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DO THE CLOUDS REALLY HAVE LIMITS?[1]

> *"A startup is always a risky endeavor; success is never guaranteed. There are many ways to fail, many of these disguised as ways to succeed."* - Shane Collier

Shane Collier, founder of *Consolidated Reality, LLC* (CReal) considered this proposition as he contemplated a potential venture with *Beyond the Psy* (BtP) which involved moving high-value, sensitive content to the cloud. With an extensive technical and business background, he grew to appreciate the value of cloud computing, along with its impact on business. To be leveraged correctly, you had to do more than simply migrate your existing infrastructure to the Cloud, or build a traditional application as a Cloud based solution--you had to innovate. Moreover, to leverage the cloud globally, you had to understand culture and its impact on security.

Beyond the Psy (BtP), founded more that twenty-five years before the time of the case, faced a challenging environment. Current business was excellent, exceeding two hundred and fifty million dollars annually, but was constrained by space, location, and staff. Closely aligned with the new age movement, competition was emerging everywhere. Though an established brand, BtP could be superseded by newer, more aggressive organizations, often with more flash than substance. How could BtP defend and expand its business while protecting its intellectual property?

CReal put an attractive option on the desk of Dave Conseen, Director of Technology at BtP. The objective was to recreate, using cloud computing, the experience of attending a program at the organization's physical facility. If done properly, BtP could become a billion-dollar a year operation.

The proposed project presented a number of risks to both parties. *Consolidated Reality, LLC* was small; this project could only be achieved by drawing staff and resources from other opportunities. A failure could threaten the company. Counteracting these risks was the potential to expand globally, while providing self-funding for future expansion. For BtP, there was the obvious financial risk; however, that was the lesser risk. Of far greater concern was the fact that many of BtP's clientele were high profile individuals whose participation at BtP, if leaked to the public, could end careers. In addition, BtP's key assets were the propriety media and other program materials that would be distributed more broadly under the proposal. Internationally, both the concepts of privacy and ownership were subject to the interpretation of the cultures in which the programs were hosted. What would happen when these programs moved beyond U.S. jurisdiction?

Editor: T. Grandon Gill

Cloud Computing

Central to Collier's proposal was taking BtP's existing live program along with supporting materials, recreating the experience for an interactive online audience, and deploying it on "the cloud". He reflected:

> The term "Cloud Computing" meant many things to many people. As with so many ideas, the line between concept and implementation often became blurred. When this happens, the implementation was seen as the new idea and not the concept it reflected. No place was this truer than when considering an emerging technology. The definition of cloud computing tended to be situational. As a consumer, you might think in terms of storage. As an application user, you might think of Software as a Service (SaaS) offerings such as Google Docs, Gmail, or Microsoft Office 365. As a business manager, you might wonder how it would impact your businesses' competitive position, operating costs, or you might only consider it as a technical issue for the Information Technology (IT) group to investigate, and not a as a management concern at all. As an IT manager, you might think of Cloud Computing as a less expensive and higher risk location for performing business as usual using Platform as a Service (PaaS) to support your software development and hosting teams, or as an alternate site, closely resembling the organization's existing technical infrastructure utilizing Infrastructure as a Service (IaaS).

So what was Cloud Computing?

Cloud Computing as a Business Model

Cloud Computing was first and foremost a business model. Companies did not invest in Cloud Computing because they wanted to implement a technology. They did it because it provided opportunities for competitive advantage by enhancing the firm's ability to increase profits, decrease costs, and improve the value proposition.

Cloud Benefits

Cloud computing allowed organizations to shift computing resources from Capital Expenses (CapEx) to Operational Expenses (OpEx). Capital dollars were often difficult to acquire, and once the equipment was purchased and in place, it could take years to recover the expense. In contrast, operational costs were recovered during the same fiscal year.

Cloud Computing also allowed a business to reduce costs, manage capacity, decrease time to market, and become more agile—allowing it to respond in a rapidly evolving market. It was no longer necessary to invest in an infrastructure capable of meeting peak needs during a period of limited duration. This combination of abilities allowed a local, regional, or national organization to compete effectively in a global marketplace. Scale as a barrier to entry became minimal, and small operations could often achieve IT cost efficiencies similar to those of much larger competitors.

The benefits of cloud computing were most readily apparent for small to mid-sized businesses. These organizations typically were not able to maintain high levels of expertise in all IT domains simultaneously: it was just too cost prohibitive to do so. As a consequence, these organizations tended to be strong in some areas and weak in others. By relying on the capabilities of sophisticated cloud providers, an organization could benefit from security, email, system administration, networking, and other specialized skills at levels that would otherwise be unavailable to them. For instance, the security provided by most cloud providers far exceeded the capacity of not only many small and mid-sized businesses, but many larger ones as well. For example, cloud providers routinely had their security audited several times a year by independent auditors—a regime that would be far too disruptive for most non-IT organizations.

It was also difficult to match the reliability of the physical infrastructure provided by cloud vendors. When data was uploaded to Microsoft Azure, for example, it was immediately replicated three times across different media. Optionally, it was then duplicated at a geographically distant data center where it would again be replicated three times on separate media. These physical infrastructure benefits extended to stable power delivery systems, redundant network service providers, global distribution of data centers, and environmental factors as well.

Cloud Service Providers

This focus on cloud computing as a business model was further supported by the nature of the leading Cloud Service Providers. Cloud services were typically classified as coming in three forms:

- *Infrastructure as a Service (IaaS)*: Customers were provided access to shared resources, such as hardware, networking and printing, and provided their own software and operating systems.

- *Platform as a Service (PaaS)*: Customers were provided a provisioned computing environment, including an operating system and basic services (such as database and web servers) over which they installed their own applications.

- *Software as a Service (SaaS)*: Customers were provided cloud hosted applications, such as desktop software, salesforce management tools, enterprise software, and virtualized applications, all paid for on a subscription basis and managed by the cloud provider.

Amazon Web Services (AWS) was the leader for Infrastructure as a Service (IaaS)—made possible by Amazon.com making its surplus computing resources available over the internet. AWS continued to maintain IaaS as it central offering, even though it was continuing to evolve in the Platform as a Service (PaaS) environment. At the time of the case, Amazon had no real Software as a Service (SaaS) offerings.

