Managing Project Scope

Project Skills

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Managing Project Scope: Project Skills
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PREFACE

This free eBook explains the processes and requirements involved in scope management. Any planning or work activity which is not directly focused on completing the specified project objective represents a waste of resources and should not be undertaken. Many projects fail because of difficulties in trying to control the scope of the project.

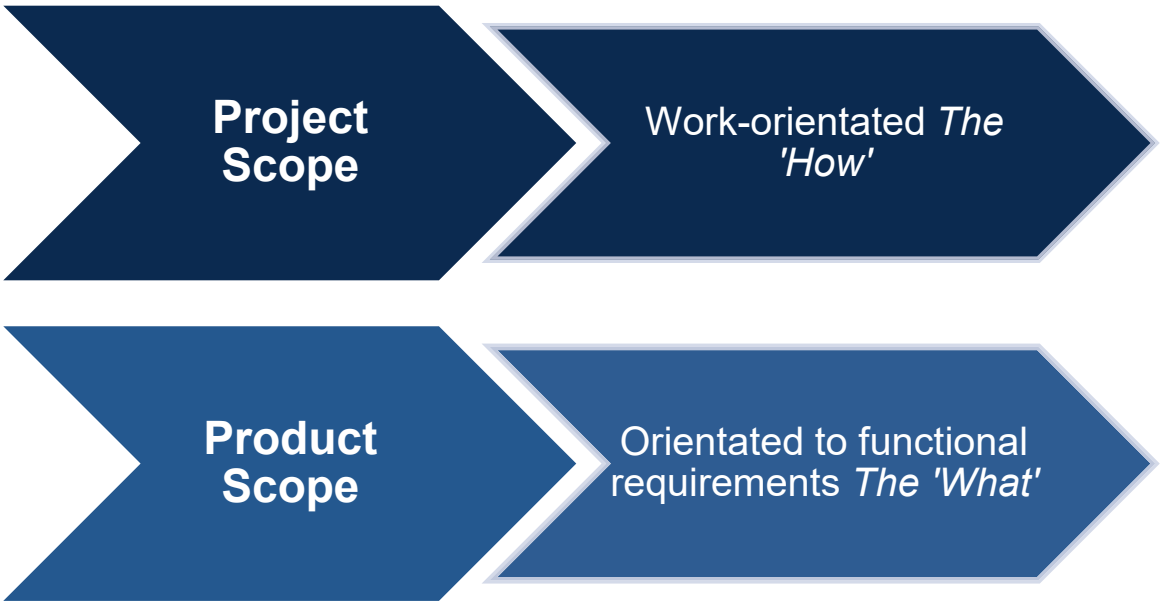
You will learn:

- How project scope management relates to the successful delivery of a project
- Why 'scope creep' and 'gold plating' represent real risks to the project
- How to confirm that only specified work is completed in accordance with the scope statement
- To apply scope definition in order to reduce the probability of scope creep within the project
- Why scope management is treated as a distinct functional area within project management.

1 INTRODUCTION

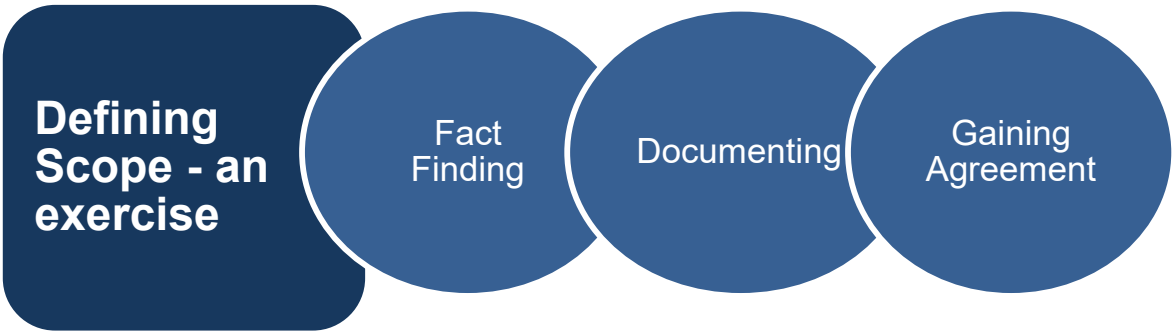
Every business or organization exists for a specific purpose. While most are intended to make money, there are usually more defined goals under that general umbrella. For example, your business might be designed to sell a specific product or service, or even just provide information on a given topic. Whatever it is that your organization is meant to do, it is critical that it does that job to the highest possible level.

On a smaller scale, it is the same way with projects. Projects exist within organizations, and they are intended to accomplish a specific purpose as well. However, instead of 'selling a certain product', a project might be created to design a new feature that will be included with that product or service next year. This is, of course, just one of an infinite number of possible examples.



No matter what a project is designed to do, it is crucial that it be defined and established as accurately as possible ahead of time. This is often called the 'scope' of the project. Scope management is a knowledge area that is focused on making sure that a given project includes everything that it needs to complete the task as described, and nothing more.

If a project doesn't have all of the necessary resources available to it, the project isn't likely to be finished because it will be ill-prepared for the challenges ahead. At the same time, if the project has more than it needs, the outcome may be reached but resources will have been wasted along the way.



Getting the scope just right on a project is one of the most-important elements of achieving success in the end. Only when the scope is dialed in correctly can everything else in the project be completed according to plan.

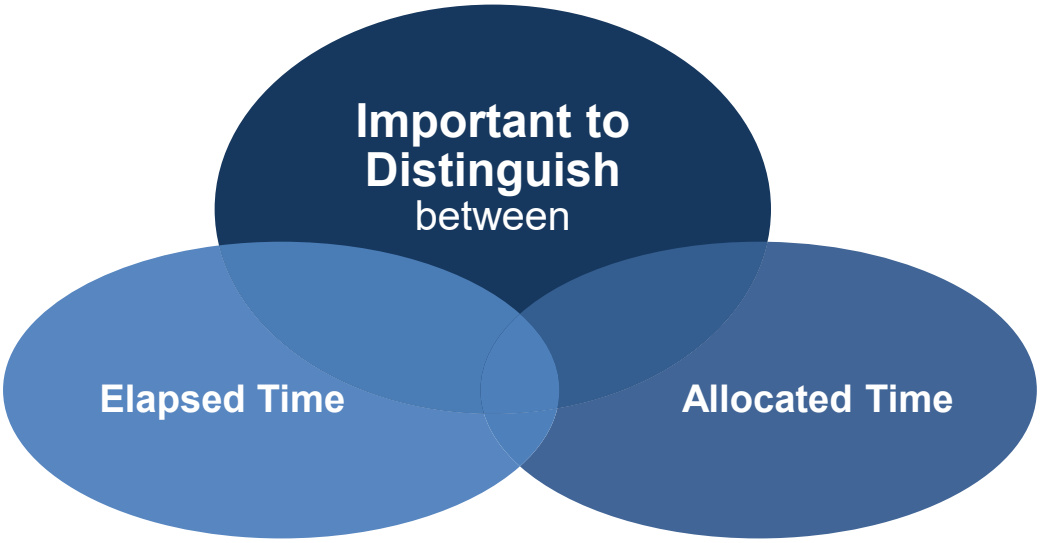
The resources dedicated to a project can take on many forms, but all of them are important. The scope of a project takes a view of these resources as a whole to determine if the project has just what is needed to reach the goal that has been laid out. Firstly, project requirements must be collected and defined so that a work breakdown structure (WBS) document can be created. This can be defined as:

> *A deliverable-orientated hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables.*

Some examples of the resources that a project can use would include –

> *Employees* – this is probably the first resource that is considered when putting together a new project. Who is going to work on these tasks? Do these people exist within the organization, or will new team members need to be retained? Do current employees have the time available to work on this project specifically? All of these questions and more need to be answered when assembling a project team. Getting the team right is a major factor of properly 'scoping' a project.

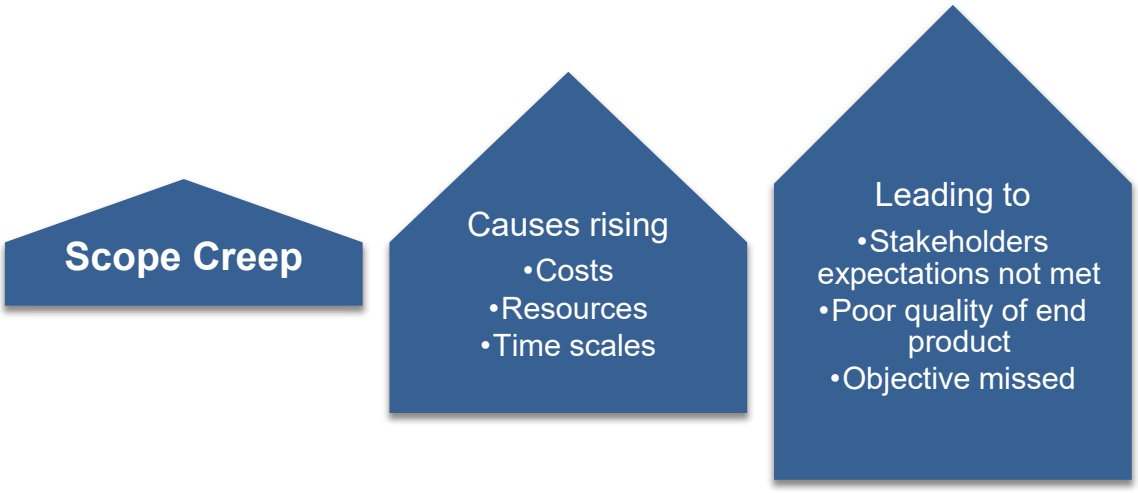
Budget – most projects include some kind of capital budget for expenses that go beyond things like payroll. Using our example from earlier regarding a new feature to add to a product, there may be some cost associated with buying materials that will go into that new feature. Budgeting for things like raw materials and new equipment also goes toward the overall scope of the project.



Time – as they say, time is money in business. The longer a project takes to be completed, the more it will cost the organization. When a project is first being designed, there should be a timeline in place that defines the scope of the work in that regard. For example, the project could be planned to take only a month, or it could be scheduled for a year or more. Since time and money are so closely connected, predicting the time scope of the project accurately is important when it comes to controlling costs.

Goal – one other important piece of project scope is simply what the goal of the project is in the first place. This can often become lost in the shuffle as the project develops, and the final result may end up well outside of the scope that was originally intended. Using that example one more time from above, instead of designing a new feature for an existing product, the team could end up with a whole new product entirely. While that could be a good or bad thing, it is certainly outside of the originally scope of the project.

The four items above are usually the main components that need to be considered when framing the scope of an upcoming project. Project managers are not only tasked with getting to the end of a project successfully, but also with making sure that what happens during the project is within the scope that was laid out for them at the beginning.

