

# Hyper-Converged Infrastructure:

*Analysis of HPE's Decision to Acquire SimpliVity*

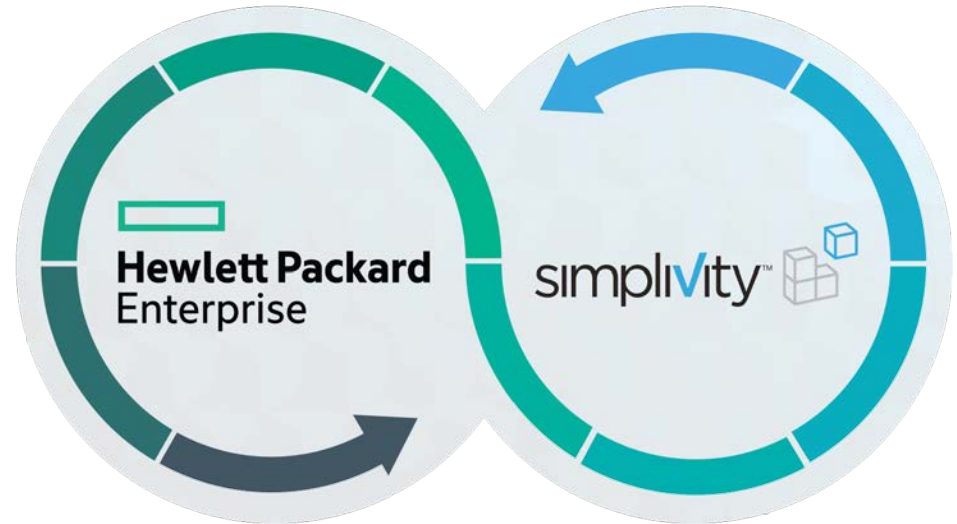
ETM 530 - Decision Making

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# Overview

- Project Objectives
- Topic Background
- The Decision
- The HDM Model
- Decision Criteria
- Data Collection
- Result
- Analysis
- Limitations
- Future Research



# Project Objectives

# Project Objectives

- ✓ Analyze and assess HP Enterprise's decision to acquire hyper-converged infrastructure (HCI) vendor, SimpliVity
  - Discuss and document acquisition options available to HP
  - Discuss the reasoning behind why SimpliVity was chosen out of all available options
- ✓ Define HCI - Consolidating IT components into a single optimized platform with centralized management enables increased utilization and lower costs
- ✓ Define HCI's importance both now and for the future of HP Enterprise
- ✓ Define HP's current technology portfolio and how it is impacted (positively or negatively) by this acquisition
- ✓ Define acquisition criteria

# Methodology

- Research Methodology: Literature Review
- Decision Making Methodology: HDM
- Note: We did not survey industry experts, we served as the industry experts based on our literature review

# Topic Background

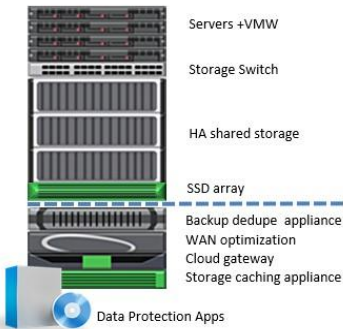

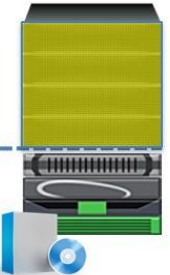

# Types of Data Centers

## Two Broad Classifications of Data Centers Today

1. Browser-based or Internet Data Centers
2. Application-based Enterprise or Internal Data Centers.

Browser-based data centers usually support only a few applications and require different data center architecture than the application-based data centers that require more expansive capabilities.

# The Evolution of Convergence

<b>Legacy Infrastructure Stack</b>	<b>Integrated Systems 1.0</b>	<b>Converged Systems 2.0</b>	<b>Hyper- Convergence 3.0</b>
			
<b>✓ Leverages Best of breed</b>	<b>✓ Limited Innovation</b>	<b>✓ Incremental Innovation</b>	<b>✓✓ Revolutionary Innovation</b>
<b>✗ TCO: High CAPEX, High OPEX</b>	<b>✗ TCO: High CAPEX, High OPEX</b>	<b>✓ Partial Savings</b>	<b>✓✓ Cost savings: 3x Lower TCO</b>
<b>✗ Islands, No pooling, Poor Resource utilization</b>	<b>✗ No pooling, no sharing of resources, limited scale-out</b>	<b>✓ Partial pooling, sharing of x86, storage resources</b>	<b>✓✓ Full pooling, sharing of all resources, scale-out</b>
<b>✗ Global Management: Very Complex</b>	<b>✓ Global Management: Limited improvements</b>	<b>✓ Global Management: Limited Improvement</b>	<b>✓✓ Unified Global Management &amp; Automation</b>
<b>✗ Data Efficiency: Not integrated</b>	<b>✗ Data Efficiency: Not integrated</b>	<b>✗ No Data Efficiency, Data Protection Policy, DR</b>	<b>✓✓ Fully Integrated Data Efficiency, Policy-based Data Protection, DR</b>
<b>✗ Complex deployment</b>	<b>✓ Deployment time: Limited improvements</b>	<b>✓ Deployment time: small improvements</b>	<b>✓✓ Deployment time: Radical improvements, Simple</b>



# HPE Overview

## Four Main Divisions of HPE

1. Enterprise
  - a. Servers
  - b. Storage
  - c. Networking
  - d. Consulting
  - e. Support
2. Services
3. Software
4. Financial Services



## Goals of Acquisition

1. Increase market share in HCI
2. Develop a future growth path
3. Improve technology offerings in the HCI space

# Core Growth

## HPE Product Portfolio

Simple, open, and automated. [Explore All](#)



