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### IBM Cloud Strategic Audit

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# IBM CLOUD PLATFORM STRATEGIC AUDIT

Jack Johnson

## BACKGROUND

IBM is an enormous company with a history that goes back more than a century, and so when pick out my strategic audit topic I decided to limit myself to just the division that I'm going to work for this summer, which is IBM Cloud Services. IBM cloud technically started all the way back in 1972 when IBM first started to sell Virtual Machine technology for its mainframes, however IBM truly started to develop its current cloud strategy in 2007. Back then, IBM wanted to build clouds specifically for enterprise clients and provide services to fill in the gaps that were in the marketplace. IBM even announced a partnership with Google to promote cloud computing in universities in 2007<sup>1</sup>. As of April 2011, IBM said that 80% of fortune 500 companies were using IBM cloud and that its services were used by more than 20 million end users<sup>2</sup>, which is definitely something to brag about, but since then things have gone downhill considerably. In 2013 IBM acquired SoftLayer to form the current iteration of IBM's cloud endeavors: the IBM Cloud Services Division<sup>3</sup>. IBM Cloud has a wide range of over 170 different products in the fields of data storage and analysis, serverless computing, containers, artificial intelligence, internet of things, and blockchain. IBM itself breaks these 170 offerings into 16 different groups

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<sup>1</sup> Jacqui Cheng. "Google and IBM team on cloud computing initiative for universities". ArsTechnica.

<sup>2</sup> "Industry Leaders Worldwide Embrace IBM Clouds to Transform Business Processes". PRNewswire. 7 April 2011.

<sup>3</sup> "IBM to Acquire SoftLayer to Accelerate Adoption of Cloud Computing in the Enterprise: IBM to Form New Cloud Services Division". News release. IBM. 4 June 2013.

based on internal divisions related to the service's development, but in-depth knowledge of every cloud service provided by IBM is not necessary for this strategic audit, as it would take far too long and contribute little to the actual understanding of how the business side of things operate. Suffice it to say that IBM cloud has a vast number of different services all organized into a large hierarchy. Although there are no publicly available documents detailing IBM cloud's current strategy, mission, or vision, an analysis of their marketing seems to imply that IBM is trying to directly compete with other cloud providers like Google, Microsoft, and Amazon by leveraging their AI and security expertise to try to differentiate themselves<sup>4</sup>.

## ISSUES

As was mentioned before, IBM cloud has some serious issues. Current market share is sitting at below 4%, and IBM is the smallest cloud company that isn't lumped into the "other" category by most analysts after being overtaken this year by Alibaba<sup>5</sup>. Additionally, there is little name recognition among general consumers for IBM cloud services, which means that many potential customers who may know and trust the IBM brand don't even know that IBM offers cloud services. Finally, there's the huge issue of lack of focus with regard to the cloud services that IBM builds, maintains, and ultimately dedicates fiscal resources to, which has led to a lack of profitability for many of the sections of cloud services. Simply put, only a few out of the 170+ services that IBM offers are actually profitable, and these profits are weighed down by the many unprofitable services.

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<sup>4</sup> Lederman, S. (n.d.). IBM's Enhanced Cloud Strategy. Retrieved from <http://ibmsystemsmag.com/mainframe/trends/cloud-computing/enhanced-cloud-strategy/>

<sup>5</sup> Cloud market share Q4 2018 and full year 2018. (n.d.). Retrieved from <https://www.canalys.com/newsroom/cloud-market-share-q4-2018-and-full-year-2018>

# SITUATION ANALYSIS

## **Business Model**

In terms of business model, IBMC's is very similar to most other cloud services providers in terms of the value that is created. These services can be separated into infrastructure, platform, and software, with each successive level adding onto the previous. Infrastructure services are the simplest where IBM simply provides servers for others to run programs on. Platform services are a little more complex, with IBMC also providing barebones software support on top of the servers. Finally, software services are almost complete software solutions that allow end users to customize some aspects. All of these services provide the same kind of value to consumers, namely outsourcing IT to a company that can do it better. Compared to the other big players in the industry, IBMC is dominated by business customers, with business to business transactions making up over 80% of all revenue in 2018<sup>6</sup>.

