

## A Study On Evaluation Criteria For The Selection Of Cloud Among The Cloud Service Providers

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**Abstract:** This paper study the importance of primary Evaluation criteria and attributes for selecting the Cloud service providers in the Market. The study was conducted to produce empirical data on the reliability and validity of the Cloud selection Attribute questionnaire. A survey was conducted and the reliability, validity of the questionnaire were tested with the Cronbach's alpha. The Cronbach's alpha test conducted shows that the overall score was 0.92 indicating high reliability of the items for cloud service provider. Principal component analysis is performed to test the dimensionality of variables used in this study.

**Key words:** cloud servers, Cronbach alpha, reliability, factor analysis, computing, dimensionality

### I. INTRODUCTION

Cloud computing is a set of IT services that are provided to a customer over a network on a leased basis with the ability to scale up or down their service requirements. Cloud Computing services are delivered by a third party provider who owns the Infrastructure. It is a rapidly developing technology which has brought significant changes & opportunities to various sectors across the Globe. However adopting a cloud computing may have positive as well as negative effects on the data security of service customers. As part of the broader Information and Communications Technology (ICT) picture, use of cloud-based technology is an asset for companies worldwide. The cloud continues to enhance competitiveness and has transformed business operations – from logistics and finance to customer relations and human resources. Top cloud services provided in the Market are Amazon Web Services, Microsoft Azure, IBM Cloud, Adobe, VM Ware, IBM Cloud, Red hat, Sales Force, Oracle Cloud, SAP, Verizon Cloud and Google Cloud Platform. In order to select the Right cloud for the Organization there are challenges and will be considering the below attributes in the Cloud selection.

S.No	Cloud Selection Attributes	S.No	Cloud Selection Attributes
1	Cloud security	11	Customer Driven
2	Compliance	12	Transparent
3	Architecture	13	Integration
4	Manageability	14	Network Ownership
5	Service Levels Agreement	15	Business process Remodeling
6	Support	16	Backup & Recovery
7	*Costs	17	Scalability
8	Governance	18	Vendor Viability
9	High Availability	19	Reliability
10	Easily Managed	20	Certifications & Compliance
		21	Regulatory Requirements

### II. LITERATURE REVIEW

Santos (1999) used Cronbach's Alpha for Assessing the Reliability of Scales. Andy Field (2000) has used SPSS in the field of Statistics for calculating Cronbach's Alpha and Factor Analysis. Costello & Jason (2005) discussed about the factor analysis that will allow researchers and practitioners to understand the various choices available through popular software packages, and to make decisions about best practices in factor analysis for making decisions regarding extraction and rotation

Louis Cohen et al (2007) discussed the importance of Cronbach's Alpha in the study of Research methods in education. Corbin and Strauss (2008) discussed the new generation of qualitative researchers of doing qualitative research analysis in The Third Edition of Basics of Qualitative Research. Andy Field (2009) has used SPSS in the field of Statistics for calculating Cronbach's Alpha.

Nicola Ritter (2010) discussed how the reliability coefficients have the ability to impact how researchers interpret study results. Cronbach alpha has been used for the awareness of alpha's properties to

accurately gather and interpret results for understanding a Widely Misunderstood Statistics. Babbie (2010) used Cronbach Alpha in the field of Social Research. Wilson (2010) used Cronbach Alpha for doing Research Project in the Business Research. Mohsen Tavakol & Reg Denmick (2011) used Cronbach's Alpha for evaluation of assessments and questionnaires. Ellen (2011) used Cronbach Alpha for Validity and Reliability in Social Science Research and International Perspectives on Higher Education.

Bhatnagar et al (2014) studied on candidate Surveys on Program Evaluation by Examining Instrument Reliability, Validity and Program Effectiveness. Douglas Bonett and Thomas Wright (2014) used Cronbach's alpha as most widely used measures of reliability in the social and organizational sciences. Cronbach's alpha reliability: Interval estimation, hypothesis testing, and sample size planning.

Matthijs Warrens (2014) used Cronbach's Alpha as the Mean of All Possible k-Split Alphas. Shih et al (2015) has done the study of Consumers' Buying Behavior and Consumer Satisfaction in Beverages Industry by using Cronbach's alpha.

