Rethinking Enterprise Boundaries:
Business Webs in the IT Industry

by Don Tapscott
Executive Summary

LOW-COST INFORMATION and communication technologies, global markets, and global competition have forced enterprises to rethink their traditional, vertically integrated structure. As the cost of collaboration plummets, it increasingly makes sense for companies to focus on core competencies and partner for all other functions. As a result, corporations are transforming into flatter and more specialized enterprises, linking with suppliers and other businesses to form a larger, more open, value-creation entity that I call the business web.

Just as the Web and service-oriented architectures enable deep changes in corporate architectures, they require that software companies embrace collaborative business models. The world of software is too large and intricate for any one applications software company to go it alone. As collaborative business models become pervasive, huge gaps are developing between the software that companies use to run their businesses and the business problems that need solving. A new world of business semantics must be forged to enable high-performance business webs. To address these challenges, software leaders are forming their own business webs to build IT solutions fit for the job.

SAP, the world’s largest applications software company, is changing its business model to win in this new reality. This paper examines SAP’s new business model, and the lessons to be learned for software companies and enterprises migrating to service-oriented architectures.

1.0 Introduction

Historically firms integrated vertically, running most core processes internally, from purchasing, through manufacturing, to warehousing, and distribution. Outsourcing a differentiated function was rare. The costs of outsourcing functions to other more-specialized players outweighed the benefits. Yes, a company could outsource payroll and benefits management, but anything considered strategic was managed in-house. As was often said, if you wanted it done properly, it was easier to manage it yourself.

Today, a fundamental change is occurring in the way companies orchestrate innovation and value creation. Smart multi-billion-dollar firms recognize that innovation often begins at the fringes. Increasingly, these hierarchical enterprises are turning to collaborative business web models where masses of consumers, employees, suppliers, business partners, and even competitors co-create value in the absence of direct managerial control. Why is this happening? Because the cost of collaboration is declining.

The demand pull of evermore complex customer requirements coupled with the demand push of new technologies has dramatically reduced the costs of coordinating work not only within geographically-dispersed firms, but also between firms. Static enterprises are now reorganizing into more dynamic, high-performance business webs that collectively create value.

Nowhere is this more striking than in the IT industry. For years hardware vendors have unbundled many parts of their value chain from design and manufacturing to fulfillment and aftermarket services. Now the software industry needs to embrace business web concepts to effectively support their customers and their new business models. Specifically, Web services and service-oriented architectures (SOA) are enabling software companies to forge elaborate ecosystems to define and deliver critical process and software components to the market.

This white paper explores the technical and business drivers behind these revolutionary ways of creating value, and examines how SAP is responding in this new environment.

SAP’s approach is two-pronged. First, it is opening up its software platform to provide customers and partners with the flexibility needed to build customized enterprise solutions quickly and efficiently. Second, it is nurturing a large ecosystem of partners to define the new services, semantics, and syntactical data consistencies required to deliver powerful new service-oriented architectures. SAP is, in effect, walking the talk by collaborating to create an open and extensible enterprise services development environment. The goal is to enable innovation, speed up development, and lower costs for all players.

SAP’s ecosystem—which includes customers, technology partners, Systems Integrators (SIs), Independent Software Vendors (ISVs) and Value Added Resellers (VARS)—are not just focused on software, but on defining common processes, standard interfaces, best practices and services to create true value in their markets. The ecosystem as a whole is committed to making SAP’s enterprise service-oriented architecture the framework for networked value creation.
1.1 Rise of the Business Web

In *Digital Capital: Harnessing the Power of Business Webs* (2000), David Ticoll, Alex Lowy, and I defined business webs as strategically aligned, multi-enterprise partner networks of producers, suppliers, service providers, infrastructure companies, and customers that conduct business communication and transactions via digital channels. As the costs of collaborating over the Internet plummeted, emerging business webs like eBay, Schwab, Linux and dozens of others transformed the rules of competition in their industries. They hijacked long-entrenched industry leaders with revolutionary offerings that surprised and delighted customers. But these pioneers could not and did not act alone: partners enabled them to move with stealth, speed, agility and force—all in the name of generating wealth in entirely new ways.

Since then, business webs have taken off. No matter which industry you examine, collaboration across enterprises is the key to innovation and wealth creation. In my most recent book *Wikinomics: How Mass Collaboration Changes Everything*, co-authored with Anthony Williams, we examine how everything from jetliners to encyclopedias, operating systems to mutual funds are being created by teams numbering in the thousands and even millions. The fundamental lesson of *Wikinomics* is that the traditional, monolithic multinational corporation that creates value in a closed, hierarchical fashion is dead. Winning companies today have open and porous boundaries and compete by reaching outside their walls to harness external knowledge, resources, and capabilities.

To win in this new world, companies need a loyal base of co-innovators that can make their business webs
stronger, faster, and more dynamic, than their rivals’ business webs. To achieve this, smart firms—regardless of the sector or line of business—are rethinking their strategy, morphing their business models, and rearchitecting their software platforms to enable frictionless collaboration with their partners. SAP is just one of a growing number of companies that are embracing this new competitive philosophy.