## **Value Chain**

First, let's talk about the IBMC value chain. Starting with primary strategic activities, in terms of inbound logistics, there's not much to talk about because cloud services don't require much in the form of raw materials or parts. This could be interpreted as human resources, but this is covered elsewhere in strategic activities and so inbound logistics is irrelevant in this case. Operations in this situation means development of new cloud services and maintenance and improvement of existing ones. Development is split up into teams organized by individual service, in which members are geographically collocated within teams. Each team has a manager, but beyond that there are very few constants from team to team with regard to

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<sup>6</sup> Rommety, V. M. (2019, February 26). IBM 2018 Annual Report. Retrieved from <https://www.ibm.com/annualreport/>

development style, team composition, and so on. Few resources are devoted to marketing and sales, and IBM is mostly relying on Watson's notoriety and their current clout to do the job for them, which is not working out well for them. Finally, service is the one part of IBM's primary value chain that I think is done really well. IBM has a somewhat odd way of doing service where developers themselves are contacts for major b2b clients and there is a customer service team available for individuals. This can limit dev time but does make business clients feel valued and lead to much better service outcomes (quicker problem resolutions and happier customers), which is more than worth the loss of productivity considering the size of the contracts that IBM mostly deals with. Moving on to secondary strategic activities, IBM's infrastructure isn't really notable, as it's pretty much the industry standard. In terms of technological development, IBM has a huge research team, and encourages all of their employees to contribute to this. This means that IBM has the most patents of any company every year and is able to stay semi-relevant in new and upcoming tech fields despite being an old company. Regarding Human resources management, costs are kept down by a recently implemented company-wide hiring and onboarding team. This compartmentalizes the costs associated with onboarding, allowing individual teams and departments to focus on other things, but also means that teams have less control over who they hire. Finally, for procurement IBM does almost everything in-house, from the servers that it hosts its cloud services on to the individual computers that those services are developed on. Two major exceptions to this were IBM's 2013 acquisition of SoftLayer, which itself became the starting point for the current IBM Cloud Services Division, and its acquisition of Cloudant in 2014, which is a non-relational distributed database service used by many other IBM services<sup>7</sup>.

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<sup>7</sup> IBM to Acquire Cloudant. (n.d.). Retrieved from <https://www-03.ibm.com/press/us/en/pressrelease/43238.wss>

There are two main inputs that IBMC uses to provide its services: physical servers and human resources. Physical servers are easily scalable, and at a price better than the rest of the industry due to the fact that IBM builds their own servers, but human resources are much trickier to deal with. There are essentially four key domains where human resources are needed: research, customer support, development, and maintenance. Research is by far the hardest group to manage, since researchers are in extremely high demand and thus must be compensated both fiscally and with regard to research projects. What this means is that IBM researchers are given a huge amount of freedom in what the research, with 50% of their time devoted to company mandated projects and 50% to projects of their own choice. This approach to research has led to the development of a plethora of features and services available on the IBM cloud platform, only some of which are profitable. Customer support, development, and maintenance are all much easier to hire for, since supply for these positions is much higher.

The major cost components here are the same as the major inputs: physical infrastructure and human resources. Unfortunately, no financial statements specific to the IBM Cloud Services Division are available that detail costs in any more detail than providing a gross total, so it is unknown exactly how much everything costs.