Balkishan Sharma (2016) focused on reliability in developmental research through Cronbach's Alpha among medical, dental and paramedical professionals. Namdeo and Rout (2016) used Cronbach's alpha for Calculating and interpreting using Rosenberg assessment scale on pediatrician's attitude and perception on self esteem. Mondal and Mondal (2017) have shown the calculation of Cronbach's Alpha in Spreadsheet: An Alternative to Costly Statistics Software. Sandhya and Vijeta (2017) discussed the use of Cronbach's alpha in dental research. Frank (2017) studied the use of Cronbach Alpha reliability estimate in research among students in public universities in Ghana. Lee Chan (2017) discussed about Validity and Reliability of The Instruments Using Exploratory Factor Analysis and Cronbach's alpha.

Taber (2018) used Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. Hoekstra and Vugteveen (2018) had done an empirical analysis of alleged misunderstandings of coefficient alpha. Bujang et al. (2018) presented a review on Sample Size Determination for Cronbach's Alpha Test: A Simple Guide for Researchers. Olaniyi (2019) discussed the application of Likert Scale Type and Cronbach's Alpha Analysis in an Airport Perception Study.

Cronbach Alpha has been used in the field of Medical, Education, Manufacturing & Engineering. We have a scope and requirement of using this in the IT Services industry for selection of cloud attributes.

### **III. OBJECTIVES OF THE STUDY**

The present paper intends to examine the attributes of Cloud selection for the Organization. There are many cloud service providers available in the Market. Here in this paper we will be finalizing the Major cloud selection Attributes and it's importance. The study was conducted to produce empirical data on the reliability and validity of the Cloud selection Attribute questionnaire.

### **IV. ATTRIBUTES FOR CLOUD SELECTION QUESTIONNAIRE**

#### *A. Cloud Security*

Determine the layers of security that exist within the application and the data center. How will the cloud vendor protect your data from viruses, hackers, and theft? Another important question to ask is whether or not a vendor has its own data center and cloud technology or uses one of the large providers, such as Amazon Web Services or Microsoft Azure.

The advantage of going with one of the big providers is that other packages are also developed on these platforms, so companies may find it easier to integrate systems with each other, for example an ERP system with a CRM application. But using an in-house data center has its perks too, such as keeping company data close and being in control of updates and changes.

#### *B. Compliance*

Cloud compliance is the general principle that cloud-delivered systems must be compliant with standards that the cloud customers face. This is a very important issue with new cloud computing services, and it is something that lots of IT professionals look at very closely.

#### *C. Architecture*

Cloud service architecture defines the overall cloud computing services and solutions that are implemented in and across the boundaries of an enterprise business network. Cloud service architecture deals with the diagnosis, analysis, design, deployment and integration of cloud services, allowing organizations to operate their businesses within the cloud. Cloud service architecture considers the core business requirements and matches them with a possible cloud solution.

#### *D. Manageability*

When businesses conduct technical operations in the cloud, they will not have control over the infrastructure in the way they are used to with physical workstations and servers. In a traditional computing

environment, management is able, for example, to ask employees to refrain from running CPU-intensive applications when those resources are needed for a project of higher priority.

When using the cloud, however, organizations may have limited control over what other applications may be running, particularly if the business is using a cloud solution shared by more than one company. Other applications may consume resources that cause performance to be slower for the businesses' employees. Using a private cloud solution increases the manageability of cloud resources, however; IT consulting firms can advise small businesses on how to implement such a solution.

#### *E. Service Levels Agreement*

Clear service level expectations must be documented within the service level agreement (SLA), including penalty clauses and conditions for undelivered services or unmet expectations. Make sure that the cloud vendor provides services beyond application delivery (e.g., business issues resolution, training, implementation support, and customer service).

Useful matters to also have addressed in the agreement are who owns the data (the vendor or the customer), the procedure of getting the customer's data back to the customer in the case of a subscription contract termination or expiration, and how fast customer's data change requests can be processed by the vendor.

#### *F. Support*

Customer service with 24/7 availability and account managers are table stakes at this point when it comes to public cloud service providers. Some vendors, like Google and Microsoft, offer a lower level of support by default, but allow customers to pay extra for enterprise-class support.

Gartner says that some of its clients with larger-scale cloud implementations have reported significant challenges with Azure adoption because professional service teams and technical support personnel may lack "adequate expertise."

#### *G. Costs*

Enterprises typically look to IaaS to achieve cost savings, Gartner says, but it varies in terms of how much savings IaaS can deliver.

