

Why Do Dinosaurs Rush to Embrace the Cloud?

Hakan Jakobsson
hakan@hakan-jakobsson.com

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Introduction

In the late 1990s, the Internet was all the rage. In 1998, Apple came out with a new product, the iMac. The “i” part of the name was the idea of Ken Segall of Apple’s ad agency TBWA and stood for “Internet.” The letter “i” caught on in Apple’s branding efforts as evident by subsequent products like iTunes, iPods, iPads, and iPhones, etc. But Apple was far from alone in trying to associate its products with what was the hottest new technology concept of the era. Oracle used to name its database software releases in a logical fashion. For instance, version 7.0 was followed by 7.1, 7.2, 7.3, and 8.0. But then, as the Internet fever hit, the next release was branded *8i*, with the “i” referring to the Internet. That release was followed by *9i*, *10g*, and *11g* with “g” standing for grid computing. Moving forward to an era where “cloud” is the buzzword *de jour*, it should come as no surprise that the subsequent release was *12c*.

But as incumbent IT vendors try to associate themselves with the cloud and cloudwash as much revenue as possible, one has to ask oneself whether the cloud should really be a source for enthusiasm on part of those incumbents. Perhaps embracing the cloud is just a matter of putting on a brave face in a dire situation and selling customers on the idea that the vendor will be relevant in the future. Perhaps the story will be similar to that of Wang Laboratories, which at its peak had over 33,000 employees. When Wang found its traditional business disrupted by the PC revolution back in the 1980s, it started making PCs thereby embracing the phenomenon that threatened its existence. It didn’t help much and Wang filed for bankruptcy in 1992.

On the surface, however, everyone (or at least the somewhat naïve) seems to think that cloud computing will be a boon to them. CIOs hope that cloud computing will reduce costs. The vendors that provide those CIOs with hardware and software all hope that the cloud will be an opportunity to increase their revenue streams. Hope springs eternal. So what gives? The only clear winner in the cloud wars so far is AWS. Amazon is not cannibalizing any existing revenue with its cloud so every new dollar for AWS is a brand new dollar for Amazon. AWS is growing revenue at a rate that’s around 50-100 percent a year, which is definitely more than IT budgets are

growing so someone else in the cloud equation has to lose. Who? It's a basic axiom that for incumbents, it's no fun being disrupted. Some may adjust better than others and may adhere to the idea of disrupting themselves before being disrupted by others. But the basic observation stands, if you are an incumbent humming along and making nice profits, being disrupted by a technological sea change is probably not a whole lot more fun than getting a root canal.

Legacy basics

For startups and "shadow IT," using the cloud is a no-brainer. But what about legacy IT? It's important to understand that for anything that's even remotely mission critical, traditional IT organizations tend to be extremely risk averse – and for good reasons. Screw up an upgrade to a new point release of an Oracle database by not doing enough testing and the VP in charge might be forced to retire after a couple of months of missed SLAs. It has happened. So traditional IT tends to adhere to the old adage "if it ain't broke, don't fix it." That has significant implications for the move to the cloud. Since there are significant risks in moving existing systems to the cloud, there would have to be significant rewards associated with doing so. So where would the rewards come from? Presumably from effects that, in the end, would somehow translate into cost reductions.

Cloud basics

Most of the disruptive aspects of cloud computing have some relationship to economies of scale. Examples would include:

1. **Hardware cost.** Companies with large clouds like AWS, Facebook, and Google have their own hardware manufactured to exact specifications on a massive scale to a low cost. If you build a data center with 50,000 to 100,000 servers, it makes sense to design the hardware based on the components you actually need and leave out ports, optical drives, etc. that you don't need. (Most likely, you don't need 50,000 DVD players in your data center.) You order the components in mass quantities and have them assembled in Asia at low cost. No need to pay extra for general-purpose hardware and brand names like Dell, HP, EMC, or Cisco. Moreover, you probably don't even need top-notch reliable hardware. No matter what enterprise-grade hardware you put in, if you have 50,000 servers there will be massive numbers of hardware failures. So you had better engineer an infrastructure that can deal with failures. And once you have a good infrastructure in place that can handle failures, paying top dollars for extra strength hardware becomes a fool's errand. Google had that insight in the early 2000s and that led them to come up with MapReduce, which was specifically designed to be resilient to hardware failures. MapReduce then spawned Hadoop, which, some years ago, was quite in vogue.

