Abstract

Through our experience working with project teams in many industries on hundreds of projects, we recognize that although Project Managers and project teams may understand the theory and value of developing a Project Scope Statement, many do not have viable tools, techniques or processes for creating a one. Unfortunately, Project Managers may attempt to write the Project Scope Statement on their own or assign this effort to a team member. Often, they move forward with a scope statement completed by one person or route the scope statement to other stakeholders seeking input, buy-in, or approval. This process can take weeks and usually results in missing portions of key information needed to effectively manage scope on the project. In this situation, Project Managers are faced with spending too much time trying to recognize and manage scope creep due to unclear project boundaries. This paper illustrates how to build a scope statement while gaining alignment from all project stakeholders in a matter of days. The alignment gained in the scoping effort will carry through the remainder of the project. This paper presents core concepts to effectively plan and run a scope statement workshop, using collaborative JAD techniques, to build the needed scope outputs for a project.

Scope Management Overview

Project Scope Management involves ensuring all of the required work and only the required work necessary to complete the project is accomplished (PMI, 2004, p103). Any work that does not support the needs of the project is Out Of Scope and should not be performed. This concept seems obvious, but unfortunately only 29% of projects are completed successfully. This means 71% of projects either fail outright or are “challenged” - completed over budget, behind schedule, or deliver fewer features and functions than the Customer expected (Standish Group, 2004).

The top 4 factors associated with project failures are:

* Poor End-User / Customer Involvement
* Poor Executive Management Support
* Improper Planning
* Unclear Statements of Requirements

Facilitated Workshop Overview

JAD (Joint Application Design) workshops can effectively address poor End-User / Customer involvement, poor executive management support and unclear statement of requirements by incorporating collaborative techniques. JAD workshops are led by a neutral Facilitator (i.e., someone without a stake in the project) to engage all the appropriate stakeholders as participants in a workshop to make project decisions and create project deliverables.

JAD workshops must be fully planned prior to conducting the workshop. Planning enables the project management team and the Facilitator to agree on the scope deliverables and activities for creating these deliverables in the workshop. A standard Planning Template and Facilitator’s Agenda can save time preparing for the workshop and creates consistency in the planning effort. The Facilitator conducts the workshop using collaborative techniques to collect information, validate this information and continually adjust it to ensure it is clear, complete and addresses the needs of the project. The results of facilitated JAD workshops are consensus among workshop participants, ownership, and buy-in on all decisions made and all deliverables produced.

The Project Scope Statement Workshop

The Project Scope Statement provides the documented basis for making all project decisions and is used to direct the project effort and communicate the project scope to the project team and other project stakeholders. Projects that do not have a Project Scope Statement are plagued with scope creep issues. When a project team creates a Project Scope Statement early in the project lifecycle, they define the boundaries of the project. The team understands the business need and the expected outcome of the project, recognizes constraints that will limit their options for developing a solution, are aware of assumptions regarding decisions outside their control, gain alignment on high level requirements, understand processes they are affecting, and recognize entities the project solution will interface with. These tools allow the project manager, project team and stakeholders to make informed decisions on what is included in the scope of the project, as well as recognize when all of the requirements for the project have been identified and appropriate solutions defined.

The facilitated JAD Workshop to create a Project Scope Statement includes these scope deliverables:

* Business and Project Objectives
* Context Diagram Reflecting Business Processes Impacted and External Entities (Interfaces)
* Project Constraints
* Project Assumptions
* Critical Success Factors
* Proposed Product / Service Statement

Additionally the JAD workshop produces a current Business / System Environment Assessment known as a SWOT Analysis (Strengths, Weaknesses, Opportunities, and Threats).

Business / Project Objectives

Objectives define the targeted changes in the organization the project is expected to achieve. They are the reason for the changes that will be introduced as a result of completing the project. Objectives are defined at two levels: Business Objectives and Project Objectives.

Business Objectives describe the high level results the organization expects to achieve relative to the overall business strategies. These results are achieved through the execution and implementation of one or more projects. Understanding Business Objectives helps the project team understand how their project fits in with the direction or strategic plan of the company.

