme management

1 Scope

This document provides guidance for practices of earned value management in project and programme management. It is applicable to any type of organization including public or private and any size or sector, as well as any type of project or programme in terms of complexity, size or duration.

This document provides the following:

- a) terms and definitions;
- b) descriptions of the purpose and benefits of earned value management;
- c) the integration and relationship with project or programme management;
- d) an overview of the processes and process descriptions;
- e) basic requirements for an earned value management system;
- f) use of an earned value management system.

It does not provide guidance on the use of specific processes, methods or tools in the practice of earned value management.

[Annexes A, B and C](#) describe cost, schedule and performance analysis, commonly used formulae with associated interpretations, and the integration of earned value with other project or programme management processes.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1.1 activity

identified piece of work that is required to be undertaken to complete a project or programme

Note 1 to entry: It may also be considered a work element.

3.1.2

actual cost

cost incurred for work performed

Note 1 to entry: Actual cost is also known as “actual cost of work performed”.

3.1.3

budget at completion

total forecasted cost for accomplishing the work related to a *work package* (3.1.19), *activity* (3.1.1) or *control account* (3.1.4)

3.1.4

control account

management control point where scope, budget, *actual cost* (3.1.2) and schedule of a project or programme, *work package* (3.1.19) or *activity* (3.1.1) are integrated

3.1.5

earned value

value of completed work expressed in terms of the budget assigned to that work

Note 1 to entry: Earned value is also known as budgeted cost of work performed.

3.1.6

earned value management

method that integrates project or programme scope, actual cost, budget, and schedule for assessment of progress and performance

3.1.7

estimate at completion

forecasted total cost to accomplish the work on project, programme, *work package* (3.1.19) or *activity* (3.1.1)

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3.1.8

estimate to complete

forecasted cost of the work remaining of a project, programme, *work package* (3.1.19) or *activity* (3.1.1)

3.1.9

integrated baseline review

assessment to establish a common understanding of the *performance measurement baseline* (3.1.13) for verification of the technical content of the project or programme

3.1.10

management reserve

amount of budget external to the *performance measurement baseline* (3.1.13), withheld for management control in response to unforeseen events or activities that are a part of the scope

3.1.11

network schedule

graphical representation indicating the logic sequencing and interdependencies of the work elements of a project or programme

Note 1 to entry: Network schedule is also known as a “network schedule diagram”, “logic diagram” or “network logic diagram”.

3.1.12

performance measurement

quantitative units of measure that are placed to track progress

3.1.13

performance measurement baseline

total time-phased scope of work and budget plan against which project or programme performance is measured, not including *management reserve* (3.1.10)

3.1.14**planned value**

time-phased budget ([3.1.16](#)) authorized for the work scheduled

Note 1 to entry: Planned value is also known as budgeted cost of work scheduled.

3.1.15**technical performance**

measure of the results of functionalities or capabilities achieved for the project or programme during implementation

Note 1 to entry: It may be incremental.

3.1.16**time-phased budget**

allocation of the cost to accomplish the work over established periods of time or phases

3.1.17**undistributed budget**

cost for authorized work that has not been distributed to a *control account* ([3.1.4](#))

3.1.18**work breakdown structure**

decomposition of the defined scope of the project or programme into progressively lower levels consisting of elements of work

3.1.19**work package**

one or more groups of related activities that are within the *control account* ([3.1.4](#))

3.2 Abbreviated terms

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The following abbreviated terms are used in this document:

AC	actual cost
BAC	budget at completion
EAC	estimate at completion
ETC	estimate to complete
EV	earned value
EVM	earned value management
IBR	integrated baseline review
MR	management reserve
PMB	performance measurement baseline
PV	planned value
UB	undistributed budget
VAC	variance at completion

4 Overview of earned value management

4.1 Earned value management

Earned value management is a structured method used to provide a performance measurement system for review of past and forecasted performance of a project or programme.

Earned value management is a method of performance management. Performance management should provide for the planning, implementing and controlling of the performance of a project or programme in accomplishing the scope of work of the project or programme.

4.2 Purpose and benefits of earned value management

The purpose of earned value management is control and analysis of the project or programme. Earned value management facilitates analysis and decision-making for, but not limited to budget, schedule, human resources and materials.

The earned value management system may include communication of the status from metrics established for the project or programme, improvements, corrective action development, and a common framework and vocabulary.

An earned management system is a set of procedures, tools and methods for establishing and maintaining project or programme control.

The application of earned value management should result in three overall benefits:

- a) developing objective measurement techniques;
- b) availability of data for project or programme management decisions;
- c) providing a system to monitor the project or programme.

Specific benefits may include, but are not limited to, the following:

- forecasting of future performance and estimate at completion based on past performance;
- objective metrics for comparison of project or programme performance across an organization and between or among organizations;
- development of budgets and baselines;
- compilation of estimates;
- objective measurement of completion of work packages that is done in a consistent manner;
- comparison of work performed against actual performance and budget;
- highlighting of inconsistencies in the measures in earned value reports;
- consistency of the reporting and performance measurement framework by regular earned value reporting.

4.3 Guidelines for an earned value management system

An earned value management system should provide for consistent performance metrics. To achieve a consistent view of performance metrics, the system should integrate the baselines established for the project or programme including the scope of work that should be defined through the work breakdown structure, and performance measurement baseline. The system should also allow for formal, controlled incorporation of changes in baselines, authorized users and procedures.

