



Gain Agility by Migrating ERP Workloads to Public Cloud Infrastructure

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IDC OPINION

Introduction: Leveraging Cloud Resources for Digital Transformation

Business enterprises have sizable investments in on-premises information technologies that they use to run mission-critical business applications, and they continue to pay for maintenance, product updates, and support. Many businesses are realizing the disadvantages of staying on these current systems, which predate the current era of widespread digital transformation (DX) with disadvantages of yielding little enterprise benefit, reducing the business' competitiveness, not being agile or flexible. ERP continues to be the largest spending area in the IT budget as per IDC's forecasts and is a top-ranking area of investment. Maintenance and upgrades for legacy ERP and back-office systems consume a large percentage of dollars allocated to the IT budget, leaving little room for innovation initiatives from what IDC calls 3rd platform technologies (big data and analytics, cloud, mobility, and social media) and innovation accelerators such as the industrial Internet of Things (IoT), cognitive (machine learning, natural language processing, and AI) systems, and blockchain. The momentum of digital transformation is driving businesses to rethink their technology strategy by building agility using cloud resources. New sources of innovation capabilities and tools are available that enable sustainable change at the speed of digital business. With large-scale usage of public cloud moving beyond the "early adopters" to the "early majority" of IT organizations, it is the deployment model for organizations that want to compete in the digital economy.

ERP implementations form the software backbone of enterprise business, managing core business transactions, and these have traditionally been deployed using on-premises IT infrastructure. Leading DX businesses of all sizes have turned their focus to SaaS- and cloud-enabled ERP software because they need a flexible, agile ERP system that is configurable, continuously updated, quick to implement, available anywhere and anytime, and scalable. Cloud deployments allow companies to remove the complexity and costs of maintaining on-premises infrastructure and apply the time and effort saved to digital transformation initiatives. Public cloud environments provide highly reliable, flexible, and secure infrastructure along with access to services that significantly enrich the way customers interact with businesses, making cloud-enabled ERP a critical success factor.

SITUATION OVERVIEW

The driver of growth in the public cloud infrastructure and platform markets has undergone a big shift in the past 15 years, from the front office (systems of engagement) to the back office (systems of record). Since 2015, there has been a gradually growing acceptance of public cloud among enterprise IT organizations — fueled by success stories, a continuous stream of migration and enablement offerings by public cloud providers for core applications such as databases, and a growing pool of managed service providers that enable greater familiarity with public cloud options. The back office is now playing catchup to the front-office modernization efforts. Most organizations recognize that while they can bring in customer insights, they cannot translate that to profitable business response without integrating legacy on-premises systems.

A key advantage to cloud services is the ability of IT organizations to shift IT resources from maintenance to new initiatives, targeting value where most appropriate in the business. This in turn leads to new business revenue and competitiveness. Companies are moving applications wholesale into the public cloud environment. In addition to cost savings, these migrations result in agility and access to emerging technologies that public cloud environments offer. Public cloud providers deliver a much better opportunity for cost savings due to economies of scale as well as the ability to match capacity with fluctuating demands. With this comes the potential to positively impact budgets, staff efficiencies, operational effectiveness, and business outcomes.

The 3rd Platform of big data and analytics, cloud, mobile, and social media, along with the innovation accelerators of industrial Internet of Things, wearables, machine learning, and blockchain, will continue to have a tremendous impact on how ERP systems are being reimaged into asset-centric networks that connect assets, processes, people, and money. Cloud-enabled ERP solutions embedded with intelligence allow users to quickly establish more impactful data-driven business processes and decisions, reducing the time to value and significantly changing the ability to generate more revenue, cash flow, and profitable growth. And, critical to profitability, operating costs are reduced because routine tasks have been simplified, human errors reduced or eliminated, basic business processes automated, and additional drilldowns, data extraction, and analysis eliminated.

Big Data and Analytics

Companies are increasingly taking advantage of public cloud service providers to host existing applications, which then allow connectivity to new cloud-delivered services like machine learning and IoT. As IoT progresses, the amount and variety of unstructured machine data created will far exceed the ability to make sense of it with current analytical methods. The increasing variety of data from social and IoT sources requires tools to abstract the complexity of the mix of data sets while delivering benefits into applications. Organizations are using AI to mine billions of data points for actionable insights, valuable for incremental revenue streams, and competitive differentiation. The increased volumes of data needed to deliver analytics at scale make it cost prohibitive to run the underlying storage with on-premises infrastructure. With cloud-enabled ERP, massive amounts of internal and external data can be brought into the business processes so that employees can quickly gain insights and positively impact business outcomes and financial performance.