### Integrated Systems

Composable Systems

Converged Systems

Hyperconverged Systems

Blade Systems

Infrastructure Management



### Servers

Rack Servers

Tower Servers

Blade Systems

Density Optimized

Mission Critical Solutions

Entry Level Servers

★ Servers for Cloud

★ Servers for Internet of Things

Server Management

Server Options



### Storage

All-flash and Hybrid Storage

Midrange and Enterprise Storage

Entry Level Storage Systems

Data Availability, Protection and Retention

Software Defined Storage

★ Storage Management and Orchestration

★ Storage Networking



### Networking

Switches

Access Points and Controllers

Routers

★ Network Management

Network Security

Location-based Services

Campus and Branch Networking

★ Data Center Networking

Small and Midsize Business Networking



### Software

Application Delivery Mgmt

Big Data Software

Enterprise Security

Data Backup and Governance

Operations Management

Infrastructure Management

Hybrid Cloud Management

Network Management

Software A-Z

Free & Trial Software

# Current HPE Portfolio

## HPE Hyper Converged Portfolio



### **HPE Hyper Converged Operating Environment 2.0**

Empower your business with a multi-tenant self-service portal for instant access to resources



### **HPE Hyper Converged 380**

A general purpose virtualization, VDI and cloud solution that integrates compute and storage, simplifies upgrades, and increases uptime and service levels.



### **HPE Hyper Converged 250 for VMware**

A pre-integrated system for VMWare that deploys virtual machines at optimal density and includes VM management for peak utilization.



### **HPE Hyper Converged 250 for Microsoft Cloud Platform Systems Standard**

A purpose-built system to simplify virtualization with added resiliency and Microsoft Cloud Platform System Standard.

# The Decision

# HCI Industry Players



# Why Each Company Was Chosen

## SimpliVity

- Chosen by HPE to acquire

## Nutanix

- Market leader in the HCI space

## VMware

- Larger company with more resources and would be a merger of equals

# Company Profile - Nutanix

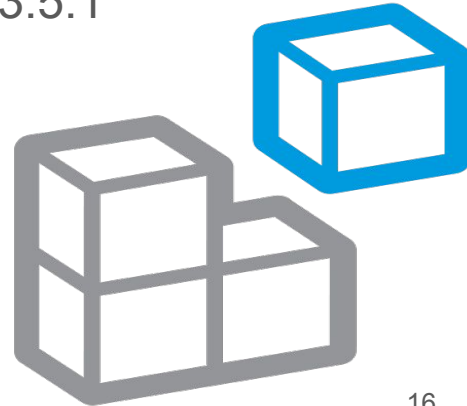
Nutanix was founded in 2009 and is based in San Jose, CA. Its core technology, its distributed file system, was heavily influenced by the success of the hyperscale market (web-scale IT). Nutanix appliances consolidate the compute and storage tiers into a single integrated solution that can scale linearly as needed. "Pay as you grow". Product - Acropolis v4.6



# Company Profile - SimpliVity

Founded in 2009 and based in Westborough, MA, SimpliVity has quickly become one of the fastest-growing companies in New England. The company was led by well-known industry veteran Doron Kempel (former CEO and founder of backup appliance vendor Diligent and an EMC executive). The company sells its software on a stand-alone basis or as part of a reference architecture relationship with Cisco using its switches and UCS servers. Product - OmniStack 3.5.1

simpliVity™





# Company Profile - VMware

Founded in 1998, Palo Alto, CA. It is a subsidiary of Dell Technologies and claims to be the first to successfully virtualize the x86 architecture commercially. The new hyper-converged solution builds upon VMware's VSAN and combines it with EMC's ScaleIO to give it the ability to scale into hyperscale environments. We view the solution, which can start at just 4 nodes and scale up to more than 1,000, as a credible first step to move hyper-convergence into larger deployments.

Product- Virtual SAN 6.2

The VMware logo is displayed in a large, dark gray, sans-serif font. The letters are lowercase, with the 'v' and 'm' being particularly bold and rounded. A registered trademark symbol (®) is located at the top right of the 'e'.

# The HDM Model

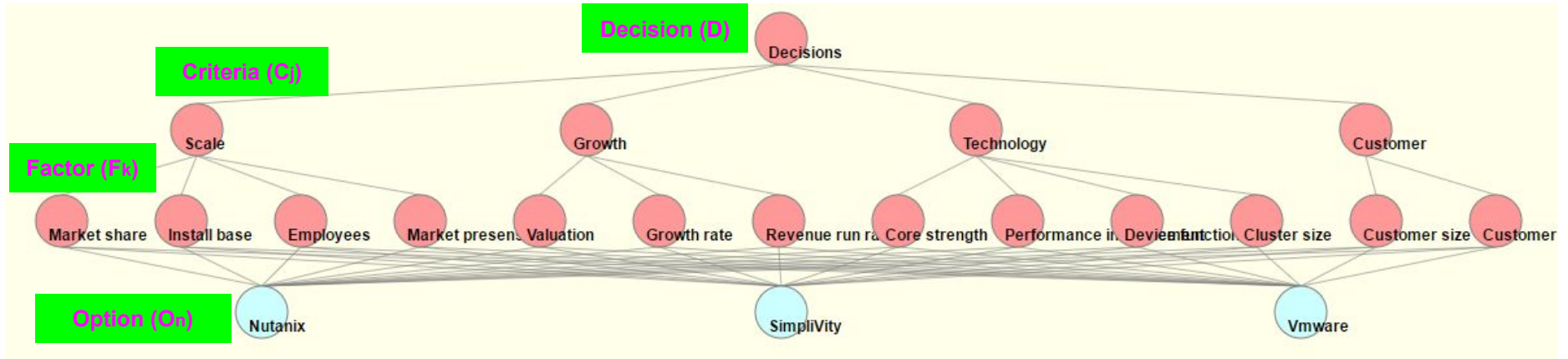
# HDM Model

HDM is used to quantify the judgment.

An effective way to form consensus among decision makers where the members of the group have different goals.

Measures such as effective model, sensitivity analysis and diverse expert panel can make HDM approach useful.

