White Paper

The Value of Business Process Modeling and Analysis

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Executive Summary
An increasingly competitive business environment, combined with the emergence and rapid evolution of new business models, means organizations are under mounting pressure to improve their existing processes and successfully launch new initiatives, particularly the development of applications that automate time-consuming or complex manual activities.

Before an organization can optimize or automate its processes, however, it must first assess its existing processes. Business process modeling can help business analysts rapidly collect and objectively analyze information about an organization’s operations, and effectively communicate that information to executives and IT staff. Armed with this information, executives can make informed decisions about how to optimize those processes and IT staff can design appropriate solutions. Modeling provides a mechanism for capturing key enterprise business knowledge while increasing collaboration, improving productivity and quality, and guiding the development process.

This document describes the objectives and benefits of business process modeling as well as the tools provided by Computer Associates International, Inc. (CA) that enable organizations to achieve those benefits.

Getting Processes Under Control
The processes that an organization uses to deliver goods or services often determine the success of that organization. However, it can be difficult to define and control those processes for a variety of reasons.

• **New Ways of Doing Business.** The growth of the Internet is changing the way organizations do everything from interacting with their customers to communicating with their suppliers and employees. Traditional interpersonal and paper-based processes are being automated and web-enabled to increase organizational efficiency and customer satisfaction.

  However, in the rush to automate, many organizations fail to first assess their objectives and optimize their existing processes. Neglecting to thoroughly understand the organization’s processes or to address ineffective processes prior to application development often results in application redesign after initial delivery, slowing the application development life cycle, and delaying or reducing end-user satisfaction.

• **Increased Complexity and Scope.** In large organizations, no one person can know what’s happening throughout the entire enterprise; a complete understanding of the organization’s activities is spread among many employees. As a result, it is difficult for executives to identify those changes that might be beneficial, let alone adequately assess the costs, benefits or risks of implementing them. In addition, critical knowledge is lost when staff members leave the organization.

  Likewise, in regulated industries, no one person can keep track of all the complex regulations that might affect how tasks are performed, and failure to properly conform to those regulations can result in fines, lawsuits and other losses.

• **Organizational Changes.** Whenever an organization restructures, merges or grows, it is easy for different segments of the organization to get out of sync. Different individuals, departments or sites might be duplicating efforts, or different groups might be performing similar tasks in different ways, producing inconsistent results that cause confusion and lower overall quality.

  If you’re receiving complaints or suggestions from customers about the way your organization conducts business; if you’ve observed problems with productivity, quality or timeliness of service; or if your organization is slow to adapt to changes in the marketplace, business process modeling and analysis can help you identify problems in your current operations. You can also use business process modeling proactively to map out the activities involved in delivering a new product or service, preventing problems before they occur.

Overview of Process Modeling
Years ago, process modeling was a pencil-and-paper exercise that produced uncontrolled, variable results that were difficult to share or modify. Over the past two decades, it has evolved into well-defined, standards-based methodologies supported by a wide range of tools. Today, modeling is one of the most effective techniques for understanding and communicating business rules and processes.

Objectives of Process Modeling
The initial goal of process modeling is to graphically illustrate what is currently happening in an organization. What activities are involved in accomplishing your business objectives, how do they happen and how frequently do they occur? What activities are involved in interactions with those outside the organization, such as suppliers or customers? What factors control these activities? What information is needed and what information is produced?
When you create a model, you can also assign a cost to each activity, such as the cost of materials or labor. This can be used not only to calculate the entire cost of a process, but also to identify high-cost areas that you might be able to optimize or eliminate in order to reduce expenses.

Once you’ve identified what is currently happening in your organization, you have a baseline that can enable you to optimize your current practices, respond to changes in the marketplace, define requirements for new applications and plan new initiatives.

**Types of Process Modeling**

Three primary types of process modeling are widely used:

- Business process or functional modeling (IDEF0)
- Process flow modeling (IDEF3), also known as workflow or activity modeling
- Data flow modeling (DFD)

Business process modeling focuses on a high-level view of the activities of the organization, the factors that control those activities and the results of those activities. Controlling factors include the prerequisites that must occur before the activity can take place, the rules that govern the activity (such as federal or state regulations, or other limitations imposed by the organization’s own business rules), and the resources needed to perform the activity (including employees and equipment).

Process flow modeling focuses on the step-by-step procedures and decisions involved in performing a particular activity, and how information or other results flow from one process to another.

