Interview with Douglas J. King on "The Impact of Virtualization and Cloud Computing on IT Service Management"

Douglas King is an IBM Vice President and Transition & Transformation Executive in IBM's Global Technology Services. He has over 25 years experience in the business transformation & information technology services business with demonstrated success in leading large scale projects involving multi-country, cross functional teams in a highly matrixed global organization. Mr. King joined the IT Delivery organization in March 2010 in a newly created role to manage a portfolio of complex, global Transition and Transformation projects for Europe based clients. Mr. King assumed his prior position as the Vice President, Enterprise IT Optimization Programs Implementation in July 2009. As a member of the IBM CIO leadership team, Doug was responsible for implementation of server virtualization, data center consolidation, service catalog offerings and application/server inventory programs worldwide.

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BISE: Virtualization and Data Center consolidation are major concerns in CIO's minds gaining importance with the increasing pressures to cut costs. Are the perceived benefits of virtualization a hype or reality?

King: Data center consolidation is indeed a significant opportunity to reduce costs and gain operational efficiencies. Various factors come into play. First, data centers are bursting both with respect to actual floor space available to place new servers as well as power consumption. Increasing demand for resources has led to the onboarding of more and more dedicated physical machines to meet the needs of the enterprise. However, dedicated resources are notoriously underutilized. For example, today's CIO's cannot afford to maintain expensive mid-range servers to run at an industry average of 14% utilization, where the same server could easily handle 60–80% utilization of CPU, at peak times. Second, power consumption has become a real issue. High power consumption is not only an ecological hazard; it is also becoming more costly due to rising energy costs worldwide. Third, over time IT ecosystems have developed into increasingly complex environments due to the large variability of systems. Dedicated application hosting environments are hard to standardize and hence drive up operational costs. High variability in operating systems and middleware deployments invariably drive up operational costs. Virtualization is not by itself solving this problem, but the transformation into virtualized environments allows a reset of deployment strategies with the ultimate goal of enforcing a coherent deployment strategy that will lead to higher standardization. All of these factors together provide the basis for CIO's around the globe to consolidate and virtualization as an enabler provides a significant business

opportunity to address all of these three issues. For example, in my organization we've addressed these issues in an initiative known as Big Green, where we migrated a large segment of our workload from mid-range servers to more powerful, virtualized systems. The effort was driven by an underlying business case that demonstrated the viability of consolidation due to the savings that were achieved by migrating workload to a fully virtualized platform and decommissioning older server models. The transformation efforts allowed us to re-architect our hosting strategy as well as put stricter enforcement on software levels to prevent version sprawl across the application portfolio.

However, virtualization is a transformational effort, hence it needs to be viewed as a major strategic investment due to the associated costs, benefits and risks. Independent of whether one decides to consolidate on the same platform or across platforms, consolidating an IT environment, especially one that is highly complex, touches every facet of an enterprise, from business application owners, who typically are accountable for service at large, to IT service delivery teams that are responsible for maintaining and running the application and infrastructure. The risks and costs associated with transformation are often an impediment that needs to be addressed at the business level. Hence, the technical side of consolidation, even though at times technically complex especially in cross-platform consolidation, and the perceived benefits are only one side of the problem. Virtualization as a transformational agenda can affect an organization at its core and therefore needs to be planned out with great care and strong organizational consensus.

BISE: Virtualized environments are coming with their own challenges from a steady state management perspective. Are we seeing virtualization helping to reduce the complexity of IT service management or is it adding new complexity in large scale environments?

King: Virtualization is adding complexity for IT service management, as it is a new paradigm from a management point of view. But as I mentioned before, the strategy to manage the virtual environment is an aspect that needs to be central to the overall transformation agenda. This requires that the planning for both the right processes as well as the right people needs to be done ahead of time with the organizations accountable for the management of the virtual environment.

Virtualization has the potential to reduce the complexity of IT service management by introducing more commonality and automation into management processes. Many service management processes from provisioning of new builds to problem resolution due to over utilization at run-time can be addressed by automation and newer techniques such as image mobility (the ability to move a virtual image from one physical machine to another without requiring downtime). This is not to say that the management paradigms for virtualized environments will radically change. For example, we will still require security, compliance, release, problem, incident, change management in virtualized environment in the same way we need them in physical environments. But consolidation into a virtual environment is an investment into the future. And with new technologies such as image management I do believe that the future of operational cost reduction will heavily benefit from virtual platforms.

BISE: With infrastructure-as-a-service or platform-as-a-service providers, new business models and new players appeared on the market. When we look at the IT outsourcing industry what role is cloud computing going to play in the future?

