Understanding the Value of Financial Intelligence for Cloud Management

A white paper by
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Executive Summary

Most of those who fund and operate cloud-based or virtualized systems do not have the right financial intelligence related to the management of those systems. That means unrealized investments.

While this is a systemic problem, most enterprises ignore it. Why? We’ve yet to understand how much the lack of good financial intelligence impacts the bottom line. Or, how the absence of cost optimization significantly reduces the ROI of cloud computing and virtualization. To make sense of this subject, we’re presenting the concept of cloud usage analytics and their impact on the emerging use of hybrid- and multi-cloud deployments.

When reading this report, enterprises that offer cloud services, as well as cloud service providers, will learn why financial analytics are more important than ever in the cloud, including how to understand resource consumption trends which aid in planning and budgeting.

Moreover, we’ll discuss how to make better cloud investment decisions with centralized visibility into IT usage and costs, such as how to select the cloud provider that’s able to offer more value to the company over time.

Finally, we’ll look at how to marry operational and financial data to understand IT service costs, consumption trends, and future resource demands, meaning the ability to have end-to-end visibility around what resources are consumed, when, how much they cost, and how this data trends over time. You’ll gain insight into which cloud providers are able to deliver the best value for dollars spent, or, if you’re providing services, who consumes those services and how much revenue they supply.

As enterprises move to complex hybrid- and multi-cloud delivery approaches, enterprise IT also needs to monitor how the cloud solution functions in its entirety, in terms of the value it brings to the business on a daily basis. Using this information, those in IT can make the right decisions about what approaches are most effective, such as private and public clouds, or hybrid- and/or multi-cloud deployments.

The objective is to manage financial data holistically, and in new, innovative ways. The rise of big data as a set of new technologies provides new options for both the storage and analysis of information. This leads to better financial analytics, and thus the ability to optimize costs on an ongoing basis.

Getting to the point where you’re able to analyze the right information within the right models, as well as leverage predictive analytics to understand future trends, takes a bit of understanding and the right technology. As we continue to move to cloud-based platforms, and do so for the sake of lower costs and increasing service, the need to monitor and measure the financial aspects of cloud computing is also critical to success.

Absent these cloud financial systems, and we’re just guessing as to the cost effectiveness of this technology. Guess wrong, and you’ll end up in big trouble, fast.
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Understanding Financial Intelligence for Cloud Management

Clouds computing promises lower costs and increased agility. Why do many enterprises and service providers not yet see its true value? Most of those who fund and operate cloud-based systems, both enterprises and cloud providers, do not have the right visibility into the data to determine cost analytics, demand forecasting, price sensitivity, and other key business intelligence. These analytics are required to make the right decisions around the operations of your public or private cloud, or the effectiveness of any number of public cloud providers that you’re leveraging, stand-alone, or in a hybrid- or multi-cloud deployment.

Clearly, enterprises and service providers are not gathering and analyzing the right data to support the ongoing viability of their clouds. However, there is a new path that’s emerging, one that can provide the data points required to support both tactical decisions for daily management, as well as strategic decisions for the business moving forward.

As mentioned above, compounding the problem is the fact most enterprises are moving to complex hybrid- and multi-cloud deployments (discussed in the next section). By leveraging more than one public cloud provider, and perhaps more than one private cloud provider, the ability to monitor the financial value of the cloud solutions becomes even more complex. There are now dependencies and complex cost models that must be supported, again, both on an ongoing basis, as well as to support a longer-term strategy.

Moving to Hybrid- and Multi-Clouds

Enterprises move to hybrid- and multi-clouds for a few core reasons:

- Single cloud solutions typically don’t provide the breadth and depth of functionality enterprises require for their cloud computing solutions, thus enterprises mix and match a variety of public and private cloud platforms to offer best of breed solutions.
- The rise of new management technology, such as cloud management platforms (CMPs), makes it possible to manage these complex environments using a single interface for provisioning and thus scaling.
- New use-based accounting technology provides enterprise IT with the ability to get a handle on the cost of cloud computing, including showback and chargeback services (covered in this report).
- Applications migrating to public clouds need a wide range of cloud services, including different types of database, middleware, development, and compute services, which drive the use of many different types of cloud computing platforms.
- The growing use of PaaS (platform-as-a-service) requires the use of IaaS (infrastructure-as-a-service) clouds to provide core services for the resulting applications, thus the need to support two or more public clouds for DevOps, in many cases.
Multi-cloud computing is exploding. In a recent CompTIA survey, we learned that more than 90 percent of companies have already moved some of their processes to the cloud. Furthermore, these same companies expect to expand their IT infrastructure to include multiple cloud solutions, or multi-cloud.

