AMAZON WEB SERVICE

Pinpointing global growth

MIDAS ADVISORY

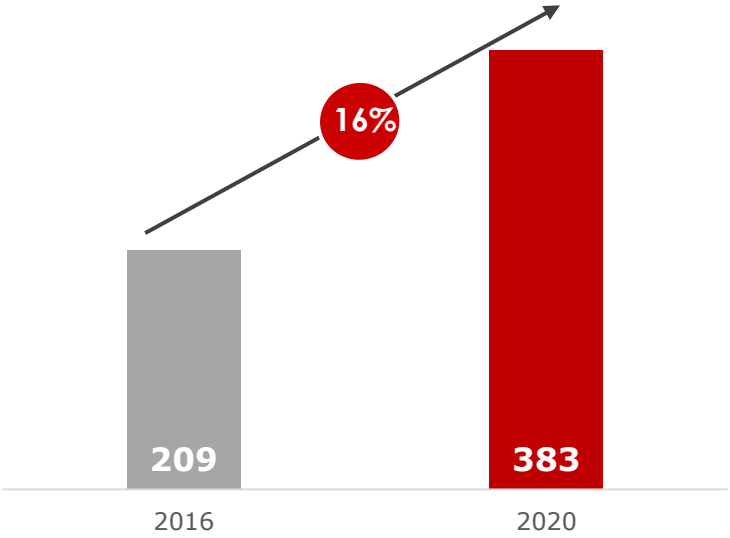
Bhan, Parit, Tatthon, Wassaporn

Cloud Service

Cloud service is on a path towards prospective growth

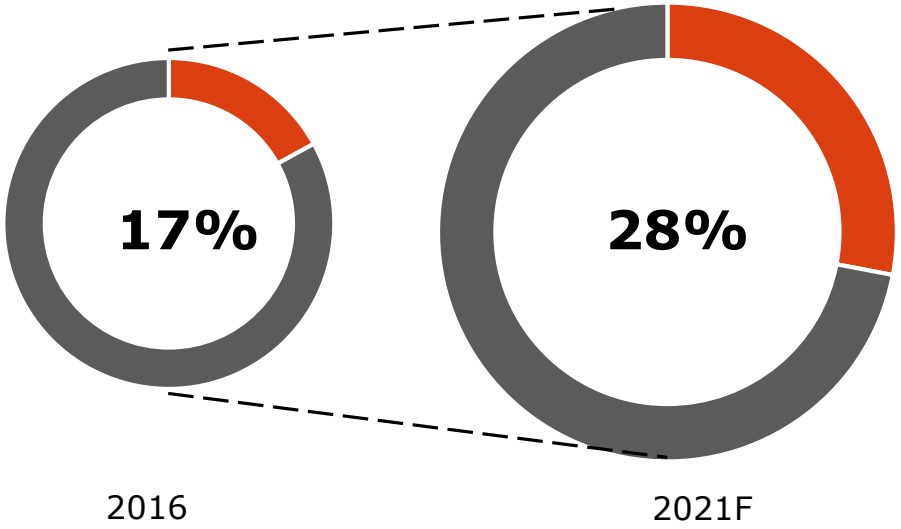
MARKET VALUE OF CLOUD SERVICES

In Billion USD



GROWING IMPORTANCE WITHIN IT

% of Cloud to IT revenue



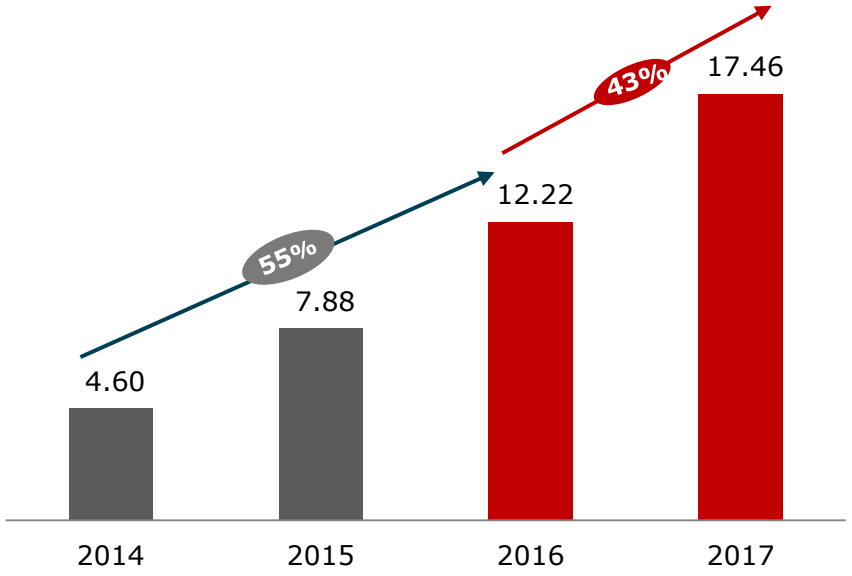
Source: Gartner, Statista, Team Analysis

Situational Analysis

As a pioneer and an industry leader, AWS is facing intensified pressure

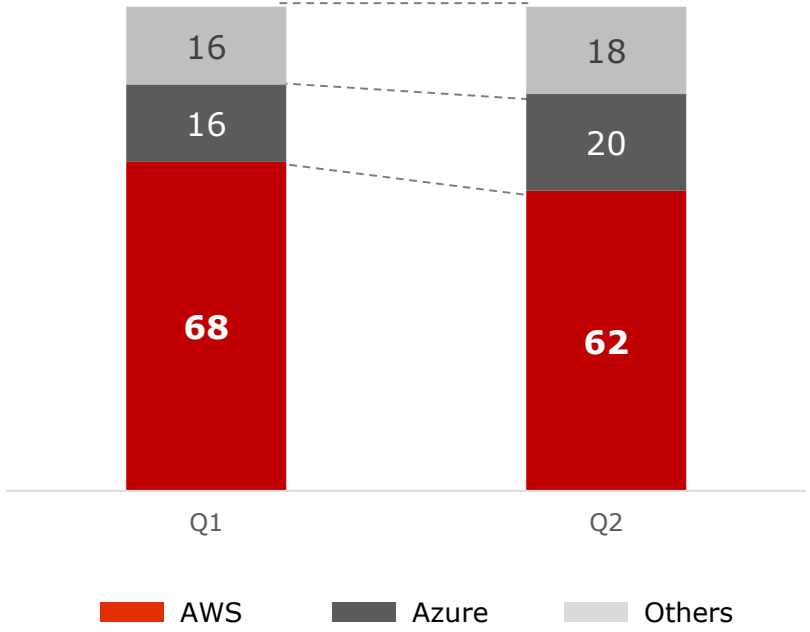
SLOWED REVENUE GROWTH

% AWS YOY Growth



RISING COMPETITION

Market share % (2017)



