

Climbing the Cloud in Waves

A pragmatic approach for
adopting the cloud for insurance
applications

Cloud computing is the next big technology in IT. For once, IT can look at real, cost-effective options to respond to business with real-time agility.

With the current economic events, most Insurance CIOs are working with their business partners to optimize IT spend. Cloud computing brings with it a promise of IT simplification and TCO reduction. Vendor offerings in this space are growing by the day, but the challenges of adopting cloud are yet to be fully addressed and many are unknown. Deciding on an appropriate path for onboarding their applications portfolio to the cloud poses a big challenge for insurance CIOs.

This paper takes a close look at the insurance value chain and the enabling applications to provide a broad guiding framework for moving these applications onto the cloud in an incremental fashion guided by the maturity of the cloud services. It takes a quick 'dip-stick' view of how the ecosystem influencing cloud computing is likely to be impacted and evolve. In this context, the paper also looks at an analytics-led infrastructure transformation approach that can help insurers achieve this transition reliably. Finally, the paper concludes with an overview of the TCS' offerings in this space and describes how TCS can help insurers in their cloud adoption journey.

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What's in the Cloud?

Cloud computing is the next big wave in information technology. It is not a new set of technologies that organizations have to deal with, but a natural evolution of information technology over the decades. It builds on existing technologies such as the internet, web services, virtualization, and utility computing, to name a few.

The design principles for a cloud-based IT environment are not very different from the traditional ones. The focus continues to be on:

- **Agility:** Ability to provision new hardware and software in a fast and efficient way
- **Elasticity:** Need-based scale-up and scale-down capability
- **Right Sizing:** Optimization of IT footprint based on the business requirements
- **Simplification:** Consolidation of technology stack and applications
- **Sharing:** Optimization of resource usage across user base

Building on these design principles, a variety of cloud services have developed. Figure 1 reflects TCS's insights on cloud computing, based on extensive study of this area. The cloud taxonomy consists of 4 layers, 8 sub-layers, and a variety of areas to address (detailed discussion on the TCS' cloud taxonomy is available in the "TCS and Cloud Computing" white paper available at www.tcs.com).

