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DECOMPOSING THE VALUE PROPOSITION OF A CLOUD COMPANY FOR TECHNOLOGICAL STARTUPS

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The CEE region is rich in software developers, which leads to a significant concentration of technological startups. Cloud Computing providers recognize the importance and potential of these startups and invest in this region. Therefore, an arising question is: How to market oneself to partner to the greatest number of promising startups? In this thesis, two studies were conducted to verify the above question. First, the free word association task combined with the affinity index was performed. Second, perceptual maps of startuppers perception were created, mapping Microsoft Azure, AWS, and Google Cloud.

Keywords: technological startups, cloud computing, CEE, perceptual maps, affinity index, free word association task, marketing research

In this work, information gathered from Industry Expert was used. Interviewed Industry Experts are coming from an international technological company and hold positions: CEE Partner Business Development Lead; CEE Startups Business Lead; Cloud Solutions Architect.

1. Introduction

The Central and Eastern Europe region (CEE) is extremely rich in highly qualified developers with an entrepreneurial spirit. In its report “Rise of Digital Challengers”, McKinsey refers to Bulgaria, Croatia, the Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia as the “digital challengers” of CEE countries because they have a significant growth opportunity, coming close to overpassing the digitalization level in developed Western Europe countries (Ignatowicz et al. 2018). According to McKinsey, there are several reasons for such rich digital potential in those countries. Among others they explain how education in the CEE region leads to so many well-qualified developers. Another reason enabling those developers' work is excellent digital infrastructure, with 4G coverage and lack of attachment to old technology, that Wester Europe has.

Such reasons create a unique ecosystem that is attracting tech giants to invest in those countries. For example, in 2020, Microsoft announced the opening of data centers in Greece and Poland, Google Cloud announced in 2019 opening data center in Poland. Such companies gain trust within those countries by opening data centers and attracting promising startups to collaborate with them using their Cloud. Behind *the Cloud* are all IT services delivered to the consumer via the Internet by a tech company. Collaboration in this context does not necessarily mean acquisition but partnership. Microsoft, Amazon Web Services, Google Cloud, Alibaba Cloud, Oracle, IBM, and Tencent Cloud are the leading cloud providers. Some types of startups consume a substantial amount of cloud resources, generating significant revenue for cloud providers (Eurich et al., 2011). Startups that are the most attractive for mentioned tech giants, as consulted with Industry Experts, are using many services based on Artificial Intelligence (AI), cloud-native applications, or are serverless. Those services are complex and require many different cloud platform components (Kratzke and Quint 2017); thus, they are costly for the user and lucrative for cloud providers (Eurich et al., 2011; Wu et al., 2020).

Knowing from the interviews with Industry Experts, even though cloud providers are proposing a wide range of possibilities, they are still not completely aware of what technological startups want and what attracts them. For this thesis, the focus will be put on the optimal value proposition of a cloud provider and the perception of main cloud providers to technology startups in the CEE region. Furthermore, this thesis will focus on the Microsoft cloud - Azure and its ability to attract technological startups and win over the competition.

This cloud provider was chosen mainly due to the personal interest of the brand; however, this is not capturing the complete motivation. Microsoft's investment in the data centers in the CEE region built upon the primary reason. Microsoft investment implies that they need a better understanding of the given market or that they already have a well-adjusted strategy for the CEE's technological startups market. Regardless of those two possibilities, the goal of this work is to verify their current position in the technological startups' market and sketch the managerial implications for Microsoft based on the studies conducted.

2. Research Question and chosen Methodology

The main goal of this thesis is to find answers to the below questions:

1. How does an ideal cloud look like for technological startups?
2. What is the perception of Microsoft Azure, and how it looks given the Ideal Cloud?
3. What is the perception of Microsoft Azure in comparison with other cloud providers?

4. How should Microsoft promote its Cloud to win engagement with technological startups over the competition?

The chosen methodology is indicated in the table below.

Table 1Research questions and chosen methodology

Research questions	Chosen methodology
How does an ideal cloud look like for technological startups?	Free Word Association Task.
What is the perception of Microsoft Azure, and how it looks given Ideal Cloud?	Free Word Association Task, Similarity Theory, Affinity Index for an open set of features.
What is the perception of Microsoft Azure in comparison with other cloud providers?	Perceptual Maps – Factor Analysis.
How should Microsoft promote its Cloud to win engagement with technological startups over the competition?	Combined conclusions from the studies mentioned above.

3. Literature Review

The goal of this chapter is intended to understand better the subject matter. Furthermore, as this thesis considers mostly startups and cloud providers, it will be examined why startups may need a cloud provider and why they need such companies as startups.

3.1 Subjects of the master's thesis

Startups and cloud providers are entities on which different thesis can be written. Thus, they will not be described in detail in this thesis, but a simplified frame will be presented to give an overview of the thesis’s context.

Taking a broad view, startups are companies with rather a small number of employees, which are just entering, or recently entered the market, providing a product or service for customers. What distinguishes startups from traditional companies is that startups are more revolutionary. It is often the startup that brings innovation to the given market segment while disrupting it, and because of that, startups gained the name of “disruptors” (Baldridge and Curry, 2021). Another unique characteristic of most startups is the scale and velocity they grow in the domestic market, but most of all in the international market. Because of that, they are often referred to as “born globals” (BGs) (Knight and Cavusgil, 2004). One more, but this time negative, characteristic that distinguishes startups from traditional companies is high risk. No matter how phenomenal startups can be on the market, a crucial but cruel statistic says that 9 out of 10 startups fail (Failory, 2021). Technological startups are only adding more risk on top of it, as technology is a high-risk industry (Jiao and Li, 2014; Yoo et al., 2012).

Cloud providers, as can be deducted, are selling the Cloud. Cloud is, in fact, the abbreviation for the term Cloud Computing (CC). The word Cloud comes from the general understanding of the Internet as a cloud – everything between the provider and the end-user (Foote, 2017). Cloud computing, in this case, means computing services delivered over the Internet (Ahmed et al., 2012). A more sophisticated description is presented by the National Institute of Standards and Technology (NIST) of the United States, found in Appendix 1. CC has five main characteristics: (1) on-demand self-service, (2) rapid elasticity, (3) measured service, (4) broad network access, (5) resource pooling. Definitions of all of them are provided in Appendix 2. Services offered by cloud providers are based on servers, which are in ownership of those cloud providers. Thus, as the servers are open to the public, they are called public clouds.

3.2 Who are the public cloud providers, and why do they need startups?

Cloud Computing for commercial use started with the Salesforce service, introduced in 1999. However, the most crucial entry for CC was Amazon; in 2006, they launched Amazon Web Services (AWS). Shortly after, competition followed (Foote, 2017).

