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INSIGHT

Software Macro-Trends: Reshaping Enterprise Software

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IDC OPINION

IDC has pushed aside the hype and identified eight macro-trends that will prevail over the coming years in enterprise software:

- The *enterprise workplace* macro-trend conjoins smarter and more intuitive, collaborative user experiences with business process management and helps drive the adoption of composite applications.
- Increasingly, larger vendors will be able to respond to virtually any kind of enterprise solution need with a comprehensive solution suite — not just an applications suite. IDC refers to such an offering as an *enterprise solutions platform*.
- Business intelligence (BI) is moving into the context of the business process, not just to make users' information experience more effective, but also to allow for business process optimization. IDC calls this *intelligent process automation.*
- Development and deployment life cycles are not so disjointed anymore. IDC sees the demand for better visibility into IT and the desire to increase IT effectiveness as drivers behind the *IT life-cycle management* (ITLM) macro-trend.
- Driven by compliance and augmented by developing metadata-driven data/content convergence, vendors will help enterprises gain control over their information, decrease costs, and enjoy new usability through *information governance.*
- As the supply side consolidates and as open source becomes mainstream, the need for intellectual property protection blossoms. Thus, vendors, investors, and customers will increasingly pay heed to *intellectual property management.*
- Infrastructure management software vendors will address operational efficiency by providing software that implements adaptive and on-demand infrastructure management strategies IDC calls *dynamic IT infrastructure.*
- IT still wants performance, scalability, reliability, and optimal use of system resources. Virtual environment software, in macro-trend form known as *virtualization,* is seen as a growing success factor in IT operations.

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IN THIS INSIGHT

This IDC Insight delineates the top software macro-trends currently impacting the enterprise software market, providing a definition for each macro-trend as well as a related high-level customer/market impact analysis.

SITUATION OVERVIEW

On any single business day, the enterprise software industry does not change much: A day in the life of the enterprise software industry invariably brings news that there is yet another major inter-industry acquisition, another revolutionary product release, another strategic partnership, or some earth-shattering technology that will render all previous technologies obsolete. The highly competitive and high-IQ nature of high technology in general, and software in particular, guarantees that the tide of significant advancements will not likely be stemmed for the foreseeable future. Even here in the post–bubble burst era, when the level of venture capital in the software industry seems like a drizzle compared to the prolonged downpour of the mid- to late 1990s, the drumbeat of change, innovation, and even investment drones on.

IDC tries to detect repeating patterns of significance from the cavalcade of mergers, products, partnerships, and technologies that pop onto the enterprise software market radar. When one of these patterns reaches a state where it will clearly produce real long-term change in the industry, IDC calls it a *macro-trend.*

What differentiates a macro-trend from a mere trend is the scope of impact: A macro-trend cuts a swath through the software industry's silos, affecting the industry cross-region, cross-vendor, cross-market, cross–vertical industry, and cross-customer. In software, the likes of the Web, Java, Web services (née service orientation), peer-to-peer/collaborative, mobility, open source, software as a service, and composite applications exemplify well-known and still highly market/customer-influencing macro-trends.

Macro-trends often don't appear out of thin air, but rather embody the tipping point of a number of related, predecessor trends. For example, Java commercially climaxed the object-oriented programming movement, and Web services coalesced the concepts of pervasive connectivity and remote procedure calls. Herein, IDC describes eight other macro-trends that are operating in today's enterprise software industry and will do so for many years to come:

- **Enterprise workplace,** a cousin to the composite applications and peer-to-peer/collaborative macro-trends
- **Enterprise solutions platform (ESP),** descending from the notion of enterprise application and middleware suites
- **Intelligent process automation,** which blends concepts such as analytic applications and business process reengineering
- **IT life-cycle management,** an evolving federation of development life-cycle tools, IT asset management, and IT project/portfolio management

- **Information governance — data/content convergence,** an embodiment of technologies such as enterprise information integration (EII), master data management (MDM), and the business drive for information compliance — with roots in data warehousing and content management

- **Intellectual property management,** an ancient legal concept that has been part of the software industry since its inception but has begun to reach new heights of importance in the industry because of alterations in the software development supply chain and globalization

- **Dynamic IT infrastructure,** a collection of technologies that enable adaptive and on-demand approaches to help increase IT efficiency through automated IT operations and infrastructure management

- **Virtualization,** a collection of six different layers of virtual environment software that make it possible for a multisystem configuration to present the illusion of a single computing environment. This environment offers higher levels of performance, scalability, robustness, and reliability than is often possible with a single system. This technology can also be used to either optimize or consolidate data, systems, or workloads.

