

Business Cloud in Brazil: Research Report 2014

At the tipping point of accelerated adoption



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Introduction

Welcome to the *Business Cloud in Brazil: Research Report 2014 – At the tipping point of accelerated adoption*, our first research study and commentary on the emerging models of enterprise infrastructure and application landscape in the age of the Cloud, focused on Brazil.

Over the last few years, Cloud has been the source of an explosion of interest in business circles and in the media, having been trumpeted as the next big IT trend. The reason was simple; a service-based perspective on the provision of computing in a ‘pay-as-you-go’ model is very attractive.

That Cloud is now a reality is backed up by the numbers. For example, Gartner Group¹ predicts that in 2014, companies will spend \$13.3 billion on Cloud, a 45% increase from 2013, but still less than 10% of the total amount of spend on corporate data centers.

Moreover, a search on Google Trends² of the term ‘Cloud Computing’ shows us another interesting result; a bell curve, with the subject awakening interest in 2008, accelerating in 2009, reaching a peak in 2011/2012, and stabilizing in 2013. What this demonstrates graphically is that Cloud has moved from being a new initiative to being at the core of the business.

Our own global Capgemini report, *Business Cloud: The State of Play Shifts Rapidly*³, based on 460 interviews with business and IT executives, concluded that perspectives were indeed shifting quickly and that Cloud was now much more firmly embedded within the business way of working.

Looking specifically at the Brazilian data set from that survey, we found that for Brazilian enterprises IT cost reduction was a key focus area, the most popular as-a-service model was SaaS, and the public cloud model was witnessing significant demand.

In 2014, we wanted to see how the situation in Brazil might have changed in the intervening year and a half, so we commissioned a more extensive quantitative research to assess to what extent Cloud had become the standard model, which cloud services adoption had most potential, and was Brazil missing out on innovation opportunities offered by the new service architecture and delivery models in the Cloud?

We carried out this survey against a slow-down in the pace of Brazilian economic growth in 2014, with an IMF annual growth forecast down to 1.8%, due to weak infrastructure, increased inflation and low private investment. Security issues, high real estate and energy costs are also contributory factors. Despite this Brazil still represents a growth market for overall IT services, and the Government is making the necessary IT investment in broadband access and Cloud as part of the ongoing Growth Acceleration Plan.

Our research was carried out by telephone interview, (at a time pre-arranged with each interviewee), taking on average 17 minutes. If you are one of the 415 people who took part in this research study, we would like to thank you for your time and contribution to the report.

The results from the quantitative research have been analyzed by senior consultants here at Capgemini Brazil that at times supported existing views from our work with clients, and at others, uncovered new viewpoints that required further investigation.

If you would like to see the research results for a specific data sub-set, such as for an industry sector, please contact your Capgemini account manager, who will be able to arrange for a specific data set to be produced for you.

We hope you find that the research, analysis and commentary contained in this report interesting, and that it both informs your own cloud and infrastructure decisions and maybe even challenges some of your current thinking.

Gustavo Trevisan

Capgemini Director / CTO for Integrated Solutions Unit,
Capgemini Brazil

¹ Gartner press release: 29 April 2014 ; <http://www.gartner.com/newsroom/id/2723717> and reported in <http://xtreamit.com/threewaycloudbattle/>

² Google trends: <https://www.google.com.br/trends/>

³ *Business Cloud: The State of Play Shifts Rapidly*; November 2012, Capgemini Report



Executive Summary



In a competitive market there's always a need to innovate and beat the competition. As-a-service is part of that innovation approach, as it provides access to better technology, frees up resources and delivers greater flexibility”

CIO, Retail

Over the last few years, the Cloud has evolved from a rather nebulous and experimental concept to a set of practical solutions for today's complex application and infrastructure landscape which places ever-growing requirements on the IT department by the business. It has moved beyond the debate of whether to go to the Cloud and of costs to be saved, to which path to take to accelerate adoption and what incremental benefits such as new business models can Cloud facilitate.

Our research based on interviews with CIOs, Heads of IT, IT Directors and other IT executives of 415 organizations in Brazil, finds that this is equally the case in this dynamic country. The gestation phase for Cloud in Brazil is over, and we are seeing evidence that Brazil is enthusiastically embracing many, but not all, of the opportunities Cloud provides, to meet the challenges of a slowdown in economic growth and pressure on costs.

Overall, our findings paint a picture of a rapidly-moving market in certain directions but also one that is somewhat diffident and cautious in its approach. Particularly over the short to medium term, little seems to be standing still, with shifts and fluctuations before, we believe, settling into a period of sustained adoption and use of the many areas of Cloud.

Business Cloud in Brazil: Research Report 2014 Key Findings

From the analysis of the survey data collected, our key findings are as follows:

1 Evolutionary not revolutionary approach to Cloud delivery model

Brazilian organizations are taking an evolutionary but comprehensive approach to the adoption of a cloud-based as-a-service purchasing model for IT, with Software-as-a-Service driving the pace to achieve improved innovation and productivity as well of cost reduction.

SaaS is the most commonly-used Cloud delivery model, with 73% currently using SaaS, and predicted to become almost ubiquitous in its take-up in a two-year timeframe with 92% of all respondents. PaaS and IaaS have lower adoption rates but look poised to accelerate their take-up in the next couple of years.

2 The rise of the Enterprise Apps Store

The shape of Apps is changing, morphing from just another screen to innovative systems managed and deployed by an Enterprise App Store model (EAS), which appears to be fast becoming the norm in Brazil. Over 70% asserted that they already have, or plan to have, an EAS in place in the next two years, to improve enterprise productivity.

Companies need to take a balanced approach to employee enablement and corporate control to ensure the entity benefits from the flexibility and cost structures.

3 IaaS poised to mature; PaaS will follow more slowly

Infrastructure-as-a-Service (IaaS) is also developing, from commodity to virtualization to a more mature, automated and self-service model, while there is considerable room for growth for migrating from on-premise deployments to the emerging Platform-as-a-Service (PaaS) market.

As the market becomes better understood and established, our data indicates a distinct upward pattern, with 73% of companies reporting that they are looking to use PaaS in the coming two years, but still low when compared to the more mature IaaS, at 88% usage in the same timeframe.

4 Data centers eat up IT Capex

Despite alternatives, the Brazilian data center continues to consume a high proportion of IT Capex, with 48% currently spending between 20-60% on data centers. The model however is shifting towards third party management, and while currently predominantly on-premise, off-premise is a growing trend. This is a pragmatic balancing between the rising 'cost-to-serve', increasing data volumes, and growing need to protect data sovereignty.

5 Hybrid Cloud to master the cloud space

The Cloud adoption model shows, over the next five years, a clear shift away from public Cloud to a predominantly hybrid model. The perception of a variety of risks, relating to both security breaches and data sovereignty, is still considered to be the most highly ranked impediments preventing the uptake of Cloud.

Conclusion

We believe this is an accurate representation of the current market in Brazil, and it is encouraging that Brazil is focused on leveraging technology initiatives that will enhance its competitiveness.

We see this snapshot, coupled with our own observations, as a strong indication that the Cloud in Brazil has reached a tipping point, and that from this point on, the rhythm of adoption will accelerate while still flexing to accommodate national economic movements and the Brazilian way of working.

In the following pages of this report, we examine the evidence for these trends in more detail, and highlight some key differences among business sectors. We also put forward recommendations for organizations in Brazil of how to maximize the opportunities that Cloud and the new delivery models offer.