According to Canalys (2021), as of 2nd February 2021, 4 leading cloud providers are covering 65% of the total cloud market. Those providers are AWS (32% of the market), Microsoft Azure (20% of the market), Google Cloud (7% of the market), and Alibaba (6% of the market). Alibaba is focused mainly on the Asia Pacific region (Alibaba, 2020), thus for consistency with chosen CEE region, only the three largest cloud providers will be considered. Cloud companies are earning billions on cloud services, almost every person has some contact with the Cloud (e.g., Netflix, Spotify, e-mail). However, only 36% of enterprises in the European Union use Cloud Computing, and only 55% of those use more advanced services (Eurostat, 2021). So, there is ample space for cloud providers to evolve and cover white spaces on the market, gaining significant profits. However, due to the granularity of the market, cloud providers cannot address each customer, which is why they need partners to help them conquer the market. Such partners are also startups who are delivering SaaS (Software as a Service) solutions to clients.

Startups who are partners of cloud providers are also their customers. By creating solutions on the Cloud, startups are *consuming* the Cloud, creating revenue for cloud providers. The scale of startups growth can be colossal; that is why cloud providers are so interested in having startups in the partner ecosystem (Eurich et al., 2011). Startups who are partners are also sharing knowledge with cloud providers. The solutions of startups are usually something new to the market, and they are most times advanced from a technical side. Such advancements enhance the exchange of knowledge between engineers from both sides.

Cloud providers are trying their best to acquire promising startups to their ecosystem wishing for high rewards in the future. However, young startups have one big problem - a lack of money. That is why cloud providers are creating special programs and contests offering free-of-charge limits or services to use by startups, incentivizing them to choose a given Cloud; programs are named in

Appendix 3. Though, as mentioned before, many startups tend to fail, so consequently, there is a threat arising here; it is not always evident in the beginning whether a startup will become successful, and investing in it makes sense.

Although those programs are interesting, they are not covering all startup market. Only a few bests receive incentives, and the rest need to decide without it, on which Cloud they would like to run their service. However, those startups can also become successful and be future “cash cows” for cloud providers. Additionally, some startups are switching to other clouds due to critical factors like pricing or lack of technological support. Therefore, in cloud providers' absolute interest, such drivers that are making startups change the cloud provider should be recognized. In the later part of this thesis, this concern will be answered based on conducted studies.

3.3 Why do startups need cloud providers?

To understand why startups need cloud providers, it is necessary first to understand a startup's goal. A startup's main aim is to be successful, earn a substantial amount of money, and exit (Picken, 2017). Therefore, they will only use cloud provider if it brings additional value in conducting business and lead to success. Cloud computing is bringing many advantages for all companies in general; naming main ones are: reducing costs of entry, no upfront capital investment for hardware, enhance innovation, being easily scalable, lowering overall entry barriers (Avram, 2014). Those benefits apply to all companies, but as stated before, startups are slightly different, and comparing them to big international corporations might be misleading. Startups stand out from all companies by their innovative spirit, rapid growth, riskiness, and technological advancement (Skala, 2019). Ross and Blumenstain (2015) propose a model on how cloud drivers enhance innovation and entrepreneurship, analyzing cloud adoption in startup firms; Appendix 4 presents this model. In the first column, there are listed benefits of using the Cloud. Based on this model, it is possible to compare the overall advantages of Cloud for enterprises and those for startups. Most of them coincide.

Regardless of indicated benefits, startups might still prefer to use a private Cloud over the public. To realize if cloud providers are essential for startups, rules for running a lucrative startup indicated by Adora Cheung (2017) will be followed, and advantages of cloud computing will be applied to see if it matches. Cheung appoints four main rules for running successful startups, (1) launching an MVP as soon as possible, (2) Focusing on core competency, (3) iterating quickly and failing fast, (4) keeping burn low. Below, comments to each of them will be included, confirming how essential Cloud is in each step.

Launching an MVP as soon as possible (1). MVP is a minimum viable product. A startup should validate it on the market as quickly as possible to develop the right, improved product and launch it successfully on the market (Tripathi et al., 2019). In such a process, the focus should be mainly on the product and not everything surrounding it. Here, cloud providers can help because they manage all unnecessary infrastructure & maintenance on their own; startups do not need to worry about it (Nade, 2021). Additionally, cloud providers have their global marketplace, which startups can leverage to gain as many clients and feedback on their MVP as possible to create the best possible product. (Senarathna et al., 2018).

Focusing on core competency (2). The focus should be on the product and how it is revolutionizing the market, not on other barriers as, e.g., infrastructure. With this mindset, a startup should be able to use many different services without the necessity of developing them on their own (Ferri et al., 2017). Cloud providers have various options, services, and machines to choose from, reducing clients' time to market.

Iterating quickly and failing fast (3). Startups can grow fast but also fail fast. Therefore, they need to have an elastic infrastructure that allows them to scale up and down quickly. Sometimes, demand for online products is growing within minutes. For such situations, startups need reliable infrastructure. Buying servers that can handle unforeseen heavy traffic is costly since startups would need to maintain them all the time, even when they are not needed. On the other hand, public clouds are scalable within minutes or even seconds. Whenever a higher number of virtual machines, instances is needed or not needed anymore, startups can automatically acquire them or detached from subscription (Ross and Blumenstein, 2014).

Keep burn low (4). No surprise that startups usually do not have much money. Technological startups are seeking support from investment funds but also cloud providers. One of the ways was mentioned before - programs for startups. Also, public Cloud can reduce IT infrastructure costs by up to 80% (Sultan, 2011), upfront costs are minimal, allowing even the smallest companies to enter (Marston et al., 2011). On top of that, all the cloud providers are operating in a pay-as-you-go model, which helps startups only increase their operating costs as they are growing (Senarathna et al., 2018).

The successful path proposed by Cheung (2017) covers many of the benefits that cloud providers offer, giving a valid reason for startups to choose public Cloud over private Cloud. There are a few more that were not covered but are similarly essential and persuasive. Cloud providers are offering high standards of data security around the globe, which will be hard and costly to implement for startups on the private Cloud. Thanks to Cloud’s worldwide availability, startups can comply with local laws immediately, just by launching virtual machines for a given client in each region. Additionally, as research shows, this factor is significant for customers (Son et al., 2014).

Having said all this, it is crucial to sketch which startups will be considered under this thesis. Considered startups for this thesis are no longer on the market than seven years, are not listed on the stock market, and are serverless; if not, they are using cloud-native or AI applications. Startups are coming from the CEE region, and three leading cloud providers for this market were indicated: Microsoft Azure, Amazon Web Services, and Google Cloud. Both sides – cloud providers and startups, need each other to run a lucrative and successful business.