2. Administration cost. In a large-scale, highly automated system, a small number of people can be sufficient to support the administration of extremely large computing resources. Monitoring tools can cover vast numbers of computing instances giving automated alerts if something goes wrong. Inevitable problems, like disk failures, can be dealt with at scale. Backups, upgrades etc. can be done en masse. Unfortunately, this idea, in order to work well, requires fairly homogenous hardware and software environments. But in an era of constantly dropping hardware cost and open-source software, the cost of system administrators, network administrators, database administrators, etc. become increasingly important factors in IT and large-scale players, like AWS, use sophisticated software to achieve significant savings through scale and automation.
3. Elasticity. You don't have to build out your own data center to be beefy enough that it can withstand the worst peak loads while having it sit underutilized for much of the time. Having multiple heterogeneous workloads sharing the same hardware in a large data center increases the possibility of offsetting load peaks and troughs that can give better over-all hardware utilization. That in turn makes it possible to charge users only for the computing resources they actually end up using. Detailed metering of resource usage also provides better transparency for the customers of the resources. The larger the cloud, the better the opportunities for having heterogeneous mixes of workloads.
4. Ease of procurement. Procuring hardware or software inside an established corporation can be quite a challenge. The IT department has standards and strict rules that have to be followed. There are preferred vendors, special approval chains for purchases, issues with data center space, software that has to be OKed by IT, etc. Frustration with the procurement process has led to the near universal phenomenon of bypassing the IT department known as "shadow IT." By contrast, cloud vendors provide a highly automated, self-serve, procurement mechanism that lets users provision hardware and software with a few mouse clicks. Usually, the provisioned system is up and running within minutes.

Such economies of scale are a major reason cloud computing has the power to be disruptive. There are other ones, of course, like capital expenditure in traditional IT becoming operational expenditure in the public cloud.

The harsh reality of the cloud for incumbents

The trend of computing moving to the cloud is obviously troubling for the major enterprise-grade hardware vendors, the likes of Dell, HP, IBM, Cisco, and EMC. The cloud doesn't need their products, or at least not at the kind of brand-related markups these vendors are used to. But AWS is also busily moving up the food chain

from IaaS to PaaS providing services like databases and thereby putting pressure on vendors like Oracle, SAP, and Teradata. A recent report from Morgan Stanley <http://blogs.barrons.com/techtraderdaily/2015/11/11/amazon-no-limit-to-what-aws-can-disrupt-says-morgan-stanley/>

suggests that in the last two years, every incremental profit dollar for AWS has come at the loss of six profit dollars for incumbents. That was for compute and storage, but as AWS moves up the food chain, it wouldn't be surprising if the same phenomenon were to be repeated: Cloud computing leading to commoditization leading to lower prices and lower profits per unit of computational processing sold. But somehow, incumbents like IBM and Oracle try to outdo one another in bragging about how rapidly they are expanding into an area of lower profit margins while their traditional, high-margin lines of business are shrinking.

It's important, though, to remember that the move to cloud computing has enormous potential for those that can benefit from it and that the market is still largely untapped. For all the buzz about AWS and Azure, their current revenue is still a very tiny fraction of what IT organizations spend on servers, storage, and networking equipment. For instance, AWS had \$2.1 billion in revenue in Q3 2015, which is significantly less than the \$3.7 billion HP made just from selling servers.

A disruptive innovation eroding profit margins, not just for the incumbents, but also for the industry as a whole, is hardly a new concept. If AWS's profit growth affects incumbents by a negative 6x, it would probably be about par for the course. In order for a new technology to be disruptive, it has to come with some significant benefit and in the case of the cloud, it all boils down to cost. You can frame the benefits of the cloud in different ways, but with enough dollars, you could probably do anything you can do in the cloud in your own data center.

So why would IT customers be convinced to move to the cloud? Because of the risks involved, there would have to be very substantial cost benefits. IT decision makers might get a bonus for saving money by moving existing workloads to the cloud. But that possibility is balanced by the possibility of getting fired if the move doesn't go well and SLAs are missed. It's an equation that may make some decision makers risk averse. For new workloads, the cloud is a much easier sell. And that goes even for departments within large, entrenched corporations with well-established IT departments. But the same thing holds: the cloud has to come with economic advantages for IT customers. And if it does and profits are squeezed for vendors, somebody has to lose. It can't be that just about every vendor from AWS to Microsoft to HP to IBM to Oracle to Salesforce will find the cloud to be a gigantic source of new revenue and profits. Something's got to break.

