Dealing with Cloud-Driven Enterprise Complexity

According to an International Data Corporation (IDC) report, the total worldwide revenue for all cloud computing by the year 2021 should more than double the numbers seen in 2016. This gives a clear picture of the robust success of the cloud computing industry at large. More specifically, 2021 revenues are predicted to reach a startling $554 billion (https://cloudtweaks.com/2017/12/cloud-computing-predicted-drive-554-billion-2021).

The patterns of adoption within enterprises are all over the place. While private clouds were all that back in 2013, we then focused more on public clouds, and now multicloud. These changing trends have not only provided much confusion within enterprise IT as to what is the ultimate goal around the use of cloud, but they have driven much complexity into the enterprises as well.

The complexity thus far has been manageable. However, if the IDC report is correct and the market will be $554 billion by 2021, then enterprise IT complexity is likely to reach a level never before seen, with IT professionals ill prepared to deal with it. This could be a new crisis that enterprises do not see coming. Unless new approaches and new technologies are leveraged, unmanageable complexity could hinder any value coming from the use of public cloud computing.

The never-ending stream of cloud computing market reports are each more aggressive than the last, but there are a few key issues that I see in the market today:

1. **Most enterprise adoption takes place around an existing business problem, with a clear business case.** Enterprises do not adopt cloud computing because it’s trendy; they need to solve real problems right out of the gate. Today, these are largely tactical, but will be strategic as cloud technology becomes more pervasive.

2. **Most enterprise adoption involves existing application migration rather than new application development.** Most enterprises that migrate applications try to do so as quickly as possible, and do not focus on “refactoring” applications to make more efficient use of native cloud services. Typically, little thought is given to what platforms are right to leverage on public clouds, they only seek platform analogs.

3. **Most enterprise adoption occurs around existing technology partners.** This includes colocation providers and managed service providers, as well as brand name enterprise technologies from companies such as IBM, Oracle, and VMware. New public cloud brands, such as Microsoft, Google, and AWS, are in there as well, of course.
deed, when enterprises talk to me about their cloud needs, they typically have a laundry list of companies they have already selected as part of their path to the cloud. It’s very difficult to get them to think outside those boxes.

4. **Security and governance continue to be afterthoughts.** This, despite the fact that security is consistently listed as the number one priority for enterprises as they move to the cloud. Most rely on technology instead of planning to meet their security needs. However, most security solutions are ineffective unless implemented with a great deal of planning.

5. **Cost is not as much of a concern as we originally thought.** While most enterprises will claim to move to cloud computing for cost efficiency reasons, the reality is that most are moving due to shifts in budget. Leadership is getting tired of paying for data center upgrades and expansions each year and have set deadlines for IT to find other locations to support core IT systems. Thus, enterprise IT turned to colocation providers, managed services providers, and public clouds as the path out of owning their own data centers. Costs are rarely considered; more consideration is usually given to speed and not failing.

The resulting solutions are clouds mixed with traditional systems, mixed with other outsourcing options (e.g., colocation providers and managed services providers). This means enterprise IT must also deal with the resulting rise in complexity that will increase by 25 percent for the next five years.

Complexity is already an issue within respective businesses (50% of them, from my experience), and the additional use of public cloud-based services only makes things more complex. However, most in enterprise IT feel compelled to give cloud computing a try, with the full understanding that their IT environments are going to be more complex to build and manage. Some, however, balk at cloud adoption due to the complexity that it will bring, or has initially brought.

The enterprise architect in me would suggest that the best solution for enterprises that are already hindered by architectural complexity without the presence of cloud computing is to get their respective “acts together” before they adopt cloud computing. However, the world does not work that way. In reality, most enterprises would have to do a ton of work over many years to be perfectly ready to move to cloud-based platforms.

The root issue is the ability to manage complexity, including the addition of applications (new and old) that will run on public cloud platforms. The trick is to think in terms of replacement, not additions. Applications that exist on traditional platforms (such as LAMP in the enterprise data center) should be moved in bulk to surrogates in the cloud. Then, after some acceptance testing, those platforms should be decommissioned with extreme prejudice.

At issue is the fact that these platforms can’t be shut down without all workloads being migrated off those platforms, which is almost never the case. Thus, legacy systems continue on within colocation providers or enterprises data centers until all workloads have been re-hosted. Of course, you would say that you’re still dealing with fewer physical servers if you have fewer workloads. While that’s correct, you still have to maintain skills to keep those platforms, as well as deal with the continued complexity. This will be the case no matter if you have one or one hundred platforms that remain.

Mistakes that many enterprises make involve moving a few applications to the cloud, which creates the need to maintain applications that run on AWS or Google, while still staring at the same hardware in the data center. Nothing changes, other than that things get more complex. At issue is always those one or two applications that are not migrated. Any cost savings made through the use of public cloud-based resources gets gobbled up by the cost and complexity of maintaining a new platform. However, this new platform happens to be within a public cloud service.

Here are a few do’s and don’ts for enterprises that balk at the use of cloud computing due to the complexity it may/will bring:

- **Do enterprise architecture and overall IT planning.** Yes, that means some advanced planning, in terms of what applications and data will run where, and why. Cloud-based platforms, at the end of the day, are nothing more than additional systems you must
manage. The fewer you need to manage, the simpler the architecture, and the more likely you are to succeed longer term. These approaches and disciplines are already well defined and well known.

- **Don't push things to cloud just for the sake of pushing them to cloud.** Applications should have clearly defined benefits when they run on cloud-based platforms, with the objective of migration to decommission existing platforms so architectural complexity is actually reduced, or, at least stays about the same.

- **Do consider automation.** While cloud management platforms and service governance tools clearly add value, most enterprises don’t consider them early enough in the process of moving to cloud computing. They should be systemic to the architecture and actually reduce complexity by abstracting those managed clouds away from the complexity using the “single pane of glass” approach to architecture.

- **Don’t stop measuring.** Keep metrics in mind as you move to the use of cloud computing, including the ability to determine and measure cost efficiencies and overall IT efficiencies. Be prepared to get some disappointing numbers at first, and adjust the process, technology, and the architecture as needed.

The existing complexity within enterprises clearly hinders movement to cloud-based platforms. However, this movement also presents an opportunity to get this complexity under control, along with leveraging cloud computing. While many enterprises don’t find this an easy path to follow, it is an opportunity to combine both the value of cloud and the value of creating and deploying more effective IT environments. But, it’s going to take time, money, and a bunch of courage.

The likely path is that enterprises will understand that complexity is a problem that needs to be addressed and begin gravitating to approaches, methodologies, and technology to make this issue easier to deal with. At its heart, the problem is a lack of thinking that goes into the use of new technology, cloud-based and otherwise. If there is not forethought as to the role and configuration of this technology, complexity is the likely end-state.

That said, perhaps we’re more prepared to deal with the issues of complexity now than at any time in the last 30 years of IT growth. Today’s cloud management platforms and cloud service brokers are examples of tactical tools that can be employed, as well as better governance and security technology.

While this technology won’t remove all of the complexity, the use of automation is a key to solving the problem. However, it’s just a tactical solution as of now. If enterprises don’t understand the right use cases, they could actually make things even more complex.

So, what should enterprises be doing right now? It’s important to understand that this wave is coming to some degree within your enterprise. If you’re prepared for it, complexity will still be a challenge but you’ll likely overcome the issues. However, I feel that most enterprises won’t be prepared. Those businesses could be crushed under the weight of their own complexity.

**ABOUT THE AUTHOR**

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