4. Ideal Cloud and perception of Microsoft cloud

This chapter is intended to answer the first two research questions. In the beginning, the methodology and its roots will be described, confirming the legitimacy of the chosen method. Secondly, the execution and findings of the research will be presented.

4.1 Free word association task, similarity theory and affinity index - methodology

The connection between what is in people's minds and what they do in real life has been explored firstly by fathers of psychotherapy; Jung and Freud used word association. Although there were no hard proofs for the legitimacy of such a method back then, it gave foundations for further research in that matter (Szalay, Carroll, and Tims, 1993). Szalay and his associates are listing dozens of researches, studies, and experiments that took place in the XX century, mining this subject and proofing the validity of such an approach. Not only is this method used in psychotherapy, but it was also evaluated in other disciplines, listed in Appendix 5.

Given method is not imposing attributes of given matter but favors person's own generated associations with a matter built on experience. To extract those associations from a person's mind, the interviewer asks the interviewee to generate all associations coming to the person's mind while thinking about a given matter; the task is performed for 1 minute. The strength of the recalled association is directly proportional to the order of the exchanged associations. Each association, according to the order, has assigned "strength" by dominance score. The score goes as follow: 6, 5, 4, 3, 3, 3, 3, 2, 2, 1, 1, 1 … Several individuals are asked to do the same, and later, their scores are summed if the associations were the same or highly similar – in the case if two words are synonyms for a given matter. Given the results, one can verify the matter image on the market (Szalay and Deese, 1978).

The free word association task allows understanding what individuals have in mind while thinking about a given brand. Word associations task, among other uses, allows managers to check the brand image and if it is like brand identity, which they were trying to achieve through marketing. Nevertheless, the free word associations task gives only the view on an asked brand. Another possibility is the affinity index, which allows comparing two objects from the same discipline (Kleine and Kernan, 1988). A given brand can be compared to another or even an ideal brand in the case of brands. The affinity index is normalizing similarity in the way that the function value is between 0 and 1. Mentioning similarity, Tversky's similarity theory (Tversky, 1977) should be brought up as well. According to this, there is a collection of features describing objects. If the common set of features is bigger, the remaining part is smaller, meaning one object is more alike to another, differences between them diminish and vice versa. Appendix 6 summarizes his findings. Affinity index and Tversky's similarity theory are based on similar assumptions, normalizing similarity to the function, with values between 0 and 1. Therefore, similarity can be presented as a function:

(1) $$p(x, y) = x/(x + y)$$

In which x is the number of common features, and y is a number of differentiating features. If the function will be equal to 1, that implies the similarity is 1, meaning that objects are perfectly similar. A pool of similar features should be enlarged to create an object more similar to a comparable one, adding similar features or eliminating differentiating features (Falkowski, 2018).

Although Tversky's similarity theory and affinity index were milestones for psychology and customer studies, they are effective only for a close set of features. Brands are evolving, and therefore it is hard to admit that sets of features that might describe a given brand can be close, especially in the constantly evolving technology industry, as in this thesis. Falkowski and his associates in the work "Asymmetry in Similarity Formation: Extension of Similarity Theory to Open Sets of Features" from 2018 prove that a combination of already mentioned methods can also be used for pairs with an open set of features. However, when a set of features is open, there are different assimilation methods to comparable objects. Adding similar features or eliminating varied, negative ones to the objects will result in distinct similarities, different outcomes; thus, they should be used in different scenarios. The first scenario (1) happens when similarity is 0.5 or above, and the second scenario (2) happens when similarity is below 0.5. Authors advise that when scenario one is happening (1), the most effective way to move towards perfect similarity is to eliminate strength and a number of negative associations. To pursue such a strategy, a researcher should try to present an “object 1” without characteristic indicated as a negative association, which was not mentioned for “perfect object”. When the second scenario takes place (2), so when two objects are just marginally similar, a strategy of promoting similar associations or increasing the number of positive associations should be chosen.

4.2 Data collection

For this interview-based experiment, set up on Falkowski's (2018) approach, a sample of 10 startups was selected. Startups were complying with the criteria from the 3rd chapter, each startup was represented by an employee who had an influence on a choice of the Cloud or who is extensively working with a cloud. They might have had an interaction with another cloud previously, but they were working with Microsoft Azure at the moment of the study.

The participants were contacted at a convenient time, by phone or with the use of online calling platform. The interview was divided into three parts; please see the script in Appendix 7. In the second part of the interview, interviewees were requested to generate associations with Microsoft Azure and the Ideal Cloud. The sequence of questions in this part was changed in a way that five individuals were first asked about the Ideal Cloud, and the other five were first asked about Microsoft Azure. This operation was made to randomize answers and even out the effect of answers to one question influencing answers to another. Finally, the third part was added to draw additional conclusions. For the 2nd part of the interview, a specific time – 2 minutes-was devoted to answer the questions; the researcher measured it, noting associations simultaneously.

Scores were summarized. As confirmed with Industry Experts, some phrases had synonyms, so those answers were added and summarized, e.g., scalable and elastic. Summarized results can be seen in Appendix 8 – for Ideal Cloud, Appendix 9 – for Microsoft Azure, and in Table 2, there are common affinities for both clouds.

Table 2 Common Affinities for Microsoft Azure and Ideal Cloud

Common affinities	Score
many possibilities, services and machines	26
easy to use, simple, friendly interface	28
high capacity	11
good documentation, tutorials	24
secure	32
easy migration, low entry level	29
scalable, elastic	35
technical support	6
sum	191

In the Appendix 9– Affinities for Microsoft Azure, there are some characteristics in red. Those features were indicated by interviewees as negatively affecting their perception or experience with Microsoft Azure. With the use of equation (1), the affinity index was calculated. Following the methodology, x is the number of common affinities, here x = 191. X+Y represents a sum of common and differencing features, which is a sum of all affinities generated for Microsoft Azure and Perfect Cloud. In this study x+y = 427. The calculated affinity index is equal to 0.447307. The result is rather low and qualifies to follow strategy no. 2, promoting similar positive associations.

4.3 Results

This part of the chapter aims to answer the first research questions: (1) How does an ideal cloud look like for technological startups? And (2) What is the perception of Microsoft Azure and how it looks given the Ideal Cloud?

From retrieved associations, a few exciting pieces of information can be captured. Nine features were highly rated regarding ideal Cloud, standing out from the rest and being top of mind for several participants. Answering the first research question, the Ideal Cloud, for startups, should be scalable, secure, easy to use, cheap and powerful. Additionally, such a Cloud should have low entry-level, good documentation and tutorials, and it should be easy to control the budget.