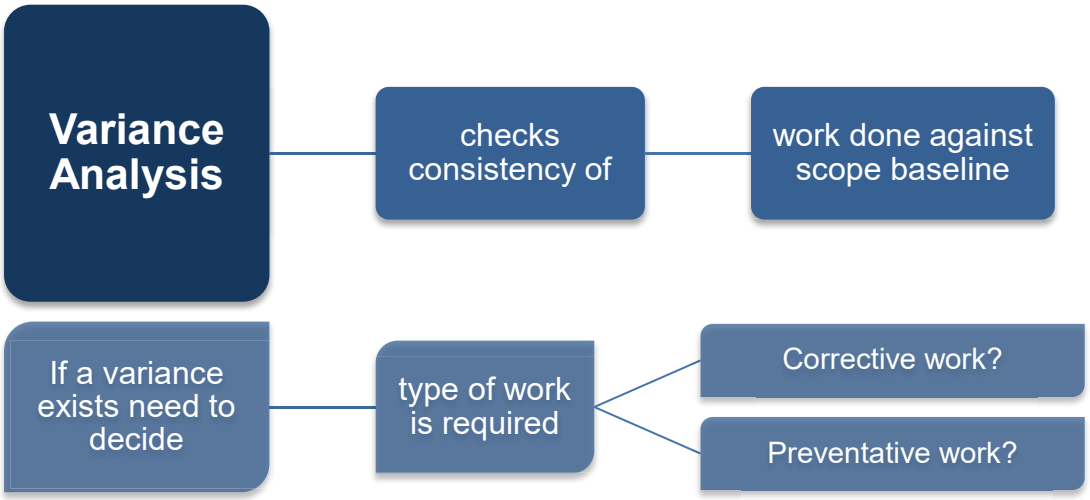


The Concept of Creep

The idea of scope creep is one that has plenty of uses in business, and it applies in project management as well. While trying to keep a project within its original scope, you might find that 'project creep' starts to develop and things grow quickly out of control.

This happens when one part of the project spurs an idea to do something else, or to add onto what is already being done. The project creeps larger and larger until it isn't anything like what it was supposed to be in the beginning. Preventing project creep is a task that the project manager and other leaders should take seriously. It creep is left unchecked over a period of time, the overall project could end up being far more costly and time consuming than expected.

Being a business leader in general is largely about understanding and managing scope. The best companies in the world know exactly what they do best, and they stick to it as closely as possible. Many businesses have been undone by straying from their core competency and trying to do too much, too quickly. Don't let that happen to a project that you are managing.



Laying out a defined scope at the beginning of the work, and then sticking with it as much as possible throughout the project life-cycle, is the path toward a successful conclusion and overall improvement for the organization.

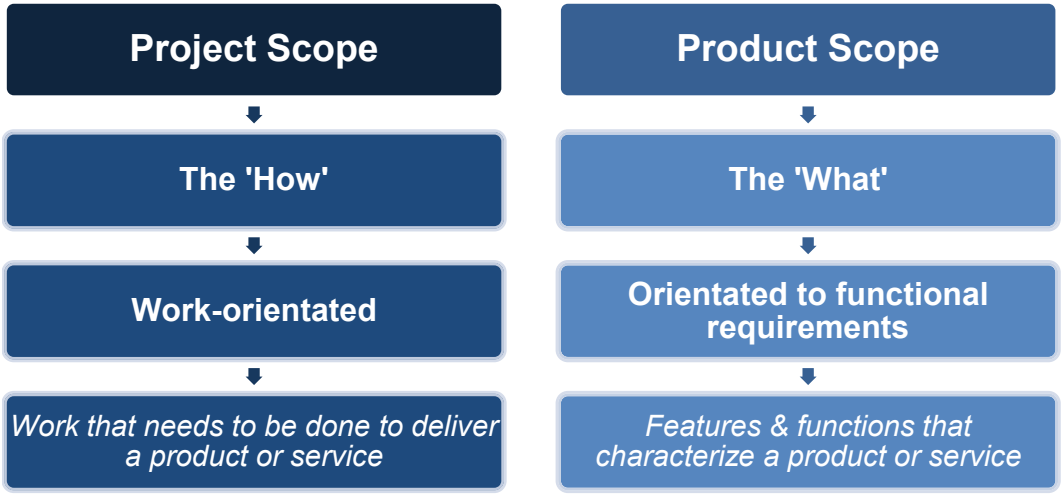
2 MANAGING THE PROJECT SCOPE

There is a well-known saying that states that: *'Projects don't fail at the end, they fail at the beginning'*. There is a lot of truth in this and whilst failure may not appear obvious until the final stages of a project, the post-implementation review often finds that there were known issues with the project which could and should have been addressed at much earlier point.

These issues often turn out to be to do with the 'scope' of the project. The word 'scope' has two distinct uses in project management.

- **Project scope** refers to 'the work that needs to be accomplished to deliver a product, service, or result with the specified features and functions'.
- **Product scope** refers to the 'features and functions that characterize a product, service, or result'.

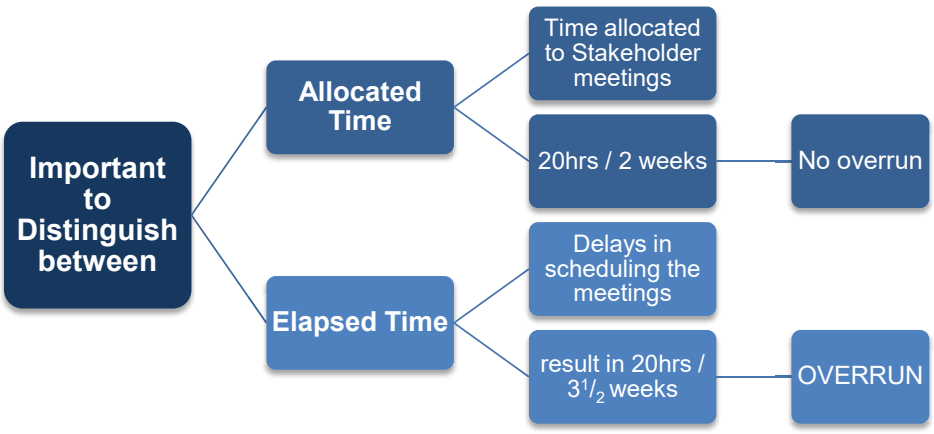
Project scope is more work-oriented (the 'how'), while product scope is more oriented toward functional requirements (the 'what').



In both instances 'defining scope' is an exercise in fact finding, documenting and gaining agreement about what needs to be done and how. This can be a time consuming process and those project team members involved in the scoping exercise can find it frustrating because stakeholders whose input is needed may not always be available for meetings and often assign these things a lower priority than their own day-to-day work. This is quite understandable because many of them will not be part of the project team and they are unlikely to have had sufficient time allocated in their already busy schedules for this additional work.

To fully appreciate this problem you need to be aware of the distinction between 'allocated time' and 'elapsed time'. Even if sufficient time has been allocated for meetings with stakeholders and they are able to find this time in their schedules, there may be delays in 'when' these meetings happen. These delays tend to accumulate so that instead of having 20 hours of meetings over two weeks, you end up with 20 hours of meetings over three and a half weeks. In this example, the allocated time has not been exceeded but the elapsed time has overrun significantly.

This can lead to a situation where the project appears to be slipping almost from the very beginning because project team members cannot get sufficient face time with stakeholders outside of the project or cannot get these people into the same meeting where a consensus about what is required could be worked out.

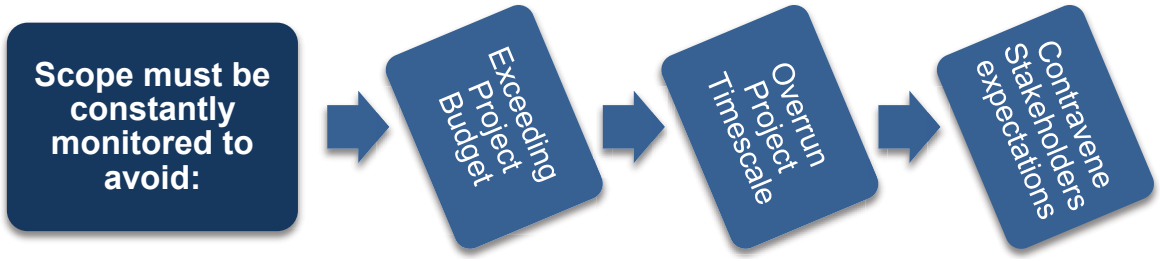


There is also the problem of how to occupy project team members during this elapsed time. A common response to this situation is to gloss over the importance of the scoping exercise based on the feeling that:

> *'Everybody seems to pretty much agree, and we really do need to get on and produce some deliverables'.*

This scenario is more common than most books on project management would admit and represents the biggest single problem with the scoping aspect of the project – very seldom is enough time allowed for it to be done properly.

Differences in perception of what was meant when the client specified the project deliverables can lead to vastly different understandings of what exactly is required. Not only must the scope be agreed up front, it needs to be constantly monitored throughout the project to avoid it changing in a way that will break the budget or timescale, or will contravene stakeholder's expectations of the final deliverable. This is usually referred to as 'scope creep'.



You will need to define those things that are out of scope as well as those things that are within the scope of the project because it cannot be taken for granted that everyone involved understands where the scope of the project ends unless they are specifically told that information.

Most experienced project managers would agree that the scope of the project needs to be decided on and documented before any real work begins. However, in the real world this ideal is often compromised because insufficient elapsed time has been allocated for it.

Remember, the principal challenge of project management is to accomplish the project goals and objectives while respecting the constraints of scope, time and cost. One of the most effective ways of balancing these constraints is by developing clear and comprehensive scope statement.

Key Points

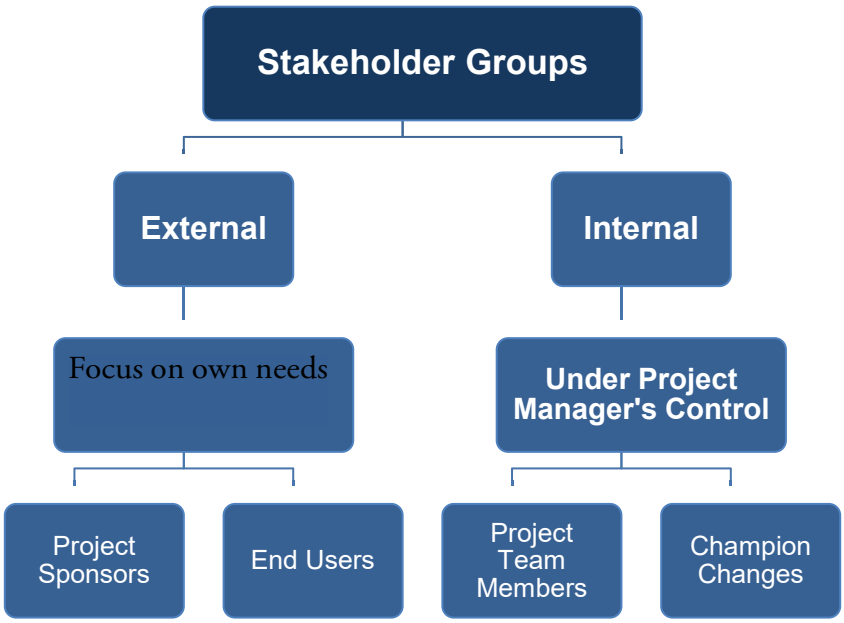
- Defining scope is an exercise in fact finding, documenting and gaining agreement about what needs to be done and how.
- It can be difficult to get sufficient face time with stakeholders to achieve consensus about the exact scope of the project.
- This often leads to work starting too early on deliverables that have not been properly specified.
- Scope needs to be constantly monitored to avoid it changing in a way that will break the budget or timescale, or will contravene stakeholder's expectations of the final deliverable.