Key Findings



“

The Cloud-as-a-service delivery model and the technology behind it has improved a lot and providers understand they have to provide concrete robust solutions, focused on security and scalability, to help companies with their strategic decisions”

IT Applications Manager, Telco

1. Brazilian organizations are taking an evolutionary but comprehensive approach to the adoption of Cloud, with Software-as-a-Service driving the pace

We started by taking the temperature of the rate of adoption of the 'as-a-service' Cloud delivery model, including Software-as-a-Service, Platform-as-a-Service and Infrastructure-as-a-Service, to get an overall feel for the both current take-up and future adoption.

What we found follows the pattern for Brazil and other maturing markets established in our earlier *Business Cloud* report. Software-as-a-Service (SaaS) is currently driving the pace as the most commonly-used Cloud delivery model, with 73% currently using SaaS, far ahead of Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS), see Figure 1.

The two sectors leading the way in their use of SaaS are, perhaps unsurprisingly, Consumer Products with 92% already running some (not necessarily all) applications using the 'as-a-service' model and Retail (70%), and the least engaged with this model of software deployment is the Public sector at 60%, which given constraints on public investment would be anticipated.

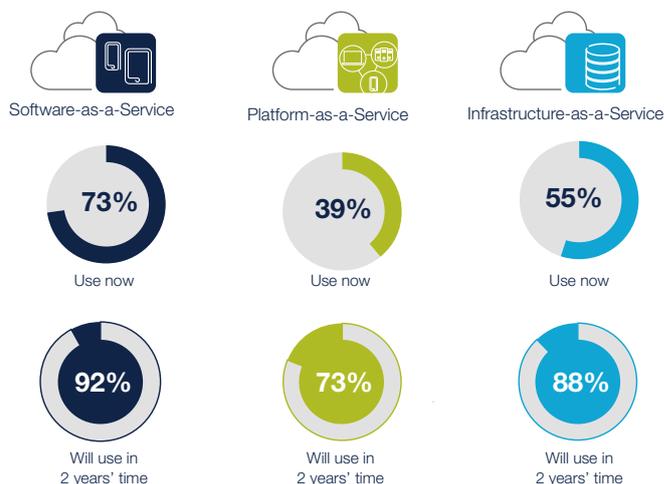
Looking ahead, our respondents believe that SaaS adoption will continue to grow, becoming almost ubiquitous in its take-up in a two-year timeframe, predicted to be used by 92% of all respondents, across all sectors. SaaS is clearly an entry level service for Cloud adoption and early migration, with its ease of adoption, agility, cost effectiveness, faster deployment, rapid evolution of new SaaS applications, coupled with the need to replace older on-premise solutions.

We see this in the market today. While some Brazilian companies initially fell behind the US and Europe in the rate of their cloud adoption, we now see a more aggressive approach because, with reduced growth in the general economic market, companies need to be more efficient and agile. So they are looking to SaaS solutions to achieve incremental competitiveness and operational efficiencies.

Of course, this does not mean that all applications will be provided to the business using this model, but the broad portfolio of SaaS applications now available on the market, servicing all areas of an organization, means that both IT and business users are keen to adopt.

As might be expected, PaaS and IaaS have lower adoption rates - 39% and 55% current usage rates respectively - considerably below the 73% of SaaS. PaaS is still immature,

Figure 1. Percentage of respondents using an as-a-service cloud delivery model now, and in the next 2 years



but we believe that, with the major players challenging for primacy in this area and wanting to establish their own standards as industry standards, this will change; those dominating the PaaS layer will have more control of the cloud ecosystem as a whole.

This is echoed by our findings. Both PaaS and IaaS services look poised to accelerate their take-up in the next couple of years and become much more pervasive throughout the organization, particularly IaaS, which by 2016 could see an increase of 33% points, reaching 88% utilization, not far off that predicted for SaaS.

The rationale for this trend could be due to the more mature market offer provided by IaaS. The world's major Cloud providers have opened data centers in Brazil and Brazilian providers are demonstrating they are also able to provide good quality services. PaaS is still consolidating and is not yet mature enough to attract a broad target market and therefore it is still focused on niche markets.

“

Investment in as-a-service is being driven by the need for increased mobility, reduced costs and faster time to market for many organizations”

CIO, Public Sector

So what is driving the move to the as-a-service model in Brazil? Perhaps predictably in the current economic circumstances, the top three multiple-choice drivers are cost, innovation and improved productivity (ranging from 68% to 60%), as indicated in Figure 2. Consumer Products companies are the most emphatic in their identification of drivers; cost is overwhelmingly important at 87%, as is innovation (86%) and productivity (80%), well above the sector mean.

Innovation is the most interesting of these drivers, as it is ranked more highly in Brazil than in for example European responses to a similar question in our earlier worldwide report. Culturally this makes sense. Brazilian organizations are actively looking for ways to compete in a fast-moving world, through significant step-changes, rather than incremental modification, and are driving the pace for new ideas and new models.

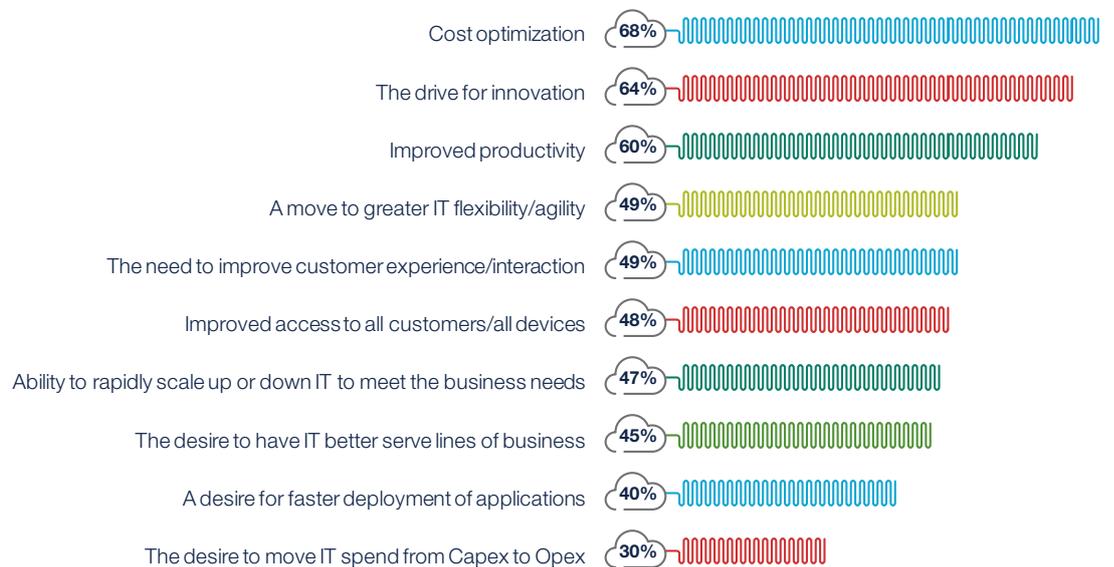
Other responses indicate that Brazilian respondents have an holistic view of the benefits of the as-a-service model. They are aware that Cloud is more than just cost reduction – benefiting an organization with improved flexibility/agility (49%) and enhanced customer experience (also 49%). Interestingly, moving from Capex to Opex ranks the lowest (30%) as a benefit. The issues of asset ownership and control of infrastructure are explored more fully later in the report. The momentum of ‘going to the Cloud’ is no longer focused just on costs, usually the initial incentive to adopt new technologies, but on its role as an integration platform for

other converging technology waves, such as social, big data and mobility, enabling fresh ways of thinking and creating different business solutions. It is clear that Cloud is definitely no longer a technology issue, but an essential business strategy to stay competitive.