Data flow modeling focuses on data processing activities — the data needed for or created by various activities, the individuals or organizations that either provide or receive the data, the flow of data between various tasks or activities, and the data stores that might be involved.

Organizations performing process modeling might use all of these types of modeling or they might use only one, depending on the type of problem that they’re trying to solve. For example, business process modeling can identify processes that don’t have any controls or that aren’t actually producing any results. Process flow modeling can pinpoint duplication of effort or tasks being performed out of sequence. Data flow modeling can determine if the same information is being stored in different locations or if different processes are overwriting the same data.

**The Value of Process Modeling**

Process modeling benefits many sectors of an organization — employees, managers, executives, analysts and application developers — and helps organizations not only improve their current processes but also prepare for the future.

**Increasing Collaboration**

One of the benefits of process modeling comes from the very act of creating the model. Gathering the necessary information requires input from multiple individuals. The people involved in this process not only get to share their unique expertise and perspectives, but also develop a greater awareness of how their particular areas fit into “the big picture” and achieve a greater understanding of the organization’s common goals.

When different individuals or departments perform similar tasks differently, creating a model also provides them with the opportunity to communicate those differences and identify which practices work best. The very act of documenting processes helps with their analysis and creates a bond among the individuals as they address their common needs and develop a common vision.

Once consistent processes have been developed and documented, the resulting process models can be shared throughout the organization, reducing training needs for new or transferred employees, and raising the overall levels of consistency and quality in the company. By capturing the knowledge of individual employees, process models increase institutional knowledge and minimize the risk of losing knowledge when staff members leave.

**Optimizing Business Processes**

Although collaborating can help identify and solve specific business problems, it is usually not sufficient to address larger, more complex organizational issues. Process models provide executives and business analysts with a baseline for assessing enterprise-wide practices, evaluating their operational efficiency, and identifying wasteful or redundant activities so that they can be improved, replaced or eliminated, thereby reducing costs and using resources more effectively.

In addition, while the employees in an organization might easily be able to see business problems from their own perspectives, they might not always understand them from the points of view of outsiders, such as their suppliers or customers.
Modeling offers the opportunity to examine processes from multiple perspectives. Once you understand the issues that might make it difficult to do business with your organization, you can work toward removing those obstacles and improving customer satisfaction.

Process modeling also helps organizations develop and document stable, repeatable processes, which enhance the overall quality of their practices. This can help businesses achieve critical certification from such organizations as the International Organization for Standardization (ISO), or achieve higher levels in the Software Engineering Institute’s (SEI) Capability Maturity Model. The SEI estimates that defining, managing and optimizing processes in an organization can reduce defects in deployed applications by more than 50% and reduce project cycle time by more than 30%.

Automating Business Processes
In recent years, many organizations have increased productivity and streamlined their operations tremendously by automating their processes and creating applications that employees and customers alike can use to accomplish their goals, such as completing an online employee benefits application or placing an order. Business process models can play an integral role in making sure that those initiatives proceed smoothly.

Using Models as Planning Tools
Before an organization undertakes any automation or application development initiative, it is important to assess the risks, costs and benefits of the initiative, and to make sure that the correct processes are automated. In this planning phase, business process models are critical for two reasons:

- They provide an objective, metrics-based understanding of current processes, making it easier to compare the time and costs being spent on current activities with the potential savings that might be provided by automation.
- They provide organizations with an opportunity to optimize their processes before they automate them, helping to ensure that the applications don’t have to be redesigned and then redeveloped after they have been deployed into production.

Using Models as Requirements Documents
Although replacing manual processes with applications can dramatically increase productivity and increase customer satisfaction, a poorly designed application might fail to fulfill business needs by not collecting necessary data or not managing that data correctly. It can also frustrate end users by presenting steps out of their logical sequence or not providing enough information to help users interact with the applications successfully.

Models can help prevent these problems by serving as application requirements documents. Business process models can identify the activity being automated and the rules that govern that activity. For example, an application that allows employees to elect health care coverage might block employees from making changes except during open enrollment season or under other special circumstances.

Process flow models can help ensure that the application prompts for information in a logical sequence. For example, an employee might need to provide a list of family members before the employee can request medical coverage for those family members.

Finally, data flow models can define how the collected information is related and stored. For example, changes to an employee’s home address might need to be stored and updated in a different database than the one that contains medical coverage information.

