TAILORING SCOPE BY PROJECT

Why One Scope Description Doesn’t Fit All

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INTRODUCTION

Whenever an organization decides to build a new process, offer a new product or service to their customers, or make any kind of a change, the scope of the project must be defined. How big is this thing we are thinking about doing or building? How sophisticated is it? Who will be involved, and who will be impacted? These questions are important to assure that, before work is started, the organization understands what it has decided to do.

Both PMI® and IIBA® have used the word scope hundreds of times in their bodies of knowledge, but we don’t have consistent methods and deliverables for scope. Some teams document scope with a textual scope statement. Some teams use a diagram or model to show the system boundaries. Many teams don’t document scope at all. The goal of this article is to explore approaches to defining scope, and recommend that teams should define scope differently depending on the type of project being initiated.

Let’s start with the English definition of the word scope, which is: “1) the extent of the mind’s grasp, range of perception or understanding; 2) the range or extent of action, inquiry, or an activity.” The second definition is the important one for this article. The “range or extent of our activity” is a good description of project scope. What are we going to do, how far will it extend, and who will it impact? These are questions a strong scope statement should answer.

Note that the word scope is used as both a noun and a verb. As a verb, it is an action to create a boundary. “Let’s scope the project to see how long it would take.” As a noun, it is a deliverable, “Is that new requirement included in the Product Scope?”

As you read this article, also pay close attention to the words product and project; they are not interchangeable. Generally a product is a tangible item (a new consumer product, a software application, a mobile device) and a project is the work that needs to be done to design and build the product. This difference is critically important for defining the scope clearly. Another key term is solution. The BABOK® Guide defines solution as the set of capabilities or changes needed to solve a business problem. A solution could include hardware, software, process changes, organizational changes, or any combination of these.
PRODUCT, SOLUTION AND PROJECT SCOPE

There are numerous aspects, or types, of scope. In this paper, we will focus on product scope, project scope, and solution scope. Each of these should be considered in the scope definition, or scope statement, for every project. The extent and content of that definition will vary, based on the type of project and the project management approach being followed.

**Product scope** is the most straightforward. It describes the features and functions of the product, service, or result that will be the output of the project. In agile projects, the product scope may not be completely defined at the outset, but it still refers to the project’s expected output.

**Solution scope** includes business processes, interfaces, and dependencies. It also should include the implementation approach, if possible. Will the solution be built in phases? Will some solution components be purchased? How will the team develop the solution?

**Project scope** encompasses the work to be done in order to produce the desired product, service, or result.

One of the challenges of any industry standard is that it tries to make recommendations for every situation. Maybe we can’t have just one model or standard set of definitions for all types of projects. As the project management discipline matures, we have discovered that different types of projects require different management. For example, managing a software engineering project is very different from managing the construction of a nuclear plant. PMI® acknowledges these differences by stating at the beginning of the *PMBOK®* Guide that tailoring of project management is required, as there is no “one size fits all” in project management. These differences are detailed in *PMBOK®* Guide extensions such as the Software Extension.

So, rather than trying to design a standard scope statement or statement of work (SOW) for all projects, scoping should be tailored to the type of project and product being undertaken. Let’s look at several different types of projects.

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**For each project type, first consider why a clear scope definition is needed, and secondly, look at some suggestions about how best to define and manage the scope. Project types discussed in this article.**

**Project Type 1:** New Product or Service Developed for Sale to External Customers

**Project Type 2:** Internal Business Process Improvement

**Project Type 3:** Software Application Acquisition, Customization and Implementation

**Project Type 4:** Change to Existing Software

**Project Type 5:** Building a Plant, Warehouse, or Other Facility

**Project Type 6:** Business Intelligence, Analytics and Big Data Projects
1. NEW PRODUCT OR SERVICE
Developed for Sale to External Customers

Why Do We Scope?
When a new product or service is being designed or developed for an external customer, a clear scope description is important to make sure the product or service will meet the customers’ needs and will be profitable for the organization. If the product is being developed for one particular customer, a clear definition of scope will be the basis of a contract with the customer. The customer will want written agreements about features, functions, or capabilities to be provided by the new product. Projects in government agencies are usually focused on providing a new service to citizens within an approved budget.