* Business Objectives Example:
  + Increase sales revenues by $200,000 by the end of 2007

Project Objectives describe the changes that will occur as a direct result of the team’s specific project effort. Project Objectives state at a high level what the project team will do to address some part of the Business Objective.

* Project Objective Example:
  + Design, Build and Implement a new inventory management system replacing 3 redundant inventory systems by 2nd quarter 2007

Objectives must be understood and bought into by all project stakeholders. To help accomplish this, Objectives should be **SMART:**

* **S**pecific – the objective is clearly stated
* **M**easurable – metrics exist or can be created to determine when the objective has been met
* **A**ttainable – the team agrees the objective is realistic
* **R**elevant – the objective fits the organization’s strategic plan and supports the project charter
* **T**ime-based – a date for achieving the objective is stated. Objectives without target dates are merely dreams.

The process for documenting Objectives is to review and clarify each Objective stated in the Project Charter. If the project charter did not include the Objectives, the workshop participants will document the Objectives with help from the Project Sponsor during this activity. It is important to understand that the project team does not have the option of deciding what Objectives they want to address. The Project Sponsor must be involved since the Sponsor establishes the Objectives. Objective statements are reviewed and clarified until each statement is clear and meaningful.

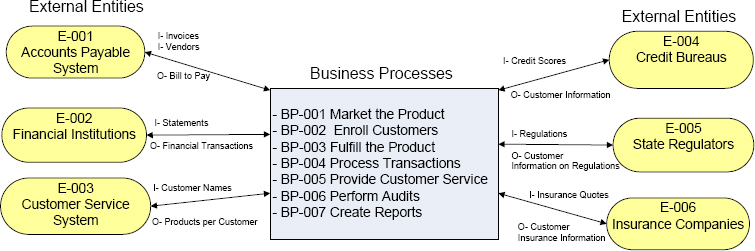
Many times, project teams are confused about the level of information captured in an Objective statement and tend to include too much detail. Objectives are high level statements. Clearly stated Objectives describe what must be accomplished, but do not communicate the details for how the Objective will be achieved. Using appropriate vocabulary will help the participants define the Objectives at the correct level. Business Objectives should start with verbs like: Improve, Reduce, Minimize, and Increase. These verbs paint the picture of the change in results the organization is striving for. Project Objectives should start with verbs like: Replace, Design, Install, Implement, and Automate. These verbs paint the high level picture of what the project team will do to achieve the change.

Context Diagram, Business Processes, External Entities

The Context Diagram is a high level picture depicting the boundaries of the project. It communicates what is “In Scope” for the project. The diagram is a one page process model - built at Level Zero (0) or the 50,000 foot level. Details about the project boundaries are not clear at this point, but understanding the major pieces of functionality and interface points are identifiable. The Context Diagram includes two components: Business Processes and External Entities (Exhibit 1). The Business Processes are presented inside the center box of the Context Diagram while the External Entities are presented as boxes surrounding the center box and connected with lines and arrows to represent flows of information.

Business Processes

A Business Process describes actions or capabilities that will be affected by the project, either changes to existing processes or creation of new processes. Project teams often confuse processes with departments (e.g., Accounting, Procurement, Marketing, etc.). A Business Process is not a department, but it does describe the work that people in departments perform. Many times this work is performed by multiple departments, a primary department (e.g. Accounts Payable Department enters, approves and pays invoices) and secondary departments (e.g., Marketing Department can initiate an invoice). Business Processes focus on the work being performed, not who is doing the work.



**Exhibit 1: Context Diagram**

Think of a Business Process as a “machine” that transforms things. It must have at least one input going into the machine and at least one output coming out. The output must be different from the input which is a result of the processing that occurred. Typically seven (7) or less Business Processes can be defined for any given project scope. Lower levels of work defined during the Business Process activity are typically pieces of a higher level process and can be rolled up into another Business Process. During the Scope Definition workshop, Business Processes will be defined at the highest level. Later in the project lifecycle, Business Processes may be decomposed into lower level sub-processes, as needed. Each Business Process should contain enough descriptive information to clearly differentiate one Business Process from another.