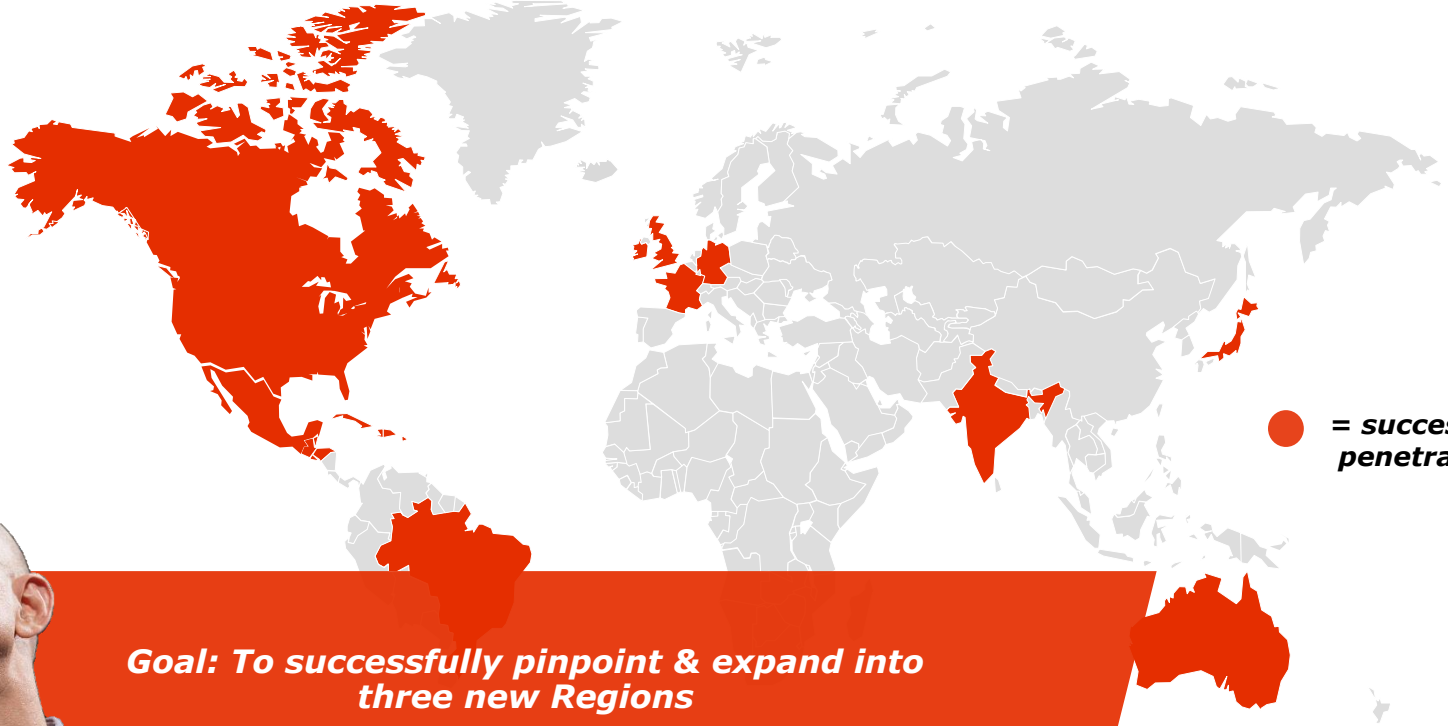
Source: Case Material, CNBC

KEY QUESTION

*How can Amazon **sustain** it's leadership position and **extrapolate** it's growth*

Current Presence

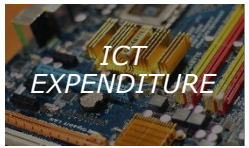
Many opportunities lie ahead in untapped markets



Goal: To successfully pinpoint & expand into three new Regions

Expansion Matrix

Countries are mapped against key criteria

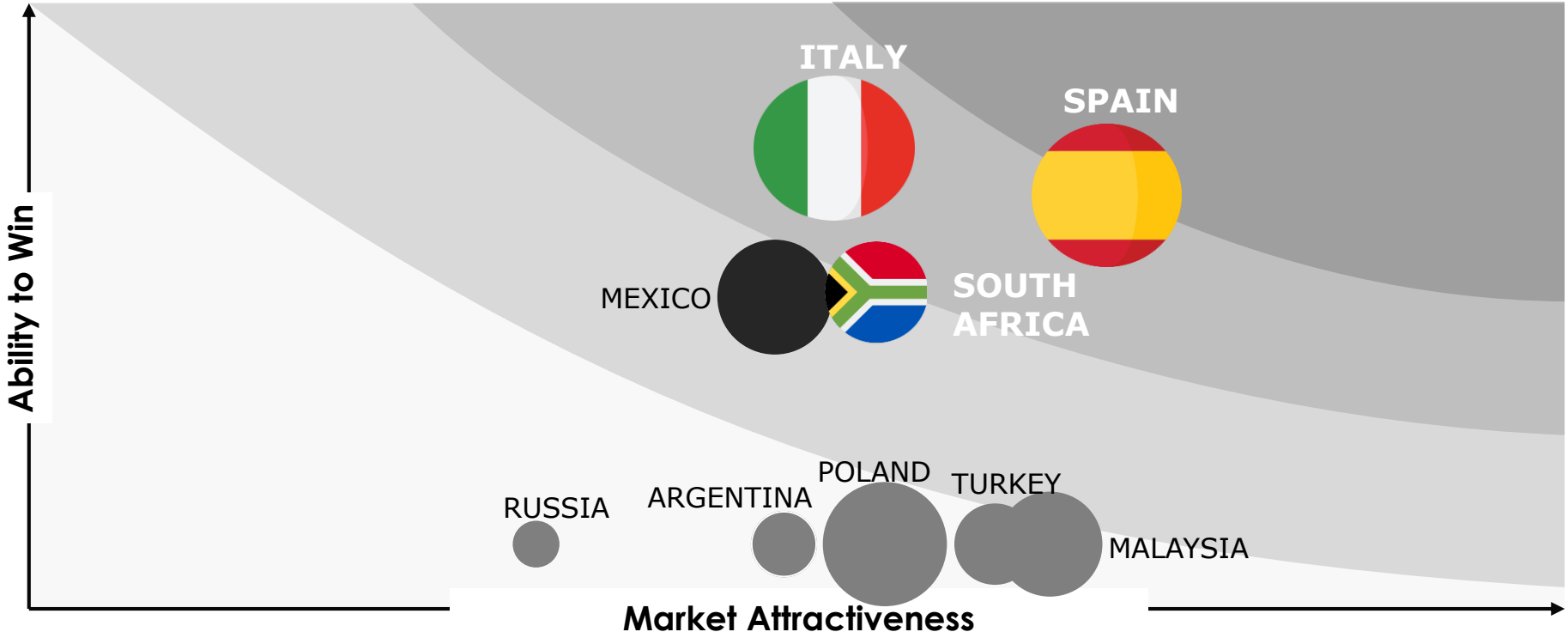
COUNTRIES	FINANCIAL IMPACT			COMPETITION INTENSITY		CLOUD READINESS
Opportunities						
Short-listed	In Trillion USD	Percentage	Ranking	Number of data center	Percentage of market share	Ranking
Weight	**10.5%**	**9%**	**10.5%**	**15%**	**15%**	**40%**
Italy	0.09	5.80%	2	0	[illegible]	9
Spain	0.06	3.30%	7	0	[illegible]	10
Poland	0.03	6.70%	7	0	[illegible]	11
Mexico	0.05	4%	5	0	[illegible]	13
Malaysia	0.03	12%	6.5	0	[illegible]	14
South Africa	0.03	7.00%	6.5	2	[illegible]	15
Turkey	0.03	7.40%	6	0	[illegible]	16
Argentina	0.03	20%	5.5	0	[illegible]	17
Russia	0.05	2.50%	3	0	[illegible]	21

