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Preventing Scope Creep

Insights into improving Requirements Gathering and Managing Change within your organization

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Introduction

Whenever I teach IT Project Management, I usually start by querying the participants as to what they consider to be their major project challenges. Invariably, the topic of Scope Creep emerges and finds universal agreement throughout the audience.[1]

Indeed, most IT Professionals will agree that changes to Requirements throughout the Project Lifecycle present a major threat to the success of their projects.

In this paper, we will discuss the root causes and consequences of Scope Creep, as well as elaborate specific means that can be imposed to eliminate it.

What is Scope Creep ?

Most discussions of Project Management as a discipline introduce the "Triple Constraints Model" to explain the critical factors and their interdependence.[2] This model is typically presented as a triangle of to illustrate the relevant factors involved in managing any project:

- Scope: The totality of work to be completed to achieve the Project Objectives.
- Resources: The people, hardware, software, funds, etc. that will be utilized to achieve the Project Objectives.
- Time: The calendar time required to achieve the Project Objectives.
- Quality: Not a constraint per se, but often a by-product of the other three factors, and one that generally suffers when the others are not properly managed.

The Triple Constraints are often depicted as a triangle to illustrate the fact that changes to any one factor impacts the others.

[1] This is not to say that this is the only challenge voiced, nor does it imply unanimous agreement with regard to priority. It is simply a challenge that most participants agree they face in their project work.

[2] PMBOK, see Bibliography and Additional Reading section of this document.

For example, one would expect that adding Resources to a project would allow it to be completed in less Time and/or permit additional work to be completed. Alternatively, adding Scope (i.e. more work to do) would generally require more Time and/or additional Resources to complete that additional work.

One useful definition of Scope Creep is the situation that occurs *when the Scope grows during the course of the project, but neither the Time nor Resources are modified in consequence*. This is said to result in an "unbalanced" triangle, and a project that is at risk for failure. The situation is compounded by the fact that Scope Creep is cumulative, with additional changes putting the project at increased risk of failure.

Scope growth usually manifests itself in the form of "Changes" to Requirements throughout the duration of the project. To fully understand and prevent Scope Creep, we will need to investigate the source and nature of changes to our projects.

What Causes Scope Creep ?

Given our earlier definition of Scope Creep:

"…when the Scope grows during the course of the project, but neither the Time nor Resources are modified in consequence"

We would reasonably ask: How can this occur ?

More often than not, the ugly truth about Scope Creep is that we allow it to happen ourselves. Despite the rigor with which we may (or may not) develop the Project Charter and Requirements, we slowly allow them to diverge from the plans we have created-- one incremental change at a time.

To prevent Scope Creep, we need to examine the underlying sources of change, consider what can be done to minimize change, and understand how to properly handle changes that do occur.

Sources of Change

One of the complexities that make dealing with Scope Creep difficult is that change originates at different times throughout the Project Lifecycle. This in fact is one of the reasons that Scope Creep is such a challenging problem—there is no simple solution. Take note of the purpose of each of the following project activities and how each can be handled to minimize subsequent change.

Project Charter
The initiation of every project provides an opportunity to clarify the motivation, objectives, and success criteria for the effort being undertaken.[3] Minimally, this early stage[4] of the project should produce a clear statement of:

[3] Affinity IT, LLC leads Project Charter Workshops for our clients. Call us to discuss how we can assist your organization in this fundamental and critical activity.

- The Business Need motivating the project: This describes the underlying economic motivation for completing the project from the sponsor's point of view. Note that this is the "real" problem to be solved from the sponsor's point of view, and is often arrived at through a "chain of whys".[5]
- The Project Objectives: What the Project will do to address the Business Need(s).
- Scope: A description of the part of the problem that the Project is committed to addressing.
- The Stakeholders involved in the project: This identifies and characterizes all individuals and constituencies that might conceivably be impacted by the project, or that might influence it. In particular, it details the Roles and Responsibilities of key stakeholders associated with the project.
- The Project Success Factors: This identifies and characterizes the factors that will be examined throughout and following the conclusion of the project to demonstrate that the Business Need underlying the project has been positively impacted.
- A Gross Estimate: The anticipated time (and potentially budget) to be required to complete the Project. This is strictly for High Level Planning and will be refined later in the Project Lifecycle.
- Perceived Risk: A short statement addressing the overall likelihood of success, and a summary of critical risks that are recognized at the time.
- Constraints: A summary of constraints that are recognized at the time.