* Business Process Examples:
  + Calculate a Payment
  + Prepare a Meal
  + Enroll a Customer

If the project has been initiated to modify an existing product or service, a list of Business Processes from the current environment may already exist. This list can be reviewed to decide which Business Processes will be adjusted or added. If a list of Business Processes does not exist, the Facilitator will use Brainstorming to help the participants define the Business Processes affected by the project. Business Processes defined during the Scope Definition workshop are used to categorize lower level Business Requirements later during the project lifecycle.

Specific vocabulary is used to define Business Processes at the appropriate level. Business Process are stated in Verb / Noun format and describe an action being performed. The use of Action Verbs versus Empty Verbs is encouraged. When participants close their eyes they should be able to visualize the work occurring associated with Action Verbs; whereas Empty Verbs do not provide a clear picture of any action.

* Action Verb Examples:
  + Evaluate
  + Cook
  + Inspect
  + Calculate
* Empty Verb Examples:
  + Manage
  + Process
  + Handle

The Business Process brainstorm may result in 20 or 30 potential processes – remember, we are looking for 7 or less high level processes. The first brainstormed idea is reviewed, clarified and if accepted as a Business Process, it is given a unique identifier. Each subsequent idea is then reviewed and clarified. The Facilitator asks if the idea is part of a prior Business Process already defined and if so, this idea is moved to the description of the other Business Process. Through multiple review passes, similar processes are grouped together and redundant processes are deleted until 7, or less, Business Processes remain. The resulting Business Processes are copied to the Context Diagram and placed in the middle box on the diagram labeled Business Processes.

External Entities

An External Entity is a person, organization or system that performs processes which are outside the scope of the project. Inputs and Outputs are always described from the perspective of the Business Process. Business Processes either send information to the External Entity (Output) or receive information from the External Entity (Input). The project scope does not include the processes performed by the External Entities. It does include providing the interface between the Business Processes and the External Entity.

Project teams often list too many External Entities on their Context Diagram. They mistakenly assume everything the company does is affected by this project, or they fail to group similar External Entities together. Participants can validate an interface legitimately exists between the Business Processes and the External Entity by defining the information that flows between them (Inputs and Outputs).

* External Entity Examples:
  + Bank: sends statements to the Reconcile Account Business Process (input)
  + Merchant: receives payments from the Pay Bills Business Process (output)

The Facilitator will lead the workshop participants through an activity to brainstorm a list of External Entities. This list is reviewed and clarified, adding enough description to distinguish one External Entity from another. The participants will list the inputs and/or outputs associated with the External Entities. At least one input or output must be defined for the External Entity to remain on the list. Each External Entity is added to the Context Diagram as a box which surrounds the center Business Process box. A line is drawn between the External Entity box and the Business Process box with an arrow to indicate input, output or both. The inputs and outputs are also listed on the Context Diagram by placing inputs above the line and outputs below the line.

The participants conduct a final review of the Context Diagram to look for gaps. They answer these questions:

* Are any External Entities missing that need to provide something to the Business Processes or receive something from the Business Processes?
* Are any processes performed by the External Entities going to be changed and funded as a result of this project, if so, the External Entity should be removed from the diagram and the associated process should be added as a Business Process.
* Are there any major inputs or outputs missing from the diagram that would require a new External Entity to be defined?

Project Constraints

A Project Constraint is any physical, legal, or policy issue limiting the options of the project team or constraining the solution produced by the project (PMI, 2004, p89). Constraints are not likely to change during the project, but if they do change, they could create opportunities the project team may want to exploit. Constraints are typically set by sources external to the organization or by management. It is important for the project team to understand the constraints early in the project to avoid developing a solution which cannot be implemented.

* Project Constraint Examples:
  + **Physical:** All software must run on the Windows XP Platform
  + **Legal:** Only forms approved by the IRS for the specific tax year can be submitted for electronic tax returns
  + **Policy:** The Tax Preparation Software must comply with Corporate User Interface Guidelines.

