Moving Applications To Cloud

Whitepaper

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Determining and implementing an IT strategy for any enterprise involves deliberating if current or new applications can be offered via the Cloud. The purpose of this document is to provide a guideline to identify applications that can leverage the power of the Cloud.

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Executive Summary

As businesses transform and adapt to an ever increasing, demand to remain competitive, enterprises are looking at leveraging the capabilities of the Cloud to adapt to these new operating models.

Many enterprises are already accessing business applications like Salesforce on the Cloud. The Cloud once viewed as a hyped word is now seeing its potential and its value being realized. Using an appropriate evaluation framework enables organizations to identify which capabilities will benefit from Cloud strategies and which capabilities can be differentiated through internal technology development.

Today Cloud-based computing is one of the hottest technology trends. This is because, for many applications, it offers major advantages over typical software or solution delivery models. Applications on the Cloud are expected to result in a shift from capital expenses to operation expenses bringing about a transformable ability to scale to a global usage with high computation power without worrying about outage to end customers.

Determining and implementing an IT strategy for any enterprise involves deliberating if current or new applications can be offered via the Cloud. The purpose of this document is to provide a guideline to identifying such applications or portions thereof that can leverage the power of the Cloud.

Are All Applications Suitable For The Cloud?

Cloud computing represents a new paradigm, leagues away from the traditional delivery methods for IT services.

This new surge of “on demand” IT services and resources - infrastructure, platforms, and software is a result of technological developments resulting in various vendors providing Cloud based services. Infrastructure vendors like Amazon and Microsoft would like to use their existing resources and provide the benefits back to organizations. Solution providers like Salesforce would like to increase their customer base and use the power of the community to provide the best back to organizations. And then, there are other vendors who are capitalizing on the market trend and provide applications on the Cloud.

What makes Cloud such a talked about concept is the appeal it has across the organization amongst different stakeholders and business functions?

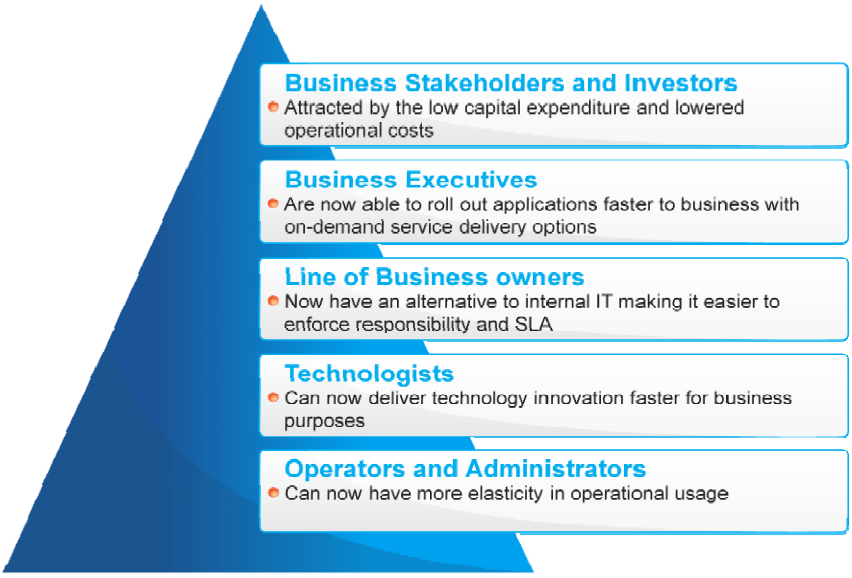

Figure 1: Different stakeholders and value Cloud promises to them

With acceptance across diverse communities, would it be wise to move all applications to the Cloud?

While there are facets that provide significant benefits, transition to Cloud needs to be evaluated based on the factors that can impact the expectations of individual stakeholders.

Different Dimensions Of Consideration

An investor for example would like to reduce capital expenditure, but it can never be at the expense of any business risks it might bring about– especially for mission critical or business critical applications. Deploying applications on the Cloud implicitly places a lot of trust on the Service Provider and all the other Service Providers (the contracted Service Provider outsources to). The economic appeal, therefore, in case of mission critical applications is lost over the risks it brings about.

Moving applications to Cloud, therefore, depends on how each such dimension impacts the expectation of individual stakeholders.