Ideally, a well-managed Project will not proceed until a Project Charter has been agreed upon by all key stakeholders. On the other hand, failure to understand, document, and agree upon the fundamentals will manifest itself negatively later in the form of:

- A prolonged and difficult Requirements Analysis process
- Thrashing of Project Objectives
- Numerous changes to Requirements due to confusion about Scope, Business Need, and Project Objectives

In summary, an abbreviated or non-existent effort to discover and document fundamental project information early in the project will result in an increased rate of change later in the project.

Requirements

In IT Projects, Requirements are a detailed description of what must be done to satisfy the expectations of the users or otherwise solve the problem at hand.[6] A "Statement of Requirements" is a set of one or more documents that collectively describe:

- What the solution system must do

[4] RUP, see Bibliography and Additional Reading section of this document.

[5] An exercise in which we repeatedly inquire as to why the business cares about the project until we arrive at an economic motivation such as raising revenue, decreasing costs, etc.

[6] This is not to be confused with the "Project Objectives" found within the Project Charter, which is a short summary statement of what will be done within the project to address the Business Need.

- How it must perform

- What constraints must be satisfied
- It's outward appearance
- How the solution will be utilized

Thus, a key step in every IT Project is the research, documentation, and verification of the solution system requirements.[7] Although a full discussion of Requirements Analysis is beyond the scope of this paper, suffice it to say that this task requires extensive experience and relevant domain knowledge in order to successfully capture and document the critical information needed to develop the solution. Another critical step along the way is the approval of the Requirements by key stakeholders. To summarize, Requirements Analysis refers to the following activities:

- Requirements Gathering: Achieving a sufficient understanding of what the system must do that reflects the consensus view of key stakeholders.
- Requirements Documentation: The capture of Requirements in one or more documents for posterity, verification, and knowledge transfer to the solution developers.
- Requirements Verification: The validation process by which the Requirements are shown to be an full, accurate, and consensus view of the solution system by key stakeholders.

Once approved[8], Requirements can subsequently change for numerous reasons, some of which can be influenced by the manner in which the project is conducted, and others that are beyond anyone's control. A potential (but far from exhaustive) list of reasons why a Project's Requirements can change includes:

- The Requirements were not completely, accurately, or clearly defined to begin with[9]
- Certain Requirements that were elaborated and discussed failed to be accurately documented or sufficiently validated with the stakeholder community[10]
- The Scope of the Project was not well understood or agreed to by Key Stakeholders
- New Key Stakeholders are discovered subsequent to Requirements Definition and their perspectives are not reflected in the current "Statement of Requirements"
- The business environment changes, rendering requirements incomplete or inaccurate
- Organizational Change occurs, rendering requirements incomplete or inaccurate

An in-depth discussion of the underlying causes for the above are beyond the scope of this document, but certainly include:

- Failure to allot sufficient time for task of Requirements Analysis

[7] REQS, see Bibliography and Additional Reading section of this document.
[8] Requirements Analysis should not be considered complete until "signed" by designated stakeholders.
[9] This is actually 3 reasons…
[10] This is actually 2 reasons…

- Lack of expertise and/or experience on the part of the analysts and/or other participants in the Requirements Analysis process
- Lack of diligent or effective Project Management discipline

In summary, Requirements Analysis represents the greatest opportunity and threat with regard to Scope Creep. Diligence in this activity will minimize subsequent change, while a rushed effort is certain to generate a flood of subsequent changes. In other words, these sources can be positively impacted by the application of disciplined methodology.[11]

Time

Time plays a role in the emergence of change. That is, the longer a Project's duration, the more likely it becomes that changes will emerge. This is one of the reasons why it is often advantageous and advisable to split a large project up into smaller pieces whenever possible.