Microsoft had always maintained a strong relationship with its development community. Because of this, Azures initial focus was on Platform as a Service while continuing to improve its IaaS offerings, making it more competitive with AWS rapidly. At the same time, Microsoft was establishing a strong presence in the Software as a Service area by moving its flagship product, Microsoft Office to the SaaS area through Office 365.

The Google App Engine was purely a PaaS offering focusing on Java, Python, and only recently moving into languages like PHP. Google offered a limited set of tools best suited for the development of mobile apps rather than enterprise solutions. This was an excellent use of the Google approach where apps were designed to run in the Chrome Browser, ChromeOS, and Android environments while providing access to Google's massive family of products.

What Is Cloud Computing?

These were all Cloud Computing, but with very different technical implementations. Cloud computing was a business model, implemented using different approaches and using different technologies. One of the primary authorities on what "Cloud Computing is" originated from the National Institute of Standards and Technologies (NIST) Publication 800-145 (Grance & Mell, 2011). This document defined the essential characteristics, service models, and deployment models of Cloud Computing. It should be noted that at no point was a particular technology or technical implementation specified. These characteristics and models from the NIST document are summarized in Exhibit 1.

What Is Not Cloud Computing?

Much of the confusion about the nature of Cloud Computing could be clarified by dismissing some things that Cloud Computing *was not*. Cloud computing was not simply virtualizing servers, a process through which multiple independent "virtual" computers were run on a single piece of computing hardware. Douglas Parkhill presented many cloud computing concepts in his 1966 book "The Challenge of the Computer Utility" (Parkhill, 1966).

Many online offerings introduced the term "Cloud" to take advantage of the trend. Per the NIST definition, Cloud Computing was based on Self-Service: the customer submitted a request for a service which was automatically fulfilled by the system with no human intervention. This ability empowered the customer to create, modify, or delete services on demand, based on need, and only be charged based on the time used. This service delivery typically occurred within 15 to 20 minutes of the request. A traditional online internet hosting company offered products such as shared web hosting, virtual servers, or dedicated website hosting and required human intervention to provision the resource(s). Fulfillment often took twenty-four or more hours, deletion of services often required an email or phone request, and the user was charged in blocks of six months or a year which made their offerings well outside of the scope of the NIST definition (Grance & Mell, 2011). Still, they referred to themselves as Cloud providers. Cloud was not synonymous with Internet or World Wide Web.

Similarly, an internal data center might point to the server farm where they hosted virtual machines and state that "is our Cloud" missed the goal. While their systems were virtualized, allowing them to use their hardware infrastructure more efficiently—most likely achieving broad network access and resource pooling—the installation would also need to meet the remaining NIST criteria (i.e., on-demand computing rapid elasticity and measured service) to be considered a true cloud (Grance & Mell, 2011).

There was a common misconception that the cloud was only the same old technologies renamed. Again, this focused on the technology, not on the business model. It was how the technologies were used. Do they meet the full spectrum of the NIST definition? While there was nothing new about virtual machines, networks, or hard drives, the sophistication of the automation systems used to deliver on the NIST specifications represented a new evolutionary stage of technology. These automated systems that monitor, manage, provision, and maintain the Cloud infrastructure also resulted in a substantial reduction in personnel needs, further reducing costs. It should be noted that there were some corresponding costs and risks. For instance, the cost of improved local network infrastructure (needed to ensure smooth communication with the cloud facilities) would offset some of the savings provided through utilization of those same facilities.

Culture

Culture drove all elements of *Beyond the Psy*'s global initiative. How well would a country accept the unique products the enterprise had to offer? Would the existing international client list reflect the general interest of a country, or simply those within a country that could afford to attend programs at the main campus in the United States? What products would be marketed in which regions? The list of concerns was long. At the top of the list were both privacy and security, and their enforceability was crucial as well.

The meanings of these terms were defined by the "norms" and "values" of a country or region. *Norms* were the basis for laws: what a culture believed to be "right" and "wrong." *Values* were what a culture considered to be "good" and "bad." Together they determined how digital security laws were authored and how those laws were interpreted. When data was put in a data center in another country, it was governed by the laws of that country—not the country of the organization that originated the data. You

could not anticipate how a country would respond to security and privacy challenges unless you understood its culture. What is culture? Collier reflected on this question:

> Culture runs deep. It can be envisioned as a series of concentric circles (Exhibit 2). When you visit another country for the first time, you are presented with new sights, smells, tastes, architectures, and more. Everything is new. These are the artifacts that a culture produces; they are not the culture. They are, in fact, tangible manifestations of culture, representing the norms and values of that society; they are explicit. Norms represent a culture's concept of "Right and Wrong" where values represent what is considered "Good or Bad" by the population. Together these define expectations for how we should behave and what the boundaries for proper behavior are. These norms and values are reflected in the culture's artifacts, but also in the rules provided to govern people's behavior. These in-turn are representations of the culture, not the culture itself. Culture is a step below this. When someone has difficulty explaining, why he or she does something, or becomes defensive about why he or she is doing something, then you are starting to get to the culture that underlies the artifacts, norms, and values. Culture originates from a regions' underlying needs which must be met due to the demands of basic survival, history, and geography.

How Is It Determined?

Geert Hofstede identified six criteria, or dimensions, for quantifying cultural differences. He identified four primary dimensions: Power Distance, Individualism vs. Collectivism, Masculinity vs. Femininity, and Uncertainty Avoidance. Recently, the following two additional dimensions--Long-Term Orientation and Indulgence vs. Restraint were added. Detailed descriptions of these characteristics are provided in Exhibit 3 (https://www.geert-hofstede.com/).

By way of illustration, the chart in Exhibit 4 presents a sampling of countries and their associated Power Distance scores from the Hofstede Center. The range of scores signifies:

- How comfortable people are with the unequal distribution of power.
- How far you are from those who can make decisions.
- Your ability to influence those decisions (https://www.geert-hofstede.com/).

The implication of widely differing attitudes to power distance is that the same managerial and organizational approach is unlikely to work in all countries. Yet this is only one dimension. To make clear decisions, you must consider all of the dimensions in concert. You also cannot make assumptions by geographic regions. For example, France and Brazil are closer in PDI to China and Asian countries than they are to the United States and Europe in general. Each country must be assessed on an individual basis.

Why Does It Matter?