# HDM Model



$C_j$ : Decision criteria categories

$F_k$ : Influencing factors

$O_n$ : Target company options

$c_j$ : The relative importance of each criteria ( $C_j$ ) to the decision ( $D$ )

$f_{jk}$ : The relative impact of each factor ( $F_k$ ) to the criteria ( $C_j$ )

$o_{kn}$ : The relative performance of each option ( $O_n$ ) to each factor ( $F_k$ )

$$S_n = \sum_{n=1}^n \sum_{k=1}^k \sum_{j=1}^j o_{kn} * f_{jk} * c_j$$

Relative score of each acquisition target company option to the decision

# Decision Criteria



# Decision Criteria

## - **Scale**

- Market Share
- Install Base
- Employees
- Market Presence

## - **Growth**

- Valuation
- Growth Rate
- Average Run Rate

## - **Technology**

- Performance improvement
- Core Strengths
- Functionality of Devices
- Cluster Size

## - **Customer**

- Customer Satisfaction
- Number of Customers

# Data Collection



# Data Collection

## Part I: Expert panel to evaluate on

- The relative importance of each criteria ( $C_j$ ) to the decision ( $D$ )
- The relative impact of each influence factor ( $F_k$ ) to the criteria ( $C_j$ )

Analysis of HP's Decision to Acquire Simplicity

```
graph TD; Decisions((Decisions)) --- Scale((Scale)); Decisions --- Growth((Growth)); Decisions --- Technology((Technology)); Decisions --- Customer((Customer));
```

Show Instructions

Please give your judgment for each pair of nodes below toward Decisions:

<p>Growth</p> <p>66</p> <p>1</p>	<p>34</p> <p>1</p>	<p>Scale</p>	<p>Technology</p> <p>67</p> <p>2</p>	<p>33</p> <p>1</p>	<p>Scale</p>	<p>Customer</p> <p>61</p> <p>1</p>	<p>39</p> <p>1</p>	<p>Scale</p>
<p>Technology</p> <p>65</p> <p>1</p>	<p>35</p> <p>1</p>	<p>Growth</p>	<p>Customer</p> <p>61</p> <p>1</p>	<p>39</p> <p>1</p>	<p>Growth</p>	<p>Customer</p> <p>37</p> <p>1</p>	<p>63</p> <p>1</p>	<p>Technology</p>

Save & Go to the Next Node   Save & Go to the Main Page   Cancel



## Part II: Data research on

- The performance of each option ( $O_n$ ) to each factor ( $F_k$ )

	Nutanix	SimpliVity	VMware
<b>Scale</b>			
Market Share	52%	18%	7%
Install Base	5	3	5
Employees	1800	750	800
Market Presence	4.5	3.15	4.80
<b>Growth</b>			
Valuation	2.34B	0.65B	38B
Growth Rate	77%	110.7%	8.8%
Average Run Rate	102M/yr	96M/yr	560M/yr

	Nutanix	SimpliVity	VMware
<b>Technology</b>			
Core Strengths	8	9	8
Performance Improvement	4.34	4.28	3.73
Functionality of Devices	4.15	4.4	4.15
Cluster size	100	24	64
<b>Customer</b>			
Customer Satisfaction	4.34	4.34	2.32
Customer Count	3100	1300	7000

# Numerical Data Addition

Numerical data will be added through a numerical normalization back to 100. This will allow the tool to work as intended.

$$A^* = (A \times 100) / (A+B) \qquad B^* = (B \times 100) / (A+B)$$

Where A is criteria 1's weighting and B is criteria 2's weighting. A\* is the normalized value of A relative to B. B\* is the normalized value of B relative to A.

# Scale



# Scale

Scale is the measure of the impact the acquisition, or lack of one, has on the size or performance of the acquirer.

Factors:

- Market Share
- Install Base
- Employees
- Market Presence

# Scale - Market Share

The measure of the impact of the acquisition on the overall market share of the companies:

- ❖ Nutanix - 52%
- ❖ SimpliVity - 18%
- ❖ Vmware - 7%
- ❖ HPE - 3%

Note: Size of the companies at the time of SimpliVity acquisition.

Forrester Wave for hyper-converged infrastructure suppliers for 3Q16



# Install Base / Employees / Market Presence

Install base: A measure of the impact of the acquisition on the overall customer base of the acquirer.

Employees: The number of employees at the company dedicated to HCI.

Market Presence: A measure of the impact of the acquisition on the overall market presence of the acquirer.

	Nutanix	SimpliVity	VMware
Install Base	5	3	5
Employees	1800	750	800
Market Presence	4.5	3.15	4.80

# Growth



# Types of Growth

- Valuation
- Growth Rate
- Average Run Rate



# Valuation

Market capitalization refers the total dollar market value of a company's outstanding shares.

Commonly referred to as "market cap," it is calculated by multiplying a company's shares outstanding by the current market price of one share.

	Nutanix	SimpliVity	VMware
Valuation	2.34B	0.65B	38B

# Growth Rate

Growth rates refer to the percentage change of a specific variable within a specific time period, given a certain context.

For investors, growth rates typically represent the compounded annualized rate of growth of a company's revenues, earnings, dividends and even macro concepts such as GDP and the economy as a whole.

	Nutanix*	SimpliVity**	VMware***
Growth Rate	77%	110.7%	8.8%

<http://www.investopedia.com/terms/g/growthrates.asp>

\*Source: <https://www.nutanix.com/press-releases/2017/03/02/nutanix-reports-second-quarter-fiscal-2017-financial-results/>

\*\*Source: <https://www.forbes.com/sites/petercohan/2016/10/10/with-simplivity-surging-can-nutanix-hold-its-ipo-gains/#77fb85f31952>

\*\*\*Source: <https://www.zacks.com/stock/news/213928/vmware-vmw-up-on-strong-q1-sales-amp-view-earnings-lag>

# Average Run Rate

The run rate concept refers to the extrapolation of financial results into future periods.