For short-term or disaster recovery needs, IaaS does provide a cost savings, but large companies with "existing internal data centers, well-managed virtualized infrastructure, efficient IT operations teams and a high degree of automation, IaaS for steady-state workloads is often no less expensive, and may be more expensive, than an internal private cloud."

When evaluating a public cloud service for competitive costs, customers should understand the types of discounts available. For example, while GCP positions itself as a cost leader in the market, its discounts are per-service rather than over the contract.

"Google is frequently rigid in contract negotiations, save for its largest customers, who may receive exceptional flexibility," Gartner says. "Its sales force, while technically adept, often has limited experience dealing with enterprise procurement organizations."

Gartner cautions against choosing a cloud based on the discount available, however, as new service offerings from less-established vendors may not have a track record of enterprise customer success, even though they offer steep discounts at first to win customers. Enterprises should speak to reference customers like them to decide if a vendor is worth the risk.

Once a cloud is in use, tracking the costs of a public cloud service is the next step, and there are numerous third-party tools available to enterprises that provide clear visibility into resource usage.

#### *H. Governance*

Infrastructure requirements may vary around batch-processing needs and periods of peak access demand. Find out if the cloud provider has means to automate provisioning and deprovisioning of infrastructure in an effort to increase performance and cut costs.

#### *I. High Availability*

Many companies today service clients and key stakeholders around the world. Are you able to simply migrate and/or provision workloads to various regions from one place? Ensure they are able to meet your global requirements and that the cloud provider offers coverage in those areas.

Other things to consider might be how your cloud will be accessed and what support services they offer, in addition to if they will be able to scale with your business. These should be qualified based on your business needs and workloads required to successfully operate.

*J. Easily Managed*

The cloud service provider should have an easy management system for the IT staff to manage, control and maintain with efficiency and simplicity. Find a cloud vendor that allows you to view the entire servers in a single unified interface.

*K. Customer Driven*

Customer Driven It's hard to work with a cloud vendor that is after profits and sales only. Make sure the vendor is customer-driven and provides 24/7 support whether in chat, call or email. You may also make your own research by comparing customer satisfaction and employee approval rating of the vendor from various sources.

*L. Transparent*

Aside from the transparent pricing plans, you must take a look at the managed service level agreements, security and data policies and terms of service of the cloud service provider. The last thing you would want to do is compromise your clients' private information and experience outage during peak seasons.

*M. Integration*

Late adopters are somehow half-hearted to migrate the whole infrastructure to the cloud because the fact is that on premise working environment is widely used. If you see the potential that allows cloud to accelerate your business, then find a cloud vendor that provides easy integration of current network resources into the cloud apps and servers.

*N. Network Ownership*

The cloud vendor must have a robust, secured and resilient network to deliver reliable network connectivity services with efficiency. The cloud vendor must be able to manage the unforeseen challenges of cloud services and take ownership of the overall infrastructure.

Cloud computing has played a huge role in improving businesses worldwide, allowing business to scale the infrastructures they need. It also provides flexibility as well as driving operational efficiencies, therefore companies are able to react faster to any issues that might arise.

*O. Business process Remodeling*

If using a public cloud, understand what kind of customization may be required based on desired internal business processes and see what possibilities are available with the cloud platforms you're considering. For example, on screen adjustments, non-source code customizations, or a certain level of business processes accommodation flexibility via pre-designed system logic may be possible but the source code can't be modified. Make sure you understand how workflows are created (point-and-click versus technical programming) with the various platforms being considered, and what kind of system integration and technical services are provided with the pricing model.

*P. Backup & Recovery*

When evaluating a cloud provider, learn about its contingency, backup, and recovery plans and liabilities for both the platform and the data. Obviously these are important as with a cloud solution your data will more than likely be hosted off-site, and you want to be sure that your company's data is safe and backed up with a reliable recovery plan in place.

*Q. Scalability*

Evaluate the cloud provider's scalability through such infrastructure points as bandwidth, load balancers, servers, data warehouses, etc. Analyze its long- and short-term growth strategy and level of service. Will the cloud provider be able to maintain and improve service levels with the growth of its business and clients? The vendor's preliminary testing of the customer's existing hardware and bandwidth along with providing technical recommendations on improving these are typically included in cloud software implementation projects.

