



**School of  
Management and Law**

# **Alibaba's ambition to become a global player in cloud computing**

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## Management Summary

Digitization in today's world appears to be more and more important and cloud computing is supporting the trend as infrastructure provider and facilitator. Meanwhile, in China the cloud provider Alibaba Cloud seems to receive heavy government support and has a domestic market share of about 40% in this business; globally the market share is only 3%. Still, Alibaba Cloud claims to overtake Amazon, with its product Amazon AWS, by 2025. This is an impressive goal since Amazon AWS currently is leading the market with a share of 44.2% (2016). Can Alibaba Cloud make this large leap and take the cloud crown? How can Alibaba become a global player in cloud computing? This paper aims to answer the second question.

The seminal works have been analyzed leading to the fact that they mostly focus on cloud computing and China in general while not focusing on Alibaba Cloud. According to those works, seven critical success factors have been identified:

1. Trust
2. Government support
3. Data security
4. Quality of service
5. Ability to innovate
6. Partnership
7. Standardization

Government support for Alibaba Cloud is given and the company appears to be heavily investing in partnerships. China is planning to invest at least three percent of GDP into research which should end up in China being the top R & D spender worldwide by 2020, so the ability to innovate also is bright. The quality of service could only be rated by comparing the existing Service Level Agreements and not being of a competitive advantage. Trust and data security is still valued highly in the western world and the fact that Alibaba Cloud does not conform to the latest ISO standardization does not help much and underlines possible trust and data security issues. Therefore, it can be stated that Alibaba possibly needs to focus on building trust and ensuring data security for its cloud business unit in order to become a global player by the end of 2025.

Jack Ma, Founder of Alibaba once stated: "eBay may be a shark in the ocean, but I am a crocodile in the Yangtze River." It still remains to be seen how well the crocodile can battle the shark because they will finally meet in the ocean in the years coming. Clear is: the crocodile has grown bigger and bigger in the last years and has reasonably sharpened its teeth.

## Table of Contents

<b>I</b>	<b>List of Table and Figures.....</b>	<b>4</b>
I.I	Tables .....	4
I.II	Figures.....	4
<b>II</b>	<b>Introduction .....</b>	<b>6</b>
<b>III</b>	<b>Theoretical Framework .....</b>	<b>8</b>
III.I	Seminal works.....	8
III.II	Limitations .....	9
III.III	Filling the gap .....	9
III.IV	Methodology .....	9
III.IV.I	Process and materials .....	9
III.IV.II	Critical Success factors .....	10
<b>IV</b>	<b>Results .....</b>	<b>11</b>
IV.I	Findings.....	11
IV.I.I	Trust .....	11
IV.I.II	Government support.....	12
IV.I.III	Data security.....	12
IV.I.IV	Quality of service .....	13
IV.I.V	Ability to innovate.....	14
IV.I.VI	Partnership.....	15
IV.I.VII	Standardization.....	16
IV.II	Discussion .....	17
<b>V</b>	<b>Conclusion.....</b>	<b>18</b>
<b>VI</b>	<b>Reference List .....</b>	<b>20</b>
<b>VII</b>	<b>Appendix .....</b>	<b>22</b>
VII.I	Strategic position of Alibaba Cloud.....	22
VII.I.I	External analysis - Macro-environment .....	22
VII.I.II	External analysis – Industry / sector .....	23
VII.I.III	External analysis – Competitors and Markets .....	23
VII.I.IV	External analysis – Key Drivers of Change (KDC).....	23
VII.II	Definition of Critical Success Factors .....	24
VII.III	Survey “Cloud Computing – Survey on the largest providers“ .....	24
VII.III.I	Introduction .....	24
VII.III.II	Questions.....	25
VII.III.III	Organization and data collection .....	26
VII.III.IV	Results .....	26
VII.IV	Definitions for different cloud models .....	30
VII.V	Glossary .....	31

## I List of Table and Figures

### I.I Tables

Table 1: IaaS Public Cloud Services Market Share, 2015-2016 (Millions of U.S. Dollars) by Gartner (von der Meulen & Pettey, 2017).....	7
Table 2 : Critical Success Factors (CSF) for Alibaba Cloud.....	10
Table 3: PESTEL Analysis for cloud computing business .....	23
Table 4: Porter's six forces for cloud computing business.....	23
Table 5: Critical Success Factors (CSF) for Alibaba Cloud.....	24
Table 6: Questions and Ratings of survey.....	26

### I.II Figures

Figure 1: Tiers of services provided by Cloud computing Qualified. Image from HostingAdvice.com (Stamey, 2017).....	6
Figure 2: Survey result - To what extent do you trust the data security in general of the provider? (Average) .....	12
Figure 3: Survey result - Importance of data center.....	13
Figure 4: Survey result - Quality of Service for the Cloud Provider Products.....	14
Figure 5: China vs. USA: Outlook on Research & Development Spending (Abolhassan, 2017, p. 100).....	15
Figure 6: China goes its own way in cloud computing and big data (Wuebbeke, Meissner, Zenglein, Ives, & Conrad, 2016, S. 57).....	16
Figure 7: Survey results - How well are providers known? (Average).....	27
Figure 8: Survey results - Do you think that the products will still be available by the end of 2025?.....	27
Figure 9: Survey results - How would you rate the market position by the end of 2025? .....	27
Figure 10: Survey results - What is your impression of the quality of this product? .....	28
Figure 11: Survey results - How do you rate the offered functionalities, if known? .....	28
Figure 12: Survey results - To what extent do you trust the data security in general of the provider? (Average).....	28

Figure 13: Survey results - How much do you trust data security and privacy with data stored in Switzerland?..... 29

Figure 14: Survey results - How much do you trust data security and privacy with data stored in the EU? ..... 29

Figure 15: Survey results - How much do you trust data security and privacy with data stored in USA / China (According to the company headquarters)..... 30

Figure 16: Pizza as a Service as an entertaining comparison between the tiers..... 30

## II Introduction

In today's world, many traditional business models and processes are being replaced by digital concepts. Cloud computing is serving as a technical backbone to support digitization with its power, flexibility and scalability (Abolhassan, 2017, p. 122).

Meanwhile, the Chinese companies appear to be more and more shaping the global economy and China's government is addressing cloud computing as a part of the strategies "Made in China 2025" and "Internet Plus" (Wuebbeke, Meissner, Zenglein, Ives, & Conrad, 2016, S. 20). "Made in China 2025" is an initiative to comprehensively upgrade Chinese industry. One of the goals is intelligent manufacturing by applying the tools of information technology and leveraging from the power and flexibility of cloud computing. It seems that China is seeking a transition from a manufacturing and export-led powerhouse to a service-oriented and consumer centric mode and cloud computing is an important supporter here.

Alibaba, the Chinese company mainly known as an e-commerce giant, is offering cloud services with its unit "Alibaba Cloud" offering products in all cloud tiers but mainly investing in Infrastructure-as-a-Service (IaaS). Alibaba Cloud is the domestic market leader in China with an estimated 40% market share (Gray, 2017). The unit "Alibaba Cloud" is now opening up for global competition with the goal to surpass Amazon AWS, currently the global leader in cloud computing, by 2025 in the tier of IaaS (Jing & Dai, 2017).