3 SCOPE CREEP & PROJECT CHANGE CONTROL

As well as defining the scope of the project in the planning stage it is also necessary to actively manage it. This is because there are two groups of stakeholders that will almost invariably apply pressure to change the scope of the project throughout its life cycle.

The first group can be thought of as essentially external and include project sponsors and end-users. These groups may not have got everything they wanted included in the initial project specification and use the 'requested change' route to incorporate elements that were not included during the initial development of the project scope statement.

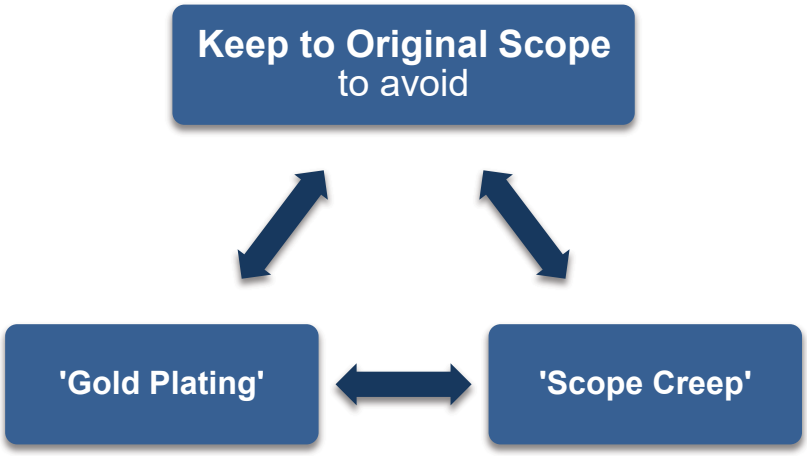
This can also happen when stakeholders become aware of the potential of the new system and mistakenly believe that adding incremental improvements during the course of the project will create a better solution without increasing risk or cost.



Project managers must always be aware that stakeholders are almost always tempted to increase the project scope via the back door once the project gets underway. They can justify this to themselves by believing that these changes are relatively small and yet will add a great deal of value to the completed project. Unfortunately this tends to prevent them from being totally objective when considering the additional resources required implementing these incremental improvements. This phenomenon is known as 'scope creep' and is endemic in project work to the extent that it is a major cause of project failure.

The second group who may champion changes to the scope of the project can be thought of as internal. These are project team members who are usually under the direct control of the project manager, for example engineers or analysts. Their motivation is quite different from the first group and usually has more to do with professional pride or intellectual curiosity than purely functional factors.

Their arguments for extending the scope of a particular deliverable usually begin with the words *'wouldn't it be great if…'* and then go on to explain that the effort involved would be negligible. These suggestions can get a lot of support from within the project team from people who think that delivering extra or higher quality than was specified is a desirable thing to do because of the recognition that it will bring.



Doing unnecessary work in this way is usually referred to as 'gold plating' and it is a very bad idea because it always brings with it additional risk and cost beyond what has been agreed. Anyone who wishes to impress their superiors by over-delivering should realize that it is far better to deliver early or under budget than to deliver more than was originally specified.

Scope creep and gold plating can become intertwined when end users and developers get together because both see their interests aligned in producing something that goes beyond the agreed functionality with perceived minimal risk. It can be very difficult for a project manager to persuade a team that real risks are involved and that the scope of the project has been defined the way it has for good reasons.

In addition, end-users can easily introduce scope creep through their feedback on early reviews of the project outputs. Non-specialists can have genuine difficulty envisaging a solution before the project starts and so despite the best efforts of everyone during project definition, users sometimes only realize what they want when they eventually get their hands on a trial version.

Remember, the biggest problem with scope creep is that the suggestions made to increase the scope of the project may be very good ones. The problems arise because accepting them implies changing something about the project objectives; the plan, resources and all of the things that have been so carefully matched to the original objectives are suddenly incompatible with the new ones.

Scope creep leads to problems in one of two ways:

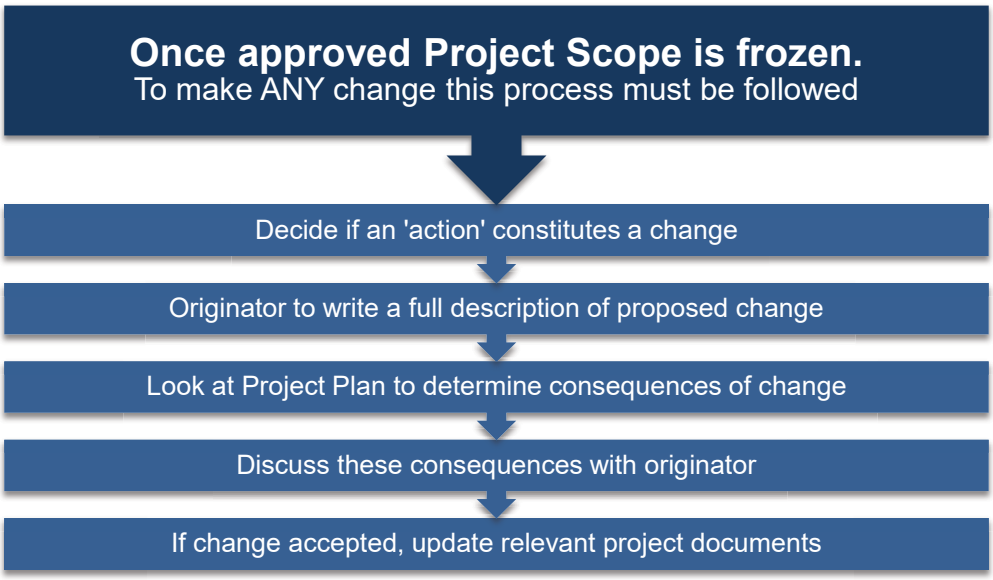
1. The suggestion is accepted and the project is committed to do things that were not in the plan, which inevitably leads to cost and time overruns.
2. The suggestion is automatically rejected and this has implications for project team morale.

The second point is important because people may have put a lot of thought and effort into devising what they see as major improvements that have (in their opinion) minimal associated costs and risks. Team members who make these suggestions invariably have a sincerely held belief that they are helping the end-users and by extension they are helping the organization itself.

This means that not only do you need an effective scope management system in place; the reason for it needs to be made clear to everyone on the project team if you want them to stay motivated even when they feel that their efforts in 'improving' the project are being rejected out of hand.

Remember, at the point where the project scope statement is authorized, the scope of the project is frozen. Anything that implies that the actual project and what is defined in the scope management statement will be materially different should trigger the scope management process.

This process starts whenever something is proposed that may change the project scope (this can be determined by looking at the project charter and the scope statement).



1) Get a written description of the proposed change with as much clarity as possible. The originator should describe the new objective but you may have to ask them to write this down in exact and neutral terms. Make sure that you do not suggest that this means that their idea is going to be adopted, only that it is going to be seriously considered.
2) Go back to the project plan and work out the consequences of accepting or rejecting the change. This should be done with reference to timescales costs and performance of deliverables as well as risk. There is always the option of revisiting these ideas once the core project is finished with a view to implementing them as part of a new project.
3) Discuss the results of the re-planning exercise with the originator of the idea and make sure they understand the consequences of their request. This is particularly important if the request has been rejected, as at least they will understand the reasons why this has happened even though their idea may fundamentally be a good one and confer advantages to the end-users and to the organization.
4) If the requested changes going to be approved for implementation then it will impact certain documents which need to be updated and reissued. If the change is sufficient to require a revision to the project charter then this may need to be submitted to a higher level for approval. If a major change is accepted then you will need to re-launch the project ensuring that all team members and all of the stakeholders know about the new objectives and plan.

As previously stated, the scope of the project is concerned with what exactly the project will deliver and the function of managing the project scope is to define and control the work required producing these deliverables.

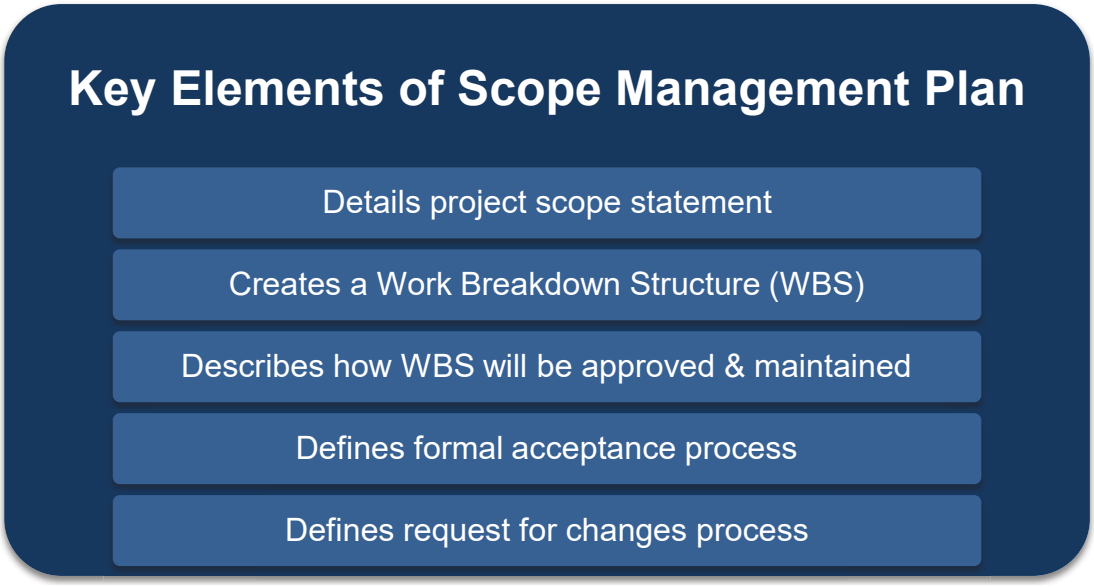
Key Points

- There are two groups of stakeholders that will almost invariably apply pressure to change the scope of the project throughout its life cycle.
- Project sponsors and end-users may not have got everything they wanted included in the initial project specification and use the 'requested change' route to incorporate elements that were not included originally.
- Project team members may believe that adding incremental improvements during the course of the project will create a better solution without increasing risk or cost.
- Project managers must always be aware that stakeholders are almost always tempted to increase the project scope via the back door once the project gets underway.
- Scope creep and gold plating can become intertwined when end users and developers get together because both see their interests aligned in producing something that goes beyond the agreed functionality with perceived minimal risk.
- The reason for effective scope management system needs to be made clear to everyone on the project team.

