Business Technology trends for 2011

Business Applications

Service-oriented architecture and event-driven architecture are becoming dominant design styles for business applications. Because of the cloud revolution, Software- and Platform-as-a-Service (SaaS, PaaS) capabilities are being eagerly embraced by many business leaders for reasons including predictable results, easy and rapid availability and a demystification of IT. Put simply, the resulting almost-enterprise applications can offer transparency in the value and cost for services, in terms understandable by the business, without the overhead too often perceived with central IT departments.

Almost-enterprise applications represent the most recent iteration of a long-running cycle, the democratization of IT in search of better, faster, cheaper enablement of the business. While technology advances and entrepreneurial energy surrounding cloud make 2011's rendition particularly compelling, there is high potential for today's almost-enterprise applications to follow a similar evolution.

A broad and growing catalog of finished services available for purchase. Instead of buying building blocks, businesses are able to subscribe to cloud capabilities (e.g., sales lead tracking).

Easy access across the internet and rapid scale based on cloud backbone reduce deployment issues, but also raise risks of uncontrolled proliferation.

Utility-based model (pay-per-use), infrastructure hidden in the cloud, and improving enterprise development and maintenance tools mitigate the cost argument – if pricing and contract terms are favorably managed.

Highly extensible tools and platforms that make it easier to operate off a common/shared data set.

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User Engagement

UX concepts are being applied much more broadly to back-end legacy systems, mobile applications, cloud solutions, collaboration tools, social plug-ins and more.

Design standards and frameworks (e.g., MeeGo User Engagement Framework project, iOS Human Interaction Guidelines) have democratized some of the science of user engagement.

Multi-touch screens, still/video cameras, natural user interface (UI) (gestures, voice) and embedded gyroscopes and accelerometers offer new input/output (I/O) possibilities.

Technologies, tools, and methods allow greater abstraction of the solution design away from the computing dependencies and toward usage patterns.

Integration, master data management, and process orchestration have become core disciplines for user engagement – moving beyond experience to influence how work actually is accomplished.

Between advances in development frameworks (e.g., HTML5, AJAX, Microsoft Silverlight, Adobe Flex) and a general shift toward open architecture standards, there have been dramatic advances in the ability to create mash-ups and composite applications, as well as to re-envision how applications are presented, data is visualized, and transactions are enabled.

Engines for business rules and workflow have been added to user engagement solutions, allowing management of routing and escalation logic and tasks.

Cyber Intelligence

Cyber security is increasingly framed as a combination of architecture, practices, and processes – with equal focus on internal and external threats. Highly integrated tool sets and investments in cyber analytics have helped connect dots and identify previously undetectable exposures.

Automated identity management tools are incorporated into day-to-day tasks, including smart cards, biometrics, fingerprint and handprint scanners. CSO role has become commonplace, possessing a mix of technology and leadership skills and a seat at the executive table.

Cyber forensics is now looking beyond the host to the network layer, determining the source (inside or outside the organization) of the malware. This is correlated with other internal and known external threats using cyber analytics in an attempt to inform of future vulnerabilities.

Forensics results are part of a closed-loop cycle in cyber intelligence, improving directly affected and associated controls. An established tradecraft of analytics, reinforced by the realization that threats and opportunities are often hidden in plain sight. Cyber Analytics is predictive, prescriptive and a part of a closed-loop cycle of continuous refinement based on other cyber Intelligence activities.

Cyber logistics includes extensive analysis to identify, assess and mitigate risk posed by vendors subject to foreign ownership, control or influence (FOCI), or other significant concerns prior to purchase or contract award.

Continuous audit of suppliers, including organization structures, corporate activity (e.g., M&A transactions), and ongoing verification of integrity of goods.

Cyber intelligence strategies include provisions for personnel security such as verifying legitimacy of background investigation agencies, proactive foreign travel risk advisory and automated reinvestigations of executives and privileged roles.

Rebirth of ERP

Leading ERP players are rapidly developing their own multi-tenant, off-premise, subscription based offerings – leveraging their process and functional experience as a part of green-field development. For new investments, this will bring stiff competition to SaaS solutions. For current customers, it will provide lightweight offerings for emerging geographies and small business units, integrated to the full-fledged existing solution. However, the self-cannibalization implications are not lost on these independent software vendors (ISVs). They must address and overcome this hurdle.

In marketing strategy, cannibalization refers to a reduction in sales volume, sales revenue, or market share of one product because of the introduction of a new product by the same producer.

Enterprise application players are investing heavily in analytics, mobility, social and other edge capabilities – looking to grow by enabling customers to extend existing investments, not replace current functionality via new platforms and delivery channels.

ERP platforms now have business process management, business rules engines and master data management embedded in their platform engines, including architectural hooks for externally sourced events.

