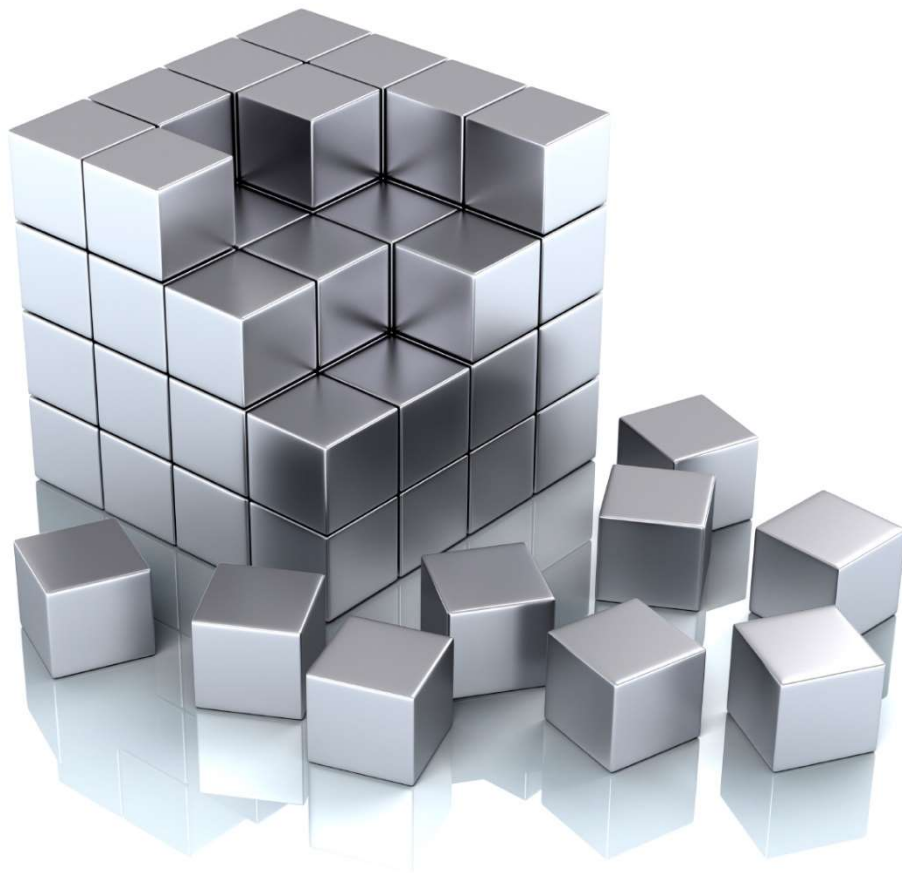# COMPONENT-BASED
WORK BREAKDOWN STRUCTURES –

A Simplified Version

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COMPONENT-BASED WORK BREAKDOWN STRUCTURES – A SIMPLIFIED VERSION

Abstract

This paper discusses using a component-based work breakdown structure (WBS) to develop individual components that add value to project planning efficiency. These components can be put into a "catalog of components" to be used by everyone in an organization. A component is a small piece of work that can be used from one project to another, and can be built with information that an organization views as valuable. The information will come from previous project knowledge, saving it to be reused. The information that is captured for each component can help enable a project to make important or even critical decisions. These components can then be used as "building blocks" to quickly construct a baseline project management plan. Although this information will still need to be validated by the new project team, it could provide a project manager with a quick start to a new project.

Introduction

This article is designed to help you understand the concepts behind a component-based work breakdown structure (WBS) and using it to enhance your organization's planning efficiency.

Although a project by its nature is unique, most organizations or departments—and even project managers—run projects that have similarities from one project to another. Software development companies, for example, will have project management plans that include requirements gathering, software development, and software testing. Companies that run large capital projects have project management plans that may contain sections for design/build, option selection, and startup. These are just a couple examples of how some companies develop plans/schedules that contain "components" that are similar or repeatable. Please keep in mind that *similar* or *repeatable* does not

mean that from project to project these items need to be the same; it just means that they contain enough information that reusing them can add real value in more ways than one.

The concept of a component-based work breakdown structure (CBWBS) is not new; it got its start with the United States Navy (Luby, Peel, & Swahl, 1995). Although the U.S. Navy had a specific use case for the CBWBS in developing repeatable, high-quality plans for building/retrofitting large naval vessels like nuclear submarines, destroyers, and aircraft carriers, this basic concept can be carried over to almost any company that executes projects that are similar in nature. The Navy took this concept to a level of detail that was required for billion-dollar projects because quality, efficiency, and timing were critical. Can it work for any company? Does a CBWBS need to be mega complicated to still provide value?

The answer to that question is *no*—and the rest of this article will explain why.

What Is a Component?