When speaking about cloud computing, it is important to understand the different tiers of services provided:

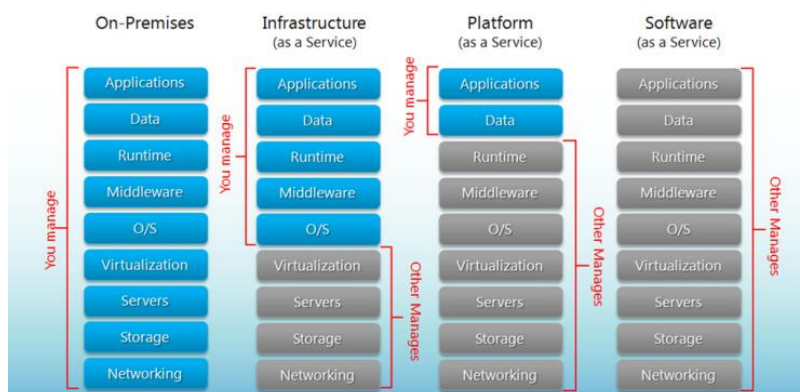


Figure 1: Tiers of services provided by Cloud computing Qualified. Image from HostingAdvice.com (Stamey, 2017)

As shown in Figure 1, the most flexible cloud approach is Infrastructure-as-a-Service (IaaS). Platform-as-a-Service (PaaS) is more restricted while Software-as-a-Service (SaaS) is the most restricted tier. Because of the flexibility and the importance of IaaS for Alibaba Cloud this paper will later focus only on IaaS, when referring to the term cloud computing.

Globally the market for public cloud business with focus on IaaS is dominated by four major players, three of whom are US companies and one of them a Chinese company.

Table 1 gives a brief overview of them:

Vendor	2015 Revenue	2015 Market Share %	2016 Revenue	2016 Market Share %	2015-2016 Growth %
Amazon	6'698	39.8	9'775	44.2	45.9
Microsoft	980	5.8	1'579	7.1	61.1
<b>Alibaba</b>	298	1.8	675	3	126.5
Google	250	1.5	500	2.3	100
Others	8'535	51.1	9'631	43.4	18.2
<b>Total</b>	16'861	100	22'160	100	31.4

*Table 1: IaaS Public Cloud Services Market Share, 2015-2016 (Millions of U.S. Dollars) by Gartner (von der Meulen & Pettey, 2017)*

As can be observed, Alibaba by the end of 2016 only has a market share of 3% with revenues of 675 million USD. The growth rate with 126.5% between 2015 and 2016 is impressive, but still the question remains:

### **How can Alibaba become a global player in cloud computing?**

The paper will focus on existing works first seeking for answers and possible indications for the above research question. In a second step potential success factors will be identified and described in order for Alibaba Cloud to succeed in the future. Lastly the criteria will be evaluated and a conclusion will be presented.

### III Theoretical Framework

#### III.I Seminal works

The book “China Cloud Rising” from Zhu (2014) is by far the most relevant work on China and cloud Computing. It does address the fact that Chinese government is pushing digitization which calls for domestic cloud computing competences and the software industry as a strategic area. Most part of the seminal work does however focus on the domestic situation of cloud computing in China and Alibaba is briefly mentioned, but unfortunately not in detail and especially not in a global context. Regarding the potential global success of a Chinese cloud computing provider Zhu (2014) states, that customers will take safety and security into consideration and value trust and data security highly. One sentence does sum it up well: “Without an overt brand strategy that signifies innovation, value, as well trust, China will have a difficult time to engage users outside of its borders.” (Zhu, 2014, S. 198 ff). It seems clear that cloud computing should be the driver which is transporting China from a production powerhouse to a service oriented future global player.

Abolhassan (2017) also is addressing China and the cloud in the book “The digital drivers of transformation” while arguing that many business processes in China were digitized for the end customer earlier than in the USA or Germany and that the “Internet Plus” initiative is based on the systematic integration of cloud computing (Abolhassan, 2017, p. 96). He mentions the big user base and mobile internet usage as an advantage China has with almost as many cell phones (1.2 billions) than the population (1.3 billions) and China being the first country to announce in 2012 that more people used their cell phone than their PC to access the internet. A good example of digitization in China combined with cell phone usage is mobile payment. 76% of metro Chinese consumers are using mobile wallets for payments compared to only 36% of the urban US population (Groenfeldt, 2017). It is proposed that with that kind of large customer base China has the best circumstances to gain experience in the cloud computing business and improve the services faster than the other competitors by experimenting in a well-protected environment in China.

Some evidence support the notion that Alibaba Cloud is indeed trying to take over the crown of Amazon AWS, who currently is the clear market leader with IaaS. This should be done in a classic way of doing business guided by Jack Ma: Go big then go after your



rivals (Tech Wire Asia, 2017). Alibaba Cloud appears to follow this principle as it seems to be modeled after its biggest competitor, Amazon AWS.

As a major challenge for China Abolhassan mentions the community, talent and sharing of ideas eventually tracing back to the counter-productive firewalling (Abolhassan, 2017, p. 103). It is questioned if the talent and know-how in China can still grow while having the currently known internet censorship ("Great Firewall") in place which does hinder exchanging know-how and sharing ideas in China and globally.

The paper "Industry Analysis: Cloud Computing" analyzes the cloud industry as a whole by creating Porter's five forces analysis gives an indicator about key success factors for cloud computing providers, namely: Security, Value, Expertise, Opportunity, Growth, Availability and maintaining partnership (Au-Yeung, Chu, Enfante, Logan, & Saelee, 2016). This work seems to be a good starting point in order to analyze the assessment of future success of Alibaba Cloud.

### **III.II Limitations**

The above mentioned seminal works are rather general and tend to focus primarily on the cloud business, to some extent, on the cloud computing business in China. None of the mentioned reports focus primary on Alibaba and a possible indicator of how Alibaba Cloud can become a global cloud player. The key success factors mentioned above only give an overview of the cloud computing industry in general, a specific list of critical success factors (CSF) for Alibaba could not be found.

### **III.III Filling the gap**

Therefore, the goal of this paper is to first of all understand the strategic position of Alibaba. This document then intends to fill the gap by creating CSF for the success of Alibaba Cloud and, in a second step, tries to assess them according to specified criteria based on the seminal works. It should then be possible to give an indicator how Alibaba Cloud will be able to become a global player in cloud computing.

### **III.IV Methodology**

#### **III.IV.I Process and materials**

As a first step, while the research on the subject was started, mainly internet researches did help to get an overview of the topic and create a first draft. Based on this first phase,

the writing process started accompanied by further researching specific topics mainly by reading the identified seminal works and doing further research on the internet; completing the analysis of Alibaba Cloud's strategic position and getting an overview of the cloud computing business overall. As a third step, primarily by accessing the read information, a set of factors have been identified to try to measure the success factors of Alibaba Cloud in the future (see III.IV.II Critical Success factors).

Soon a specific topic, namely the question: "How trustworthy is a Chinese cloud computing provider in the eyes of a Westerner" came up and was a potential limitation for this paper. Not much information on this topic could be gathered from existing seminal works and therefore an additional survey has been created and concluded to get more insight on this topic.

### III.IV.II Critical Success factors

A CSF would need to have a positive or negative impact on how Alibaba can become a global player in cloud computing. Based on the researched literature the following success factors could be identified:

Critical Success factor	Key Question
Trust	Will the end customer in general trust a Chinese cloud provider enough that there will be enough customers?
Government support	Will the Chinese government support Alibaba Cloud enough to be successful?
Data security	Will the end customer be convinced that his data is secure on the Alibaba Cloud?
Quality of Service	Will the quality of the Alibaba Cloud service be sufficient to please the end customer?
Ability to innovate	Will the ability to innovate be available for Alibaba Cloud in order to constantly innovate?
Partnership	Will Alibaba Cloud be able to leverage from partnerships to increase trust and market share?
Standardization	Will China be able to harmonize with international Standards?

Table 2 : Critical Success Factors (CSF) for Alibaba Cloud

In order to evaluate the above CSF the existing seminal work will be considered. Additionally, for the CSF of “Trust”, “Data Security” and “Quality of Service” a survey has been concluded to get more insights; since the paper will mostly rely on seminal work, the details of the survey, including an introduction, Questions asked, an explanation of the data collection and the results, have been moved to the appendix (VII.III, Survey “Cloud Computing – Survey on the largest providers”).

## IV Results

### IV.I Findings

This section describes the findings regarding the critical success factors and thus aims to give an insight of how Alibaba Cloud can become a global player by the End of 2025. The CSF's defined in chapter III.IV.II will therefore be analyzed for each of them the findings will be stated below starting with the CSF of “Trust”.