In the following section, IDC offers a detailed definition of each macro-trend as well as a discussion of the customer and/or market impact the macro-trend will render over time. It should be noted that many of these macro-trends overlap in market effect, technology roots, customer impact, and supply-side ecosystem management considerations.

FUTURE OUTLOOK

Enterprise Workplace

Definition

IDC believes that in the next five years, an electronic, mobile user work environment will emerge that will be supported by a new, unified, modular enterprise software stack. IDC calls this the *enterprise workplace,* which will yield the following characteristics:

- A natural, intuitive, and adaptive user experience

- An aggregation of interoperable application services determined by user roles and tasks

- A cohesive server-side platform for resolving multiple interfaces that takes advantage of the convergence of services across the server-side stack and information infrastructure, rendering those services and that information in new ways

- An infrastructure and interactive environment to support the intersection of people, processes, and information

Customer/Market Impact

The enterprise workplace will dramatically improve interactions across applications and between workers — driving productivity and improvements in information worker work quality. The change will be driven in equal parts by users who are tired of scrambling to adapt to a multitude of interfaces, formats, and compatibility issues and by vendors that are cognizant of this need and see in the enterprise workplace an opportunity to differentiate their products. According to today's user paradigm, task- or role-based requirements such as searching for information, collaborating, managing projects, and managing customer relationships commonly require separate interfaces that draw information from isolated repositories, each with its own business logic and workflow. IDC believes that this disconnected state of the enterprise user experience is ripe for change, and that once customers understand the productivity and worker quality benefits associated with enterprise workplace, demand for enterprise workplace will alter vendor/service provider ecosystems, application and infrastructure design, design/development tooling, and, most important, the nature of the enterprise workers' computing experience.

The concept of composite applications, a term prevalent in the industry for several years now and itself on the boundary of reaching "movement" status, addresses delivering the right cross-silo mix and granularity of business processes in a fashion that aligns with "how we do business." When paired with the enterprise workplace, the resulting composite solution becomes more collaborative, potentially massively customized (for a particular role or even user), and more mobile. Customers will experience the "aha" effect when exposed to such solutions, which will drive adoption of this emerging class of enterprise applications.

Enterprise Solutions Platform

Definitions

- A wide but mainly integrated functional set of enterprise software encompassing business and/or industry applications, integration, business process management, development, security, information governance, collaboration, business intelligence, and other enterprise solutions technologies, sold as a unified offering by a single vendor entity. The offering is primarily based on open standards and targets on a massive scale enterprises that are attempting to create IT-based solutions in response to business requirements. The vendor may offer integration with other vendors or even "integration on the glass" with other vendors (through a composite user experience).

- An ecosystem whereby a very large enterprise software vendor or systems integrator assumes the role as the one-stop shop for enterprise software solutions, acting as a form of broker for other (typically smaller) software vendors or even service providers. The ecosystem includes a set of open standards–based frameworks around which software suppliers must comply and about which the value-added channel must possess expertise. The ecosystem may also offer runtime management services as in software as a service. Examples include a bundle of IBM offerings such as IBM Workplace in conjunction with IBM WebSphere middleware, IBM's Corio, plus IBM Global Services; Oracle's Project

Fusion; Salesforce.com's "AppExchange"; SAP's Enterprise Services Architecture (ESA) and NetWeaver; or the EDS Agile Enterprise Architecture (AEA).

Customer/Market Impact

ESP is in the process of overtaking the enterprise applications suite, and to a lesser degree middleware suites, as the architectural, packaging, and ecosystem major offering for enterprise solutions going forward. ESP, for the first time, combines comprehensive application offerings with an open middle tier; associated development capabilities; and generalized services such as business intelligence, compliance, systems and security management, and so on. ESP uses open standards to help organizations embrace the complexity associated with heterogeneous application and infrastructure environments. ESP further provides all or most of the technologies and applications for composite applications, combining the applications services with the user experience services and technologies (see the Enterprise Workplace section above). From a go-to-market perspective, ESP alters the nature of independent software vendor (ISV) alliances because previous competitors can now be partners (and previous partners may now become competitors). Vendors that offer an ESP will also offer alternative licensing options, either directly and/or through partners, for hosting/managed services; on-demand, turnkey solutions; and business process outsourcing. ESP also opens the doors for an up-leveled concept of an enterprise license, perhaps to the point where major IT supplier-buyer relationships could entail true value-based pricing.