For example, a company could report to its investors that its sales in the latest quarter were \$5,000,000, which translates into an annual run rate of \$20,000,000

	Nutanix	SimpliVity	VMware
Average Run Rate	102M/yr	96M/yr	560M/yr

# Technology

# Technology

- Performance Improvement
- Core Strengths
- Functionality of Devices
- Cluster Size

# Performance Improvement

- Evaluation of how others' product could offset current weakness
- Incorporate various aspects:
  - Hypervisor support
  - Nonvirtualized environment
  - Hardware platform support
  - Maximum configuration
  - Hyperconverged functions
  - High availability and data protection
  - Manageability and ease of operations

	Nutanix	SimpliVity	VMware
Performance Improvement	4.34	4.28	3.73

# Core Strength/Functionality of Device/Cluster Size

- **Core Strength:** Based on the number of implementation engineers and dedicated support engineers
- **Functionality of Devices:** hyperconverged functions
- **Cluster size:** pre-integrated computing and storage module

Vendor	Product
Nutanix	Acropolis v4.6
SimpliVity	OmniStack 3.5.1
VMware	Virtual SAN 6.2

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\*Source: <https://www.simplivity.com/wp-content/uploads/forrester-wave-report-hyperconverged-infrastructure-q3-2016-en.pdf>

\*\*Source: <https://blogs.vmware.com/virtualblocks/2015/05/29/20-common-vsan-questions/>

# Customer



# Customer

- Customer Satisfaction
  - A measure of how satisfied each customer is with the current component offering and business interactions
- Number of Customers
  - Number of customers that the company currently supports

	Nutanix	SimpliVity	VMware
Customer Satisfaction	4.34	4.34	2.32
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# Data Summary

# Hard Data Summary

	Nutanix	SimpliVity	VMware
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# Expert Data Compilation

Level-1	Decisions
Scale	0.23
Growth	0.28
Technology	0.28
Customer	0.22
Inconsistency	0.02

Level-3	Market share	Install base	Employees	Market presense	Valuation	Growth rate	Revenue run rate	Core strength
Nutanix	0.67	0.37	0.37	0.34	0.22	0.39	0.15	0.32
SimpliVity	0.24	0.21	0.29	0.28	0.76	0.50	0.21	0.36
Vmware	0.09	0.42	0.34	0.39	0.01	0.11	0.64	0.32
Inconsistency	0.00	0.01	0.02	0.01	0.00	0.09	0.06	0.00

Performance improvement	Device functionality	Cluster size	Customer size	Customer satisfaction
0.35	0.33	0.53	0.27	0.39
0.35	0.34	0.13	0.12	0.39
0.30	0.33	0.34	0.61	0.21
0.00	0.00	0.00	0.00	0.00

Level-2	Scale	Growth	Technology	Customer
Market share	0.37	0.00	0.00	0.00
Install base	0.23	0.00	0.00	0.00
Employees	0.11	0.00	0.00	0.00
Market presense	0.30	0.00	0.00	0.00
Valuation	0.00	0.39	0.00	0.00
Growth rate	0.00	0.35	0.00	0.00
Revenue run rate	0.00	0.27	0.00	0.00
Core strength	0.00	0.00	0.23	0.00
Performance improvement	0.00	0.00	0.21	0.00
Device functionality	0.00	0.00	0.37	0.00
Cluster size	0.00	0.00	0.21	0.00
Customer size	0.00	0.00	0.00	0.57
Customer satisfaction	0.00	0.00	0.00	0.43
Inconsistency	0.03	0.03	0.02	0.00

The final result:

Level-1	Decisions
Nutanix	0.36
SimpliVity	0.34
Vmware	0.31
Inconsistency	0.02

# Result

# Final Result

Options	Nutanix	SimpliVity	Vmware	Inconsistency
Expert 1	0.35	0.3	0.34	0.01
Expert 2	0.35	0.31	0.34	0.01
Expert 3	0.35	0.4	0.25	0.01
Expert 4	0.37	0.33	0.31	0.04
Mean	0.36	0.34	0.31	
Minimum	0.35	0.3	0.25	
Maximum	0.37	0.4	0.34	
Std. Deviation	0.01	0.04	0.04	
Disagreement				0.027

# Analysis

# Analysis

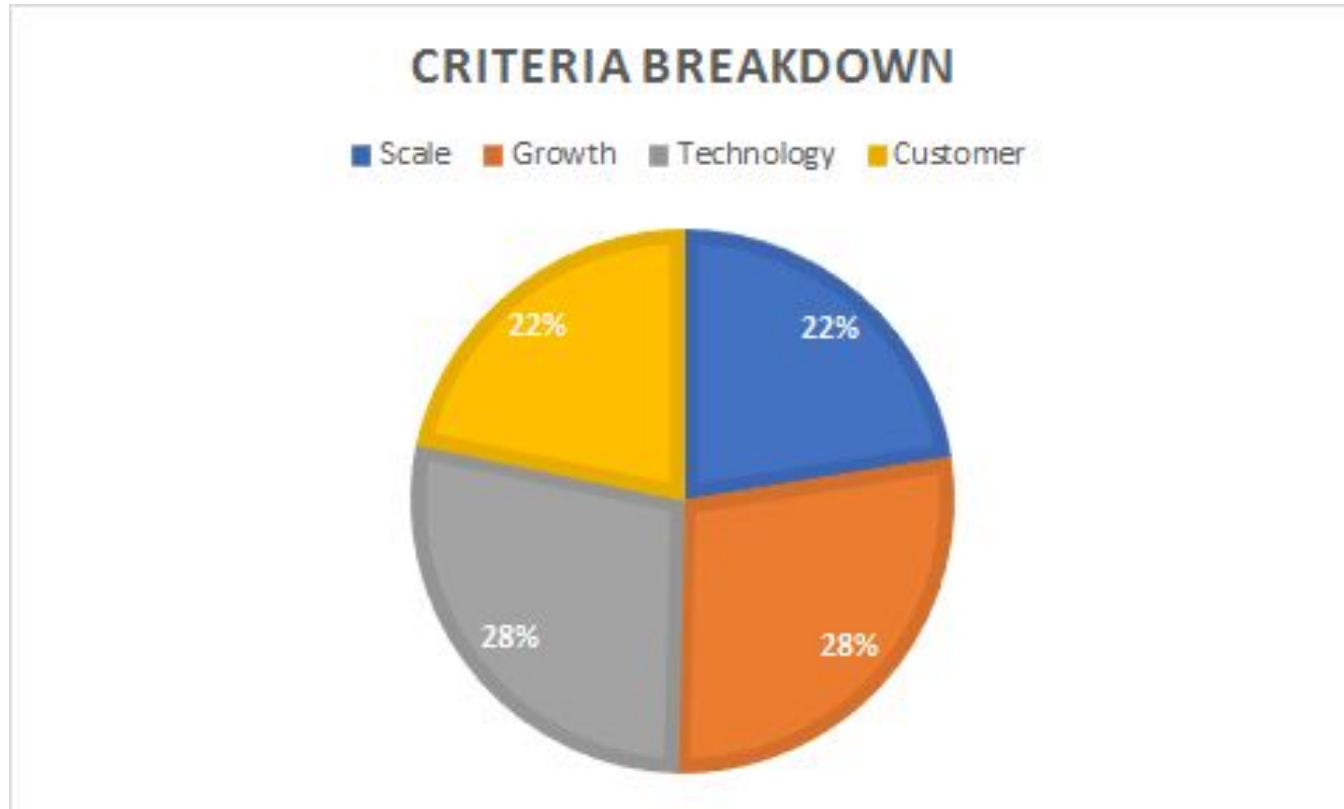
- With a score of 0.36, Nutanix is chosen as the best possible acquisition target
- Simplivity was a close second with a score of 0.34
- VMware has a final score of 0.31