## **EXTERNAL ANALYSIS**

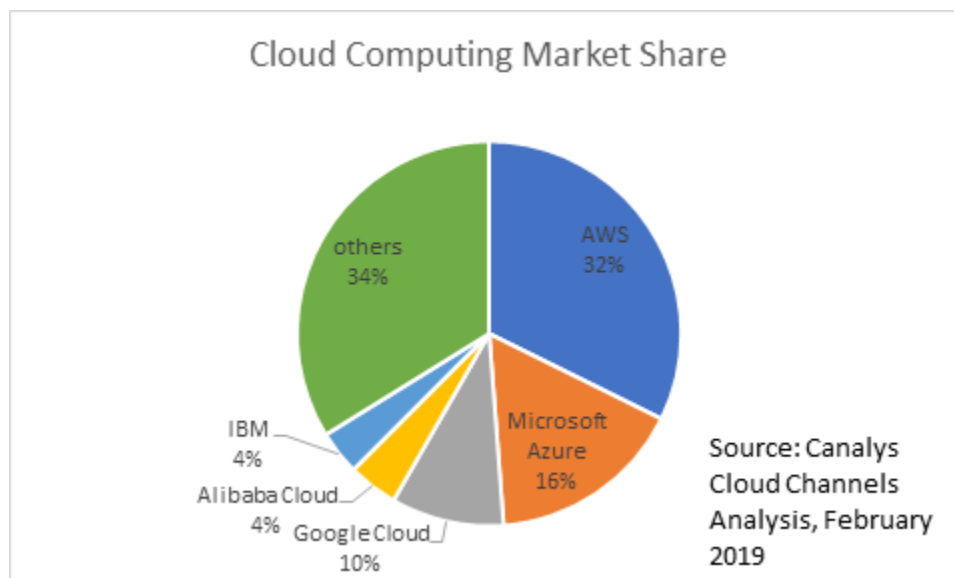
### **Competitors**

IBM Cloud's main competitors are Amazon Web Services, Microsoft Azure, and Google Cloud. Amazon is far and away the biggest in the industry, with control of nearly a third (32%) of all cloud market share. AWS offers fast, reliable web hosting for companies and individuals, and backs its product up with an aggressive marketing campaign including running video and TV ads and giving away millions of dollars' worth of cloud credits to developers at hackathons and other

events. Amazon has the biggest economies of scale of anybody in the industry, and with a product like cloud that is a huge advantage. Although AWS has a very strong reputation for cloud services, its artificial intelligence services are not very well developed at all.

Microsoft Azure is the second biggest contender, with 16% market share. Although it has only about half of Amazon's market share, Azure is leveraging its connection with Windows, and specifically Visual Studio and the C# language, to make it by far the easiest to use service in the industry for development on the Windows platform. Additionally, Microsoft has recently began investing more in AI marketing, running video ads focusing on it and featuring AI prominently in all marketing materials.

Finally, Google is not as big of a player in the cloud marketplace as the other two discussed here with only 10% market share, but it by far the leader when it comes to AI. Google Cloud sells itself mostly on the AI capabilities that it has rather than price or stability like azure and AWS, and this means that it is competing more directly with IBM than the other two.



## **Success Factors**

There are three key success factors in the cloud marketplace: ease of use, price, and unique capabilities.

Ease of use is exactly what it sounds like: how easy are the cloud services to use? This is important because it is the biggest influencer of developer preference, which is the biggest or even only deciding factor in businesses with small or exceptionally flat IT departments. There are a ton of things that go into ease of use, but the three biggest ones are modularity, developer support, and existing market share. Modularity is a measure of how customizable cloud services are and how many different options they support. Developer support is how much documentation there is for developers to use to quickly learn how to use a given cloud service. Finally, existing market share is a huge factor in ease of use because it determines which cloud platforms developers are likely to already be familiar with and which ones will be foreign to them. I looked into each of the competitors mentioned, and from my analysis Microsoft Azure does a better job with ease of use than IBM cloud due to its windows integrations and large market share, while AWS is about equal despite poor developer support due to its massive market share, and Google Cloud is slightly lower than IBM because of its esoteric documentation aimed at advanced developers and smaller market share. IBM is ranked where it is because it has more extensive and updated documentation than any of the other services, and even provides video tutorials for a ton of tasks.

Pricing is obviously a principal factor and is often the deciding factor for companies that want to minimize costs. In an analysis of prices for cloud computing performed by the cloud services company RightScale, it was found that Microsoft Azure was the cheapest service, matching or

beating out AWS for all scenarios researched, with Google Cloud the second cheapest, followed by AWS, followed by IBM<sup>8</sup>.