Therefore, Cloud is a concern that goes beyond the remit of a CIO, being actively considered by C-level executives of an organization, as we discovered. We asked which functions within the organization were the key drivers for moving to the as-a-service model. We found that the IT function in Brazilian organizations is still in the driving seat, primarily the CIO or Head of IT, at 31%. Other functions including IT Manager, COO, CTO and the Board are at 17-15%.

Business unit ownership of Cloud however in Brazil is relatively low (6%) compared to other countries in our global *Business Cloud* survey. But we believe this will change over time, as departments such as Marketing seek their own IT solutions, a phenomenon known as ‘shadow IT’, encouraged by the ease of purchase of certain cloud solutions. Consumer Product companies are already demonstrating this shift, with 65% currently citing business unit ownership as part of the mix, a high percentage when compared to 21% in Energy/ Telco for example.

Figure 2. Key drivers for the move to the as-a-service model in Brazil



“

We now trust infrastructure and platform-as-a-service development in Brazil. I see this as a key growth trend in the next 2 years, led initially by larger companies making the investment, followed by smaller enterprises”

IT Director, Energy

“

Software-as-a-Service is a rapidly growing model of software licensing in Brazil, because it provides such good cost-savings and flexibility”

IT Applications Manager, Telco



Recommendation

Cloud models have significant implications for the IT function in Brazilian organizations. From controller and provider of services and infrastructure (whether in-house or outsourced to a third party), the IT function has to ensure that it takes advantage of the benefits of Cloud or start to lose competitiveness. One strategy is to act as a broker, coordinating the demands from the business, either implementing private or public Clouds, or a combination of both.

IT should reposition itself as the key integrator between on-premise and Cloud systems, and the coordination and management of 'personal' Clouds. As Cloud will play a strategic role for the business, the IT department should be the accelerator of this process of migration, transitioning from more than a 'cost center' to a 'value center'.

But to achieve this goal, the IT department will need to review and develop new methods and processes, and adopt new technologies that ensure not only security but also interoperability between different clouds, which will provide the future IT infrastructure.

2. The shape of Apps is changing – from just another screen to innovative systems managed and deployed by an Enterprise App Store model

Our next focus was to take a deep dive into Software-as-a-Service applications and the evolution of the Enterprise App Store. As we have seen, there is a convincing take-up of SaaS (73%) already in place, leaving only 27% of our respondents still to make the move. This is consistent with commentary from the Analyst community, which has also cited the strong adoption potential of SaaS – especially for the small to medium business sector - with its lower license costs, reduced integration costs and speed of local deployment.

Looking at the applications currently being deployed using this model, the results are quite evenly spread across a portfolio of business-essential services. ERP and CRM are the most common (both 31%), followed by Business Intelligence and Supply Chain Management (SCM); see Figure 3. Again the Consumer Products sector is the front-runner with a very high 73% using ERP-as-a-Service – well over double the sector average – and 66% using CRM-as-a-Service.

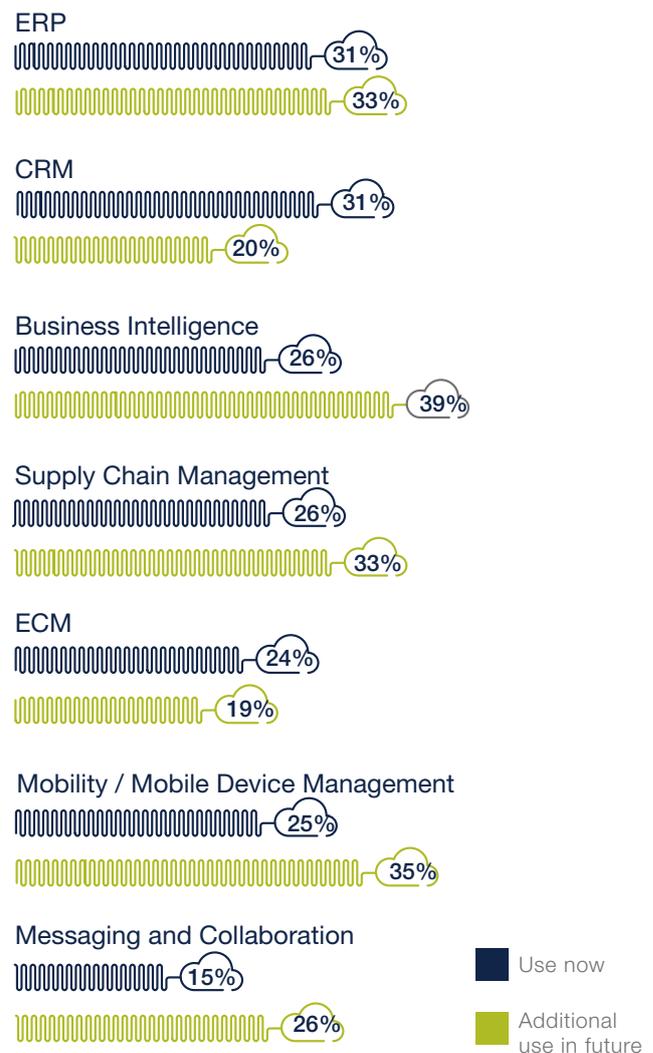
Our findings reflect the fact that ERP and CRM have been an indispensable investment for many, if not most, organizations, and as such there is significant legacy system investment and contracts – 69% remain using ERP and CRM in the traditional way.

These are typically large, monolithic applications under global contract, and so will take time to overcome cultural conservatism and migrate to a more cost-effective and flexible model. We know many CIOs do not want to change what is working but changes are beginning to occur, albeit slowly.

Looking into the near future portfolio of applications, as Figure 3 illustrates, the balance shifts significantly; away from the traditional enterprise applications to specialist software, built to benefit from the ‘pay-as you-go’ model. The hot topic solutions that are new to the application landscape, such as Business Intelligence (BI) and Mobility/Mobile Device Management systems, show the greatest growth, with respectively 39% and 35% more companies looking to use them, with SCM at 33%.

The future purchase of ERP is predicted to remain somewhat constant, due we believe to many SAP contracts that are sourced earlier in the adoption cycle by multi-nationals at a global level, rather than locally purchased. The Financial Services sector is the most advanced adopter, with 45% predicting a move to purchasing BI-as-a-Service, and 48% looking at Mobility solutions.

Figure 3. Percentage of respondents using SaaS now, by application type, and additional percentage who will use each application in the future



However, the purchase of CRM-as-a-Service in the future indicates a relative decline of 11 percentage points. This may seem counterintuitive with the current focus on the importance of the customer experience, but traditional CRM systems are increasingly being supplemented or replaced by other systems involving digital solutions in mobility, social media, Business Intelligence and analytics.

We see that the boundaries between traditional CRM, customer data management, mobility and big data are becoming somewhat blurred, and the emphasis is moving towards more specialist applications, such as rapid analytics and mobile-enabled solutions. Also of note is the emergence

of Messaging and Collaboration services, predicted to rise significantly as these solutions become more prevalent around the world.

With regard to making these apps available to the business, the Enterprise App Store (EAS) would appear to be fast becoming the norm in Brazil. An EAS, modeled on the concept of the Apple App Store or Google Play, is a central repository for authorized apps, eliminating or significantly reducing the indiscriminate use of apps by employees. An industry survey in 2013 showed that over half the companies in the US surveyed intended to make apps available to their employees via internal 'apps stores' – a concept that is taking off and our Brazilian respondents certainly agree.