Source: WorldBank

Prioritization Map

Spain, Italy, and South Africa represents the most lucrative markets

***Bubble size reflects cloud readiness**



Source: Team Analysis

Executive Summary

AWS should expand into Spain, Italy, and South Africa

Goal

Successfully expand into three new Regions

	1	2	3
Strategic Regions	**SPAIN**	**ITALY**	**SOUTH AFRICA**
			
First-Tier Segment	>Focusing on startups segment	>Focusing on business enterprise segment	>Focusing on startups segment

Executive Summary

Goal

Successfully expand into three new Regions

Strategic Regions

1

SPAIN

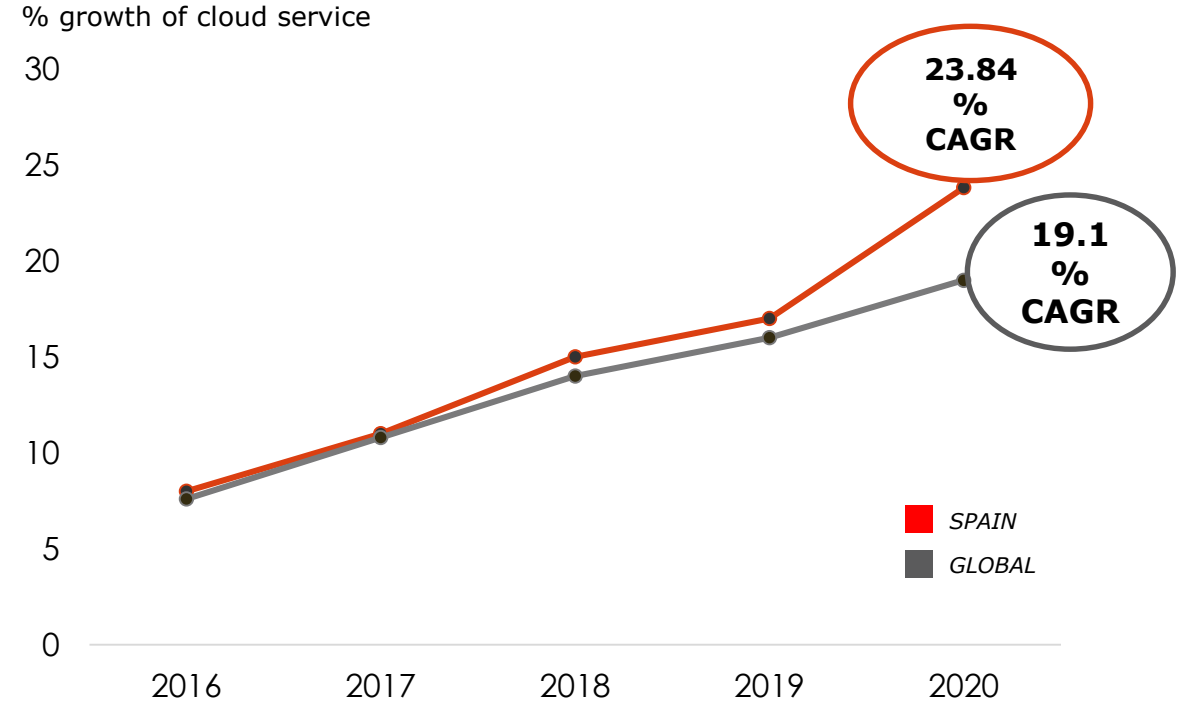
First-Tier Segment

>Focusing on startups segment

Country Overview - Spain

Looking deeper into the Spanish market

SPAIN HAS HIGHER GROWTH RATE IN CLOUD MARKET…



Source: GTDT, ENTREPRENEUR

…DUE TO KEY FACTORS

ADOPTION CLOUD

Spanish companies implement cloud technologies

RISING STARTUP

More than 200 deals were offered in Spain

IT DEVELOPMENT

Government boosts IT infrastructure

Customer Segmentation - Spain

AWS should prioritize on startups segment for growth

	MARKET ATTRACTIVENESS			ABILITY TO WIN	
	ICT Expenditure *(In Million US$)*	Growth *(In %)*	Profitability *(Low-High)*	Competition *(Low-High)*	Ability to Retain *(Low-High)*
 SMEs & Startups	784	50.68%	Medium	Medium	High
 Mid-Large Enterprise	8363	7.6%	Medium	High	Medium
 Public Sector	2400	-	Medium-Low	Medium	Medium

Source: BSA, Case Material, Team Analysis

Potential Offerings - Spain

Key offerings are identified for expansion plan

SECTOR	KEY RATIONALES	AWS PRODUCT OFFERING	ADVANTAGE
	> 30% growth rate over a year > Internet usages is rising	**AMAZON EC2** Resizable and secure compute capacity in the cloud	**Scalability** **Speed**
	> Large investment from private and government	**AMAZON EC2&VPN** Provides advanced security features and scale resources	**Security** **Cost Reduction**