From a customer perspective, the ESP macro-trend sheds light on how customers should manage their IT supplier relationships going forward. As ESP-style vendors add to the breadth of their offerings, enterprise customers will enjoy the advantage of fewer "throats to choke," but simultaneously will slowly lose pricing/negotiating leverage as supply-side diversity decreases. At the same time, the nature of the ESP macro-trend opens up new opportunities for creative supplier contract options, where buyers can effectively manage contracts as a portfolio with an ESP supplier, allowing for common product support terms, for example.

Intelligent Process Automation

Definition

Intelligent process automation represents a move to handle exceptions within an already automated business process set, going beyond the scope of today's enterprise application suites. Examples are sudden changes in demand impacting order fulfillment, unforeseen disruptions in logistics and distribution, and responding proactively to a profitable customer who is likely to churn.

Applications that exhibit intelligent process automation have the following three characteristics:

- They automate repeatable, operational decisions.
- They act in response to events.

- Analytics drives the business process workflow.

The automation of repeatable operational decisions has its roots in operations research, the discipline that guided custom applications such as yield management in the airlines industry (e.g., American Airlines Decision Management) or fraud detection in the credit card industry.

The response to events is becoming increasingly important because of changes in business and regulatory conditions. The motivator can be either to improve bottom-line business performance and/or to comply with regulations that mandate early warning of changes. Examples of such regulations are Sarbanes-Oxley (for early warning of material financial changes) or the TREAD Act (for early warning of product defects to the National Highway and Traffic Safety Administration). Event-monitoring software (sometimes referred to as business activity monitoring) inspects the flow of transactions, sending alerts when a defined threshold or condition or pattern is observed.

The capability for analytics to drive the business process workflow entails the development and deployment of predictive models that evaluate decision alternatives, considering the probabilities, risks, and expected benefits and making an optimized recommendation. This extends processes automated by transactional applications, automating exception handling and decisions — enabled via a business process management and orchestration deployment environment.

Customer/Market Impact

Business motivations are responding to regulatory compliance (for greater consistency in the execution of processes) as well as optimizing operational decisions to enhance business performance. This will put pressure on the pure BI vendors (who have focused on information delivery) and on application deployment software vendors (who have focused on application interoperability and integration [e.g., BEA, TiBCO, webMethods]) in expanding their capabilities to address user requirements for application deployment and BI, respectively. From a packaged application perspective, competition will emerge among the large cross-industry (e.g., SAP, Oracle, Siebel) and vertical-specific (e.g., Amdocs, Sungard) application vendors, as well as decision-centric application specialists (e.g., Fair Isaac, SAS).

IT Life-Cycle Management

Definition

IDC believes that improving IT's alignment with the business — and delivering more value to the business in the face of flat or only slightly increased IT budgets — requires a more integrated approach to IT life-cycle management, and this will drive the trend to life-cycle platforms from the dominant vendors. Building out the ITLM platform requires the integration of IT planning, application delivery, and application management processes and will include three broader areas of automation:

- IT project portfolio management (IT PPM), as IT looks to take a more strategic, portfolio-based view of its assets — whether hardware, software, human, or financial

- Application life-cycle management (ALM) solutions, but in a more integrated, full-life-cycle form than customers are deploying today, and integrated into their IT PPM solutions

- Application management (AM) solutions, integrated with the IT PPM system and with the ALM solution

Customer/Market Impact

ITLM will dramatically improve the visibility into, control over, and coordination of life-cycle activities — cradle to grave — for IT investments. It will provide the foundation for IT controls for compliance with government- and board-mandated regulations, and it will help enterprises close the loop between planning, development, and production operations, where silos today impede the flow of information and create inefficiencies. Web-based ITLM tools will facilitate this closed-loop approach to IT governance and improved collaboration throughout the life-cycle phases for geographically distributed and mixed internal/external organizations, including outsourcers/offshorers and supplier/customer ecosystems. By making the business process of software development more agile, ultimately ITLM becomes an important enabler for organizational change. It is important to note, however, that IT life-cycle management requires a significant change in how most IT organizations interact between the operations and development staffs. While the technology will continue to improve in integrations and streamlined workflows, the larger challenge is improving the communication gaps between operations and development teams and ensuring that their business and IT objectives are aligned.