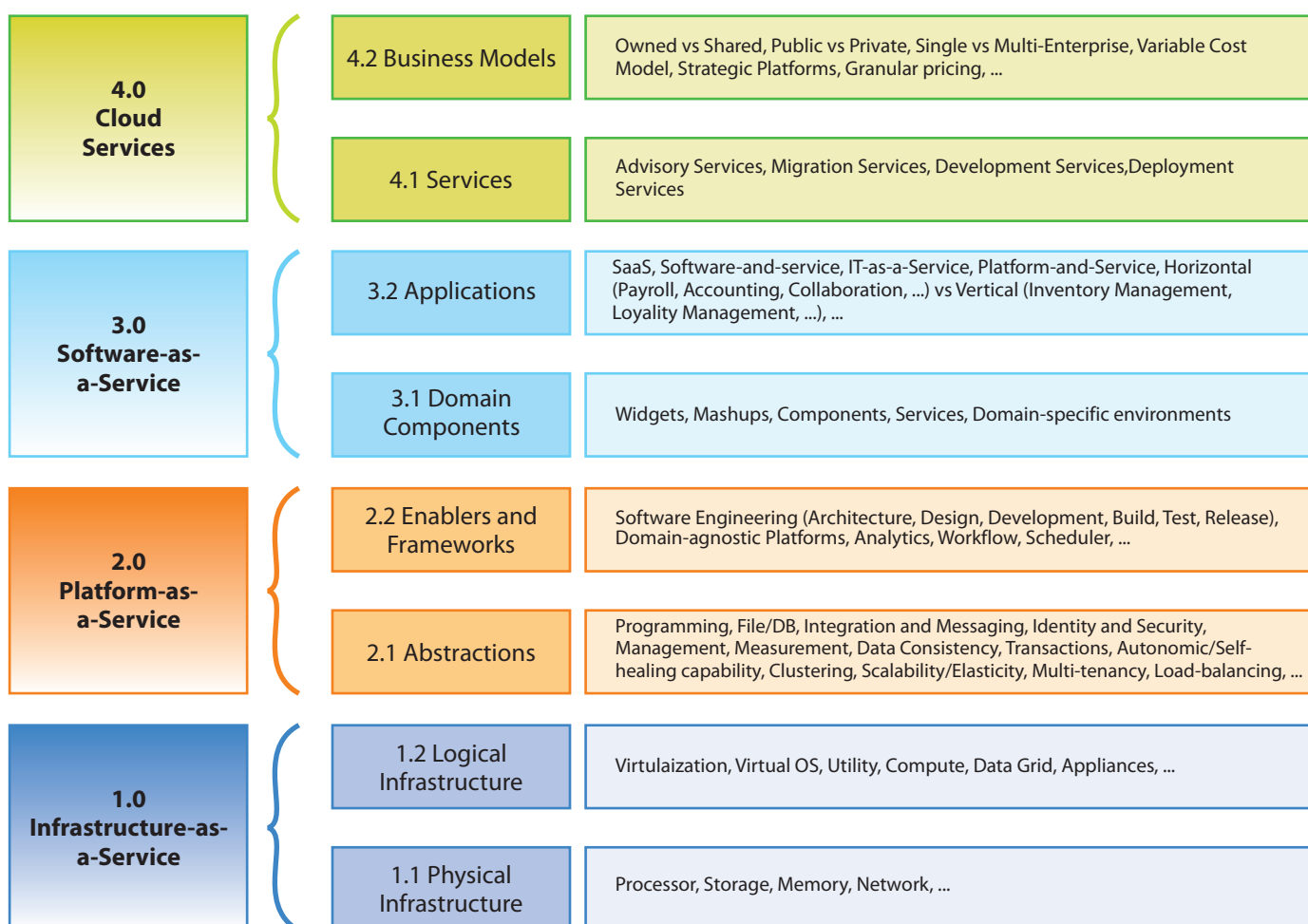


Figure 1: TCS Cloud Taxonomy

The level of standardization that the consumer of a cloud service has to deal with is much lower with the Infrastructure as a Service (IaaS) model than with the higher models. For example, the consumer of Software as a Service (SaaS) has very little control over the business processes and functionality offered, the enabling platform, or the infrastructure on which the service is hosted. But at the same time, the cost advantage of services goes up with the increasing level of the models to the point where the advantage is highest for the cloud services model. The cloud services model provides the unique services needed to truly disrupt business models and bring out the true value of cloud computing to enterprises. In other words, cloud is a true enabler of innovation.

Any or all of these models can be enabled using either public (third party) or private (internal to the organization and/or its IT partner) clouds. However, the practical path that most organizations will end-up adopting over time is a combination of multiple cloud provider services (private and public) – in other words a ‘federated cloud’ providing optimal cost savings and business value.

The Cloud Waves

While the economics of the cloud answers the ‘Why?’ and a plethora of cloud services provides the answer for ‘How?’, the two big questions that remain mostly unanswered are ‘What?’ and ‘When?’.

Riding the Waves

The parameters that will decide what applications may be moved to the cloud and when can be broadly classified into three groups:

- **Maturity of Cloud Computing:** This is a function of robustness, reliability, and cost effectiveness of the services available.
- **Business Criticality:** The business criticality of an application is a function of various factors, such as what business functions are enabled, impact of standardization of the business processes involved on competitive advantage, revenue impact, influence on customer experience, and competitive advantage.
- **Insurers’ Willingness:** The third and most critical piece of the puzzle is the risk that insurers are willing to take to put their systems onto a cloud environment. Based on the combination of the first two factors, insurers are likely to calculate the risk of migration and adopt cloud computing in an incremental manner as shown in Figure 2.

