

If your project milestones are missed, making budgets bloat, Work Breakdown Structure (WBS) can help by providing a bird's eye view of the situation for CEOs.

WORK BREAKDOWN STRUCTURE

—YOU MAY NOT KNOW IT, BUT YOU NEED IT

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PROGRAM, PROJECT OR JOB MANAGEMENT – to a CEO or a computer system, it's all the same. Are we hitting our project targets? Are we within budget to date? What's our estimate to completion? How do earned value and actual value compare? Do we have acceptable data to obtain prepayments from our customers based on reaching our milestones?

If you're a project-oriented manufacturer – make-to-stock, make-to-order, or engineer-to-order – these are questions you ask in one way or another each and every day. Your organization has to keep track of almost each and every part, when it was bought and for which compartment (WBS), and when it is due to be sent on to the next station and/or shipped. Plus, you need to know how much it costs and to which budget it must be allocated.

Oftentimes, depending on the size of the contract, the people running these projects probably report directly to the CEO. If not, for a project-oriented manufacturer, they're typically only a level below. Regardless, if your company has one project going, it probably has many projects, jobs, or customer orders being undertaken at the same time. This is important. Without having actual, real-time data, you could have several projects going bad at the same time, and – here's the kicker – you wouldn't even know it until it's too late.

WBS and Other Jargon

WBS IS ACTUALLY common sense reporting that most CEOs attempt to undertake as second nature. The problem is that some tools are needed. The original builders of these tools provided names for them that the actual users never would ever have created. So, let's define them in English and then rename them for you in program vernacular.

When you begin a project (job, program, et al), you set up milestones. You also allocate a percentage of your budget for each milestone. As a mile-

stone is reached, you want your project team to show you that they met their goal in a specific amount of time at a specific cost that is, hopefully, within budget. Your project team, though, will tell you that they have "earned" the estimated cost of this portion of the project. If their cost was \$100,000 and their budget was \$100,000, they will have earned a value of \$100,000 within your time schedule. That's, of course, a scenario for the perfect project.

I don't know about your firm, but we haven't had the perfect project yet; so now we'll get into "earned" and all the rest of the project management names and acronyms and see how they make sense for you:

- Budgeted cost of work performed (i.e. Earned) – BCWP
- Actual cost of work performed – ACWP
- Budgeted cost of work scheduled – BCWS

These terms know each other on a first-name basis and are interrelated. With them, you can measure any project's performance. For example, comparing BCWS to BCWP gives you your schedule variance, while the relationship of BCWP to ACWP provides your cost variance. There are more acronyms, but these get the point across. Bottom line – you can measure the performance of a project.

What WBS Does for You

WBS LETS EACH department in your organization look at your numbers in the way they want and need. Take the word "costs." Costs, along with payables and receivables information, allow your accountant to put together a financial picture of your company that your Board can review and com-

pare from month to month. Costs determined by product will show where you are spending your money. Labor costs can be compartmentalized by employee grade. Department costs show where your greatest investments in assets are located. And, if you're a contract or job shop manufacturer, you will want many of these costs segregated by customer or job order. That's a requirement of project management!

Indeed, you want to be able to monitor the actual procurement and production that goes into a project against an estimate. You would like to sum up material, labor, overhead, subcontract and other direct charges for each individual project and compare these costs against your total estimate for the project. Then, you could determine, through any given period, your earned value.

Obtaining the data to provide these calculations is not difficult. A project cost system simply needs to capture and record costs through the end of each period, plus the budgets for each cost element, plus the BCWP for each period. To do so, each cost charge needs to be stamped with a time period. And, of course, there must be a budgeted amount for each cost element for each time period.

Perhaps, you're an engineer-to-order firm. You engineer, prototype and run production of product well in advance of finally shipping production product and would like to receive prepayments on milestones reached. Using WBS, you will establish budgets – by period and cost element – for subgroups such as software design, mechanical engineering, electrical prototyping, final assembly and so on. A cost account manager will be responsible for each.

This is WBS. In this case, we have a three-level WBS with the top level reporting to the program manager (the Detroit, Inc. program), the second level being the individual manager's WBS (Turbo Valve 2 project) and the subdepartment cost account manager level (tooling) being the third. In this three-level WBS, cost accumulation, the budget and the cost performance measurement must be available at the lowest level. Each person concerned with the WBS information must be able to get what he or she needs without impacting any-

body else's data. Yet, there are all sorts of people in the corporation that don't want their data soiled with time stamps.

Most enterprise resource planning (ERP) providers have not solved this problem; because of our background in aerospace, Relevant has. Typically, a project control module lets you associate inventory items, sales orders, work orders, purchase requirements and purchase orders with each project. With project-oriented material requirements planning (MRP), you even have the flexibility to plan by project or not. Certain items can be planned without regard to projects to increase purchasing or manufacturing efficiencies. Such an item could be a subcomponent, a bolt, or screw used throughout your company's products. Project control, though, will control allocation of material or finished subcomponents to any specific projects. Ultimately, each manufacturing work order and purchase order line will be associated with an individual project.

The WBS Module

WORKING IN consort with the project control module will be the WBS module, providing the WBS for each project and each multi-level of the project. A WBS program defines the posting level accounts and the summarization program that rolls up costs from the lowest level to the higher levels. As you obtain individual contracts or sales orders, you will enter them into the system. Budget figures – in both dollars and hours – will be entered. From that point on, multiple budgets will be provided: original, revised, and current. As transactions are processed in other modules, the costs associated will be posted to the WBS structure automatically.

There's One Big Problem

ALTHOUGH YOUR project management people have project management software, it's being fed batched ERP data that needs translation. In other

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words, the data required is being collected as described; then it is sent to the project management team where it is translated into a format usable by their project management software and, only then, actually run. By the time the data is turned into information, the report is typically days or weeks old.

The WBS modules from the ERP vendors were not formatted to the needs of the project management software vendors, which provide all the calculations required to monitor projects. We learned that ERP modules need four architectural capabilities to support real-time project management:

- Inventories, costs, shop orders, purchase orders, requisitions, receipts, and sales orders must be maintained by item number as well as by project and WBS account.
- Costed transactions, including all material movement and labor transactions, are not only the basis for accounting's business-as-usual general journal entries, but, in real time, update the project/WBS cost components of material, labor, overhead, subcontract, and other direct costs and selling, general, and administrative – which are used in all ACWP (Actual Cost) and BCWP (Earned Value) calculations.
- A cross-reference must be maintained between the ACWP costed transaction and the general journal entry.

- ACWP and BCWP costed transactions must be as up-to-the-minute for the project management department as the journal entries emanating from the business-as-usual departments are for the general accounting department.

We've now incorporated such a system into our Relevant ERP – on-line project status in real time achieved with proper data. At any time, you can enter a specific customer and sales order and immediately receive to-the-second status regarding purchase requisitions, purchase orders, and production work orders that have been established to meet the requirements of any specific project.

Today, not only do you need WBS, you can get it in a multitude of flavors. With WBS in real time, you will be able to more aggressively manage projects. All reporting variables will be readily available, and corrective actions can be taken immediately.

Patrick J. Garrehy is president and co-founder of Relevant Business Systems. During Relevant's formative years, Garrehy raised capital, managed the development of INFIMACS, and secured an IBM relationship. Prior to that, he worked for Martin Marietta Corporation and as an independent consultant.

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