A THINKstrategies Whitepaper for CXOs

The Integration Implications of the Internet of Things in a Connected World:

Why Application and Data Integration is Even More Important, and Why it Demands a More Modern Approach

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Executive Summary

The world is becoming increasingly connected via the 'cloud' and through the explosion of mobile devices and remotely accessible objects, ranging from household appliances to industrial components.

In today's increasingly mobile, social and 'on-demand' world, immediate access to timely information is essential to quickly respond to changing customer needs, widening competitive threats, and new market openings.

Capturing the data being generated from this rapidly expanding universe of endpoints and pulling that data together to optimize business operations and capitalize on new market opportunities has become a key 'Big Data' challenge.

In the same way traditional enterprise applications and data center systems have fallen short in meeting these new demands, traditional application and data integration technology is being challenged to keep pace with today's changing business requirements.

The promise of the 'Internet of Things', combined with the growing demand for more efficient and seamless business processes, are driving escalating demands for more flexible, powerful and cost-effective integration capabilities.

THINKstrategies believes a new set of integration platforms and tools are necessary to satisfy these escalating needs. This whitepaper will explain how a new generation cloud-based integration solutions that can address both simple and complex enterprise IT requirements can fill this void, and make it possible to reap the business benefits of today's connected world.

Measuring the Potential Impact of the Internet of Things

One of the hottest technology topics of 2014 is the 'Internet of Things' (IoT) which suggests we are entering a new era in which nearly every object can be connected together to enable companies and consumers to more easily monitor, measure and manage their business processes and personal lives respectively.

The IoT idea has evolved from the more industrial concept of machine-to-machine (M2M) communications, which was primarily focused on commercial deployments of remote sensors aimed at improving logistics and other aspects of their operations.

The IoT is becoming a reality because of advancements in nanotechnology that have made it more economically feasible to embed remote sensors in nearly everything. A wider range of communications frequencies has made it easier to connect these sensors to centralized systems. And a rapidly expanding array of cloud services is also making it easier and more cost-efficient to collect, store, collate and share the data being generated by the sensors so it can be employed to make better business decisions and take appropriate corporate actions.

The 'consumerization of IT' has also contributed to the popularization of the IoT idea. As 'prosumers' become more aware of the potential benefits of geospatial services offered by their mobile devices, they become more receptive to applying the same capabilities to other aspects of their business operations.

The confluence of these technological trends now makes it possible to leverage connected objects and devices to better understand their movement and behavior so as to improve their operating efficiency and create new market opportunities.

Gartner predicts the IoT will equal approximately 26 billion connected objects by 2020, not including PCs, tablets and smartphones which will substantially increase the IoT universe.[1] This represents a 30x increase over the population of connected objects in 2009. Gartner believes IoT product and service suppliers will generate over $300 billion incremental revenue through 2020, and the IoT phenomenon will create $1.9 trillion worldwide in new economic value across a variety of industries.

When you add in all the mobile devices at our disposal, Cisco Systems predicts there will be over 50 billion connected objects worldwide in 2020.[2]

Number of Connected Objects Expected to Reach 50bn by 2020
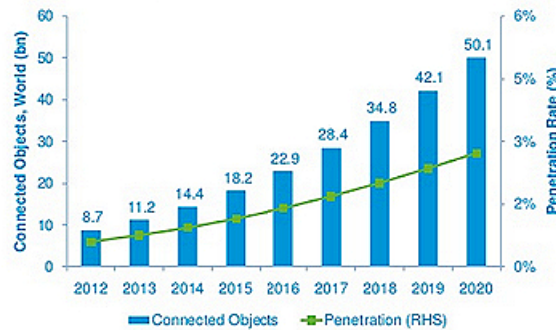
Penetration of connected objects in total 'things' expected to reach 2.7% in 2020 from 0.6% in 2012

Source: CCS, 2013

McKinsey forecasts even greater economic value from today's IoT initiatives, predicting it will have an economic impact of up to $6.2 trillion annually by 2025.[3] As the following figure from the same report illustrates, McKinsey also believes the IoT will produce six types of data that will provide information and analysis and promote automation and control.

Information and analysis			Automation and control		
1 Tracking behavior	**2** Enhanced situational awareness	**3** Sensor-driven decision analytics	**1** Process optimization	**2** Optimized resource consumption	**3** Complex autonomous systems
Monitoring the behavior of persons, things, or data through space and time.	Achieving real-time awareness of physical environment.	Assisting human decision making through deep analysis and data visualization	Automated control of closed (self-contained) systems	Control of consumption to optimize resource use across network	Automated control in open environments with great uncertainty
Examples: Presence-based advertising and payments based on locations of consumers	*Example:* Sniper detection using direction of sound to locate shooters	*Examples:* Oil field site planning with 3D visualization and simulation	*Examples:* Maximization of lime kiln throughput via wireless sensors	*Examples:* Smart meters and energy grids that match loads and generation capacity in order to lower costs	*Examples:* Collision avoidance systems to sense objects and automatically apply brake
Inventory and supply chain monitoring and management		Continuous monitoring of chronic diseases to help doctors determine best treatments	Continuous, precise adjustments in manufacturing lines	Data-center management to optimize energy, storage, and processor utilization	Clean up of hazardous materials through the use of swarms of robots

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[1] "Gartner Says the Internet of Things Installed Base Will Grow to 26 Billion Units By 2020", December 12, 2013 press release, http://www.gartner.com/newsroom/id/2636073.