Source: AWS

Strategic Location - Spain

Barcelona presents as the strategic location for data center expansion

LOCATION OF DATA CENTERS

Strategic Regions for Data Centers Placement

KEY RATIONALE

Hubs of startup

More than 1,000 potential startup

Rising of Startup Value

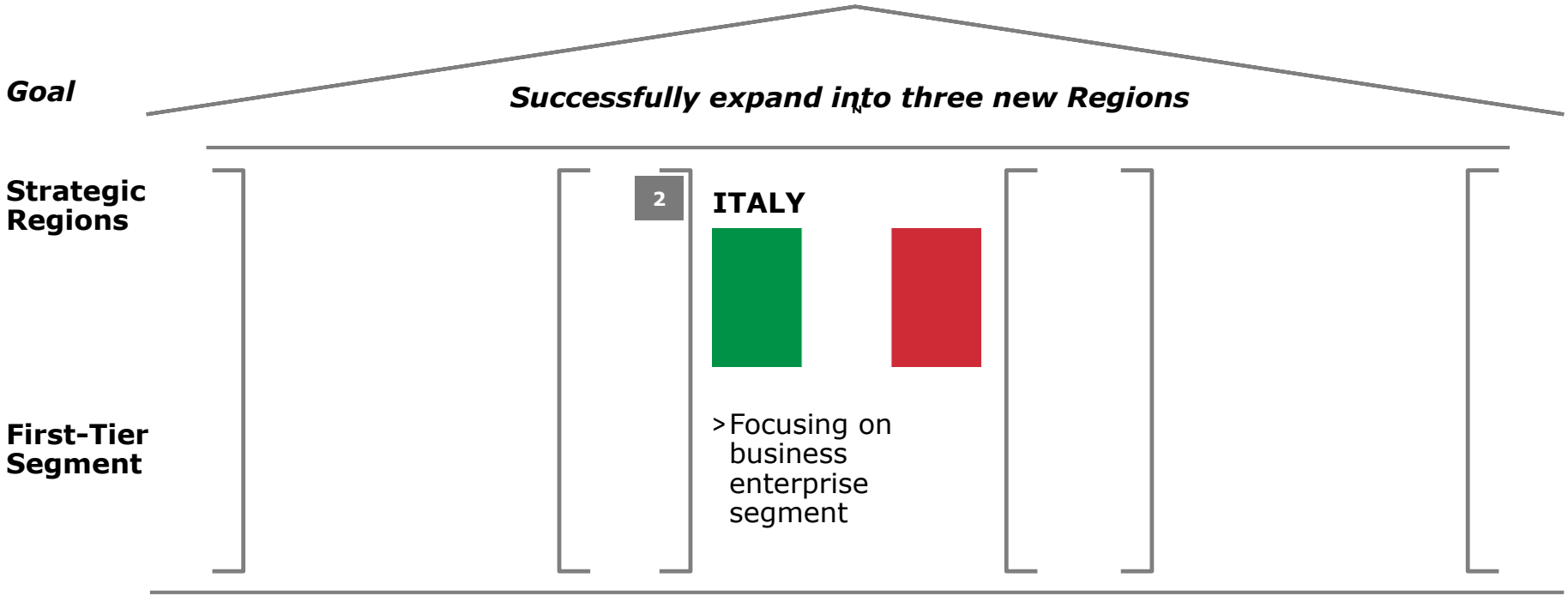
Startup market value reach $6.4 billion– 56 percent larger than global median

Low Latency

Able to serve Valencia ; Spain 2nd largest startup hub

Source: WORLDBANK, GTDT

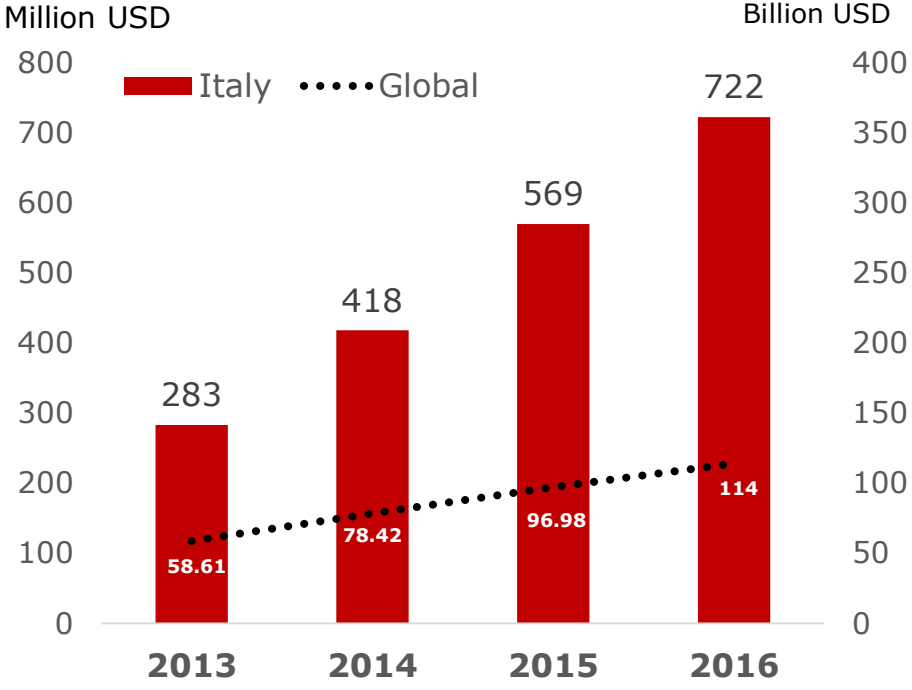
Executive Summary



Public Cloud Computing Industry Trend - Italy

AWS should capitalize on opportunity in Italian market

MORE GROWTH IN ITALY THAN GLOBAL



Source: Statista (2016)

