Scope Creep-A Lethal Project Disease
Thoughts on Prevention and Cure

INTRODUCTON

"Are we there yet?" An echoing question not reserved only to small children on short jaunts, but also a familiar query of every Project Manager who has overseen a complex project. How does one actually know if one has arrived at the desired destination? If we knew where we were going and how we were going to get there, the answer would be simple. But too often a complex project is undertaken without clear goals and direction. These "*minor*" details are haplessly left to sort themselves out once the project is underway. If work expanded to fill only the time available, this strategy would be optimistic at best. Unfortunately, work tends to expand far beyond both the time and the money budgeted for its completion. This tendency for projects to extend beyond their initial boundaries is often referred to as "scope creep". Scope creep can cripple a project and if unchecked, it can be terminal for both the project and its manager. Fortunately, at best it can be controlled or at least managed with proven project management disciplines and techniques.

Scope Creep Defined

Scope creep can be loosely defined as "the tendency for a project to extend beyond its initial boundaries". When the customer's expectations change so that the previously agreed upon set of deliverables is exceeded in features or functionality, the project is said to be suffering from the disease known as "scope creep".

Symptoms of scope creep can manifest themselves in a number of different ways. Consider the following examples of disease-laden projects.

> *The contract states that you are to conduct a minimum of fifteen tests to determine the material properties of a new lightweight alloy for use in a vehicle. You price out twenty tests just to "play it safe". After the fifteenth test, the customer states: "These test results are inconclusive. You need to run another fifteen tests!" The cost overrun is $300,000 dollars.*
>
> The patient is not feeling well.
>
> *The Navy gives you a contract to develop a prototype for a new class of destroyer. The contract states the prototype must be tested in "water". Your test facility is in Iowa – you test the prototype in the community swimming pool. Unfortunately the Navy's definition of "water" is the Atlantic Ocean. You need to spend an extra $1 million to transport all your equipment, engineers, and support staff to the Atlantic to conduct further tests.*
>
> The patient is now very sick!
>
> *You receive a contract that says you must transport goods, worth approximately $20 million, across the country by rail using "aerated boxcars". You select boxcars with open tops so that the air can flow in. During the trip, the train passes through an area of torrential rains, and the goods are ruined. The customer wanted boxcars that were aerated from below.*
>
> The patient passed away last evening!

Causes of Scope Creep

What causes scope creep? Many renowned project management scholars and practitioners have identified "just a few." We will take a sample of these and present them in some detail.

One of the premier project management scholars, Dr. Harold Kerzner, in his book *Project Management – A Systems Approach to Planning, Scheduling, and Controlling* (6th edition) suggests that scope creep is caused by misinterpretation of what is contained in the project scope, contract, or Statement of Work (SOW) – as in the examples above. This misinterpretation may be caused by:

- Mixing tasks, specs, approvals, and special instructions
- Using imprecise language ("nearly", "optimum", "approximately", etc.)
- No pattern, structure or chronological order
- Wide variation in task size
- Wide variation in work description details
- Failing to get third party review

According to Kerzner and others, another factor which can lead to scope creep is a **lack of a defined and disciplined procedure for change management**. Without documented and enforced change management procedures, an environment can be created in which no one is really sure what the deliverables (statement of work) are to include. Individuals on the project may be working from a completely disparate set of assumptions as to what is to be produced at the conclusion of the project. Without a documented, approved and enforced change management process that is supported by senior management, customers, and the project team, features may be added to the product or system without using any coordinated approach. This makes the scope very difficult to control and can very easily lead to "scope creep".

The project may have **no formal risk analysis and planning process**. Not identifying risks and their associated impacts on a project may have a very detrimental effect on the budget and/or schedule. For example, if a key supplier's facility is suddenly destroyed by fire, and no analysis has taken place prior to project plan development to identify the risk and plan for a contingency, the project could be in serious trouble. Its scope may creep to include the cost and time of bringing a new supplier and /or facility on board. The product launch may be delayed, costing valuable market share.

Scope creep may be caused by the **lack of a formal communication plan**. If a communication plan has not been developed or is not being followed, individuals may not have key information on which to base project decisions. For example, a major milestone may be in jeopardy, and if the proper individuals are not aware of the problem, decisions may be made which will adversely impact the project budget. For example, a supplier may decide to substitute a key component at the last minute – this new part may have minute differences in dimensions. If the new substituted part is a sub-component of a larger part, and there are no tolerances for the changed part, the project budget and / or schedule may "creep" to accommodate the change.

