

Business Performance Modeling for ERP Projects

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Executive Summary

The purpose of this paper is to provide information and examples of how business process modeling and simulation is used to support enterprise resource planning (ERP) commercial off the shelf (COTS) projects. It is a powerful capability to support both the Program Managers in the selection and implementation of COTS as well as to support the functional community to address the concerns of the ultimate end-users and owners of the system. Additionally, the models and the resulting gap/configuration matrices that are produced from this approach are critical to continual business process improvement and sustainment of the COTS post-implementation. The theme throughout this paper is "focus on the business". The focus is placed on the functional user and how their processes are improved or supported by information technology. The technology should not drive the business; rather it should support and enable efficiencies in the business.

COTS ERP implementation brings with it considerable risk, especially on the functional and operational side of the business when changing functional processes to take advantage of the ERP product. The use of models that provide not only systems process flows but also functional process steps is key to the approach described in this paper. This approach blends both the functional/manual steps with the steps supported by the systems (ERP) to gain unique insight to how the ERP will support the end user operations. This insight coupled with the ability to simulate the models and focus on business performance metrics provides significant risk reduction in ERP implementations.

The following key questions outline how the use of dynamic simulation models are used to successful implement ERP:

- Why is it important?
- How does it support ERP implementations?
- Is it practical to simulate all the business processes for ERP implementations?
- What are the results?
- What is the payback?

This is why it is important

As organizations move to COTS and ERP solutions for business applications, it is absolutely critical that they have the ability to understand how the COTS/ERP business applications and rules will perform in their environment and how well they will integrate with external business processes. The absence of this knowledge brings high risk of a significant failure.

Dynamic process simulation models can provide this type of insight. Because of its dynamic nature, it provides the ability to measure effectiveness (such as activity based costing, resource utilization, throughput, delays, timing, etc.) of the business areas. Isn't this the real reason for the IT effort? Dynamic modeling provides a quantifiable way to compare the "As Is" processes to "To Be" COTS processes to improve gap analysis/blueprinting tasks. Simulation modeling is a great technique to find the "domino effect" of changing one area that potentially damages another area. This phenomenon is extremely difficult to uncover using traditional static process mapping technologies and methods (such as IDEF).

This is how it supports ERP implementation

It is a powerful tool for change management and customer buy-in. It is often said that Change Management is the single largest hurdle in successfully adopting COTS/ERP. The biggest roadblock here is the stakeholder not understanding what they are changing to and how it will impact them. The use of simulation models is key to gaining buy-in from the functional users.

The simulation models can be used to communicate to stakeholders, at all levels, how the ERP will be configured to support their processes and specifically what the impact will be to them.

In addition to the initial operational architecture baseline, the models will also provide a foundation for continual business process analysis and continual improvement for years to come. This is a powerful long-term tool and benefit.

It is a Practical Approach

There are commercial products available today that support rapid high-level process mapping that can be used for quick dynamic simulations. In many situations, the functional requirements can be extracted from the legacy systems using a methodology like CACI's RENovateSM. Experience with the military aircraft maintenance systems show that typically only 20 – 30 percent of the key processes in the model will need to use the full simulation capability. The bottom line is that only those key critical processes (which are the ones that really make the difference in operational performance of the organization) will likely need full simulation to mitigate risk when going to a COTS/ERP product.

Here are the results

Dynamic simulation provides a measurement-based way of making critical decisions on how changed legacy processes will be most efficiently implemented in the COTS/ERP.

It provides a capability to measure and communicate business process changes to the end users and stakeholders to reduce change management risks.

It provides the capability to justify process changes and reduce customization or development of plug-ins to the COTS.

It provides the foundation for future business process reengineering and sustainment of the COTS implementation/configuration.

The payback

Compared to the total investment in implementing a COTS ERP, the use of dynamic process modeling as a risk mitigation strategy and change management tool is minor cost.

With ERP COTS the cost of success is high but the cost of failure is devastating. Practical use of innovative techniques such as dynamic modeling to reduce the risks of failure has a huge return on the investment for the ERP COTS projects.