*R. Vendor Viability*

As many cloud vendors are relatively new players in the market, you should consider a cloud provider's financial robustness. Focus on revenue streams (since pay-as-you-go revenues need to be maintained) and venture capital (investors backing the company) to assess whether the vendor will be around and able to grow as your organizational needs grow.

*S. Reliability*

How reliable is the cloud vendor? Can the cloud servers consistently handle robust bandwidth and data exchange in uptime? Make sure you partner with a reliable hosting provider that can manage the entire hosting environment, especially if your website receives robust traffic in uptime.

*T. Certifications & Compliance*

All infrastructure vendors make claims about the security and compliance of their platform, usually with the best of intentions. But it's almost impossible for a cloud client to be certain of the quality of a platform without third-party verification.

A premium cloud provider should be able to provide evidence of certification and auditing for industry-standard data center and security certifications. Among the most important certifications to look out for are SAS70 Type II for data center controls, PCI DSS for storing and processing credit card data, HIPAA for storing healthcare data. Server Mania's team will be happy to consult with your organization to help you build a secure and compliant network on our certified infrastructure.

*U. Regulatory Requirements*

Regulatory compliance is when a company obeys the laws, Regulations, guidelines and specifications that pertain to its business. Here are a few practical examples from TechTarget:

**Sarbanes-Oxley Act (SOX) of 2002:** SOX was enacted in response to the high-profile Enron and WorldCom financial scandals. It's meant to protect shareholders and the general public from accounting errors and fraudulent practices in the enterprise. Among other provisions, the law sets rules on storing and retaining business records in IT systems.

**Health Insurance Portability and Accountability Act of 1996:** (HIPAA): HIPAA Title II includes an administrative simplification section that mandates standardization of electronic health records systems and includes security mechanisms designed to protect data privacy and patient confidentiality.

**Payment Card Industry Data Security Standard (PCI DSS):** PCI DSS is a set of policies and procedures created in 2004 by Visa, MasterCard, Discover, and American Express to ensure the security of credit, debit, and cash card transactions.

**Federal Information Security Management Act (FISMA):** Signed into law in 2002, FISMA requires federal agencies to conduct annual reviews of information security programs in order to keep risks to data at or below specified acceptable levels.

## V. METHODOLOGY AND DATABASE

### a. Research Methodology

We have selected the Non - Probability Sampling Method based on the selection capabilities and not fixed collection process. Questionnaire has been provided to the group of people who are working on cloud technologies and transition to cloud. They are working as Architects, Project Leads, Delivery Managers & Cloud Engineers and also working in the Top Management.

We have considered experience of Minimum 7 + years in the Cloud Technologies and hence Average Age Group of 28 – 38 years has been considered for this sample. Also considered the Diversity part comprising 39 percent of Females and 61 percent of Males in the Sample. They are working in various organizations like Credit Suisse, JP Morgan & Chase, IBM, Royal Bank of Scotland, Barclays, Western Union, Scotia Bank, Cognizant Technology Services & HCL Technologies.

A survey was conducted on 46 people and the reliability, validity of the questionnaire were tested with the Cronbach's alpha using the Statistical Package for the Social Sciences (SPSS) software version 16. The Cloud selection attributes questionnaire is a 5 point Likert – scale survey consisted of 21 attributes.

Sampling is defined as the process of selecting certain members or a subset of the population to make statistical inferences from them and to estimate characteristics of the whole population. Sampling is widely used by researchers in market research so that they do not need to research the entire population to collect actionable insights. It is also a time-convenient and a cost-effective method and hence forms the basis of any research design.

For example, if a drug manufacturer would like to research the adverse side effects of a drug on the population of the country, it is close to impossible to be able to conduct a research study that involves everyone. In this case, the researcher decides a sample of people from each demographic and then conducts the research on them which gives them an indicative feedback on the behaviour of the drug on the population.

### b. Primary Data

The present study is based on primary data collected from the Software professionals working on the Cloud Computing in the IT Services Industry as how they will be selecting the Cloud Vendor and what attributes are mandatory for these selection. Please find the Questionnaire below:

Name:		Educational Qualification:	
Organization:		Years of Experience:	
Gender:		Number of Employees:	
Age:			

S. No	Evaluation Criteria for Cloud Selection	Rating				
		1	2	3	4	5
1	Cloud security.					
2	Compliance					
3	Architecture					
4	Manageability					
5	Service Levels Agreement					
6	Support					
7	Costs (*Reverse Scored)					
8	Governance					
9	High Availability					
10	Easily Managed					
11	Customer Driven					
12	Transparent					
13	Integration					
14	Network Ownership					
15	Business process Remodelling					
16	Backup & Recovery					
17	Scalability					
18	Vendor Viability					
19	Reliability					
20	Certifications & Compliance					
21	Regulatory Requirements.					