Over 70% asserted that they already have, or plan to have, an EAS in place in the next two years - the force behind an EAS being increasingly widespread mobility and the new generations of apps. A central orchestrated Cloud-based repository for apps, for use throughout the business, is a key element of improved enterprise productivity and control (particularly for mobile access – whether customer or employee). Most sectors are adopting this model, with no clear leaders, although the Public Sector lags somewhat behind the norm at 59%.

Although many companies have started to implement an EAS, in our view, comprehensive availability across all functions in a business is still far from a reality, mainly due to network instability, legacy investments, and prioritization of other expenditure.

However, all business sectors are, or will be, affected to a greater or lesser degree by this trend, with users being the spearhead of the entry of new technologies in the enterprise. Employees' habit of using smartphones and tablets at home is undoubtedly putting pressure on companies to adopt mobility strategies in the workplace, in place of existing enterprise systems that have interfaces that are neither user-friendly nor intuitive.



I think most ... companies are now moving to cloud-based applications, as it helps to improve business processes and deliver better mobility”

IT Applications Manager, Manufacturing

Recommendation

These demands are forcing many organizations to create what we call a second generation of apps, which can process and generate new opportunities and business models. The resulting vector is that CIOs should have a clearly defined strategy to encourage mobility in their operations.

Part of this strategy is addressing not only the phenomena of BYOD and its implications on security and support, but also that of BYOA (Bring Your Own App). The integration of features of end-user apps with enterprise resources creates a new and challenging opportunity, such as integrating a company's supply chain delivery system to Waze, the largest community-based real-time traffic and navigation app.

Moreover, to counter the issue of home-grown apps being used within an organization outside the direction of IT, it is absolutely necessary to operate a controlled environment, creating an official corporate repository. Prevention is not a shrewd solution because it blocks opportunities to create innovative apps. Instead, we urge companies to embrace the potential, and educate users. Control is necessary, but with flexibility, using Mobile Enterprise Application Platform technologies to manage apps and their deployment. The era of absolute IT control simply does not exist anymore!



“

Currently ... everyone is looking for more data security. They don't want to take any risks as data back-up...is very important. With advances in technology, there's greater take-up”

IT Applications Manager, Manufacturing

3. Infrastructure-as-a-Service is also developing – from commodity to virtualization, and to a more mature, automated and self-service model, while there is considerable growth potential for the emerging PaaS market

Turning to Infrastructure-as-a-Service, the market view has been that there is strong adoption potential because of the clear benefits of cost and operational efficiencies, impacting all sectors. For Brazilian enterprises, IaaS is a more evident component of the Cloud delivery model, because of growing data center services and virtualization. Recent tax exemptions for telecoms infrastructure, including data centers, is likely to provide further impetus to the IaaS market.

The market for cloud-based data centers in Brazil has not yet reached full capacity. In fact, quite the contrary; it is a sector with great potential for expansion. Recent research from Frost & Sullivan⁴ estimates that the data center market in Brazil is worth “R\$ 1.8 billion, with average annual growth of 9.5% from 2011 to 2018, when it will reach US\$ 2.8 billion [compared to] the market for public cloud at US\$ 328 million in 2013.”

Against this backdrop, we were interested to explore the likely pattern of IaaS purchasing, both now and over the coming years in Brazil (see Figure 4). First we looked at precisely which IaaS services were currently being purchased. Backup-as-a-Service (BUaaS) is clearly the most widely bought, cited by 61% of our respondents and is certainly, in our experience, a growth market in Brazil, helping companies to reduce their spend on hardware and physical infrastructure, while still supporting expanding terabytes of data.

From a sector perspective, Financial Services are the heaviest users of BUaaS at 75%, a reflection of the need to retain high volumes of ‘live’ data. Manufacturing is the lowest at 47%.

Other services that were cited most frequently are Virtual Machines (43%), Virtual Desktop Infrastructure (40%) and Storage-as-a-Service (39%). From our work in the market, we are certainly seeing clients scaling back their investment in servers and data farms, to focus on assets that are cheaper, can be utilized to the optimum, and don't build in excess capacity.

⁴ *Analysis of the Brazilian Cloud Computing Market*, April 2014, and *IT Infrastructure Outsourcing Services: Brazil, Argentina, and Chile*, April 2013: Bruno Tasco, Frost & Sullivan

Of the least purchased services, Archiving is the lowest at 25%, and Compute-as-a-Service (CaaS), seen as synonymous with IaaS providing processing capacity, is at 36%. In our experience we might have expected CaaS to have been more in line with the usage of VMs, as a way of reducing Capex spend on physical infrastructure.

As indicated earlier in the report, our respondents indicate that IaaS is likely to increase from 55% by an additional 33 percentage points in the next two years. We wanted to find out how this growth was likely to influence the pattern of IaaS services bought in the future. Our question focused on the services that companies would be likely to start to purchase, and the findings show a clear shift away from the largely commoditized BUaaS, towards Storage (28%), (particularly by Retail at 56%) and Archiving (25%). The virtualization services show similar rates of future purchase in the 20%^s. Only Compute-as-a-Service remains very low, with a mere 14% indicating they are likely to start buying capacity in this way.

Platform-as-a-Service has been often regarded as the least immediately attractive component of the Cloud model, with a relatively weak adoption potential. Certainly there are distinct

Figure 4. Percentage of respondents using IaaS now, by service type, and additional percentage who will use each service in the future

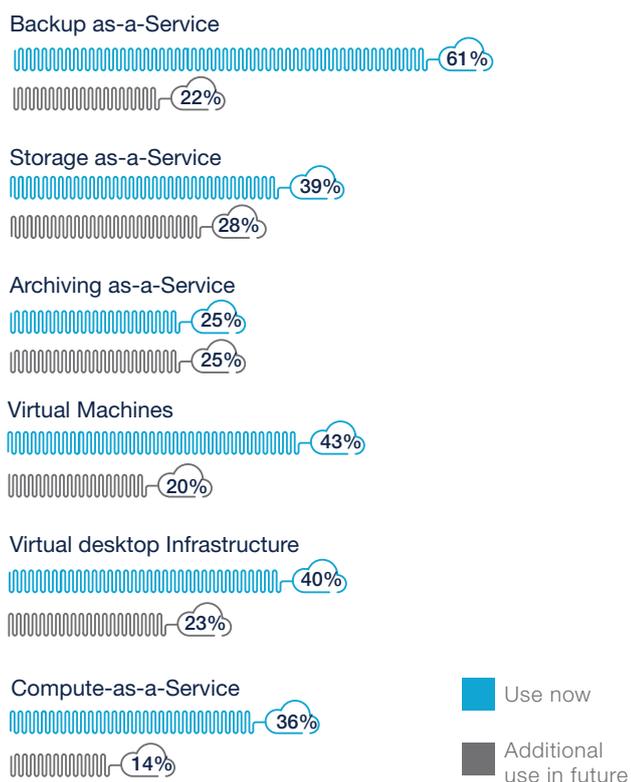
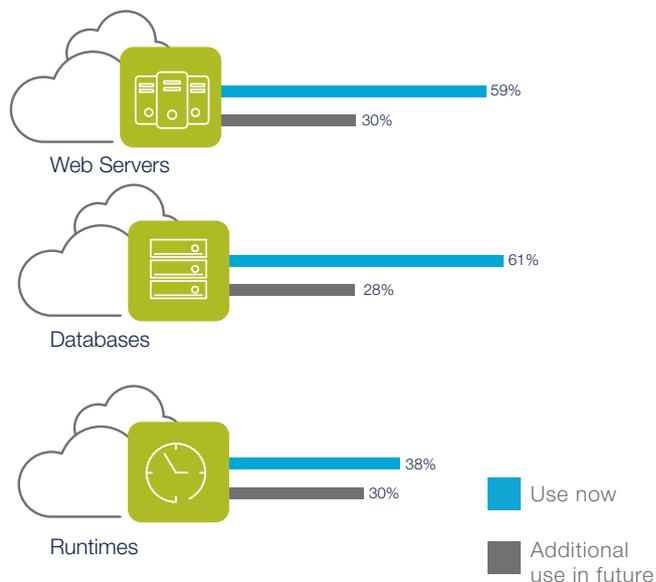