Background

Purpose: The purpose of this paper is to provide information and examples of how business process modeling and simulation is used to support enterprise resource planning (ERP) commercial off the shelf (COTS) projects. It is a powerful capability to support both the Program Managers in the selection and implementation of COTS as well as to support the functional community to address the concerns of the ultimate end-users and owners of the system. Additionally, the models and the resulting gap/configuration matrices that are produced from this approach are critical to continual business process improvement and sustainment of the COTS post-implementation. The theme throughout this paper is "focus on the business". The focus is placed on the war fighter and how their processes are improved or supported by information technology. The technology should not drive the business; rather it should support and enable efficiencies in the business.

COTS ERP implementation brings with it considerable risk, especially on the functional and operational side of the business when changing functional processes to take advantage of the ERP product. The use of models that provide not only systems process flows but also functional process steps is a key to the approach described in this paper. This approach blends both the functional/manual steps with the steps supported by the systems (ERP) to gain unique insight to how the ERP will support the end user operations. This insight coupled with the ability to simulate

the models and focus on business performance metrics provides significant risk reduction in ERP implementations.

Examples of models and the use of simulation in this paper are drawn from work performed by CACI in Department of Defense programs in the Human Resource and Asset Management (aircraft maintenance systems) domains. The primary points in this paper focus on the use of dynamic (simulation) modeling approaches to support a major ERP COTS project in the following ways:

- Provide a performance-based approach to selection and gap analysis of COTS products.
- Provide a quantifiable way to compare the “As Is” processes to “To Be” COTS processes to improve gap analysis/blueprinting tasks. This shifts the focus from a technical problem to a business performance and change management problem.
- Provide a measurement-based way of making critical decisions on how changed legacy processes will be most efficiently implemented in the COTS ERP. This is even more critical since the recent versions of ERP COTS are highly configurable.
- Provide a capability to measure and communicate business process changes to the end users and stakeholders to reduce change management risks.
- Provide the capability to justify process changes and reduce customization or development of plug-ins to the COTS.
- Provides a foundation for continual process monitoring, performance prediction, and improvement commonly used in business process management (BPM) methodologies.
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Situation: The DOD has formed integrated teams to provide top-level policy, guidance, and direction in the definition, design, implementation, and integration of enterprise solutions across the services and external organizations. The goals are:

- To eliminate duplicative processes and adopt common GOTS or COTS solutions across the enterprise.
- Support business transformation objectives for the operational and institutional services, across all functional domains, through enterprise integration;
- Develop, validate, and maintain an end-to-end strategy and provide governance, for the integrated development and fielding of service-wide functional enterprise resource planning (ERP), enterprise architecture, and enterprise integration initiatives, projects, programs, systems, and services;
- Ensure all ERP-related domain architecture, transformation, enterprise, application, business process modernization, integration, and development projects are coordinated, including costs, schedules, performance measures, and sustainment, and;
- Support executive decision-making on ERP integration and business process change through the identification of metrics and at repositories.

Challenge. Current processes must be changed to take advantage of ERP COTS products and their embedded processes. These changes must be modeled, measured, and communicated from the beginning of ERP-based projects in order to remove unknowns, ensure that improved business performance is achieved from the ERP information technology, gain buy-in from the stakeholders, and develop confidence in the end-state solution. Change management will be the single largest hurdle in successfully adopting ERP.

Introduction

Most ERP projects in the DoD are part of a larger enterprise architecture (EA) and business modernization/transformation effort utilizing frameworks such as the Department of Defense Architecture Framework (DODAF). An example of this is work done for a Air Force aircraft

maintenance transformation. The project is part of a larger EA and ERP effort, Logistics Enterprise Architecture (LogEA) and Expeditionary Combat Support System (ECSS), respectively. The project focused on extracting the "As Is" business processes and information technology requirements from a series of legacy aircraft maintenance systems/capabilities and their supported communities and developing a "To Be" EA Operational View (OV-1 through OV-7). One of the key components of the OV is the business process model, which is represented as an OV-5.