In addition, because models are graphical and consistent in the way they present information, they avoid the ambiguity often associated with written requirements documents. By clearly communicating requirements the first time, models help reduce design and development time, accelerate time-to-market and help ensure that applications align with business objectives.

Responding to Change
Once you have created a model that illustrates how your organization’s processes currently work, it is much easier to formulate and evaluate alternative responses to changing market pressures — in short, to create “what if” scenarios.

Modifying a model can help you understand the impact of the changes before you implement them. You can better estimate what the costs or cost savings might be, how much time a new process might take or save, what data or resources might be required, and what risks might be involved. As a result, executives and managers can consider many possible courses of action and make better, more-informed decisions.
Having a model of existing processes can also make it easier to respond to regulatory changes. Each activity in a business process model includes the factors that control those activities. When a controlling factor changes — for example, when a new regulation is imposed or an existing regulation is modified — it’s easier to pinpoint exactly which activities will be affected and how the organization’s processes might have to be altered to accommodate the change.

In addition, an organization’s ability to react quickly to changes in market conditions is often directly related to its IT department’s ability to meet new needs. This kind of agility is greatly enhanced when business processes are well-documented via process models.

**CA’s Process Modeling Solution**

To help organizations achieve the benefits offered by process modeling, CA offers AllFusion® Process Modeler. This powerful solution provides the framework for understanding, optimizing and automating business processes.

AllFusion Process Modeler offers business process, process flow and data flow modeling all in one tool, serving the needs of both business and technology analysts. Unlike simple drawing applications that merely create diagrams, AllFusion Process Modeler provides access to multiple layers of detail through drill-down capabilities that link business process modeling activities to work flow or data flow. In addition, each object in a model can have its own properties, including user-defined properties that are relevant to your particular business. AllFusion Process Modeler can also link particular activities to different roles or sites within the organization, giving you a complete understanding of not only what is done, but by whom and where.

Since AllFusion Process Modeler is specifically designed to develop process models, its user interface provides appropriate prompts that guide you in their creation. With this tool, you can split complex process models into more manageable work packages, and then merge the split models back into a single, large model that provides the big picture. AllFusion Process Modeler also fully supports activity-based costing (ABC), and its bidirectional interface with dedicated ABC tools makes it easier to implement an activity-based management strategy.

**Extending Beyond Process Modeling**

AllFusion Process Modeler is part of a comprehensive suite of CA products that integrate with one another to provide complete, end-to-end development and data management. For example, information can be exported from AllFusion Process Modeler into AllFusion® ERwin® Data Modeler so that you can easily update your existing databases. Likewise, data from AllFusion ERwin Data Modeler can be imported into AllFusion Process Modeler and linked to arrows and activities in process models.

AllFusion Process Modeler also integrates with AllFusion® Model Manager, which helps coordinate the development and maintenance of large models among several team members, offering version control, conflict resolution, security and enforcement of standards. AllFusion Model Manager, in turn, integrates with AllFusion® Model Navigator, which allows many different individuals throughout an enterprise to view the models, providing a common understanding of the business’ processes throughout the organization.

AllFusion Process Modeler helps organizations understand the impact of change on existing business processes.
Through its various interfaces, AllFusion Process Modeler can also provide additional support for simulation environments as well as requirements traceability and management systems. This extensibility allows detailed process and data information from the AllFusion® modeling tools to further support complex and large-scale enterprise architecture analysis and development.

Conclusion

Business success often relies on efficient, effective business processes, yet ever-changing and complex business environments often make it difficult to define and control those processes. Business process modeling offers a reliable, objective mechanism to better understand enterprise-wide operations, identify critical flaws in current practices and determine how to optimize them.

Creating process models benefits all members of an organization. Executives and managers can evaluate proposed changes to existing systems before investing in implementing those changes. Team members benefit from improved communication and a shared understanding of the organization’s goals. Business analysts can quantitatively analyze enterprise-wide practices and identify those activities that can be improved, replaced or eliminated. Development staff can use process models as requirements documents to help ensure that the applications they create accurately meet business needs.

Once developed, process models help organizations rapidly respond to changes, positioning them for future success.

CA’s AllFusion Process Modeler is an ideal tool for achieving these benefits. With its distinctive features and capabilities to integrate with other CA and third-party solutions, it offers what organizations need to remain competitive.

Endnotes

1. Process Maturity Profile of the Software Community