Participants did not agree on Azure's characteristics as they did for ideal Cloud; none of the Azure's features received more than 20 points, while ideal Cloud has three features like this. The first most common feature mentioned for Azure, with 17 points, is negative – difficult, weak migration. However, just 3 points less have the statement "easy migration, low entry-level". Those contradictory statements imply that different individuals had different experiences with Azure, and this directed brand image. Surprisingly, looking at individual answers of interviewees, negative opinion about Azure difficulty, have people who never used other public Cloud. However, interviewees agreed that Azure has many possibilities and services. The remaining features worth consideration, and were indicated by participants, are enterprise customers, scalability, and security.

The affinity index for this pair: Microsoft Azure and Ideal Cloud, is equal to 0.45. It can be interpreted that Azure Cloud is not necessarily considered an Ideal Cloud. According to the methodology, obtained similarity indicates that more advantageously than removing or weakening different (negative) features increases the number or strength of common (positive) features until similarity is achieved 0.5.

Interviewees did not indicate that Microsoft Azure is cheap, but they mentioned that it is essential for the Ideal Cloud to be cheap. A parallel situation happened for strong characteristics: easy to control budget, transparency of costs. Another feature, which was highly ranked for ideal Cloud but not for Azure, is powerful and efficient; working on this will enlarge the pool of common characteristics, bringing Azure closer to Ideal Cloud. The second possibility, which can also be done simultaneously, is strengthening common positive features. Those are mentioned in Table 2.

This chapter answered the first two research questions. The perception of Ideal Cloud and Microsoft Cloud is summarized in Appendix 10. The free word association task, affinity index, and similarity theory made it possible to retrieve associations about the Ideal Cloud and Microsoft Azure from participants' minds. Microsoft Azure does not appear as the Ideal Cloud in the mind of its users, more importantly, for users whom Microsoft indicates as a highly desirable group of users. There is room for improvement of marketing activities by Microsoft managers. The second research in this master thesis will give more insightful information, which will also help to compare Microsoft Azure to its competition.

5. Microsoft Azure standing among competitors – perceptual maps

The fifth chapter of this thesis is devoted to examining the perception of Microsoft Azure in comparison to its competitors on the market to, later, pull out of its managerial implications and recommendations for Microsoft managers. To capture the perception of three main public clouds, perceptual map is going to be used.

5.1 Perceptual mapping - methodology

Positioning is a powerful technique that maximizes the company's potential benefit by locating the brand in customers' minds (Kotler and Keller, 2009). Well-defined and executed positioning creates brand core and, through this, the optimal value proposition (OVP) for clients. Perceptual maps help to verify if determined positioning is the one reflected in clients' minds. The popularity of the method, besides literature coverage, is also reflected in the range of computer software available on the market; perceptual mapping can be conducted in, e.g., SPSS, R, Python, Enginius, and with more advanced commands in Excel. There are three main techniques of perceptual mapping: (1) multidimensional scaling (MDS), (2) factor analysis, and (3) discriminant analysis (Kohli and Leuthesser, 1993). Each is insightful and powerful while also being costly and time-consuming (Hauser and Koppelman, 1979). Thus, to make the right choice of technique, each was shortly studied for this thesis, considering the theoretical assumptions and the method of surveying the respondents. They are presented in Appendix 11, and below, only discussion on choosing the most relevant one is provided.

Each of the studied methodologies has its pros and cons, and each of them might be valuable for marketing research. MDS method allows comparing two objects concerning each other. Such methodology might be helpful when evaluating chosen brands with respect to competition but not the market overall. Additionally, to use MDS methodology, a set of at least seven objects is required to present them on a two-dimensional map (Klahr, 1969). This indicates that the method is appropriate only for bigger samples. Discriminant analysis has a constraint of at least two investigated groups and at least two objects to be examined. For two objects, only three attributes can be verified in the study. Supposing that three objects will be examined in this thesis, only four attributes will be examined in this methodology's scope (Klecka, 1980).

Factor analysis does not limit the number of objects or attributes investigated; thus, it is favorable for a small sample. Furthermore, objects can be examined concerning the perception of the whole market, not necessarily chosen competitors. Investigated individuals do not need to be grouped (Hauser and Koppelman, 1979). Hence, the perceptual mapping will be done using factor analysis to achieve the richest perceptual map, with beforehand assumed imputes (from the first study).

5.2 Data collection

Based on factor analysis methodology, ratings about given objects need to be collected from the research group to create a perceptual map. Consequently, as a first step few factors need to be determined: (1) objects to be rated, (2) rating criteria – attributes, (3) rating scale, (4) research group properties, (5) means of collecting data. Based on previous chapters, some factors can be determined immediately.

Objects, which will be rated by the research group, will, as a result, be presented on a perceptual map. Hence, three clouds considered in the thesis are the objects of this study: Microsoft Azure, Google Cloud, and AWS. Rating criteria should be the attributes referring to the objects. During the first study, seven of the associations for Ideal Cloud received more points than others, meaning they were more critical for subjects (Falkowski et al., 2018). Since those attributes are essential for the target group, those will be used as rating criteria in factor analysis: (1) ease of use, (2) scalability, (3) security, (4) budget control, (5) affordability, (6) documentation and tutorials, (7) services and machines. Preceding chapters also helped establish the research group, which is at the same time the target group for cloud providers.

Two factors that previous chapters did not define have yet to be specified: (1) rating scale and (2) means of collecting data. As proposed by Kohli and Leuthesser (1993), a seven-point scale was chosen to conduct analysis. Regarding the mean of collecting data, a survey is the most efficient and effective way to do so. Therefore, a survey with the use of Microsoft Forms was prepared.

The survey created was divided into three main parts. The first part of the survey aimed to qualify subjects to the research group; thus, five questions were asked. Each of the questions was corresponding to a property of the research group described earlier in the thesis. The second part examined seven objects' attributes, and the third part asked two more questions for further analysis. The complete survey can be found under the link: https://forms.office.com/r/uvbjPnKyyG. The survey was distributed from 25th May 2021 to 4th August 2021. The survey was answered by 38 individuals, of which 27 were complying with previous criteria, thus N=27.

5.3 Results

This part will focus on presenting results from collected data and answering the third research question: What is the perception of Microsoft Azure in comparison with other cloud providers?

From the set of available software for perceptual mapping, Enginius was chosen for data analysis. Enginius requires input data to be means of scores received by each object on each attribute; thus, the researcher calculated such means using Excel and are presented in Appendix 12. Preference data were also gathered by the survey in the 3rd section and then uploaded to the program. With such a set of data, analyses were run. Below retrieved outcomes and data will be discussed.