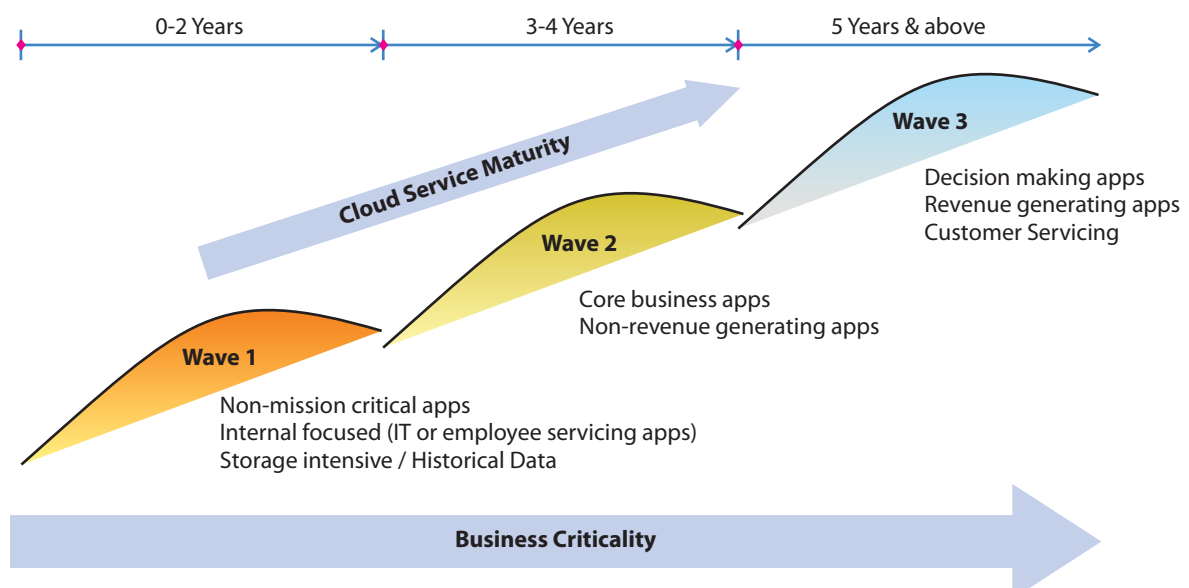


Figure 2: Cloud Computing Waves

The waves indicate the level of maturity of cloud computing and the insurers' willingness to take the risks of migrating to cloud. In other words, because cloud computing is in its early stages, insurers are hesitant to migrate their critical transaction systems. If, for some reason, cloud computing still remains in its current state of maturity over the next three years, the insurers will continue to hesitate and may not move beyond Wave 1. The waves can and will accelerate or decelerate depending on the amount of money vendors have for research and innovation and the breakthroughs they can create.

Having said that, it is worth noting that insurers are already looking at early adoption of cloud computing. Some of the key areas where the industry is seeing traction are:

- Use of SaaS CRM solutions (Salesforce is very common among leading insurers)
- Use of PaaS to set up applications to support functionalities peripheral to core CRM, like case and campaign management
- Migration of high performance computing applications like actuarial calculations onto cloud grid environments
- Storage of historical data that does not have strict compliance requirements
- Setting up testing and/or development environments on shared cloud

The following table provides a high level distribution of application categories across cloud computing waves based on business criticality and risks that insurers are likely to take as cloud computing matures over time.

Application Category	Current Cloud Maturity Level	Wave in which it may Mature	Predicted Adoption Timeframe
<ul style="list-style-type: none"> • Non-mission critical apps • Internal-focused (Apps servicing internal IT or employees) • Storage intensive/historical data 	High	Wave 1	Can begin now and in the next two years
<ul style="list-style-type: none"> • Core business apps • Non-revenue -generating apps 	Maturing	Wave 2	Can begin 3 to 4 years from now depending on the results of Wave 1 and maturity of cloud computing
<ul style="list-style-type: none"> • Decision-making apps • Revenue-generating apps • Customer servicing 	Maturing to Not Available	Wave 3	At least five years out

Insurance – What is Ready and What is Not?

At a very high level, the insurance value chain can be broadly classified into two groups – core and support functions. Using the decision framework discussed above, the applications enabling the business functions of the insurance value chain can be categorized across the cloud adoption waves.

The core functions within the insurance value chain are likely to see the following cloud adoption trends as shown in Figure 3.

Product Development & pricing	Marketing Sales and Distribution	Underwriting	Risk Management	Claims	Customer Service	
▪ Storage	▪ Data for day-to-day operations ▪ Data for campaign management	▪ Policy Admin databases	▪ Database and Infrastructure	▪ Document Management ▪ Claims support systems		Wave 1
▪ Desktop or point solutions to SaaS	▪ Marketing apps to SaaS	▪ Contact Management ▪ Workflow systems		▪ Claims Management system		Wave 2
	▪ Sales & Distribution system	▪ Policy Admin System	▪ Visualization tools		▪ Customer services system	Wave 3

Figure 3: Cloud Adoption along the Insurance Value Chain – Core Functions

Product Development and Pricing

- Storage and historical data for this functional area is a candidate for Wave 1 migration to cloud computing.
- Most of the software utilized today is desktop software or point solutions. These will likely move to SaaS in Wave 2.

Marketing, Sales and Distribution

- Data utilized for day-to-day operations and for campaign management can be moved to cloud computing in Wave 1.
- Most software utilized in marketing will move to SaaS in Wave 2.
- Sales and Distribution Systems, especially those used by captive and independent agents, are likely to be Wave 2 or Wave 3 migrations to cloud. This is primarily because these systems are not robust, are constantly changing, and tend to be created in-house, since they are viewed as differentiators. The vendors of agency systems will begin their migration to SaaS but will do so very slowly.