Information Governance — Data/Content Convergence

Definition

Information governance, the realization of trends and technologies having to do with data/content convergence, involves a collection of rules and definitions, schemas, master concept lists, and so forth that govern how information in the organization is organized, secured, managed, and distributed. Information governance begins with the assumption that all enterprise information can be mapped to a central schema, no matter what format it is in. This enables the various departments/software/tools to maintain their own views into information for more specialized users, but it also gives the whole organization the ability to see all information in one unified view.

In addition to mapping among schemas, however, the notion of information governance includes the growing collection of categorization technologies, rule bases, taxonomies, lexicons, and inference engines that now surround collections of information. These act as a kind of reference shelf that various applications call upon to determine meaning of terms, as well as to govern how information is distributed and displayed, and to whom. For example, lexicons and taxonomies can unite terms

into a single concept, based on the meaning of the terms and their co-occurrence with other terms in a taxonomy concept node. Business rule bases govern which products are offered as cross-sell or upsell adjuncts to a product search. Inference engines determine the most appropriate package to offer a customer complaining about a cell phone plan.

From a content perspective, categorization technologies, business and access rule bases, knowledge bases, and data crosswalks control how information is analyzed, tagged, ranked, or displayed. These tools are used today to establish weighting for relevance-ranked searches; provide upsell, cross-sell, and other business rules; provide domain expertise; determine meaning from context; disambiguate words; map across languages for multilingual queries and document sets; or map among diverse taxonomies and concepts.

Customer/Market Impact

Efforts to map among schemas are still at least partially manual today. Some description, such as a taxonomy plus rules, needs to be imported; appropriate training sets need to be selected before information is categorized, or some editing must take place after the fact to ensure accuracy. Rules are generally established manually as well, although machine-aided indexing as well as rules development tools have become prevalent in most software applications. A few newer applications claim to categorize or map entirely automatically with no bootstrapping, but accuracy is lower.

From a structured data perspective, information governance revives the metadata repository concept, embracing the original idea of managing data definitions within a much broader semantic context of business terms and concepts defined in a comprehensive model. The active dimension of this solution would include intermediary data retrieval, routing, and transformation technologies to create an integrated virtual enterprise data environment for business-significant data. The rebirth of these technologies is apparent in the development of MDM (master data management) or "hubs" (information or data) to extract, transform, and manage mission-critical data in a standardized format.

The missing ingredient is how to manage structured data and online content together, providing comprehensive search and query capabilities across both and ensuring integrity of information across both, while ensuring consistency with respect to security and regulatory compliance.

Intellectual Property Management

Definition

IDC believes that over the next five years, vendors will dramatically increase their focus and attention on better leveraging intellectual property (IP) assets. Patents and other IP protection/management measures are quickly becoming a more important fixture in the software vendor landscape. Activities in the software industry suggest that vendors are increasingly viewing IP as currency — and putting greater emphasis on appropriately managing this asset. This isn't about just acquiring patents, but rather the entire IP management process, which includes:

- **Internal IP management processes:** Effectively managing internal resources around the creation of IP to reduce risk around IP infringement and ensure it is leveraged appropriately

- **IP protection:** The ongoing rigor of applying for patents and trademarks, protecting trade secrets, and monitoring the industry for potential IP infringement

- **IP trade:** Negotiations to provide access to patents that belong to other companies and licensing patent rights (From a customer perspective, this activity is vital because it amounts to proactive work to ensure that IP litigation threats are kept in check.)

- **IP indemnification:** The vendor policies and practices to protect customer interests in the event they are caught in the crossfire of a vendor dispute over IP infringement

Customer/Market Impact

Patents are a relatively recent phenomenon in the software industry. Although software patents started to be approved in the United States in the early 1980s, it wasn't until 1996 that the United States Patent and Trademark Office put the issue to rest and published guidelines clearly stating that software was patentable. In Europe, the patenting of software is a very controversial issue, with legislation that would allow software patents currently before the European Commission.

The impact of software patents and other IP issues has been significant. In the United States, the number of software patents has increased 16-fold in the 20-year period from 1982 to 2002, with software patents jumping from 2% to 15% of the overall number of patents during this period. High-profile IP infringement litigation cases have marked the landscape along the way, with notable cases such as Lotus v. Borland (circa 1987–1996: Is a menu structure copyrightable?) and Apple v. Microsoft (circa 1988–1992: "Look and feel" of the desktop).