[2] Cisco Systems Internet of Everything Value Index 2013, http://internetofeverything.cisco.com/explore/full

[3] "The Internet of Things", The McKinsey Quarterly, March 2010 | byMichael Chui, Markus Löffler, and Roger Roberts. http://www.mckinsey.com/insights/high_tech_telecoms_internet/the_internet_of_things

Key Application and Data Integration Challenges in Today's Brave, New World

Pulling together data from an assortment of software applications, systems and sources has never been easy. While a new generation of cloud-based integration tools has made this process less painful and expensive, contending with the explosive growth in APIs, software as a service (SaaS) applications, social data and other endpoints in the new world of the Internet of Things exponentially compounds the integration challenge.

Not only does an organization have to deploy more connectors to collect the data, it must also implement more flexible and intelligent integration solutions to assimilate a more diverse array of data flows so they can be utilized to support a wider array of business applications. This means merging data collected from a broader population of objects and devices with critical data captured from individual customers and prospects.

And, ultimately both business users and IT organization alike need to be able to dynamically assemble real-time data into trusted views of the 'truth' regarding operations, customers and opportunities to streamline business processes, improve quality of services and capitalize on new revenue streams in a more profitable fashion.

This integration imperative is clearly illustrated by the emerging data challenges associated with Salesforce.com's three areas of primary focus:

- Sales Cloud

- Marketing Cloud

- Service Cloud

Sales Cloud: The main use cases for the Sales Cloud ensure the sales team has a single customer view and processes such as the opportunity-to-order workflow are streamlined so that you have better alignment between front office and back-office operations. In some cases, this means the initial CRM to CRM migration from a legacy system like Siebel to Salesforce.com. But migration, and specifically manual data loading, is not really integration. The integration process begins with the synchronization of the account information, but also requires better access to financial systems to ensure alignment across sales and finance where the master data is typically housed.

Cloud migration and integration processes can be complicated even further when an organization decides to also move to a Cloud-based financial management system such as Intaact, NetSuite, or FinancialForce. Now, mission critical ERP data must be moved from legacy systems powered by SAP, Oracle EBS, Microsoft Dynamics AX, etc. Truly achieving the single customer view across all of these systems and ensuring that your sales team is highly productive and Salesforce is well adopted is easier said than done. Being able to tackle the multi-faceted integration challenge at cloud speed is the key driver to CRM success.

Marketing Cloud: The Marketing Cloud represents a fundamental shift to a more dynamic, digital marketing approach that is driven by a deeper set of analytics from multiple channels. Generating, collating and interpreting real-time data from various marketing programs can produce valuable insights about customer preferences based on their priorities and buying behavior. Tracking this behavior, measuring its impact and monitoring how it is affected by various marketing campaigns and triggers is essential to win and retain customers. Unified application, process and data integration is critical to turn subjective marketing ideas into scientific marketing techniques that can produce quantifiable results.

Service Cloud: Organizations of all sizes across nearly every industry are recognizing that properly supporting their customers is critical to long-term success in today's 'subscription economy'. Providing quality services can ensure customer satisfaction, reduce churn, increase the lifetime value of the customer and encourage cross-sales opportunities and referrals. This is the premise which has driven the growth of Salesforce.com's Service Cloud. And, once again, pulling together the data generated from an organization's helpdesk operation with that gathered from its CRM, marketing automation and financial systems will give an organization valuable information about the needs of individual customers and unique insight into potential new market opportunities. A growing number of Cloud/Software-as-a-Service (SaaS) players, such as ServiceNow, are also focusing on the service management space, compounding the need for powerful and proven cloud service integration requirements.

Pulling all these pieces together, along with a myriad of connected objects and devices, is the key challenge facing organizations of all sizes across various industries today.

New Integration Tools & Techniques to Address Today's Business Needs

Meeting the escalating integration needs of today's connected world is no small task.

In the past, data and application integration primarily entailed tying together relatively static applications, systems and data sources within traditional data centers and departments. Over time, this environment became more heterogeneous, but the responsibility of pulling together the pieces was still confined to the IT/software industry players providing the systems and applications driving business operations. Now, the software world is being tied together by application programming interfaces (APIs).

In the brave, new world of the Internet of Things, a broader set of companies are becoming engaged in the integration process. For instance, according to John Paul MacDuffie, director of the Mack Institute's Program on Vehicle and Mobility Innovation (PVMI), the automobile is experiencing its first fundamental design change since the late 1920s as it becomes more software driven and architected to consist of wider set of independently developed systems.[4] As Marc Andreessen famously noted, "software is eating the world"[5], and this creates the need for a new level of integration that hasn't been required in the past.