Collier felt that culture was a critical issue in evaluating the decisions facing his company and BtP. He explained:

> Culture drives the behaviors and regulations of a country. They cannot be separated. The rate at which technologies evolve today outpaces the ability of the laws and regulations to keep up with them. Therefore, these tend to lag the actual implementation and practice of a technology. How do you predict what these governance tools will be? You try to understand the culture that drives them. Canada holds the domestic company liable for what happens to data stored offshore.

> France struggles to find the balance between need and the "right to be forgotten." Other nations do not recognize the right for corporate entities to privately own data. Often today companies develop and deploy systems, and expect the laws to catch up; this is a high-risk approach. Understanding the culture that drives those laws can help reduce or even manage that risk.
>
> There is a second factor--also driven by culture-- which is how the people respond to the rules. Just because a law is a law, does not mean that the people will accept it. Ever drive down a highway? How many people are driving the speed limit? With any culture, the laws and the norms don't always match the values. Think of the norms as the laws, and the values as acceptable behaviors. The law sets the speed limit, but acceptable behavior determines the acceptable speed on the roadway. When you store your information or sell your product overseas, you need to understand not just the norms, but the values as well. More importantly, you need to understand the culture from which they originate, to understand the relationship between them, along with how they compare with those of your own country.

The complexity of mapping the relationship between cultures can be seen by comparing the differences in Hofstede's dimensions between the United States and South Korea, as shown in Exhibit 5 (https://www.geert-hofstede.com/).

Privacy and Security

The clientele of *Beyond the Psy's* was broad in scope; they ranged from curiosity seekers to high-level business and political leaders. Privacy was critical to this element of BtP's patrons. If their participation in such an unconventional program were made public, careers could possibly be ruined. If this information were stolen and posted on the internet, even one time, then the entire organization could be in jeopardy. More than any other factor, this element was understood to be the single greatest risk, and the single greatest possible point of failure—a failure that could result in not only the end of the project, but the end of *Beyond the Psy* as well.

Privacy is the right to retain control of your proprietary data; security is how you maintain it. The conception of privacy, however, was in the culture of the beholder. Collier remarked:

> If you have ever spent time with someone from another country or time in another country, you quickly discovered that the definition of "'Personal" space is not the same, and this also happens with privacy. Americans are very open, and much of the information we share with others would be considered extremely personal data for someone in another culture. Their definition of personal data is relatively shallow. When one culture's public data definition overlaps with another culture's private data definition, the results can be unpredictable, and this constitutes the "Danger" zone.

In the Cloud Computing environment, security existed to ensure privacy, just as Cloud Computing was not a technology, but was implemented using technology, privacy was provided through security. Given that expectations for privacy were defined by the culture, it was not surprising that the rules and laws that were established to provide the appropriate level of privacy tended to be based on the norms and values of the society. As a consequence, in some cultures the regulations regarding data privacy were quite strict; in other cultures, these regulations were absent. In some cases, the requirements of culture A came into conflict with those of culture B. This tends to happen where personal data entered the "Danger" zone (Exhibit 6b). Therefore, culture could be used to predict when difficulties were likely to arise.

The "Pacing Problem" referred to the delay between the adoption of a technology and the delay of laws and governance to manage it. This problem was also present in the adoption of Cloud Computing, particularly on the international stage. Countries struggled to develop legislation to ensure the privacy and protection of data stored in the Cloud; meanwhile, the data was already there. Everything from

credit card information to ongoing dialogs about our private lives, to photos were posted online. The United States was still, after decades, struggling to draft regulations to protect its citizens. France was wrestling with a new fundamental "Right to be Forgotten." Constantly in conflict were the right to ensure the privacy of your information with the right to manage that same information.

The complementary concern for the "Pacing Problem" was "Culture Lag," the time it took for the laws, rules, and standards to become accepted by the populace. When the norms (rules and regulations) of a culture were out of sync with the values (society's concepts of good and bad), tensions could arise within the community. This often happened when an emerging country adopted an international legal position that contradicted the values of the citizenry. For example, the laws relating to international copyrights and patents would not guarantee intellectual property protection where a country's citizenry had long established norms for sharing all information.

One example of "Culture Lag" was a popular South Korean video blog, *Eat Your Kimchi* (EYK), on YouTube which had almost 750,000 subscribers (http://www.eatyourkimchi.com/about/). They were approached to participate in a South Korean television program. When they declined, the network downloaded their online content and edited it into the program without EYK's consent. There was little recourse available to the Korean based EYK group, nor was this an unusual event. Even though the government was slowly moving toward enforcement of this type of infringement, it continued to be broadly practiced.

Cloud Computing could bring advanced, international computing capability to regions with weak laws. Even as those laws slowly adapted to protect the data and activities that resulted from this increased ability, the "Pacing Problem," compounded by "Culture Lag," could remain—resulting in spotty enforcement of whatever laws were on the books. In the context of the EYK example, it should be noted that the protection laws in South Korea were among the strongest in Asia.

Culture bias could also produce a false sense of security. The United States was largely a nation of laws, administered objectively. Contracts were binding. They were between organizations, not the individuals who signed them on behalf of the organization. Americans tended to believe this was universal, and acted accordingly. It was not. Collier offered the following example:

> An American teaching English in South Korea had scheduled a two-week trip, and paid for the flights, hotels, and other expenses. This trip had been approved by the principal of the school 30 days in advance. The morning of the journey, she was informed that she could not go. The school was undergoing an inspection, and they wanted to put their best image forward, which included her. Protesting, she mentioned the pre-approval, which was overridden. At that point, she contacted the contracting company that had arranged the employment and discussed the guarantees in her contract wondering if they might be of use. The contracting company informed her that in South Korea, "The contracts were more like guidelines." She had to stay. We have seen this same behavior on a larger scale with lawsuits between Apple and Samsung.

In China, the situation was far worse. Contracts were made under the company names, but were seen more as agreements between individuals. For instance, if the person who negotiated and signed the agreement on behalf of your organization should leave eighteen months later, you might discover your contract was not being honored. Prices could start to vary; shipments might change or stop. In such circumstances, your only option would be to send another negotiator, and negotiate a new contract, even though your original contract still had two years remaining. Your final option would be to fall back on foreign courts to enforce the contract or law. You would be doing so based on the expectations driven by your culture; this would be a risky proposition.