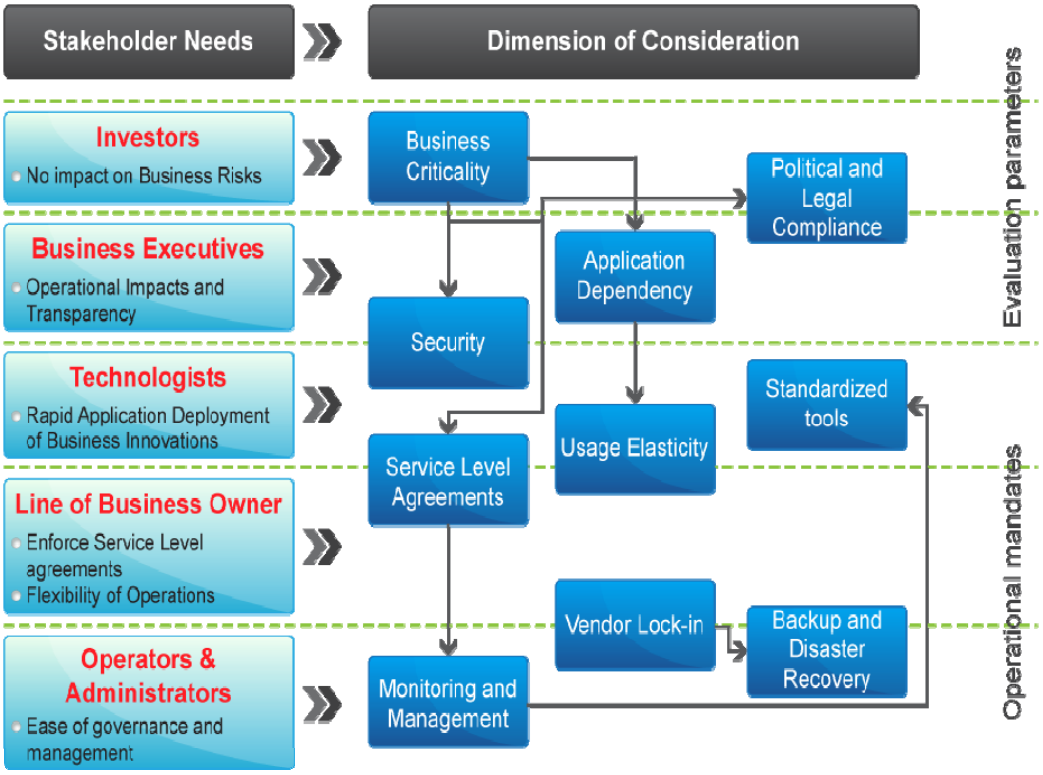

Figure 2 Dimensions of consideration and stakeholder expectations

The dimensions listed above, are not the only facets – but comprise the significant aspects of consideration. Let's look at each of these dimensions, and their evaluation vis-à-vis Cloud.

Assessing For Cloud Transition

Business Criticality

First week of this year saw outages in the services provided by two Cloud Service Providers: Salesforce.com and Amazon, the pioneers in this area. While this can be pardoned for productivity improvement tools, this would result in significant losses for mission-critical and business core applications. This may limit the adoption of Cloud to certain industries or certain services. For instance, governments would perhaps always be unwilling to send sensitive data to the Cloud while major enterprises might adopt Cloud for Office Productivity Tools significantly reducing the license costs of on-premise software.

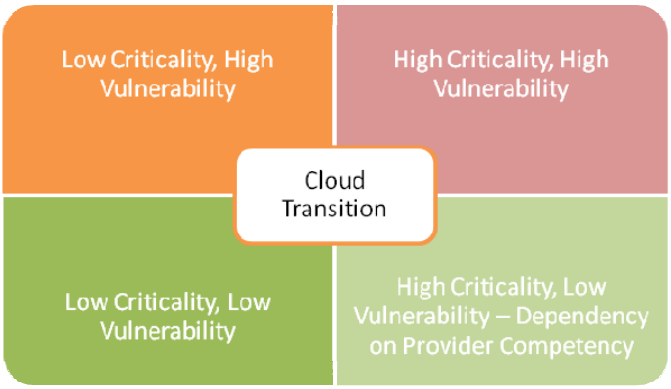

Figure 3: Business Criticality

For business application moved to the Cloud, the Service Provider must be able to provide the guarantee of reliability and availability of their services. Till such time as industry matures as showed in Figure 3, only applications with low criticality and low vulnerability seem possible candidates.