Project Constraints may be provided to the project team from the Project Charter, but if they are not provided, the Facilitator will lead the workshop participants through an activity to identify the Project Constraints. After brainstorming, participants review and clarify each Constraint ensuring it is clear. It is important for the Project Sponsor and other management stakeholders to participate in this activity to ensure the project team does not randomly describe limitations that are not real Constraints for the project.

Critical Success Factors

A Critical Success Factor states major expectations the project MUST accomplish in order for the project to be considered a success. There may be many ways for the project team to provide a solution for the project, but if the solution does not satisfy the Critical Success Factors, the project is a failure. Critical Success Factors are actually high level requirements for the project. The project team has full control over work required to achieve the Critical Success Factors.

* Critical Success Factor Example:
  + The Tax Preparation Software Release must be completed in time to take software orders by Oct 1 or we miss the major segment of the 2006 tax preparation season.

A list of Critical Success Factors may be identified by the Project Sponsor or defined in the Project Charter. If a list is not provided, the Facilitator will lead a brainstorming activity to identify Critical Success Factors. This list is reviewed and clarified, with the project team acknowledging they have control over achieving each Critical Success Factor. It is important to involve representatives from the management team and the Project Sponsor to validate that the statements listed are indeed Critical Success Factors for the project.

The vocabulary used for defining Critical Success Factors includes the word “MUST” in each statement to indicate it is a known expectation of the project team.

Project Assumptions

A Project Assumption represents a decision the project team believes is valid, but may not be valid, and for which they have little control over (PMI, 2004, p89). Other project deliverables are influenced by the fact that these decisions are assumed to be valid. Due to their uncertainty, Project Assumptions contribute to risk identification during the Risk Management Process. Project Assumptions may describe the availability of other project deliverables or resource dependencies affecting the project. Any time a Project Assumption proves to be invalid, the project team needs to identify the changes to other project deliverables that were dependent on the assumption being valid.

* Project Assumptions Example:
  + The final approved tax forms from the IRS will be released and available for inclusion in the Tax Preparation Software no later than Feb 1, 2007, allowing for a timely release of the product.

An initial list of Project Assumptions may be provided in the Project Charter to be reviewed during the Scope Definition workshop. If the Project Assumptions list does not exist, the Facilitator will lead a brainstorming activity to help the workshop participants uncover the Project Assumptions. Vocabulary used for Project Assumptions includes the words “WILL BE or WILL NOT BE” in each Assumption statement to reflect the sense of uncertainty about the decision. Although Project Assumptions are defined during this activity, the list of assumptions may be added to throughout project lifecycle.

It is recommended that the Project Assumption List be reviewed at the beginning and end of each facilitated workshop, as well at all project meetings, and during Risk Identification and Monitoring, to test the validity of each Project Assumption.

Proposed Product / Service Solution

The Proposed Product / Service Solution is a high level statement or statements describing the approach the project team is considering for the project solution. This is the point where the workshop participants begin to consider Make or Build decisions for the project, as well as decisions for phasing, prototyping, and pilots. The decisions documented in this deliverable will influence the WBS and related activities, resource needs, and schedules planned for the project. The statement includes consideration of these options:

* Product Evaluation
* Product Purchase
* Product Build
* Product Re-Use
* Product Build / Purchase
* Proposed Product / Service Solution Examples:
* Product Build

▪ The project team will build all components to satisfy the required functionality of the project.

* Product Build / Purchase

▪ The project team will build A, B and C components and will purchase D and E components to satisfy the required functionality of the project.

The Facilitator will lead the participants through an activity to document various decisions regarding the solution: will pilots / prototypes will occur, will the implementation be phased, are purchases required, and if so, which parts of the solution will be purchased, and will an RFP will be developed to select a vendor.

SWOT Analysis

A SWOT Analysis is an assessment of the current environment, which is documented before developing project requirements and solutions. The SWOT Analysis consists of four (4) components:

* **S**trengths (internal to the organization) – Characteristics of the current environment to be retained in the new solution
* **W**eaknesses (internal to the organization) – Characteristics to eliminate or minimize the impacts of as part of the new solution
* **O**pportunities (external to the organization) – Elements existing outside the company which should be considered for adoption into the new solution
* **T**hreats (external to the organization) – Influences outside the company which might cause a loss of market share, competitive edge, or effect the ability to achieve the project objectives.