From provided data, two dimensions were retained, explaining 100% of the variance; explained variance by each dimension can be seen in Appendix 13. Below, in Figure 1, dimension 1 is presented on the x-axis, and dimension 2 on the y-axis. The exact coordinates of each of the objects are presented in Appendix 14.

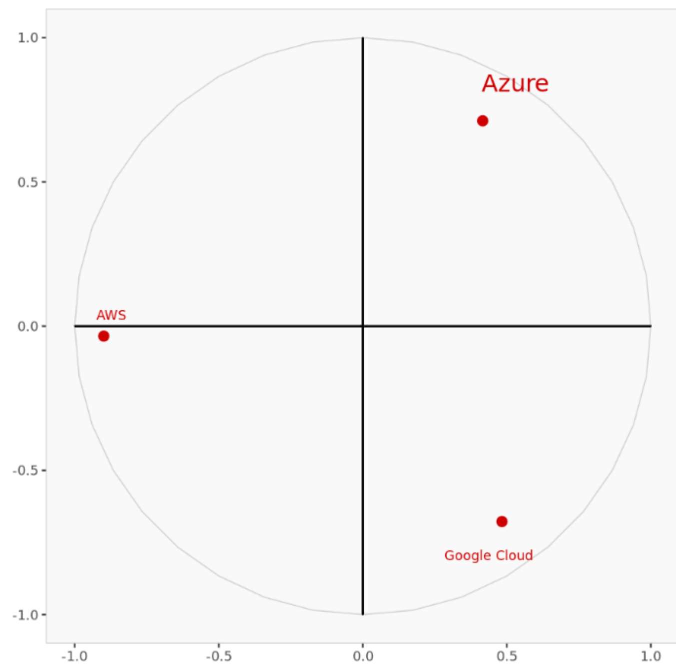

Figure 1 Positioning of the objects on the 1st and 2nd dimensions of the perceptual map.

Each of the Clouds occupies a different space in clients' perception, but to understand it better, another perceptual map with added attributes was created, presented in Figure 2.

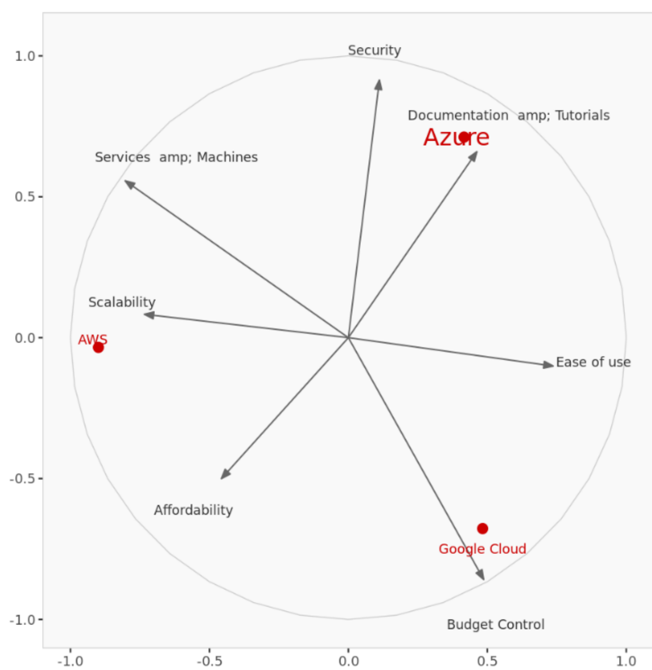

Figure 2 Objects and attributes on each dimension of the perceptual map

Attributes that are moving in the same direction are positively correlated; here, the most correlated pairs of attributes are (1) security and documentation & tutorials; (2) scalability and services & machines. Moreover, it can be derived that attributes which are perpendicular to one another are uncorrelated. Attributes that are moving in the opposite directions are negatively correlated. On the perceptual map presented by Figure 2, few negative correlations can be found: (1) scalability and ease of use; (2) documentation and tutorials with affordability; (3) services and machines with budget control; and (4) security is negatively correlated with both: affordability and budget control.

Some of the attributes are more important for given objects than others. In Appendix 16, perception values for each attribute are shown. Values in red are significantly lower than the average perception of all objects, those shown in green are, on the contrary, significantly higher than the perception of others. Average brands preferences were also captured and are presented in Appendix 17. Microsoft Azure is the most preferred brand among respondents; however, as the scale was from 1 to 7, all the obtained values are similar.

Received perceptual maps revealed how Azure, AWS, and Google Cloud are perceived and answered the third research question. Maps were created over two dimensions, and those dimensions are giving the first understanding of objects' perception, thanks to attributes coordinates – Appendix 15. Each of the objects lies in a different quarter giving the product a well-defined position. From the perceptual map presented in Figure 2, more detailed conclusions can be drawn. Microsoft Azure stands out by its documentation & tutorials and security. Those amenities are more costly, as can be seen by negatively correlated affordability and budget control characteristics. Microsoft is relatively easy to use, in contrast to AWS, and has rather more services & machines than Google Cloud. Nevertheless, security and documentation & tutorials are those points of difference that distinguish Azure from other clouds, as those two characteristics are significantly higher for Azure than for any other competitor, see Appendix 16. The attribute that might be a pain point for Azure's target group is affordability, as it was ranked significantly lower than its rivals. Microsoft Azure is also the most preferred Cloud for respondents

Microsoft Azure is the first choice, followed by Google Cloud and then AWS. Matching those preference data with significantly higher scores on given characteristics, it can be said that the research group, which is the target group at the same time, cares more about security and budget control than scalability. Nevertheless, the balance between the first two should be found, as security negatively correlates with budget control. With a higher number of services & machines, it is also harder to control the budget; again, the perceptual map indicates a negative correlation. An essential role in those preferences may also play the fact that 17 out of 27 individuals are currently using Microsoft Azure; thus, Azure's main attributes are essential for them, information about used Cloud by participants can be seen in Appendix 18.

6. Conclusions and Managerial Implications

The previous chapters presented general knowledge about startups and cloud computing and how these two entities are correlated. This has been completed with two studies conducted by the researcher, on a base of which, first three research questions were answered. The purpose of this chapter is to summarize findings, relate them to the theoretical part, and answer the last research question: How should Microsoft promote its Cloud to win the engagement with technological startups over the competition?

Thanks to the free word association task, a picture of Ideal Cloud, as seen by CEE startupers, was captured. The main features of such Cloud are scalable, secure, easy to use, affordable, easy migration, easy to control budget, good documentation and tutorials, many services, and machines.