Underwriting

- The policy databases can be moved to the cloud as part of Wave 1 but will see resistance from many insurers (due to fear of loss of security and loss of control).
- The core policy administration systems are likely to be Wave 3 cloud migration because of their criticality to the business.
- Underwriting systems, which are primarily SQL or Access databases coupled with access to external information sources, are not likely to be moved to the cloud.
- Contact management, email, and workflows (in other words, the CRM aspects of an underwriter's job) will likely be moved to SaaS and can be moved to cloud as part of Wave 2.

Risk Management

- Risk management here refers to identifying new risk opportunities for insurance, monitoring the book of business, and going through industry data and econometrics to arrive at the right price for the right risk. The IT support services, which includes the infrastructure, databases, data management and security, loading and unloading of data, and data cleansing, can all be moved to cloud computing in Wave 1.
- The analytics and models will remain in-house. (The difference between this area and the actuarial services is that risk management looks at the entire book of business.)
- Visualization tools will be critical here and those will move to SaaS most likely in Wave 3.

Claims Management

- Document management systems and all other support systems for claims (e.g. OCR, indexing, and data storage) can be moved to the cloud during Wave 1.
- The claims management systems will be Wave 2 since they are complex and perceive as mission-critical and differentiating. When cloud computing matures, these systems can be migrated. However, there will be reluctance from insurers.

Customer Service

- Customer service systems will move to SaaS. However, because of the focus on customer service, client retention, and service as a differentiator, there will be resistance to move this to cloud computing. This is likely to be in Wave 2 or even Wave 3.

The applications enabling the support functions in the insurance value chain predominantly fall in the non-mission critical category and are going to be part of the Wave 1 migration. The adoption trends for these functions are likely to be as shown in Figure 4.

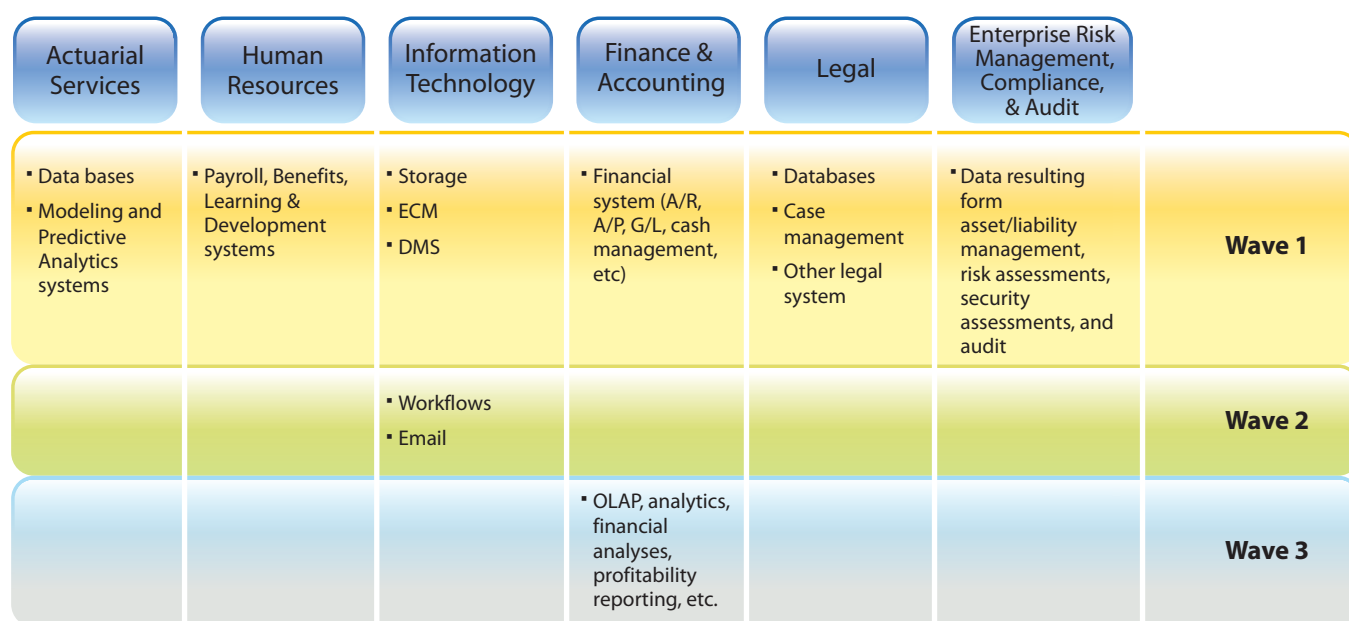


Figure 4: Cloud Adoption along the Insurance Value Chain – Support Functions

Actuarial Services

- Actuarial systems, mathematical tools, and analytics (e.g. using Excel or other desktop packages) are likely to remain in-house and under actuaries' control.
- Databases, modeling systems such as RMS for earthquakes and other perils, and predictive analytics systems are all candidates for Wave 1 migration to cloud computing.