In summary, the Pacing Problem augmented by Culture Lag both limit the strength of legal protection and in time these might narrow, but it would take time—it could take a generation. The population of an emerging country could also decide not to follow the international standards, and elect to maintain the status quo. Culture is slow to change. The reality was that all of these elements were bounded by the interpretations and behaviors of the cultures that implemented them. Given that the very definition of privacy varied significantly from culture to culture, only the level of privacy accepted by that culture was likely to be enforced. Anything beyond that would depend upon the security standards that were implemented.

Beyond the Psy

Beyond the Psy, (BtP) was located in the remote desert, about an hour's drive from Sedona, Arizona. This secluded venue was the perfect spot for a retreat. Individuals traveled to this remote location for one primary reason: to experience new levels of conscious awareness. Attendees were presented with a program typically lasting from a few days to two weeks. They attended group and individual sessions where they hoped to experience other realities. In doing so, they changed how they viewed their lives, their relationships with others and themselves.

Upon arrival, individuals voluntarily turned in their watches and phones, which were then kept safe until the end of the program. Once assigned to their rooms, they would gather to discuss the upcoming activities. After which the attendees returned to their rooms, put on a pair of headphones and waited for the hypnotic session to begin. After the hypnotic session, they shared what they experienced during the hypnotic session. This cycle repeated several times in a day, with brief interludes for lunch and dinner. This pattern repeated over a period of several days to two weeks. At the end of the program, each student received a certificate.

There was a tremendous need for privacy; the attendees were from all backgrounds and vocations. Many of these individuals would suffer severely, should their participation in such a program become public knowledge. Scientists, medical doctors, business leaders, and politicians could find careers either ruined, or at best significantly challenged. These individuals traveled from around the world, 93 countries in all, to participate in this consciousness expanding activity.

BtP found itself in the center of an extremely competitive market. When it was founded twenty-five years previously, the new age industry was just beginning. The current market has become highly completive, with its equivalent of "Rock Stars." The newer organizations leveraged everything from advanced marketing analytics to mass media publications in order to brand themselves and sell their products. One example was the book *The Secret*, by Rhonda Byrne,which sold roughly nineteen million copies. The book then evolved into websites, DVDs, Apps, and at least, eight related titles. BtP now had to be sought out, rather than being on center stage as it once was. This situation had to change and improve, or the organization would fail.

The materials that drove the BtP program were highly proprietary. Many scaled back versions of the products were available for sale at new age and online retailers. Should the retreat versions of the materials (which provided the full experience sought by clients) find their way into the public domain, it would be financially devastating for the company.

Existing Facilities

The setting of BtP was isolated, offering quiet, beautiful vistas to sooth the soul. What it did not have was high-speed internet access. In fact, there was no broadband network access available in the county, limiting the options for online hosting. The facility provided rooms and meals for up to 85 participants at a time. This was a hard limit that could not be exceeded, placing a limit on potential income for programs

hosted at the facility. To address this BtP has developed a partner program with various individuals around the globe. However, these partners could only perform introductory level hypnotic sessions. For intermediate or advanced training participants had to come to the Arizona facility. In many ways, these affiliates served as a funnel driving traffic to the primary facility.

A further attempt to address the facility limitation was to develop a mobile system to support the hypnotic sessions that could be transported to other cities to accommodate intermediate and advanced classes. These already expensive classes only became more expensive when you added hotel and meal charges to the price of the course.

Finally, the BtP's retreat facility was aging. As a result, it was increasingly in need of repair—not only to the physical buildings, but also to the system that distributed the hypnotic sessions to the attendees. This system was in desperate need of either refurbishment, overhaul, or complete updating to newer technologies.

Existing Economics

Even with all of these facility challenges, BtP was continuously operating at maximum capacity, with individuals streaming in from all over the world. Its gross annual income had leveled off at roughly two hundred and fifty million dollars. This income derived from a combination of retreat programs, the sale of hypnotic audio materials, other course materials, affiliation fees paid by regional partners, and other sources.

The cost per participant was $1,800 per class on average. That fee included room and board, and all costs associated with the course. The expenses associated with delivering these classes were correspondingly high, and included the cost of flying the conference leaders in from all over the globe as well as paying their fees.

The cost of attending the program limited potential students to the very dedicated or to upper-income brackets. In addition to the $1,800 tuition, participants had to cover the cost of their transportation to the facility. For those coming from overseas the cost of round-trip, airfare could cost $2,000 or more. For a couple from Japan the cost to attend a program, flying coach, would quickly exceed $7,000.

The Strategic Goal

The strategic goal of *Beyond the Psy* was growth through global market expansion. The existing market consisted of those able to travel to the main campus along with the associated travel, time, and expenses. Additionally, introductory level programs were available through a limited distribution network of affiliates. This combination already facilitated a substantial international audience. Expanding this client base with a global online system would require a large investment in infrastructure, or cost efficient use and automated management of on-demand cloud computing resources. Collier described the situation as follows:

> If the program could be brought to a global audience, bypassing the restrictions of the primary Sedona area campus, thereby reducing tuition cost, travel, and housing expenses, then the potential growth for BtP would be substantial. With over twenty-five programs the return rate per student was five courses. Unfortunately, many of these courses could only be offered once or twice a year because they could only be held at the principal facility.

> If these classes could be offered either on demand or concurrently, at a reduced rate, there would be a significant increase in the number of returning students. Also, if the full range of courses could be provided through, or promoted by, the affiliate network, then the potential growth could be a factor of 10. Reducing the cost of the courses from $1,800 per class to $950 per class for off-campus participants, while retaining the higher rate for on-campus participants could shift the gross revenues from roughly eight million dollars annually to almost forty-six million gross dollars a year. This figure along with corresponding growth in associated materials, books, audio files, t-shirts, and other materials would drive revenues substantially higher.

But, how would BtP proceed? Go online, build additional facilities, become a true multinational company with training facilities worldwide? Despite stable gross numbers, the cost of operation was high, and getting higher as the existing facilities aged. This put a substantial restriction on funds available for expansion, yet the potential was real. They could go from a quarter of a million dollar a year company to an almost billion dollar a year enterprise, or they could stagnate and eventually fail. Just another new age company that could not survive beyond the charisma of its aging founder.