Open Source, Containers, and Microservices

Open source software has become a central focus for virtually every cloud platform vendor. These technologies enable public cloud service providers to deliver transformational capabilities in an easy to consume manner to optimize application delivery. A robust open source software tool portfolio enables customization, especially for integration in hybrid cloud environments, and brings the resources of a large developer/user community to the cloud platform. Organizations like Cloud Native Computing Foundation (CNCF) and Open API initiatives are driving the adoption of these tools as well as the "born in the cloud" paradigm for distributed environments fundamental to public clouds. The momentum of CNCF and the who's who of large software vendors supporting this initiative show the interest in being front and center for cloud-native application environments. Vendors, of course, want to be part of an initiative that promises to continue leading and influencing the larger industry around it.

Even enterprises with legacy code need access to tools like microservices, container packaging, and orchestration. Containers are part of a cloud-native deployment method and enable an order of magnitude speedup of workload start-up, thereby enabling greater agility in development and deployment. Containers make for a more Agile development model and can support a granular pricing model. They can be launched in seconds and replicated/scaled up and down based on demand, responding to resource demand in real time. Container orchestration software is critical to ensuring high levels of scalability, latency, and security for container cluster management, provisioning, and control based on customer-defined policies' requirements. By using technologies such as open source Kubernetes, container orchestration solutions support enterprise on-premises, hybrid, and public cloud infrastructure.

It Takes a Village

Enabled by technologies such as containers and analytics, connecting services from a variety of sources is becoming essential to bring intelligence and agility to existing applications. IDC has seen an acceleration in enterprise adoption of public cloud, complemented on the offerings side with an increasing number of partnerships that bridge the public cloud and on-premises infrastructure environments. Third-party data sources can augment and enhance the available first-party data. The ability of software vendors to productize open source technologies has proliferated the number of applications available in the public cloud. Connecting all these are APIs, which have become a central foundation for companies digitizing their business process interactions internally and externally. The outcome is that a majority of enterprise IT organizations are seeing public cloud as a necessary component of their IT platform and services mix and are executing on this vision.

FUTURE OUTLOOK

The demand for cloud-based ERP software continues to greatly outpace the demand for on-premises/other software, with the five-year CAGR for cloud ERP software an exceptional 26.3% through 2021. IDC sees strong growth in public cloud adoption by enterprise IT organizations executing on large-scale migration and refactoring projects. This white paper presents factors for businesses to consider while combining innovation capabilities of public cloud with core enterprise applications.

Stackdriver's broader ability to support application monitoring across more than one public cloud vendor represents one of the key differentiators of the tool in the application monitoring space. Customers can use Stackdriver to monitor multicloud deployments across a multitude of cloud vendors while obtaining an integrated picture of application performance via an interactive dashboard with drilldown functionality.

Stackdriver increases developer productivity by providing insight into application performance through a collection of tools and analytic methodologies. Customers can use Stackdriver to seamlessly manage applications, monitor performance, and swiftly go deeper to examine performance issues or to implement remediation efforts as needed.

Migrating ERP Applications to Public Cloud Service Providers

As enterprises embrace digital transformation, they are migrating their back-office applications to the cloud and frequently choose public cloud service providers for the cost saving, flexibility, and agility previously described. These businesses recognize that they can finally start optimizing across all resources of people, process, and technology, and that leveraging technology more makes them more efficient and more profitable. Some businesses are favoring hybrid environments where some of their functional applications remain on-premises, while others are in a public or private cloud. A note of caution: hybrid solutions may appear to be a good middle ground but often prevent companies from taking a much-needed major shift to the cloud.

Migrating core business applications and processes such as ERP from an on-premises deployment to a cloud-based ERP can be a formidable project. Organizations will seek out providers who offer robust migration tools that provide an intuitive user experience to ease the migration process. Partners and systems integrators help in managing this transition and migration, eliminating disruption and risk during the change, and ERP customers demand long-term technology partners. Software license management is more complicated in a cloud environment, so software vendors are incorporating "bring your own license" (BYOL) capabilities to public cloud.

Leveraging Public Cloud for Digital Transformation advances Mission Critical Applications Service

New innovative technologies like machine learning, analytics, and AI can add intelligence to existing ERP applications. Many of the top ERP vendors such as SAP have announced intelligent ERP (i-ERP) applications that utilize machine learning algorithms applied to curated data sets, enabling deep insight and automation and improved efficiency of tasks. In-memory databases connect with analytical engines and utilize dashboards to help in speedy decision making. For example, real-time data analytics enable quick decision making in a fast-moving industry with seasonal products that have a short shelf life. Supply chain applications leverage predictive analytics to proactively identify bottlenecks in the supply chain and to subsequently optimize distribution pathways to ensure the timely delivery of products. Many organizations are beginning to use deep learning models to personalize content, predictions, and recommendations to specific customers or prospects. This is especially true with mobile applications where users increasingly expect their devices and applications to "know" their likes, dislikes, and expectations.