Figure 5. Percentage of respondents using PaaS now, by service type, and additional percentage who will use each service in the future



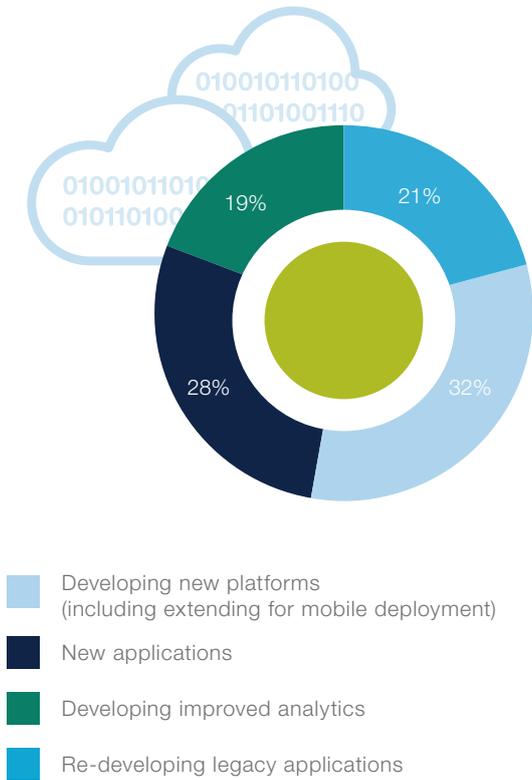
benefits, such as lower integration costs, particularly when aligned to ISVs (Independent Software Vendors), but many companies around the world are still struggling to understand what PaaS offers and its significance. Brazilian organizations appear to be consistent with this view, and are not at the forefront of PaaS utilization, judging by our data, with 39% currently using PaaS, significantly lower than the usage for IaaS and SaaS.

Looking at PaaS services currently purchased as illustrated in Figure 5, there is a clear preference for databases (61%) and web servers (59%), rather than runtimes at 38%, a view shared more or less equally across the sectors. There would appear to be room for growth for migrating from on-premise deployments to this emerging PaaS market and concept of BYOA. In Brazil, the main players of PaaS are still the main providers of traditional middleware solutions such as IBM, Microsoft and others. As specific offers in this sphere become more comprehensive, we expect development to be driven by Application Integration, new ISVs focused on mobile apps that are global in nature, such as Moovit⁵, and other non-Brazilian ISVs seeking to enter the market.

As the market becomes better understood and established, our data indicates a distinct growth pattern, with an additional 34% reporting that they are looking to use PaaS in the coming two years. The services most likely to be purchased using the

⁵ www.moovitapp.com. By using Moovit's free mobile application, users can plan trips, receive and share real-time transportation information and easily navigate to their destination of choice

Figure 6. Current focus of application development using the Cloud



PaaS model show a continued and equal rise in all three identified services - web servers, databases and runtimes - at around the 30% rate. The growth in runtimes appears to be driven by Manufacturing (47%) and Retail (44%), with Public Sector significantly lower at 14%.

We believe that the increased penetration and adoption of SaaS and specific EA Stores across most organizations, together with a clear insight into the benefits and integration more generally of cloud services, will inevitably lead to an increased demand for PaaS services among Brazilian users in the near future.

Finally, to conclude this analysis, we explored the categories of application development currently using the Cloud. Outlined in Figure 6, developing new platforms (including extending apps for mobile deployment) is a clear focus for 32%, followed by new applications at 28%. This resonates with our previous finding on the wide-scale adoption of an Enterprise Application Store. Telcos and Manufacturing (44% and 40% respectively) are at the forefront of developing new platforms, for clear-cut reasons of competitiveness and operational efficiencies. Probably due to the complexity and specificity of existing systems, redeveloping legacy systems is low at 21%.

Recommendation

This data reflects the developing view of applications in two layers, as outlined by Geoffrey Moore⁶ in his 'Systems of Engagement' model: the basic operational layer, called 'Systems of Records' made up of legacy systems, the basis of current enterprise processes, designed around discrete pieces of transactional information (records), and the transition to a new layer, focused on people through mobility and analytics, called 'Systems of Engagement'.

The engine for this is Cloud, as it boosts the concept of System of Engagement, by delivering value to the user at the time it is needed. Decentralized and interactive, this holistic view of resources is made possible by mobile devices, linking traditional data from the 'systems of record' with data digital footprints left on social platforms.

These systems of participation or 'Engagement' represent a significant change in the concept of current enterprise systems and we would advise the IT function, and the business in general, to take time to understand how this shift might impact their existing portfolio of systems and how they could improve the level of usability of enterprise technology to match that of consumer technology, already commonly used by employees and customers alike.



I see companies watching other companies; they want to use a contractor or service their competitors are using, so there's great potential for growth [in the PaaS market]"

IT Director, Energy

⁶ <http://www.aiim.org/futurehistory>

4. Despite alternatives, the Brazilian data center continues to consume a high proportion of IT Capex; the model is shifting towards third party management, and while currently predominantly on-premise for data sovereignty, off-premise is a growing trend.

Having reviewed the three components of the as-a-service model, we wanted to take a more detailed look at the traditional data center model in Brazil and the future provided by cloud-based infrastructure.

As we have seen, data centers are predicted to grow, and some studies show that this will be necessary because of the exponential expansion (by a factor of ten if not a hundred) of the number of applications and services over the next ten years. Several factors will drive this: mobile apps, app stores, the DevOps concept (continuous delivery of systems) and easier user ability to obtain many more solutions in the Cloud without IT intervention (but requiring integration with existing systems in the data center).

So how would Brazilian companies balance the 'cost-to-serve' against the national cultural inclination for asset ownership and control? In Brazil, as elsewhere in the world, organizations are keen to protect data sovereignty and keep data secure; but to what extent and at what cost? Setting up data centers in Brazil is expensive, due to complex tax laws and high energy costs, and this has boosted the need for more flexible and scalable infrastructure.

We started by asking our respondents about their current data center model. The most commonly set-up cited by 44% of respondents is data centers that are wholly-owned and run internally/on-premise, thereby maintaining a high degree of

control. A further 20% have also invested in on-premise centers but these are managed by a third party.

When the two sets of data are combined, there is a clear current preference (64%), for companies to retain close control by ensuring that these essential facilities are kept on-premise. Only 33% have opted for data centers that are both off-premise and managed by a third party.

Looking ahead by two years, how is this predicted to change? Our respondents note a distinct shift towards on-premise, but increasingly managed by third party, up from 20% to 45%, indicating a need to still retain control, but cost-effectively, through a fixed price managed service. The Telco sector appears to be strongly adopting this approach at 67%. This means there is a compensating reduction in other model usage, with off-premise third party management down 10 percentage points, and wholly-owned down 14 points.