Consolidated Reality, LLC

Consolidated Reality, LLC (CReal) was founded by Shane Collier during the summer of 2014, with a focus on integrating the concepts and impacts of culture on the adoption and implementation of Cloud Computing. The fundamental premise was that cloud computing resources, deployed by organizations such as Amazon Web Services, Microsoft Azure, IBM, Rackspace, and many others, provided the physical foundation for a global computing engine. Logically, this engine was wired together with common communication protocols such as Extensible Markup Language (XML) and JavaScript Object Notation (JSON), allowing data to be exchanged between the disparate systems that constitute the global Cloud Computing environment. This combination provided a relatively homogeneous global computing environment.

With this environment deploying data centers at a steady rate, technology was no longer the barrier to global and corporate computing. It served businesses, governments, and individuals alike, removing many barriers to entry that have traditionally barred new entities from entering markets. Once the thought that the need to deploy a hundred million dollar technical infrastructure provided a secure barrier to entry from competitors was deemed valid, belief in such protections, led to false security and overconfidence. An individual could still enter that market and compete, growing the resources on an as-needed basis, and releasing them just as quickly. They did not have the burdens of support and maintenance of unnecessary resources. So, what were the barriers?

The walls were common to both of the above participants--the regulations, laws, and, more importantly, the impact of the culture that drove them. Most organizations stopped at the laws, regulations, and other governance concerns. Having addressed these topics, they believed they were prepared to move forward. They may have even seen themselves as relatively prosperous. They generated sufficient revenues and achieved their goals, even if they had to struggle to do so. But they missed the point. Culture drove everything. How efficient were your software development teams, what products did you build, where did you make them, how did you market them, where would they be successful and where would they fail? These were the crucial issues of culture.

If you believed that culture did not impact you or your Information Technology (IT) organization, because you were one hundred percent based and operational in a single country, then you were likely mistaken. Very few software development and IT teams consisted of a single culture. It was not uncommon to find Ukrainian, Vietnamese, Indian, Taiwanese, Polish, and American all on the same development team. How did you integrate them all? What processes were efficient and which ones led to

poor performance? While this was true for any technical organization, it was particularly critical for those adopting Cloud Computing.

These were the issues, aside from the technology used to build and deploy one's products or manage one's organization, which had an impact on how successful an organization was. It was this area, and the associated impacts, that Shane found to be the real determining factors in success, survival, or failure in a global reality.

CReal also developed a Wildlife Research Community Cloud, leveraging Colliers's background in scientific research, fish and wildlife data management, Cloud Computing, and technology in general. CReal partnered with wildlife researchers to pioneer a standard computing infrastructure that would facilitate collaboration, increase data stability, ease political pressures on organizations, increase grant based funding opportunities, and manage costs. Many of these activities spanned the state, national, and international boundaries presenting a need for the cultural expertise CReal had to offer, providing a real-world laboratory for CReal to explore the impacts of culture on IT and the Cloud communities.

Beyond this, CReal served as a general consultancy on Cloud Computing, software development processes, business processes, and strategy. The company was also available to address specific training needs.

Over time, through a series of informal meetings, Collier met with the CEO and other members of the Board of Directors of BtP, leading to a formally extended discussion with the Director of Technology. These meetings served as the foundation for the relationship. With each meeting, the relationship was reinforced, and a strong trust was developed between the parties. It was this trust combined with a belief on the part of BtP that Shane understood their needs and situation that allowed the project to move forward.

The Proposal

BtP's goal of expanding to an audience beyond the capacity of the current facility would necessarily include substantial investment in refurbishing the existing installation. If they decided to grow by expanding the existing facility in Arizona, the cost would be high and the return steady, but small. There would only be a limited opportunity to expand attendance by reducing the costs since the bulk of the costs for most participants—particularly international participants—involved transportation.

An online solution delivered to a global audience would provide the potential for a fivefold increase in revenues while also making the program affordable to a much larger audience. This would be attained by reducing the cost of the course by fifty percent. Such a reduction would be possible through eliminating room and board expenses, travel expenses, and the need to bring instructors from around the world into the Arizona retreat headquarters for each program. Renovation costs could be significantly reduced. The infrastructure necessary to replace the currently wired system would simply be an in-house wireless instance of the system delivered online.

The online program for participants would be tightly coordinated and monitored in real-time. Two central challenges had to be addressed. The first challenge was the management of latency, along with an absolute requirement for one hundred percent uptime. The only possible solution was the utilization of cloud computing with a triple redundancy failover capacity. As one layer of redundancy failed, the backup would fill the gap while a replacement element was activated. All the while an additional backup

was active and waiting. Latency would be addressed by utilizing data centers located closest to the majority of participating clients.

CReal introduced this option to BtP. If they moved toward an online virtual facility, the absence of high-speed bandwidth would be a constraint--this would drive them to a cloud-based solution. CReal had the option to develop the system, and then manage the cloud-based infrastructure and oversee its operation for each course for ten percent of the course's gross revenue, plus expenses. By leveraging the on-demand characteristic of Cloud Computing, the infrastructure for a class would be brought online the first day of the program and released on the last day. Latency issues that would impact the ability to synchronize the activities of the entire class would be managed through the use of Content Delivery Network and Edge Servers to forward deploy content. Appropriate levels of redundancy and automatic failure would raise the reliability of the system to the range of the classic five nines, 99.999 percent uptime, or less than five minutes downtime per year.

The high international participation level in the program meant that this proposal carried substantial risks for both BtP and CReal. The attendees were occasionally very high profile individuals, or in professions where participation would be severely detrimental to their careers. Privacy and the accompanying security would be critical. Also, the need to protect the intellectual property aspects of the BtP materials would also be essential. Moving outside of the borders of the United States, this became increasingly difficult to ensure. You were struggling against the Pacing Problem, Culture Lag, Judicial systems, and the various cultures that drove them--cultures often built around norms and values that resulted in contradictory regulations.

While the technical infrastructure existed to facilitate the implementation and delivery of the courses and their content, the soft issues might preclude it. BtP could increase its class generated revenue to over forty-six million dollars annually in twenty-four months. Potentially, CReal could earn over 4.6 million dollars a year within 24 months if the most optimistic projections were realized. These same estimates indicated that BtP would receive a fourfold increase in revenue from the sale of supporting materials and other merchandise. Unfortunately, this huge potential came with the associated risk that a single data breach could devastate both organizations.