The CompTIA report found that, once businesses become comfortable with their first cloud integration project, they are likely to deploy different cloud platforms for different areas of the business, depending upon their requirements. Moreover, the report revealed that 60 percent of companies studied say they already use cloud services for data storage, 48 percent say they use it to improve business continuity and disaster recovery, and 44 percent say it has increased data security.

At the same time, enterprises are adding capabilities to support complex cloud deployments, including the use of modern management and monitoring tools such as CMPs. Moreover, they have the ability to create applications that leverage many back-end public and private clouds, as well as the ability to build mobile applications using complex hybrid and multi-cloud deployments on the back-end.

However, missing is the ability to provide financial monitoring and reporting to these complex cloud architectures with many moving parts. Moreover, the ability to determine the costs of leveraging these cloud-based platforms, relative to usage, and the value they will or can bring to the enterprise.

Are the Clouds Serving the Business?

PC Connection conducted a survey of more than 500 organizations for the 2013 Outlook on Technology around the business value, and also the obstacles of using cloud-based resources. Among other things, they found that cost savings (51 percent) was the top influencer. However, cost savings comes in different forms in businesses, mostly around how the use of cloud-based resources can meet the needs, or service, the underlying business.

Is the cloud serving the business properly? That’s the core question many enterprises that leverage cloud computing seek to answer. While most believe the answer is ‘yes,’ the real answer is ‘not always.’ Cloud-based platforms provide different values for different businesses, depending upon the type of business and the types of cloud technology employed. However, there are some fundamental concepts to consider:

**Ability to adapt to shifts in the market.** The cloud-based platforms need to provide core agility to the business to quickly change IT resources around changes in the market. An example would be regulatory changes to healthcare that drive those who provide healthcare services to change core processes, such as changes to how healthcare is delivered and thus automated using cloud-based services.

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1 “Cloud Adoption Enters New Phase with Rise of Multi-Cloud Use, CompTIA Research Finds”
If the hybrid- or multi-cloud architecture is built and leveraged properly, then these systems should be able to shift quickly around changing requirements. This is typically accomplished through auto- and self-provisioning of cloud services, as well as through the elasticity and scalability of those services. Incorporating other private or public clouds into the solution allows enterprises to mix and match cloud services to quickly automate or re-automate core business processes. These concepts allow you to allocate the resources you need, when you need them, without a long hardware and software procurement and configuration process.

**Ability to serve new business processes** builds upon the previous notion, meaning that using the new hybrid- or multi-cloud services, the business is able to quickly stand up and operate new business processes. Typically this is accomplished through the self-provisioning features of cloud-based resources, along with the ability to quickly develop and deploy core applications with the public or private cloud-based platforms.

**Ability to adjust to user expectations** means quickly adjusting processes as user needs change. The use of hybrid- and multi-cloud becomes responsive to user needs, and thus makes the users more productive.

Finally, **the ability to support demands on performance** means that the systems can scale up to support a massive amount of processing with a minimal amount of work on the part of IT.

If our clouds are to serve the business, typically around the concepts above, then we also need the ability to define and measure this value. We do this by translating cloud usage into resources consumed, and thus measured, as well as how the use of those resources supports and enhances the automation of the core processes. Thus we learn how that usage comes back to the business in terms of value.
Enter Cloud Financial Intelligence

The use of cloud-based resources also requires that we understand how those resources are being consumed, including the: Who? What? Where? Why? When? and How much? We also need the ability to determine patterns of cloud use that lead to demand planning capabilities, and/or revenue or cost projections. This information should be presented in such a way that it’s not only operationally effective, but effective in driving core decision support around the use of cloud-based resources - single-, hybrid- or multi-cloud.

The use of cloud financial intelligence, typically from cloud financial management systems, provides insights into cloud usage. This includes how effective the cloud platforms are in delivering services. Thus the value to the business includes addressing some of the core needs of the business, such as:

- Understanding how cloud customers (internal or external) consume the cloud services being offered, by revenue, service type, or geography
- Understanding service performance by cost, revenue, platform, or technology
- Understanding costs and profitability by IT customer or service
- Understanding trends and overall business growth to enable more informed and cost-effective decisions about provisioning requirements.

As depicted in Figure 1, there are a number of questions that come up when deploying cloud-based services, and your ability to answer these questions goes directly to understanding the cost efficiencies and usage patterns of your hybrid- or multi-cloud deployment. Not being able to answer any of these questions typically means that you have no insight as to how your cloud-based resources are serving the business, or how successful or unsuccessful your cloud deployment truly is. Missing that information, you’re basically feeling your way through the dark, not understanding exactly what your clouds are doing, and how well they are serving your business and/or your customers.