Service Level Agreements

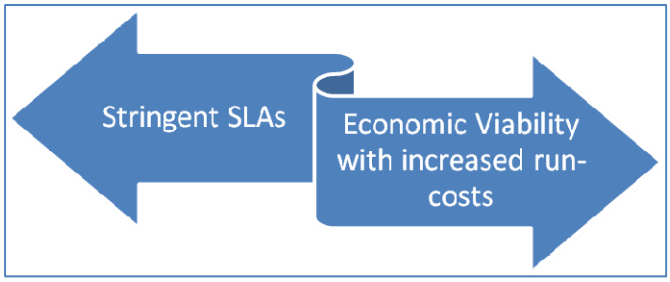

Figure 4: Service Level Agreements

On principle, even if SLA might sound like a basic requirement, the cost for the provider depends on the severity of the requirements, reducing the economic appeal of the transition, where providers can demonstrate ability to meet the SLAs. Contracts should be prepared only after the actual costs in these environments are assessed by testing these applications. Dependence on third party providers for calculations is detrimental to organization's interests. Google suffered a near two-hour Gmail outage Q3 2009, as a result of a miscalculation regarding the capacity of its system.

Cloud becomes more appealing wherever SLA can be mandated; as outsourced providers are obligated by binding contracts, when compared to internal Information System (IS). In some cases, when the usage

pattern is unknown, the estimates of operational costs when compared to the actual might see a significant variance. In such cases, while moving to Cloud, enterprises should be prepared for a possible transition to traditional means.

Security

When organization moves any of its IT services on the Cloud, they are no longer aware or in control of the location of the data. In these cases, enterprises should ensure that the Service Provider is contractually obliged to protect such data to the levels which accord with its own internal policies – including privileged user access, compliance as required by their internal security audits, and also local security government policies. Also, Service Providers do not serve only a single client; so, segregation of data needs to be ensured. While many providers use encryption to ensure this for reasons of data privacy, this might make the data unusable to a large extent.

The Security Controls from the provider also needs to be assessed based on the application's security needs and organizational policies. For example, Amazon AWS provides a single AWS key for an AWS account. For most applications this might be sufficient, but when the business needs calls for environments within the account to be segregated, this might prove to be a significant challenge.

Maintenance And Governance

With the advent of applications and services on the Cloud, the enterprise IT ecosystem will only become more complex. What are the services used by different consumers? For any changes, who would get affected?

Governance related to design time challenges of ad-hoc service creation will lead to uncontrolled cost implications. Additionally, as services are provided to more users in an internet centric delivery model, run time governance policies needs to ensure compliance checks that thwart the additional vulnerability that Cloud brings about.

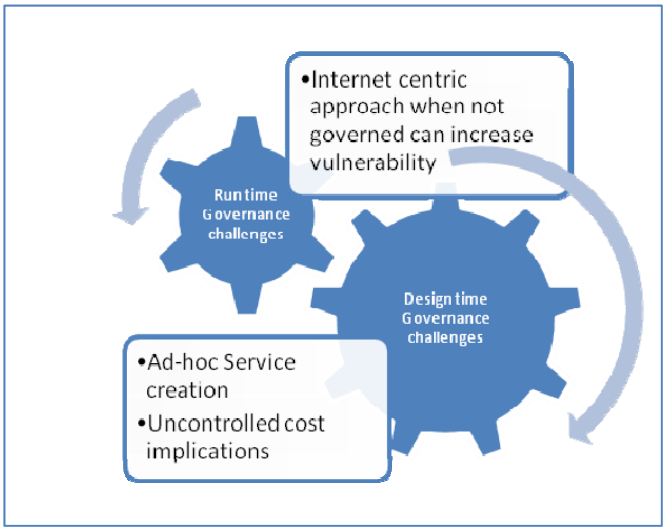

Figure 5: Reduced benefits of Cloud in ungoverned

Considerations around governance of services and applications will need to be about ensuring better practices that would enable various stakeholders to make informed decisions throughout different stages of service delivery. Whereas, these are challenges that traditional on-premise delivery model would also

face, potential of overheads due to inefficient and unmanned Cloud strategy which makes it imperative that Cloud Governance be addressed upfront before Cloud adoption.