### **PEST Analysis**

From a political viewpoint, there are two major opportunities for IBM, both of which are in the government. The first is the current move for digitization, and the second is the intensifying call for more data security measures to be taken by the government. IBM is positioned as a reliable, highly secure company<sup>9</sup>, which gives it an advantage over services like AWS that have had widely publicized outages. Additionally, while competitors do perform some cloud services for the government, IBM holds a huge amount of government contracts, and is better positioned to do something like this. If IBM were to get either of these opportunities, it would not only be a huge contract in the short and long term but would also increase IBM's reputability among other customers. Economically, there are no opportunities that IBM has that are not also available to its competitors, but the big one here is that there is rapid growth occurring in developing marketplaces such as India, China, Brazil, and Russia, and it would be hugely beneficial for IBM to continue to invest in these markets. Socially, there is the increasing trend of using customer service as a substantial portion of product evaluation, which is an opportunity for IBM due to their high-quality support system. Finally, one technological factor at play is the continuous increase in cybercrime around the world, which is both a threat to IBM in that it could happen to it, but also an opportunity to differentiate itself from competitors by having good security.

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<sup>8</sup> Weins, K., & Weins, K. (2017, November 22). Cloud pricing comparison: AWS vs. Microsoft Azure vs. Google vs. IBM

<sup>9</sup> Rowland, C. (2017, June 12). IBM SWOT Analysis & Recommendations

## **Threats and Opportunities**

Overall, IBM has a plethora of opportunities available to it in the form of developing markets to invest in, possible new opportunities within government, and taking advantage of cybercrime paranoia to push its security solutions. As far as threats go, the biggest one is that IBM will simply lose relevance as a cloud computing provider if industry trends continue. This will mean that IBM will have trouble finding new clients due to low market share and relevance and its revenue will decrease until it becomes unviable to stay in the industry.

## **INTERNAL ASSESSMENT**

### **Core Competencies**

IBM has three core competencies: Artificial Intelligence, Customer Service and accessibility, and Quantum Computing. IBM is an industry leader in Artificial Intelligence with IBM Watson probably the most well-known AI in the world and services ranging from weather prediction to medical diagnosis. The only other competitor that has close to the same perceived AI competency is Google, with Microsoft catching up and Amazon lagging behind. IBM dedicates a huge amount of money and resources to AI research, and obtained an industry-leading 1,600 AI patents in 2018. IBM's Customer Service and accessibility are second to none in the industry, with more thorough documentation, better tutorials, and (for companies) higher quality customer service. Finally, IBM is currently winning the quantum computing race, with more powerful processors than anybody else, and this could be leveraged in cloud.

### **SWOT ANALYSIS**

As far as strengths go, the IBM brand is one of the strongest and most well-known in the tech industry. This brand strength helps IBM successfully attract and retain customers for both current and new products. Additionally, the company benefits from an enormous portfolio of

intellectual property. In 2018 alone IBM acquired over 9,000 patents<sup>10</sup>, and this strengthened both its brand and its competitive advantages. Finally, IBM has access to high economies of scale, which help to keep IBM competitive in spite of high development costs for new tech products. To quickly summarize, IBM's main strengths are a strong brand, massive amount of intellectual property, and access to economies of scale.

IBM Cloud Divisions main weaknesses are a lack of strong marketing presence, imitable products, and disorganized offerings. In terms of market presence, IBM does almost none, which has led to it being an almost unheard-of service among many developers. This leads to fewer customers, lower market share, and lower profits. Another crucial weakness is the imitability of most of IBM's offerings. IBM does a poor job of leveraging all of the unique intellectual property, AI expertise, and unique hardware advantages afforded to it by its situation and instead offers a product that is extremely similar in function to the rest of the market. While some degree of homogeneity is good, IBM has far too many unique opportunities to do something as limiting as this. Finally, IBM Cloud has very disorganized offerings. As mentioned before, there are over 170 individual services, separated into 16 different categories. This not only makes it difficult and intimidating for a customer to figure out what they want to buy, but also this oversaturation of features can lead to misallocation of budget and other problems. IBM has a range of important opportunities coming up, which it should take advantage of in order to see the best results. First, there is the opportunity to be first to market with a large-scale commercially viable quantum computing service. Although it's still about 5 years away, IBM is currently a good deal ahead of everyone else in the world in terms of advances in quantum