The Decision

As a basic start-up, CReal was both staff and capital constrained. If it accepted the challenge to build this system, it would have to suspend its two primary drivers: the impact of international culture on IT and the development of the Wildlife Community Cloud. Temporarily, this would leave both of the niches open to exploitation by other vendors. It would also put, on a short-term basis, all of the burden, risk, and reward on one significant project. In the long run, however, the infrastructure developed and used to deliver courses could then be utilized by other organizations, provided that they did not compete in the same space as BtP. This would offer CReal substantial opportunities for additional revenue. In practical terms, however, it would mean entirely redirecting the target markets and business model for CReal.

As Collier considered the decision that he needed to make, CReal appeared to have four basic options:

1. CReal could disengage from all other current development efforts. It would then re-task staff and resources to develop and deploy the online training system for BtP, a path that could produce significantly greater income potential than the current business model.

2. They could function as a consultant to BtP helping them assess, select, and monitor a third party developer who would then develop and operate the system for BtP. Acting as a consultant would allow CReal to support BtP while having minimal impact on existing activities. At the end of this

effort, CReal's obligations would end. This option would place the startup at the edge of its capacity.

3. CReal could be contracted to perform oversight of the system as it was developed by a third party. At the end of development, operation and maintenance would then become the responsibility of CReal on behalf of BtP.

4. CReal could withdraw from the process and focus on the current strategic directions that had already been established.

In addition, given his already close relationship with BtP, he felt the need to be objective in terms of what would best fit the needs of that organization. Regardless of what might be most beneficial to CReal, what course of action should he recommend to BtP?

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Acknowledgements

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Biography

Shane Collier is the founder of *Consolidated Reality, LLC*. He holds a Master's degree in Information Management Systems from the University of South Florida and a Bachelor's degree in Marine Biology at Texas A&M University. He is CompTIA Certified in Cloud Essentials and is accredited by the Hofstede Centre as both an Intercultural Management and an Organisational Culture lecturer. He also holds credentials for Teaching English as a Second Language (TESOL) and Teaching English as a Foreign Language (TEFL). Professional experience ranges from Antarctic scientific research to strategic roles bringing major multinational corporations to the Internet.

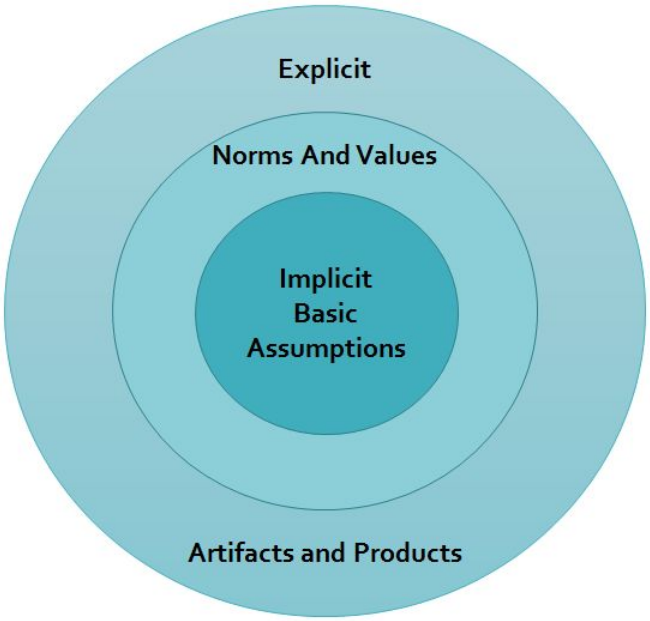
Exhibit 1: Cloud Computing Characteristics and Deployment Models

Cloud computing characteristics and deployment models summarized from the National Institute of Standards and Technologies (NIST) Publication 800-145

- **Five Essential Characteristics**
  - On-Demand
    - Resources can be deployed without human intervention on the part of the service provider, at the discretion of the customer
  - Broad Network Access
    - Mainly ubiquitous access through standard networks, your service is available where ever you are, from your workstation to your laptop, to your mobile phone.
  - Resource Pooling
    - The assignment of resources to meet the shifting demands of a given user are made from a transparent pool of physical and virtual resources, without concern for the exact location of those elements at any given time.
  - Rapid Elasticity
    - Resources are allocated and released based on the demand at any given point in time.
  - Measured Service
    - Like the electricity in your home, you only pay for what you use
- **Service Models**
  - Software as a Service (SaaS)
    - The use of an application delivered directly to the consumer through the Cloud
  - Platform as a Service (PaaS)
    - The ability to develop and deploy an application using a cloud-based infrastructure without concern regarding the underlying infrastructure.
  - Infrastructure as a Service (IaaS)
    - The ability of the consumer to deploy fundamental computing resources such as servers, storage, and limited network management. The user can then deploy the software to these systems as needed.
- **Deployment Models**
  - Private Cloud
    - A Cloud is deployed for the exclusive use of a single organization
  - Public Cloud
    - cloud environment established for the use of the general public
  - Hybrid Cloud
    - A combination of two or more of the above models that are bound together.
  - Community Cloud
    - Cloud is provisioned to meet the particular needs of a given community, such as healthcare or government, with a particular set of shared requirements or governance obligations it must meet.

Source: http://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Exhibit 2: Cultural Layers