Viability of the app marketplace has been illustrated by Salesforce.com's App Exchange, increased adoption of platform-as-a-service and the renewed investments by SAP and Oracle to curate a lasting commitment to externally developed applications and partner ecosystems.

Visualization

In computer science, visualization has been attempted for decades, but has been limited by graphical horsepower, CPU, memory, and storage constraints.

Three-dimensional visual and interactive elements allow many variables to be considered for any given analysis.

Visualization tools have continued to add features and toolkits – from stand-alone packages (e.g., SAS, ILOG) to productivity tool plug-ins (e.g., Excel) to cloud services (e.g., Many Eyes, Google, Tableau Public).

Tools allow information acquisition (with requisite cleansing and correlation) or real-time integration to connect relevant data, inside and outside of organizational boundaries.

High degrees of interactivity both for drilling down and on the fly editing of core dimensions of the analysis.

Business intelligence solutions are often part of rich analytics suites – which include visualization tools designed with business analysts and end-users in mind. Data structures are abstracted based on enterprise objects and metrics; 4GL languages allow drag and drop exploration.

The last few years have seen consolidation in the ERP/BI space (e.g., SAP and Business Objects, Oracle and Hyperion, IBM and Cognos, SPSS). As product lines are becoming integrated, organizations have easier access to, and an easier time feeding into, tools capable of driving visualization.

Natural links to performance management and predictive modeling tools, allowing not just confirmation of intuition, but discovery and insight.

High-performance appliances, in-memory analytics solutions, cloud-based infrastructure as a service and distributed data processing solutions have introduced cost-effective means to remove technology constraints.

Tools for rendering and displaying complex visuals are a natural part of this trend. Beyond the presentation layer, visualization requires foundational Enterprise Information Management and Information Automation disciplines – as well as means to integrate data silos within and beyond the organization.

Applied mobility

Protective shells and hardware extensions are available from various third parties, integrating through open ports/protocols (USB, Apple 32-pin connector etc.), allowing simple consumer devices to undertake highly specialized activities, while also enabling communication and multi-purpose functionality.

The ability to use commercially available devices creates a fundamentally lower price point. Powerful processors, memory, capacity, screen size, resolution, and UI schemes remove hardware-based restrictions on potential mobile business scenarios.

A critical mass of developers leads to a critical mass of apps, which leads to innovation and broader adoption. This is enabled by well-designed and governed sales and distribution channels such as Apple's App Store – whose catalog grew an estimated 111% in 20104, with 94% of applications reviewed within seven days of submission5. In response to the growing threat by Android, Apple recently revealed its App Store approval guidelines to developers and relaxed its rules on the use of Adobe's Flash.

Application adoption can easily reach critical mass to generate "buzz" and continue to drive incremental uptake.

The rising tide of spend in mobility apps has moved the needle forward on the availability and sophistication of cross-platform development, deployment and management tools. This improves the opportunity for a rich catalog of apps available even to narrowly focused business domains.

Auto manufacturers are increasingly adopting a hybrid model – combining in-dash systems with mobile services accessed through Bluetooth or wireless networks.

Solutions have expanded to include productivity (speech to text/email), collaboration (onboard social networking streams), and driver assists (sensor-driven parallel parking, Google's self-driving platform).

Platforms connected to the internet, allow ongoing automated feature updates and content upgrade options.

Extension of vehicle-mounted telematics position, presence, and situational awareness to other hand-held devices allows new and important services to be conceived and delivered to customers and employees.

Capability clouds

Cloud is now a tested architecture for some workloads for large-scale enterprises. Adoption may have been accelerated by recent economic pressures, but current cloud business cases benefit as much from speed-to solution and sophistication of the capabilities, as they do from the trade-offs between operational and capital expenditures.

While de jure standards are still evolving, de facto standards are sufficient for confident enterprise deployment and integration. Beyond elastic capacity for IT services, capability clouds often emphasize the business service linkages. IT can clearly associate ROI in direct business terms.

The enterprise CIO can and must become a trusted storefront for these business services for business executives. Significant improvements in cloud operations support systems (OSS) and business support systems (BSS) allow effective subscription, billing, incident and customer management.

Capacity cloud continues to be relevant for several usages – supporting applications with unpredictable usage needs and rapidly scaling edge solutions. But it needs to be viewed as one of many possible options, not the default application of cloud.

Capacity clouds are enablers for higher-value business services, necessary for realization of additional value.

Organizations have a much clearer definition of the "what" and "why" of cloud. Discussions in 2011 have moved from education to pilots and full-blown implementations, many utilizing capability clouds

Capability clouds lend themselves to rethinking about operating models in terms of services. Service-Oriented Business Architectures are beginning to emerge, where organizations have identified their catalog of critical capabilities and are making targeted fulfillment decisions for individual areas.