For a new product to be mass produced, the organization will decide the scope and features of the new product, using focus groups, market research, and/or existing customer feedback.

Defining a clear product scope helps the customer see what they will receive and helps the organization accurately estimate costs of design and development. In agile or change-driven approaches to product development, the product scope or vision may be less detailed than in traditional approaches, but there are clear agreements about what the product is expected to deliver to its customers.

Once the desired product is understood, the work and resources needed to create it can be defined. This combination of the product requirements, resources needed, and work to be done is referred to as the project scope in the PMBOK® Guide.

An additional component that is sometimes important for technical products is how the new product will interface with existing products. For example: Will the new mobile device be able to communicate with customer’s existing systems? Existing customer systems and their possible interfaces with the new product must be considered. These interface requirements also become part of the scope definition.
1. NEW PRODUCT OR SERVICE
Developed for Sale to External Customers (cont.)

How Do We Define Scope?
New products (especially software) for external customers are often developed using an agile approach. Agile approaches offer many techniques for scoping, such as product visioning, product box, and the product roadmap. When the product will be delivered to the customer as a stand-alone product, the scope is defined by its features, functions or high-level requirements. Prototypes may be built. This is the product scope. Once the product scope is agreed upon, the team can think about what resources and work will be needed to build the product. This is the project scope.

The project scope is a bit easier to define in agile approaches because the team (number of people) is fixed, and the length of time allocated to each iteration or sprint is fixed. A product roadmap or release plan lays out the high-level direction of the work to be completed. The product scope is generally agreed to, but can change based on the product owner’s priorities. Initially, the product scope is defined and features are prioritized by the product owner. The features may be adjusted as work is completed. The project is deemed finished when the product owner feels all of the high-value features are done. Project managers (or Scrum masters) don’t always create a WBS (work breakdown structure). They may use a similar approach, decomposing high-level user stories into tasks or create a product roadmap to assist with planning. The schedule or release plan is mapped out in a release planning session and adjusted as the project moves forward. The product scope, a description of the product to be built, is part of the overall project scope. (The product scope is shown with a dashed box in this case, because it can vary. See Diagram A)
2. INTERNAL BUSINESS PROCESS IMPROVEMENT

Why Do We Scope?
When an organization decides to improve a business process, the scope of the change is very important and sometimes difficult to articulate. Scope definition is critical to keep the team focused on the specific process to be improved and prevent them from expanding their work by looking at related processes. Process improvement and reengineering approaches like Six Sigma and Lean provide diagramming tools to help visualize the current process and identify the area for improvement. Typically the team will first study the current process, collecting metrics and making observations about the problem to be solved.

Scoping the area of analysis or solution scope includes identifying which processes are candidates for change and what limitations are set on the change. For example: Can personnel changes be included? Can job descriptions or roles be changed? Can automation be recommended? Best practices suggest the business analyst look at the entire system (people, process, and tools) to find the best solution for the organization.

How Do We Define Scope?
The scope for a process improvement initiative should be defined by identifying the process(es) to be studied and possibly changed. Scope includes the people involved with and impacted by the process(es), along with procedures, business rules, decision criteria, and tools that support the process. IIBA® uses the word solution to describe the change needed to solve a business problem. Scope is often shown in a high-level process diagram like a SIPOC (Six Sigma's Supplier-Input-Process-Output-Customer. See Diagram B) or a value stream map (from Lean). The high level processes in these diagrams are defined, measured, analyzed, improved and controlled (Six Sigma's DMAIC). Getting very clear boundaries around the scope of the change is important here because it is the only way to ever “finish” a business process improvement project. Analysts love to keep learning more, so they need clear boundaries around their work.

Also note that these projects should be split into at least two separate sub-projects:
1. Study the current process(es) and make recommendations for a solution (Define, Measure, Analyze)
2. Design, develop and implement the solution (Improve, Control)

These should be separate sub-projects because it will be impossible to plan the needed project components for the solution before the analysis or study is complete.