In an article published in PM Network Magazine, January 2000 (p. 44), Adrian Abramovid adds some additional insight as to why scope creep occurs. According to Abramovid, scope creep can be caused by internal and external changes. Some examples of external changes include:

- customer requirement changes
- environment changes
- platform changes (e.g. car or truck)
- poor understanding of customer requirements prior to project scope definition & contract signing

Internal changes are much more insidious. In addition to the standard strains of scope creep disease there exists another strain that often doesn't manifest itself with the usual 'external' type of symptoms. In the project management world, this strain is often called "creeping elegance". It generally manifests itself in product development or software development projects. This type of scope creep is usually generated from within. Product engineers, and software engineers in particular, usually are individuals who, by their nature, are driven to produce the best product (or system) with the highest level of quality and performance capabilities. These "perfectionists" look with disdain on those who just meet the minimum requirements – those individuals are "underachievers". However, meeting "minimum requirements" is what "scope creep" prevention is all about. Unless "the best" has

been negotiated into the original scope, anything you do beyond the minimum requirements can cause severe cases of “bloated budget,”,\ “schedule hyperextension,” and “temporary job loss.”

When present simultaneously, these symptoms may cause permanent disability or may, in some severe cases, be terminal.

In this section, we have attempted to identify a number of the causes of scope creep. Creating an awareness of the causes can lead us to research into the effects and possible remedies.

How Scope Creep Can Ruin Your Project and Your Life

Scope creep can have very serious effects on the overall performance of a project, its personnel – especially the Project Manager - and the relationship between those performing the work and the organization receiving the finished product or system. Let's examine some of these effects.

Budget – everyone has certainly heard horror stories of cost overruns on projects. Whether the project was a new airport facility, a new freeway, a nuclear power plant, or a new software system – in many cases there were cost overruns. Poor estimating is not always the cause of these overruns. Often the project became infected with scope creep – the airport clients requested ten new gates, the freeway was upgraded to have more lanes or more interchanges, the nuclear power plant may have had to increase backup facilities for safety, and perhaps additional functionality was requested by the customer and for the software product. All these changes, or "enhancements", add cost to the effort. When this happens the project suffers from “bloated budget”. Someone has to take the blame and typically it is the project manager – you!!! This symptom causes other symptoms to appear, the most notable of which is stress. Other symptoms may be job termination and/or tarnished reputation.

Time – creeping scope will have an impact on the time it takes to complete the project. Additional effort with no corresponding increase in resources will cause the project to suffer from “schedule lengthening”. This will move the completion date out and may cause other side-effects. For the customer, the product may be too late getting to market, and profits may be diminished as a result. For you, the project manager, your stress level may be increased and other symptoms may be manifested. These can include diminished family and or recreation time, team morale problems as a result of team members having to work excessive amounts of overtime, and deserting staff -- staff leaving and moving to other assignments prior to finishing their tasks – leaving you with the job of figuring out how to get the project back on track.

Quality of life – creeping scope may require you, as the project manager, to spend more time at your job, with less time for family and recreation. Being able to relax at home with your family and having time to participate in recreational activities allows you to be rejuvenated and thus better able to deal with the pressures of the job. Spending more time at work and less time at home will throw this situation out of balance and the project manager may suffer from the symptom of “not having a life!” Over time, the individual may also suffer from “glazed over eyes” and perhaps even the dreaded “looking like a zombie” symptom.

When am I done? – scope creep can also cause the project leader to fall into a catatonic state. This is exemplified by the individuals walking around mumbling to themselves – “when am I done – I don’t know when I finished”. Generally, this shows up when the project manager and or the customer have failed to agree, understand, or document exactly what the completion criteria for the project will be. The project manager will be caught in an endless cycle of have to add “just one more feature” or make “just one more change”.

As we have seen from this discussion, scope creep can have a very detrimental effect on the project and the project manager. The added stresses and demands placed on individuals who face project scope creep can be extremely detrimental to their health and overall well being. It can ruin their life and therefore every attempt should be made to “inoculate” the project against this dreaded disease.