Hardware

Hardware is perhaps the most obvious candidate for what will break and it's already in full swing. IBM's revenue is steadily dropping; Dell went private and is merging

with EMC; HP is in a state of flux and confusion even more than usual; Teradata announced that it's going to run as pure software on AWS hardware.

<http://www.datanami.com/2015/10/07/aws-cloud-pact-shows-how-far-teradata-has-come/>

In other words, the sky is falling.

Meanwhile, AWS is claiming that making its own networking equipment not only improves cost, but the simplified design also improves availability. Apparently, the everything-and-the-kitchen-sink hardware that the enterprise vendors make is so complex that it comes with a lot of bugs.

<http://www.enterprisetech.com/2014/11/14/rare-peek-massive-scale-aws/>

So let's look at the prospects of some individual vendors. We will mercifully skip some of the most obvious candidates for becoming bugs on the windshield of cloud computing: Dell, HP, Cisco, and EMC. We will also leave out AWS, which is virtually free from downside – not much at stake for Amazon as an on-premises vendor.

IBM

IBM, to some extent, qualifies to be in the same bug-on-the-windshield category as Dell and HP. However, IBM is an iconic company whose brand name, according to Forbes, is the fifth most valuable in the world (between Coca-Cola at no. 4 and McDonalds at no. 5).

<http://www.forbes.com/powerful-brands/list/>

So it might make sense to give IBM some special attention. If nothing else, thanks to ambitious cloudwashing, IBM claims to be the biggest player in the cloud with annual cloud revenues exceeding those of AWS and Microsoft. And IBM just hired a cloud executive from Verizon to help get its cloud story on track.

<http://fortune.com/2015/11/13/former-verizon-cloud-chief-joins-ibm>

For CIOs who use Gartner as an alibi when it comes to technology decisions, looking at the Gartner Magic Quadrants for IaaS is unlikely to instill a lot of confidence in some form of Verizon/IBM combination of skills.

<https://aws.amazon.com/resources/gartner-2015-mq-learn-more/>

The reality behind IBM's incredible cloud revenue is that the company is trying to reinvent itself. Instead of being your grandfather's Oldsmobile of tech companies it is trying to become a shiny new Tesla. As part of this effort, it is focusing on "strategic imperatives" which means the cloud along with analytics, mobile, social, and security. "CAMSS." Of course, these areas have overlaps with IBM's legacy business, but IBM's upper management is compensated in part based on its success in growing the strategic areas. Needless to say, the strategic areas are growing quickly while the legacy business is shrinking. So the key to understanding IBM's success in the cloud is that it's accounting constrained – the theoretical upper limit for how fast IBM's cloud business can grow is based on how fast its accountants can reclassify legacy revenue as cloud revenue.

Unfortunately for IBM, the chances that it will be able to reinvent itself into a relevant, fast-growing high-tech company are virtually zero. The good news is that IBM has enough legacy customers for whom its technology is mission critical that it will likely be able to milk its shrinking revenue for good profits for a decade or two at least.

Microsoft

Microsoft is faced with the same painful disruption as all the other legacy vendors, but at least it's addressing the emergence of the cloud quite aggressively under the leadership of Satya Nadella. And there are scenarios where Microsoft could prosper from the cloud. Interestingly, the greatest opportunities for cloud prosperity may come from royally screwing over its most important, long-time hardware partners, the likes of Dell and HP.

Microsoft is nowhere near the "Evil Empire" it once was. Not because it's less evil but because it has missed out on important trends that have undermined its "Empire" status. Mobile, of course, is a very obvious example of an increasingly important area where Microsoft has failed. Android and iOS rule the day and Microsoft is pretty much nowhere to be seen. Social is another area where people might think of companies like Facebook, Twitter, and LinkedIn first and Microsoft somewhat later. Perhaps much later. So in spite of having a research division with many, many hundred of PhDs, just like IBM, Microsoft has found itself to be an insignificant player in two of the most prominent technology trends of the last decade. And the longtime trend towards "free" open-source software isn't really helpful to Microsoft either. Does anyone care whether a website is powered by Linux and MySQL or Windows and SQL Server as long as it works?