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<sup>10</sup> IBM Earns Record 9,100 Patents in 2018, Tops U.S. Patent List. (n.d.). Retrieved from <https://newsroom.ibm.com/2019-01-08-IBM-Earns-Record-9-100-Patents-in-2018-Tops-U-S-Patent-List>

computing, and if it were to invest even more heavily in this, as well as pair this competency with its cloud platform and be the first to market, it would not only be a huge source of competitive advantage but also slingshot IBM back into relevance in the cloud marketplace.

Another opportunity that IBMC has that is more immediately available is to invest more heavily in marketing in emerging economies. Doing so would help to increase IBMC's market share, increasing both profits and economies of scale.

Finally, IBM Cloud is facing some serious threats currently in the form of rapid loss of market share to competitors and loss of profitability from low-value but high-effort features and services. As mentioned earlier, IBMC has lost a massive amount of market share, and is only trending downward. The main problem here is not that IBMC isn't growing, in fact it grew 44% from 2017 to 2018, but that its competitors are growing much faster. As discussed before, loss of market share will not only hurt revenue but also margins due to loss of economies of scale. The other weakness here has also been mentioned: that a majority of IBM Cloud product offerings are making little to no money for the company, leaving a few high performing and highly profitable services to pick up the slack. This results in a huge loss of profitability not only from the loss of money by these other services, but also because the resources invested in those services could have been allocated to successful ones instead.

## STRATEGY GOALS

The goal of my strategic recommendation will be twofold: First, to maintain a profitable business in the short term, and second, to ensure the long-term sustainability of IBM Cloud Services.

Long-term sustainability means that IBM will be able to stay as a top cloud services provider over the next decades as the industry consolidates more and more, which currently looks unsure.

Short term profitability is of course exactly what it sounds like, which is maintaining or improving existing profit margins for the business division.

## STRATEGY ALTERNATIVES

Before getting into the main recommendation, there are three other possible alternative strategies. An examination of their likely outcomes in terms of results, viability, and feasibility will be made for each of them.

### **Liquidation**

Simply put, this strategy is to liquidate IBM Cloud Services as a division. The logic for this decision is that since IBM is rapidly losing relevance in the cloud marketplace, the best thing to do is to get out now before they lose anything. Although this would prevent IBM from taking any losses from cloud division, it makes little sense to do so financially because IBM Cloud is still profitable even with lower market share. If the trend continues for another 3 or 4 years this strategy will definitely become more viable as profitability decreases but pulling out now would be extremely preemptive. From a feasibility standpoint this is perfectly feasible but would lose IBM a lot of potential profits even if cloud is destined to fail.

### **Marketing Blitz**

This strategy is to significantly increase marketing efforts for IBM Cloud in an attempt to regain market share. From a sustainability standpoint, this would work as long as the marketing was effective enough, but therein lies the major issue with this plan: it relies too heavily on one thing. Additionally, even if the marketing did work, the cost of such a large-scale campaign would likely decrease profitability, which is one of our key strategic goals. Ultimately, the biggest winner in this plan would be whatever marketing firm IBM hired, as the cost of a campaign

would hurt profitability. In the event that this plan fails the consequences would be disastrous, and even if it succeeds it still requires taking a large financial hit up front.