Prevention, Treatment & Cure

Frozen specifications and the abominable snowman are alike: they are both myths, and they both melt when sufficient heat is applied. To believe that projects are non-dynamic systems is both naïve and detrimental to ones general health within project management. Often it is this dynamic system, which acts like a mutating virus and the ever-changing challenge to develop a "cure" that has drawn many of us to the project management field. Both project deliverables and expectations often require "minor" mutations over time. But what originally appears as several minor changes can become collective in nature and develop from a source of irritation, fester into dispute and delay, and sometimes lead to "project death." The goal for a project manager is to create a vaccine in the form of structure and some semblance of control around a project. An excellent preventive care measure that can serve as a foundation for such an "inoculation" is the Project Charter.

Project Charter

A Project Charter is a collection of documents that establishes the primary ground rules for the execution of a project. This aids in creating a baseline and a common reference point for both the customer and project manager. It captures the project goals and means of achieving those goals through written expectations and specifications. A Project Charter also provides a means by which "informed" decisions can be made concerning a project. Enlightened decisions supported by data driven risk-analysis will help prevent run-away changes from occurring and thus preventing scope creep . "Prevention is the Best Medicine."

The Project Charter consist of seven elements encompassing a project and related processes:

1. Project Definition
2. Project Plan
3. Risk Management
4. Resource and Communication Plan
5. Progress Status
6. Change Management
7. Open Issues

Project Definition
A project is a set of interrelated tasks leading to the achievement of an overall objective or milestone. This achievement marks the end or completion of the project. A well-developed project definition will help the client, project team members, and all related management have a consistent understanding of what is transpiring. It also serves to build a better-defined project plan as the scope of work is outlined.

Assumptions List
Assumptions consist of both true assumptions and customer givens. Both types are taken into account as a project is budgeted for time and costs. For instance, if you are working on the Statement of Work and discover that you must assume something about a systems interface, identify this on the assumptions list. The tracking of assumptions is often overlooked, but it is a critical facet of successful project management. An assumptions list is used from the start to the finish of your project.

Statement of Work
The Statement Of Work (SOW) is a narrative description of the work required for the project (Kerzner, p.535). This is the portion of the Project Charter that outlines in explicit detail the expectation of the project technical requirements, schedule parameters, special facilities, training, documentation and other non-hardware deliverables. All relevant project details should be referenced and addressed in this portion of the Charter.

Specifications and the Statement of Work (SOW) must be reviewed requirement by requirement with the customer prior to signature. Review your interpretation and the customer's – ensure there are no gray areas. Try to obtain absolute clarity. Don't leave vague statements in the Statement of Work (SOW). Leaving

vague statements is of no benefit to the project manager who will have to argue with the customer over whose interpretation is right in future disputes. (PM Network, Jan 99, p.47) This is typically a losing proposition for the project manager. Remember: "The Client is Always Right"…unless you have it documented otherwise.

Project Plan

A recommended approach should be developed and reviewed with the customer for both the technical and business portions of the project. This approach should be a practical high-level plan, workable in the customer's environment, having identified associated risks and viable alternatives with estimates. The approach needs to have considered all facets of the project such as special resources needed, major work assignments segmented into a Work Breakdown Structure (WBS), schedule, and budget.

Schedule

The tasks required to complete deliverables and meet the project objectives are the fundamental blocks to a schedule. Once identified and accounted for, dependency relationships between these tasks can be better understood to establish proper workflow. Timing can be assigned to each task with the project's budgetary and resource constraints considered and a critical path can then be calculated to understand the challenges in completing the project within a desired timeframe.

Budget

When developing your budget, identify all elements that will contribute to your project expenses. This checklist should correspond to the WBS (Work Breakdown Structure) on which the schedule is based. It will help you identify the major cost areas and the activities that were estimated to establish a project budget. For each cost category, determine the person responsible, the due date, and the date completed.

Risk Management

The key in risk management is the attempt to uncover and recognize as many of the hidden "trap-doors" of a project prior to beginning. A rich resource for risk knowledge is the collective experience of the project's team members. This is the place for "War Stories" to be constructive.

Risk Identification

A Risk Identification List is used from the start of your project to help you keep track of the risks identified while developing the project plan. This list will be the major source of input into your risk assessment activity. Identify the project document in which the risk is applicable -- for example, if you discover a risk caused by one of the technical requirements, identify the "Scope of Work" and the related area. Describe the risk in enough detail that a third party who is unfamiliar with the project can understand the content and nature of the risk. Also, try to identify and document risks without assessing their impact. Assessment will be done as the development of the project plan nears completion.

