

Unisys Business Blueprints

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Business executives have spent the past several years struggling to improve the efficiency of existing hardware and software operations and to gain control over the price of changing information technology. Companies have explored and invested in software component systems, packaged software applications, best-of-breed software, and IT and business process outsourcing to improve IT. We fully expect this trend to continue. In fact, we expect to see it accelerate, in no small part because of innovations that Unisys is beginning to roll out. Unisys Business Blueprints represent a major improvement in the way best-of-breed software applications are sold and in the way business process outsourcing is managed. In essence, a Unisys Business Blueprint combines a best-of-breed application with an open, enterprise architecture that makes the application easier to understand, change, and maintain and easier to align with corporate goals.

Before exploring the innovations that Unisys has introduced, let's consider some of the problems that executives face today to better understand the problems that Unisys Business Blueprints were developed to ameliorate.

The Challenge of Change

Every executive knows only too well that the rate of change is relentless. Changes in the economy, new laws, new market strategies introduced by competitors, new materials, and new information technologies all contribute to the changes every company must deal with.

Changes in IT have been the major driver of business process change for the last few decades. Computers first became widely available in the Seventies, when most companies acquired mainframes to handle back office accounting and to build customer databases. In the last Thirty years, changes in computer hardware have followed Moore's Law, which asserts that computing power will double every 18 months. The converse, of course, is that the cost of an equivalent amount of processing power will be halved every 18 months. This law, which focused on chip makers ability to pack more power into a smaller space, has led from mainframes to minis, then to personal computers, to workstations and laptops, and recently to handheld computers.

With each increase in processing capability, software designers have identified new ways to create applications. Companies have gradually expanded from mainframe-based back office systems, to core business transaction processing systems and desktop productivity programs. Databases have evolved from systems for cataloging and documenting orders and customers, to powerful relational systems that allow managers to ask questions about new customer trends.

Recently, the spread of the Internet, email and web browsers have not only made it possible to link internal applications in new and more productive ways, but have encouraged a revolution in how customers access information and acquire products and services. Today, every large company maintains portals that allow customers to obtain information about the company, and most also market and deliver their products to customers over the portal. Increasingly, suppliers, employees and customers will access corporate applications from laptops and phones, as needed, from any location in world.

If the introduction of all this hardware and software had proceeded a bit more slowly, companies would, no doubt, have created much more efficient and integrated systems. Unfortunately, with new rounds of innovation coming each 18 months, most companies have been forced to acquire new technologies before they have managed to integrate their previously acquired technologies. Thus, today, every large company finds that it owns mainframes, workstations and desktop machines which often don't communicate effectively. Worse, the company is running a wide variety of software applications, relying on diverse databases that were never designed to work together, let alone provide responses to customers, on-line, 24 hours a day, within 2-3 seconds.

As the different types of hardware and software have accumulated within the typical corporation, the complexities in integrating the various systems and the problems of creating new applications that can run on the various different types of hardware and software have grown exponentially. IT has grown from a small percent of corporate spending to a major part of every organization's budget. Most IT managers suggest that software integration is one of their major concerns. Similarly, most IT organizations are working on some kind of enterprise IT architecture to provide managers with a better overview of their company's diverse hardware and software resources. At the same time, corporate executives are constantly seeking better ways to manage the cost of IT development and maintenance.

The New Focus on Business Process

Many executives have turned to business process concepts to help them organize and prioritize their corporate systems. Many integration problems derive from the fact that most hardware and software systems acquired in the Seventies and Eighties were created to support departments. Thus, Accounting acquired an accounting system that ran on a specific type of hardware. Manufacturing acquired a Computer Aided Design (CAD) application that ran on a different type of hardware. Sales built a customer database with one software package while Accounting built an order database in a different package that was more compatible with their accounting system, and so on.

In the Nineties, executives began to refocus, moving away from a departmental emphasis and focusing, instead, on complete business processes. In part this was done to provide a better way to control the flow of work through the company, provide better ways of accounting for corporate activities, and to assure that departments would be more responsive to customer needs. A secondary effect, however, has been to provide a better way of organizing and controlling IT resources.