Usage Elasticity

The main challenge when planning for Capacity of an application is to understand the usage pattern and to have the infrastructure for it. For applications that see seasonal spikes – like an eCommerce site around the time of Christmas, the infrastructure has to be sized to address these spikes. This results in sub-optimal utilization for majority of the time. With the elasticity that Cloud provides, IS now no longer needs to invest in the Computing power to address this maximum load of spikes. Expenditure for the organization would only be based on the usage – like that of Utility companies. However, like utility companies, metering needs to be exposed to the consumer directly to help avoid wasteful expenditure.

Application Dependency

Applications do not exist in isolation. They depend on other run-time environments within the Enterprise; require access to data and dependent third party services; and appropriate network configuration. While some of the challenges can be managed quite easily, dependency that limits the application's requisite performance and includes third party providers, are a lot more difficult to address. An application with dependency on external web-based services would be limiting its flexibility to scale-out, based on the performance the external service can provide. The more independent the nature of the application, the easier it becomes to move it to the Cloud.

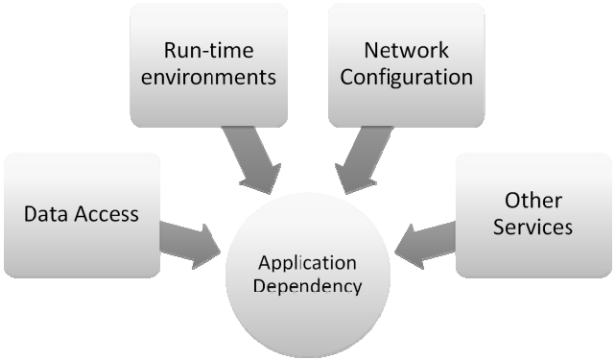

Figure 6: Parameters of application dependencies

Political And Legal Compliance

Every organization has certain internal policies – either dictated by the industry, or the Governments or their own internal diktats.

Requirements related to any of these should be considered early, as they have the potential to affect basic topology, location of data, and communication patterns. For example, for medical records, is the provider certified as HIPPA compliant? Providers also need to be more aware of country laws to address the required legal obligations. For example, Companies operating in Europe are mandated by law to adequately protect private data for any processing done outside of EU. So, providers to any European country need to ensure their QoS addresses these mandates.

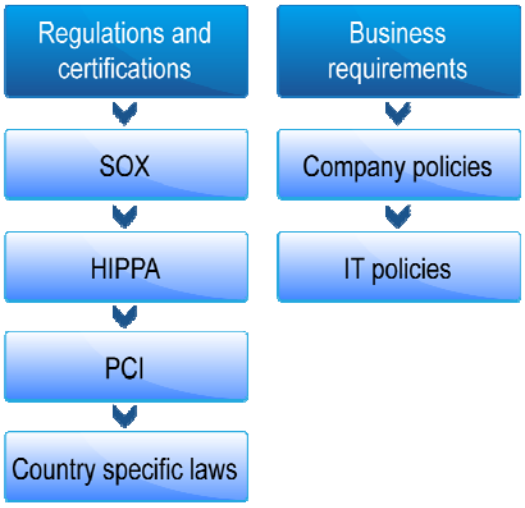

Figure 7: Political and Legal Compliance

Preparing For Cloud Transition

Even as Cloud computing infrastructures are assessed to ensure that they are able to deliver the service levels required for the application; that it keeps data and applications safe; that it meets compliance and governance requirements; enterprises need to put adequate measures in place to ease day-to-day operations and prepare for any accidental eventuality.