Source: Case writer's adaptation of Fons Trompenaars' Model of Culture

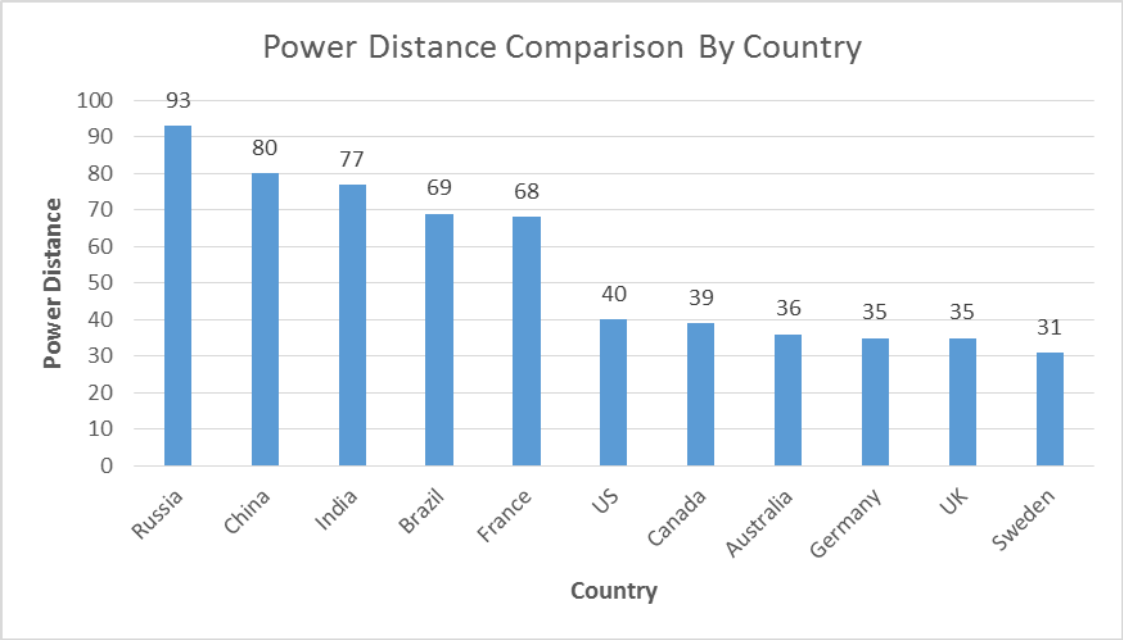
Exhibit 3: Cultural Layers

Geert Hofstede's Six Dimensions of National Culture:

- **Power Distance (PDI)**
  - How do societies accept that the power is distributed unequally, people with low power distance want an equal distribution of power, and demand justification where it does not exist. The United States is a small power distance country.
- **Individualism vs. Collectivism (IDV)**
  - Does the individual take care of themselves, or in exchange for complete and total loyalty, depends on a particular group, such as family, business, or government. Do they think in terms of 'I' or 'We'?
- **Masculinity vs. Femininity (MAS)**
  - With masculinity, the focus is on achievement, rewards, and success. While femininity prefers cooperation, quality of life and caring for the weak.
- **Uncertainty Avoidance (UAI)**
  - How does the society feel about uncertainty and ambiguity? Should the future naturally unfold and reveal itself or can we control it?
- **Long-Term Orientation (LTO)**
  - This has recently been rolled into a new dimension called "Pragmatic vs. Normative" (PRA). Pragmatic societies prepare for the future through savings and education while more normative cultures focus on traditions and see change as suspicious.
  - LTO refers tendency to place more emphasis on the future. Short term communities focus more on the present and past while long term societies place more importance on the future.
- **Indulgence vs. Restraint (IND)**
  - How much gratification, lack of self-restraint, is the individual allowed (low number) or how much does the society restrain these drives through social norms.