KEY INFRASTRUCTURES

>The Italian Criminal Code

>Access to **encrypted data**

>**National cybersecurity strategy**

>Law regarding security management

>**Major contributor** to various European cloud initiatives

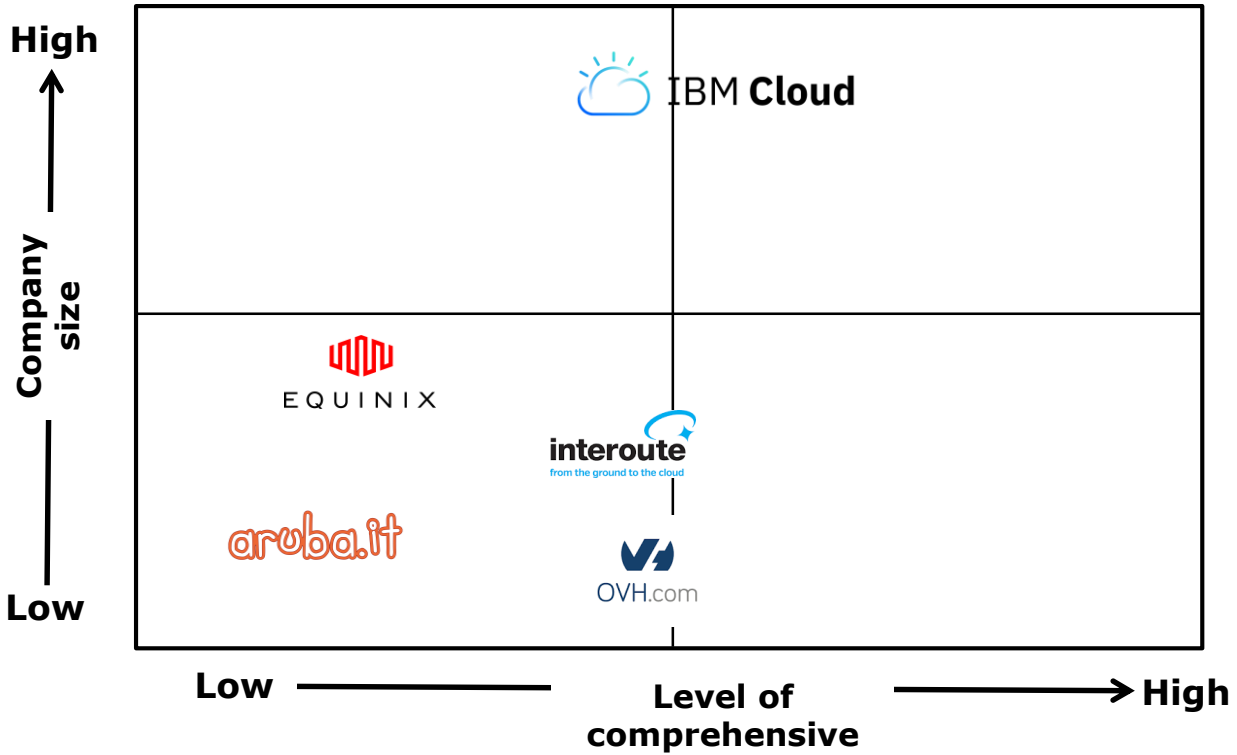
>No tariffs on cloud services or products

Positioning map - Italy

Looking into the competitive landscape in Italy…

Key criteria:

1. **Company size *50%***
   - *Market value*
   - *Number of data center*
2. **Level of comprehensive *50%***
   - *Range of service offering*



Source: Team analysis

Positioning map - Italy

…There is room for opportunity for AWS

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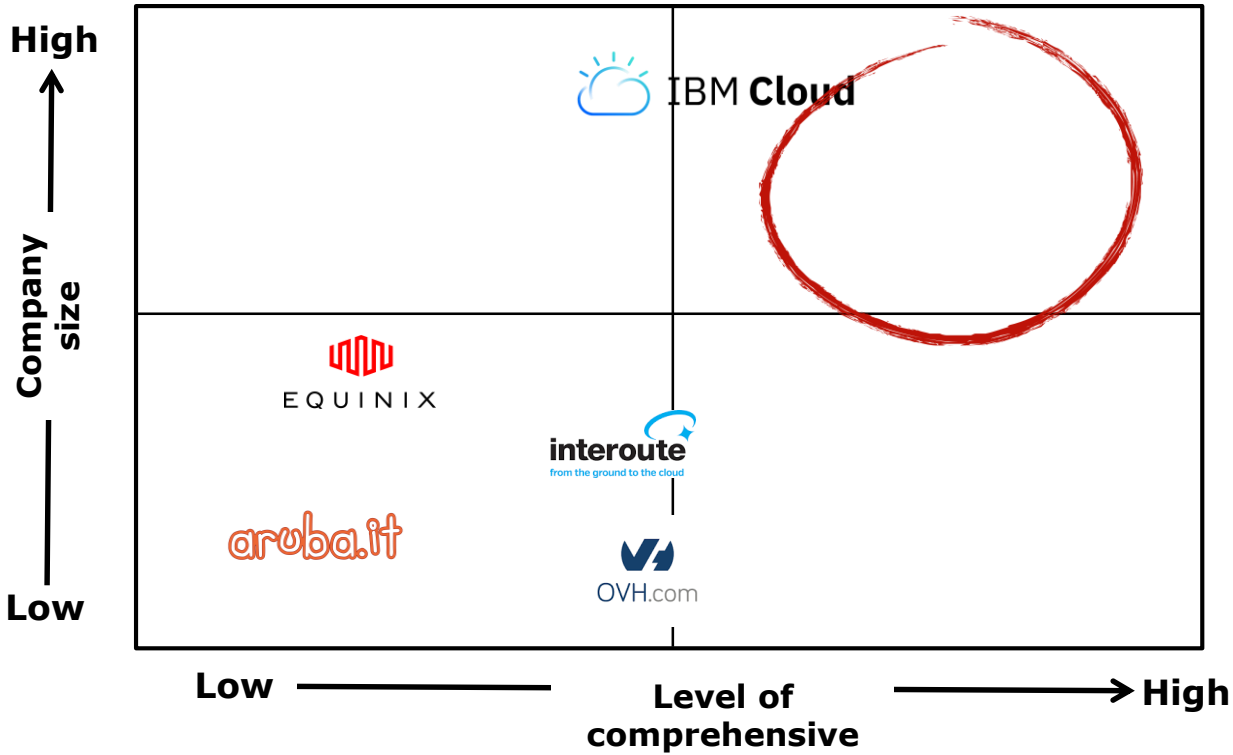