Human Resources

- HR systems for payroll, benefits, and learning & development can be moved to cloud computing in Wave 1.

Information Technology

- Data storage is a good candidate for Wave 1.
- Document management and enterprise content management systems are likely to be part of Wave 1.
- Email and workflow systems are also candidates for Wave 1.

Finance and Accounting

- Financial systems including A/R, A/P, G/L, and cash management can be move to cloud computing in Wave 1.
- OLAP, analytics, financial analyses, profitability reporting and other similar systems are likely to remain close to the finance communities (meaning under their control). They are likely to be migrated in Wave 3 unless the analytics are included in the financial systems (e.g. SAP).

Legal

- Software for case management and other legal functions will more likely adopt an SaaS model as part of Wave 1.
- The databases may also be moved separately to cloud computing in Wave 1.

Enterprise Risk Governance, Security, Audit and Compliance

- The large amount of data resulting from asset/liability management, risk assessments, security assessments, and audit can be moved to cloud computing (Wave 1) but primarily for storage.
- In most firms, there is in-house software used for risk governance, security, audit, and compliance. Asset liability management systems and databases are candidates for Wave 1.

The Impact

The progression of the cloud waves will impact and be impacted by various aspects of how IT is perceived and used today. Some of the key impacted areas will be:

- Service (replacing the concept of Application) Ownership
- Pricing Models
- Product Vendor Offerings
- IT Service Provider Offerings

Service Ownership

The business community is likely to gain a lot of agility by adopting Cloud Computing. However, the decision about what can be moved to cloud and when is going to be largely driven by a business' willingness to take risk. This makes the business owner a bigger stakeholder in the IT services portfolio.

The pay-as-you-go or chargeback pricing models will also put more pressure on business to clearly define when a service will no longer be required by the business. Thus, the business will not only be responsible for making the decision and establishing requirements for introducing a new service or capability, but will also be an equal stakeholder in maintaining and decommissioning (turning off) a service when it is no longer required. This, if taken in the right spirit, can improve business and IT alignment to a great extent.

Last but not the least, the internal IT organizations will also have to adapt to the changing needs. The focus has to be more on how they are managing the services and charge-backs. The IT teams will have to move away from the concept of physical ownership of IT assets to ownership of the Service Level Agreements (SLA). This will be very similar to the model where IT today is responsible for the availability, reliability, quality, and overall impact on business of services like network and telephony, even though it is provided by a third party. This is going to be a big paradigm shift from how IT organizations are operating today with focus shifting to co-ownership between the business, vendor and self.

Pricing Models

The pricing models are likely to evolve as cloud computing matures over the waves. A combination of pressure from insurers for more efficient pricing and initiatives on the part of product and service vendors to remain competitive are likely to lead to very innovative pricing models. Figure 5 shows some of the pricing models that are likely to evolve in the insurance space along with cloud computing waves.