Too often, in the past, the IT organization was besieged by departmental managers, each demanding new applications. Every departmental manager wanted new



applications as quickly as possible, and few wanted to pay for the infrastructure that would link their applications with applications outside their departments. By shifting the focus to processes, companies are better able to decide which software application changes will aid valuable processes and which are less valuable. Moreover, by emphasizing processes, executives are better able to focus on the importance of infrastructure and integration issues to ensure that the various applications work together to make the entire process as efficient as possible.

At the same time, an emphasis on business processes has focused managers on the differences between *core processes* that capture the core competencies and the proprietary knowledge of the organization, and support or *enabling processes* that don't differentiate the company from its competitors. Executives want all their processes to run as efficiently as possible, but they are increasingly discriminating between processes that the company should focus its best talent on, and processes that might be better done by purchased applications or by outsourcing.

Components and Packaged Application Suites

In the mid-Nineties, most companies began to experiment with the acquisition and use of off-the-shelf software components to make new application development faster. At the same time they also explored the use of packaged suites of applications to handle Enterprise Resource Planning (ERP). In essence, software applications from companies like SAP, PeopleSoft and Oracle were acquired to provide the company with a common database and standard ways of passing information from one module to another. Most companies continue to expand their packaged ERP suites to provide company-wide accounting and planning standards.

Unfortunately, the packaged application suites seldom match a company's actual needs. Worse, tailoring packaged applications is a time-consuming and expensive process. Most companies have acquired packaged applications to support enabling processes, like accounting and human resources, but find that they are less satisfactory when used in conjunction with core processes. Moreover, packaged application systems don't solve the company's overall architecture problem, since they usually don't work very well with other systems that the company already has. The use of packaged applications represents a first step toward reducing and controlling the costs of IT, but more steps are required. Instead of solving the company's architecture and integration problems, packaged applications often contribute to the overall problem, and alternate solutions need to be developed.

Best-of-Breed Applications

At the same time that companies have explored reusable software components and packaged applications, they have also experimented with best-of-breed applications and with outsourcing. Packaged suites tend to be generic in their design and provide average functionality to a wide variety of different situations. This approach may be fine for accounting and for some human resource activities, which are well defined and regulated, but it usually isn't sufficient for key business processes, let alone core processes. When companies consider acquiring a software application for a key process like claims processing or airline inventory management, they are likely to turn to a company that has considerable expertise in the area and that sells a best-of-breed application that is widely regarded by industry insiders as the best

possible off-the-shelf solution for the specific task. And, even after acquiring the best-of-breed package, most companies will spend quite a bit of time and effort tailoring it for their specific needs.

Unfortunately, although best-of-breed applications are preferred for key business process automation efforts, they are often not designed to integrate with other corporate application suites or legacy applications, and can easily add to the overall application integration problems facing the IT organization.

Outsourcing

Outsourcing is an increasingly popular alternative to component-based development or the acquisition of packaged applications. In some cases a company will simply hire an outside company to create and run an application for them. In other cases, the company will hire an outsourcing company to take over the management and maintenance of existing ERP applications. In a few cases, companies have turned their entire IT organizations, hardware, software and employees over to an outside contractor.

In an ideal world, if your company had a well-defined architecture and an infrastructure systems in place, outsourcing applications or even complete business processes would be easy, since you would know exactly which hardware and software functions you were outsourcing, and would know, whenever a change needed to be made, exactly how to tell the outsourcer to change your applications. Unfortunately, most companies don't have either an adequate business process architecture, or a process-oriented IT architecture.. Nor do they have an integration system that can define all the interfaces and links between in-house and outsourced applications.

Once again, most companies have been willing to experiment with outsourcing support applications and processes, like accounting and human resources, and have been much more resistant to outsourcing key or core business processes.