In the third chapter, rules of running a lucrative startup by Cheung (2017) were presented with the assumption, why Cloud might be necessary for startups in each step. Above mentioned characteristics for the Ideal Cloud confirmed that what the Cloud offers highly matches what startupers want.

Ideal Cloud characteristics were also used to create perceptual maps in chapter 4. By superimposing results from the first study on the perceptual map, it can be seen that each cloud provider is specializing itself in one of the Ideal Cloud characteristics. They are occupying their own space on perceptual maps meaning, they are seen as experts in those matters by startupers. For Azure, it is security, for AWS scalability, and for Google Cloud budget control. The second study's characteristics attributed to AWS are ranked the highest for Ideal Cloud in the free word association task. However, looking at preference data – Appendix 17, AWS is the least wanted Cloud; this would mean that scalability itself is not enough to be chosen by CEE startups as their business cloud.

Results in the fourth chapter disclosed that Microsoft Azure is not perceived as an Ideal Cloud. However, it is not a permanent feature, and work can be done to bring it closer in the perception to appear as an Ideal Cloud. It was mainly considering the second study, which found Azure to be the most preferred Cloud. Some proposed marketing movements were listed in the fourth chapter, but the perceptual map shed new light on them. Combining the results from these two studies will help answer the fourth research question: How should Microsoft promote its Cloud to win the engagement with technological startups over the competition?

One of the possible moves presented in the third chapter was to work on characteristics: easy to control budget, affordability, to appear more as perfect Cloud. However, what was found thanks to the perceptual map is that those two are correlating negatively with the characteristic: security. Security was highly ranked for Ideal Cloud, higher than those connected to budget; it also distinguished Azure from the competition. Promoting Azure as more affordable may bring a backfire effect, lowering its perception as the most secure Cloud. Thus, this correlation should be well balanced. Perhaps, to attract technological startups, instead of being more affordable by lowering prices, Azure can offer some usage credits.

The second proposition based only on the first research was to promote Azure as powerful and efficient. A perceptual map did not check this construct; thus, it cannot be double verified. Nevertheless, without any doubt, technological startups are looking for powerful technology, as it is part of their competitive advantage. Microsoft already possesses one of the world's most powerful supercomputers based on Azure technology, which proves its legacy (Krazit, 2020). One of the marketing moves may focus on boosting this information. To strengthen the market position of Azure, marketers can also use affinities ranked highly for both: Microsoft Azure and Ideal Cloud. Among them are scalable, elastic; secure; easy to use simple; friendly interface. The first three are one of the highest for Ideal Cloud; thus, those may be tackled in the beginning until 0,5 similarity is achieved (for more information on similarity, please go back to the third chapter). They were also addressed by perceptual map. Again, security is the competitive advantage of Azure, at least as perceived by the target group. Perhaps, it may be the theme of marketing campaigns. As technological startups perceive, scalability is a strong point of AWS, but Microsoft does not fall far behind. The average score for Microsoft is just 0,2 points lower than for AWS; thus, there is still room to convince the unconvinced that Azure is the most scalable Cloud.

However, scalability is negatively correlated with ease of use, the third characteristic common for Ideal Cloud and Azure. Once again, the balance needs to be found while choosing what to base on the strategy. It is worth looking again at Appendix 16; none of the leading cloud providers was significantly higher-ranked regarding the ease of use. Thus, ease of use might be a strategically more profitable goal, as no competitor is there yet.

Coming back to perceptual map with the knowledge of results from free world association tasks, some more implications can be found. An azure marketing strategy might start expanding to the sides (regarding its current position on the perceptual map). The perceptual map only confirms what was said before; a field near the characteristic ease of use is a no cloud field. This should be rather a low-hanging fruit to grasp for Azure marketing strategists. Affinity services & machines were the highest common affinity for Ideal Cloud and Azure. Looking at the map, it is closer to AWS, but Azure can also try to stretch out around this characteristic and promote its services.

Summing up, the current location of Azure in startupers minds, come not ideal; it gives many possibilities for future marketing exploration. Azure is highly ranked in many vital characteristics while being the most preferred Cloud. The current affinity index, which equals 0.45, gives information that Azure is rather not an Ideal Cloud. However, with well-chosen marketing strategies, it can move closer in perception to Ideal Cloud. To do so, strategists should focus on promoting those affinities that were equal to those mentioned for Ideal Cloud. Doing this should also frame itself more as the Cloud, which is easy to use and has many services & machines. Microsoft Azure should be careful with promoting itself as affordable and scalable as this can cause a backfire effect.

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Appendices

Appendix 1- Cloud Computing in the understanding of NIST.

"Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction." (NIST, 2011)

Appendix 2- Characteristics of cloud computing

Characteristic	Description
On-demand self-service	Each user can use or purchase services whenever needed, without interaction with another human. Everything is happening over the Internet.
Rapid elasticity	Users can change the demand for services inward and outward without any previous notice, in line with business needs. Those effects: scaling in and scaling out, for some services, can happen automatically.
Measured service	For cloud providers, as for a user, the system provides transparency by using the measuring capability to monitor, report, control, and optimize used services.
Broad network access	Cloud Services can be accessed from heterogeneous thin or thick client platforms which have access to the Internet.
Resource pooling	The cloud provider shares the servers among other users, meaning that one server can be used by one or many users. It changes dynamically and depends on the demand. Such a set-up allows both the user and provider to be more cost-effective.