4 PLANNING HOW TO MANAGE THE PROJECT SCOPE

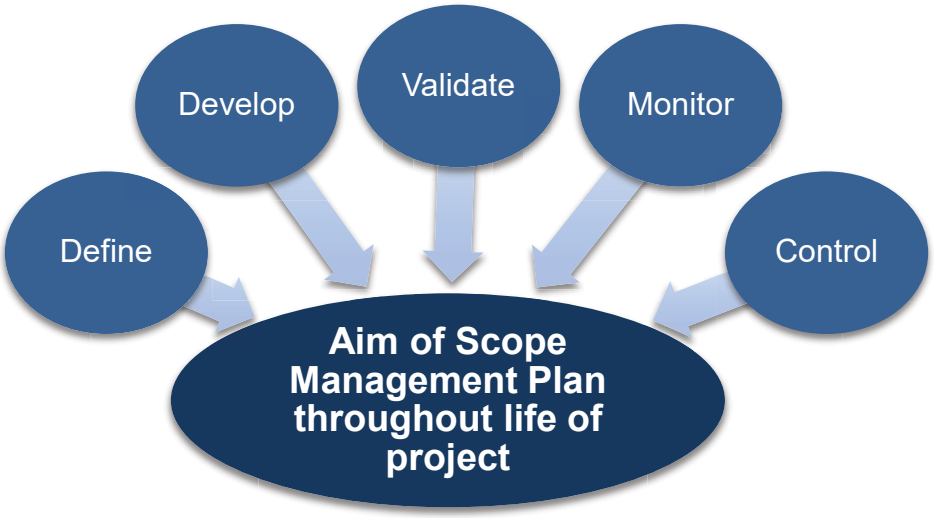
This involves creating a scope plan that describes how the scope of the project will be defined and managed throughout the life of the project. This task involves the project manager, the project sponsor, selected project team members, selected stakeholders, anyone with responsibility for any of the scope management processes, and others as needed.

The resulting scope plan describes how the scope will be defined, developed, monitored, controlled, and verified.



Key elements include processes that detail how:

1. A detailed project scope statement will be prepared
2. The work breakdown structure (WBS) will be created from the detailed project scope statement
3. How the WBS will be approved and then maintained
4. How formal acceptance will be obtained
5. How requests for changes to the project scope statement will be accepted and handled



The main input to this process is the project charter, and the two main outputs are the scope plan itself and the requirements management plan. The project plan is the document that describes how the project will be executed, monitored, and controlled. It integrates and consolidates all of the subsidiary plans and baselines from the planning processes. Approved subsidiary plans of the project plan are used to create the scope plan and influence the approach taken for planning scope and managing project scope.

The project charter provides a preliminary definition of roles and responsibilities and the project objectives. It is usually a fairly short document that refers to more detailed documents. It provides the high-level project description and product characteristics. It also contains project approval requirements and will be completed by the sponsor or individual initiating the project.

There are several key sections that you need to include in your project charter:

1. Contact points for key individuals of the project.
2. Project Purpose – the issue/problem to be solved by the project.
3. Business Objectives for the project as they relate to the organizations strategic plan.
4. Assumptions that have been made as part of the project.
5. Description of the project.
6. Definition of the project scope and the limits identified.
7. Overview of major milestones and deliverables for the project.

8. Project Authority – including an organization chart and definition of roles and responsibilities.
9. Resources required for the project including: costing, equipment, staffing, support, operational & IT facilities.
10. Signatures of the key project members that authorize the project.

When the project charter is first circulated it can attract additional sponsorship from other areas of the business that feel as though they would benefit from getting on board and increasing the scope of the project or it can sometimes be decided that the business case is not strong enough for the project to proceed.

The main objective here is to clarify the business need and define the scope of the project and show clearly that other options have been considered and that this project is the right choice along with the reasons why this is so.

You can find a project charter template on this website which can help you to produce this document or you may find that your organization has a template of its own that you will be expected to use.

The purpose of the project charter is to document the reasons for undertaking the project including:

- Objectives
- Constraints
- Main stakeholders
- In-scope items
- Out-of-scope items
- High-level risk plan
- Communication Plan
- Target Project Benefits
- High-level Budget
- Spending Authority

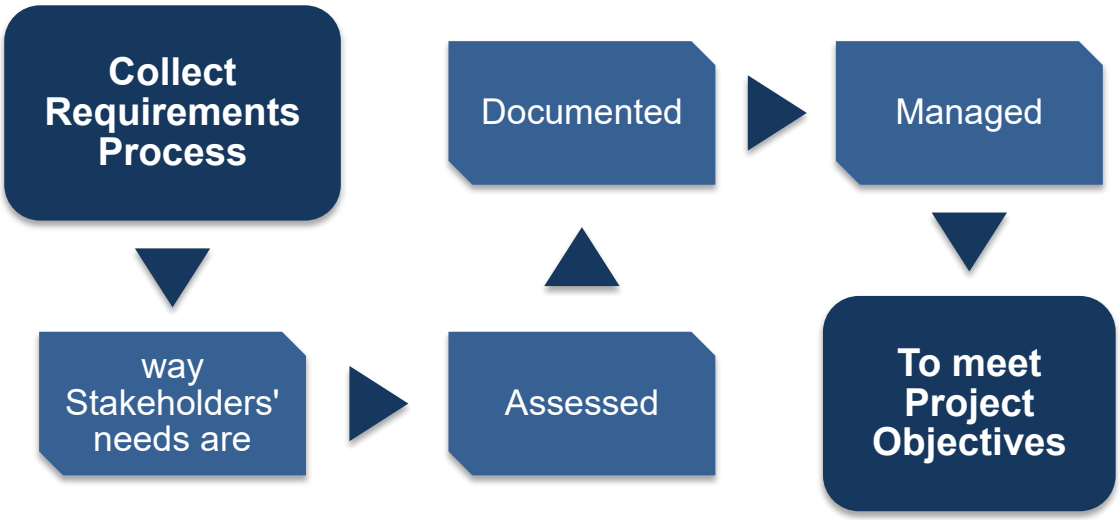
In summary, the purpose of this step is to create a scope plan that will serve as a guide for the project team members to give them direction on how the scope will be managed throughout the project. See the scope plan checklist.

Key Points

- A scope plan describes how the scope of the project will be managed throughout the life of the project.
- The main input is the project charter, which provides a preliminary definition of roles and responsibilities, and the project objectives.
- The resulting scope plan describes how the scope will be defined, developed, monitored, controlled, and verified.

5 DOCUMENTING THE PROJECT REQUIREMENTS

This step is concerned with documenting stakeholder needs to meet project objectives. All requirements should be gathered at the start because it becomes more costly to make changes as the project progresses. Gathering requirements from all stakeholders will also ensure that their opinions are taken into consideration, which will lead to higher rates of project acceptance.



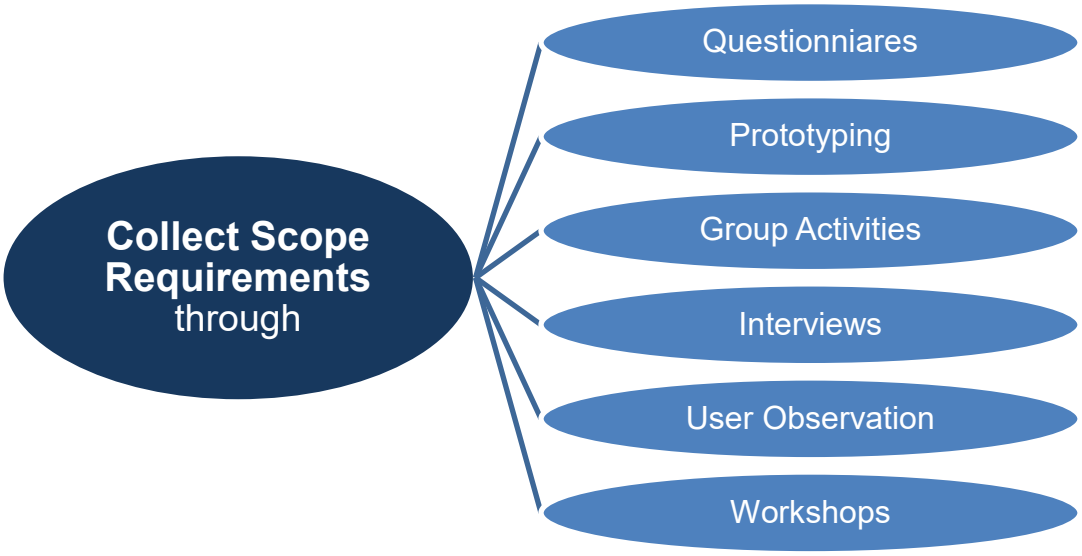
The development of requirements should begin by analyzing information the project scope plan, requirements management plan, project charter and the stakeholder register. You can check out the complete range of project management eBooks free from this website.

The important thing to note is that the needs and requirements of the customer and other key stakeholders need to be translated from high-level requirements to more detailed requirements that eventually will turn into the deliverables that comprise the work breakdown structure (WBS).

There are various ways that the project requirements can be established including: interviews, workshops, group activities, questionnaires, user observation, and prototyping. All of these approaches involve meeting interested parties face-to-face to discuss requirements and deliverables. During these interactions you can use visual tools and diagrams that help others to identify particular deliverables.

It also categorizes the latter showing the high-level relationships between these deliverables. This type of aid is often referred to as a 'deliverables diagram'. This makes it much easier for people to see these things quickly and will save you a lot of time describing them in words or trying to overcome misconceptions about how things are going to fit together.

Whether you are interviewing someone one-to-one or running a workshop or group event, you will need to plan exactly what is required from the participants. It is all too easy for these types of interactions to stray into areas that are not strictly within the bounds of the project or to get bogged down in areas of disagreement.



Obviously, where there are significant differences of opinion then these will need to be resolved but it is vital that these meetings are kept 'on track' by a nominated chairperson or facilitator who has the authority to terminate discussions that are going nowhere and to keep the meetings as productive as possible.

If you would like to know more about taking charge of meetings and ensuring that they are as productive as possible then you should download our free 'Meeting Skills' eBooks from this website.