2.0 Enabling High-Performance Business Webs

In today’s complex and fast-moving economy, the economic deficiencies and liabilities caused by the lack of standardization surface faster and are more jarring and consequential than in the past. For example, it’s no longer sufficient to manage a company as a collection of separate subsidiaries, business units, and product lines—each with their own technical architectures. To compete in a global economy, you need a seamless global enterprise where physical, financial, human, and intellectual assets are managed across geographies and organizational boundaries. In other words, all of the disparate elements of the business web need to act as a single entity.

Acting as a coherent entity is hard enough for a single company, especially if you’re buried in disjointed legacy systems and processes. The act of coordinating people, processes, applications, and data across global business webs represents a tremendous operational challenge. Just ask Ralph Szygenda, the CIO of General Motors. “Most big companies are multinationals, not global,” he says, “and increasingly that’s a big problem for all of us.”

Szygenda describes how GM grew up as a collection of separate companies. Each major brand, including Cadillac, Oldsmobile, and Buick, had separate staff, procedures, IT systems and agendas, and there was very little coordination among them. In fact, the auto manufacturer was not only divided by business units; it was also divided into geographically demarcated fiefdoms. Like many multinationals, its regional divisions had power and autonomy to develop, manufacture, and distribute cars according to local needs and by sourcing from local suppliers.

For GM this federated structure came with immense and costly redundancies. Each division employed a full roster of local workers and administrative and operational support systems to take care of everything from manufacturing to human resources. Bob Lutz, GM’s vice chairman of global product development says that duplication of effort cost the company billions of dollars a year and prevented it from leveraging its size and scale. The lack of global systems and global coordination also cost the company dearly in lost opportunities for innovation—as competitors jumped on the hybrid craze, GM was falling behind.

In an increasingly global and competitive economy such redundancies are swiftly punished. So it pays to have global capabilities—including truly global workforces, unified global processes, and a global IT platform to enhance collaboration among all of the parts of the business as well as the company’s web of external partners. Indeed, the emergence of open IT standards makes it considerably easier to build a global business by integrating best-of-breed components from various geographies and various business web partners.

Szygenda envisions how such global unity might play out for GM. “Whether we’re developing a product, manufacturing, sourcing, or distributing,” he says, “we’ll be able to link up all of our activities in a seamless global operation.” Or as Bob Lutz says: “We will treat the whole world as if it were one country.” GM has already taken large steps towards this vision, which may well be the company’s ticket to recovery. But Szygenda is keen to point out that this journey would not have been possible in the absence of a broader shift toward open systems and service-oriented architectures.

2.1 The Shift to Service-Oriented Architectures

During the 1980s and 1990s, many firms set up enterprise IT systems as an information backbone. The technology streamlined and standardized business processes. By delivering accurate and consistent data to executives and front-line employees, these applications facilitated collaboration and cost savings. By embodying industry best practices they helped many companies achieve huge leaps in operational excellence.

Encouraged by enterprise systems vendors, companies adapted their processes to conform to such best practices. However as best practices became standardized, they no longer provided competitive differentiation. Best practices are only good enough when routine cost cutting is all that matters.
Enterprise systems-enabled excellence entailed several transformation challenges: adapting to new processes, standardizing master data, adopting best practices, retraining staff, engaging stakeholders, and successfully managing change. For global companies the transformation was even more challenging. Expensive bandwidth made it tempting to set up separate application versions in different geographies, as the GM example illustrates.

For those that chose to go global, the reward was a tightly integrated system of technology and business processes that spanned the enterprise, rationalized and synchronized once-fragmented activities, and provided mechanisms for continuous improvement. Standardized processes delivered economies of scale and helped build new bridges that spanned departments and physical distances, and were implemented in a repeatable, measurable way.

But to gain this level of enterprise integration, firms had to relinquish flexibility. Many molded their businesses to the software, rather than the other way around. Vendor technologies forced that trade-off—a system that was both integrated and flexible simply did not exist. Enterprise systems were meant to integrate your company and help you conform to industry practices. Achieving differentiation or developing custom processes was difficult, costly, and potentially release dependant.

### 2.1.1 A New Business Architecture Demands a New Technical Architecture

Today, changes in the global economy require changes in the organization of work, and that means enterprise systems must also change. Now that market leaders like Dell, Cisco, and Procter & Gamble have learned to manage efficiency, productivity, and costs, they need to focus their human and financial resources on innovation and growth. Industries are consolidating, new business models are changing competitive dynamics, and regulatory and reporting demands are far more rigorous. Success in this environment demands a new level of information sharing within the firm and beyond—including customers, partners, suppliers, regulators, and other stakeholders. Global corporations that have until now been able to “act locally” now need to act globally—as markets, networks, and trade agreements demand. To do so, they need seamless resource planning based on common master reference data shared easily across the business web.

### What is a Service-Oriented Architecture?

In a service-oriented architecture, software is defined and written as building blocks of decoupled services that conform to a set of standards and principles that allow for their discovery, execution, and reuse. These typically stateless and autonomous tasks can be aggregated and composed into more complex services that perform business tasks within or between firms. For today’s implementation these services are Web Services that conform to an evolving set of agreed-upon standards. These include WSDL (the Web Services Description Language) for their definition, UDDI (the Universal Description, Discovery, and Integration Protocol) for their visibility and on SOAP (the Simple Object Access Protocol) for their execution.