Multi-tenancy guides design principles that are usage and purpose-driven, which naturally align to services. Because many of the platforms were designed in the era of SOA, they can be embedded, integrated and orchestrated – not acting as simply tacked-on interfaces applying modern standards to antiquated architectures.

Real analytics

ERP providers have invested in adding information platforms to their solution sets, including performance management and some advanced analytics tools. These are largely integrated into the core process automation solutions.

Integration between internal and external systems has been eased by adoption of open architecture standards and advancements in transactional and view-based integration tools.

Leading organizations have adopted a combination of performance improvement, information management and advanced analytics to meet the needs of the business.

Enterprise-wide governance is a critical dimension of real analytics, allowing for visibility across and beyond organizational boundaries.

Real analytics efforts are embedded in business processes with executive and management support, with continuous feedback loops so that actual performance can guide the next iteration of analysis.

A combination of improvement in storage, processing and network performance, as well as advanced new options for dealing with complex calculations on large data sets (e.g., high-performance information appliances, column-based in-memory databases, distributed computing tailored for data processing). For example, a large consumer credit card issuer recently analyzed two years of data (73 billion transactions across 36 terabytes of data) in 13 minutes. In the past this transaction would have taken more than one month5.

Analysis now routinely handles massive datasets with millions of variables and billions of cases, increasingly in real time. Tools such as PMML, DMQL, SPSS and

DMX allow the focus to be on exploratory analysis to discover relevant patterns, trends, and anomalies in data, without having an explicit goal in mind.

Social computing

New social computing platforms either are built on public offerings or have been designed with an "outside-in" mindset, recognizing upfront that external contributors are an important aspect of strategy.

Initiatives are being launched with focused intent, and adoption is often driven by the business.

Integrated tool sets like Microsoft's SharePoint 2010, IBM's Social Me and Salesforce.com's Chatter are designed to provide the necessary connections between disciplines.

Social network analysis is the formal science of individual and organizational nodes, relationships, and their applications to society, politics, and economics.

Improvements in computing resources and analytical tools allows for real-time modeling of behavior across the entire network – leading to better understanding and the ability to explore and manipulate data.

Advances in mobile technology and services from the cloud allow networks to communicate and collaborate, enable transactions, and quickly form, scale and evolve.

Leading social networking sites have seen continued growth – in both number of users and frequency of usage. By the end of 2010, Facebook is estimated at well over 500 million users, with users spending more than 700 billion minutes on the site each month4. LinkedIn claims 90 million registered users, with 65 million unique visitors to its site each month5. Twitter has over 200 million registered accounts, with over 110 million tweets a day6. And enterprise-focused platforms are seeing rapid growth – from Yammer's presence in 80% of the Fortune 5007 or Chatter's presence in over 77% of Sales force. com customers.

Video, pictures, and electronic documents have emerged as essential corporate communication tools, such as advertisements, training manuals, product catalogs, or vehicles for collaboration.

The shift to digital content created via dis-intermediated channels represents a crucial element of social computing today. Most platforms include "social media" support (sharing pictures, videos, etc.) as only one dimension of the community.

CIO as Revolutionaries

The potential of cloud, mobile and social computing is transformational and unpredictable.

This dynamism is what can make a lasting change to the CIO's role so important – positioning the organization to have the required agility to take advantage of market shifts.

Technology-enabled business transformation has left organizations with more complex dependencies on IT support, compounding the CIO's stewardship responsibilities. New disruptions shift the burden from directly managing operations to providing end-to-end capabilities, dependent on third-party services and infrastructure.

The next generation of employees and the current generation of consumers expect new ways to interact with business. They demand usable, intuitive, empowering solutions, delivered at the edge that provides a view of relationships, information, and transactions tailored to the individual. Meeting these needs requires more than new tools; it also requires new skills and a new approach to enterprise market engagement.

Most of the innovations in 2011 will be inherently visible and valuable to the business, including mobility, information platforms for better answering "what do I need to know" and rapidly-delivered, functionality-rich cloud solutions.

Revolutionary CIOs.

IT makes the market for business services, introducing technology-driven disruptions to existing businesses or opportunities for entering net-new markets. The CIO is actively incubating potential new business solutions based on technology innovation. Advanced information and analytics capabilities are built to complement traditional systems, with the CIO becoming the trusted source of hindsight, insight and foresight for the organization. Continued advances include:

Agility: Make rapid deployment the de-facto organizational standard, influencing everything from investment and portfolio processes and portfolio management, through conventional SDLCs and support functions.

Social and mobile – transformation:

Use of social computing and mobility technologies to enter new business models or to change operations internally as well as within the marketplace. Develop centers of excellence for analytics and innovation: Include ideagoras and crowd sourcing for ways to create and leverage information assets.