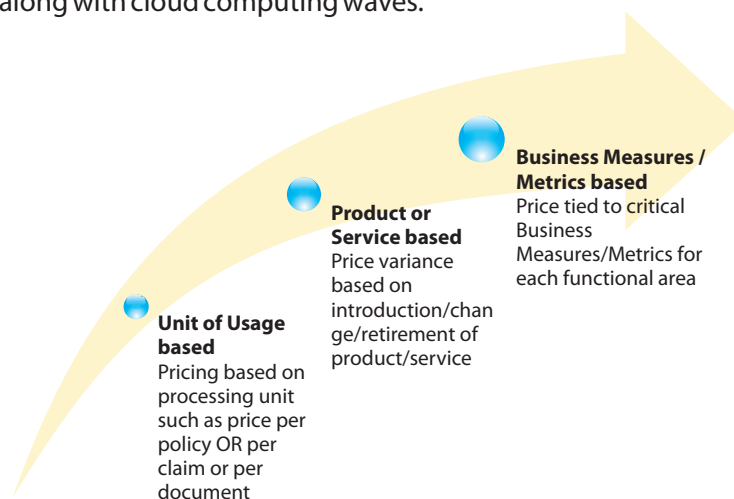


Figure 5: Evolution of Pricing Models

- **Unit of Usage-based:** This model represents the unit-based pricing. It may be tied to number of policies, number of claims, number of documents (Wave 1 migration of document management data), units of data for storage, number of policyholders or customers, (when pricing customer information) and/or policyholder data (for example, number of miles driven per year and where the driver tends to drive).
- **Product or Service-based:** Insurers focus on products and services they are launching, or have in the marketplace, or are retiring. They are likely to gravitate towards pricing where they pay as they grow (on a product or service launch) and get price breaks as they retire products and services.
- **Business Measures/Metrics-based:** As cloud computing matures, insurers are likely to evolve towards this more strategic pricing model. This will involve identification of the key business measures/metrics for each functional area and tying the pricing to these critical metrics. For example, to price SaaS software for marketing, the metric to tie prices to can be hit ratio, number of campaigns, number of marketing collateral created or mailed, number of customers, or number of prospects. For actuarial services, the metrics can be the number of models per peril (earthquake, fire, flood, hurricane, etc.), the number of data loads, number of concurrent models (especially for multi-year trending), number of upgrades, or amount of data storage.

Product Vendor Offerings

In recent times, there has been a lot of focus on 'buy' over 'build' options. Many insurers have started using products across the insurance value chain for both core and support functionalities. Naturally, how the product vendors adopt to cloud computing will have a major impact on the acceleration or deceleration of the cloud waves.

SaaS will be the first logical stepping stone for product vendors to enter the cloud computing space. The current software products are likely to be moved into SaaS model. However, moving to a SaaS model may require multi-tenancy, which requires a radical redesign and hence the product vendors will have to make a significant investment for such design shifts. As it matures, product vendors may even consider offering the Platform as a Service for development of related functionalities by insurers. Salesforce.com is a great example of the SaaS and PaaS model evolution. Vendors that can provide products in this manner will gain business, while those that cannot are likely to be left behind. However, products such as SAP and Oracle's ERP systems have a large client base and it's not clear how and when they will offer SaaS.

Cloud pricing models, as discussed previously, will also have a huge impact on the product vendors. The issues with SaaS is that although pay-as-you-go is advantageous to insurers, the move away from software licenses means loss of upfront revenue for product companies. Software licenses have traditionally funded further R&D for product companies. Pay-as-you-go means a different funding approach to R&D.

Product differentiation will also be a challenge in a world of cloud computing. To maintain context and relevance, it's likely that product companies will tailor more and more of their solutions to specific functional areas in a company and find the balance between providing core functionality that will run as a utility and differentiating features. For example, the Enterprise Marketing Management (EMM) software may provide standard marketing processes and campaign management, but have features tailored to a specific line of business and specific marketing function or information for differentiation. One such differentiator can be offering a marketing feature where marketing analytics is automatically applied to marketing data obtained via a campaign.

IT Service Provider Offerings

IT service providers are an integral part of almost all insurers' IT organizations. These service providers will also have to change and adapt to the new rules of the game. They will have to focus on delivering business solutions (base and customized) leveraging SaaS, PaaS, and IaaS. The other key focus area will be enabling the operations layer using these cloud computing techniques. This ability to provide a managed services model to plan, architect, migrate, and maintain solutions on a cloud computing environment will be a key differentiator.

Putting it in Action

Insurers will have to define a holistic transformation roadmap taking the business view of the cloud computing waves and their expected impacts. The planning should be done at the enterprise level, keeping in mind the predicted maturity across all the waves and then detailed for the current wave. The detailing can be done at individual division or line of business (LoB) but must keep the holistic picture in mind. Some of the key inputs for this planning exercise are detailed understanding of the current application landscape, constraints, target state requirements, investment requirements, and ROI calculations. The plan, once put into execution, should be monitored for early warnings and the lessons learnt from one implementation should be used to optimize the plan to achieve continuous improvement.

Planning for the Pitfalls

Some of the common pitfalls of an IT transformation program are:

- **Lack of understanding of the current landscape:** It is often manual and/or intuition-based rather than fact-based. Detailed analysis of the current constraints such as suitability of the application architecture, integration and data dependencies, and data confidentiality and availability requirements are not understood completely while defining the transformation roadmap.
- **Lack of planning for changes required:** The first pitfall often leads to the next. Stemming from the lack of understanding of the current state, one fails to understand what changes are required to the applications to migrate successfully to the new environment. Cloud services will have specific standards that the current application will have to comply with and hence changes may be required. A detailed analysis is required to identify whether the whole or part of the application will move to cloud and how the resource provisioning for the same has to happen in the cloud.