But there's been an important change recently. In the past, end users and smaller vendors could largely consider the courtroom battles of the titans a spectator sport. Although there might be implications for everyone because of the fallout, the battle was generally between large companies.

For end users, the 2003 SCO lawsuit against IBM (and others) for copyright infringement took a new twist when the company sent letters to 1,500 end-user companies warning them that they were allegedly in violation of its intellectual property rights and offering licenses to avoid possible legal action. These letters were followed in January 2004 with letters to 6,000 Unix licensees asking them to certify compliance with all Unix source code agreements and to confirm that they were not using any of SCO's Unix code in Linux. In March 2004, the company announced it was pursuing litigation against two targeted end-user organizations, DaimlerChrysler and AutoZone. Regardless of any debates regarding the legitimacy of the SCO case, customers are now attuned to their potential exposure to getting caught in the crossfire of vendor IP infringement disputes, and they're pressing for details about their coverage. While some vendors are quick to dismiss indemnification as an issue, IDC research suggests it's not going away soon.

IP infringement battles aren't limited to industry titans. Smaller companies such as Eolas are taking on large companies (Microsoft) in significant battles with industrywide implications. There are also major concerns over the emergence of a secondary market for IP, and in particular the potential for companies to purchase IP rights for the primary purpose of infringement litigation (a trend one trade journalist called "patent terrorism"). End users are especially concerned because if these firms are not vendors, they're not likely bound by the market credo that it's bad business to sue your customers.

Today, IP is becoming big business. Companies such as Microsoft and IBM have executives whose job is to manage the business around the inflow and outflow of patent licensing. Think of this as a balance of trade. The objective of IP licensing is to ensure that the company has access to the patents it requires to conduct business and serve its customers, and at the same time find IP within the company that can be used to generate revenue through other firms. In 2004, IBM reported $1.17 billion in income from "intellectual property and custom development" — predominantly patent licensing. And this perspective isn't limited to products — companies are looking at ways they can leverage their services expertise and best practices as IP.

The IP landscape is rapidly changing. While IP management was once considered the domain of administrators and lawyers, it's today becoming a mainstream activity that will dramatically impact a company's ability to effectively compete. Innovation will require not only smart developers and keen marketers, but savvy processes to quickly protect and manage the asset appropriately.

Dynamic IT Infrastructure

Definition

IT infrastructure management software is evolving to meet the demands of increased business process support and responsiveness to dynamically changing business needs, as well as IT operational efficiency. Major system management software vendors have announced key initiatives and architectures such as adaptive enterprise and on demand that require long-term development efforts to achieve fully automated, adaptive, goal-driven operations and infrastructure management, which IDC characterizes as *dynamic IT*. The following are key technologies that underlie the automated operations and infrastructure management capabilities within dynamic IT:

- Service-level management and automation
- Metering, measurement, and chargeback
- Security
- Infrastructure virtualization
- Infrastructure provisioning
- Platform monitoring and management

Customer/Market Impact

The wide-ranging set of functional capabilities needed to fully implement dynamic IT has resulted in a significant number of merger and acquisition activities in the system infrastructure management markets, as the major vendors race to fill in gaps in their larger IT management platform architectures. This has further heightened the overall trend of vendor consolidation in the infrastructure management software industry, driven by competitive economics.

For large software vendors, the challenge around dynamic IT is to clearly articulate the vision and product strategy and identify quantifiable benefits to IT, while proceeding with a development and implementation plan that combines technology acquisitions and organic software development. Delivery of an efficient, integrated dynamic IT management platform that can be deployed in stages is the goal to be achieved over the longer term. Smaller software vendors including best-of-breed tools suppliers need to define their product strategies and interoperability with major vendor products in the context of the evolving dynamic IT platforms. For some hardware vendors, such as EMC and Cisco, the pressure to increase their management capabilities has driven the decision to acquire management software assets to assist installed bases in reducing hardware cost of ownership and improving platform manageability. The pressure to differentiate based on management capabilities will continue to increase and drive more deal activity.

For IT managers, decision makers, and business managers, key concerns include evaluating strategies for improving operational efficiency and business responsiveness, analyzing opportunities for process improvements, and prioritizing key infrastructure management objectives. Evaluation of infrastructure management software in the near term should include consideration of how it can integrate with or transition to automated dynamic IT platforms in the future.