Finally... the answers to your toughest questions

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<td>How do I automate my multi-tenant billing?</td>
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<td>How profitable are my services?</td>
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<td>What should I charge for my services?</td>
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<td>Who are my top customers by industry?</td>
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<td>Who’s consuming the most resources?</td>
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<td>What is my forecasted demand?</td>
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<td>Where are my business growth areas?</td>
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Figure 1: Cloud financial management and intelligence systems provide insights into usage data and resource utilization, as well as ongoing return on investment. Those are critical for most cloud deployments, but exceptionally useful when dealing with hybrid- and multi-cloud deployments and operations.
The core value of leveraging this technology is having a complete understanding of your single, hybrid- or multi-cloud environment that allows you to make specific and effective calls around management of these resources to reach the core objectives of the business. The idea is to remove the complexity rather than make these systems more complex, as well as answer any and all questions around use and value.

### Understanding Usage Analytics

The core purpose of cloud financial intelligence systems is to have a complete picture of the existing private and public clouds under management, as well as how these cloud interact with traditional systems (see Figure 2). They monitor these systems over time, gathering both operational and financial data.

![Figure 2](image)

Figure 2: When leveraging cloud financial analytics, the tool should be able to analyze information from public clouds, private clouds, and traditional systems.

What’s relevant here is that the cloud financial management system that provides the cloud financial analytics services is also able to abstract the various back-end clouds and traditional systems. This provides those who manage and monitor the cloud services, either as a cloud providers or as an enterprise, with the ability to monitor usage of one to many cloud services, or services that are configured into applications. This flexibility means that the cloud manager is able to look at these systems in different dimensions, and thus make more informed decisions around how they should be managed.

Cloud-based systems don’t neatly link up to an application 1-to-1. Instead, a single business application may be made up of many back-end systems, including those that reside in public or private clouds, in a multi-cloud or hybrid-cloud architecture. Or, perhaps also in traditional systems that are in the mix as well.
For example, a production management system may leverage core storage services from Amazon Web Services (AWS), a public cloud provider, session management services from their OpenStack private cloud, and core database services using a traditional Oracle database running in their data center. Thus, the cloud financial management system needs to gather information from many different system components, including the private and public clouds, as well as the local database. System owners can use this information to determine the amount of resources consumed, as well as patterns of consumption and consumption over time. They have a complete picture as to how a holistic system is functioning, including cloud and non-cloud components.

Once the data is stored in the cloud financial management system, it can be analyzed any number of ways. This includes understanding consumption patterns that may range from a specific resource, such as public cloud storage, to a complex system of resources, which could be a number of public and private clouds, as well as traditional systems. For example, Figure 3 shows a cloud service consumption dashboard that depicts a number of cloud services consumed, and the resulting revenue from those services.

![Figure 3: Cloud financial management systems allow you to see cloud service usage and revenue, including break outs of use around components over any period of time.](image-url)
How it Works

Financial management systems support cloud financial intelligence by gathering information from private and public clouds, as well as traditional systems. There are two categories of data gathered, including operational and financial data. Operational data includes what resources were leveraged by what consumer, the amount of the resources consumed, and when the resources were consumed, to name just a few things that are tracked. The idea is to provide a complete time-series view of most core usage data. This data can be leveraged for current state analysis, such as what’s occurring now, or historical analysis in terms of what occurred in the past. Moreover, this data can be leveraged for predictive analysis, or what is likely to occur in the future. Many features and functions built around the use of big data come into play, including the ability to quickly cull through huge amounts of information to provide a good summary analytical view.

![Diagram](image)

Figure 4: When leveraging cloud financial systems that support cloud financial intelligence, the data gathered from the clouds is leveraged for various types of analysis.

Also gathered is financial data, which is cost data that relates to usage data. This data is useful in defining what was paid for the usage, which could be as easy as a steady subscription price that is the stable over time, or complex usage pricing, such as different usage costs around time-of-day, or tiered pricing. When mashed up with the usage data, this provides a robust data for analysis any number of ways to provide the best insights into the cloud computing usage.

The analytics engine is able to read the financial and operational data to provide core decision analytics. This includes helpful reports and interactive dashboards for core cloud management functions, such as demand forecasting to predict future demand for cloud services, and making sure there are resources to meet these future demands. The analytics engine also generates operationally-focused reports, such as showback, and chargeback for the enterprise, or cloud billing for service providers.
Of course, the analytics engine also supports analytics around service use. This includes who’s using what services and for what purposes, and which groups or individual customers are leveraging the services - allowing cloud managers to spot trends and issues to improve cloud service quality for cloud consumers. Again, it’s relevant for both enterprises that provide cloud services (internally or externally), and commercial cloud service providers.