To implement an earned value management system, the project or programme control metrics and processes should be documented and understood in the organization or organizations doing the work. The system should be established to allow systematic review of the data, common assessment methodologies, targeted levels of performance, and an assessment feedback process. The system may be able to be tailored to accommodate different project or programme subject area integration, more than one organization reporting, and other tailoring as deemed necessary to control the project or programme or provide an integrated programme view.

The core data contained in an earned value management system should be the earned value, actual cost, the planned value, estimate to complete, and budget at completion. The earned value management system should be able to show the planned status, as well as the actual status of the project or programme.

To implement an earned value management system, the system requires a common agreement on the assignment of “value” and “performance”, which may be tailored for projects or programmes based on organizational considerations.

The review of metrics of performance should be accomplished on a regular, scheduled basis to allow for comparison and analysis of performance.

An earned value management system should be able to do the following:

- a) determine what work is to be accomplished, by whom and when;
- b) establish resource requirements;
- c) measure work achievement and record associated costs;
- d) report deviations from the plan for which metrics have been established;
- e) forecast the completion date and cost;
- f) plan and implement corrective and preventive action plans;
- g) authorize scope changes; any approved changes to the prior approved baselines contained in the earned value management system should be controlled, traceable and documented.

4.4 Earned value management planning

Earned value management planning should enable:

- establishing project or programme objectives, as well as the integrated view of the planning of the overall projects or programmes,
- monitoring of project or programme progress to measure deviations from the plan, and
- planning by the users of the performance management system for project or programme, objective assessment of progress and use of resources.

4.5 Using earned value measurements and performance metrics

Earned value measurements should be used to determine performance metrics to assess the status of a project or programme at a selected point in time. These metrics should enable informed decisions about the management of the project or programme. The metrics derived may be used to compare actual project or programme cost and schedule performance with the performance measurement baseline. The performance measurement baseline should be used to establish variance thresholds for cost and schedule that when exceeded identify significant variances for further analysis and management attention.

The information acquired by using the earned value performance measurements should be used to determine:

- progress of a project or programme,
- progress towards work accomplished,
- completion of the deliverables, and
- progress towards delivery of a project or programme.

These measurements, combined with the agreed upon variance threshold, should be used to determine the cost and schedule variances, and cost and schedule performance indices.

The information should also be used to forecast future performance of the project or programme. The data to establish a project or programme performance forecast, based on historical performance, should include, but are not limited to, the following:

- a) estimate to complete;
- b) estimate at completion;
- c) variance at completion;
- d) to complete performance index.

The information gathered in calculating these values should be captured in an earned value management report.

NOTE See [Annex B](#) for the parallel application of earned schedule.

5 Earned value management process steps

5.1 General

The earned value management process steps are shown in [Figure 1](#).

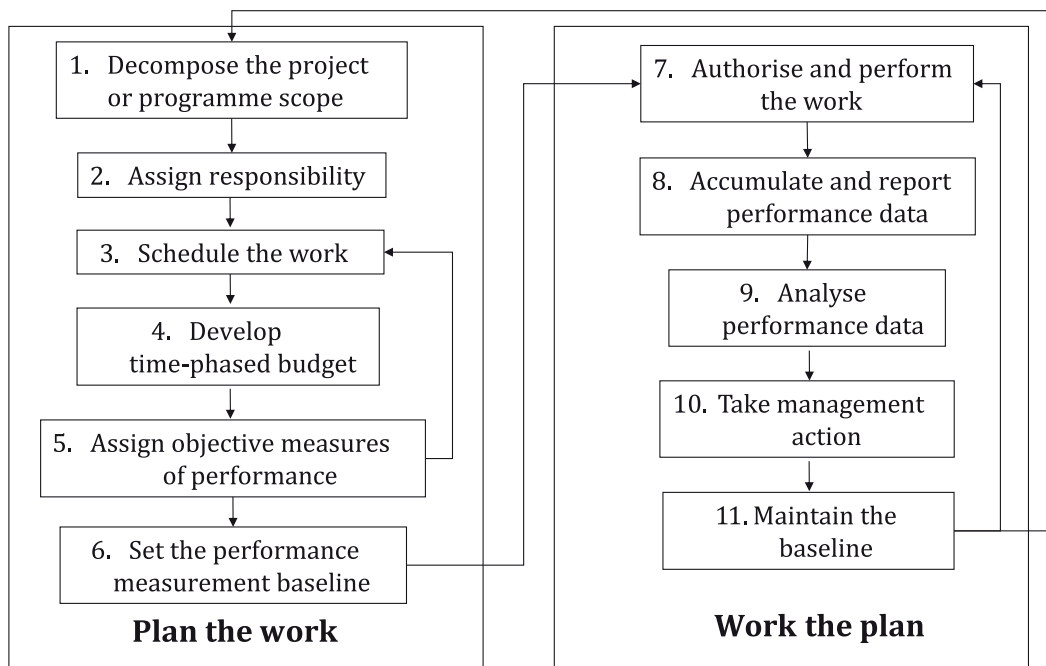


Figure 1 — Earned value management process steps