Overall, several underlying drivers provide impetus to the dynamic IT movement. One is the ongoing imperative to reduce IT operational costs by improving hardware resource utilization and automating management tasks and processes. CXOs continue to drive infrastructure management projects that reduce the risk of infrastructure failures and improve operational efficiencies. The high cost of managing large numbers of distributed servers can be mitigated by automation software, which can improve scalability in terms of the number of servers and diversity of management functions that can be performed by an individual system administrator. Another factor is responsiveness to changing workload demands and business priorities, which requires an underlying management capability that can adapt the allocation of infrastructure resources to workloads to meet service objectives. The evolution to dynamic IT infrastructure management is a work in progress designed to address these needs.

Just as important as the technology that enables dynamic IT, the maturation of IT organizational structures, staffing expertise, and processes is critical and core to the effectiveness of a dynamic IT strategy. This maturation will continue to drive the aforementioned benefits; the competitive marketplace will continue to consolidate and attempt to meet the unique enterprise management needs of both IT and business executives.

Virtualization

Definition

The virtualization macro-trend encompasses virtual environment software (VES), which includes six layers of software that collectively support the concept described by various suppliers of hardware, software, and services as adaptive environment, dynamic systems initiative, grid computing, matrix computing, on-demand computing, or utility computing.

Virtualization creates the impression of a single computing resource for the end user, even though the actual computing environment might be made up of distributed systems housed in datacenters all over the globe. VES can break the link between a given function and the underlying systems. This means that functions can survive the loss of their original host systems.

In the event of a failure or slowdown, some forms of VES will either start the function on another system or pass the request to another instance of the appropriate application or function. The newest generation of VES allows organizations an increased ability to see a system as a pool of shared resources that appears to be both self-healing and self-managing. The following are the segments of the VES model:

- **Virtual access software.** This software allows applications to be accessed from nearly any intelligent access point device over just about any network, without the applications' being architected to support that device or network. Virtual user interface software, application streaming software, and various types of portal software fit in this category.

- **Virtual application environment software.** This software creates an application development and deployment environment that allows properly developed applications to be more robust and reliable and to be unaware of the underlying operating environments and hardware platforms. These benefits are only available to applications written for this environment. Application server software and parallel database software fit in this category.

- **Virtual processing software.** This category of software ranges from virtual machine software, which makes a single system appear to be many systems, each supporting its own operating environment, to single-system image clustering software, which makes many systems appear to be a single computing resource running a single operating environment. This category also includes parallel processing software, load-balancing software, and data and application availability software.

- **Virtual storage software.** This software allows applications to be unaware of where and how applications and data files are actually stored. This category includes storage replication and file system software. The software supports both storage area network (SAN) and network-attached software (NAS) hardware configurations. This category includes file system software and data replication software.

- **Provisioning and management software.** This software makes it possible for operators and administrators to load, manage, and operate multisystem configurations regardless of whether any of the other VES categories are present. This is a primary component of on-demand or adaptive environment approaches to application deployment.

- **Security software.** As applications are decomposed into components (sometimes called services), identity management and access control become increasingly important. Without a strong security layer, "black hats" could pick apart the distributed architecture and commandeer application components or functions to an organization's detriment.

Customer/Market Impact

Organizations are seeking ways to both reduce operational and administrative costs and improve the performance, scalability, and reliability of their information systems. To reduce hardware and software acquisition costs without also increasing operational and administrative costs, organizations have purchased a group of low-cost industry-standard systems and harnessed them together using virtual environment software. This approach has also addressed organizational requirements for improved levels of performance, scalability, and reliability. Naturally, this impacts supplier organization strategies — both now and for the longer term. This virtualization macro-trend has driven interest in VES, which has been experiencing rapid revenue growth because of these trends.

In the end, virtualization allows organizations not only to protect their investments in hardware and software, but also to optimize those investments. A completely virtual environment allows established applications or functions to access features of newer systems and to be more reliable, more powerful, more scalable, or enhanced in some other way.

Summary

In our enterprise software macro-trends, IDC has delineated significant industry movements, without the hype, in major business areas of IT, including application user experience, supplier ecosystems, business intelligence/analytics, IT management, IT infrastructure, information management (both structured data and content), and legal. These macro-trends identify fundamental metamorphoses in the nature of software solutions, how IT works, and the relationships between buyers and suppliers. As customers, and particularly CIOs, as well as software vendors and their value-added channel partners gaze over the long-term landscape of enterprise software, understanding such fundamental macro-trends may make the difference between success and failure.

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