Source: Team analysis

Positioning map - Italy

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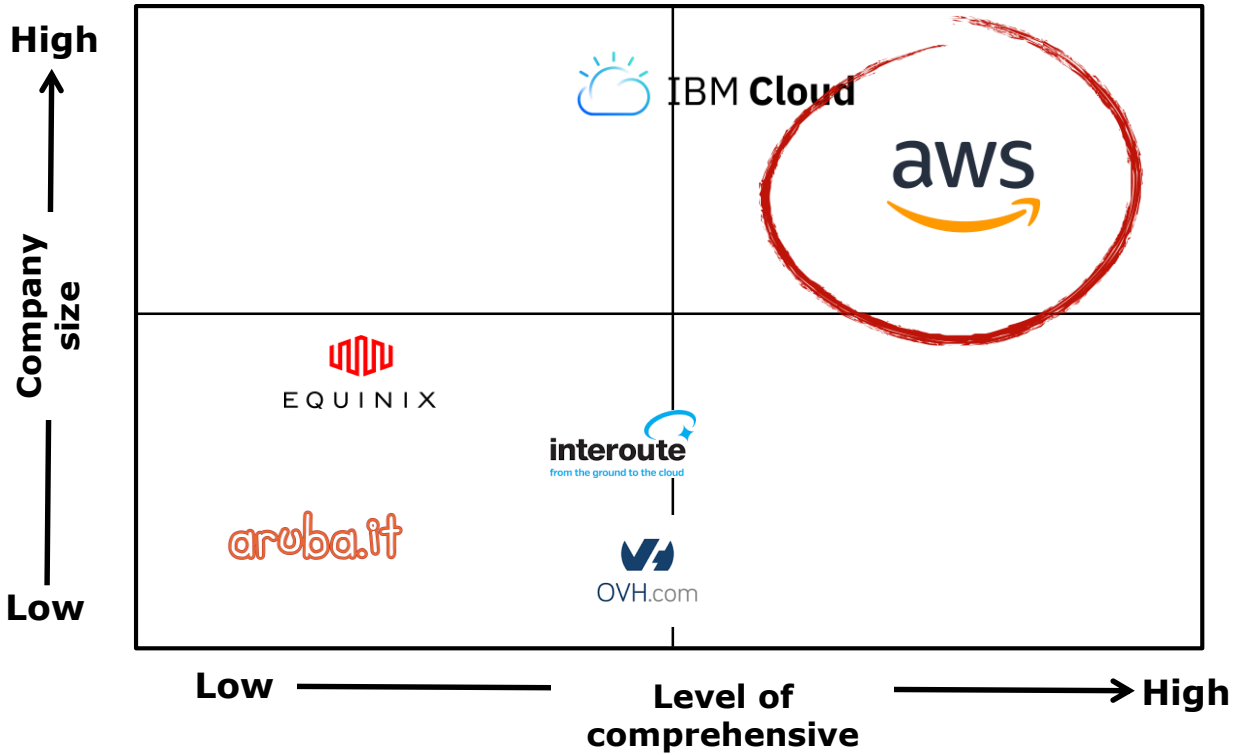

Source: Team analysis

Customer Segmentation - Italy

Looking into the customers in Italy

	MARKET ATTRACTIVENESS			ABILITY TO WIN	
	Market Value of ICT *(In million euro)*	**Growth** *(In %)*	**Profitability** *(Low-High)*	**Competition** *(Low-High)*	**Ability to Retain** *(Low-High)*
 SMEs & Startups	351	0.5%	Medium	High	Low
 Mid-Large Enterprise	60,200	2.3%	High	High	Medium
 Public Sector	5,500	3.56%	Low	Medium	High

Source: Team Analysis, hks.Harvard, assinform.it

Customer Segmentation - Italy

AWS should capture mid-large enterprises as spear-tip for growth

	MARKET ATTRACTIVENESS			ABILITY TO WIN	
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Sector Selection - Italy

Key offerings are identified for expansion plan

SECTOR	KEY RATIONALE	AWS PRODUCT OFFERING	VALUE
 **Medical Services**	Cloud Computing expenditures as a % of GDP will likely reach 1.36% from 1.23% in 2020	**AMAZON S3** collect, store, and analyze their data at a massive scale	**Flexible** **Speed**
 **Media and Entertainment**	44% consider data management is a success factor for a business	**AMAZON EC2** Manage content to be published with secure compute capacity	**Scalable** **Cost management**