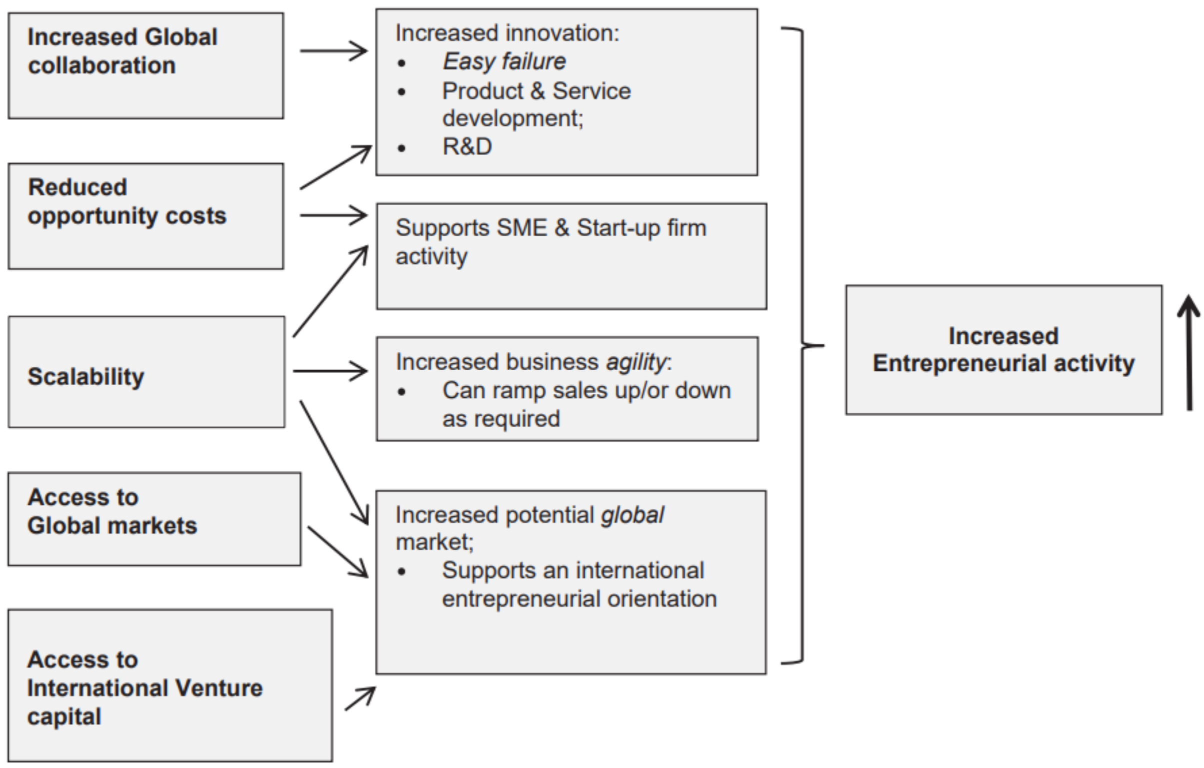
Appendix 3 – Chosen cloud providers' programs for startups

Microsoft: Microsoft for Startups, Microsoft BizSpark

Google Cloud: Google Cloud Startup Program, Google for Startups Accelerator: Climate Change, Google Play Indie Games Accelerator

AWS: AWS Startup Ramp, AWS Builder Space at Floor28, AWS Activate.

Appendix 4 – Ross & Blumenstain cloud adoption model (2015)



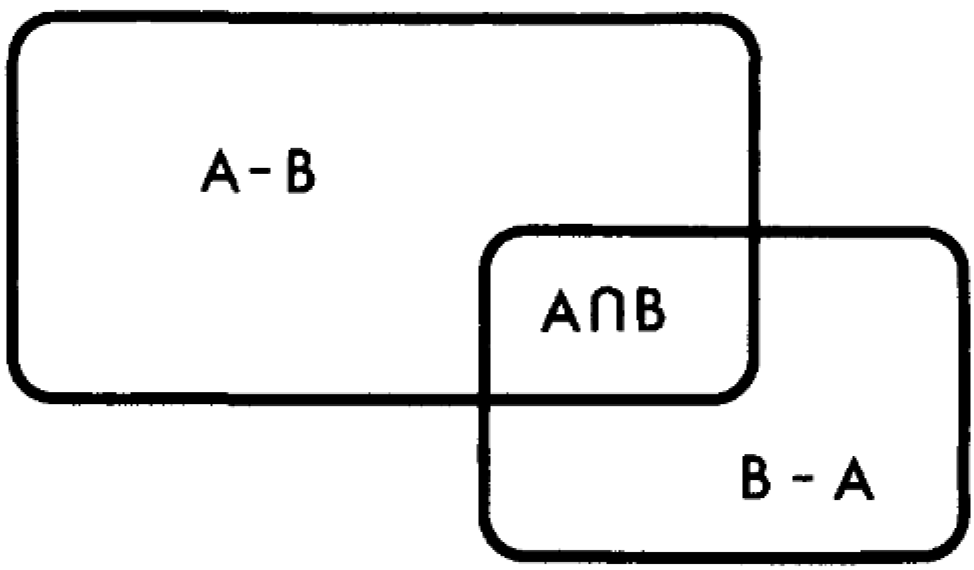
Appendix 5 – Usage of free word association method in several disciplines

Ethnology – checking the cultural difference between American and Chinese (Chow, Inn and Szalay, 1987);

Political Sciences – testing how changes in a politician's profile affect his proximity to an ideal candidate (Falkowski and Jabłońska, 2018; Cwalina and Falkowski, 2014),

Marketing - customer preferences – associations made by Portuguese with herbal infusions (Rocha, Moura and Cunha, 2020), Europeans' perspective on traditional food (Guerro, et al., 2010).

Appendix 6 - Relationship between two features set according to Tversky (1977)



Appendix 7- Questions prepared for interview with startupers. Study no. 1

Round 1: General questions asked to qualify for the experiment:

1. Are you working in a technological startup based in CEE?
2. Does your startup use AI services, or is Cloud Native/Serverless?
3. How long has your startup been on the market?
4. Is your startup listed on the stock market?

Round 2: Specific questions to find a perception of Microsoft Cloud and Perfect Cloud

Instruction: *Right now, I will ask you to create associations for two constructs. To complete the task, you will have 1 minute per construct. I will measure the time, and I will inform you when time has passed. During this time, I will also be noting your answers. Is everything clear?*

(Order of the questions was different per participant)

1. Please tell me all your associations with Perfect Cloud.
2. Please tell me all your associations with Microsoft Cloud.

Round 3: Specific questions to draw conclusions:

1. With how many public clouds have you worked?
2. How many clouds have you worked with?

Appendix 8 – Affinities to Ideal Cloud

Ideal Cloud	Score
scalable, elastic	25
secure	23
easy to use, simple, friendly interface	20
cheap, affordable	18
easy migration, low entry level	17
easy to control budget, transparent costs	14
good documentation, tutorials	13
many possibilities, services and machines	12
efficient, powerful	12
high bandwidth	6
adapted do company size	6
Regionalize in given territory	6
SLA	6
geolocalization	6
with no legal barriers	5
BigData	5
high capacity	5
access to the equipment	4
Connectivity	4
leased computer	3
technical support	3
granted money to use, test	3
easing things that were expensive in the future	3
speeding business	3
easy purchase process	2
sum	224

Appendix 9 – Affinities to Perfect Cloud

Microsoft Azure	Score
Difficult to use, weak migration	17
many possibilities, services and machines	14