However, when turning to the five year forecast, the two year scenario appears to have been a transitional phase; see Figure 7. The trend now shifts again to a data center model predominantly managed by a third party (69%) and increasingly off-premise - a significant rise in three years from 23% to 41%.

Reviewing this data, we believe this indicates a longer-term willingness to relinquish some control but also to leverage the cost-benefits of third party management, taking advantage of greater scalability and flexibility. Another reason for this shift could be that some multinational companies, with operations in Brazil, run multiple data centers, so have the potential to mix and match their model to suit different types of operation, whether locally and/or internationally.

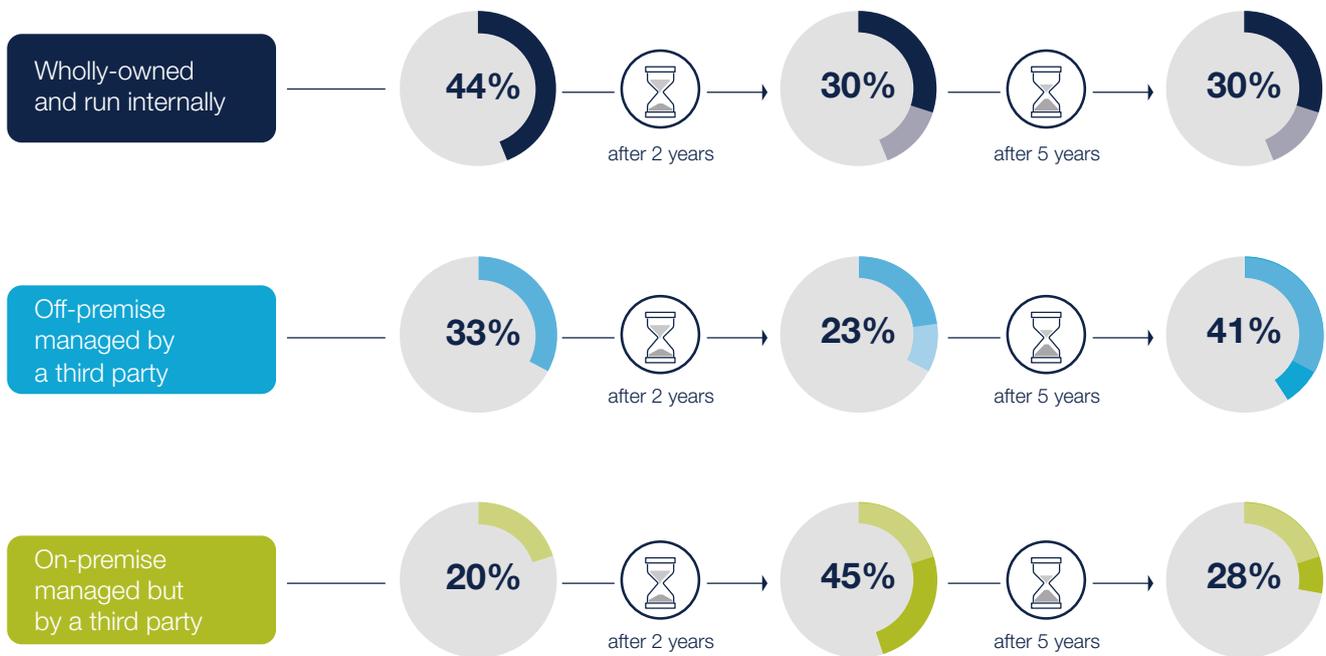
While there is a growing tendency to use third parties, respondents indicate that they still expect to keep data



I think most companies have moved to third-party managed data services for cost reasons, but have kept the main data centre still within the company for security reasons”

CIO, Retail

Figure 7. The data center model in Brazil – now, 2 years' time and 5 years' time*



* Figures do not necessarily add up to 100% due to 'Others' option

centers close by – 28% on-premise but run by third parties and 30% of respondents remain committed to an on-site wholly-owned and run internal model. We believe this is almost certainly for highly pragmatic, protectionist or risk-management reasons. In conversations with CIOs, we recognize that many wish to preserve the 'traditional' culture in which security is perceived to be tighter if the system is kept in-house, but we believe this will in time inevitably change.

This attitude is particularly prevalent in sectors where data security is critical and where off-premise data centers are not appropriate, such as parts of the Public Sector (43%) and even Manufacturing (50%), but, longer term, this trend towards off-premise third party management will probably continue for most sectors.

The responses to the question of virtualization are less complex. Asking the degree to which their current IT estate was virtualized, 58% claim to have between 25%-60% virtualized, (led by over half of the Financial Services respondents), with a further 17% in a 'leadership' position, having virtualized over 60% of their estate. At the other end of the spectrum, 25% are slower adopters of this form of asset efficiency, with less than 25% of their estate virtualized, (see Figure 8), examples being the Energy and Retail sectors.

The 17% 'leaders' we would expect to be primarily larger companies that have assessed the benefits early in the adoption curve and are already seeing the advantages of lower capital expenditure. The Consumer Products sector is certainly leading the way with over half (53%) indicating a high level of virtualized assets. However, from our experience working with clients, we might have expected the adoption figures to be somewhat higher. So we have to conclude that most Brazilian enterprises appear to be behind the global virtualization curve, which means that Virtual Machines as a service have considerable potential for growth in Brazil.

So how might both virtualization and changing data center models impact the proportion of IT Capex allocated to data centers, now and in five years' time? Our research reveals that nearly half (48%) of firms are currently spending between 20%-60% of their IT Capex on data centers and that this percentage is predicted to stay relatively stable over the coming 5 year period (49%)—illustrated in Figure 9. A growing number (30% up from 14%) anticipate spending over 60% of available IT Capex on data centers, driven by Telcos (56%), while only 21% indicate that this type of investment would be just 20% by 2019, down from 38% now. Maintaining a substantial proportion of available asset funds for investment in data centers may seem counter-intuitive,

given the cost-effective Cloud and virtualization opportunities to move to a more Opex-based 'as-a-service' model.

But in our opinion this relatively high share of IT Capex investment is linked to the challenges of growing volumes of data being processed, the increasing security requirements on data centers, and the desire to retain as much control as possible over the IT estate, as an expression of the culture of asset ownership in Brazil.

However we predict that this will slowly change as, over time, organizations recognize the competitive downside of the status quo position.



I see the trend to third party management ... driven by better service provision, cost savings and the ability to scale up and down more quickly”

CIO, Public Sector

Recommendation

Realistically, the adoption of new concepts and technologies takes years to consolidate and disseminate across a market. Companies don't abandon their initial, large investments in technology, but create layers of newer technologies on top of the old. The shift to the paradigm of Cloud will not happen overnight. Companies are correctly cautious about how they deal with their information assets, as concerns about security and reliability will act as barriers to entry for some time.

So the speed of ongoing adoption of Cloud will depend on how companies use the new features, how they will meet the growing expectations of their customers and what they learn from the leaders in the field. What Google and Amazon do so well, can and should be done by large firms in their data centers; to be able to scale up to manage large volumes of services, companies should invest in an industrialized approach to data centers, enabled by, most likely, the private Cloud.

