



## White Paper 2012-08

### How To Build Quickly and Cheaply the System Infrastructure You Need to Execute a Large, Complex Project

*Standard ERPs or integrated project management software are not the right solution for executing large, complex projects. Instead, Project Value Delivery supports a consistent implementation of different specialized software, linked together through a common Breakdown Structure. It is a cheaper, more effective solution that can draw on pre-existing systems. In addition, a large, complex project is always a particular case; the flexibility given by this approach will save many headaches while increasing the level of control and understanding of the project status. Here is how to do it.*

#### Avoid the big bang - improve on the existing

Organizations have a tendency to go for big flashy things. It's quite nice to announce that all problems and inefficiencies will be solved and millions of savings obtained by implementing a new system that does everything.

This is rarely true. And it takes an awful lot of time and effort to get such systems running.

Moreover, when everything is (supposedly) automatic, organizations can easily lose control on the reality of the business, in particular for one-off endeavors with non repetitive events like large projects (cf. the paper 2012-07 on "The fallacies of all-encompassing enterprise management systems (ERPs) for project companies")

At the brink of starting a large, complex project, time is also counted. Systems and processes need to be up and running quickly, sometimes in remote areas, or seamlessly between different remote locations. The best is to build a consistent system framework from the existing – or from off-the-shelf solutions for each specialty with only slight, short customizations.

#### What systems do you need to run a large, complex project?

The basic systems that are absolutely required to run a large, complex project are:

- A document and correspondence control systems (including workflows for review and approval)
- A cost control system (which is different from the accounting system, and needs to be more robust than an Excel spreadsheet)
- An accounting system
- A scheduling tool
- A number of commitment registration and approval systems, which shall include approval workflows and be based on a data-base infrastructure:
  - A timesheet system
  - A Supply-Chain Management system
  - A site logistics commitment system
  - A construction / operation reporting system

In addition, here are some nice-to-have:

- A risk analysis system using Monte Carlo analysis (for both cost & schedule risks)
- A project internal social network system to enhance internal communication (including instant messenger, audio and video call and other document sharing capabilities).

Project Value Delivery's experience is that most often, organizations have some of these systems available that fulfill the organization's needs; they must be analyzed to determine if they can sustain the increased level of activity linked with a large project. In organizations accustomed to executing small, simple projects, some of these systems are present in the form of manual / fax registers, or Excel spreadsheets. While they are fine for small projects, these systems are not scalable, or are only scalable at the expense of a large administrative manpower and of a high frequency of errors. This is often not desirable.

In general, Project Value Delivery's experience is that organizations that are moving into large, complex projects often mainly miss robust cost control systems, document control systems, and site logistics commitment registration systems.

#### Taking into account the project's geographical spread

When designing the systems, an important parameter to take into consideration is whether several project offices will work simultaneously on the project. In that case, the systems need to be accessible from different locations and need to be web-based tools that can be accessed from anywhere through secured connections.

In addition, two particular points need to be carefully considered:

- the site logistics commitment system need to be accessible from anywhere through any internet connection and include the appropriate approval workflows with approvers in different locations
- the project documentation needs to be made accessible on the construction site, with document updates being transferred promptly, and obsolete documents hidden or removed. This can be best achieved by a direct access to the project's documentation system, or if not possible because of a poor internet connectivity,

automatic replication of the document database on the construction site at least on a daily basis.

### **The key to success: a shared, maintained Breakdown Structure**

Many of the systems required are available as stand-alone systems, off the shelf. They can thus be implemented reasonably quickly, as long as a reasonable physical infrastructure is in place (servers, internet connectivity).

Now that we have a variety of systems working in parallel, satisfying the basic or advanced needs of all the functions, how can we ensure that the project is adequately controlled?

The points of control for the project lie at the interface between the systems, when reconciling the information from the different sources. To enable effective reconciliation, the following need to be put in place:

- a common Breakdown Structure implemented rigorously and consistently across all systems used in the project
- reports from each system that can be easily mutually reconciled.

The stumbling points of implementing effectively a common Breakdown Structure (BS) are:

- ensure that the inevitable evolutions of the BS through the project are reflected consistently and immediately in all systems
- coding all the data consistently with the Breakdown Structure, which is often achieved by having all commitments going through cost control for coding, and good discipline from all parties involved in the project.

Enabling appropriately consistent reports from each system might require some customization; however, customizing reports is much easier to do than customizing workflows or functionalities of the systems themselves and can generally be done cheaply and easily.

### **The reconciliation process, key to keeping the project in control**

The reconciliation process between systems now becomes the key activity that ensures a tight control on the project. It is by no means an automatic activity (although there can be some automatic routines to sieve more quickly through the data). It is an activity which requires deep understanding of the project dynamics to be able to identify and understand discrepancies, and act quickly if some discrepancy is not justified.

What are the reconciliation processes that are really key for a large, complex project?

- Reconciliation between document control system and engineering schedule;

- Reconciliation between budget and commitments: the rate of consumption of the budget at the BS level is a key factor to be analyzed;
- Reconciliation between scheduling and cost control: actual physical progress versus cost consumption, and more advanced earned value analysis;
- Reconciliation between cost control and accounting systems: the ultimate reality check, it allows to derive and justify accruals, and identify areas where the commitment control system is not operating as expected;

The reconciliation process needs to be done regularly, diligently, by personnel that is aware of the drivers of the project and understand its dynamics.

### **How much does it cost?**

The discussion should not be about cost, but about value for the cost.

The cost and duration will depend on whether your organization starts from scratch or builds on existing systems. It also strongly depends on your actual needs in terms of geographical coverage: it will cost more, and possibly require more complex local replications, if distant offices work together on the project. The order of magnitude to set everything from scratch is 1 to 4 MUSD, which is clearly small compared to the revenue and profit of large, complex projects.

The benefits on the other hand are immense: savings in terms of direct administrative staff; huge savings from lack of non-quality (like using obsolete documents or losing precious time of highly paid personnel looking for information); and very significant savings in terms of control over the project, early identification of trends, etc.

The cost of setting up the right systems is much less than 1% of the project revenue. You can't hesitate to do the investment, even for one large and complex project, because it will certainly save you more than this amount, be it only in cost of non-quality.

### **Having the right systems is a must – and can be justified even for a single project**

Having appropriate systems to execute large projects is a must today. You just can't manage large, complex projects with a paper or Excel based system. Modern technology and internet allow fantastic gains of efficiency and effectiveness. It is very cheap compared to the upsides and can even be justified for a single large, complex project. The key is just to be pragmatic, rely on real project execution experience to implement what is really needed and not to seek the one marvelous system that is supposed to do everything. Why hesitate?



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