Microsoft Cloud	12
easy migration, low entry level	12
good documentation, tutorials	11
scalable, elastic	10
Enterprise clients	9
secure	9
2nd on the market	8
easy to use, simple, friendly interface	8
well working, good quality of services	7
high capacity	6
complicated distribution structure	6
frustrating	6
not optimal	5
better than AWS	5
.NET	5
not transparent	4
modern	4
2 years after AWS	4
problems with operations	4
cloud	4
hard to operate - names	3
technical support	3
difficult partnership	3
some functionalities are changing without info	3
different interface	3
bank industry	3
web applications	3
Office	3
AI	3
Partnership	2
Active Directory	2
IoT	2
sum	203

Appendix 10 - Perception of Ideal Cloud and Microsoft Azure

	The most common associations that reveal perceptions of given clouds
Ideal Cloud	Scalable, secure, easy to use, affordable, easy migration, easy to control budget, good documentation and tutorials, many services, and machines.
Microsoft Azure	Difficult to use, many services and machines, Microsoft Cloud, easy migration, good documentation and tutorials, scalable, enterprise clients, secure

Appendix 11 – Methodologies for creating perceptual maps

Methodology	Basic assumptions	Data colection	Proposed future reading
Multidimensional scaling	MDS is a technique with roots in mathematical psychology and was widely explored in the XXth century (Torgerson, 1952). Since then, the method was broadly used in different fields: accounting (Patau et al., 2020), marketing (DeSarbo et al., 2008; Natter et al. 2008), sociology (Amato, 1990), ecology (Kenkel, 1986), psychology (Jaworska, Chupetlovska-Anastasova, 2009), political sciences (Rabinowitz, 1975). MDS method measures consumers' perception of relative dissimilarities or similarities between pairs of objects. The primary outcome achieved after conducting MDS analysis is spatial configuration of points, where points reflect investigated objects – perceptual map. Distances between objects reflect similarities or dissimilarities between them; the closer point are to each other, the more similar they are (Cox and Cox, 2008).	This method evaluates objects in pairs along a given dimension. Selected individuals are asked to rate two objects' overall similarity or dissimilarity on a specific dimension, using metric scaling – rate, or non-metric scaling - rank-order. (Kohli and Leuthesser, 1993). The scores are dependent variables in a regression on the perception measures, which serve as explanatory variables. The regression weight is called directional cosines and indicates how strongly each perception measure relates to each dimension score (Hauser and Koppelman, 1979).	*"A General Index of Nonlinear Correlation and Its Application to the Interpretation of Multidimensional Scaling Solutions."* Carroll and Chang (1964); *"Applied Multidimensional Scaling"* Green and Rao (1972).
Factor Analysis	Factor analysis, as the preceding model, derives from mathematics, firstly described by Charles Spearman in 1904. It was proposed to represent the structure of correlations among observed outcomes on a set of measures (Fabrigar and Wegener, 2011). The primary assumption in this model reveals that the initial set of attributes can be reflected in a parsimonious number of underlying perceptual dimensions. Through correlations, attributes are related to few basic dimensions, where one dimension has many attributes related (Hauser and Koppelman, 1979). With many attributes, evolved dimensions are unobservable constructs that exert linear influences on objects perception (Fabrigar and Wegener, 2011). Graphical illustration of such dimensions is called the perceptual map.	Given model examine correlations between attributes. To find such correlations, chosen individuals must rate objects on given attributes by likert-like scale (Kohli and Leuthesser, 1993). In contrast to the previous method, here, objects do not need to be ranked in pairs. Further, across given data, correlations should be computed, providing a correlation matrix. From the given matrix, created dimensions can be found by connecting correlating attributes. Usually, two dimensions are found and used for simplicity and clarity of the presented date. However, as an outcome, more than two dimensions may be discovered and used as well (Hauser and Koppelman, 1979). All the calculations and mapping can be done by available software.	"*Applied Factor Analysis"* Rummel, (1970); *"Exploratory Factor Analysis"* Fabrigar and Wegener, (2011).
Discriminant Analysis	Discriminant analysis has strong mathematical and statistical background (Klecka, 1980). Like the previous method, this model requires attribute ratings by examined individuals, and as well its goal is to diminish a number of attributes to fit them in dimensions. At the same time, it is not looking for correlations between attributes but patterns of attributes that best discriminate	This model, using rated attributes, measures perception by discriminant scores that best distinguish objects. The collection of data for such a method is analogous to factor analysis but includes the division into significant groups of respondents. In practice, the discriminant dimensions are constrained to be uncorrelated (also called orthogonal). (Hauser and Koppelman, 1979; Klecka, 1980).	*"Discriminant Analysis"* Lachenbruch and Goldstein (1979); "*Discriminant Analysis*" Klecka (1980).

	between objects (Hauser and Koppelman, 1979). Unlike factor analysis, this method required at least two mutually excluded groups to examine the construct and seek variations between groups (Klecka, 1980). Thus, variation within one group will be ignored, and as a result, dimensions discriminating between two groups will be achieved (Kohli and Leuthesser, 1993).		

<u>Appendix 12</u>- Means of objects ratings on given attributes

	Azure	**AWS**	**Google Cloud**
Ease of use	5.04	4.52	5.15
Scalability	5.78	6	5.74
Security	6.04	5.6	5.37
Budget Control	4.81	4.81	5.07
Affordability	4.63	4.85	4.78
Documentation & Tutorials	5.56	5.15	5.23
Services & Machines	5.67	6.22	4.96

<u>Appendix 13</u> – Variance explained by the model

	Variance explained	**Cumulative variance**
Dimension 1	55.7%	55.7%
Dimension 2	44.3%	100.0%
Dimension 3	0.0%	100.0%

<u>Appendix 14</u> – Coordinates of each object in every dimension

	Dimension I	**Dimension II**
Azure	0.416	0.712
AWS	-0.899	-0.034
Google Cloud	0.483	-0.677

Appendix 15 – Attributes coordinates

	Dimension I	Dimension II
Ease of use	0.737	-0.101
Scalability	-0.734	0.083
Security	0.112	0.915
Budget Control	0.487	-0.858
Affordability	-0.457	-0.500
Documentation amp; Tutorials	0.462	0.660
Services amp; Machines	-0.803	0.557

Appendix 16 - Perceptual data overview with significantly lower and higher perceptions.

	Azure	AWS	Google Cloud
Ease of use	5.0	4.5	5.2
Scalability	5.8	6.0	5.7
Security	6.0	5.6	5.4
Budget Control	4.8	4.8	5.1
Affordability	4.6	4.9	4.8
Documentation amp; Tutorials	5.6	5.2	5.2
Services amp; Machines	5.7	6.2	5.0

Appendix 17- Average object preference

	Average preference
Azure	5.83
Google Cloud	5.57
AWS	5.39

Appendix 18 – Clouds used by research group