Figure 8. The percentage of respondents' IT estate currently virtualized



Figure 9. The proportion of IT capital expenditure currently consumed by respondents' data center and anticipated spend in 5 years' time



5. The Cloud adoption model shows a clear shift away from public Cloud to a predominantly hybrid/private model over the longer term, for reasons of costs, while factoring in security and data sovereignty concerns

With multiple market offers providing a broad-range of sometimes complex packages of solutions to complement or replace existing software, platforms and infrastructure, Cloud is certainly becoming more mainstream. But for many organizations in Brazil, however it is still an evolving model, as we have discovered.

Asking our respondents about their current preferred Cloud adoption model – spanning public, private and hybrid – just over a quarter (26%) express no preference at all, and we would hope that they are considering the various options on the market. Thereafter, the results are spread across the continuum from public – the most attractive model at 24% – through private on-premise (18%), hybrid (18% public and private) and private third party managed (14%).

We believe this is an accurate reflection of the current evolving pattern of adoption in Brazil, with no one model dominating. In practice, we are seeing smaller companies tending to use public Cloud, while medium and large enterprises are more intensely using hybrid Clouds.

However, in two years' and five years' time, the picture shifts, as illustrated in Figure 10. There is a definite and gradual move away from public Cloud in favor of a variety of private and

hybrid cloud models. By 2019, if private off- and on-premise and hybrid are combined, private Cloud in one form or another is clearly the preferred option at 76%, leaving 'pure' public Cloud attracting only 17% (declining from 24% to 20% and then 17%) as their preferred model.

We know from our clients that much of their cloud strategy is determined by the need for tight data security and control, to counter the real international challenges in the macro-economic environment, and the need to see a positive return on their existing embedded investment in Cloud.

An organization's cloud strategy has to balance the requirement for control with the obvious cost attractiveness of the public Cloud. So, in the medium term, private Cloud meets those requirements more closely. Reliance solely on private Clouds we believe will be the approach of specific organizations such as certain government agencies, because of some interoperability issues between private and public. But the majority will use hybrid, because so many applications and workloads can be processed in the public Cloud, even those of banks and government departments.

By 2019, most companies across the sectors appear to have worked through these conflicting priorities, because by this point, only 7% are still unconvinced of the distinctive advantage of any one model.

Having investigated our respondents' cloud strategy, we then turned to the current balance being operated by organizations between private and public Cloud across the timeframe of now, 2 years' and 5 years' time.

Figure 10. Respondents' current Cloud model, and anticipated model in 2 years' time and 5 years' time

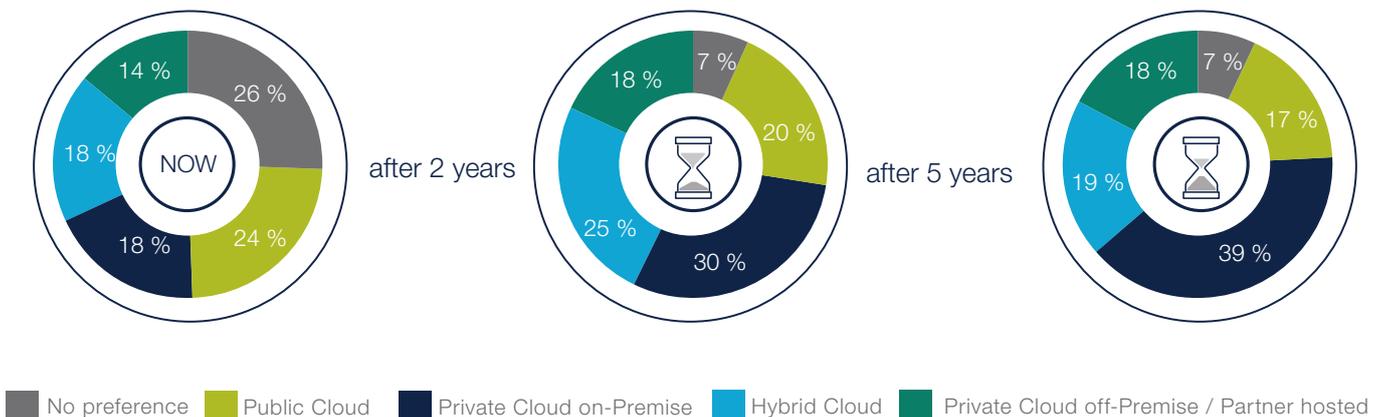
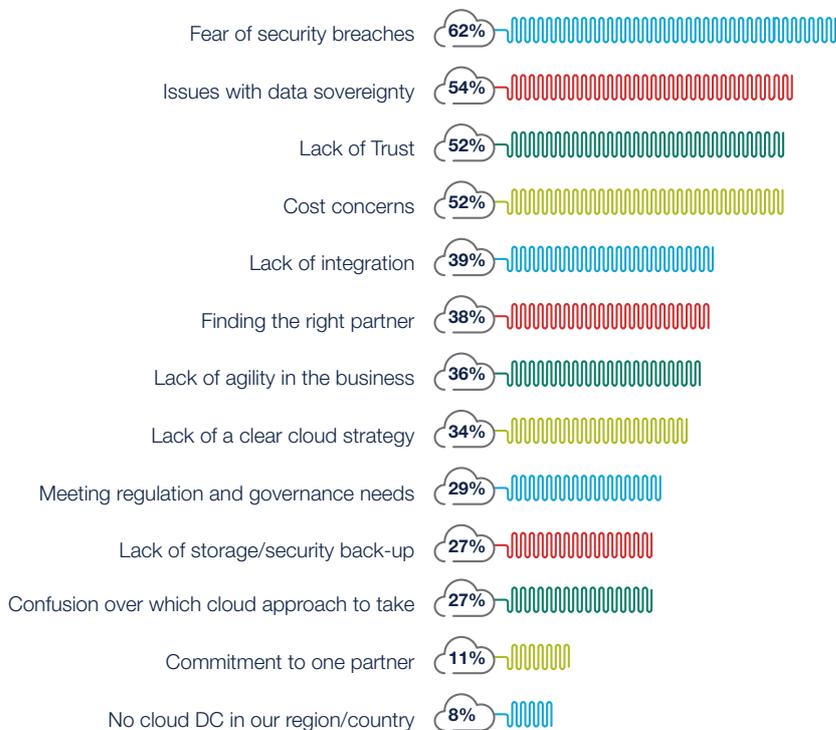


Figure 11. Top impediments preventing the uptake of Cloud



This mirrors the previous finding. The current preference for mostly public (50%) will dramatically reduce to 18% in 5 years' time, with a compensating increase in mostly private, from 25% up to 55%, led by the Telco and Energy sectors at 68% and 62% respectively. True hybrid picks up the middle ground, moving from 15% to 25%, and is the option chosen most by the Public Sector (33%) and Retail (34%).

Our interpretation of this pronounced migration away from mostly public Cloud is that while this model provides the relatively simple initial entry-point to cloud usage, over time, because of, for example security concerns, organizations will reassess their options and look to take a different path, most likely the hybrid model.

Taking this a step further, we drilled down into the critical specific impediments preventing the uptake of Cloud (Figure 11), and discovered that security and sovereignty are considered to be the most highly ranked challenges, with 62% citing fears of security breaches, followed by issues with data sovereignty at 54%. Lack of trust and cost issues rank just below at 52%. Predictably, security is a key issue for Financial Services firms (72%), while data sovereignty is a major concern to Consumer Product companies, at a very high 81%.

Security is certainly a key issue because Brazil has been seen as a major source of cyber attacks, impacting all sectors, but

particularly on e-commerce sites and banks, naturally raising security concerns. Until recently, the large global Cloud providers were not particularly active in Brazil with most providers being local. But with the security concerns, the market is becoming more reliant on global suppliers, because of their greater security experience and resources, so as players such as Amazon, IBM, Google and Microsoft grow their market share, these concerns will diminish over time.