**Selecting the Right Tool**

Selecting the right cloud financial intelligence is a matter of understanding just what these tools do, including the value that they bring. Then, you need to understand the core functions that these tools perform, as well as your own requirements in managing your hybrid- or multi-cloud deployments.

The core capabilities of this technology should be able to:

* **Track cloud costs and revenue in a dynamic, multi-tenant computing environment.** You need to understand pretty much everything that occurs in your IT environment, in terms of usage. The technology should provide easy-to-use canned reports, as well as the ability to dynamically slice the data by different metrics and visualize the results in ways that are meaningful to the business.

* **Quickly scale to meet the needs of an ever-expanding business.** As you grow your cloud usage, as well as add public and private cloud-based services to your clouds under management, the cloud financial management solution should be able to scale up to support these changes.

* **Easily onboard new customers and cloud services, and leverage dynamic and changing pricing models.** You need the ability to track any number of cloud services and cloud consumers, and have the ability to make changes around new ways of pricing cloud services, such as time-of-day and tiered pricing.

* **Gather key analytics to determine business trends, and spot and correct key issues within the cloud services business.** This helps you understand trends in how the cloud service is leveraged ongoing, and provides real-time insights into the current state of the cloud services, as well as how they are being consumed.

* **Keep ongoing records for past, existing, and future transactions for governance and billing reconciliation.** This allows you to provide data that can be audited and analyzed as per the needs of the business, and as required for compliance in some industries and countries.

* **Gain predictability of service costs to alleviate fear of uncontrolled spending in a pay-per-use model.** When dealing with public cloud computing providers, the fear is that a huge bill for services could show up at the end of the month, which is a possibility if there is no visibility into the services consumed and what is charged for those services. Cloud financial management tools remove this fear by providing real-time tracking of the amount of services consumed, which can be viewed at any time. Even alerts can be established to point out when a certain spending threshold has been reached, allowing the cloud managers to take corrective action.
Conclusion

The use of a cloud financial management system, including financial analytics, is a requirement for service providers and enterprises to manage and control IT costs, as well as provide the proper cost and usage accounting for their customers or IT service consumers. Using the cloud financial analytics, enterprises and cloud service providers now have a tool that they can leverage to provide visibility into past, current, and even future cloud consumption patterns. IT and finance professionals are able to see all of the analytical information they need to properly manage the clouds, as well as determine cost efficiencies, and the ability to provide the correct services to the business.

This is no longer optional technology, but a critical tool that should be used by any organization that leverages a single-, hybrid-, or multi-cloud deployment. This rule applies if they are enterprises just standing up cloud services for internal use, or full-blown commercial public cloud providers.

The path to this technology is relatively simple. First, create a plan to leverage cloud financial management approaches that will monitor and manage your cloud deployments. Second, select how you need to view your data, both in tactical applications, such as invoices, or strategic applications, such as demand planning and predictive analytics. Finally, select the right cloud financial management software for the job, and pay careful attention to how the technology supports cloud financial analytics.
About the Author

Leading technology publications frequently name David S. Linthicum among the top 10 enterprise technologists in the world. He is a true thought leader in the industry, and an expert in complex distributed systems, including cloud computing, data integration; service oriented architecture (SOA), and big data systems. As the author of over 13 books on computing with over 3,000 published articles, as well as radio and TV appearances as a computing expert, he is often quoted in major business and technology publications. In addition, David is a frequent keynote presenter at industry conferences, with over 500 presentations given in the last 20 years.

David's industry experience includes tenures as CTO and CEO of several successful public and private software companies, and upper-level management positions in Fortune 100 companies. Dave has delivered over $2 billion dollars in value by transforming companies from traditional to innovative technologies, moving them to lucrative exits that benefitted investors, employees, and customers.

About Cloud Cruiser

Founded in 2010 and headquartered in Silicon Valley, California, Cloud Cruiser offers an innovative cloud financial management solution that is architected for on-demand, scalable hybrid cloud environments. The product offers granular metering of public, private, and traditional IT environments, agile pricing models, and billing automation, as well as a robust suite of decision analytics designed to help companies transform their IT businesses into more efficient and profitable enterprises. Supported platforms include AWS, Microsoft Cloud OS, VMware, OpenStack and HP CloudSystem, as well as other industry-leading cloud management platforms, hypervisors, storage management systems, databases, and applications.