



White Paper 2012-19

The Economic Justification of Proper IT tools to Support a Large, Complex Project

Following our White Paper [2012-08](#) on “How to Build Quickly and Cheaply the System Infrastructure You Need to Execute a Large, Complex Project” we have received numerous questions about how to justify the Return on Investment of such investment. This paper demonstrates that even in the context of a single, stand-alone large, complex project, the return on investment is so significant that it is difficult to justify not to implement the right systems – and that actually it would be extremely dangerous not to do it.

The case-study project

We consider here for this case-study a single large, complex project of a size of 1 billion USD over a duration of 4 years, out of which about 120MUSD is project management and engineering (PME) cost – a typical benchmark.

The profit will be measured differently depending on whether it is executed from the point of view of a contractor (a 10% margin can then be considered as a basis) or whether it is executed from the view of an Owner (in which case the return-on-investment of the infrastructure needs to be considered; a very low minimum would then be 10-20% per year to remunerate the capital used).

As is usual in this type of projects, multiple contributors spread geographically across the world are supposed to contribute, and project execution often happens in diverse areas distinct from the project offices.

What are the systems needed?

The basic systems are listed in our White Paper [2012-08](#). They include some specialized software (cost control, scheduling) and most importantly, a number of document databases including workflows for their processing. Those databases are either internal or need to have interfaces allowing other stakeholders to interact.

The investment of setting up and operating these systems is very limited compared to the size of large project

The key to minimize cost and delays for IT systems implementation, which is often a driver, is to avoid as much as possible any customization project:

- Use available software in their core competency with minimum customization
- Avoid the design and the implementation of automated interfaces between the different systems.

Interfaces can be limited to proper reports structured according to a common breakdown structure, which should be sufficient at project level. Different tools are used for their core competency: a scheduling tool for schedule, an accounting tool for accounting, a cost control tool for cost control... without seeking to stretch the abilities of those systems to non-core applications, which takes significant time and money as it ends up to be a full customization program (re-read our White Paper [2012-07](#): “*the Fallacies of All-Encompassing ERP Systems*”).

For basic implementation of these systems, modern technology allows simple and cheap implementations that are accessible globally via web-based interfaces – for example by implementing some workflows on the basis of well-designed Microsoft Sharepoint databases – or any other similar enterprise-wide collaborative system. The few specialized systems e.g. for cost control, scheduling are available off-the-shelf in stand-alone versions at prices that do not exceed 200 to 300KUSD all included.

Most companies will already have some of these systems available. The full implementation of these systems could finally cost around 0.5 to at most 1MUSD including consulting services and training and take around 6 months maximum.

In addition, system administration resources need to be made available during the course of the project – 1 or 2 people. Being junior positions, depending on the country, this is an additional cost of up to around 150KUSD/year, or 0.6MUSD over 4 years.

The total investment is thus 1.6MUSD maximum over the life of the project. This is quite a moderate investment compared to the size of the project. It is less than 2% of the expected profit for the contractor, and less than 1% of the annual return for the owner.

What are the gains from implementing such systems?

The gains from these systems in a large, complex project can be considered to fall under the following categories:

- Direct productivity gains;
- Indirect Opportunity and Cost of non-quality gains.

The first type of gains that people expect from IT systems is generally productivity gains, because that is the main gain in a conventional manufacturing or administrative context. Modern ubiquitous technology will allow project team members to work from anywhere, at any time, on the same documents, in a virtual way – without sending physical documents. This will represent a significant advantage for projects using resources (including suppliers and clients) spread over several locations. An improvement of a mere 5% in the personnel productivity and travel cost avoidance – readily achievable in most organizations - results in a saving of 6MUSD (5% x 120MUSD PME cost).

This would represent by itself a sizeable return on investment; yet it is not the main contribution from a sound IT infrastructure in a large, complex project context. Reliable, shared and real time project data available widely at a click will result in a much higher quality of decision-making (e.g. everybody working on the same document version, real-time understanding of changes and interface issues, sound forecast for cost and schedule), and the quality of this data will be further enhanced by the fact that project personnel will be able to spend more time on real, cognitive work (strategization, forecast) instead of dumb administrative or mechanical work (reconciliation of flawed data, etc).

Loss of Opportunities because of inadequate or delayed dashboards or lack of time by senior project management to grab them; and conversely, the high Cost of Non Quality that is encountered in all projects, when measured, reaches as a minimum more than 5% of the project revenues in all project companies (and often upwards of 10%) – and this is a very conservative measurement based on our experience, in a world where projects frequently overrun by large amounts (which may or may not be recovered by one of the parties through a clever claims process – that in turn, needs to be supported by a reliable recording system).

If we conservatively suppose that a high quality IT system can lower the cost of non-quality / increase the available opportunities by 25% – which is quite conservative, because when one party has the most accurate and reliable data it can take advantage over the other parties, we still reach an additional gain (or avoidance of loss) of 12MUSD in our contractor case-study; and a substantial improvement of the capital ROI and future cash flow for the owner due to less initial cost.

Our conservative estimate in our case study is thus a potential gain (or avoidance of loss) of 18MUSD as a conservative measure. This gives a return on investment on the IT systems implementation of more than a factor 10, with more upside possible still in terms of work quality and control over the project – who would not invest in something that would give more than a 1,000% return rate?

Can you even spare yourself the implementation of modern IT systems to execute large, complex projects?

This paper intends to compute in a traditional way, what would be the return on investment of the implementation of simple yet effective IT systems on a large project. Yet this is not the right question.

The right question, and the right answer, is that on a modern large, complex project, you can't afford not to

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implement these systems. Because of the sheer complexity of the tasks at hand, of managing the numerous interfaces spanning over thousands of miles of geographical spread, you just

can't afford to be on top of what is happening in the project. This would result easily in a loss of control of the project.

And the consequences of not being in control of a large, complex project are painfully predictable:

- Being taken advantage of by the other suppliers / partners / clients up to unbearable hostage-taking situations;
- No anticipation of issues leading to permanent fire-fighting, compounded by a major administrative burden that results in dramatic overwork and exhaustion of the team;
- Shortcut-taking and non-quality spreading everywhere in the project and leading to losses in the orders of several dozen percent of the initial cost;
- Potentially a huge issue at company level that might put the mere existence of the company at risk – as it already happened many times in the project industry and will certainly continue to happen to those that resist the thought that higher size and complexity requires more powerful IT systems.

Conclusion

Implementing the right systems infrastructure is cheap and straightforward – and immediately profitable when done in a simple and effective manner. Of course, the publicized failures of the implementation of all-encompassing IT systems have made executives cautious when it comes to IT projects. Yet modern web-based technology and the availability of very cheap yet powerful software platforms allow very simple implementations of powerful systems that would have cost millions a few years ago.

In this age of larger and more complex projects, only those project companies will survive that understand that reasonable usage of modern technology is indispensable to stay in control of their projects. The romantic days of the lonesome and heroic project managers that could keep a total overview and control of the project on an Excel spreadsheet are gone; they will fade in mythology as the cowboys did. The era of the high-performing structured project team, supported by powerful IT systems to address complexity, has come. Don't resist – and face inevitable extinction.

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