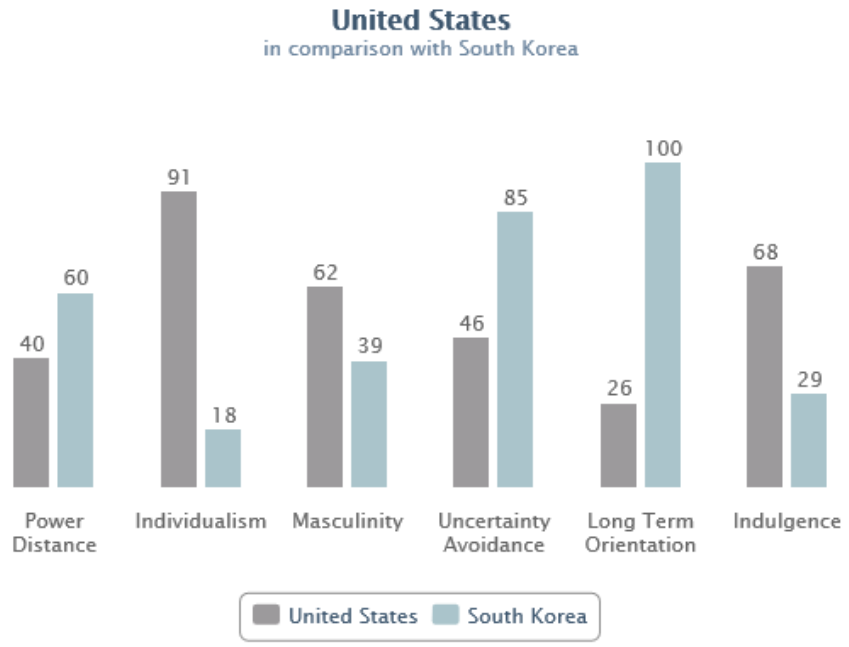
Source: https://www.geert-hofstede.com/

Exhibit 4: Power Distance Sample Distribution



Source: © Consolidated Reality, LLC used by permission

Exhibit 5: Cultural Comparison United States and South Korea



*Source:*http://geert-hofstede.com/united-states.html

Exhibit 6: Interpretation of Personal Space - Lewin's Circles

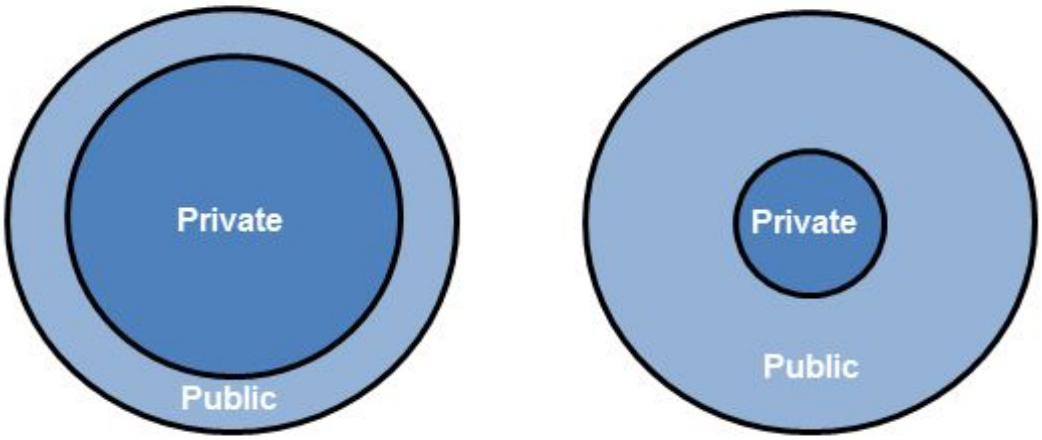


Exhibit 6a – Two Separate Cultures

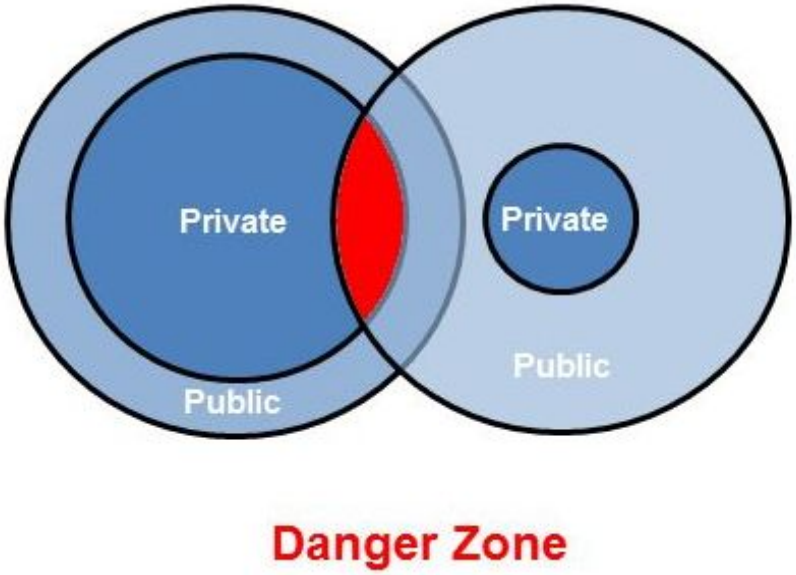


Exhibit 6b – Culture Interaction

Source: © Consolidated Reality, LLC used by permission

Exhibit 7: Shane Collier Extended Biography

Shane Collier

Shane Collier has an eclectic background, growing up in radio and broadcasting he developed a passion for all things technical. In high school, he was producing background music for local restaurants and national chains, such as TGI Fridays. He later went to work for Texas Instruments (TI) as an electronics assembler, as a data entry clerk, he developed the Baseline Management System for the Electro-Optics division. This system was eventually adopted as the Software Configuration Management System for the Avionics Division as well. Combined it managed over one billion dollars' worth of software. Texas Instruments developed a job category because of him, 'Software Technician'. In addition to software development roles, Shane also served as the System Analyst at the Corporate Engineering Center and provided operations support for the Avionics Division, this included network support for a two and a half million square foot facility. While pursuing a Computer Science degree from the University of North Texas, Shane decided to change majors and chase a childhood dream, he changed majors and changed schools.

Pursuing a degree in Marine Biology, he attended Texas A&M Galveston (TAMUG), which would be his home for the next ten years. While at TAMUG, he participated in the Texas Marine Mammal Stranding Network, scientific research cruises in the Gulf of Mexico, the Marine Mammal Behavioral Ecology Group. and the GulfCet Data Management Office (DMO). Upon graduation Shane worked, as a Research Associate, in the Marine Mammal Physiology lab, as part of a team, designing instrumentation for marine mammal research, along with the analytical software. This instrumentation collected physiological and environmental information, mapped dive profiles, synchronized this with video, and then recreated the dive in virtual reality. At TAMUG, he designed and implemented a Geographical Information System (GIS) teaching and research laboratory. Finally, this research track included field work with Leatherback Sea Turtles in Trinidad and Tobago. Along with Weddell Seals on the fast sea ice, just outside of McMurdo, Antarctica, and research with the Office of Naval Research. Shane's core role was to identify new technologies that could be applied to marine research, then develop new instrumentation and analytical tools to keep the lab at the technological cutting edge.

The next phase of Shane's career takes him to Dallas Texas and Electronic Data Systems (EDS), where he served as an Information Specialist. His next stop was Agency.com, participating in the dot-com boom. While at Agency, he was part of the strategic leadership teams that brought industry giants 3M and Halliburton/KBR to the internet. These multi-national organizations required genuine globalization of their web presences. It was at this time that the impact international business was developed. Caught in the bursting of the dot-com bubble, he moved to Florida and worked as a Research Associate in a Stroke Research Laboratory at the University of South Florida (USF) College of Medicine. Where he was exploring the use of GIS tools to analyze stroke images. It was at this point that he founded Digital BioTech, LLC.

Digital BioTech's business goal was to develop online data management for a sophisticated analytical tool, Affymetrix Microarray, provide technical support for research labs and develop image analysis software. Good idea, bad timing. It was 2008, and the bottom dropped out of the economy. It became necessary to close the company, and Shane faced challenging times. The country was facing record unemployment levels, using his marine science and nautical background he worked as crew and guide for sailboat based dolphin tours. Combining this experience with his sea time from his marine science work,

he acquired a U.S. Coast Guard Master Mariner license. As the challenging job market continued, he did the logical thing. He went to work at Walt Disney World (WDW) in Orlando as Cast member.

At WDW, Shane worked at Innoventions as a presenter and trainer, describing the relationship between innovation and invention. Later he leveraged his Captains License and served as a Trainer for the boat captains at Downtown Disney. Shane took advantage of his time at Disney; he came into contact with over 250,000 guests, from virtually every nation and culture around the world, from Buddhist Monks to Movie Stars. Granted, this was a self-selecting population of individuals that were attracted to Disney, but it was an opportunity to observe the differences of the individuals from around the world. How they behaved, why they were there, what attracted them? It continued to drive interest in culture, developed while working at Agency.com

Following Disney, Shane led the data management efforts for the Fish and Wildlife Research Institute (FWRI), a Division of Florida's Fish and Wildlife Conservation Commission. In this role, he managed the migration from a Java/Oracle to a Microsoft C#/SQL Server environments. He also oversaw the data management needs of the Dependent and Independent fisheries monitoring programs and other datasets responsible for approximately eighty percent of the wildlife research data for the state of Florida. He participated in the granting process by writing, managing, and serving as Primary Investigator (PI).

Leaving FWRI, Shane attended the University of South Florida attaining a Master of Science degree in Management Information Systems (MIS). While moving through the MIS program, he kept a focus on two things: Culture and Cloud Computing. He became accredited by the Hofstede Centre as a lecturer in International Cultural Management and Organizational Management and CompTIA on Cloud Computing Essentials. Toward the end of his graduate career, Shane combined all of these experiences to form the business venture: Consolidated Reality, LLC (CReal).

Source: Case writer