#### IV.I.I Trust

Based on the study of Abolhassan (2017) digital transformation requires trust. It has been argued that more than one-third of all Germans say that they are mostly afraid of digitization and only the under-45s embrace the change and have a certain trust for future implementations (Abolhassan, 2017, p. vii). For this reason, the CSF of trust will be analyzed in the first step and might be one of the more important factors for Alibaba Cloud to master.

In order to make a more precise statement about the CSF trust and answer the key question a survey has been analyzed. Answers from the survey have come mainly from European persons which might have a different view on Alibaba Cloud in terms of trust compared to a Chinese person. In all trust-related questions the Alibaba Cloud had by far the lowest value when it comes to trust and data security.

The minimum value for an answer was 0 stating “No trust” as description while the value of 10 stands for the maximum value of trust stating “Maximal trust” as the option to choose. Figure 2 displays the result of the question “To what extend do you trust the data security in general of the provider?” and Alibaba Cloud only had an average of 1.88 out of 10.00.

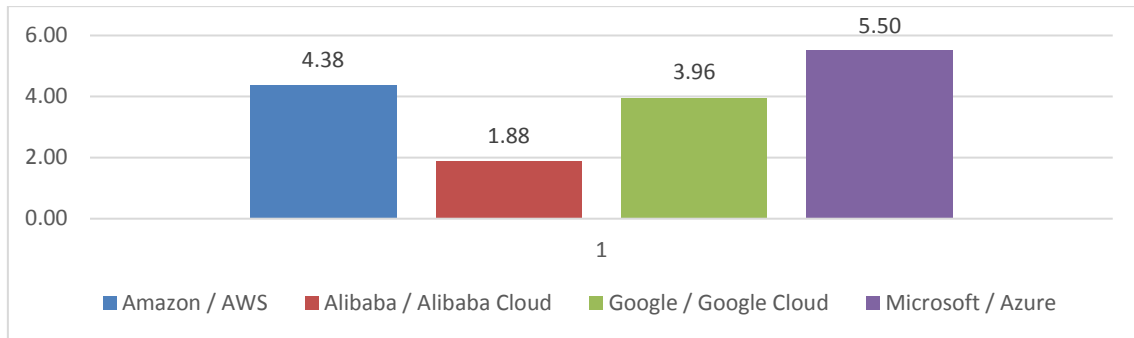


Figure 2: Survey result - To what extent do you trust the data security in general of the provider? (Average)

One needs to say that fear of the unknown could also be a reason for the low rate of trust for Alibaba Cloud, since Alibaba was by far the least known cloud provider of the four candidates (Appendix, Figure 7: Survey results - How well are providers known? (Average)).

#### IV.I.II Government support

Support from Chinese government is still a very important factor for Alibaba to grow further. The desire to further go into the path of digitization is still unbroken and this fact should likely have a positive impact on the cloud computing business in China, where currently Alibaba Cloud has a strong market share of about 40%.

The new Chinese cybersecurity law is forcing foreign companies doing business in China to store data only locally in China (KPMG China, 2017). This could be an additional driver for further domestic growth of Alibaba Cloud in China. Those foreign companies who decide to not host data on their own technical platforms could choose Alibaba Cloud as the Chinese cloud computing provider complying with the Chinese cybersecurity law. Furthermore, cloud computing is included in the two major Chinese government programs “Made in China 2025” and “Internet Plus” making it obvious that government is supporting the cloud computing business and their biggest asset, Alibaba Cloud.

Summarizing those facts, it is highly likely that the existing Government support for Alibaba Cloud will be sufficient.

#### IV.I.III Data security

Data is the raw material of the new digital economy and could be mentioned as the successor of money. Therefore, a sensitive approach to data is crucial to survive in the cloud computing business. The physical location of the given data center seems to be an

important factor in the perception of data security. The concluded survey did ask for data security aspects, if the cloud provider would host the data in a) Switzerland, b) the EU and c) in the USA or China.



Figure 3: Survey result - Importance of data center

The above Figure 3 clearly shows that trust in data security seems to be far better, if located in Switzerland. Alibaba Cloud had in general the lowest outcome of the companies, but also here a local data center seems of importance.

Therefore, it can be stated that local data centers for Alibaba Cloud are an important critical success factor. Alibaba Cloud is already addressing this by expanding its international footprint and launching four new data centers in Europe, Australia, the Middle East and Japan (von der Meulen & Pettey, 2017). Furthermore, Alibaba Cloud itself announced in a press statement that it will also open additional data centers in Mumbai, India and Jakarta, Indonesia by the end of March 2018 (Alibaba Cloud, 2017). On the contrasting side, the new Chinese cyber security law heavily emphasizes the importance of data for the Chinese Government and raises the question, if data placed in data centers outside of China really stays outside.

#### IV.I.IV Quality of service

Zhu (2014) states that “Quality of services counts as a main competitive advantage as sales engagement has changed from a one-time transaction to a long-term service contract. The survival and success of the provider will increasingly rely on its service quantity and quality, which will be used to calculate the perceived value of its products and services.” (Zhu, 2014, S. 31). Unfortunately no reliable source could be found during the research about the quality of the products offered by Alibaba Cloud and comparing them to the other cloud providers.

Possibly the provided Service Level Agreements (SLA) give the one of the better indications for this CSF, however the difference is marginal. All mentioned cloud providers offer a monthly uptime percentage of 99.95% with only Google Cloud offering 99.99%. Also, the survey has asked the question about “What is your impression of the quality of this product?” and the results were as follows:

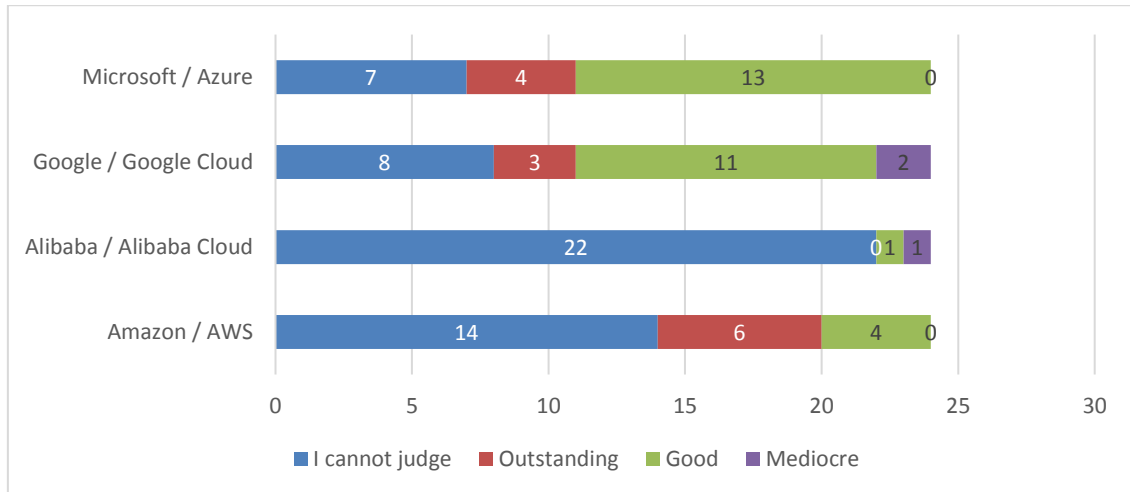


Figure 4: Survey result - Quality of Service for the Cloud Provider Products

Unfortunately, regarding the quality of service of Alibaba Cloud, no conclusion can be derived from the answers in the survey as most participants could not judge the quality of this cloud provider. It seems however that the experience in general with Alibaba Cloud is by far the lowest leading to a possible fact that this cloud provider is the least known of the four compared providers.