Growth of the industrial internet as defined by interconnected devices, machines, and things (IoT) that supply real-time data allows organizations to monitor and manage the performance of devices in real time. As exemplified by sensors used to monitor industrial machines and devices in assembly lines, automobiles, sensor-driven appliances, and medical devices, the rise of IoT correlates to a rise in the need for real time analytics to process and act on streaming data from connected devices. By analyzing volumes and varieties of data from IoT sensors embedded in equipment, companies are using AI for predictive maintenance applications to provide service before failures occur.

In a world where everything is connected to everything else, data from multiple sources brings new opportunities for revenue growth to organizations. Data comes in through connected assets, employees, and connected processes or as other data streams through APIs. This data circulates through an intelligent ERP "core," which can pull out insights. Those insights circle back into the organization as improved internal processes. But data also comes in through ecosystem engagements, i.e., bots, mobile devices, AR/VR, connected vehicles and so forth. This data circulates through the intelligent core, which turns the data into actions to be taken when engaging with the ecosystem. With analytics connected to ERP and the addition of external data feeds, line-of-business (LOB) users can make decisions that impact the future in real-time as opposed to waiting for monthly/quarterly reports.

Delivering Innovation on a Budget Using Public Cloud Infrastructure

The transformation to the cloud continues to gain momentum, disrupting traditional IT budgets by stripping them of capital expenditures (CapEx) and moving more software purchases to cloud applications, which reduces overall costs and recognizes the purchases as variable operating expenses. But cloud innovation is more than a shift of CapEx to OpEx. With cloud-based intelligent ERP, operating costs (OpEx) are also reduced. As previously mentioned, routine tasks are simplified, human errors are eliminated, basic business processes are automated, and additional data drilldowns, extraction, and analysis are eliminated, all critical to profitability. Infrastructure-related challenges such as a cost-effective, reliable, and elastic hosting service with automated backup and disaster recovery are taken care of by cloud-based deployments. Rather than dealing with capital allocation, capacity planning, and infrastructure maintenance, enterprises will increasingly rent IT resources from cloud service providers. This transfers the task of building and running elastic IT infrastructure to a shrinking group of experts. Consequently, economies of scale in public cloud infrastructure bring lower costs to enterprises choosing public cloud as a destination for their mission-critical workloads.

Cloud-based ERP is an attractive option for businesses since savings come from both hardware and software. Hardware costs are based on actual usage of the system. Through efficiencies in costs, infrastructure on-demand or the pay-as-you-go model allows enterprises to try new initiatives on the public cloud much faster than possible in an on-premise implementation. For software, public cloud vendors support, and ERP software vendors are commonly offering, "bring your own license", referred to as BYOL. This allows users to migrate their core ERP business processes from on-premise to cloud infrastructure without additional software license costs or the risk of violating license agreements. Users don't need to manage multiple copies of software licenses across the flexible containerized infrastructure of a public cloud environment. Flexibility of pay-as-you-go infrastructure and BYOL are making it easier for enterprises to move to public cloud and gain access to emerging and innovative technologies.

Resources to Enable Enterprise Agility

Innovations and advancements in cloud-based development tools are driving enterprises to modernize their back-office environments, leveraging open source technologies, containerization, microservices, big data, and cognitive tools (AI, deep learning), and use an assistive user interface (UI), dashboards, and metrics to navigate and uncover insights. APIs to a breadth of cloud-based services enable ERP systems to integrate these technologies, extending the reach of their business processes. Containers are integral to cloud-native deployment methods, providing quick, mass deployment of isolated, modular applications to support enterprise on-premise, hybrid, and public cloud infrastructure.

In a recent IDC webinar, 40% of participants specified that a more modern ERP system that is SaaS and cloud enabled was not yet on their radar because of other investments the company was making. When we took a deeper look in this area, we found these businesses are laggards that have overinvested in their legacy products, are devoting more to the front office, or are neglecting their business IT strategy such that it will impact their business in the short and long terms. Inaction is a costly proposition for any business in our fast-moving digital economy.