**Note:** All items are responded to on a Likert scale of 1-5, where 5 = Strongly agree and 1 = Strongly disagree. \*Asterisked items are reverse scored, so that the opposite is true (i.e. 1 = Strongly agree and 5 = Strongly disagree). This is so throughout the scale a high score on a question indicates a high belief in perceived task value.

**c. Internal Consistency**

A kind of reliability is **internal consistency**, which is the consistency of people’s responses across the items on a multiple-item measure. In general, all the items on such measures are supposed to reflect the same underlying construct, so people’s scores on those items should be correlated with each other.

Perhaps the most common measure of internal consistency used by researchers is a statistic called **Cronbach’s  $\alpha$**  (the Greek letter alpha). Conceptually,  $\alpha$  is the mean of all possible split-half correlations for a set of items. For example, there are 252 ways to split a set of 10 items into two sets of five. Cronbach’s  $\alpha$  would be the mean of the 252 split-half correlations. Note that this is not how  $\alpha$  is actually computed, but it is a correct way of interpreting the meaning of this statistic. Again, a value of  $\geq .80$  or greater is generally taken to indicate good internal consistency.

**d. Reliability Coefficient**

Commonly used technique for assessing reliability is Cronbach’s alpha for internal reliability of a set of questions (Interval and Ratio Scale). Ideally, the Cronbach’s alpha coefficient of a scale should be above 0.7. Following guideline developed Gliem & Gliem (2003) by presented in the table can be a guide to evaluate the reliability coefficient. If the Cronbach’s Alpha is greater than 0.90 then the Interpretation is Excellent.

**Table-1**

<b>Cronbach’s Alpha value</b>	<b>Interpretation</b>
Greater than .90	Excellent
Greater than .80	Good
Greater than .70	Acceptable
Greater than .60	Questionable
Greater than .50	Poor
Less than .50	Unacceptable

**e. Output of Cronbach Alpha in SPSS**

SPSS is short for Statistical Package for the Social Sciences, and it's used by various kinds of Researchers for complex statistical data analysis.

There's no better way to measure internal consistency with the software than setting up the Cronbach alpha in SPSS. If there are numerous similar questions in a survey or test that form some sort of scale this kind of an inspection can determine whether the scale is valid or not.

**SPSS Output Case Processing Summary**

Table-2(a)

		N	%
Cases	Valid	46	100
	Excluded	0	0
	Total	46	100

**Reliability Statistics**

Table-2(b)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	# of Items
0.918	0.919	21

From table-2(b), it can be noted that Cronbach Alpha is **0.918** which shows an excellent reliability of scale in the study.

**Item Statistics**

Table-2(c)

Attributes	Mean	Std. Deviation	N
Cloud Security	4.06	1.04	46
Compliance	4.54	1.06	46
Architecture	3.67	1.01	46
Manageability	3.89	0.73	46
Service Level Agreements	4.06	1.08	46
Support	3.69	0.89	46
Costs	2.30	0.78	46
Governance	3.73	0.92	46
High Availability	3.73	1.02	46
Easily Managed	3.36	0.87	46
Customer Driven	3.89	0.92	46
Transparent	3.26	0.88	46
Integration	2.52	0.98	46
Network Ownership	2.52	1.00	46
Business Process Remodelling	3.00	1.13	46
Backup and Recovery	3.95	1.03	46
Scalability	2.91	1.00	46
Vendor Viability	3.34	0.89	46
Reliability	3.84	1.09	46
Certifications and Compliance	3	1.17	46
Regulatory Requirements	4.65	0.97	46

**Item – Total Statistics**

Table-2(d)