A component is a small piece of work. Something that can be set up in a way that you would want "the majority" of the work within the component to be standard. The dates and times will change, the work effort may change, but the tasks themselves should stay the same. The example in Figure 1 is an extremely simple example, but it shows the concept. In this case, "training material" is the component. This component is made up of three tasks: gathering requirements, developing training materials, and shipping to the training location. The premise is that each time you want to develop training materials, you will need to do these same three things. The training materials themselves will be different with each project, but the tasks will or should remain the same. The best part about this simple process is that even if you need to add additional tasks, you can. But this component gives you a starting point, along with any valuable information that is stored with the component.

Figure 1: Component example simple.

What Value Does This Bring to Your Project?

Components allow you to quickly take known/proven information and begin building your project management plan. Project managers can then start validating their plan with their project team, faster than they were ever able to do before. The project team now has access to knowledge that probably would have never been passed from one project to another (or one project manager to another), and all using a simple catalog of components.

Why Is This Important?

More importantly: Why should this be important? We lose so much internal knowledge from project to project and from project manager to project manager. Companies struggle with finding a good way to share lessons learned, best practices, or simply just good general project management principles. They spend countless hours trying to figure out sophisticated databases that they can query, or file storage systems like Box.com that will allow them to search. These solutions have merit, but it takes a lot of time, energy, money, and discipline to implement them. Once implemented, their usefulness typically wears off in a very short period. Components are simple; they can be maintained in a Microsoft Excel spreadsheet. Although you would want to put a process together to maintain this information, again, it doesn't have to be complicated. Keep the process simple, keep the information simple and valuable to your organization, and keep the tool simple. Prototype it for your organization before building it out to a more robust tool. It is important to gain acceptance regarding how valuable components can be before making any larger investments in either time or money.

What Is an Example of the Type of Information You Could Capture as Part of the Component?

Below is just an example of the type of information that could be kept with each task and/or within each component. Things that I would consider important (but might be different for you or your organization) include:

- Risk information

- Who does the work

- What the work effort would be

- What was the actual duration

- Cost information

- Comments

The information that you track as part of a component should be what is important to your organization, your department, or your company; typically, information that, once known, can help you make better decisions. This information can help mitigate risk, understand resource requirements, or even resource capabilities. It really doesn't matter what you capture, if the information has value to the group using it.
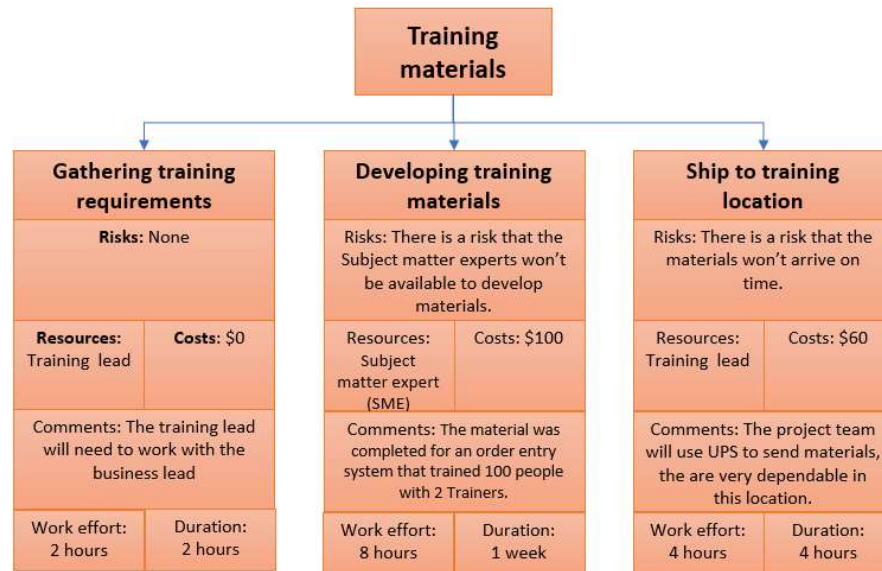
Figure 2: Component example detailed.

What Advantage Does This Give You When Planning and Scheduling?

Valuable planning information can be stored with each task. In the example in Figure 2, both the work effort and the duration for each task are indicated. This information will be helpful regardless of whether you schedule based on duration or work effort. I am also including the resource needed, and in the comments have included one of the tasks—the level of capability of the resource. This type of information would be important to understand when resourcing a project, or when evaluating the resources against the schedule. The information included in each of these tasks is intended to help project managers make better, more informed decisions in both planning and scheduling.

Practical Example

Now, let's talk about where this can really pay off. The boss walks up to the project manager's desk and hands them a new assignment: they are going to be the project manager for a new product launch. This launch is similar to one that was done by the project manager's predecessor, who left the company a few months ago. The boss instructs the project manager to get a team together and present a plan by the end of the week.