- **Siloed approach to infrastructure optimization:** Cloud computing is all about economy of scale. This in itself necessitates that the organizations derive a holistic plan. As the organizations design their 'federated cloud-based' IT landscape, it is important to understand the interoperability issues, vendor lock-in, and data security and exchange requirements at the enterprise level and not just at individual division or LoB level. Taking a siloed approach leads to implementation surprises and often results in point solutions. This in turn impacts the overall ROI projections.

Analytics-led Transformation

The realization of the transformation roadmap is a multi-year program involving considerable investment of time, effort, and dollars from both business and IT. Hence it is absolutely important to have transparency and predictability built into the execution plan. A structured approach will help keep the program on track and flag any potential pitfalls upfront so that course correction can be done at the right time.

At TCS, we address this using analytics. To achieve this, TCS has developed iTransform, a tool for largely automating the process of deriving infrastructure transformation strategy (e.g., the federated virtual private cloud strategy) and providing advice on how cloud computing fits in with the overall infrastructure strategy. Currently, iTransform supports three infrastructure transformation strategies: (1) server virtualization and consolidation; (2) storage optimization (through storage virtualization, thin provisioning, tiering, and information lifecycle management); and (3) software stack consolidation. We are in the process of enhancing this tool to incorporate 'migration to a federated virtual private cloud' as an infrastructure optimization strategy.

The iTransform tool has been utilized to derive and execute large-scale infrastructure transformation activities for several large clients. The framework enables:

- Fact-based current state analysis by relying on data rather than intuition
- Transparency into the current constraints
- Predictability of the changes required, potential challenges, and results through what-if analysis of options
- Holistic transformation business case derivation, planning, execution, and monitoring at an enterprise level

TCS' Cloud Offerings

Selecting the right partner will be a critical decision for insurers to ride the cloud waves successfully. Delivering a credible set of cloud computing offerings to enterprises requires collaborative innovation across multiple players such as public cloud providers, software and service providers, product vendors, and application vendors.

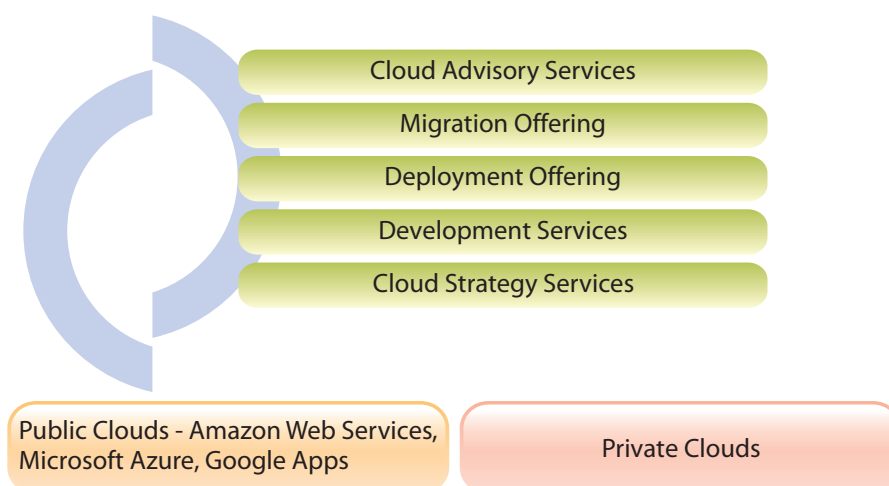


Figure 6: TCS Cloud Offerings

TCS believes that it is uniquely positioned to play a major role in cloud computing with its Co-Innovation Network (TCS COIN™), built on a strong internal foundation of TCS Innovation Labs, anchor clients, and strong strategic alliances with a range of innovative companies and academia. The TCS Cloud Computing Initiative has built a credible set of offerings across advisory, implementation, and support functions as shown in Figure 6 (detailed discussion on service offerings is available in the “TCS’ Service Offerings in Cloud Computing” white paper available at www.tcs.com). This holistic portfolio of TCS’ cloud services provides insurers the ability to select a partner whom they can partner with effectively in riding the cloud waves.

Conclusion

Cloud Computing is a reality and here to stay, but it is still in an early stage. Insurers will have to closely review the questions of ‘What?’, ‘When?’ and ‘Why?’ while defining their cloud adoption strategy. The cloud waves discussed in this paper coupled with a strong analytics-based transformation approach provides a structured approach to answer these questions. It is worth noting that the waves indicate the level of maturity of cloud computing and the insurers’ willingness to take the risks and migrate to cloud. Hence, it can and will accelerate or decelerate depending on the co-evolution and innovation in this space brought in by the ecosystem of insurers, product vendors, infrastructure providers, service integrators, and academia. TCS, along with its COIN™ partners, has developed a set of credible offerings across advisory, implementation, and support functions to enable its customers ride the cloud waves.