Attributes	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Cloud Security	69.93	143.75	0.70	.	0.911
Compliance	69.45	140.69	0.81	.	0.909
Architecture	70.32	149.15	0.5	.	0.916
Manageability	70.10	153.65	0.45	.	0.917
Service Level Agreements	69.93	145.44	0.60	.	0.914
Support	70.30	147.10	0.677	.	0.913
Costs	71.69	157.50	0.224	.	0.921
Governance	70.26	146.90	0.655	.	0.913
High Availability	70.26	146.90	0.589	.	0.914
Easily Managed	70.63	147.88	0.65	.	0.913
Customer Driven	70.10	150.63	0.487	.	0.916
Transparent	70.73	149.30	0.579	.	0.915
Integration	71.47	149.41	0.506	.	0.916
Network Ownership	71.47	149.72	0.48	.	0.917
BusinessProcessRemodelling	71	153.91	0.26	.	0.922
Backup and Recovery	70.04	144.88	0.66	.	0.912
Scalability	71.08	148.65	0.52	.	0.916
Vendor Viability	70.65	147.38	0.65	.	0.913
Reliability	70.15	144.22	0.65	.	0.913
Certifications & Compliance	71	148.48	0.44	.	0.918
Regulatory Requirements	69.34	142.85	0.80	.	0.91

Table-2(d) presents the value that Cronbach's alpha would be if a particular item is deleted from the scale. The Corrected Item-Total Correlation column in the Item-Total Statistics table provides an indication of the degree to which each item correlates with the total score. Low values (less than 0.3) here indicate that the item is measuring something different from the scale as a whole. If scale's overall Cronbach's alpha is too low (e.g. less than .7) and you have checked for reverse items that might not have been entered properly, It would be a good idea to consider removing items with low item-total correlations.

It is observed that removal of any question except items 7 and 15, would result in a lower Cronbach's alpha. Thus it is not necessary to remove these questions. Removal of items 7 and 15 would lead to a small improvement in Cronbach's alpha, and it can also seen that the "**Corrected Item-Total Correlation**" value was low (0.224 and 0.26 respectively) for this item. This might lead us to consider whether we should remove these items or not.

**g. Principal components analysis**

Cronbach's alpha generally provides us with an overall reliability coefficient for a set of variables. If the set of variables reflect different underlying dimensions (or personal qualities), Cronbach's alpha will not be able to distinguish between these. In order to do this, we need to run a test such as a principal components analysis (PCA) to identify the dimensions in test.

Principal components analysis is the most commonly used procedure and it's also the default procedure in SPSS. The Cloud selection attributes questionnaire is a 5 point Likert – scale survey consisted of 21 attributes. All items are responded to on a Likert scale of 1-5, where 5 = Strongly agree and 1 = Strongly disagree. \*Asterisked items are reverse scored, so that the opposite is true (i.e. 1 = Strongly agree and 5 = Strongly disagree).



**Output of Principal Component Analysis:**

Table-3(a)

<b>Total Variance Explained</b>								
<b>Component</b>	<b>Initial Eigenvalues</b>			<b>Extraction Sums of Squared Loadings</b>			<b>Rotation Sums of Squared Loadings</b>	
	<b>Total</b>	<b>% of Variance</b>	<b>Cumulative %</b>	<b>Total</b>	<b>% of Variance</b>	<b>Cumulative %</b>	<b>Total</b>	<b>% of Variance</b>
1	8.51	40.55	40.55	8.51	40.55	40.55	4.99	23.78
2	2.84	13.56	54.11	2.84	13.56	54.11	3.31	15.79
3	2.48	11.83	65.94	2.48	11.83	65.94	3.17	15.13
4	1.44	6.88	72.83	1.44	6.88	72.83	2.4	11.46
5	1.31	6.24	79.07	1.31	6.24	79.07	1.96	9.35
6	1.05	5.03	84.11	1.05	5.03	<b>84.11</b>	1.8	8.57
7	0.93	4.46	88.58					
8	0.58	2.8	91.38					
9	0.45	2.17	93.56					
10	0.39	1.85	95.42					
11	0.26	1.27	96.69					
12	0.23	1.12	97.81					
13	0.14	0.7	98.52					
14	0.11	0.55	99.07					
15	0.07	0.36	99.44					
16	0.05	0.25	99.69					
17	0.03	0.15	99.85					
18	0.02	0.12	99.97					
19	0	0.01	99.99					
20	0	0	100					
21	0	0	100					
Extraction Method: Principal Component Analysis.								

As just a matter of definition, it's always the case that the number of variables we input in our analysis, will always be equal to the number of components shown here. So we have 21 variables input in our analysis, therefore we have 21 rows or 21 components shown here. Now here in our Initial Eigenvalues table, notice that we have various eigenvalues.