This is a very high-profile project, and everyone expects the project manager to have a highly successful launch. The boss gives them a little advice and warns them to be careful to not to fall into the same type of problems that the previous project experienced. Unfortunately, the project manager does not have access to any of the prior project manager's files, and, even if they did, the former project manager was known for very incomplete documentation.

Now, let's see how using a CBWBS and a catalog of components can help. A product launch is a great example to use. It has quite a few things that could be broken up into individual components. You can create almost an entire project management plan just by using components as "building blocks."

Our new project manager begins by sitting down with the new project team and selecting the components that could apply to this project. The list below shows a sample of what was selected, and what was not selected. Keep in mind, even similar projects will not always need to share all the same tasks.

WBS	Name	Risks	Resources	Costs	Complexity	Comments	Work	Duration
1	**Product launch planning**						2 weeks	1 month
1.2	Determine sales objectives	Make sure to include senior leadership	Business owner, sales director		Low	There were issues identified late in the project due to senior leadership not being included in the beginning of the project	4 hours	1 week
1.3	Define launch goals (launch timing and publicity objectives)		Sponsor, business owner, project manager				4 hours	1 week
1.4	**Determine partners (if needed)**						2 weeks	1 month
1.4.1	Identify channel partners	Takes time	Sales		Medium		2 weeks	1 month
1.4.2	Identify retail partners	Takes time	Sales		Medium		2 weeks	1 month
1.4.3	Identify online opportunities	Takes time / need to include the right "thought leadership"	Business owner		Medium		1 week	1 month
1.5	Establish launch budget	Make sure to include budget for digital work	Business owner, project manager, finance lead		Medium	There was no budget included for the digital work	8 hours	2 weeks

Figure 3: Catalog example (product launch planning).

Next, our new project manager works with the team to evaluate each component and determine how the information applies to the current project. In this new example, the boss cautioned the project manager to be aware of the previous project's risks, so the project manager made sure to pay

close attention to that information in each task. This paid off when they identified two risks in planning that could have had an impact on the project if they had not known about them at all. Apparently, the previous project did not include senior leadership when determining the sales objectives. That risk made a lot of sense to the project manager, since they had heard rumors that the last product launch was not aligned with corporate objectives. It failed to have leadership support or even approval when it came to the final launch. The new project manager made note to make sure that leadership was brought in and included from the very beginning. The next risk noted had to do with digital. There was no digital work included in the budget up front. That would explain the cost overrun that the last project reported. These two risks alone were extremely helpful to the new project manager.

Now that the team has worked through the known components, they are ready to build out the rest of their plan. Our new project manager estimated that this one-day exercise saved them weeks of planning, and potentially time/cost savings that would have been lost had they not identified the risks called out in the "product launch planning" component.

Components won't build your entire project, but they can give you a starting point, with valuable information in every task. This alone will speed up the process. You can save the time of working through each task and determining the resources, work, and duration. You can have those things defined in each component. You will have to validate the information as you use it, but doing 20% of the work versus 100% should help you move faster, be more efficient, and provide you with better quality projects.

Conclusion

Project management has come a long way, and yet we still can't seem to be consistently successful. We still fail at an unacceptable rate. I believe that one of the reasons for this is that we

don't learn from our own mistakes, and we don't successfully teach others about those mistakes. We lose so much knowledge when project managers leave companies for other opportunities or retire after decades of service. There is so much great information that we keep to ourselves, primarily because there is no great way to pass it on. Do I think that CBWBS is a perfect solution? No, but it is a great start and a simple solution that any company can try. The most important thing to remember is to keep it simple. You can set it up anyway you want—it can be simple or complicated. It's all up to you. My recommendation would be to start small, use a simple spreadsheet, pick a few components that mean the most to your group, and see if it makes sense. If after a few projects you don't see the value, then you're not out a thing. If you start seeing how much it can offer, start adding additional components and start building out your catalog. I believe that if you give it a try and really think it through, you should see real value in using a component based WBS and developing your own catalog of components.

Reference

Luby, R. E., Peel, D., & Swahl, W. (1995). Component-based work breakdown structure (CBWBS). *Project Management Journal, 26*(4), 38–43.

About the Author

Brenda L. Taylor, MS, PMP, is the President and Co-Founder of Cox Premier Consulting, LLC. She has been a project manager for over 25 years, and has spent the majority of that time in manufacturing.

Ms. Taylor has run many large, complex IT projects including several SAP implementations. She also led a project management office (PMO) for a global construction materials company and has instituted demand/resource management for a large IT organization to help facilitate project performance and execution. She earned her Project Management Professional (PMP)® certification in 2002 and holds a master's degree in project management from George Washington University.