### **Going Third-Party**

This strategy is similar to liquidation, in that IBMC would cease to directly provide cloud computing services to customers, but instead of completely ceasing operations it would migrate its offerings to other more popular cloud platforms. This has the benefits of lower scaling costs due to no servers to manage, access to a much larger customer base through third-party status, and the ability to retain many of IBM Cloud's key competitive advantages such as strong customer support, brand value, and ease of use over other services. Essentially IBM will offer everything but the actual physical hosting, and thus be able to be platform neutral, opening up more potential customers. The downsides to this plan are that there would likely be a significant decrease in revenue due to lower prices for third party services and fees associated with being on other platforms, as well as an increase in volatility due to reliance on other organizations. This strategy would utilize IBM's existing catalog of powerful AI solutions, analytics, and platforms, but it is unlikely that it's feasible. Although the profit margins may be higher in this situation, overall revenue would most likely be much lower, especially in the short term, and it would be difficult to justify laying off IBM Cloud Services Division's entire hardware division for this. Ultimately, although it plays well to IBM's strengths in terms of AI, platform ease of use, and unique solutions due to intellectual property solutions, it is not feasible and may not even be profitable.

## STRATEGY RECOMMENDATION

My strategy recommendation is this: Reallocate resources from unprofitable cloud features to invest more into quantum and AI research (as well as other more profitable features) and leverage these core competencies to differentiate IBM. The ultimate goal of this strategy is for IBM to be first to market with business-ready Quantum computing and market this heavily along with AI capabilities to win over new customers and regain market share.

### **BUSINESS UNIT**

At the research level, quantum will of course be given top priority, followed by plans to implement quantum computing in a cloud setting. Teams will need to be formed to implement these new features, and this will be done using people from unprofitable features. Once quantum is market ready, there will need to be a big marketing push for the new service

### **OPERATIONAL/FUNCTIONAL**

The nice thing about the strategy of reallocation is that IBM already does things like this regularly, so it won't be too much of a change from normal functional strategy in terms of the relationships needed between business units.

### **JUSTIFICATION**

This not only utilizes all of IBM strengths and plays into various market opportunities, but also is a unique opportunity for IBM. Quantum is inherently less imitable, and if IBM is first to market with it, they will be able to reap huge rewards. Quantum computing is highly desirable to businesses because it allows for certain computational problems to be solved much, much faster. On top of the concrete benefits that it provides, quantum computing is also a subject of considerable public interest, and if IBM were to be first to market with it, the impact on IBM's brand would be immense.

# IMPLEMENTATION PLAN

## **SEQUENCE**

There are two major parts of the envisioned cloud-based quantum computing system: the actual quantum computers themselves, which will be the bottleneck in terms of time, and the infrastructure that will allow cloud users to access it, which will need to be developed alongside the computers. The research team will focus mostly on the quantum aspect of the plan, while the development team will focus on creating a service that allows customers to access the solution. Initially developers will simply be reorganized to focus on more profitable features, since there would be no point in starting to implement a system for something that does not yet exist. This will also provide value on its own by streamlining IBMC's offerings and making its profitable services even better. Once the research team is ready, development focus will be shifted to the implementation of the quantum plan.

## **ORGANIZATIONAL CHANGES**

No major structural changes above the feature team level will be needed, but at that level there will be a ton of changes. Essentially this plan involves a total restructure of how IBM cloud development works, making the same number of teams, but with much more focused goals and cutting out features that aren't profitable.

## **RESOURCES AND PROJECTED RESULTS**

Looking at the immediate capital impact for this strategy, the actual effect will be negligible, since the strategy is simply to reallocate existing resource, no new debt will need to be taken on and no additional investment will be needed. The biggest impact that this will have right away is that during the restructure, productivity is almost guaranteed to fall, which is normal, but with

how often these restructures occur and how prepared IBM's organizational structure is for things like this, the loss should be minimized to a month at most. In the long-term, this of course has the potential to make IBM huge gains if the strategy succeeds and IBM is able to be first to market with quantum computing, but even if it isn't, the restructure of resources away from unprofitable projects will still save IBM money and make the services that are making profit even better. As far as a measurement and control strategy goes, these will be different between research and development. For research, IBM will implement a stricter deadline policy by working with employees to determine a fast but still realistic schedule for progress in quantum computing. For developers, currently used agile methodologies for progress tracking will continue.