From the above Table we see there are 6 Eigen Values greater than 1 and everything after that is less than 1. We keep the number of factors or components that have eigenvalues greater than one. All other components with eigenvalues less than one, such as these here, we do not keep.

So since only six components had an eigenvalue greater than one, we only have six components in our solution here. In other words, we reduce those 21 variables down to six components. These six components, from this perspective, does a pretty good job at explaining the relationships between all the 21 cloud selection attributes.

One way to assess how good of a job this Principal Component Analysis did at explaining the relationships between those variables is to look at the percent of variance accounted for by the component. Here six component solution accounted for **84.115%** of the variance, or about 84% of variance, which is pretty good in practice.

**Table-3(b): Rotated Component Matrix**

	Component					
	1	2	3	4	5	6
Cloud Security	<b>0.544</b>	0.166	0.372	-0.05	0.346	0.257
Compliance	<b>0.781</b>	0.291	0.362	0.034	0.082	0.112
Architecture	0.333	0.358	0.254	-0.479	0.139	<b>0.633</b>
Manageability	0.184	-0.005	0.094	0.372	<b>0.7</b>	0.202
Service Levels Agreement	<b>0.806</b>	-0.113	0.246	0.419	-0.078	0.107
Support	<b>0.524</b>	0.371	0.37	-0.407	0.218	0.338
Costs	0	-0.059	0.095	0.133	0.09	<b>0.939</b>
Governance	<b>0.635</b>	0.043	0.572	0.112	-0.12	0.123
High Availability	<b>0.866</b>	0.14	-0.118	0.044	0.298	-0.073
Easily Managed	0.175	0.209	<b>0.863</b>	0.061	0.145	0.141
Customer Driven	0.1	<b>0.793</b>	0.268	0.019	-0.088	0.168
Transparent	<b>0.797</b>	-0.008	0.013	0.229	0.253	-0.043
Integration	0.237	<b>0.836</b>	0.103	0.033	-0.08	0.103
Network Ownership	0.065	<b>0.87</b>	0.16	0.022	0.278	-0.234
Business Process Remodelling	-0.235	<b>0.762</b>	0.055	0.446	0.102	-0.019
Backup & Recovery	0.348	0.115	0.473	-0.074	<b>0.562</b>	0.245
Scalability	0.279	0.132	0.068	<b>0.819</b>	0.34	0.11
Vendor Viability	0.103	0.321	<b>0.876</b>	0.043	0.211	0.035
Reliability	0.458	0.05	0.487	-0.039	<b>0.66</b>	-0.197
Certifications and Compliance	0.327	0.237	0.07	<b>0.839</b>	-0.02	-0.028
Regulatory Requirements	<b>0.743</b>	0.027	0.441	0.152	0.254	0.156

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 7 iterations.

### Rotated Component Matrix

The rotated component matrix of table 3(b), factor 1 has high coefficients for variables Cloud Security, Compliance, Service Levels Agreement, Support, Governance, High Availability, Transparent, and Regulatory Requirements. Thus this factor may be labelled as *Identifying Cloud Opportunities*. Factor 2 is highly related to the variables Customer Driven, Integration, Network Ownership and Business Process Remodelling. This factor may be called as *Feasibility of Migrating Existing setup to Cloud*. Third factor is highly correlated with variables Easily Managed and Vendor Viability. This factor may be labelled as *Financial Robustness of Vendor*. Fourth factor is highly correlated with variables Scalability, Certifications and Compliance. This factor may be called as *Cloud Implementation Project Experience*. Fifth factor is highly correlated with variables Manageability, Backup and Recovery, Reliability. This factor may be labelled as *Disaster Recovery set up*. Sixth factor is highly correlated with variables Architecture and Costs. This factor may be labelled as *Size of Infrastructure which needs to be Migrated to Cloud*.

## VI. CONCLUSION

In this paper, an attempt is made to study the evaluation criteria for the selection of a cloud using Cronbach alpha. The value of Cronbach alpha showed very good internal consistency of items selected for the study. Further, Factor analysis is used to identify the underlying dimensionality of items. Six factors are identified through this method. These are *Identifying Cloud Opportunities*, *Feasibility of Migrating Existing setup to Cloud*, *Financial Robustness of Vendor*, *Cloud Implementation Project Experience*, *Disaster Recovery set up* and *Infrastructure which needs to be migrated to Cloud*. These six factors accounted for nearly 85 percent of variance.

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