#### IV.I.V Ability to innovate

There apparently is a widespread impression of China not able to innovate, mainly rooting from stories about stolen ideas, patent infringements and copies in the past. In this case the CSF for innovation might be one of the most difficult one to master for Alibaba Cloud. According to Abolhassan (2017), China has an excellent chance to innovate and excel while pushing digitalization domestically, mainly for the following reasons:

1. Market dominance will force even more international companies to share knowledge with Chinese companies via Joint-Ventures
2. Better protection of patents and intellectual property rights in China should eventually lead to more innovation since Chinese entrepreneurs are force to boost their own innovation

3. Increased spending on research and development (R&D) in China with the goal to assign at least three percent of GDP into research. This would lead to China being the top R&D spender worldwide by 2020 (see Figure 5) and even surpass the united states in this category

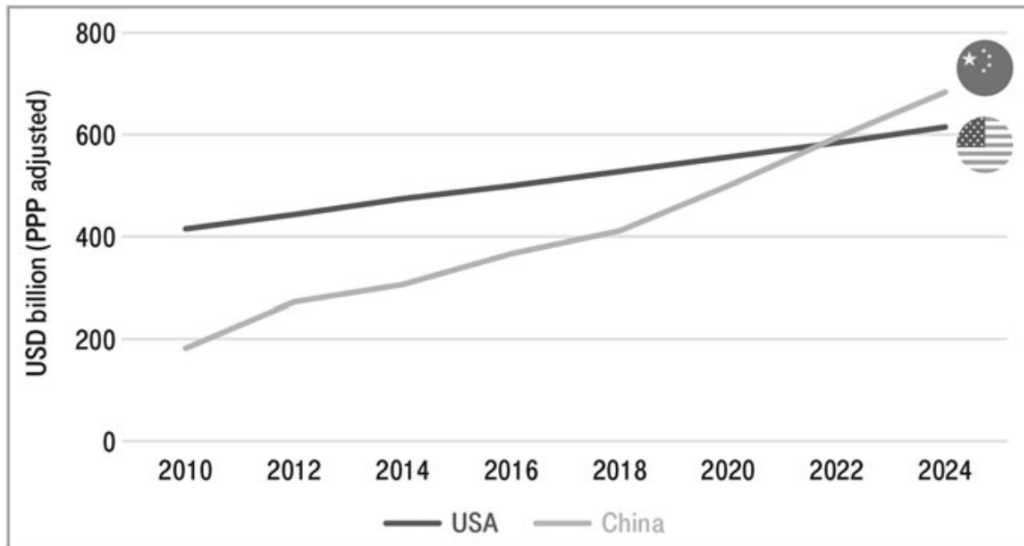


Figure 5: China vs. USA: Outlook on Research & Development Spending (Abolhassan, 2017, p. 100)

Having the right talent however might be a challenge for China and Alibaba. China is still struggling to cover its need for specialists and the “Great Firewall” is also suppressing the flow of information and therefore limiting innovation (Abolhassan, 2017, p. 102).

#### IV.I.VI Partnership

Starting from 2016 Alibaba Cloud has been heavily investing in strategic partnerships with other corporations. The business of Alibaba is aiming to increase its publicity by leveraging from those partnerships. The last two years, Alibaba has partnered with Accenture, IBM, Megaport and Eficode. In Germany Alibaba Cloud is partnering with Vodafone to co-locate its first data center in Frankfurt and customers can now purchase Alibaba Cloud products from Vodafone (Vodafone, 2016).

Alibaba Cloud is also sponsoring the Olympic Games through 2028 in a deal that has a reported value of \$800 million. This sponsorship is putting Alibaba in the same league like Coca Cola and Samsung by providing online computing services and data analytics for the Olympic Games and therefore putting the Alibaba Cloud platform on the spotlight (Panja, Wang, & Satariano, 2017).

#### IV.I.VII Standardization

Will China be able to harmonize with international Standards? It seems that China is in general willing to adhere more to international standards in the future. However, the reality differs as Wuebbeke et al. did state in their paper about “China 2025”. State-owned enterprises and state-dominated associations could use their influence to give external enterprises a hard time and thus still not complying with international standards. A possible reason in for this behavior might be the protection of the domestic market which is, depending on the industry sector, more or less dominated by state-owned enterprises.

The paper furthermore identified the rate of correlation with international standards in various categories:

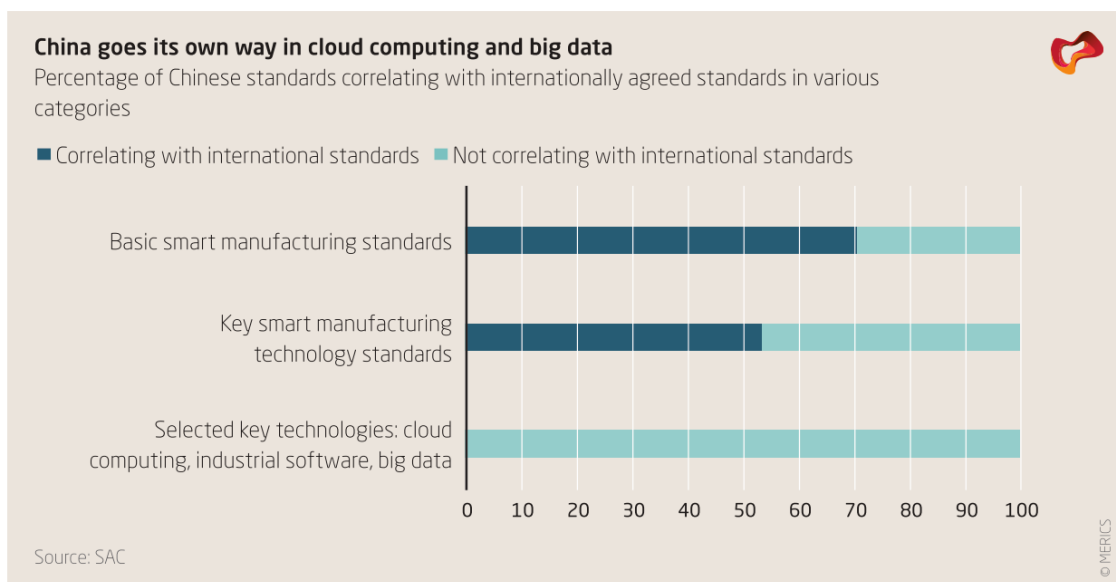


Figure 6: China goes its own way in cloud computing and big data (Wuebbeke, Meissner, Zenglein, Ives, & Conrad, 2016, S. 57).

The above figure gives us the impression that cloud computing in China is not complying with international standards at all. Is this really the case?

The most important standard is ISO 27018 which covers the following topic: “Information technology - Security techniques - Code of practice for protection of personally identifiable information (PII) in public clouds acting as PII processors” (International Organization for Standardization, 2014). What is standing out of ISO 27018 is the fact that the cloud provider will not use customer data for their own purposes without the customers consent and that the provider will need to establish a clear and transparent parameters for the return, transfer and secure disposal of personal



information. The ISO certification is therefore generally regarded as a major milestone for cloud computing providers. Amazon AWS, Google Cloud and Microsoft Azure do comply with the ISO 27018 standard. Alibaba Cloud does not. The Chinese cloud computing provider only complies with ISO 27001, an older, more lightweight and not at all focused on cloud computing certification.

#### **IV.II Discussion**

First of all it needs to be stated that the process of getting clear information about the future strategy of Alibaba Cloud was very difficult. The studies also revealed that it is difficult to have a hard factor to say if and when Alibaba Cloud can really become a global force.

The most important points seem to be the topics of “trust” and “data security” which customers value highly and apparently, according to the survey, do not seem to be taken so serious of a Chinese cloud computing provider. The identified critical success factor “Standardization” did state, that Alibaba Cloud is not fulfilling the same standards compared to the other mentioned cloud computing providers. This could possibly shed a negative light also on “trust” and “data security” however it needs to be critically challenged, it small and medium corporations do value this fact highly enough to be a CSF.