The problem is most acute with core business processes. These are the processes that you depend upon to stay in business. They define your company, make you different from your competition, and are what your customers think about when they think of your company. They contain the proprietary knowledge your company has accumulated and they must be changed frequently as customer tastes and competitive offerings change. In some industries, where product lifecycles last months rather than years, new core processes are constantly under development.

Core business processes lie at the heart of every company's integration and architecture plans. These are the valuable processes that suppliers need to interface with and that customers access when they visit your company portal. These are also the key processes that other enabling processes support and must interface with. These are ultimately the processes that define the key features of your IT architecture and therefore determine the IT architecture that support processes must interface with.

Complexity, Architectures, and Integration

Even companies that understand the problem face a dilemma. IT development is getting more complex all the time. Most IT analysts think, for example, that companies will tend to rely more on the Internet and access more applications over the Web. These Web Services may be outsourced applications or applications used internally, but accessed on-line from a vendor's portal. The details of this transition aren't important. What is important is that the technology standards required for this transition are only now being created by meetings among architects of major software companies like IBM, Unisys, Oracle, and Microsoft. Understanding how these new software technologies will impact good architectural design is a full time job and few companies have the budget or the specialists required for this effort. Moreover, even when the new standards are accepted by international standards groups, it will take time for companies to train people and gain the experience to apply these new techniques.

Few companies not involved in IT full-time want to invest in the type of IT organization that can understand and integrate the latest concepts in architecture design and software engineering. Thus the dilemma most CIOs face: Before you can acquire or outsource good applications, you need an infrastructure and an IT architecture that assures you can link and update the new applications. But the creation of such an architecture and the maintenance of such an infrastructure is a complex and time consuming job, and few executives want to provide their IT organization with the resources required for such an effort.

In a nutshell, executives want to get control over their IT budgets. They want to find ways or reducing new IT development costs and controlling ongoing maintenance costs. They are attracted to the idea of acquiring software or outsourcing software if it will assure that their enabling processes will be run more efficiently for the same or lower cost. They would like to find a way to acquire or outsource major business processes, but fear that the inflexibility of best-of-breed applications or of an outsourcer will limit their ability to respond to their customers quickly.

The Unisys Business Blueprint Solution

For companies in six key industries, Unisys has a solution to the dilemma executives face. A Unisys Business Blueprint is a business application architecture, a component-based application implementation, and a methodology for transforming business processes while simultaneously aligning them with corporate goals. A Business Blueprint provides managers with an explicit, layered, model-based definition of an application. It also provides a specific way to trace any changes made to the application. Business Blueprints provide managers with explicit control over both their applications and their IT budgets.

From one perspective, a Unisys Business Blueprint is a set of models that describe a business application and supporting infrastructure. It's the kind of systematic business and IT architecture that every CIO wishes his company had for its core business applications. (See Figure 1.)



From another perspective, a blueprint is a collection of reusable business patterns and software components that contain the code that implements the application. And, from still another perspective, the Business Blueprint is a methodology that defines the roles of all of the business system and infrastructure models and components and prescribes practices to maintain their alignment and make changes when necessary.

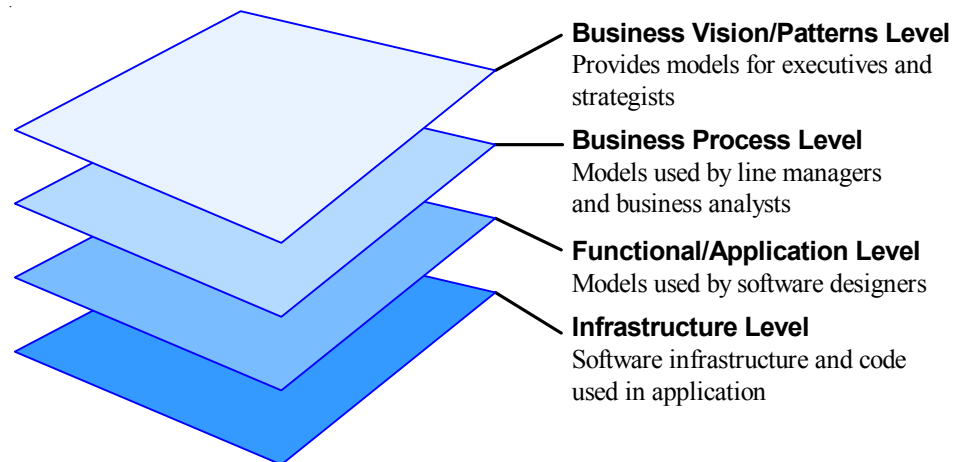


Figure 1. Layers in a Unisys Business Blueprint.