Diagram B
3. **SOFTWARE APPLICATION Acquisition, Customization, and Implementation**

**Why Do We Scope?**

When an organization chooses to purchase a software application to support part of its business, scope is important because selecting and implementing a package is a large project and can easily get out of control. The organization should decide what it needs (high-level business requirements) before it looks at vendor offerings. Without a clear understanding and agreement about what should be included, vendor features and functions (and marketing messages) can distract evaluators from the original goal of the purchase. Vendors often offer add-ons, integrations to other packages, and customization. Starting with clear boundaries and objectives prevents the team from expanding the size of the purchase and time to completion.

**How Do We Scope?**

For these projects, there should be at least two and usually three separate sub-projects:

1. Determine needs, assess vendor options, and make a selection;
2. Perform gap analysis (no package meets every need perfectly), design customization if necessary, and perform interface analysis; and
3. Build the customization, manage the transition tasks and implement

Each sub-project should have clear scope definition. For example: How many vendors will we consider? What is our selection process? Who will build the customizations?
3. **Software Application** Acquisition, Customization, and Implementation (cont.)

A software application purchase requires significant planning and encompasses the three types of scope we have been discussing. These three types of scope are:

A. **Product scope** – the product you are purchasing (features, functions, components)
B. **Solution scope** – the product along with any customization, interfaces to existing systems, and organizational changes needed to use the product
C. **Project scope** – the work needed to purchase and implement the product (procurement, contracts, vendor relationship management, data conversion, customization, coding, etc.)

The project manager manages all three types of scope, making sure the procurement process goes as planned, along with making sure internal customization and interfaces will meet stakeholder needs. The project manager manages both vendor and internal resources as part of the project scope. Development and management of product and solution scope is often delegated to a business analyst. See Diagram C.
4. Change to Existing Software

Why Do We Scope?
Software maintenance projects grow in complexity every day. Few software applications run stand-alone, so a change to a function or feature often has far reaching impacts on other software applications and business processes. Investigating these potential impacts is necessary before the change is approved. Understanding the scope of the change and performing impact analysis allows the organization to realistically estimate the costs of the change; the impact of the change on stakeholders, and to determine the true expected value (cost/benefit analysis). Sometimes the change is simple, but the impacts significant, making the change too costly. For example, a request for a new field on a report may require a database change. If the database is used by several other systems, the change may be too expensive to justify the value gained from the updated report. Scope analysis allows the organization to make better decisions before spending money on the change.

How Do We Scope?
We define scope by identifying the software changes needed and the impacts of those changes, and then plan the project. Prototypes may be created. For a small change (adding a field to a report that is used by only one department) this might just take a few minutes. For a bigger change, more analysis will result in a more realistic estimate. Be sure to analyze the interfaces to other systems which might be impacted and other stakeholders who need to be aware of the change. Three types of scope may be useful for a large change (See Diagram D):

A. **Product scope** – the software changes to be made
B. **Solution scope** – the impacts of the changes on interfaces, processes, and people
C. **Project scope** – the work needed to make the change and implement it

Understanding the scope of the change and performing impact analysis allows the organization to realistically estimate the costs of the change; the impact of the change on stakeholders, and to determine the true expected value.
5. Building a Plant, Warehouse, or Other Facility

Why Do We Scope?
We scope a physical building or structure because we need to know how it will fit on the land, if it will meet zoning regulations, and how much it will cost to build. We need to know how much material will be needed and when skilled labor will be required. We need to look at feasibility. For example, is the proposed location for a public library close to public transportation? Often a clear description of the product scope is needed for government approval.

How Do We Scope?
Architects and engineers create detailed blueprints, specifications, and other diagrams to clearly define the final product scope. They may also build small models of the building and grounds to show stakeholders their vision for the completed product. Geological impact studies, economic impact, neighborhood impact studies, etc. may be required. These projects use traditional approaches of getting the requirements upfront, before project planning so the plan can include the needed resources, materials, and time. A formal plan is used for approvals and to secure funding. These projects may have three or more types of scope: the product itself, the environmental impacts, and the project work to create and install it. See Diagram E.
6. BUSINESS INTELLIGENCE, ANALYTICS, AND BIG DATA PROJECTS

Why Do We Scope?
Projects that use existing data stores to predict behaviors or improve decision making are referred to as business intelligence (BI), predictive analytics, or Big Data. As the name Big Data implies, organizations have amassed vast amounts of information. They look into that data for patterns, and use the patterns to improve decisions. These projects require clear scope definition for the same reason as business process improvement projects: without clear boundaries, analysts and data scientists can analyze forever, looking for connections and patterns in an infinite number of combinations. The organization must have a clear goal in mind and determine the “definition of done” for the project.