**All 3 companies have scores that are very close to one another which means we can conclude that any option could have been a solid choice**



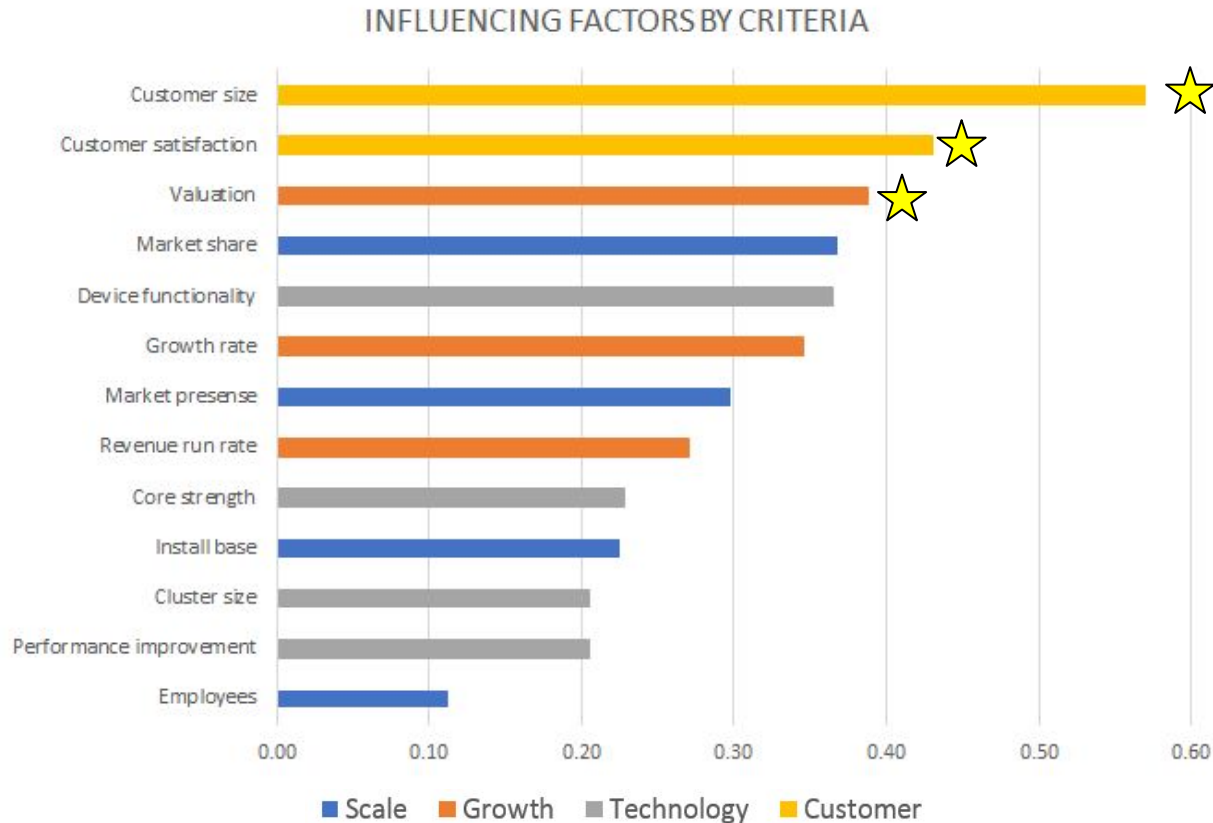
# Data Breakdown

# Criteria Breakdown



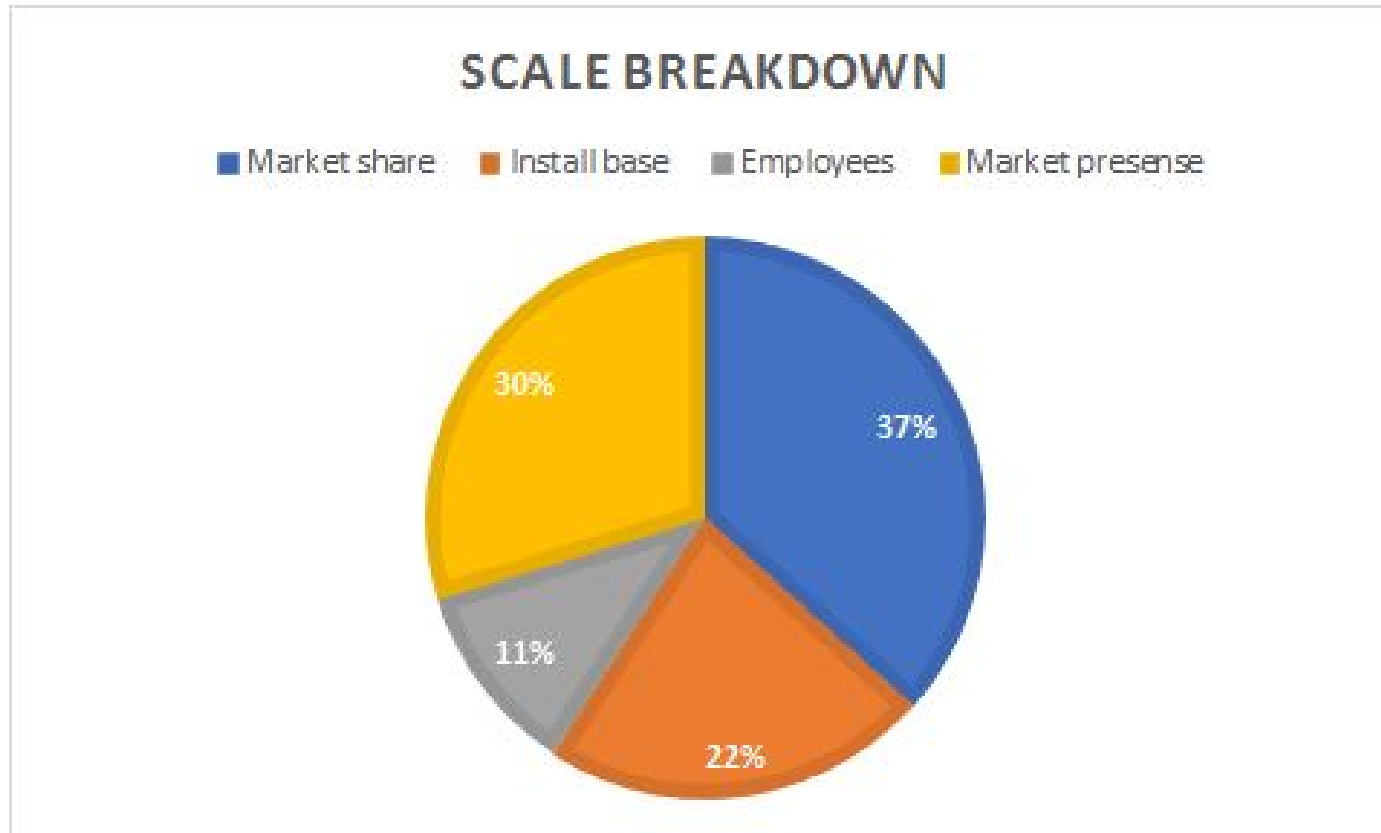
# Influencing Factor Breakdown

# Influencing Factor Breakdown

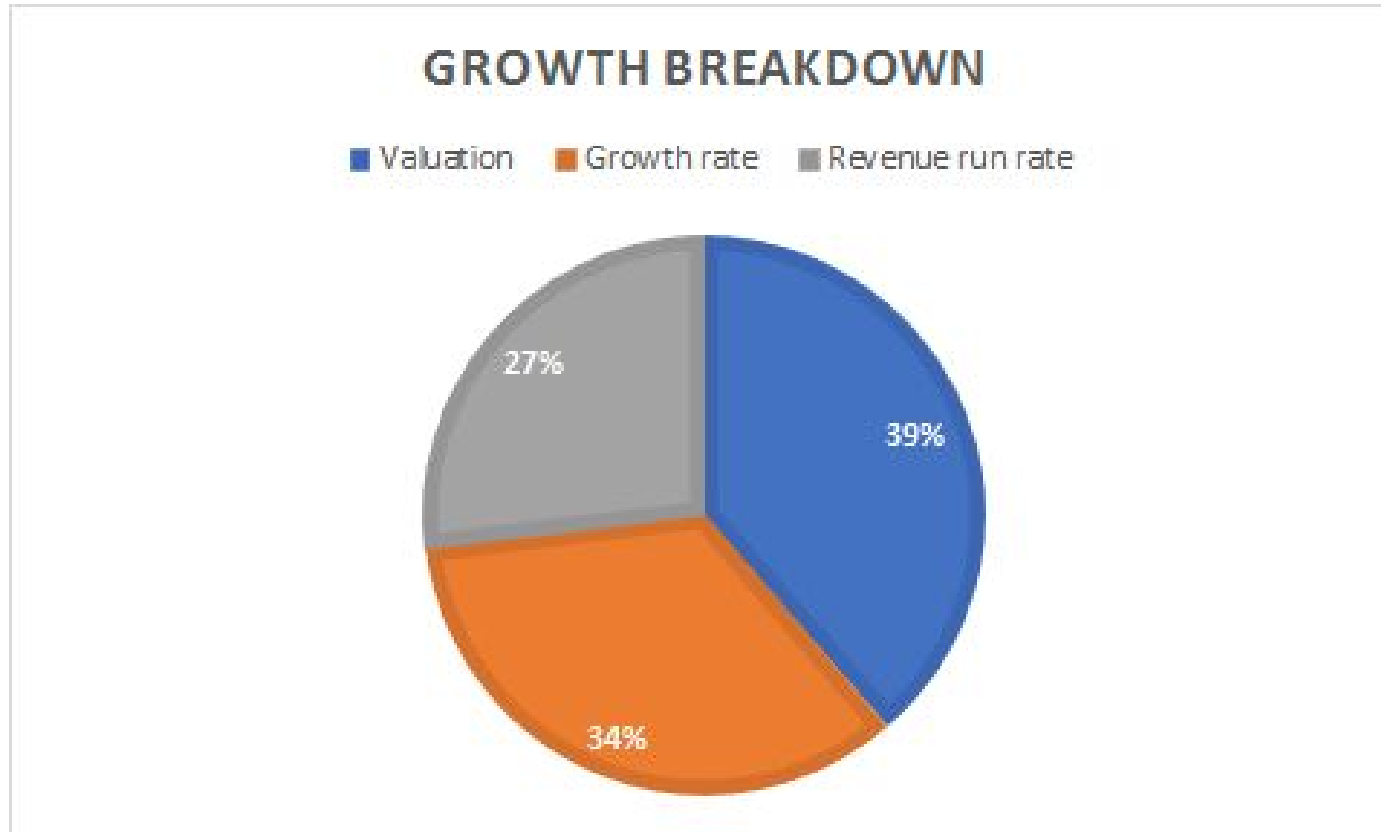


# Influencing Factor Breakdown by Criteria Category

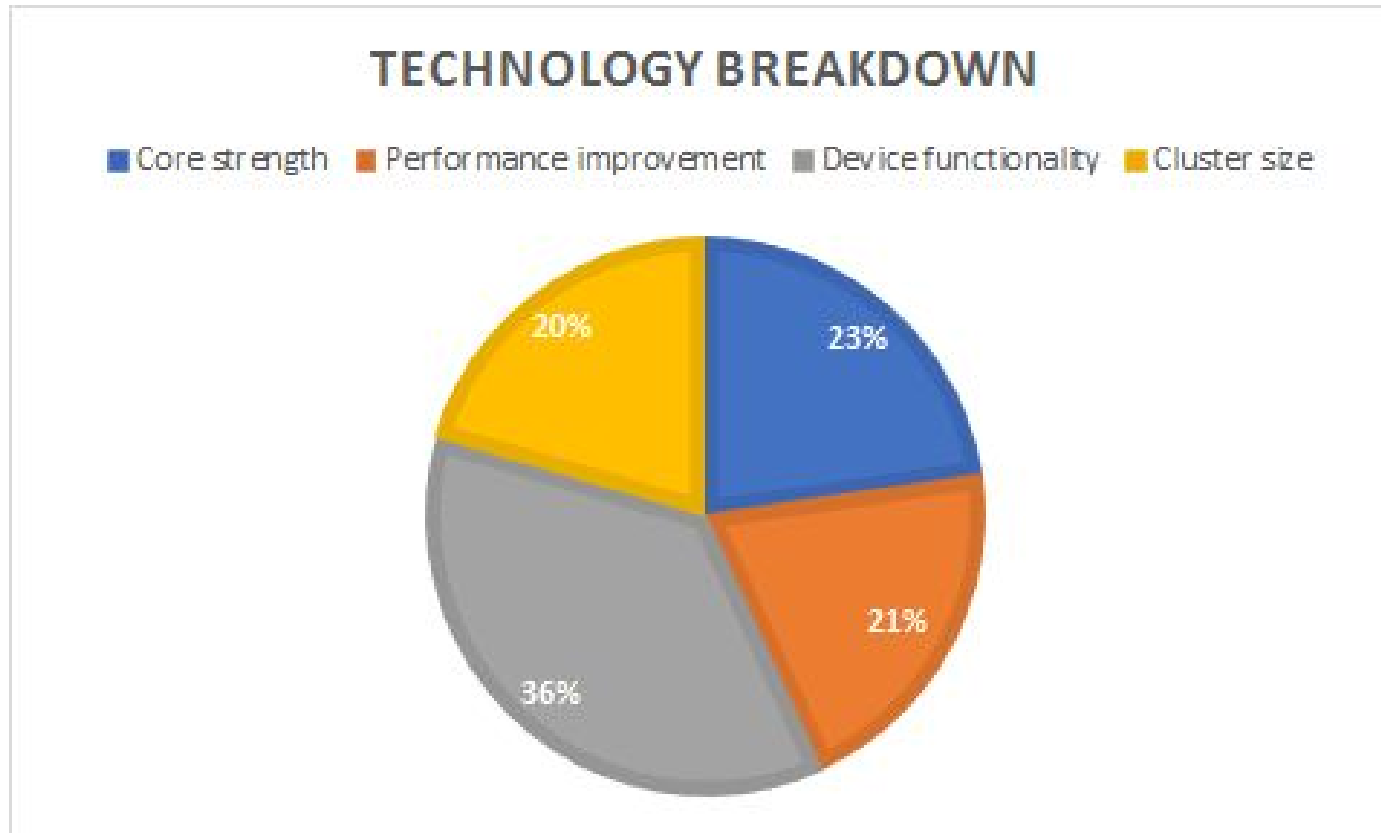
# Scale Breakdown



# Growth Breakdown

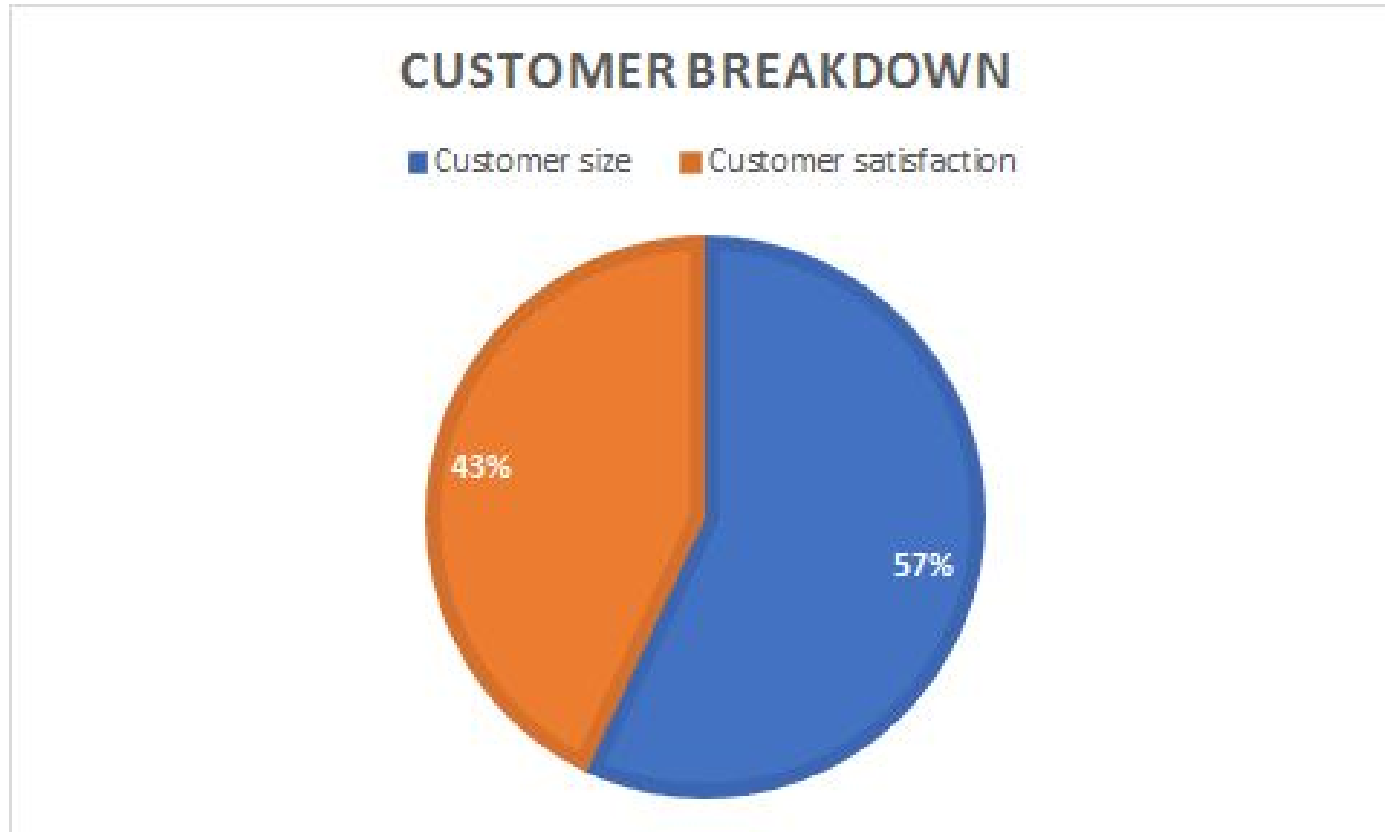


# Technology Breakdown





# Customer Breakdown



# Top Contributors

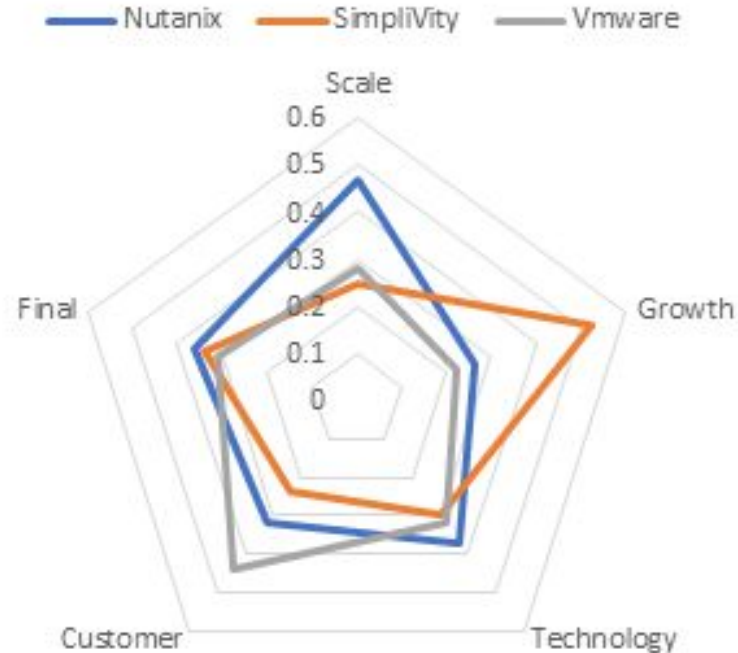
## Level 2

1. Growth
2. Technology