One way to think about a Business Blueprint is to think of a stack of four layers, as illustrated in Figure 1. The top layer is made up of models and diagrams that capture information of interest to business managers. This layer is concerned with business objectives, process measures, and a description of how the blueprint supports a specific business strategy.

A next level down contains models and diagrams of the business operation and its constituent activities. The elements described at this level define business activities without defining exactly how they will be implemented.

The third level down contains models and diagrams that capture information about the specific design of the software applications that will actually implement the business process described, abstractly, on level two.

The bottom level describes specific infrastructure used by the software defined on Level Three.

Software components, as defined by Unisys, refer to a wide range of software modules. In some cases, existing packaged software applications can serve as components. In other cases new software components are created for the specific application. In still other cases, middleware code that links and integrates other elements may be generated.

By separating the levels, one is assured of institutionalizing key Intellectual Capital (IC) so that it is explicitly available in the future. Thus, knowledge is available for

others to leverage and reuse, and there is no waste in "rediscovering" the IC is typically buried in the code of most applications. By using an underlying modeling technology that allows lower level models to be generated by higher level models, one assures that changes made at the business process level can be quickly and accurately reflected at the design level. Similarly, changes made at the design level can quickly result in new software components with changed functionality. By using components, one is assured that existing legacy applications, packaged suites, and new applications can all be integrated using a common interface.

With appropriate software tools one can easily trace how a change in one model results in a change in others. This kind of automatic traceability is a major feature of Unisys Business Blueprints. Unisys relies on industry standards (E.g. the OMG's Model Driven Architecture -- MDA) and on standard software products and methods, like Microsoft's Windows and .NET, Sun's J2EE, the OMG's Unified Modeling Language (UML), IBM's Rational Rose and Rational's Rational Unified Process (RUP) for software development, Proforma's ProVision tool for business process analysis and Cost Xpert for cost analysis and ROI. This assures that companies can easily examine Unisys process designs and systems elements and monitor the results. The integrated layers assure that a client can trace specific, strategic goals through process designs to software designs and ultimately to software components.

Unisys Business Blueprints also draw on a proven software technique termed *patterns*. In essence, the diagrams at various levels of a Unisys Business Blueprint stack can be analyzed to identify repeating patterns. Unisys Business Blueprints identify Business Patterns at the upper levels and Application and Infrastructure patterns at lower levels. These patterns often reflect the fact that different activities are performing the same tasks. By consolidating similar tasks, or supporting multiple tasks with a single implementation component, Unisys Business Blueprints assure that applications run efficiently.

Unisys is Focusing on Six Key Industries

Business Blueprinting requires an exceptionally detailed knowledge of all aspects of the business strategy and processes used by a company. To assure that Unisys Business Blueprints are truly best-of-breed applications, Unisys has focused on six key industry areas where it has well established expertise. Unisys is currently selling or creating the following Business Blueprints.

Financial Service Industry

- Life Insurance and Pension Blueprint: Policy and contract initiation, management and administration.
- Property and Casualty/General Insurance Blueprint: Policy initiation, management and administration.
- Banking and Mortgage Blueprint: Retail and commercial banking and mortgage processing
- Enterprise Payments Blueprint: Paper and electronic payments factory.

Transportation Industry

- Airline Core System (AirCore) Blueprint: Booking, departure and inventory management.