Risk Assessment

In assessment, separate those external factors and constraints that you cannot control, from the factors that are under your control. Evaluate risk items for probability and impact on the project. Then develop a Risk Mitigation Strategy for each item of high probability. Such a strategy plan should consist of avoidance, control and deflection alternatives versus advantages and drawbacks for each.

Resource and Communication Plan

A resource and communication plan must be developed in order to make the most effective use of the people involved with the project.

Roles and Responsibilities Definitions

Establishing ground rules for each project member, including customer involvement, will reduce risk and misunderstandings during the project. It is critical to precisely define what the customer can influence and to what extent (PM Network, Jan 99, p.47). Clearly defining roles and responsibilities is also the first step in establishing an effective change management policy.

Communication Plan

Written communication must be meaningful to its audience and useful to its author. Therefore an established policy detailing how the project manager will communicate with the customer will help limit confusion and build rapport. This plan should also encompass a project-meeting schedule for both frequency and duration. "Meeting saturation" is an absolute project killer and can be avoided by good up-front planning. An excellent project communication plan should always include a Kick-Off and a Project Close-Out meeting.

Progress Reporting

A great deal of time is spent in reporting the status and progress of a project. Upfront agreements with both internal departments and the customer for regularly scheduled, documented, and formatted reporting procedures are worth the time investment. Reporting procedures should contain three resource parameters: time, cost and performance. An effective system monitors and analyzes all three factors (schedule, performance, and costs) as a group by setting budgets, measuring expenditures against budgets and identifying variances, assuring that the expenditures are proper, and taking corrective action when required (Kerzner, p.790). This aids in delivering a high level of quality in both communication and time utilization.

Project Status

Everyone enjoys giving and receiving good news. But remember, bad news does not get better with age – keep your customers and staff informed. If a project manager attempts to "manage" negative portions of a project by keeping them a "secret," he/she not only runs the risk of damaging the project, but also degrading the level of trust and credibility that has been fostered. It is always better to be open and honest, tell the truth, and admit errors.

Change Management

Continuous change leads to the loss of overall project control. But almost every project will change for a variety of reasons: new opportunities, new managers, new methods as well as problems encountered during the execution phase. It is also not unusual for such changes to originate on two separate fronts: external customers and internal customers. The key is to manage change by establishing a robust change management process; a system that analyzes proposed changes and tracks their implementation if adopted. This will aid in setting internal and external ground rules concerning all types of changes including those that are deemed out-of-scope. It is important to review and gain up-front agreement upon these ground rules along with all other customer expectations. After this initial agreement with the customers, establish a "no freebies" discipline. If this is not in place, the customer will expect you to accommodate "minor" changes and requests for data or work (PM Network, Jan 99, p.48). It is always important to remember that any non-scheduled work means cost and time against "your" project budgets.

Change Notification

A change notification is a written notification of a potential change. As an "early warning" system, it can provide an opportunity to group together potential changes for analysis. Many times the benefits or detriments of an individual change can be influenced by other changes under consideration. This effort may solidify a decision about possible changes. It will certainly force the reconsideration of the scope, list of issues and opportunities, and strategies.

Change Request

Once a change is deemed necessary and/or unavoidable, then a change request must be submitted through the established change management process. This process begins tracking the request by first assigning it a unique control number and then distributing the requested change to the impacted departments for analysis.

Change Analysis

The project team evaluates the impact of a change as well possible alternatives. Active negotiations begin on changes and commitments to the baseline schedule and baseline budget.

Change Approval

The final step is to review and obtain the agreement from the customer for change approval. An approved change will then be coordinated for implementation.

Open Issues

During the project, it is important to address the issues that will arise. It is to everyone's advantage to "kick over rocks" looking for potential problems and then to raise warning flags early. This precaution can include taking corrective actions, taking no action, or providing further clarification. It is critical that issues are addressed. Unresolved issues can wreak havoc on a project of any size. Documenting the issue is the first step in addressing project issues. To resolve an issue, changes may be required in the plan and possibly in the project deliverables. An "open issues" form will enable a project manager to look at the issue more clearly and will provide documentation that can help to improve the management of future projects.

Conclusion

In this paper we have offered the reader some insight into "scope creep." Our intent has been to define scope creep through illustrative examples. We then examine some of the impacts this disease might have on projects and project managers if it is left unchecked. After examining the disease and its "symptoms", some thoughts were presented on how to prevent and cure this disease. Hopefully, by having project managers follow these suggested precautions, the project management profession can help reduce the impact of scope creep and perhaps, one day, eradicate this disease entirely!