Other Factors

Other potential change sources exist, including:

- Statutory/regulatory change
- Organizational change
- Technological change

Note of these latter sources of change cannot be influenced by disciplined methodology.

Change as Inevitable

Our discussion thus far should lead us to two conclusions:

- That the application of strong Project Management discipline can and will reduce the number of changes introduced during the Project Lifecycle
- *That change should be perceived as inevitable*. Certain factors are beyond the project's control. Change should be perceived as an irresistible force such as gravity that every project must be prepared to deal with.

Acknowledging these realities is an important step in preventing Scope Creep.

Minimizing Change

While it may not be possible to prevent change from occurring, it is possible to minimize the number of changes that must be accommodated during the Project Lifecycle.

One technique for minimizing Change is to make sure that all key stakeholders are known and agree to the fundamentals drivers of the Project as documented in the Project Charter. Failure to have a Project Charter, and/or failure to achieve universal agreement is certain to generate change later in the Project.

[11] UCS, see Bibliography and Additional Reading section of this document.

In addition, we have seen that the diligent Gathering, Documentation, and Verification of Requirements will lead to less change later in the Project. Conversely, a lack of diligence in Requirements Gathering, Documentation, and Verification is sure to spawn a flood of subsequent change.

In other words, the quality and thoroughness with which the "Project Charter" and "Statement of Requirements" are developed correlate strongly with the number of subsequent changes emerging later in the project.

Thus, it is therefore particularly important that adequate time be allotted during Project Planning to insure thorough and diligent Project Charter and Requirements Analysis activities. Furthermore, the durations allocated for each should reflect the experience and expertise of the participants; providing sufficient time for learning as circumstances dictate.

Managing Change

Sometimes, project participants are surprised to learn that the goal of Project Management is not to eliminate change, but rather to manage it in a way that allows the Project Manager to:

- Retain control of the Project
- Maintain credible plans for the remaining work
- Lead to a successful conclusion to the project

Imposing an effective means to achieve the above goals requires us first to understand some of the problems inherent in designing a change management process. To that end, let's make explicit some of the realities of the Project Lifecycle.

In the following discussion, we will refer to changes that originate within the stakeholder community as "Change Requests", so as to distinguish them from other types of change that may be encountered.

Declining Flexibility

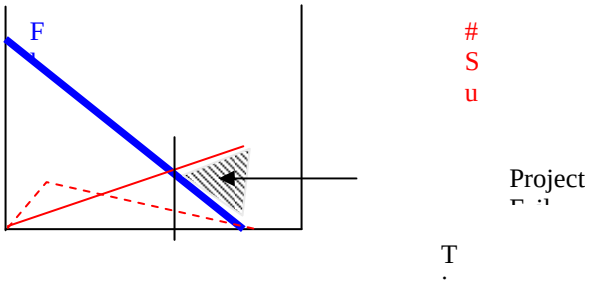
As we progress through the Project Lifecycle, the ability of solution developers to accommodate change declines. Indeed, there will come a point at which the acceptance of "one more change" will jeopardize the successful delivery of the entire effort. Note that this is true for all projects, regardless of their diligence in developing the Project Charter and Requirements Analysis.

We might illustrate the situation with the following graph[12] in which the thick blue line represents the declining ability of the solution developers to embrace change; while the two versions of the red line (SA and SB)

[12] Purely illustrative. Graph depicts the relative relationships between time, flexibility, and potential change-rate scenarios.

represent alternative scenarios regarding the rate of incoming Change Requests. Time proceeds from left to right.

Figure 1:
Time/Flexibility Curve



Scenario A (depicted by line SA) illustrates a situation in which Change Requests increase throughout the project. The area below line SA but above the blue line (to the right of t1) represents a failed Project – one that has been overwhelmed by Change Requests.

Scenario B depicts a much healthier situation in which Change Requests decrease throughout the project, and never exceed the abilities of the solution developers to accommodate them. Scenario B describes a Project that has not be overcome by change.