Acknowledgement

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Cloud Vocabulary

Term	Brief Description
Cloud	TCS defines cloud as a set of IT infrastructure optimization techniques rolled into one and offered as a shared service to its customers. A cloud computing model is generally characterised by: <ul style="list-style-type: none"> • A true on-demand computing paradigm • Decoupling of application design and development from deployment • Automated system deployment and scaling • A pay-per-use pricing model • Flexible access models
Federated Cloud	A federated cloud design leverages multiple cloud implementations – including both multiple public cloud provider services and an internal private cloud service. It is also referred to as hybrid cloud.
Grid Computing	Grid computing is an infrastructure design that harnesses distributed computing resources for resource-demanding applications such as High Performance Computing (HPC) systems.

Term	Brief Description
IaaS	Infrastructure as a Service providers offer computational resources such as servers, network, and storage from a shared facility managed by the provider to cloud users on an on-demand basis. (Example: Amazon Web Services)
PaaS	Platform as a Service providers offer development platforms to cloud users for application development that is deployed on the underlying elastic infrastructure provided with the platform. (Examples: Microsoft Azure, Google AppEngine, Force.com)
Private Cloud	A private cloud is created and operated by an organization to support its own infrastructure design. It is shared across business units, hosting applications within the enterprise, but not for anyone outside the enterprise.
Public Cloud	A public cloud service is provided by a cloud service provider to a cloud user as an infrastructure, platform, or software service on an on-demand and pay-as-you-go model. It is owned, operated, and maintained by the cloud provider.
SaaS	Software as a Service providers offer specific application services delivered over the internet on some form of on-demand payment system. (Example: Salesforce.com)
Security	Security is a critical component of cloud computing. It is not just about the physical security, but also availability of right audit information, regulatory and other legal compliances, capabilities for monitoring, analysis and improvement in prevention and response to vulnerability threats and incidents. Both cloud users and providers will have to focus on providing the appropriate level of security based on the sensitivity of the application and/or data.
Service Management	Service management in the cloud computing context brings together various aspects of monitoring and management such as application, system, storage, infrastructure and network management, SOA run time governance, VM management, and vendor SLA management.
Service Oriented Architecture	TCS defines SOA not just as an architecture or technology solution but as an enterprise-scale business transformation program that enables a paradigm shift of an organization's IT landscape from vertical silos of applications, systems, and platforms to a virtually integrated infrastructure that shall provide an adaptive business network to dynamically link together business services and processes so as to address emerging business models. SOA thus lays foundation for designing and realizing a federated cloud.
Storage Tiering/ Virtualization	This refers to the abstraction of the logical storage from physical storage, thereby eliminating the dependency of the applications on the actual physical location of the data (SAN/ NAS/ Tape/ ...). Tiering is applied to segregate the data based on various parameters (such as frequency of usage or performance requirement) across various physical layers. The cost of storage is inversely proportional to the real-time proximity of the data.
Utility Computing	Utility computing is a model to dynamically provision shared resources for different applications and apply chargeback using a metering concept similar to traditional public utility services such as electricity, water, and gas.

Term	Brief Description
Virtualization	Virtualization in the context of cloud refers to the abstraction of computing resources such as machines, memory, storage, network and even desktops. A Virtual Machine (VM) enables the separation of the operating system from the underlying platform resources, thus enabling the hosting of multiple virtual servers on a single physical server. Virtualization is the one of the most important and essential steps in the realization of cloud computing. It allows for design of applications to share computing resources in a virtualized and federated environment. The most prominent players in this field are VMWare, Microsoft, and Citrix (XenSource).

References

1. Wikipedia, http://en.wikipedia.org/wiki/Cloud_computing
2. Security Guidance for Critical Areas of Focus in Cloud Computing, Cloud Security Alliance, April 2009
3. Gartner Hype Cycle for Emerging Technologies 2009: What's Peaking, What's Troughing?, July 27, 2009
4. Hype Cycle for Cloud Computing, 2009, Gartner Report, July 16, 2009
5. 10 Virtualization Vendors to Watch in 2009, January 29, 2009 – www.cio.com
6. TCS and Cloud Computing – TCS White Paper (www.tcs.com)
7. TCS' Service Offerings in Cloud Computing – TCS White Paper (www.tcs.com)
8. Service Oriented Architecture – An Enterprise Perspective – TCS White Paper (www.tcs.com)

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