To reduce complexity, shorten response times, and increase intersystem integrity, SOA implementations tend to be based on the guaranteed delivery of autonomous messages and the resulting asynchronous execution of the requested service rather than the traditional highly interdependent (and at times problematic) remote procedure call.

An SOA implementation hides the complex and often proprietary logic of the computing platform—including the location it operates in and the computer language it is written in—from those that use it. In doing so, SOA maximizes interoperability, shortens development time, and positions a company’s system and services for seamless integration internally and with others.

The rules of the message exchange and the underlying business logic can be defined, overseen, and orchestrated by one party, or can be dynamically negotiated through collaborative processes by business web participants. BPEL, the Business Process Execution Language, enables companies to extend systems beyond the enterprise towards a more federated architecture by providing the process description and vocabulary required to manage and oversee business web integration.

For business webs, the promise of this technology is for systems to find, negotiate, and establish trusted relationships, whose transactions can create value directly from computer to computer. Employees can move beyond managing the day-to-day execution of tasks to strategizing, defining, and overseeing the products, processes, rules, and relationships that create value in the business web. After all, SOA is not only a powerful platform for meeting today’s needs; it is flexible enough to meet the unforeseen needs of tomorrow. Think of it as an innovation accelerator. The loose coupling of discrete services with common content and context enables developers to rapidly build flexible new systems within and between enterprises.
Software designers a decade ago could not fully anticipate today’s radically different business climate. Regulatory changes, the growth of the Internet, fierce global competition, a new wave of outsourcing, and blurring enterprise boundaries are changing the rules of competition. As companies band together in business webs to address these challenges, they are increasingly demanding a new, more open, extensible, and flexible breed of enterprise software.

After all, enterprise software systems were built to systematize, automate, and connect previously disjointed data and processes within a single enterprise, not a network of collaborating partners. This is hardly surprising—enterprise applications can’t be all things to all people, and even if they could, not all members of a business web choose the same vendor. As a result, ERP implementations did not readily share data and connect people and processes across multiple enterprises, so companies engaged in business web partnerships have had to rely on ad hoc systems and processes to connect their operations. More often than not, that meant defaulting to faxes, phone calls or email—hardly the stuff of a high-performance business web.

Fortunately, new methods, processes, and standards for interoperability are driving important shifts in software to support these emerging business webs. Instead of the tight integration of the original enterprise systems, firms now need an open architecture that allows them to quickly uncouple and re-couple services as required across the business web. A new Internet-enabled computing paradigm called service-oriented architectures is the first generation of software to enable this level of openness and flexibility.

2.2 SOA Enables New Ways of Doing Business

As the Internet evolves beyond a presentation medium to a global computational platform, a new generation of software architecture has arrived. Service-oriented
architecture, typified by standards like XML, SOAP, WSDL, and UDDI, is here today (see sidebar). Flexible, distributed collaboration through networked services is the result.

Applications once confined to individual computers have already been networked across the enterprise, but SOA provides the basis for a global computing fabric that embraces a vast array of internal and external users—the Internet is the computer. The change will finally bridge the divide that exists between our IT resources—a divide that has stood in the way of engagement and collaboration. SOA expands the boundaries of the enterprise—enabling employees, suppliers, customers, channel partners, and others to participate in networked value creation. The same principles can be applied to traditional enterprise software, weaving these systems into the fabric of global networks.

The result: enterprise systems are becoming service-enabled. Sounds impressive, but what does it mean?

Essentially, service-enablement adds a new category of software elements to an enterprise application environment. Designers can use these elements, called “services,” over and over. A service can be set up to pull information from existing applications or to cause applications to make something happen, perhaps a transaction. A service can be simple or complex. Several services can be combined into a more complex service.

Services have two important features that give them great power:

- **Services are defined in business process terms**—like a purchase transaction, inventory lookup, or customer request. This means that they are intuitively easy to work with and can apply to any functional area.

- **Services are often based on industry standards.** They can interact with a variety of different applications from several vendors (if the applications have been enabled to understand and work with these services).

Because of these features, service-enablement is emerging as the “secret sauce” that turns enterprise applications supported functions like manufacturing, purchasing, finance, and human resources. Service-enabled applications support processes that can readily crisscross several different functionally oriented systems. Manchette Publicité built a service that links placement, fulfillment and invoicing of advertisements through a common interface on its customer Web site.

- **Service-enablement supports innovations that improve differentiation and speed time to market.** Small, modular software-based services lend themselves to rapid design. Services can be readily linked together and reused in a LEGO-like fashion. All this supports timely product and process innovation. British American Tobacco (BAT) built a service-based supply chain dashboard as a proof-of-concept. It combines information from SAP, i2, and other sources. Normally, such a project would take nine months; this one was completed in 12 weeks.