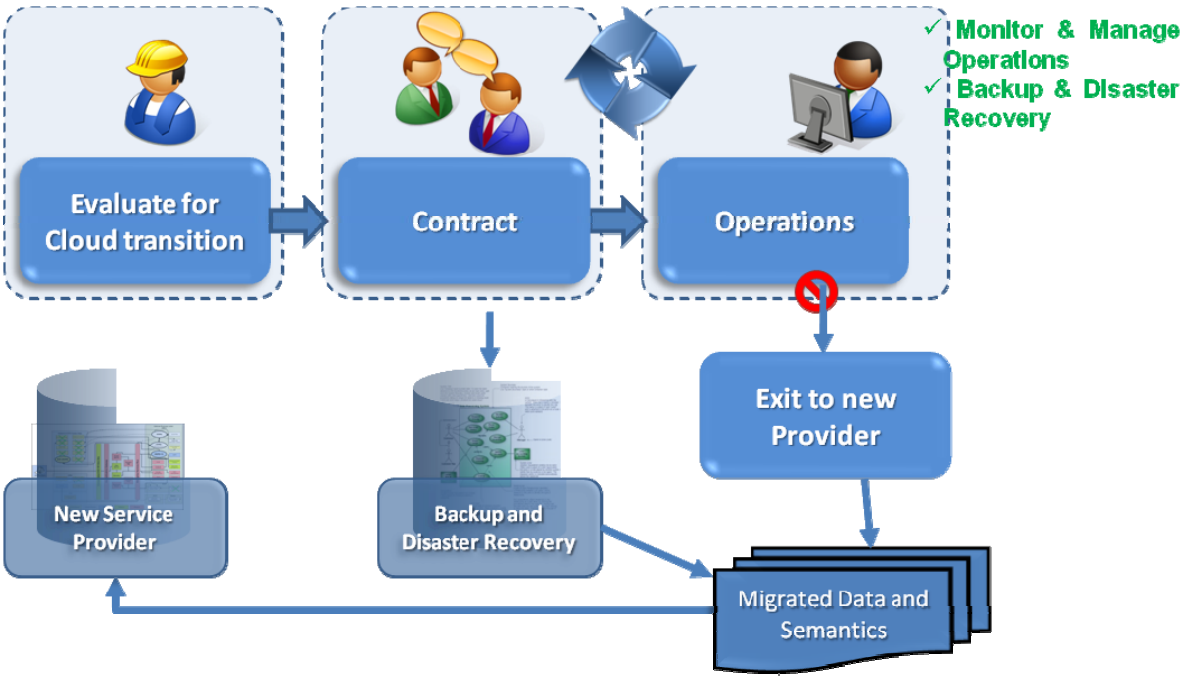

Figure 8 Safeguard operations when moving to Cloud

Monitoring And Management

Operational infrastructures must provide for same or better visibility, and control as they had been using internal resources. As multiple Cloud providers become part of Enterprise Architecture, it would become imperative to have monitor systems for performance across these solutions. While each Cloud vendor may have their own format in which application and service performance is reported, it could become difficult for Operations to manage the environment.

Backup And Disaster recovery

Ensuring business continuity translates to securing business critical data, processes, and minimizing on outages. Outages cannot be predictably controlled, but they can be prepared for by restoring IT infrastructure, data, and operational and business processes using replicated standby resources. Contractual obligations and provider support for backup and disaster recovery should be adequately addressed. "Any offering that does not replicate the data and application infrastructure across multiple sites is vulnerable to a total failure," says Gartner. Ask your provider if it has "the ability to do a complete restoration, and how long it will take."

Exit strategy

Enterprises should not be constrained by the providers' inability to address the dynamics of business needs as they transition to the Cloud. As applications are outsourced to a provider, a forward looking approach should also consider an exit plan. The critical issue would be related to data migration and in some cases application migration.

For data migration, Service Providers should be asked to supply for the data, in a format that is acceptable to the business. As data is moved to the alternate application, the earlier provider should be required to aid in moving this data to ensure that the semantics are not lost, and can be migrated to the replacement application.

Summary - Prioritization Based On Application Suitability

Cloud presents a significant opportunity to enterprises to build efficient applications while preserving the mandates that would have applied to an on-premise application. As applications are ported to the Cloud, certain questions need to be considered. Is the application Cloud-ready? Is the Service Provider addressing all the considerations related to SLA, Security, and Compliance? Would the consumption pattern lead to unmanaged costs?

In many cases, answers will not be a clear Yes or No. The application could be a multi-tier service with a mix of new Cloud-ready code and archaic code with chatty protocols. Some components might have dependency on enterprise resources or third party services or some of the application data may be subject to regulatory or other non-technical considerations.