## Level 3

1. Market Share
2. Valuation
3. Device Functionality
4. Customer Base Size

## COMPANY FINAL SCORE BY CRITERIA



# Model Validation

The basic model assumptions were that HPE's goals were to:

1. Increase market share in HCI
2. Develop a future growth path
3. Improve technology offerings in the HCI space

**Top model contributors all match the assumptions**



# Why Nutanix Had Top Score

- Criteria with high weightings:
  - Growth
  - Market share
  - Technology improvements
- Nutanix performs very well in all 3 criteria, so the company is skewed to the top

# Why HPE Chose SimpliVity over Nutanix

- Purchase represents a significant devaluation of the company.
- SimpliVity was said to be valued as high as \$3.9 billion.
- At a cost of \$650M
  - SimpliVity becomes a realistic counter to Nutanix's hybrid cloud ambitions and a very real threat to VMware
  - SimpliVity's technology has advantages to HPE beyond HCI .

# Gap analysis - Simplivity vs Nutanix

- Simplivity has similar growth characteristics to Nutanix
- The valuation is significantly lower for SimpliVity, making it a smaller and easier to justify acquisition
- While Nutanix has a market share of 52% vs 18% for SimpliVity, both are significantly larger than HPE at 3%
- High valuation, low sales price

# Limitations

# Limitations

- **Data**

- Data driven but through articles, not directly from the source as not all companies are public.
- VMware is a large company and has many fields of expertise. It was difficult to find HCI specific information, so some percentage adjustments were required for numerical data.
- HCI is a relatively new domain and very volatile, hence data is evolving.

- **Experts**

- More diverse experts could be used.
- Involve industry experts.



# Limitations

- **Methodology**
  - Difficulty to quantify intangible criteria
  - Span of attention decrease as PCM criteria increase
  - Tool is limited to PSU

# Future Research

# Future Research

- Survey executives or key opinion leaders of each company.
- Use as experts for model development and data collection
- Deep dive into the technology/industry



Thank you!

Questions?