A possible limitation of this paper is the CSF of “Quality of Service” which was analyzed based on the SLA's of the cloud providers and the concluded survey. Both might not be adequate and sufficient to make a clear statement about the quality of service by Alibaba Cloud and this would need to be further researched.

## V Conclusion

This paper has investigated how Alibaba Cloud can become a global player by the end of 2025. The aim was to first get an understanding of the current strategic position of Alibaba Cloud and then identify possible critical success factors in order to analyze each of them separately.

This work contributes to the existing public knowledge by first of all identifying and later on focusing on the critical success factors for Alibaba Cloud. It seems clear that the Chinese government is actively supporting the Chinese Cloud business and thus also Alibaba Cloud. Digitization in China is far more advanced than many might think and it will be even more pushed with the implementation of “China 2025” and “Internet Plus”. With a population of 1.4 billion people there is no way around cloud computing and its benefit of flexibility and scalability in order to cover the future needs for digitization. Digitization and the heavy use of mobile devices requires cloud computing and thus the prospect for Alibaba Cloud to at least grow more domestically in the future is highly likely. Although the outlook looks good for Alibaba Cloud to become a global player there are three CSF standing out which need special attention when Alibaba Cloud goes global and tries to create more revenue outside of China.

The critical CSF are “Trust”, “Data Security” and “Ability to innovate”. Trust and data security is still valued highly in the western world and a Chinese cloud provider is still scanned critically. The fact that Alibaba Cloud does not conform to the latest ISO standardization does not help much and underlines possible trust and data security issues in the eyes of a Westerner. The findings of this research support the idea that the biggest challenge for Alibaba Cloud will be to gain the required trust of future foreign customers. Chinese government is emphasizing the importance of data with the new Chinese cybersecurity law giving an explanation mark that Chinese data stays in China and is of high importance for the government. On the other hand, the future success of Alibaba Cloud lies in the fact to convince global customers that their data will stay in the chosen local data center and will not be used otherwise. Clever handling of these opposites could have a significant impact on the future success of Alibaba Cloud.

Returning to the research question posed at the beginning of this study, it can now be stated that Alibaba possibly needs to focus on building trust and ensuring data security for its cloud business unit in order to become a global player by the end of 2025. Complying the newest ISO 27018 certification would be one of the steps to implement as soon as possible to gain more trust and put Alibaba Cloud on the same level as the current main competitors in the sector of cloud computing.

For this study, a number of important limitations need to be considered. First there is a lack of clear corporate strategy information from Alibaba Cloud and it seems that the business unit of Alibaba is not so much predictable. After all, who knows what the next step of Jack Ma will look like? Secondly the conducted survey resulted in only 24 answers. Although most of the answers came from IT experts, this is a rather low amount for a statistical analysis. The research question also proved a difficult one to fulfill since in the ever changing global economy might prove some of the listed CSF's wrong only in some months of time. A factor which has been consciously omitted in this study is the question of competitive pricing where possibly Alibaba Cloud might have an edge over the competitors but this would also need to be further researched.

Further research and investigation could be conducted to more precisely define the issue of trust from western customers to Alibaba Cloud and how this affects future success. Since the issue of data security is not only relevant to IT experts a possible broader approach with a new survey could shed light on the public view of the topic data security.

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## VII Appendix

### VII.I Strategic position of Alibaba Cloud

The strategic position of Alibaba Cloud in the cloud computing business has been analyzed to get a better understanding of the business unit of Alibaba and to come up in the end with critical success factors to predict how Alibaba Cloud can become a global player in cloud business.

#### VII.I.I External analysis - Macro-environment

In order to analyze the macro-environment of cloud businesses the PESTEL framework has been used. The below PESTEL values are based on the theories of Issa, Chang & Issa. (Issa, Chang, & Issa, 2010). Further additions have been made by the author; marked in italic to better distinguish.

<b>Political</b>	<b>Economic</b>
<ul style="list-style-type: none"> <li>• Government regulations and legal issues</li> <li>• Borderless jurisdiction in the cloud with problem of clear responsibilities</li> <li>• <i>Strategic government support</i></li> <li>• <i>Possible favorable tax treatment</i></li> <li>• <i>Sustainable development politics</i></li> </ul>	<ul style="list-style-type: none"> <li>• Reduction in capital expenditure</li> <li>• Requires little capital investments to start a business</li> <li>• Utility-based: Business needs to pay only what it really needs</li> <li>• <i>Often better security than local, on premise installations</i></li> <li>• <i>Open business platform</i></li> </ul>
<b>Social and demographic</b>	<b>Technological</b>
<ul style="list-style-type: none"> <li>• Consumer awareness</li> <li>• Citizens attitudes</li> <li>• Privacy issues &amp; Different level of data sensitivity</li> <li>• Possible effect on job security of employees</li> <li>• <i>New skills development for the future</i></li> </ul>	<ul style="list-style-type: none"> <li>• High availability because of centralized resources and redundancy</li> <li>• High durability</li> <li>• High flexibility with possibility to change provider anytime</li> <li>• <i>High scalability to increase or decrease resources on request</i></li> </ul>
<b>Environmental / Ecological</b>	<b>Legal</b>

<ul style="list-style-type: none"> <li>• <i>Less infrastructure globally since cloud infrastructure is shared</i></li> <li>• <i>Resources on demand reduce energy consumption</i></li> </ul>	<ul style="list-style-type: none"> <li>• Concern in the storage of sensitive data</li> <li>• Ethically give possibility for provider to access data technically</li> <li>• Possible legal action if information is used in an unauthorized manner</li> <li>• Protection of intellectual property</li> </ul>
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Table 3: PESTEL Analysis for cloud computing business

### VII.I.II External analysis – Industry / sector

The following Porters' six forces summary have been identified for the cloud computing business based on the works of (Au-Yeung, Chu, Enfante, Logan, & Saelee, 2016). The author provides an in deep analysis of the cloud computing industry leading to the following summary.

Forces of competition	Competitive force strength
Threat of new entrants	Low to moderate
Rivalry among existing firms	High
Threat of substitute products or services	High
The bargaining power of buyers	High
The bargaining power of suppliers	Moderate
The relative power of other stakeholders	Moderate

Table 4: Porter's six forces for cloud computing business

### VII.I.III External analysis – Competitors and Markets

Especially for the IaaS Sector, the most important competitors of Alibaba Cloud are:

- Amazon Web Services (AWS), Google Cloud and Microsoft Azure

They have already been described in Table 1.

### VII.I.IV External analysis – Key Drivers of Change (KDC)

Based on the external analysis with the PESTEL Framework and industry analysis the following list of key drivers of change have been identified:

- Cost savings – Not needing invest in large initial investments for infrastructure
- Mobility – The need to access content from everywhere anytime

- Agility, Flexibility and Scalability – Ability to scale up and down as per the businesses requests
- Internet of Things (IoT) – IoT will be a major driver of cloud computing
- Human Resources – Ability to free up IT staff for other projects

## VII.II Definition of Critical Success Factors

Based on the external analysis the following critical success factors (CSF) have been identified for Alibaba Cloud:

Critical Success factor	Key Question
Trust	Will the end customer in general trust a Chinese cloud provider enough that there will be enough customers?
Government support	Will the Chinese government support Alibaba Cloud enough to be successful?
Data security	Will the end customer be convinced that his data is secure on the Alibaba Cloud?
Quality of Service	Will the quality of the Alibaba Cloud service be sufficient to please the end customer?
Ability to innovate	Will the ability to innovate be available for Alibaba Cloud in order to constantly innovate?
Partnership	Will Alibaba Cloud be able to leverage from partnerships to increase trust and market share?

Table 5: Critical Success Factors (CSF) for Alibaba Cloud

## VII.III Survey “Cloud Computing – Survey on the largest providers“

### VII.III.I Introduction

The seminal work hat limitations regarding two CSF, namely “Trust”, “Data security,” and “Quality of Service”. To get additional insights on those factors, a survey has been concluded technically based on “Google Forms”.