- **Engaging and collaborating with business web participants and newly acquired companies becomes more effective and efficient.** Modular services—whether based on industry or firm standards—can be readily deployed across enterprise boundaries. As a result, transaction costs decline, trust improves, automation speeds up, sourcing becomes more flexible, and everyone gets the same information. Air France has adopted a services-oriented approach to connecting its systems with those of its recently acquired KLM. Because of the breadth of this challenge, developers have been tempted to take shortcuts that minimize the effort of defining and following standards. But the company has made service-orientation a policy because it believes the investment will pay off.

- **Service-enablement cuts costs and frees up resources.** This is true for several reasons. Once built, modules can be reused and recombined over and over—where previously it would have been necessary to custom build capabilities for each functional enterprise application that participates in a process. The same factors also help minimize the costs of maintenance and upgrades. Perhaps more important, once they are deployed, services make possible innovative linkages that can dramatically improve business efficiencies. Not only did BAT build its procurement dashboard in record time; it
also achieved a 70% cost saving. Manitoba Hydro built a service-enabled employee self-service portal that enabled it to cut printing and mailing costs, and to redeploy human resources staff from manual administrative tasks to advising line management on HR strategy.

Services-enabled enterprise applications provide new levels of integration that can better optimize corporate resources and improve business processes. They support visible, flexible and adaptable business processes that can be easily brought together to satisfy business needs. Services can trigger events and drive changes in behavior in real time. For example:

- Excess inventory at a supplier automatically triggers discounts on a customer Web site “while supplies last.”
- Reduced prices on a set of parts trigger an order for an assembled device that a retailer previously considered too expensive.
- Exposing core services allows composite applications to streamline the loan approval processes for customers with excellent credit histories or big deposits.
- With transparency and integration across the supply chain, a customer request on a retail site for an innovative mobile phone feature alerts a product designer to the idea—and to the fact that a consumer wants it.

With easily accessible services, connections across a business web help optimize formerly isolated activities. These connections make impacts and dependencies clearly visible. Sales can prepare customers for delays from materials shortages in the supply chain, and design sees the impact of a material substitution on returns and warranty costs. Illuminating all these dependencies is the first step in improving them. Companies need their enterprise vendors to provide the service-enabled building blocks that make dependencies visible and improve access to services.

In the next section, we explore in detail how these service-enabled building blocks are also redefining the way enterprise software providers and their customers and partners work together to create flexible business solutions. Instead of modifying an in-house implementation, for example, SIs can leverage the SAP NetWeaver platform to assemble a customized set of reusable and interoperable Web-enabled services that are invoked by the end-user as the needs of the business demand. Indeed, the shift to SOA means it no longer makes sense to think of enterprise systems as discrete islands of technology. Instead, a vast ecosystem of customers, partners, suppliers, and integrators can now use, extend, and amend each other’s services to create powerful new composite applications. This new collaborative capability represents one of the most significant developments in the history of enterprise software.

3.0 SAP’s Ecosystem

Just as the Web and service-oriented architectures enable deep changes in corporate architectures, they require software companies to embrace collaborative business models. The world of software is too large and intricate for any one applications software company to go it alone. As collaborative business models become pervasive, huge gaps are developing between the software that companies use to run their businesses and the business problems that need solving. A new world of business semantics must be forged to enable high-performance business webs. To address these challenges, software leaders are forming their own business webs to build IT solutions fit for the job.

By embracing SOA and engaging large ecosystem co-development partners, SAP has established itself as a leader in this new business paradigm. Its management team has admirably committed the company to enable its ecosystem of partners and customers to achieve the holy grail of interoperability and reusability—not just within an enterprise but also between enterprises.

Recognizing that existing SOA standards such as SOAP, XML, and UDDI are not sufficient, SAP is working aggressively with a business web of customers, partners, and yes, even competitors, to extend SOA to what SAP refers to as enterprise SOA. Enterprise SOA is a business-driven extension to SOA that combines the technology of SOA with the business content and context required to effectively collaborate across disparate systems and enterprise boundaries. Enterprise SOA moves beyond the theoretical connectivity of SOA to drive real time communication based on common definitions of reference data and the interactive enterprise services that support value creation in the business web.
By assembling an enterprise SOA ecosystem, SAP is bringing together the expertise required to create the common service definitions, semantics, and the logical and syntactical data consistencies that are required to realize enterprise SOA’s promise: the ability for business webs to quickly compose and assemble new business solutions that meet ever-changing business requirements. This collaborative approach represents a fundamental departure from the way software companies have traditionally worked with their customers and partners.

Enterprise software companies have traditionally guarded their internal workings like state secrets and avoided open standards. The information technology industry in general fiercely fought concepts like open systems and open source for years—largely because their business models were premised upon a lack of interoperability with other vendors’ systems.

This proprietary logic extended to ERP implementations where enterprise software providers and third party system integrators (SIs) worked together in closed ecosystems that resembled a hub-and-spoke system. Software suppliers like SAP were the hubs, and third party SIs were the spokes. Customers could choose from among the various SIs’ proprietary ERP implementation methodologies, but the lessons learned from one implementation to the next were never openly shared—nor were the customized services and applications that SIs created for customers. With SAP’s new approach, the hub-and-spoke model has at last been abandoned.