Typically, EA projects use static models to represent the various views defined in the DODAF. In the aircraft maintenance project, the PMO chose a more strategic modeling approach by building the business process flow models (OV-5) in a technology that sits on a simulation modeling capability. The remainder of this paper will focus on how this simulation modeling capability can be a strategic advantage in planning for, implementing, and managing the business using ERP solutions.

The shift to using COTS ERP should not be based only on information technology (IT) savings but should include the possible business operations improvements that are potentially enabled by the IT. Our recommendation for the DoD's initiatives is a simple one - Focus on the Business. This tagline is based on work that CACI has performed for the Navy and Air Force relative to planning for large-scale ERP systems. The "As Is" to "To Be" and "As Is" to COTS "To Be" gap analysis, planning, and implementation are important to the success of an ERP solution in DoD. It is our opinion that the business processes and operational performance of the DoD's organizations are the critical leverage areas that should be considered when moving to ERP and other COTS-based solutions. The planning for COTS starts with setting a baseline. This is not to imply that years of "As Is" modeling is needed, rather a quick level-set of the "As Is" processes followed by a detailed "To Be" baseline that can be used directly in COTS evaluation, gap analysis, implementation/blueprinting, and post-implementation management of the COTS configuration.

The technology is easy. It is the culture change, process improvement, and operational performance measurement that are difficult to get a grip on when trying to align to COTS packages. The following paragraphs provide examples of how we believe that focusing on the business is key to transforming the DOD's initiatives of using major COTS applications systems.

Focus on the Business

Focus on business processes is the key to achieving a transformation to COTS packages. The legacy operational architectures must be captured and baselined at a high-level using state of the art business modeling and simulation products in order to quickly examine the processes efficiencies/inefficiencies and organizational performance metrics.

This is not referring to the traditional IDEF-type monolithic static modeling activities that takes years and millions of dollars and has proven too lethargic to be of much benefit in business analysis and reengineering. The AF aircraft maintenance project is a good example of how dynamic models can be built easily while satisfying the static content of DODAF, yet providing a strategic advantage in future gap analysis, implementation, change management, and process management for ERP projects. The aircraft maintenance project utilized CACI's SIMPROCESS™ product for the OV-5 process models.

The technical approach is to map and model the operational business processes and information use-points at a high-level to get an understanding of the "As Is" situation. The "As Is" models can be simulated and visualized to help communicate between the business analyst and systems analyst in preparation for migration to COTS. In addition to the "As Is" operational architecture baseline, the models will provide a foundation for continual business process analysis and continual improvement for years to come. This should not be a one-shot deal.

The business models clearly layout the processes and show the skill levels required to accomplish a particular portion of the process. This metric can be used to help establish training programs and access the current workforce capabilities. If the model shows an alternative to the current way of doing business, training will also become obvious.

In addition to the model's benefit in understanding how the business performs and integrates with other business processes, is the ability to measure effectiveness (such as activity based costing, resource utilization, throughput, delays, timing, etc.) of business areas.

These business metrics are used as a QUANTIFIED benchmark against targeted COTS products. For example, the "As Is" model represents the legacy process while an ERP-implied process (assuming the out-of-box ERP product implies a set of system transactions that in turn dictate how many of the processes must align to those transactions) is a "What-If" model that represents another benchmark. The simulations and resulting metrics (speed, bottlenecks, costs, response, turnaround, throughput by organization, location or other factor) can then be used as an important tool in comparing and determining how and if work flow/processes/sequences can be changed to match the COTS product or can be improved by adjustment to the flow or whether customization is imminent.

Traditional static process modeling tools and methodologies will not support this type of rapid functional process analysis. The dynamic simulations available with SIMPROCESS™ are a crucial technology that is the catalyst in making this technique work.

It should be noted that we are not suggesting that all processes in a process model should be simulated. As with any other technology, it should be used appropriately to address the areas where it provides the most benefit. Our experience shows that typically only 20 – 30 percent of the key processes in the model will need to use the full simulation capability. However, these key processes will typically be areas where the biggest risks are for moving to a COTS ERP product.

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