The survey did focus on the following cloud computing provider:

- Amazon with product AWS
- Alibaba with product Alibaba Cloud
- Google with product Google Cloud



- Microsoft with product Azure

### VII.III.II Questions

For every cloud computing provider the following questions have been posed:

Question	Rating
How well <b>do you know the provider</b>	1 to 10
“Amazon/Alibaba/Google/Microsoft” with the product “AWS/Alibaba Cloud/Google Cloud/Azure”?	1 = Not at all / Never heard of 10 = Very well
Do you think that the <b>product</b> “AWS/Alibaba Cloud/Google Cloud/Azure” will still be <b>available on the market by the end of 2025?</b>	Yes or No
How would you <b>rate the market position by the end of 2025</b> compared to other cloud providers?	<ul style="list-style-type: none"> <li>- I cannot judge</li> <li>- Product will have the largest market share</li> <li>- Product will be in midfield</li> <li>- Product will have the least market share</li> </ul>
What is your impression of the <b>quality of this product?</b>	<ul style="list-style-type: none"> <li>- I cannot judge</li> <li>- Outstanding</li> <li>- Good</li> <li>- Mediocre</li> <li>- Bad</li> </ul>
How do you <b>rate the offered functionalities</b> , if known?	<ul style="list-style-type: none"> <li>- I cannot judge</li> <li>- The offered functionality does not cover my needs</li> <li>- The offered functionality is sufficient for me</li> <li>- The offered functionality goes beyond my needs</li> </ul>
To what extent <b>do you trust the data security</b> in general of the provider?	1 to 10 1 = No trust 10 = Maximal trust

How much do you <b>trust</b> that the aspects of <b>data security and privacy</b> will be fully respected when the <b>data is stored in a data center in Switzerland?</b>	<ul style="list-style-type: none"> <li>- I cannot judge</li> <li>- I do not trust at all</li> <li>- I tend not to trust</li> <li>- I rather trust</li> <li>- I fully trust</li> </ul>
How much do you <b>trust</b> that the aspects of <b>data security and privacy</b> will be fully respected when the <b>data is stored in a data center in the EU?</b>	<ul style="list-style-type: none"> <li>- I cannot judge</li> <li>- I do not trust at all</li> <li>- I tend not to trust</li> <li>- I rather trust</li> <li>I fully trust</li> </ul>
How much do you <b>trust</b> that the aspects of <b>data security and privacy</b> will be fully respected when the <b>data is stored in a data center in USA / China?</b> (According to the company headquarters)?	<ul style="list-style-type: none"> <li>- I cannot judge</li> <li>- I do not trust at all</li> <li>- I tend not to trust</li> <li>- I rather trust</li> <li>I fully trust</li> </ul>

Table 6: Questions and Ratings of survey

### VII.III.III Organization and data collection

The survey was once shared on social media (Twitter, LinkedIn) and also potential subjects were addressed directly. Especially since this is a narrow topic which requires specialist know-how in cloud computing the directly addressed group did consist of IT staff with at least basic know-how of cloud products. In total there were 24 answers to the survey. Totally 39 potential subjects where addressed directly via e-mail and 16 of them did participate resulting in a result rate of 41%. 8 answers came either though the social media sharing or have been posted anonymously.

### VII.III.IV Results

How well do you know the provider “Amazon/Alibaba/Google/Microsoft” with the product “AWS/Alibaba Cloud/Google Cloud/Azure”?

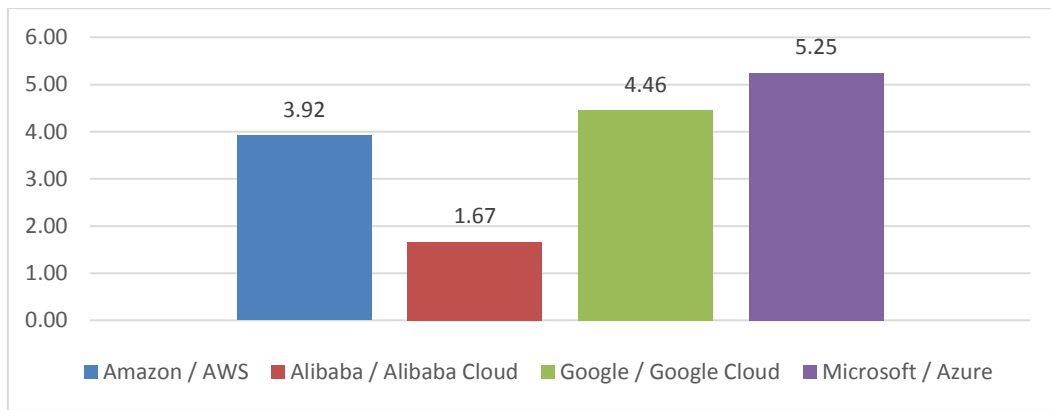


Figure 7: Survey results - How well are providers known? (Average)

Do you think that the product “AWS/Alibaba Cloud/Google Cloud/Azure” will still be available on the market by the end of 2025?

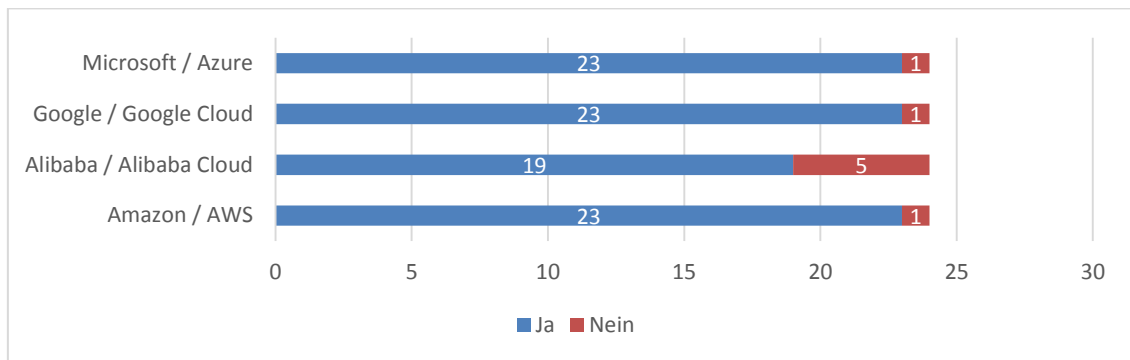


Figure 8: Survey results - Do you think that the products will still be available by the end of 2025?

How would you rate the market position by the end of 2025 compared to other cloud providers?

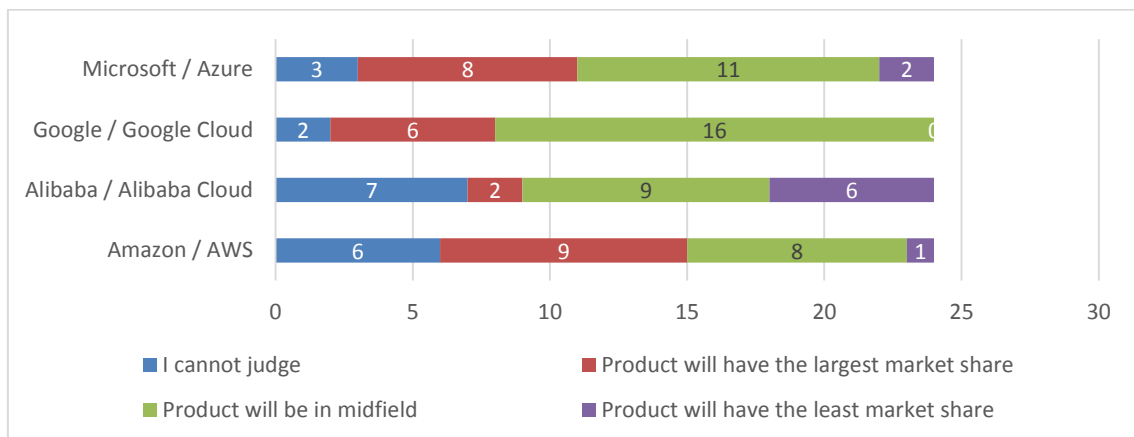


Figure 9: Survey results - How would you rate the market position by the end of 2025?