The "Declining Flexibility" phenomenon suggests that we must endeavor to influence and control the rate at which changes are submitted against the project. It also suggests that we must be willing to impose a cutoff deadline for Change Requests at some point in time in order to preserve the likelihood of successful delivery.

Change Evaluation

Retaining control in the face of change requires a process by which incoming changes can be evaluated from a cost/benefit perspective, and selectively incorporated into Project Plans.

Assuming that we have identified a qualified team to receive and evaluate incoming Change Requests, their decisions as to whether to incorporate various changes into the Project Plans (i.e. to "accept" the change) is usually challenging. Their evaluation process should include:

- What is the perceived benefit of accepting the change ?
- What is the cost of rejecting the change ?
- Is the Change Request congruent with the Project Charter ?
- If accepted, how significantly would the change effect existing Project Plans ?
- What is the current "satisfaction level" of the customer/client ?
- What is the "state" of the project in terms of completion ?
- Is the Project currently on schedule ?
- Is the Project currently on budget ?
- Where are we on the "flexibility/time" curve ?
- If applicable, who will pay for the implementation of the change ?

The breadth of considerations hints at the inherent complexity of the evaluating Change Requests. Diligence is also required in this activity, because a "bad call" can jeopardize the entire project.

Change Disposition

In a well-managed project, Changes Requests submitted by the stakeholder community as well as other changes that originate elsewhere share a common fate: the change will be evaluated and "resolved" in one of the following ways:

- The Change will be approved and Project Plans updated to reflect the incorporation of the change. This may require adjustment of the Scope, Time, or Resources associated with the project.
- The Change will be declined, but retained for future consideration as a candidate feature in a subsequent release.
- The Change will be declined and not retained for future consideration.

In all cases, the stakeholder community will be informed of the disposition of the change, the justification for the decision, and any consequent modifications to Project Plans.

A Change Control Process

All of the above suggests the need for a well-defined Change Control Process that details:

- Guidelines regarding who can submit Change Requests
- Guidelines regarding when Change Requests can be submitted
- The means by which Change Requests are submitted
- How and when Change Requests are evaluated
- The Disposition of Change Requests
- The implementation of accepted Changes, including the associated re-planning

Such a process is clearly a key ingredient in Preventing Scope Creep.

Consider that each time the Change Control Process is circumvented, ignored, or deemed too time-consuming for the urgent issue at hand, we contribute to Scope Creep and reduce the likelihood of a successful delivery. Furthermore, the effects of changes are cumulative, and like "death by a thousand cuts" [13], inexorably erodes our ability to successfully achieve the Project Objectives.

Commitment to the Process

Of course, simply having a Change Control Process is not enough; the entire stakeholder community must be committed to using it. This typically requires some education with respect to the problem that is being avoided, and the importance of avoiding it. It is often useful to present the Change Control Process to the stakeholder community as a non-negotiable reality of the development process.

The importance of universal compliance with the process cannot be overstated, as the effects of circumventing it are damaging and cumulative. Each and every time that a change is permitted to occur without having been processed through Change Control, the effects of Scope Creep are intensified. Conversely, rigorous application of a Change Control Process by the entire stakeholder community allows for retention

[13] Apologies for the dramatic metaphor, but this does capture the situation.

of control in the face of change. Simply put, it is the means by which change can occur while preserving the likelihood of successful delivery.

Conclusion

We defined Scope Creep as the situation that occurs when the amount of work to be completed in the course of a Project grows in the absence of consequent changes in the resources and time allocated to it.

We examined some sources of change and acknowledged that more discipline and rigor in earlier Project stages can minimize the number of changes to be managed later. In particular, we recognized the value of achieving stakeholder consensus in the form of a Project Charter as well as doing diligence to the Requirements Analysis process. Both investments of time will lessen the amount of change encountered later.

It was made clear that it is not reasonable to avoid all changes in the course of a Project, and that change should be perceived as inevitable.

The need for a well-defined and universally accepted Change Control Process was elaborated, as was the critical importance of strong commitment for its rigorous employment throughout the Project Lifecycle.

In summary, we found that Scope Creep can be prevented through a variety of measures applied in combination at different stages in the Project.

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About The Author

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