But not all is lost – legacy computing to the rescue. In so far companies move to the cloud, Microsoft has a great opportunity to capture the Windows shops, of which there are quite a few. For IT shops that are completely in the Microsoft ecosystem, Azure would seem like the logical place to go. So where would Microsoft find the opportunities for cost savings that could motivate its customers to make the potentially risky move to the cloud? The most likely answer is on the hardware side. By achieving economies of scale in its own gigantic data centers, Microsoft should be able to offer computing for less than its customers are used to paying hardware vendors when running on premises. But that also means that Microsoft potential success in the cloud will come at the expense of longtime partners like Dell and HP. This development represents a huge milestone in the unraveling of Microsoft's traditional revenue model: Microsoft would provide the software but, for the most part, let partners manufacture the hardware. Microsoft's Surface tablets that put it in direct competition with hardware vendors already strain this model, but Azure has the potential of taking Microsoft's competition with its OEM partners to an extreme.

Oracle

Oracle is somewhat late to the cloud game and it's hard to see how its efforts are much more than a "me too" attempt to disrupted itself rather than being disrupted by others.

Let's start with the positive. Oracle's Larry Ellison has been a master at navigating the sea of technology upheaval that has taken place throughout the company's existence. And Oracle manufactures hardware, so there is potential in taking revenue away from other hardware manufacturers by switching customers to Oracle-run data centers.

Now for the bad news: Oracle sells extremely complex software. Superficially, that may appear to be good news. It makes it hard to migrate away from Oracle. If upgrading Oracle's database software to a new version is a multiyear project in IT (for a mission-critical system), imagine the amount of work that would have to go into migrating to a completely different database. Even Amazon, almost a decade after the inception of AWS, is still running significant parts of its retail operations on Oracle-based legacy systems. The Move to AWS, the "MAWS" project, is still work in progress. If you are an etailer selling stuff at a rate of 400 transactions per second, you don't want to make any risky moves that could potentially result in downtime. Likewise, Microsoft doesn't run all its internal systems on Azure. Having rightfully risk-averse customers means that Oracle has a big moat.

Unfortunately, selling complex software doesn't work all that well as a cloud story. Oracle's software has a very large number of settings, initialization parameters, tuning nobs, etc. not to mention the fact that customers can and will write their own code, e.g., in the form of stored procedures in the database. That means that few Oracle installations are alike. And customization is the archenemy of economies of scale. If each system needs its own individual testing before making any form of change or software upgrade, if any downtime of backup policy needs to tailored the unique needs of each mission critical system, the potential for doing massive amounts of administration at scale through automation goes out the window. Oracle has long realized that areas like software upgrades generate huge headaches for its customers and invested heavily in features meant to ameliorate the problems, but there is only so much progress you can make in solving problems that are inherently intractable.

Hence there are limits to the value proposition Oracle will be able to offer customers by moving to the cloud. Oracle's best shot at rapid cloud revenue growth might be the same as IBM's – accounting tricks and acquisitions. Unfortunately, there aren't all that many cloud companies with significant revenue that can readily be acquired.

Google

The irony is that Google in many ways was *the* pioneer in massive cloud computing but only for its own internal use. Instead, it was Amazon that successfully implemented the idea of renting out its own computing resources to the public. At this point, Google provides some highly useful, end-user facing cloud services, like Gmail, Google Calendar, and Google Drive. But for IaaS, Google's offerings lag AWS by a mile and the Windows crowd will probably go with Azure anyway, so it's hard to pick Google as a winner in that space. If it had made the right moves in 2005, Google, an online advertising service, could have become the "King of the Public Cloud." Instead, that title went to a bookstore.

But all is not lost. Google still has its gigantic internal cloud it can leverage. The big question is whether it has enough "fire in the belly" to do so.

Conclusion

It's far too early to predict how the dinosaurs will fare in the era of cloud computing, but likely, there will be few winners. Of the IT incumbents, Microsoft probably has the best chance of coming out ahead by getting into the hardware rental business to the detriment of longtime partners like HP and Dell. Oracle can to some extent do the same, but it's unlikely that the cloud will have a positive overall effect for Oracle. The rest of the incumbents are likely to find the cloud disruption to be quite unpleasant.