The increasing prevalence of cloud-based applications is driving the need to address new multidimensional integration challenges of today's connected world. Cloud-oriented integration solutions promise simpler connectivity between cloud applications and data sources. They can also focus on the application integration issues associated with enterprise application integration (EAI) and service-oriented architecture (SOA) integration tooling to pull together on-premise applications in real-time at relatively smaller volumes. Cloud integration solutions can also address data-centric extract, transform and load (ETL) requirements to build and maintain enterprise data warehouses (EDW) and run large batches of data.

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[4] "The Promise – and Challenge – of Integrating IT into the Auto Industry", Knowledge @ Wharton, January 22, 2014. http://knowledge.wharton.upenn.edu/article/the-promise-and-challenge-of-integrating-it-into-the-entrenched-auto-industry/

[5] "Why Software is Eating the World," The Wall Street Journal, August 20, 2011 http://online.wsj.com/news/articles/SB10001424053111903480904576512250915629460

The SnapLogic Integration Cloud: Addressing the "Integrator's Dilemma"

The SnapLogic Integration Cloud and its 'Snap' connectors overcome the "Integrator's Dilemma" of being forced to choose one integration tool over another to cover a variety of use cases.

The SnapLogic Integration Cloud consists of a multi-tenant execution network, called Snaplex, a multi-tenant Designer, Manager and Dashboard, and more than 160 pre-built integrations, called Snaps. Snaplex is built on a scale-out execution network that can either run in the cloud or behind the firewall. The elastic architecture makes Snaplex more scalable and flexible. The platform can handle real-time and batch-oriented application and data integration requirements, rather than being relegated to just one use-case or the other like previous integration solutions.

The SnapLogic Integration Cloud is able to address a broader set of requirements because it does not store or cache data. Instead, data is streamed between applications, databases, files, and other data sources via Snaplex. The Snaplex can operate in the cloud or behind the firewall depending on an organization's system, software and data requirements.

Snaplex can dynamically scale in the cloud in response to the volume of data being loaded and transformed. This also permits the Snaplex to minimize latency issues associated with the integration process.

The SnapLogic Integration Cloud offers a more modern and elastic platform that can accelerate the deployment process and time-to-value. Its flexible design enables customers to scale to meet a variety of on-premise and cloud-oriented needs, which is particularly important in today's connected world.

Summary & Conclusions

The promise of the Internet of Things is capturing the imagination of the marketplace and quickly becoming the focal point of many corporate technology and innovation initiatives. The concept of a world filled with connected devices and other objects conjures up countless use cases and new business opportunities.

However, fulfilling the IoT promise depends on deploying a new generation of data integration tools that are more powerful, flexible and economical than traditional, legacy platforms and solutions. The IoT world will consist of many more integration points, sharing information at many more levels. Unless the data captured at the endpoints can be retrieved, collated and shared in a timely and cost-effective manner, the purpose of using connected devices and objects to optimize performance, ensure quality and capitalize on new opportunities will be lost.

Fortunately, companies like SnapLogic are developing a new generation of cloud-based integration platforms and connectors that are perfectly suited to meet these escalating needs. By deploying these new integration technologies, organizations in any industry can attain the business benefits of the IoT promise and achieve a competitive advantage in their respective markets.

About SnapLogic, Inc.

SnapLogic is the leader in Elastic Integration, helping companies connect enterprise applications in the cloud and on-premise for improved business agility and faster decision making. With the award-winning SnapLogic Integration Cloud, organizations can more quickly and affordably achieve data and application integration and improve the timeliness of their information flow. SnapLogic offers a scalable, elastic integration platform as a service (iPaaS) and a rich library of intelligent connectors called Snaps. Funded by leading venture investors, including Andreessen Horowitz and Ignition Partners, SnapLogic is used by prominent companies in the Global 2000. For more information, go to: www.snaplogic.com.

About THINKstrategies, Inc.

THINKstrategies, Inc. is the only strategic consulting services company focused entirely on helping its clients capitalize on the unprecedented business opportunities created by the technology industry shift from a product-centric to a services-driven orientation and an "on-demand" delivery model, such as Cloud Computing, Software-as-a-Service (SaaS) and Managed Services.

THINKstrategies' mission is to help our clients re-THINK their corporate strategies, refocus their resources and re-align their operations to achieve their business objectives. THINKstrategies helps enterprise decision-makers with their sourcing strategies, IT solutions providers with their marketing strategies, and VCs with their investment strategies.

THINKstrategies has also created the Cloud Computing Showplace online directory and best practices resource center to help IT and business decision-makers find and fully leverage today's leading SaaS, Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS) solutions. To learn more about the Cloud Computing Showplace, go to www.cloudshowplace.com.

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