GOOGLE CLOUD AND SAP PARTNERSHIP

In March 2017, Google Cloud and SAP announced their partnership to integrate SAP enterprise applications with Google Cloud Platform (GCP) and G Suite. IDC has seen an increasing number of partnerships that bridge the public cloud and on-premises infrastructure environments; SAP software already runs on several cloud platforms. The Google-SAP partnership was more than merely certifying SAP software on GCP. Together, they form a highly complementary relationship, and each fills a unique need for the other. For SAP, this includes GCP's global and secure network, reach, marketplace, applications such as G Suite, and particularly Google's expertise in technologies such as machine learning, analytics, artificial intelligence and containers with examples including Google BigQuery and Google Kubernetes Engine. The relationship further lowers any potential concerns for SAP customers of becoming locked into one infrastructure vendor.

Google Cloud's portfolio of products, services and tools enable customers to modernize their operations for today's digital world. Google Cloud touched every layer of the business and includes Google Cloud Platform with offerings that span storage, infrastructure, data, analytics and app development; machine learning tools and APIs; G Suite's collaboration and productivity tools; enterprise Maps APIs; and also Android phones, tablets and Chromebooks.

SAP business applications certified on GCP include SAP HANA, SAP S/4HANA, SAP BW/4HANA, SAP Hybris, SAP Business Suite, SAP Business Warehouse, SAP BusinessObjects Suite and more. Additionally, SAP's Cloud Platform is now generally available on Google Cloud Platform.

Differentiation of SAP on GCP

Engineered for the Enterprise

Google Cloud Platform (GCP) is engineered to deliver the highest levels of availability for SAP landscapes. Google's global network runs on Google's privately owned and operated fiber, controlling and managing data between regions and zones. This software-managed network enables previously on-premises-only SAP applications to run in the cloud with performance and security. GCP has SAP-certified compute infrastructure across the globe in the Americas, Europe, and Asia/Pacific. In addition, unlike bare metal-based cloud implementations, GCP leverages a VM-based model with certified custom VM shapes, allowing the flexibility and cost-effectiveness of provisioning and scale. Additional integration of GCP's access transparency with SAP Data Custodian allows customers to view who is touching their infrastructure in the cloud and to create and manage audit controls.

Risk Mitigated

GCP allows customers to mitigate the risk of getting to the cloud and running in the cloud. Velostrata, a recent acquisition, assures on-prem or cloud-based VMs are migrated to Google Cloud Platform without the need to wait for replication periods or downtimes. SAP landscape availability is enhanced with live migration by eliminating VM downtime due to Google Cloud planned maintenance events. High Availability and Disaster Recovery events are managed with single-security virtual private network. SAP infrastructure investments with GCP are protected through a pricing model that allows customers to pay for today and not tomorrow. This eliminates guesswork of sizing, with no required usage commitments. Customers can burst and flex with the cycles of their own SAP environment.

Innovative

High-performance analytics at petabyte scale are implemented with BigQuery, the GCP serverless data warehouse. Google has collaborated with SAP to natively integrate SAP HANA with BigQuery through smart data access. This fully integrated data tiering solution creates the ability to run "hot" data analytics with the enterprise-grade interoperability and security of SAP HANA, while the larger data pool is accessed from GCP. Innovation capabilities in the areas of AI and ML allow customers to drive new revenue streams and efficiency. Examples include invoice processing and quality control solutions. For innovation in the area of monitoring and diagnostics, Google Cloud Platform has fully integrated Stackdriver with SAP HANA, allowing users to better understand the health, performance, and availability of their cloud-powered environment. SAP Datahub and SAP Vora are standardized on Kubernetes, affording containerized rapid deployment, availability, and scalability. Last, Google recently announced G Suite integration with SAP Cloud Identity enabling SSO across SAP and Google, including G Suite Sheets integration with ECC, affording automated export of ERP data to G Suite Sheets for quick analysis and reporting.

CHALLENGES/OPPORTUNITIES

SAP customers are mostly traditional enterprises that have not historically been aware of Google Cloud's IT solutions. Educating IT managers unfamiliar with modern cloud technology about Google Cloud and SAP's joint value could be a challenge for both companies. Google Cloud's differentiating capabilities could be an on-ramp for business transformation at enterprises and serve as an opportunity to encourage more enterprises to combine SAP's applications with Google Cloud.

CONCLUSION

- Public cloud infrastructure makes a difference in supporting mission-critical enterprise applications with highly available and secure capabilities.
- Supporting existing applications with on-premise infrastructure is time consuming, making the transition to become an intelligent enterprise highly challenging.
- Moving to public cloud infrastructure enhances enterprises' agile capabilities that are essential for digital transformation.
- Enterprises should take advantage of public cloud infrastructure to not only benefit from lower costs but also leverage the associated innovative cloud services available.
- Google Cloud offers SAP customers highly available IaaS capabilities that help minimize risk, increase agility and security, and allow for innovation to drive new revenue streams and reduce costs.



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