The Facilitator will lead a brainstorming activity allowing the workshop participants to identify each component of the SWOT Analysis separately. Questions to keep the brainstorm activity focused include:

* **Strengths Activity:** What are the characteristics in the current environment we do not want to inadvertently lose or we can capitalize on with this project?
* **Weaknesses Activity:** What are the characteristics or results we currently achieve that we want to eliminate or minimize impacts of with this project?
* **Opportunities Activity:** What new technologies, ideas, or gaps exist that we want to develop or exploit to achieve our objectives?
* **Threats Activity:** What factors or competition exists that might cause us to lose business or fail to achieve our objectives that we need to mitigate or eliminate?

After the components are brainstormed, each item is reviewed to achieve clarity. It is not realistic to assume every item from every SWOT component should be addressed by the project. Each participant will select what they consider to be the 3 - 5 most important items for each category. The facilitator will read each SWOT item, asking for a show of hands from those who selected the item as one of their top choices. Sorting the list allows the items with the largest number of votes to filter to the top. These are the SWOT items the project team will primarily focus on for developing requirements, and identifying and managing risk.

Follow Up Tasks

To complete any facilitated JAD workshop, it is important for the participants to agree on next steps. There may have been issues identified during the Scope Definition workshop which could not be resolved due to time constraints, lack of appropriate decision makers, or the resolution to the issue was not critical at this point in the project lifecycle. Follow Up Tasks are created to ensure resolution to these issues is achieved. This deliverable is sometimes referred to as an Issue Log.

* Follow Up Tasks Examples:
  + Identify legal restrictions, if any, for the new product
  + Determine if Tax Form formats are changing for the new tax year

To ensure tasks are completed, it is necessary to assign a responsible person (owner) to each task and to assign a realistic date for completion. The Facilitator will ask the workshop participants to document the next major milestone for the project, placing this on the Follow Up Task list. The due date of this milestone and the person responsible for ensuring the milestone is achieved, will be documented. Each of the remaining tasks on the list are then reviewed for clarity. If it is determined the task is still needed, the person responsible for the task is assigned. The responsible person must be someone in the workshop, to ensure proper ownership of the task, although this person may not do the work to complete the task. If the task must be completed in order to achieve the next milestone, a date prior to the milestone date is assigned. If the task is not needed to complete the next milestone, participants document the date as TBD (To Be Determined) indicating the task resolution occurs after the next milestone and a date will need to be set later.

Summary

Defining Project Scope in a collaborative workshop environment provides several advantages to the project team. Team building occurs as a result of working collaboratively to make decisions regarding the Project Scope Statement. This approach minimizes overlooking decisions, increases alignment on the project scope deliverables, and reduces confusion related to what ideas or decisions mean. When participants work together to create a realistic and achievable Project Scope Statement, team buy-in is achieved.

Management commitment is required for project teams to work collaboratively. Their support and approval is necessary to allocate the time needed to conduct and complete the workshop, and to reduce interruptions during the workshop caused by outside demands on the participants’ schedules. Although a 2 day commitment to a Scope Definition workshop may appear to be a significant time commitment, the results produced through this collaborative effort save valuable project time by eliminating costly rework later.

Organizations need to acquire or develop facilitation skills which allow JAD workshops to be successful. Workshops that are led by a neutral skilled facilitator, versus an unskilled project team member, allow the participants to focus on content and make decisions for the project, during the workshop. The Facilitator’s focus is on ensuring the appropriate processes are selected and followed, and participant interaction is effective.

A great way to introduce collaborative workshops and JAD techniques into an organization is to prove the concept one project at a time, versus introducing these techniques across the board. Select a project with high visibility to the company, and implement the JAD workshop techniques. Once the project team experiences the success and time savings of this method, they become instrumental in promoting the concept to other project teams, encouraging the use of these collaborative techniques on their next project involvement.