Source: export.gov, AWS

Strategic location - Italy

Milan serves AWS as next foothold in European area

LOCATION OF DATA CENTERS

Strategic Regions for Data Centers Placement

Source: investinmilan

KEY RATIONALE

Hub of Domestic commercials

>2,925 multinationals or 30% of all those active in Italy

>turnover in the area is €180 billion

Edge Network Location

>Amazon has already build a strong presence of Edge Network

Data center Location

>More than 70% of Data center operate in Milan

Executive Summary

Goal

Successfully expand into three new Regions

Strategic Regions

3

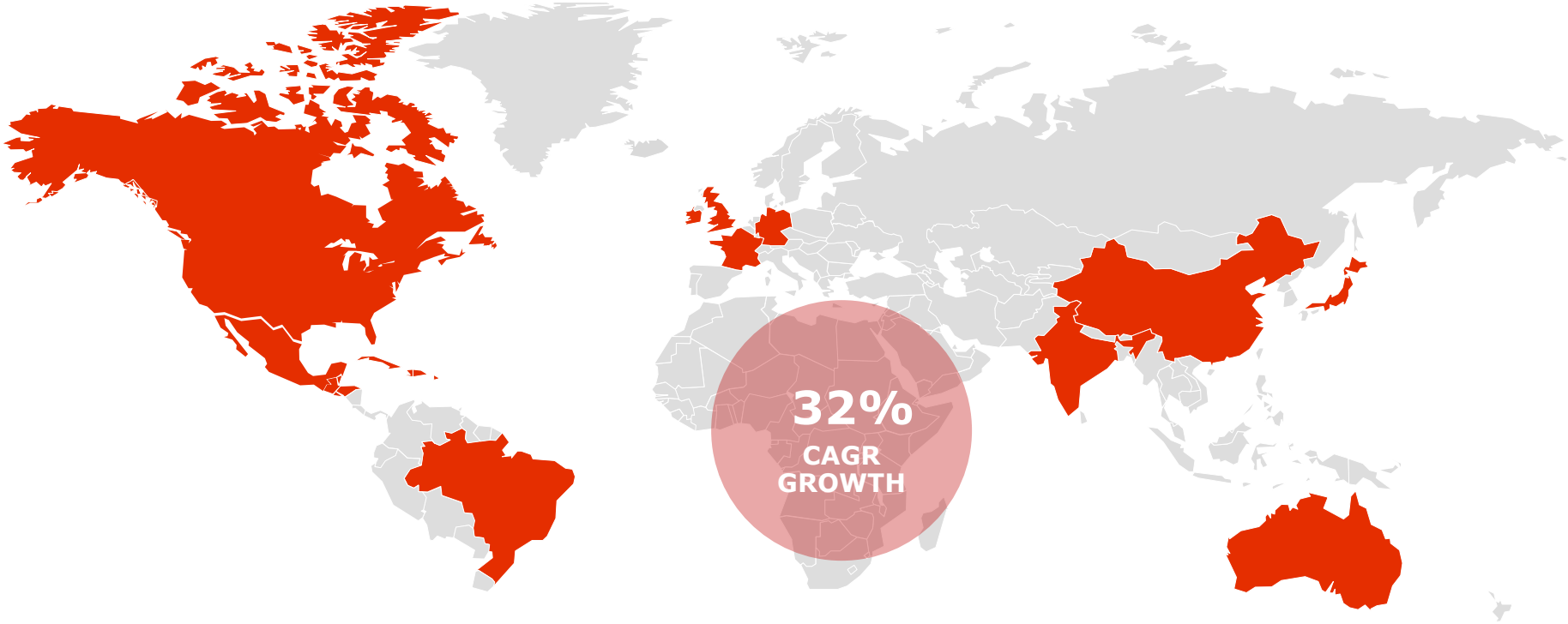
SOUTH AFRICA

First-Tier Segment

> Focusing on startups segment

Global Presence

Africa is the 'emerging' untapped growth opportunities

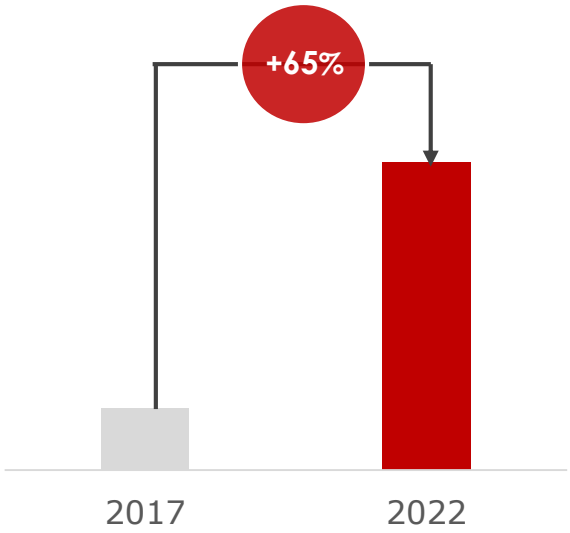


Market Analysis

South Africa is set to embrace the cloud services penetration

ROBUST GROWTH

% penetration of application in cloud



CLOUD READINESS

Africa Cloud 20:20 Index(Ranking)

South Africa

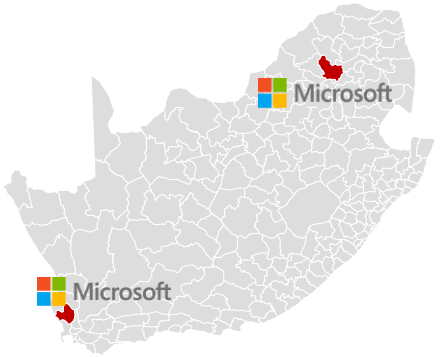
Kenya

Morocco

Tunisia

BARRIER TO IMITATION

Microsoft Data Centers in SA



WHAT 1st public cloud providers to open Hyper centers

WHY Leveraging on coverage, latency, and economy of scale

Source: Frost & Sullivan, ITnewsAfrica, VenturetechBurn, ITC Search

Customer Segmentation-S. Africa

Amazon should capture SMEs and Startups as spear-tip for growth

	MARKET ATTRACTIVENESS			ABILITY TO WIN	
	ICT Investment *(In Million USD)*	**Growth** *(In %)*	**Profitability** *(Low-High)*	**Competition** *(Low-High)*	**Ability to Retain** *(Low-High)*
 SMEs & Startups	140	50.68%	Medium	High	High
 Mid-Large Enterprise	195	14%	Medium	High	Medium
 Public Sector	24	-	Low	Low	Low

Source: Seda, Cisco, Cloudscorecard, Bloomberg

Customer Segmentation-S. Africa

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Potential Offerings –S. Africa

Key offerings are identified for expansion plan

SECTOR	KEY RATIONALE	AWS PRODUCT OFFERING	ADVANTAGE
	>**350%** rise in funding >Demand an integrated services	**AMAZON Quicksight** **VPN**	**Scalability** **Experience** **Security**
	> 45 of Fintech startups **raised 1/3 of total funding** going into tech venture	**Amazon AppStream** **Amazon Quicksight 2.0**	**Security** **Resiliency**

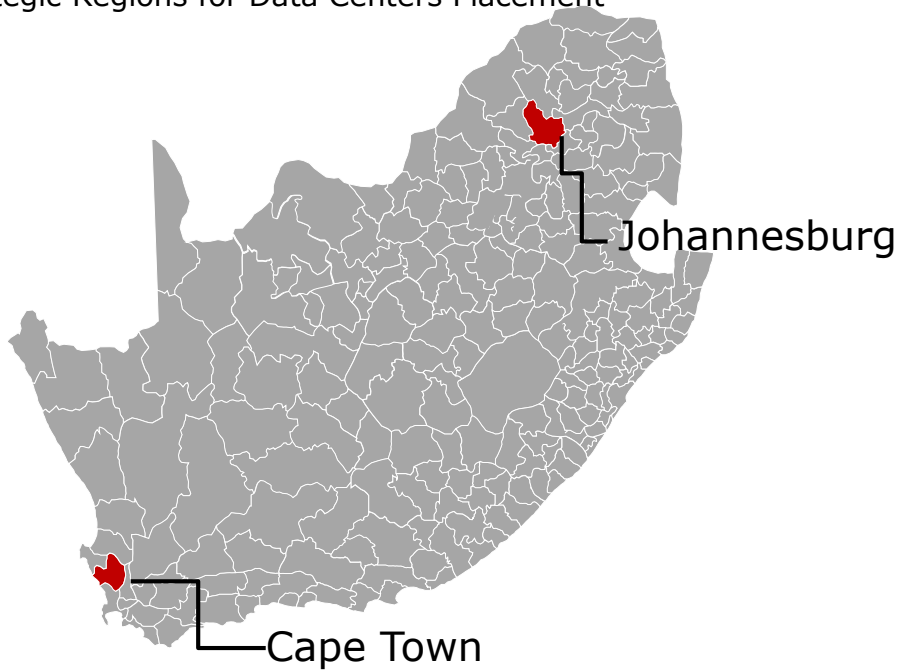
Source: AWS, Gartner

Strategic Location

There are 2 key region for AWSs' data centers in S.Africa

LOCATION OF DATA CENTERS

Strategic Regions for Data Centers Placement



KEY RATIONALE

High Startups Concentration
Houses 58% of S. Africa's startups

Proximity to key enterprises
Highest accessibility to big enterprises for future growth

Low Latency
50ms in comparisons to avg. of 230ms (From Johannesburg)