Today, SAP is reengineering its core services on an open, extensible, SOA compliant architecture it calls SAP NetWeaver. This open platform enables customers and partners to build new features and functionality. Customers, SIs and other partners in the ecosystem are now encouraged to share their knowledge openly and build standardized services that can be leveraged throughout the ecosystem. The resulting collaboration is a win-win for SAP, its customers, and its partners because the net value created by the ecosystem is much greater than in the past.

Collaboration in the SAP ecosystem is channeled through a variety of communities that work on different challenges. So far these include:

- An Enterprise Services (ES) Community that is defining and standardizing a growing repository of enterprise services that can be used to build composite applications and systems

Figure 3  SAP Ecosystem
• Industry specific groups called Industry Value Networks (IVNs) that bring together SAP and its customers and partners to articulate, develop and implement solutions for industry problems.

• A Business Process Experts (BPX) Community that uses advanced tools and techniques to define, model, implement, and measure the effect of automated processes within and between firms.

Together, these collaborative communities add powerful new knowledge and capabilities to SAP’s offering, allowing it to extend the breadth and depth of its software and services to an even larger community of customers. Let’s look at each in turn.

3.1 SAP’s Enterprise Services (ES) Community

The ES Community brings together software developers and business experts from diverse industries to share ideas and innovations in enterprise services. Its mandate is to help define, clarify and standardize enterprise services to be delivered by SAP or its partners.

For SAP, the ES Community is an increasingly important conduit through which to develop new enterprise services. Two distinct groups play complementary roles in the ES Community:

• **Definition Groups** propose new or extended enterprise services, whether for an industry, a profession, or a new technology. Enterprise customers, ISVs, technology partners, and SIs collaborate in a flexible framework to direct enterprise services development efforts. There are two models of Definition Groups: higher level groups that request new enterprise services, and technical groups that develop, refine and package these services for inclusion in SAP NetWeaver’s enterprise services repository. The result is a growing set of discoverable services that SAP customers and partners can invoke as required.

Today, ES Community Definition Groups exist for industries such as health care and banking, and technologies such as RFID (radio frequency identification) and GIS (geographical information systems).

• **Open Advisory Groups** meet to discuss and resolve broader business issues related to the creation or implementation of enterprise services.

For example, advisory groups might focus on identifying industry trends, best practices, and optimal processes and/or resolving operational issues such as security or network performance. Advisory groups typically disband once they have reached their conclusions and submitted recommendations to the broader Community.

So why did SAP set out to create the ES Community in the first place and what are its key benefits today? Quite simply, SAP recognizes a basic principle of our networked world: there are always more smart people outside your enterprise boundaries than there are inside. By leveraging outside expertise, SAP innovates faster and delivers a superior value proposition to its customers and partners. “Customers get this collective innovation process,” says Zia Yusuf, SAP’s platform ecosystem EVP. “A large pool of innovative software companies can now provide them with additional solutions with integration by design, not integration as an afterthought.”

So, for example, when RFID technology emerged as a potential enabler of everything from product tracking to inventory control to gasoline purchases, SAP began working with over 200 companies in 18 different industries to exploit the integration and real time information this technology can supply. The result is a collection of pre-configured RFID services that customers can use to rapidly implement RFID in a number of key business processes.

According to SAP’s Krish Mantripada, director, Global Solution Strategy, RFID, and SCM Solutions Management, the applications for RFID services are potentially limitless. Mantripada points out, for example, that drivers in California can pass effortlessly through tollbooths on the expressways using an RFID tag that captures the data and sends them a monthly bill. Hospitals are talking about tagging their patients with RFID to ensure that correct medicine is given to the correct patient. Pharma companies see RFID as a means to curb counterfeit products. And, a number of countries, including the United States, are planning to implement RFID tagged passports. With the help of the ES Community, SAP can rapidly build enterprise services to enable all of these scenarios and more.

These RFID applications are just one example of a self-organized ecosystem of customers, suppliers, and other partners. For another example, let’s examine the SAP ES Community for banking.
3.1.1 Collaboration for Innovation in Finance

Global consolidation, cross-border mergers, turmoil in the financial services value chain, and new regulatory requirements are making things tough for the banking industry. To succeed in this new environment, financial institutions need agile and flexible enterprise systems that enable them to respond to emerging threats and opportunities.

SAP knew that enterprise SOA could provide services and functionality to enable companies to build new processes and solutions. But, it soon realized that its ability to define the effective standards and consensus definitions for core financial services depended on expertise and buy-in from across the industry. After all, a proprietary approach to SOA would simply create new islands of technology and make it harder to leverage the benefits of SOA across the value chain. So in September 2005, SAP facilitated the launch of an ambitious financial services business web to shape the future of service-oriented architectures in the industry: the Enterprise Services Community Definition Group for banking.

The Group’s primary task is to define standards and services that will accelerate the transition from today’s traditional banking systems to the next generation of SOA-based banking solutions. Membership is completely open and currently includes companies such as ABN AMRO, ABSA, Banca Intesa, Barclays, Banco Bilbao Vizcaya Argentaria (BBVA), Credit Suisse, Deutsche Postbank, ING, Nordea, and Standard Bank. With leadership from SAP, the consortium’s mandate is to define, harmonize, and drive the adoption of enterprise services for financial institutions. It is noteworthy that not all of these companies are SAP customers—even companies using competing vendors are invited to join the ES Community.