What is your impression of the quality of this product?

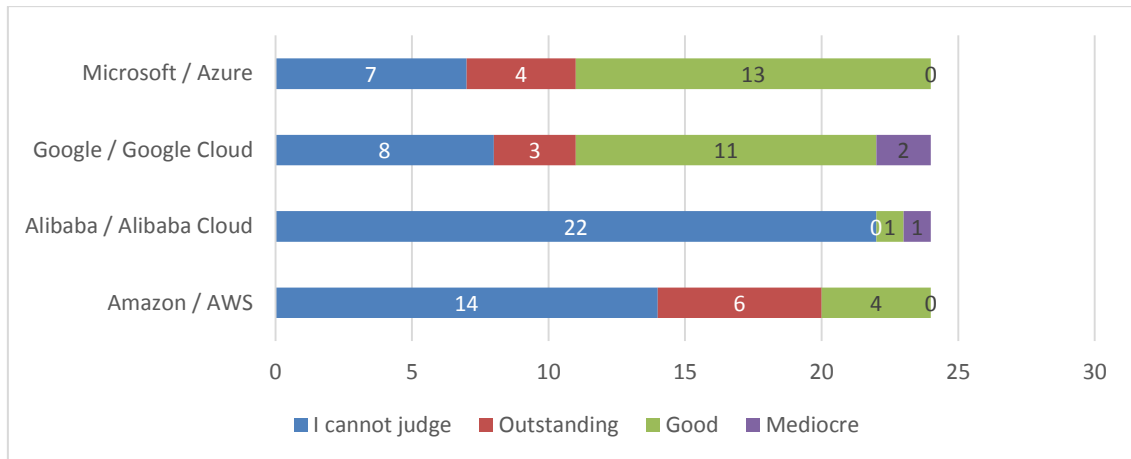


Figure 10: Survey results - What is your impression of the quality of this product?

How do you rate the offered functionalities, if known?

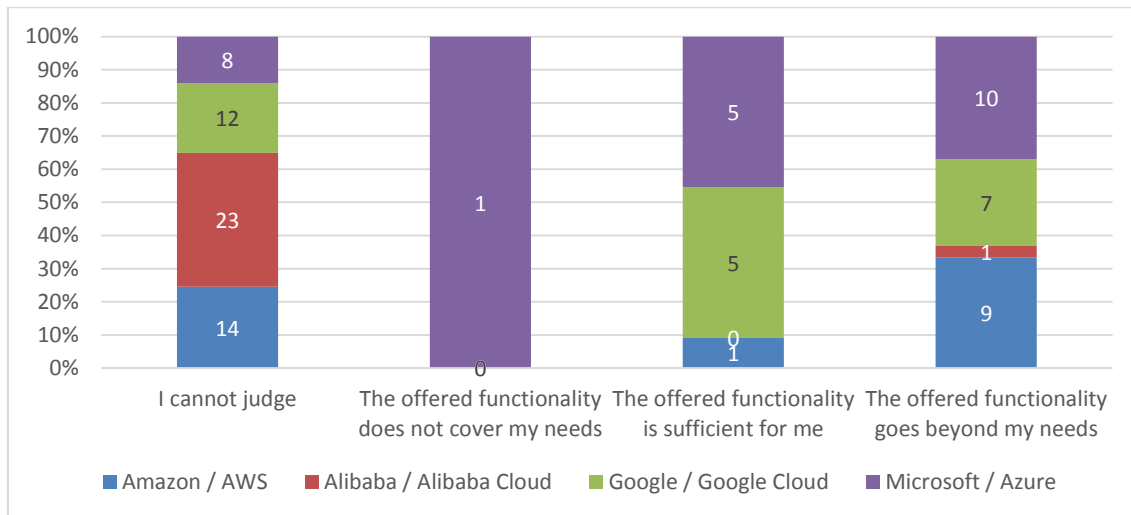


Figure 11: Survey results - How do you rate the offered functionalities, if known?

To what extent do you trust the data security in general of the provider?

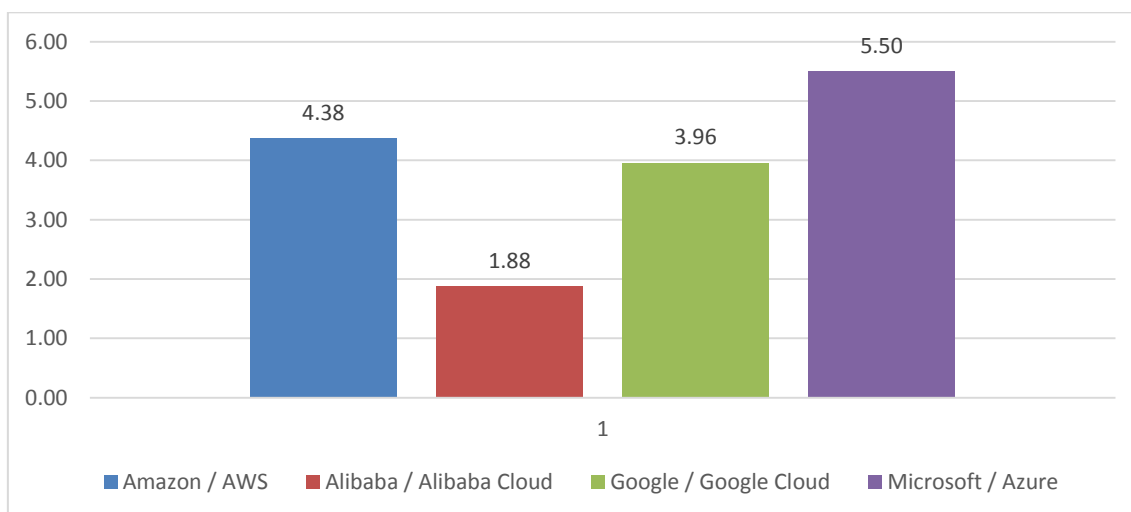


Figure 12: Survey results - To what extent do you trust the data security in general of the provider? (Average)

How much do you trust that the aspects of data security and privacy will be fully respected when the data is stored in a data center in Switzerland?

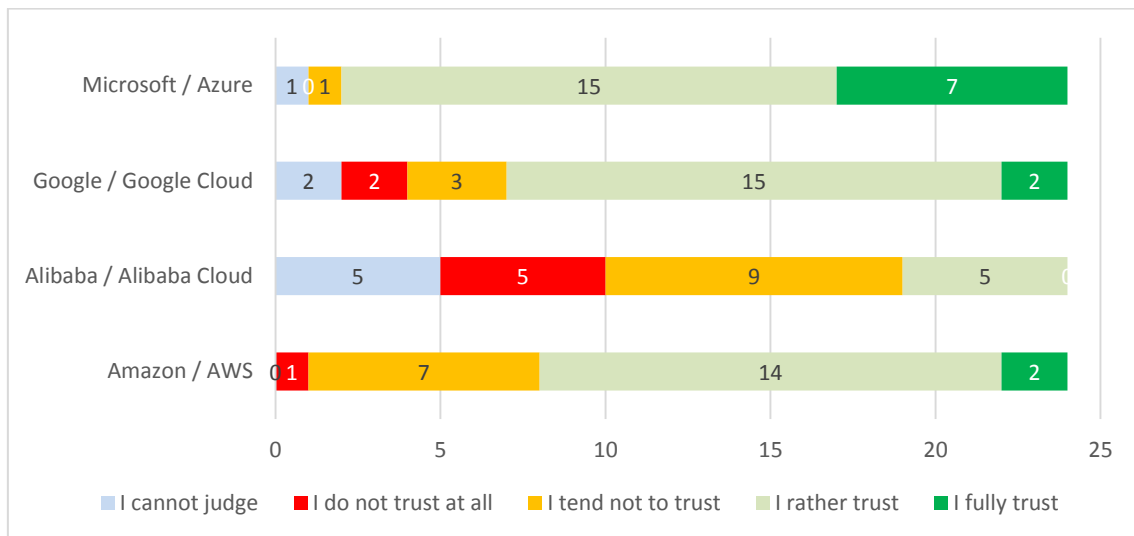


Figure 13: Survey results - How much do you trust data security and privacy with data stored in Switzerland?