Recommendation

Many concerns are actually based on habitual thinking, perceived 'facts' or even the fear of the unknown. For example, concerns around security. Many perceive that the public Cloud leads to an increased risk of unauthorized access or hacking in comparison to on-premise servers, which are often believed to have zero security risk. Obviously this is not true; unauthorized access, theft of confidential information and even misuse of devices is common now, whether the services are in the Cloud or not.

We recommend that a company carries out an extensive risk assessment before going to the Cloud, to identify the level of risk a business can take and the level of security the Cloud provider offers. This is an important step, because while the Cloud is not 100% mature, not all providers can actually offer the level of security demanded.



Conclusion

It is clear from these findings that Cloud is no longer just a technology issue, but an essential business strategy to stay competitive. As companies are interconnected in networks of collaborative value, working as 'virtual organizations' on-demand, more and more computational infrastructure must also operate on-demand. A business cannot depend on a rigid architecture as is still often the case today and choosing the right type of cloud for specific features is quite crucial for an enterprise.

Brazil has reached a tipping point and has almost certainly caught up with its BRIC counterparts. Enterprise Cloud in Brazil will develop into a more complex delivery model, combining scalable infrastructure and a blend of on- and off-premise solutions. And the widespread availability means that despite issues of security and the culture of asset ownership, cloud investments will be economically viable to enable companies to try new and innovative business ideas that would otherwise have been dismissed as too expensive or difficult.

Moreover, the theme of hybrid Cloud is clearly on the agenda of senior executives, with a desire to move through to execution and generate positive results within as short a period of time as possible.

There remain significant challenges ahead; growing cloud complexity due to increasing user demand, disruptive applications, and huge increase in the volume of data to be handled in real time. We believe that the ability to orchestrate applications and loads between Clouds will become key to managing this situation, in particular the dynamic between legacy systems and private/public Clouds; as will the role of cloud broker, to enable seamless and automated orchestration between Clouds.

But nonetheless, Cloud will enable Brazilian businesses to manage the unpredictability of demand and to be more agile and innovative. Cloud makes the concept of computing as 'utility' a reality, and Brazil is on track.

About the Study

Business Cloud in Brazil: Research Report 2014 - At the tipping point of accelerated adoption is we believe a unique survey, based on bespoke research with senior IT leaders/executives from 415 large and medium private companies and public sector organizations in Brazil, during March and April 2014. This quantitative data was subsequently enhanced by ten additional in-depth interviews with a selected number of respondents.

Survey Sample

Country



Brazil only

Organizations

We interviewed a single representative from as broad a base as possible - 415 enterprises, encompassing a variety of sizes from 750 employees through to over 10,000 employees, located in Brazil. We focused on the larger sized organizations as these are broadly more engaged in cloud adoption.



415 enterprises

Sectors



FMCG



Retail



Manufacturing



Financial Services



Energy & Telecom



Government/ Public Sector

We aimed for a minimum of 50 per sector to provide a reliable sample, giving us the ability to compare and contrast between sectors.

Who



- CIO
- Head of IT
- IT Director
- IT Applications Manager
- IT Infrastructure Manager

We took a spread of roles involved in cloud strategy and deployment to garner a range of views. While it is clear from our global *Business Cloud Report* that the Business is becoming increasingly involved in driving cloud adoption around the world, we took the view that, as the Brazilian market was growing in maturity, we should focus on the opinions of IT leadership and management who were more likely to be driving these changes, rather than those of the Lines of Business. The findings proved this assumption to be correct.

How



Telephone interviews were carried out in Brazilian Portuguese



The average length of each interview was approximately 17 minutes.

Statistical Relevance

In order to ensure the production of a dependable and substantive piece of market research, the recruited sample needed to be statistically representative of the population in terms of its size and profile. In a business-to-business market research project (B2B), the average recommended minimum sample size is 100 organizations.

This market research is based on a highly robust sample of 415 enterprises in Brazil, the majority (72%) with more than 1,000 employees. These naturally included native Brazilian organizations as well as major subsidiaries of global organizations operating in the country.

Figure 12. Interviews by Job Title

Job Title of Respondent	Number of Respondents	%
CIO	59	14%
Head of IT	88	21%
IT Director	130	31%
IT Applications Manager	76	19%
IT Infrastructure Manager	62	15%
TOTAL	415	100%

Figure 13. Interviews by Sector

Vertical/Sector	Number of Respondents	%
Consumer Products (manufacture of consumer-facing goods)	70	17%
Retail (inc. Distribution and Logistics)	59	14%
Energy (inc. Oil, Gas, mining, utilities) and Telecoms (including Media & Entertainment)	82	20%
Financial Services (inc. Retail & Investment Banking, Capital Markets and Insurance)	58	14%
Manufacturing (inc. industrial, automotive and engineering)	81	19%
Government/Public Sector, predominantly Federal rather than State (inc. Healthcare)	65	16%
TOTAL	415	100%

Questionnaire and Methodology

- The survey questionnaire was devised by Cloud and CI experts in Capgemini Brazil, in consultation with Coleman Parkes Research, the independent company that carried out the survey. The 27-question survey was carried out using pre-arranged telephone interviews in Brazilian Portuguese, and was anonymous.
- The research questions were posed, based on the relevance to the respondent's job title, and answers to previous questions, where applicable. For this reason, the base number of respondents for each survey question shown in the graphs in this report is not always the full sample size.
- For further clarification and insight, we carried out additional qualitative, detailed interviews, some of which are reflected in quotations in the report.
- All research carried out by Coleman Parkes Research is conducted in compliance with the code of conduct and guidelines set out by the MRS in the UK, as well as the legal obligations under the Data Protection Act 1998.

Thank You

In accordance with the UK's Market Research Society Code of Conduct (under which this survey was carried out), all respondents were anonymous. However, Capgemini would like to thank all of the respondents who provided their in-market experience, expert opinion, and input into this survey, and we appreciate the time that each interviewee provided on the call with our research company.

We would also like to thank all of the business leaders and subject matter experts who provided valuable insight into their respective areas of expertise and market experience:

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About EMC



EMC Corporation is a global leader in enabling businesses and service providers to transform their operations and deliver IT as a service. Fundamental to this transformation is cloud computing. Through innovative products and services, EMC accelerates the journey to cloud computing, helping IT departments to store, manage, protect and analyze their most valuable asset — information — in a more agile, trusted and cost-efficient way. Additional information about EMC can be found at www.emc.com.

About VMware

vmware

VMware is the leader in virtualization and cloud infrastructure solutions that enable businesses to thrive in the Cloud Era. Customers rely on VMware to help them transform the way they build, deliver and consume Information Technology resources in a manner that is evolutionary and based on their specific needs. With 2013 revenues of \$5.21 billion, VMware has more than 500,000 customers and 75,000 partners. The company is headquartered in Silicon Valley with offices throughout the world and can be found online at www.vmware.com.





About Capgemini

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In 2010, the Capgemini Group acquired CPM Braxis, which had been successfully operating in Brazil for more than 30 years. Later in 2012 CPM Braxis Capgemini was newly rebranded Capgemini. Capgemini in Brazil employs 7,800 people and serves over 200 clients, offering four main service lines: Applications Services, Infrastructure Services and Products and Business Process Outsourcing (BPO).

Learn more about us at www.br.capgemini.com

For more information on how Capgemini can optimize the benefits of Cloud for your organization, visit our website

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