Much has already been accomplished. One working group defined a taxonomy or “meta” model to accommodate the need for structure and a common set of semantics to enable an industry-wide SOA. A second group developed a service landscape that provides the business function framework for enterprise services definitions and a structure for organizing the process of services definition. Five subgroups defined a total of 18 service interfaces and 70 service operations. All considered, this work maps a non-disruptive, step-by-step process to help banks integrate new functions and services into existing enterprise IT environments.

The collaboration is beneficial for everyone in the financial services industry. The banks can share best practices, increase industry adoption, and ensure that the next generation of enterprise services meets their collective requirements. SAP benefits too. While generally not known as a banking system provider, SAP’s leadership in SOA places it in the center of an industry ecosystem that is defining innovative new banking services and solutions.

Figure 4 ES Community Definition Group for Banking

CDG for Banking Results:
- Identified a standard services definition landscape for all banks
- Defined 70 service definitions to be shipped by SAP in December 2006
- Collaborating with SAP to build up an ecosystem of solution partners in Banking

Source: SAP
3.1.2 Leveraging the ES Community

By enabling a diverse group to help build a constantly evolving set of enterprise services, SAP has positioned itself to address today’s top-of-mind business challenges. Customers and partners will not only get to understand, see, and reuse SAP’s enterprise services, they will be able to augment or even replace them. Rather than the traditional monolithic one-size-fits-all software, think of SAP NetWeaver as an open toolkit or an application development environment that enables business agility. Using this new toolkit, customers and partners can mix and match enterprise services to create composite applications as the business requirements change.

3.2 Industry Value Networks

Defining common data and associated reusable services across all industries is an impossible task for one company. So SAP is not only opening up its software and exposing its central repository of enterprise services, it is harnessing its ecosystem of customers, technology partners, SIs, ISVs, and other thought leaders to jointly define and develop industry-specific solutions and standards. Industry Value Networks (IVNs) have been launched for consumer product goods, retail, technology, chemicals, banking, mill products, the public sector, and oil and gas, among others.

SAP believes that working with other industry experts to co-innovate solutions and address common problems will drive faster adoption of eSOA and create greater value for its customers. For example, on complex problems such as batch traceability, Basel II, and supply chain management, the ability to leverage a service-enabled environment and pull together the relevant industry expertise shifts the focus from integration worries to building robust business solutions. As Stephen Graham, group vice president, Global Software Business Strategies at IDC points out, “Well structured partner networks can provide vendors with significant benefits over traditional relationship models. SAP’s Industry Value Network provides an important foundation for a new type of engagement model involving customers, services firms, and technology vendors.” Let’s look at SAP’s IVN for chemicals as an example.

3.2.1 Collaboration for Innovation in Chemicals

SAP has developed a strong IVN in the chemicals industry. Like the ES Community for banking, this group engages SAP customers, system integrators, and other partners to define innovative solutions for the chemicals industry.

A recent pilot project involving Nova Chemicals, Pavilion Technologies, Accenture, and SAP demonstrates the IVN’s promise. Wanting to cut costs and increase margins, Nova sought to integrate real time plant-floor information and predictive intelligence (managed by Pavilion’s advanced process control system) with enterprise-level business data (managed by mySAP ERP) in an attempt to achieve better asset utilization, product quality, and profitability.

“In the past, the two applications, APC and ERP, were siloed,” explains John Wheeler, former senior vice president and CIO of Nova. “If we wanted to deal with another vendor and integrate their applications with our SAP applications, it was very difficult. We did not have standards and would have to build and maintain expensive interfaces or do without that integration.”

Nova Chemicals, SAP, and Pavilion worked collaboratively using Pavilion’s model-predictive intelligence (MPI) technology to enable real time visibility, run what-if scenarios using predictive analytics, and maximize plant performance. By integrating MPI with Nova’s implementation of Pavilion’s APC system, the company employed the same models used in the APC software to enable real time performance.

Decision makers now have greater control in optimizing performance management through an expanded view of processes—such as contribution margin by product—and greater functional capacity provided by further integration with SAP ERP (using the SAP xApps Manufacturing Integration and Intelligence composite application).

The IVN members collaborated to conceive, design, and deploy the solution. The process took only two months. “Our experience working with SAP and Pavilion enabled us to identify significant opportunities to make reliable decisions based on instantaneous and predictive insight into production performance and market demands,” says Wheeler. “The new capability allows us to tighten operations, improve plant asset utilization, and increase visibility into operations, costs, and the supply chain,” he adds. “We’re talking about substantial breakthroughs in our ability to take our plant operators and use them as a valuable asset to drive manufacturing excellence, which is certainly, for a company like ours, one of the top priorities.”
3.2.2 The Benefits of Industry Collaboration

The move to open up its software model, services, and code represents a big change for SAP, and some might argue a big gamble. It takes vision and skill to design an industry ecosystem that works for everyone, minimizes opportunism, and gets results. But SAP’s forays into banking and chemicals may prove that the rewards outweigh the risks.