How much do you trust that the aspects of data security and privacy will be fully respected when the data is stored in a data center in the EU?

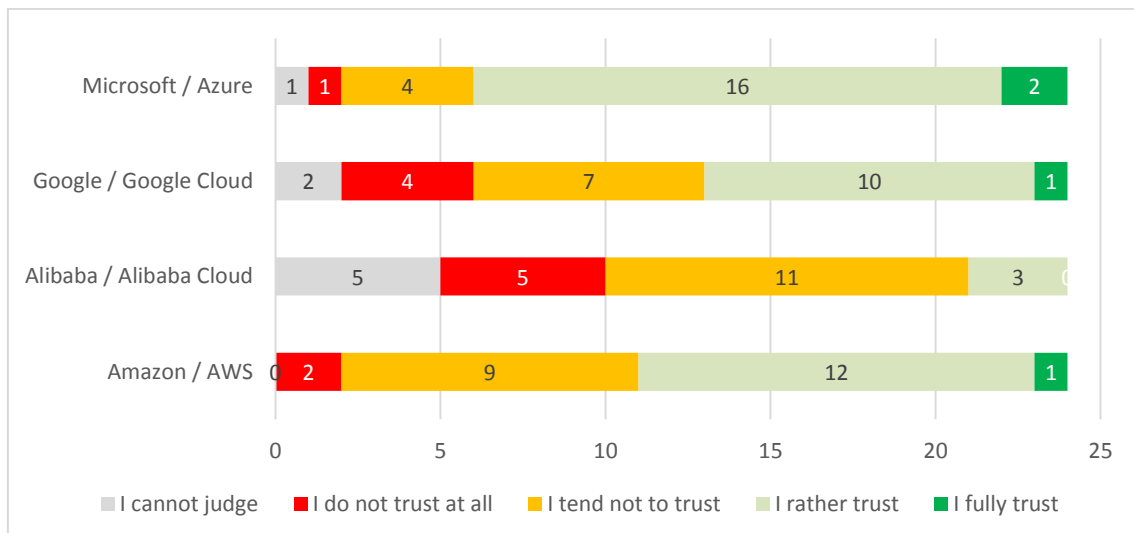


Figure 14: Survey results - How much do you trust data security and privacy with data stored in the EU?

How much do you trust that the aspects of data security and privacy will be fully respected when the data is stored in a data center in USA / China? (According to the company headquarters)

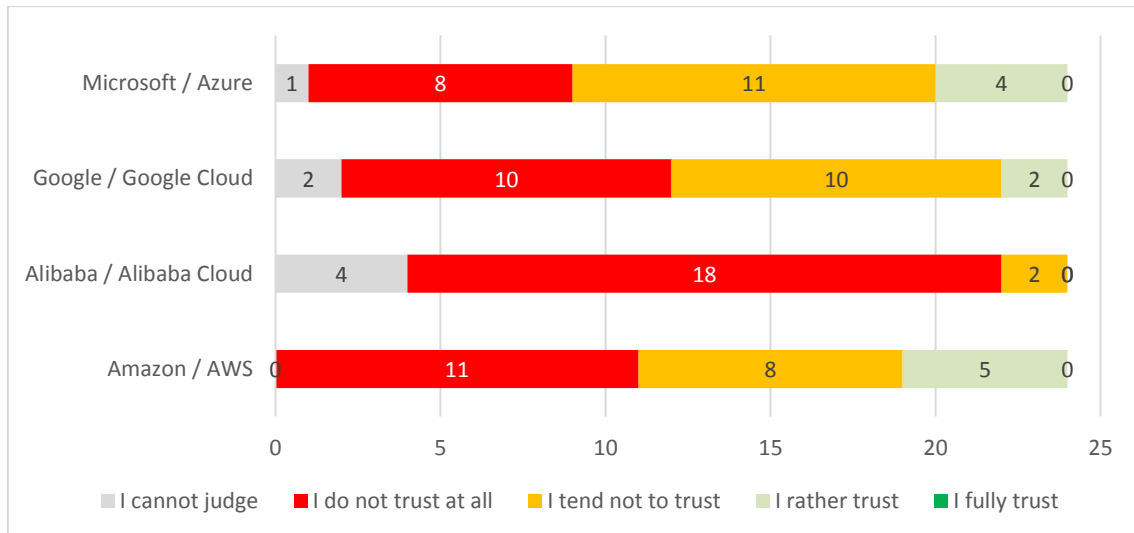


Figure 15: Survey results - How much do you trust data security and privacy with data stored in USA / China (According to the company headquarters)

### VII.IV Definitions for different cloud models

To better understand the different cloud models, the author of “IaaS vs. PaaS vs. SaaS Cloud Models (Differences & Examples)” did create a comparison with “Pizza” (Stamey, 2017):

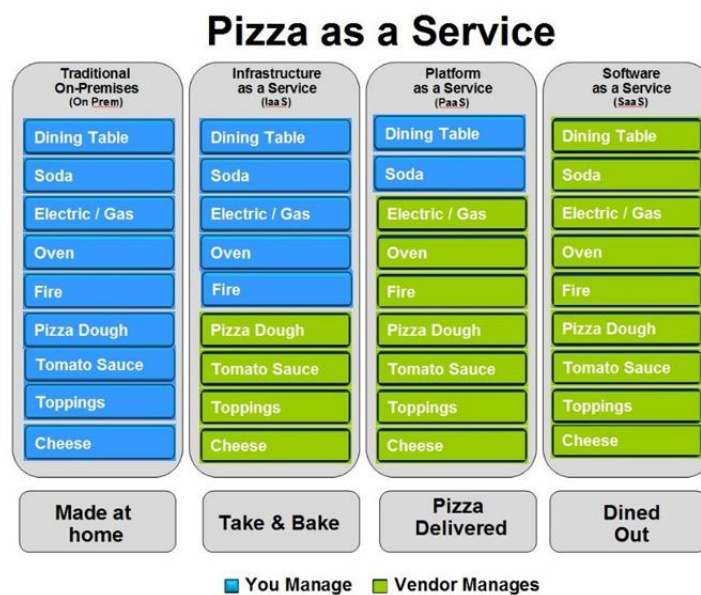


Figure 16: Pizza as a Service as an entertaining comparison between the tiers

#### VII.IV.I.1 Service Level Agreements Cloud Provider

The monthly uptime of the four cloud provider products have been verified and noted here on the base of the published service Level agreements (SLA)

Cloud Provider	Monthly uptime (%)	Reference
Amazon AWS	99.99	(Amazon, 2017)

<b>Alibaba Cloud</b>	99.95	(Alibaba Cloud, 2017)
<b>Google Cloud</b>	99.95	(Google, 2016)
<b>Microsoft Azure</b>	99.95	(Microsoft, 2017)

## VII.V Glossary

<b>Abbreviation</b>	<b>Explanation</b>
<b>CSF</b>	Critical success factor
<b>GDP</b>	Growth domestic product
<b>IaaS</b>	Infrastructure-as-a-service
<b>IoT</b>	Internet of things
<b>ISO</b>	International organization for standardization
<b>KDC</b>	Key drivers of change
<b>PaaS</b>	Platform-as-a-service
<b>PII</b>	Personally identifiable information
<b>R&amp;D</b>	Research and development
<b>SaaS</b>	Software-as-a-service
<b>SLA</b>	Service level agreement