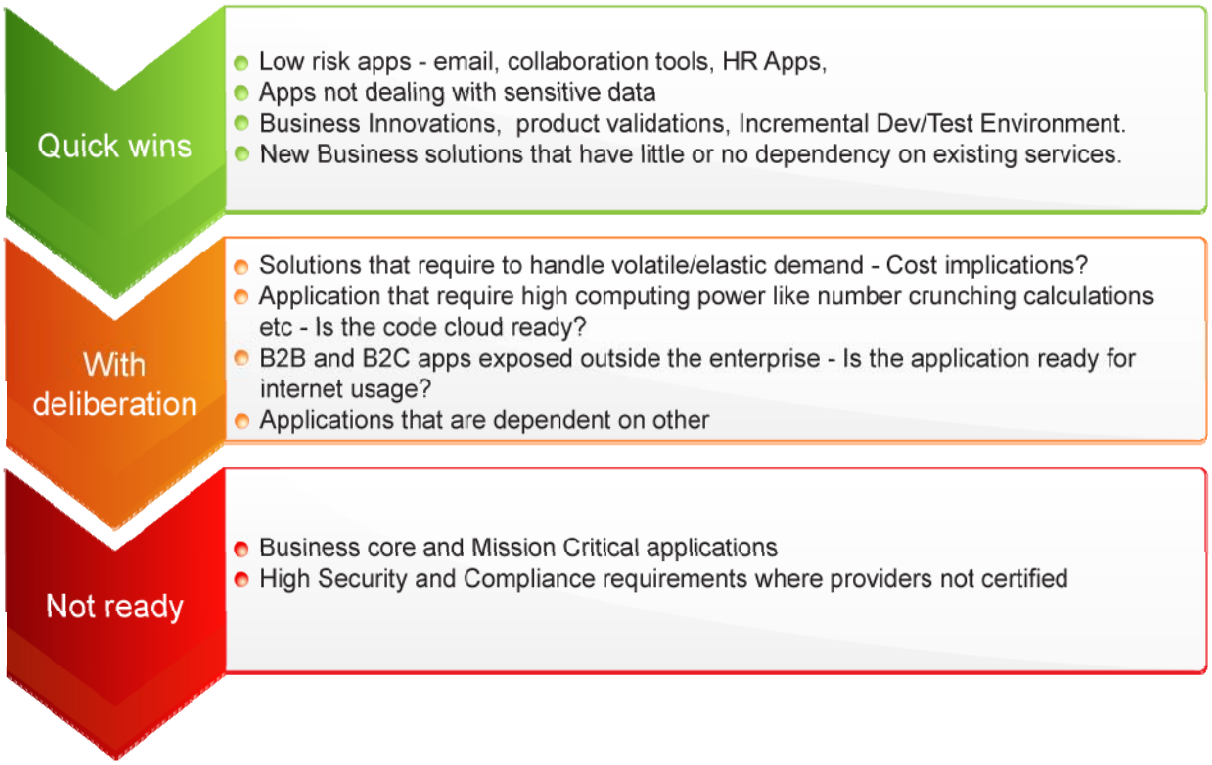

Figure 9 Opportunity for transition to Cloud

Identifying the right opportunity within the enterprise, therefore, for transition to Cloud needs to be prepared after significant considerations to the application. The risk they impose for each of the dimensions needs to be compared to the benefits they can provide.

Figure 9 provides a categorization based on the different dimensions of consideration and their possible impact on the application's transition to the Cloud. Quick wins are applications that can be incorporated in the current IS plan and implemented with ease in the current year. Applications with deliberation are the ones that present moderate risks and should therefore be approached with caution. The Service Providers themselves are at a mature place in this area, and therefore should be able to present good value if contracted well and architected appropriately. For some applications, the Service Providers at present are not at a level of maturity that would favorably be able to prevent the risks the transition would bring about.

Even when applications are moved to the Cloud, the stakeholders need to ensure that the operations are monitored and managed effectively and provide with appropriate disaster recovery options without any challenges of vendor lock-in.

Bottom-line one-size does not fit all; we need to choose a suitable time and right type of application to transition to Cloud.

About UST Global

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About The Authors

Jaya Arvind Krishna is currently a Director for UST Global, advising on UST's Cloud Practices and Center of Excellence (CoE) initiatives. He is also the Chief Architect for building next generation line of products for a key account in UST Global. He has over 17 years of experience selling, advising and building software products, solutions and services. He has worked with senior leadership for middle and large enterprises helping them align their IT systems to achieve business goals. He has architected enterprise solutions for various industries such as Automotive, Financial Services, Insurance, Mortgage, Retail, Business/Legal Publishing and Transportation. His current areas of research are on Mobile Application Frameworks and Cloud Computing.

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