Retail Industry

- ITPR Integrated Trade Replenishment Blueprint: Large consumer product suppliers and retailers

Federal/Public Sector

- Health Claim Management Blueprint: UniPAS Medicaid Processing
- Health and Human Services Blueprint: Eligibility determination and case management
- Justice and Public Safety Blueprint: Collection, court case management and citizen identification

Communications

- Multimedia Messaging Blueprint: Open system storage and forward messaging platform for integrated media

Publishing Industry

- Newspaper and Web Publishing Blueprint: Multimedia asset management for news planning and gathering

Unisys Business Blueprints are best-of-breed business practices and applications that automate key business processes. Unisys has been working with the industries it support for many years. The current Unisys Enterprise Payments application, for example, is used by 22 of the top 25 global banks. That means that half of the checks cashed in the world rely on this Unisys application. Similarly, Unisys airline applications are used by 23 of the top 25 airlines in the world, by some 200 airlines, and by over 100 airports around the world. This kind of industry acceptance is exactly what defines best-of-breed applications.

To create its Business Blueprints, Unisys is re-architecting and rewriting its existing, best-of-breed applications using an open architecture approach, known as Model Driven Development (MDA), that assures that application designs are transparent and easy to modify. In essence, a company that buys a blueprint isn't just buying an application, they are buying an architecture and all the technology that is require to reengineer their company's IT organization. Unisys has also standardized its own development practices on popular software development tools, like the UML notation, Rational Rose, J2EE, Microsoft Windows and .NET, ProVision, and Cost Xpert to assure that companies can easily interface with Unisys Business Blueprints.

Unisys sells its Business Blueprints with all of the support and training necessary to bring your company up-to-speed on business practices for business transformation with the MDA architecture and associated software engineering techniques. Unisys has defined an extensive training program to accomplish this. Since the underlying architecture and infrastructure are generic, once your IT group has mastered the architecture used for a specific Unisys Business Blueprint, they are ready to extend this application to encompass other applications your organization maintains.

On the other hand, if a company doesn't choose to invest so much in upgrading its existing IT organization, Unisys will provide and manage the blueprint as an outsourcer. In the past, many organizations would have been wary of outsourcing the kinds of key processes that Unisys Business Blueprints automate. In this case, however, the company gets the architecture and the infrastructure, even if they outsource the actual application. In other words, your business managers and remaining IT

organization, using what Unisys provides, is positioned to make detailed changes in its processes, whenever it wants, and can trace exactly how the changes are implemented by the outsourcer.

ING's Use of Business Blueprints

ING is an international financial services group headquartered in Amsterdam, in the Netherlands. It serves some 55 million customers in 65 countries and has more than 110,000 employees. ING is the number one life insurance company in the world, with some \$628 billion in assets and the twenty-fifth largest bank in the world. In 1999 Unisys and ING entered into an agreement and Unisys began to develop a Unisys Business Blueprint for ING's life insurance processes. ING already had a sophisticated architecture and a suite of applications. ING realized, however, that it would need a new software architecture and improved applications as it moved into the new millennium. Rather than try to develop the in-house sophistication to create a new architecture and a new suite of applications, it decided it would let Unisys apply its Business Blueprint approach to its processes and systems.

Unisys has developed a suite of new insurance applications for ING. They have done much more than simply create functioning applications, however. They have created a state-of-the-art component architecture that is defined using internationally accepted standards. They have created an aligned architecture that assures that ING can revise their goals, and immediately see how those changes are implemented by changes in the process model and in the underlying software application. And they can use the software tool, Cost Xpert, to explore the cost implications of changes to their applications and to monitor results. ING now has a new set of applications, and they also have a well-defined set of reusable components and an architecture that future-proofs changes that will be required later. ING has benefited from the major investment Unisys has made in defining the business and IT architecture of the future and implementing ING's business processes and software components in that environment.

Unisys Business Blueprints - A Personal Interpretation

I've been following developments in business process and IT architecture for the past decade. Similarly, I've reported on the development of software engineering techniques and software design methodologies during that same period.