King: Cloud computing has indeed captured the imagination of the entire IT industry and is here to stay. Hence, both from a technical and business perspective IT outsourcing providers will need to create new offerings that provide clients with benefits arising from a utility based model. There will be different entry points for clients. In some cases clients are looking at low entry point offerings that provide mostly capacity versus high entry point offerings that require a Cloud to provide the high levels of support as well as guarantees regarding compliance posture. It is important to understand what today's enterprises want from IT outsourcing. The traditional view of IT outsourcing has been about reducing costs and freeing up capital and resources at the client side thus enabling the enterprise to focus on their core strategic mission. For example, a telecom provider should care more about driving sales rather than managing complex IT infrastructures. Today's role of an IT outsourcing provider is to provide higher value to clients, i.e. how to best leverage their IT environment to most effectively help clients meet their strategic goals. We want to enable clients to bring new products and services to the market quicker to ensure competitiveness. This is our role as IT outsourcing providers. Cloud computing as a technology is one aspect but by itself is not going to provide higher value. We need to deliver industry specific solutions that leverage the cloud as a capability. The inherent standardization will allow us to deliver more cost-effectively and deploy new services more rapidly. The future of outsourcing will need to focus on both aspects: cost effective, high quality delivery and at the same time new strategies to deliver higher value to the client. I believe Cloud computing is a key enabling capability.

BISE: One of the big challenges for both the IT outsourcing provider as well as the client is the ability to seamlessly transition into the new model. A question in two parts: Where do you see the biggest area for innovation and second, how do you see cloud computing making a difference in transition?

King: Transition is clearly a significant challenge at many levels. Conceptually speaking, the requirement is fairly straightforward. The provider needs to know all the details about the client environment that is contractually part of the outsourcing deal. The client should provide the information, the provider will then take over the environment, ideally applying its own standardized processes to manage the environment. The challenges however start at the beginning. The client may not necessarily have all the details about the environment, and hence the provider may underestimate the complexity of the environment, which in turn will lead to challenges on transition. Secondly, the environment needs to be (physically or logically) transitioned into the service management eco-system of the provider. For example, at IBM we consider this second phase as transformational, hence we speak of Transition & Transformation. Transformation is crucial to standardize the delivery of operational management services yet bears its own challenges and needs to be tightly planned and managed. There are several areas for innovation. For example, knowing what the client has not just at the inventory level but also at the dependency level can prevent surprises early

on. Think of a typical distributed application hosted on three servers. The asset inventory may list each server separately, but may not have information about the linkages between the servers. Discovery mechanisms that help you to detect these dependencies can prevent you from e.g. virtualizing one machine without remediating the linkages that could have been affected due to changes in IP or hostnames. Secondly, enabling more automated management processes on the provider side will allow transition into a standardized environment. This sounds easier than it is due to the high variability we typically encounter.

Cloud computing needs to be exactly this: a capability that enables automated processes out of the box.

BISE: IT service management is about streamlining operations to strive towards higher quality of service. How deep is the adoption of industry best practices and frameworks such as ITIL and has it delivered value?

King: I cannot speak for the industry at large. At IBM we believe in the value of ITIL and in fact have trained and certified many practitioners on ITIL. Standardization is key in our services business and ITIL is an important component. IBM is a large global enterprise with service delivery centers in all geographic regions. Standardizing on the processes ensures that we can move workload around to ensure optimal utilization of our workforce and at the same time the best possible turn around time for our customers. Service mobility however is not possible without ensuring that a service delivery team in India follows the same process as a service delivery team in Europe. ITIL as a collection of best practices for service management processes is definitely an integral part of ensuring this kind of flexibility.

BISE: New technologies such as server virtualization are based on many years of research. Which new research challenges do you see in the area of virtualization and cloud computing? Which role can research play to help make IT service operations more efficient?

King: The big challenges in the area of virtualization and cloud computing are not necessarily in the technology areas. Even though there are always areas to improve, virtualization is an industrial strength technology. The challenges are in the processes around virtualization. For example, we can virtualize a single server using off-the-shelf tools. But if we virtualize without thinking about standardization we've simply transformed an existing environment into the same environment from an operational steady state perspective. However, if we could consolidate from the OS level upwards to standardize and significantly reduce variability we can consolidate operational processes and reduce operational management costs. This is a hard technical problem and in fact if we throw complex distributed applications into the mix, it gets even harder as we may need to remediate applications. By the same token, we need to understand how we devise new processes and automation technologies to manage virtualized environments radically different.

I believe research is needed to understand how to best identify cloud suitable workload and how to transition workload onto the cloud. This is more a process issue but even automated analysis of a given application to test for cloud suitability is a hard technical problem.

BISE: Which specific skill sets do you expect from university graduates who want to focus on IT service management in their professional career?

King: This is an important question. Clearly, the IT business requires people who know how to go deep. Learning a technical competency is crucial to success in a technical career. However, another aspect that I believe needs to be strengthened in the current university curriculum is process-centric thinking. Today's IT environments are amongst the most complex systems known to mankind. Dealing with these environments requires the ability to devise strategies that take an end-to-end perspective, from a business perspective to a business strategy as well as understanding how processes can be applied to manage the environment within the scope of a business case. IT service management is all about combining a strong business case with process centric thinking. Today's world is about large-scale complex systems and a single technology is not necessarily going to help a business to be more competitive. It is the combination of technologies, automation and service management processes that will make a difference. The aspect of IT service management as an academic discipline is currently underrepresented and it is important to develop this theme into the computer science and information systems engineering curriculum.

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