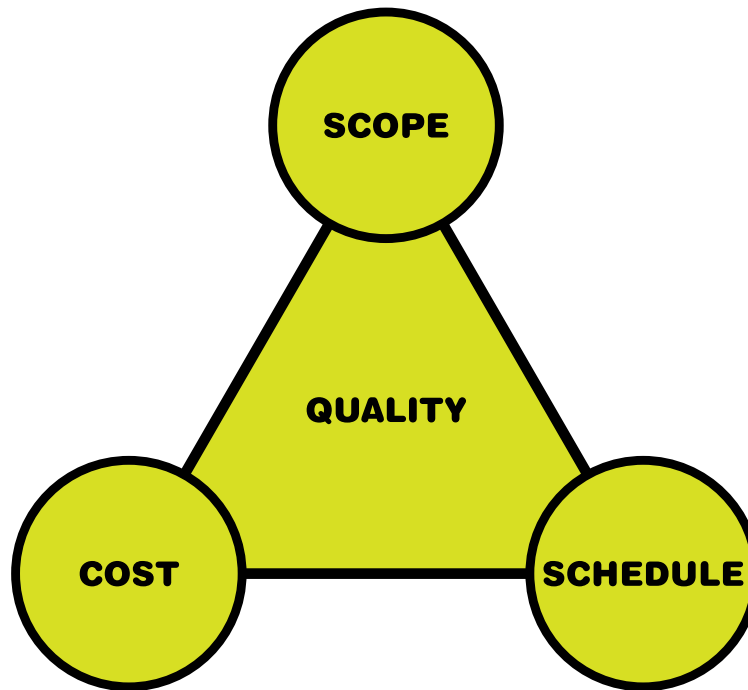




## The Golden Triangle of Project Management Constraints



The golden triangle of project management is a visual model of the constraints that project managers face. It's presented as a triangle to demonstrate the opposition between the project elements. Similarly, one side of the triangle cannot be changed without altering the others—each of these constraints competes with the others.

For example, if the scope of a project is increased, that often means that the time needed to complete it will increase, along with associated costs.

### **Time/Schedule**

A common technique for determining the amount of time needed to complete a project is the creation of a work breakdown structure (WBS). A WBS estimates the time needed to complete tasks and shows which tasks have priority, as well as which tasks are constrained by dependency.

A task that is dependency constrained cannot be started without a prerequisite task being completed first. Tasks with dependency constraints are an unfortunate reality of time estimation planning; failure to account for dependency constraint lead time can result in inaccurate time estimates.

Other constraints that must be kept in mind when developing accurate time estimates are tasks that are constrained by their resource needs. The availability of the requisite resources—whether material, human, or financial—will impact task completion and therefore time needed

to complete. This is yet another example of how the constraints of the golden triangle are linked to one another and in opposition.

## **Cost**

The cost of a project includes the consumption of more resources than just financial capital (though financial implications are a huge part of a project's cost). Aspects such as worker skill and productivity must be taken into account. The availability, storage, and transport of materials are also tied to financial concepts but can potentially have a disruptive effect greater than their financial cost if mishandled or incorrectly estimated.

Today's project managers benefit from advanced software that crunches the numbers and forecasts cost fluctuations. As the golden triangle outlines, cost is tied to time and scope, often in opposition. Want a project completed faster? Less time invariably means more cost. Want to expand the scope of the project by setting new goals? That's going to increase the cost (as well as the time needed to complete the project).

The inverse can be true as well. A decrease in the scope of a project can reduce cost. Extending the timeline also can have cost-reduction benefits.

## **Scope**

The scope of a project is the project's goal. What is this undertaking aiming to achieve? Ideally, this outcome is delivered on time and under budget (without exceeding the estimated time or cost).

A major component of a project's scope is the quality of the final product. A project's scope can be thought of as a specification, meaning that a high-quality final product is a project that is delivered on time, on spec, and on budget.

It is for this reason that quality is placed in the middle of the golden triangle. Each of the competing constraints of cost, schedule, and scope are contributory to the quality of the final product. Distortion of one of the constraints—exceeding cost, for example—would take each of the constraints out of balance, therefore changing the shape of the triangle. In real world terms, this would be an issue with the quality of the project's final deliverable.