Industry-wide collaborations have the potential to drive adoption, co-innovation, and monetization where all partners share in the value created. By opening its software, and its road map, and by encouraging others in its community to collaborate on common standards and semantics for eSOA, SAP reduces risk for its customers and simplifies business web integration within and across industries.

3.3 Business Process Experts

SAP’s IVNs and the ES Community provide powerful new building blocks for assembling high-performance inter-enterprise systems for enabling new business webs. But exploiting these building blocks requires a new breed of Business Process Experts (BPXs) with the right mix of creativity, business acumen, and deep technical abilities to compose effective and usable solutions. As Gartner recently observed, usability is particularly important:

You can have the most effective and efficient new or redesigned processes in the world, but unless you can convince people to use them efficiently, or at all, then you have nothing. People need to be included as an integral part of the development journey. They need to be consulted, listened to, trained and communicated with on a regular basis. If they do not understand the process, the reasons for the new processes and why
changes to the existing processes are necessary, how do you expect them to take ownership and responsibility for them?

In the past, designing processes and applications for complex enterprise systems required multiple levels of specialists—some with training in business and others with training in software development. Business analysts would painstakingly model and document the business needs, while systems analysts translated these models and needs into specifications that programmers could code. This was slow and inefficient for one company, let alone for a business web where the processes of multiple enterprises need to be remodeled and interconnected.

Fortunately, improvements in software are providing a new class of experts with the tools necessary to weave new service-oriented architectures together within and between firms. Think of a Business Process Expert as a business analyst and applications developer rolled into one. They bridge the gap between business users and technology professionals and streamline business process innovation. With the tools and techniques now available, and the underlying enterprise services content and context well defined, they can now adapt, compose, and execute end-to-end business processes without writing a single line of code.

SAP’s Visual Composer, for example, is a model-driven, visual development environment that enables users to create service-based applications quickly and easily using composition software tools and enterprise services—simply by modeling the application. So connecting an inventory-based ordering system, for example, with a purchasing system can now be done quickly and without fear of the business needs getting lost in translation. Visual Composer is also a powerful integration tool between a company’s existing or acquired systems.

SAP’s new development tools are the perfect complement to its enterprise services building blocks. These tools enable the Business Process Expert to drive new process innovation by building composite applications without having to engage in a time-consuming process of writing code. Not only does this reduce development time and help BPXs to avoid costly requirement misinterpretations, it also opens a window of opportunity previously thought too small to exploit. ERP used to be about standards, not flexibility. Now that has changed.

Figure 6 Business Process Experts

Source: SAP
3.3.1 Building a BPX Community

Business Process Experts play an increasingly critical role in enabling business webs. By working with business managers they can eliminate duplication of effort; improve, automate, or even eliminate existing business processes; harmonize data; and build applications that leverage the intrinsic interoperability of enterprise services.

Given the relative complexity of the role, it’s not surprising that BPXs are increasingly banding together in communities to share knowledge and hone the emerging skills of service-oriented analysis and design. After all, understanding, modeling, and bridging services within one company, let alone between companies, is no simple task. One requires knowledge of how the business web is optimally integrated, and how to securely automate the transactions that flow between firms.

For these specialists, top-down, company-specific training is simply not enough. To develop, augment, and maintain their expertise they are working with SAP to develop collaborative relationships with others in the BPX Community, which includes experts from SAP’s ecosystem of customers and partners. Like other communities in the ecosystem, BPXers use Web-enabled tools such as blogs and wikis to swap insights and keep each other up-to-date with the latest knowledge and tools.

For example, SAP Labs are now developing a composite application for the consumer packaged goods (CPG) industry that will automate and simplify the collaboration between manufacturers, wholesalers, and smaller retailers by increasing the transparency of inventory levels, through the simplicity and ubiquity of email. Like other initiatives in the BPX Community, discussion, feedback, and coordination of the initiative are mediated through a CPG-focused blog.

Examples of self-organized collaboration in the BPX Community are increasingly plentiful. Recently on the SAP Software Development Network (SDN), a newcomer, Andrea Maraviglia, posts a query from Italy on how to integrate Google Maps from Visual Composer. The answer comes from Twan van den Broek, a near-three-year blog veteran and contributor from the Netherlands who explains how to invoke the Google API from within the Visual Composer environment. Such exchanges in the SAP SDN’s virtual forums, wikis, and blogs help sustain real time collaboration and learning across the BPX Community.

3.4 Learning Drives Innovation Throughout the Ecosystem

No longer content to be an application developer, SAP is repositioning itself as a conductor of various hubs of software innovation that collectively constitute SAP’s ecosystem. SAP is putting significant resources into training, sharing, and learning from these hubs of co-innovation and development. Members of these communities increase their technical and business expertise, and ultimately generate new business. By collaborating with others through technical reviews, blogs, solution maps and by sharing code snippets, everyone learns more about how best to extend solutions and skill sets in developing customized applications. After just one year of existence, the SAP SDN has attracted over 650,000 members, including members from SAP’s direct competitors, which is a testimony to the ecosystem’s effectiveness.