How Do We Scope?
BI projects can be thought of as research projects. An executive may ask: “How can we predict the future buying habits of our customers?” or “Can we determine which of our customers brings us the most value, so we can enhance our relationship with them?” A clear scope definition must be based on the goal of the research, not the number of data sources to be mined. The desired goal should have measurements for the expected value, so the team can monitor how much time and money should be spent trying to find the answer. See diagram F. For example: “Can we predict which of our customers will not renew their subscriptions? Let’s spend $10,000 to try to find out.” Some of these goals will not be achievable: “We can’t find any common patterns between customers who renew their subscriptions and those who don’t.” The team must set limits around how much time and money they are willing to spend to find an answer, and at what point they will stop looking.

Big Data projects require clear scope definition for the same reason as business process improvement projects: without clear boundaries, analysts and data scientists can analyze forever, looking for connections and patterns in an infinite number of combinations.
Conclusion

Scope creep occurs whenever we add more to the product or solution than was originally agreed upon. Effective definition of project, product, and solution scope is key to preventing or limiting scope creep. Clear descriptions of what is part of the project, and how will we achieve it, put clear boundaries on every aspect of the project. This makes life easier for the project manager, as well as providing a clear reference for the team of what they are chartered to do, and what is not in the project. (One of the big benefits of agile approaches is that scope doesn’t need to be so strictly defined at the beginning. Time and cost are fixed, and the product owner can change the priorities at the end of each iteration or release, based on which product features are most important at the time.)

As with many endeavors, the cliché, “think before you act,” really applies to projects. Analyzing the benefits, costs, and ramifications of a project (or potential project) and getting agreement about the scope of the work always results in a better use of organizational time and resources. Clearly defining the appropriate scope at the appropriate level of detail is worth the upfront time required. Having clear definitions of scope doesn’t guarantee there won’t be changes during the project. It does, however, give the team a shared understanding of when requested changes threaten to expand the work beyond the agreed-upon scope, thereby preventing scope creep and keeping the project on target.

Different product and project types require different approaches to scope. Project managers and business analysts must consider both individual stakeholders’ and organizational goals when deciding how best to analyze and represent scope. To get agreement about the scope boundaries requires a clear, realistic presentation of the proposed product and its impacts, along with realistic estimates of the expected business value of the project.

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Scope Recommendations by Project Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Product or Service Developed for Sale to External Customers</td>
<td>First develop a vision of the product, and then use it to decide the skills needed on the team and develop release plans.</td>
</tr>
<tr>
<td>Internal Business Process Improvement</td>
<td>Decide which processes will be studied and break work into two sub-projects: 1) study, 2) improve.</td>
</tr>
<tr>
<td>Software Application Acquisition, Customization and Implementation</td>
<td>Get agreement about needed functionality before looking at vendor offerings. Once a package is selected, analyze gaps, decide on customization, and build an implementation plan.</td>
</tr>
<tr>
<td>Change to Existing Software</td>
<td>Determine the needed changes, analyze impacts, and plan how the changes will be completed.</td>
</tr>
<tr>
<td>Building a Plant, Warehouse, or other Facility</td>
<td>Elicit requirements and design the facility considering environmental factors. Develop project scope of work based on construction and engineering needs.</td>
</tr>
<tr>
<td>Business Intelligence, Analytics and Big Data Projects</td>
<td>Be sure to understand the goal of the work – the question you are trying to answer – and how much you are willing to spend to find the answer.</td>
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</tbody>
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ABOUT RMC Learning Solutions™

RMC Learning Solutions develops and trains project managers, business analysts and agile practitioners by helping them learn the skills necessary to succeed in their careers. We deliver a wide range of training in multiple learning formats across the globe.

Founded in 1991 by Rita Mulcahy, the company continues to develop and provide innovative, real-world tools and instruction, delivered by professionals with extensive experience and a working knowledge of industry best practices.

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