Questionnaires can be an effective way of getting information quickly because more people can be persuaded to find the time to complete a questionnaire than to attend a meeting. The results of a questionnaire can be compared to see if there is common ground between the different stakeholders and where this is the case it can save a lot of time in face-to-face meetings, which can then be used to discuss and agree areas of contention.

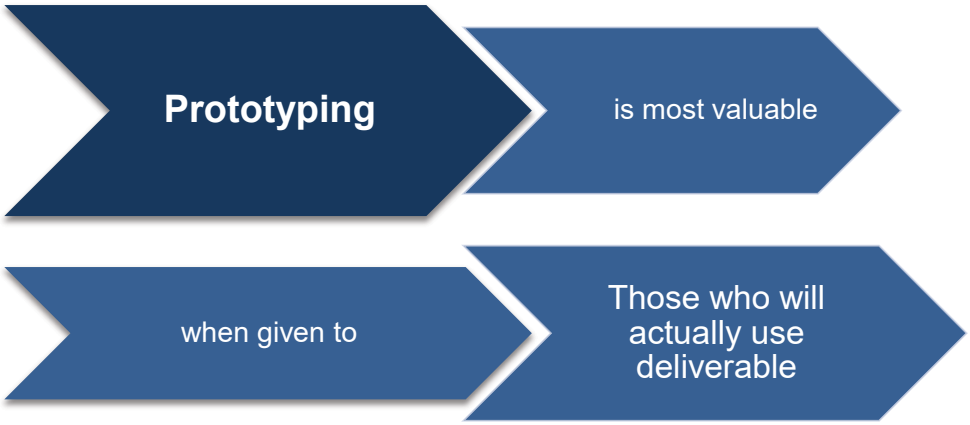
There are some industry specific questionnaires available online and you may be able to find one that you can modify and use for your own project. Obviously, if there are areas where there is general agreement about the scope of particular products or deliverables then these are candidates for utilizing project resources whilst other more controversial areas are still being discussed.

In an ideal world, the scope of the whole project would be agreed before any real work began but in reality you may find yourself in a situation where you are waiting for stakeholder meetings and you have people who are assigned to your project who are becoming frustrated at the lack of progress and are keen to get started producing something. Some members of the project team may become disillusioned if they cannot get on with productive work and you will need to balance this with your desire to do things 'by the book'.

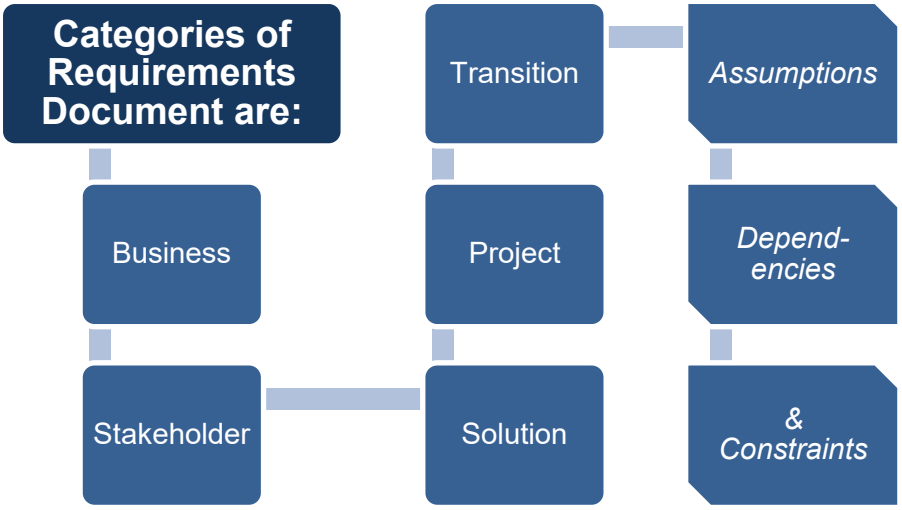
Some types of project lend themselves to user observation and prototyping more than others. Software interfaces are a good example of those that do and could represent an opportunity to engage team members in useful work even in cases where the scope of some aspects of the project is still under discussion.

User observation is particularly useful where stakeholders have been unable to articulate their requirements. Remember, not everyone is good at describing exactly what it is that they do in a way that can be easily understood by others. Assigning an experienced business analyst to shadow someone for a day or two will often produce far more usable and accurate documentation then asking that same person to document it themselves.

Prototyping aims to implement a working model of a project deliverable to see how well it fulfils its requirements. Prototyping can provide early feedback on suitability and provided that prototypes can be produced quickly enough this can be a very powerful tool that can highlight unforeseen problems that could otherwise prove expensive to remedy later on.



This technique has most value when the prototype is given to the people who will actually be using the deliverable. This may sound obvious but in the real world deliverables are sometimes specified by supervisors or managers, people who have not actually 'done the job' for some time and may be out of touch with the day-to-day task the deliverable is designed to accomplish or facilitate.



Requirements documentation describes how individual requirements meet the business need for the project. This consists of the following categories of requirements:

1. Business requirements
2. Stakeholder requirements
3. Solution requirements
4. Project requirements
5. Transition requirements
6. Requirements assumptions, dependencies, and constraints.

Requirements may start out at a high level and become progressively more detailed as more is known. Before being baselined, requirements must be unambiguous (measurable and testable), traceable, complete, consistent, and acceptable to key stakeholders. The format of a requirements document may range from a simple document listing all the requirements categorized by stakeholder and priority, to more elaborate forms containing executive summary, detailed descriptions, and attachments.

A requirements traceability matrix is a table that links requirements to their origin and traces them throughout the project life cycle. The implementation of a requirements traceability matrix helps ensure that each requirement adds business value by linking it to the business and project objectives.

It provides a means to track requirements throughout the project life cycle, helping to ensure that requirements approved in the requirements documentation are delivered at the end of the project. Finally, it provides a structure for managing changes to the product scope.

This process includes, but is not limited to tracing:

1. Requirements to business needs, opportunities, goals, and objectives
2. Requirements to project objectives
3. Requirements to WBS deliverables
4. Requirements to product design
5. Requirements to product development
6. Requirements to test strategy and test scenarios
7. High-level requirements to more detailed requirements

Attributes associated with each requirement can be recorded in the requirements traceability matrix. These attributes help to define key information about the requirement. Typical attributes used in the requirements traceability matrix may include:

- Unique identifier,
- Textual description of the requirement,
- Rationale for inclusion,
- Owner,
- Source,
- Priority,
- Version,
- Current status (such as active, cancelled, deferred, added, approved),
- Date completed.

Additional attributes to ensure that the requirement has met stakeholders' satisfaction may include stability, complexity, and acceptance criteria.

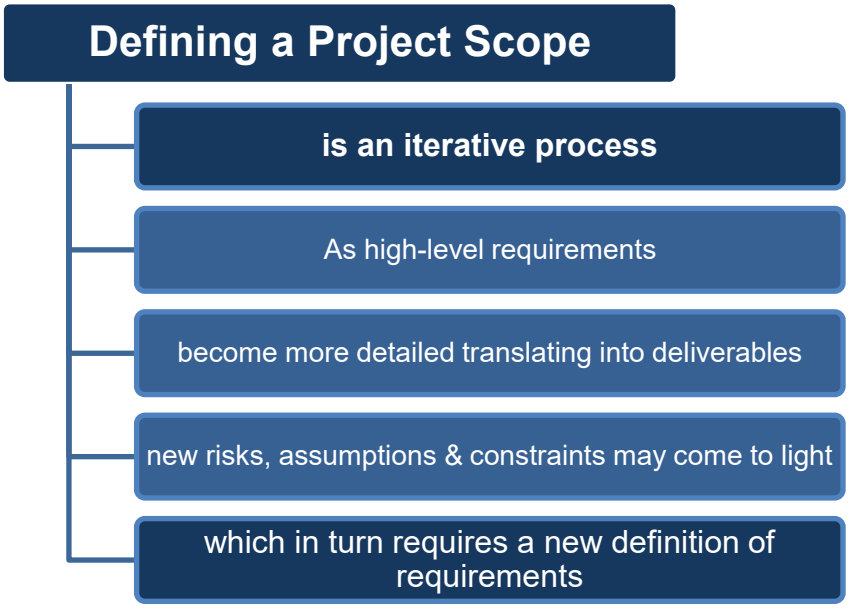
In summary, this step is about determining, documenting, and managing stakeholders needs and requirements to meet project objectives and stakeholders needs. The collecting requirements will ensure that the customer's needs are completely and fully understood. This process provides the basis for defining and managing the project scope including product scope.

Key Points

- This step is concerned with documenting stakeholder needs to meet project objectives.
- The development of requirements should begin by analyzing information the project scope plan, requirements management plan, project charter and the stakeholder register.
- There are various ways that the project requirements can be established including: interviews, workshops, group activities, questionnaires, user observation, and prototyping.
- This process provides the basis for defining and managing the project scope including product scope.

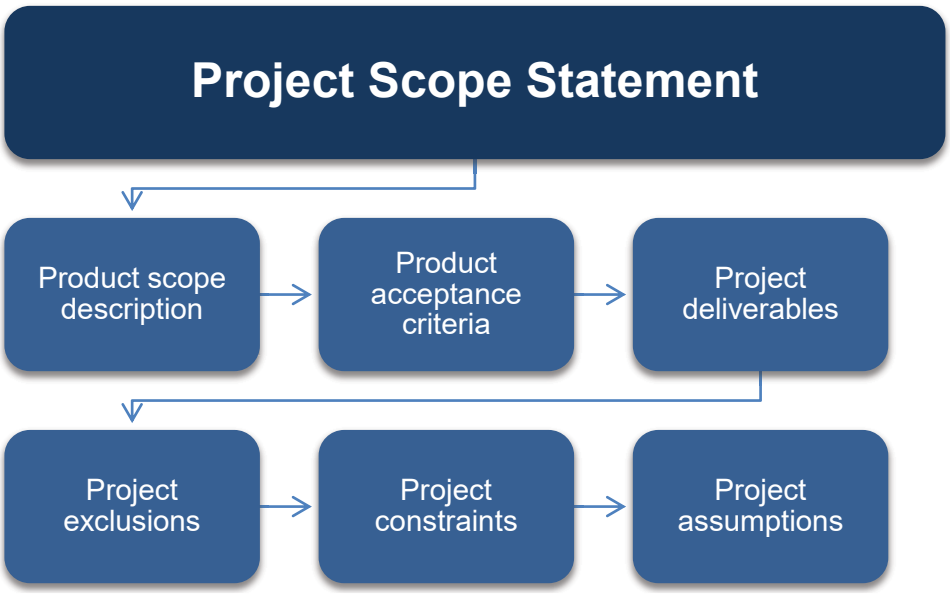
6 CREATING A PROJECT SCOPE STATEMENT

This step involves creating a detailed description of the project and it's deliverables using the scope plan, project charter and the requirements documentation. It may need to be done more than once because it may not be possible to fully define the scope of a complex project in one pass. As high-level requirements are refined into more detailed requirements and as these are translated into deliverables this can bring additional risks, assumptions and constraints to light, which can in turn affect the scope of the project.