Of course there are parochial benefits for SAP too. It hopes that ecosystem participants will not only adopt NetWeaver, but also the service definitions, semantics, and definitions of the basic objects of business created by the SAP ecosystem. Nevertheless, in a commitment to openness, these service definitions extend to non-SAP shops, who are still invited to become community members. For SAP customers, non-customers and partners this commitment to openness makes entry into this new world of business web collaboration a lot easier.

4.0 Winning with an Open Platform

By opening its services and its interfaces, SAP will allow developers to enhance, extend, and even replace its core functionality. As SAP’s Zia Yusuf put it, “It’s almost like you’re taking down your borders and opening up for no tariffs, no tax competition. You need to know that your core assets and your skill sets allow you to continue to innovate fast enough as a corporation.” But SAP is confident that its ecosystem will help it lead the pack in developing innovative enterprise services.

SAP NetWeaver will level the playing field, both for SAP and for others in the software industry. “You need to decide, as a corporation, whether you take your core assets and processes and keep them to yourself, or do you expose them to every software company on the planet and entice...
them to come in and help develop those assets,” says Yusuf. “We believe that our strength, our genome, our understanding on how to build applications is significantly enhanced by this kind of collaborative innovation marketplace.” In other words, whoever combines the best business sense with the smartest innovation network will win.

The key is that there are considerable advantages to be gained from acquiring network effects. As SAP NetWeaver gains traction, there will be less and less incentive for customers, partners and developers to defect to other platforms. In fact, the trend is self-reinforcing. More developers create better solutions. Better solutions attract more customers. Growing customer-bases attract more participants to the platform.

Open platforms such as SAP NetWeaver become more important in an economy where growing numbers of individuals work as free agents. Yusuf has a nice way of putting this. He says, “Most of the free electrons will gravitate toward the biggest centers of gravity.” In other words, companies with the most dynamic platforms can harness the enormous wealth of talent free agents offer.

After all, success in most platform-related businesses is linked to pervasiveness and continuous innovation. Becoming a pervasive and continuously innovative presence means becoming a magnet for innovation, attracting the relevant partners, suppliers, developers, customers, and other interested participants.

5.0 Conclusion

The plummeting costs of collaboration and the advantages of harnessing a larger talent pool are causing many to rethink their assumptions about innovation. SAP understands that innovation no longer occurs solely within the confines of traditional organizations. Indeed, the historical view that innovation was an internal, guarded, and secretive process has been turned on its head.

The evolution of ecosystems has seen industry innovation increasingly take place in business webs where partners, suppliers, customers, and even competitors come together to help define problems and solutions. The SAP ecosystem is a prime example of the value that such business webs can enable. Customers now stand to benefit tremendously from the work that SAP is doing with its partners to flesh-out industry-wide semantics and common definitions to deliver on the promise of service-oriented architectures.

6.0 Glossary

**Composite Applications**

Enterprises that embrace SOA can publish their core services as “building blocks” for other companies to mix and match to build composite business applications. In business webs, composite applications will automate and orchestrate collaborative business processes and workflows that span systems, people, and companies over the Web.

**Enterprise Systems**

One of the primary functions of enterprise software is to integrate multiple facets of a business. Enterprise systems are often devoted to managing and controlling the enterprise’s transactional data flows to automate and integrate its core corporate activities. However, the vision for enterprise software is now expanding to Customer Relationship Management, Business Intelligence, and the supply chain, and enterprise systems are also becoming service-enabled. New services-enabled ERP systems will act as the building blocks for composite applications that perform sales, inventory control, and other essential activities. Composite applications are shipped with an open and visible library of underlying services providing a foundation for extensibility and growth. These services are visible for ready integration with other applications or for the creation of new composite applications, within or between firms, in a standards-based, service-oriented architecture.

**eXtensible Markup Language (XML)**

XML is meta language (a self-describing language) for the exchange of data. It offers a structured data format composed of markup tags that facilitate the sharing of data. Other field-specific markup languages have been written using XML.

**Service-Oriented Architecture (SOA)**

The Organization for the Advancement of Structured Information Standards (OASIS) defines a service-oriented architecture as a “collection of best practices, principles and patterns related to service-aware, enterprise-level,
distributed computing [with a] focus on workflows, translation coordination, orchestration, collaboration, loose coupling, business process modeling, and other concepts that support agile computing.” SOA is distributed networked architecture in which core resources are available as services to other applications on the network. Each service is self-contained and may be published or subscribed to as needed. SOA can be used to expose core enterprise services while allowing for greater flexibility in how and where they are used, encouraging reuse of inter-enterprise IT resources.

**Simple Object Access Protocol (SOAP)**

SOAP is a lightweight messaging protocol based on XML that can be used to exchange information between computers.

**Universal Description, Discovery, and Integration (UDDI) Protocol**

UDDI is a directory of Web Services, the digital equivalent of “yellow pages” for electronic services. It helps identify and describe the services your company offers for other computers to discover.

**Web Services Description Language (WSDL Pronounced Wyzdell)**

WSDL is an XML language used to describe Web Services and how to access and use them. It allows users of Web Services to understand how individual services may be accessed and invoked.

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Endnotes

1 Examples cited in the following bullets are sourced from SAP and IDC case studies.