If you asked me to describe the best practices in software engineering today, I would tell you that the best architects use the Unified Modeling Language (UML) to model applications and associated infrastructure. In most cases they rely on Rational's RUP methodology to analyze business process requirements and create the software models required for automation. They use component-based techniques to create the actual software. Component techniques, whether they rely on .NET or EJB components, guarantee that different software modules can be given uniform interfaces and can, therefore, be linked with legacy applications with a minimum of difficulty.

I would then proceed to explain that the very best architects and designers are currently working to implement the Model Driven Architecture (MDA). MDA is being created by the OMG, the same standards organization that created and maintains UML. In essence, MDA organizes UML models into layers that are independent of

each other, but that are aligned so that changes in high-level business models are automatically transmitted to lower level design models, and ultimately to the components that contain the code needed to execute the applications.

I would tell you that, simultaneously, Internet standards groups are working on standards like XML and BPEL, techniques that can be used to model business processes and pass data between components via the Web.

This isn't the place to go into detail about any of these architecture standards or software techniques. Suffice to say that it's a full time job just to keep up on these developments, and a much more demanding job to master the specific techniques in order to define a specific corporate architecture or infrastructure. Most large companies are just beginning to experiment with these techniques and a few vendors are beginning to use these techniques in their applications.

What Unisys has done is to survey the latest technologies and create an architecture and an infrastructure based on the latest technologies. In fact, Unisys has done a great job of creating a general framework and then using only those techniques that are already well defined and robust, while leaving room for extensions to other techniques as they prove themselves. If you were a Fortune 50 company and had a large and sophisticated architecture group, this is exactly the kind of enterprise-wide design you would expect them to create for your company. It's hard to imagine how other companies would have the time and the talent required to create such a sophisticated approach. Most companies are simply too bogged down in maintaining what they have and creating new applications under impossible deadlines to be able to step back and create a comprehensive IT architecture like the one Unisys has design into its Business Blueprints.

Having created the Unisys Business Blueprint architecture and the infrastructure necessary to implement it, Unisys then proceeded to reengineer its best-of-breed applications in finance, government and transportation to run within the architecture it had created. Where before, one of their best-of-breed applications performed, it wasn't defined by UML models that would make it trivial to change the way the application performed. The new Unisys Business Blueprints are applications designed using the latest techniques precisely to assure that they can be changed on a dime and integrated with anything else your company uses.

I don't know of any application vendor or outsourcer who has anything equivalent to the Unisys Business Blueprints. A large systems integrator would be happy to design you an architecture like the one provided in a Unisys Business Blueprint and would even develop you an application using such an architecture, but it would be a tailored development effort and you would pay accordingly. What Unisys has done is "packaged" tomorrow's architecture with a best-of-breed application to provide users with the most flexible and agile applications available on the market today.

The Future

Unisys has done nothing less than change the ground rules by which best-of-breed vendors and outsourcers play. A Unisys Business Blueprint is a lot more than an application. It's an application designed to be changed quickly and repeatedly. Moreover, it comes with the architecture and the infrastructure a manager needs to control the application, to redesign it if necessary, to integrate it with whatever else you own, and to maintain it.

Some companies will buy a Unisys Business Blueprint and use it as the catalyst to initiate a complete reorganization of their IT organization. They will begin by installing the Unisys Business Blueprint application and training their IT people to understand and maintain it. Then, once their people are trained, they will gradually use the Unisys Business Blueprint architecture and infrastructure to transform all of their other IT resources. Others will not want to spend that much on their IT operations and will outsource the management of a Unisys Business Blueprint to Unisys, content that their business analysts will now be able to quickly change the business process whenever they want, confident that the underlying software application can be quickly altered to support any change made in the process.

Whatever your company may decide, you can be sure that lots of application vendors and business process outsourcers are going to be struggling to come up with packages more like the ones Unisys is now starting to sell. Clearly Unisys knows what it means to delight its customers by significantly raising the bar on what they might expect from a best-of-breed application vendor or a business process outsourcer.

Note: Business Blueprints is a registered trademark of Unisys.