The scope plan, the project charter and the requirements documentation produced in the previous step are all used to produce the project scope statement, which documents the project deliverables and the activities required to create them. Based on this statement, the project team can undertake more detailed planning.

It also serves as a benchmark against which requests for change or additional work can be considered. Specifically it will answer the question whether these requests within the projects original scope or outside of it. The project scope statement includes:



Product Scope Description

This details the features and functions of the deliverables your project will produce. It answers the question of what is being produced rather than why or how.

Product Acceptance Criteria

These are the standards required to satisfy the customer's quality expectations and gain acceptance of the final product. This can be summarized as the process and criteria for accepting completed products, services, or results. These criteria include things like: major function, capacity, accuracy, availability, running costs and repair times.

Project Deliverables

These could be could be any of the building blocks of a project including project documents, software of physical objects.

Project Exclusions

These represent things that outside of the project boundaries.

Project Constraints

There are three types of project constraints:

- Technological constraints relate to the sequence in which individual project activities must be completed.
- Resource constraints relate to the lack of necessary resources that may force parallel activities to be performed in sequence.
- Physical constraints may be caused by contractual or environmental conditions.

The reason for identifying them is to highlight possible delays to the completion of the project.

Project Assumptions

Assumptions presume that what you're planning or relying on is true, real, or certain. For example, your project might require someone with specific technical skills and your assumption is that this person will be available when needed.

As the project stakeholders provide more information, which can then be analyzed a better understanding of the project needs will emerge which in turn allows for the definition and expansion of the preliminary project scope statement.

Once the scope boundaries are set for the deliverables, what is and is not included with the product and project scope can be determined. The final output produces the project scope statement, which is a full and detailed document able to describe all of the deliverables, the work required to achieve them, and product acceptance criteria.

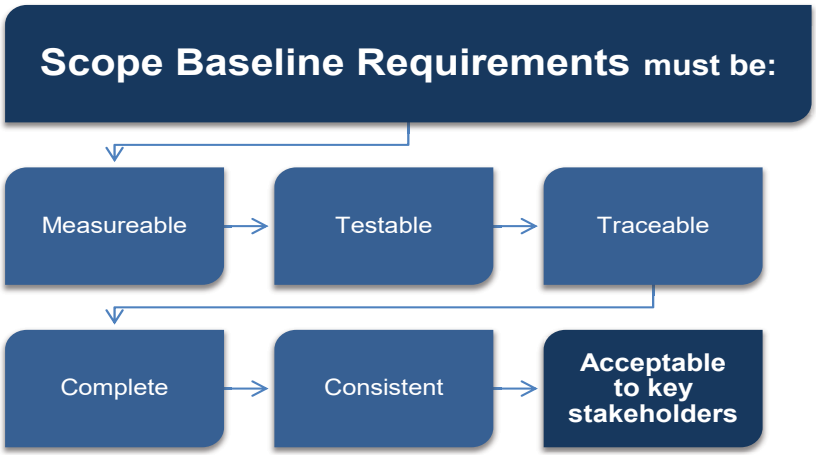
The project management team are responsible for the refinement of the preliminary scope statement, which is achieved by canvassing the stakeholders and then translating their expectations and objectives into specific deliverables. This step should also determine the priorities assigned to the project requirements which can then can be used to feed in to the decision-making process where trade-offs need to be made.

Product analysis may be required to determine what problems exist with a previous product and then to decide on the requirements how to improve it. The final stage of product analysis is to specify the work necessary to achieve the improved requirements.

The project scope statement must ensure that all stakeholders have a common understanding of the project scope and its objectives. The link between individual requirements within the project charter and project scope statement should be maintained to show the justification of every requirement included in it. The project charter is the key document in which the entire project requirements are traced back to because it states the sponsor's needs.

The project charter provides the high-level project description and product characteristics. It also contains project approval requirements. The project charter is described above. If a project charter is not used in the performing organization, then comparable information needs to be acquired or developed, and used as a basis for the detailed project scope statement.

Requirements documentation describes how individual requirements meet the business need for the project. Requirements may start out at a high level and become progressively more detailed as more is known. Before being baselined, requirements must be unambiguous (measurable and testable), traceable, complete, consistent, and acceptable to key stakeholders.



The format of a requirements document may range from a simple document listing all the requirements categorized by stakeholder and priority, to more elaborate forms containing executive summary, detailed descriptions, and attachments.

Expert judgment is used to analyze the information needed to develop the project scope statement. This is available from many sources, including:

1. Other units within the organization
2. Consultants
3. Stakeholders, including customers or sponsors
4. Professional and technical associations
5. Industry groups
6. Subject matter experts

For projects that have a product as a deliverable, as opposed to a service or result, product analysis can be an effective tool. Each application area has one or more generally accepted methods for translating high-level product descriptions into tangible deliverables. Product analysis includes techniques such as product breakdown, systems analysis, requirements analysis, systems engineering, value engineering, and value analysis.

Identifying alternatives is a technique used to generate different approaches to execute and perform the work of the project. A variety of general management techniques can be used such as brainstorming, lateral thinking, pair wise comparisons, etc.

Requirements workshops are focused sessions that bring key cross-functional stakeholders together to define product requirements. Workshops are considered a primary technique for quickly defining cross-functional requirements and reconciling stakeholder differences.

Because of their interactive group nature, well-facilitated sessions can build trust, foster relationships, and improve communication among the participants, which can lead to increased stakeholder consensus. Another benefit of this technique is that issues can be discovered and resolved more quickly than in individual sessions.

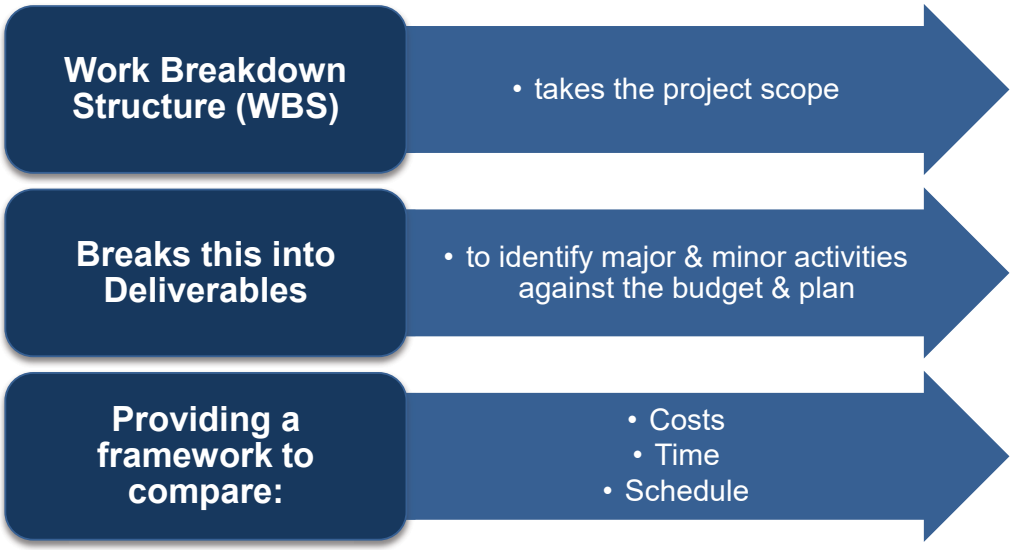
In summary, defining the scope will create the scope statement that is a detailed description of the project outcomes, including the major deliverables, budget constraints, key schedule milestones, project assumptions and constraints, and known risks.

Key Points

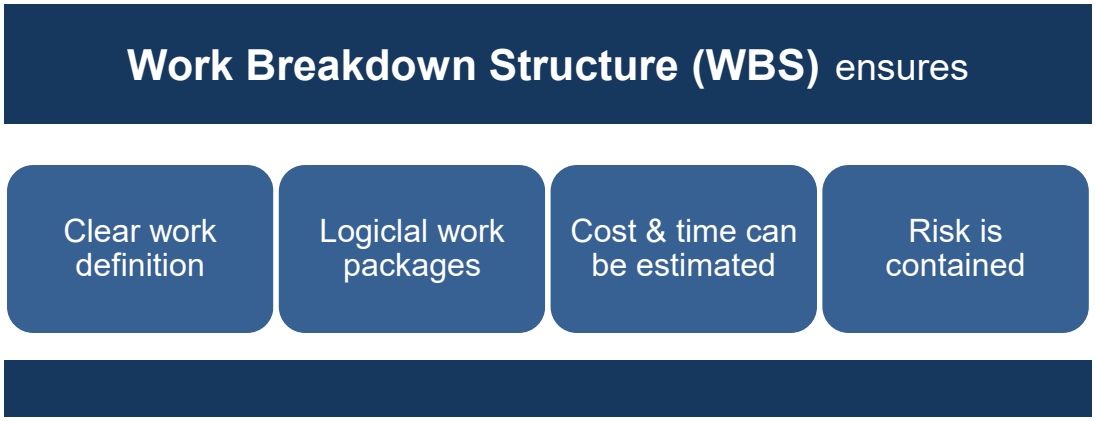
- This step involves creating a detailed description of the project and it's deliverables using the scope plan, project charter and the requirements documentation.
- The project scope statement includes: a list of deliverables and their descriptions, as well as constraints on and assumptions about the project.
- It is a comprehensive and detailed document describing all of the deliverables, the work required to achieve them, product acceptance criteria in the approval of acquirements to meet the project objectives.
- The project management team are responsible for the refinement of the preliminary scope statement, which is achieved by canvassing the stakeholders and then translating their expectations and objectives into specific deliverables.

7 CREATING A WORK BREAKDOWN STRUCTURE

The work breakdown structure (WBS) takes the scope as outlined in the project scope statement and breaks it down into more manageable components called deliverables. It serves as a graphical illustration of the structure of the project and is thus useful as a communication tool for explaining the project to key stakeholders.



The work breakdown structure (WBS) is a hierarchical decomposition of the work to be completed in order to achieve the project deliverables. It defines and structures the total scope of the project because it starts from the deliverables as stated and then decomposes the work and the smaller sections. The number of levels through which this breakdown occurs will be determined by the project size and complexity.



This is a key output from project scope management because it determines what work needs to be completed to deliver the objectives of the project. Breaking the work down in a systematic way using the project team reduces the chance of missing anything.

The output produces a graphical representation of the work specified in the project scope statement. The work breakdown structure (WBS) is a unique decomposition of the work generated for each project but a previous WBS can be used as a template for a comparable project because the required deliverables are likely to be similar.

The reason for breaking down the project into manageable and defined sections is to enable a project team to estimate the time and costs for each activity or work package. The review and assessment of smaller work packages will provide a better estimate for the overall cost of the project.

The WBS serves to:

1. Ensure better control of the work definition
2. Allow the work to be delegated in coherent packages
3. Allow the work to be defined at the right level for estimating and control
4. Allow the containment of project risk

Projects are sub-divided in this way for ease of control. Having sub-divided the project, in order to devise a suitably detailed WBS, the project manager will then need to act as the integrator to ensure the practical and timely delivery of the various work elements required.

The creation of the WBS should be one of the first steps in the planning process, once the requirements specification for the project has been written. It should reflect the way the work will be performed and the way in which project costs and data will be summarized and reported.

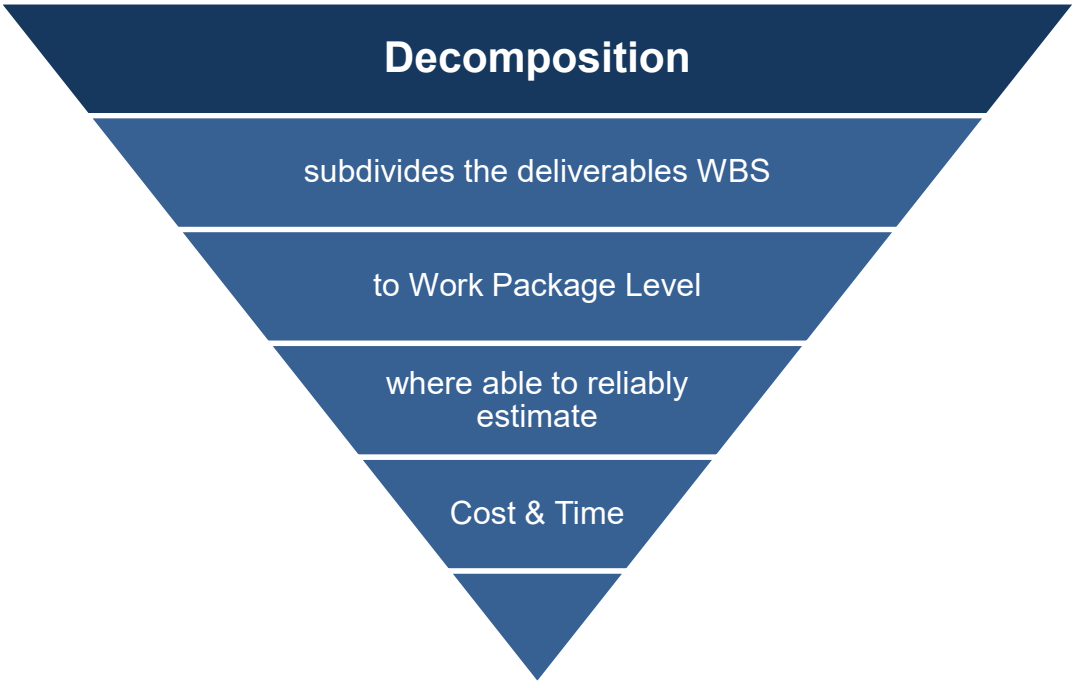
It provides the framework on which costs, time and schedule performance can be compared against the budget. It also enables the work to be broken down into smaller elements and this should result in the identification of all the activities required by the project. You can check out the complete range of project management pdf eBooks free from this website.

Decomposition is the subdivision of project deliverables into smaller, more manageable components until the work and deliverables are defined to the work package level. The work package level is the lowest level in the WBS, and is the point at which the cost and activity durations for the work can be reliably estimated and managed. The level of detail for work packages will vary with the size and complexity of the project.

Decomposition of the total project work into work packages generally involves the following activities:

1. Identifying and analyzing the deliverables and related work
2. Structuring and organizing the WBS
3. Decomposing the upper WBS levels into lower level detailed components
4. Developing and assigning identification codes to the WBS components
5. Verifying that the degree of decomposition of the work is sufficient

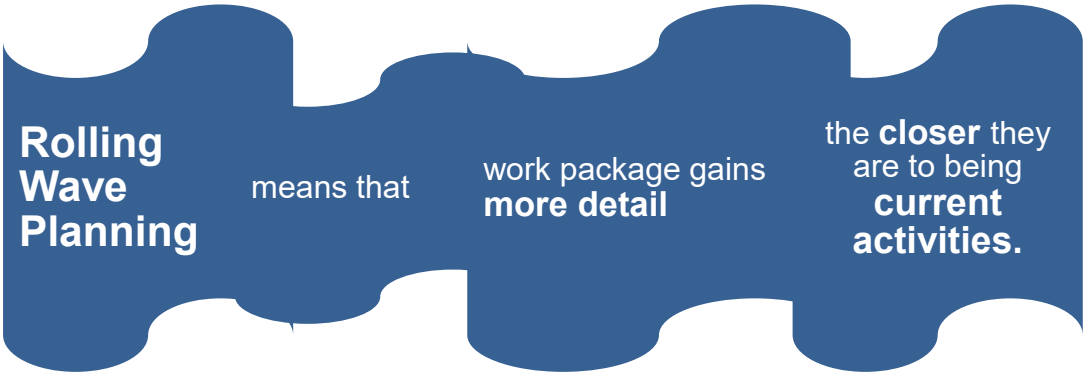
Decomposition of the upper level WBS components requires subdividing the work for each of the deliverables or subprojects into its fundamental components, where the WBS components represent verifiable products, services, or results.



The WBS can be structured as an outline, an organizational chart, a fishbone diagram, or other method. Verifying the correctness of the decomposition requires determining that the lower-level WBS components are those that are necessary and sufficient for completion of the corresponding higher-level deliverables.

Different deliverables can have different levels of decomposition. To arrive at a work package, the work for some deliverables needs to be decomposed only to the next level, while others need additional levels of decomposition. As the work is decomposed to greater levels of detail, the ability to plan, manage, and control the work is enhanced. However, excessive decomposition can lead to non-productive management effort, inefficient use of resources, and decreased efficiency in performing the work.

Decomposition may not be possible for a deliverable or subproject that will be accomplished far into the future. The project management team usually waits until the deliverable or subproject is clarified so the details of the WBS can be developed. This technique is sometimes referred to as rolling wave planning.



The WBS represents all product and project work, including the project management work. The total of the work at the lowest levels must roll up to the higher levels so that nothing is left out and no extra work is completed. This is sometimes called the 100% rule.

The WBS should be designed and developed carefully as it will typically form the basis for a variety of other aspects of the project environment – for example: project costing, the validation of organizational responsibilities, risk analysis, the coordination of objectives and project control.

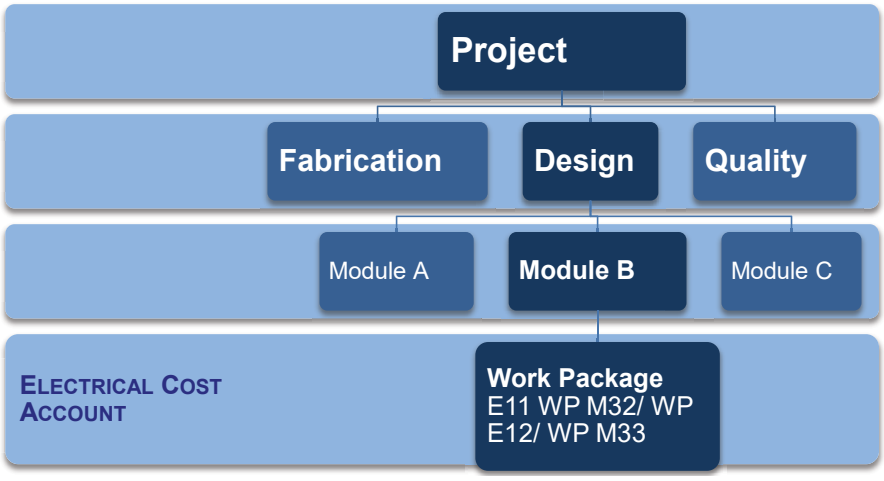
Project managers normally manage at the top three levels of the WBS and also provide management reports at this level. Some organizations have attempted to standardize management reports by imposing a generic structure to the top three levels of the structure diagram across all projects. This approach may work in cases where an organization runs a large number of very similar projects – but it is not well suited to the majority of organizations – that run a variety of projects that differ fundamentally in some way.

The WBS typically supports different types of managerial actions at different levels. For example:

Authorization and release of work is generally carried out at level 1
Budgets are normally prepared at level 2
Schedules at level 3

Other characteristics that can normally be applied to different levels of the work breakdown structure include:

1. The top three levels reflect project-wide efforts and should not be related to specific departments, whose efforts should be addressed at lower levels. Each element of work should be assigned to only one level of effort. At the lowest levels the work packages should be identifiable and homogeneous.
2. The term work package is a generic name for a low-level task or job assignment – it describes a discrete piece of work and facilitates the monitoring and reporting of work in progress.



3. Different industries and organizations have a variety of strangely named documents for authorizing and assigning work. However, whatever it is called, the work package is the critical component that facilitates management of the WBS. Work packages should be natural subdivisions of effort planned according to the way the work will be carried out.
4. Work packages may be supported by additional documentation, which is generically termed a work package description to ensure that those carrying out, supervising and monitoring the work in progress are clear about exactly what is intended.

WBS for New Model Project		
Project: New Model		01-00-00
Sub-project 1	Analysis	01-01-00
	Task 1: Marketing Study	01-01-01
	Task 2: Cost Benefit Analysis	01-01-02
Sub-project 2	Design	01-02-00
	Task 1: Concept Sketches	01-02-01
	Task 2: Engineering Drawings	01-02-02
Sub-project 3	Prototype	01-03-00
	Task 1: Fabrication	01-03-01
	Task 2: Installation	01-03-02
	Task 3: Safety Testing	01-03-03
	Task 4: Efficiency Testing	01-03-04

This illustration shows a simple WBS and its associated numbering system. The first number represents the total project, the second represents the first sub-project, the third identifies a task within it, and so on. From this table it is easy to see that:

Component numbered 01-03-03 represents task 3 of sub-project 3.

Because so many other aspects of the project depend on the work breakdown structure care should be taken to create an accurate and workable diagram. One of the most important tasks is to ensure that it contains the right number of levels – the consequences of having too many or too few should be apparent.

There are some basic rules to consider when producing a WBS because the resultant diagram achieves a clear indication of the work involved together with an improved level of buy-in from team members due to their involvement with the work and estimation process.

- Ensure that team members assist in drafting the WBS in a systematic way
- Make sure that only the work required to meet project deliverables is included
- Any work not included in the WBS must fall outside of the scope of the project
- The WBS and its support documentation should be easy to understand
- Work should not be subdivided arbitrarily to the lowest possible level.
- WBS elements at the lowest control level should typically range from 0.5% to 2.5% of total project budget.
- No task should be less than 8 hours or more than 80 hours.

The WBS is an absolutely critical document and the success of the project depends upon it being done thoroughly.

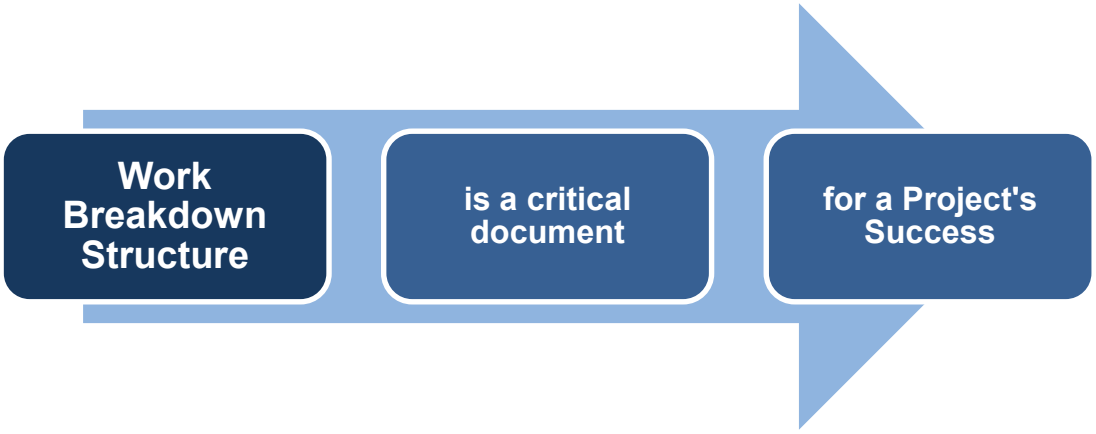
The WBS Dictionary is a document generated that provides more detailed descriptions of the components in the WBS, including work packages and control accounts.
The WBS is input to most of the planning processes, for example:

- Cost Estimating
- Cost Budgeting
- Scope Control
- Activity Definition
- Plan Purchases and Acquisitions

Furthermore, you should be aware that the WBS can be developed to reflect the trust that you have in specific line groups, by leaving them the autonomy over specific areas of work. Finally, always remember that projects are dynamic working environments, so try to maintain flexibility wherever possible.

A great deal of work is required to produce a comprehensive WBS but the benefits of using this approach mean there is less chance of work being missed. The project team will also have a better understanding of the work together with the knowledge of whether element fits into the overall scheme.

Dissemination of the WBS to all stakeholders will maintain the cooperation and communication link, which may in turn help manage the project and expectations. Another vital benefit is the team's buy into the document for the opportunity to ensure everyone remains focused on the output of the project.



Once the WBS has been completed it then becomes a valuable tool for the overall management of the project. It is of particular use when you need to evaluate the impact of a requested change in scope and also when reassessing the scope of the project due to an approved change. The WBS is critical in controlling the scope because if something is not within the WBS then it is outside of the scope of the project.

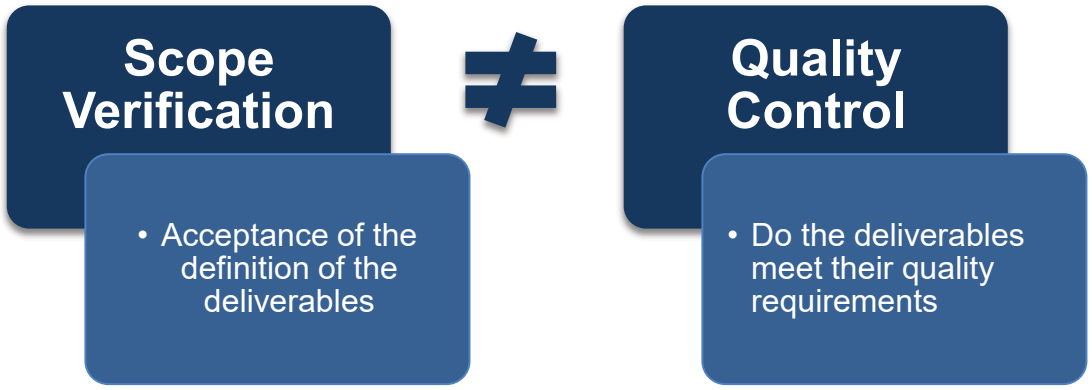
In summary, the work breakdown structure (WBS), is a description of all the deliverables to be provided in fulfilment of the project. Creating it is the process of subdividing project deliverables and project work into smaller, more manageable components that provide a structured vision of what has to be delivered. The WBS is a list of deliverable items to give the project team a visual of the work to be accomplished.

Key Points

- The creation of the work breakdown structure (WBS) should be one of the first steps in the planning process, once the requirements specification for the project has been written.
- It is a description of all the deliverables to be provided in fulfilment of the project.
- It is created by subdividing project deliverables and project work into smaller, more manageable components that provide a structured vision of what has to be delivered.
- It provides the framework on which costs, time and schedule performance can be compared against the budget.
- It also enables the work to be broken down into smaller elements, which should result in the identification of all the activities required by the project.

8 VALIDATING & CONTROLLING THE SCOPE

Scope validation confirms that the work being considered matches the details in the WBS, project scope plan and project plan. This is done using reviews or audits and user trials. It differs from quality control because it is concerned with the acceptance of the definition of the deliverables while quality control is concerned with whether or not the deliverables meet their quality requirements.



If a project has to be terminated early for any reason the process of scope verification is still required to determine the degree of project success. The verification report document should document what was achieved up to the point of termination because this information could establish the start point for follow up action.

Once the approval of a deliverable is formally declared, project documentation should be generated to state acceptance of this fact. Sometimes confirmation of acceptance may need to be signed off by both the sponsor and customer before formal compliance is granted. If a deliverable is not accepted then a formal document stating noncompliance should be produced instead. In other words, if the deliverables are accepted, then the project continues as before; however, if the deliverables are not accepted, then change requests are generated which will bring the deliverables in line with the customer's requirements.

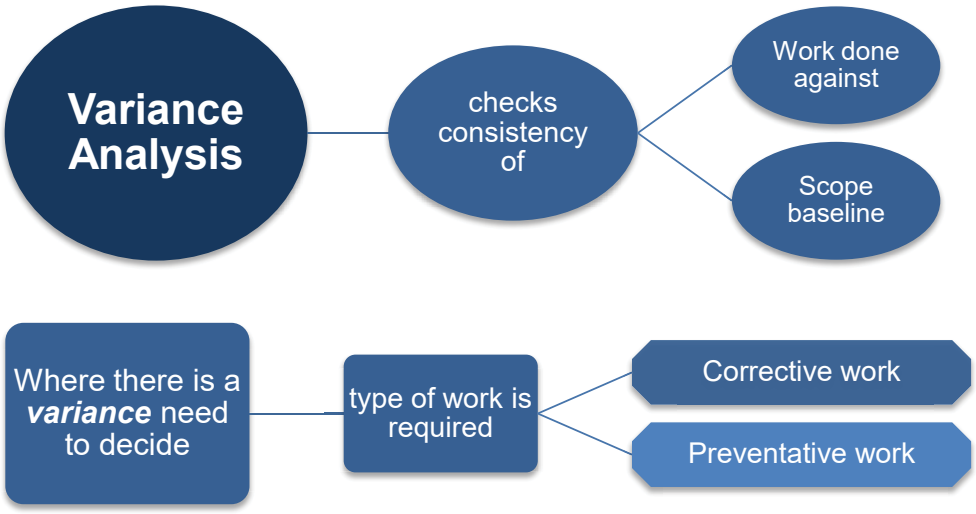
Inspection includes activities such as measuring, examining, and verifying to determine whether work and deliverables meet requirements and product acceptance criteria. Inspections are sometimes called reviews, product reviews, audits, and walkthroughs. In some application areas, these different terms have narrow and specific meanings.

Controlling the scope means managing the changes to the scope baseline. There will inevitably be changes to this but it is important to ensure that these changes do not build upon each other incrementally. This is something referred to as scope creep and always produces unacceptable risks because the combined effects of these incremental changes are seldom considered in total.

The project plan contains the following components to control scope:

- Scope Baseline – this represents the approved project scope and is used during scope change management to determine and prevent scope creep. The scope baseline comprises the project scope statement, work breakdown structure and WBS dictionary.
- Scope plan – this is a subsidiary of the project plan that describes how scope will be managed, controlled and details the management and approval procedure for changes to the scope baseline.
- Change management plan – this represents an ongoing process and is outlined during the planning phase of the project and describes the steps that will be followed to initiate, review, and resolve change requests within the project. Its intended audience is the project manager, project team, project sponsor and any senior leaders whose support is needed to carry out the plan.
- Configuration management plan – this is designed to ensure that adequate controls are in place over all processes, configuration items and project deliverables.
- Requirements management plan – this is a subsidiary of the project plan and describes how requirements will be prioritized, managed, controlled and details the management and approval procedure for changes to the scope baseline.

Project performance measurements are used to assess the magnitude of variation from the original scope baseline. Important aspects of project scope control include determining the cause and degree of variance relative to the scope baseline and deciding whether corrective or preventive action is required.



Using this information the project manager can check whether there is consistency between the work actually performed and the scope baseline. In case of any differences the project manager can propose corrective or preventative action by issuing change requests, which may lead to updates to the project plan.

The first stage of this evaluation means that a requested change is thoroughly reviewed against the product scope of the project scope before passing on to the next process. The justification for a change could be generated from variance identified from the work performance information. The outcome could then determine the corrective action is required to eliminate the variance. After completing the first evaluation a requested change, corrective action can only be considered once it has been through the integrated change control process.

If the action is successfully approved the next step is to return to scope control and update the project plan and components of the scope baseline. If the approved changes have an affect on the project scope then you may need to revise and reissue the project scope statement, the work breakdown structure and the WBS dictionary.

Analysis of scope performance can result in a change request to the scope baseline or other components of the project plan. Change requests can include preventive or corrective actions or defect repairs. Change requests are processed for review and disposition according to the change control process.

Key Points

- Scope validation confirms that the work being considered matches the details in the WBS, scope plan and project plan.
- Controlling the scope means managing the changes to the scope baseline. There will inevitably be changes to this but it is important to ensure that these changes do not build upon each other incrementally.
- This is something referred to as scope creep and always produces unacceptable risks because the combined effects of these incremental changes are seldom considered in total.

SUMMARY

Project management is a complex activity that requires a structure, procedures and processes that are appropriate to your project. This will enable you to manage the inevitable changes that occur throughout a project's lifespan in a professional manner to ensure success. Each project function describes the expertise, skills and tools needed for your project.

So much work is now run as projects and so few people have the necessary skills to manage them properly that there is a huge demand for good project managers and that demand is increasing all the time.

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