Source: CDN, TechSA, Deloittle

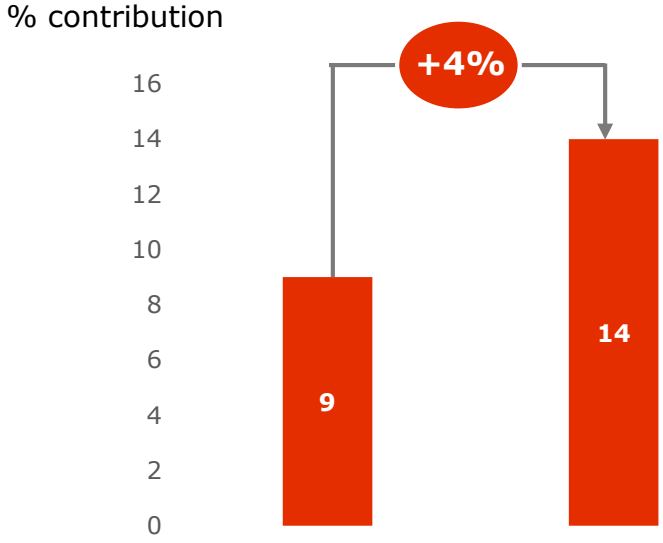
FINANCIALS

Translating to robust performance

Key Performance Indicator

Amazon Web Services will achieve these key impacts…

AWS revenue contribution to Amazon



Amazon Web Services will contribute up to **14% of** Amazon's total revenue

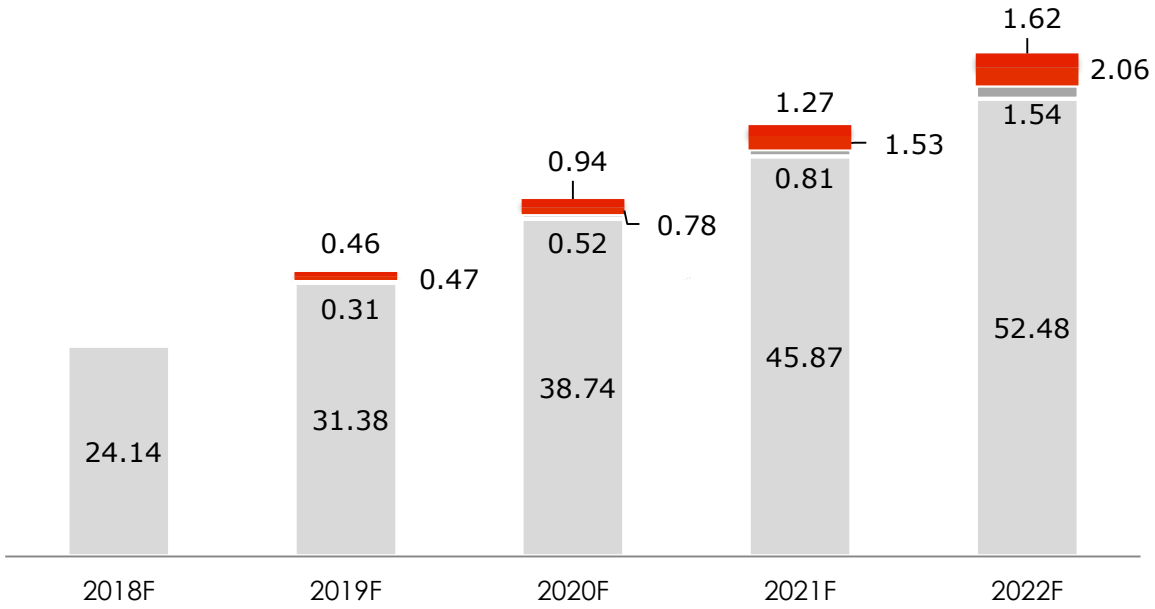
Datacenters

Amazon Web Services will successfully build **11 data centers** in newer regions

Source: Team Analysis

Revenue Projection

Total revenue is expected to reach USD 57.7 billion by 2022



Key Assumptions

- Up to **15% market share** of the startup market in the Spain, and South Africa market
- Up to **10 large sized enterprises** in Italy
- **20 terabytes** of data per startup

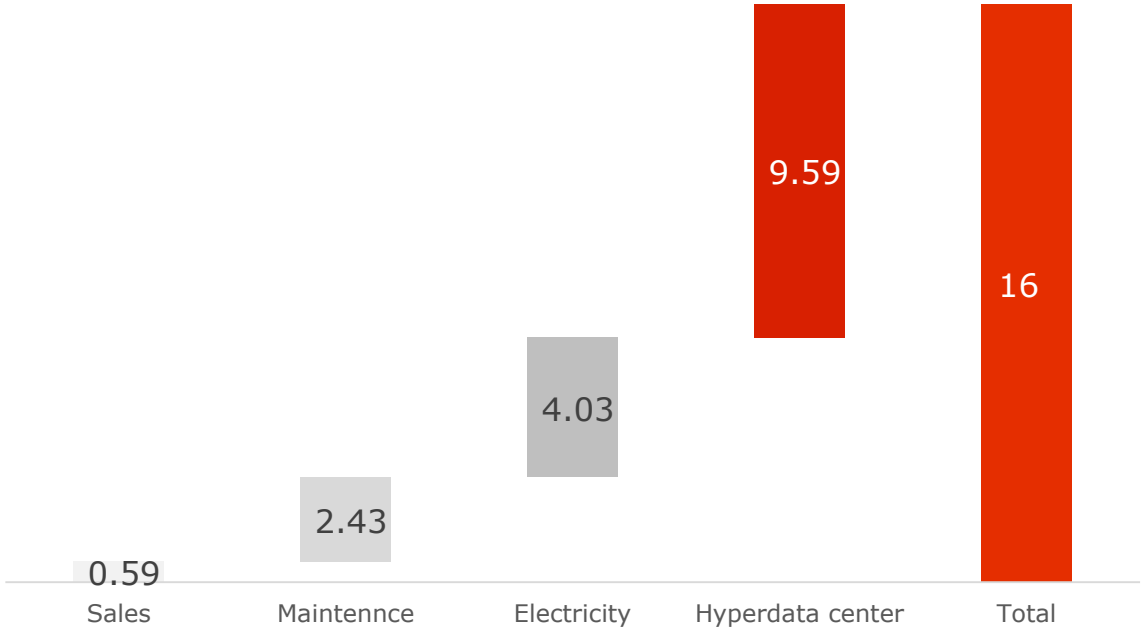
21% CAGR → **24% CAGR**

Source: Team Analysis

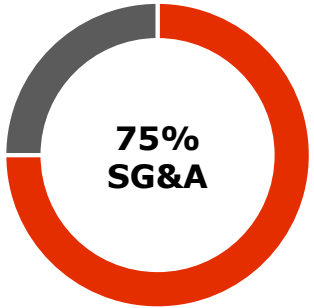
In Billion USD

Cost Estimation

Total cost is expected to reach USD 16.6 billion



Recurring Expenses



Source of Fund

> Internally generated fund

> Cash on hand

> Debt Financing

Source: Team Analysis

In Billion USD

Net Present Value Sensitivity Analysis

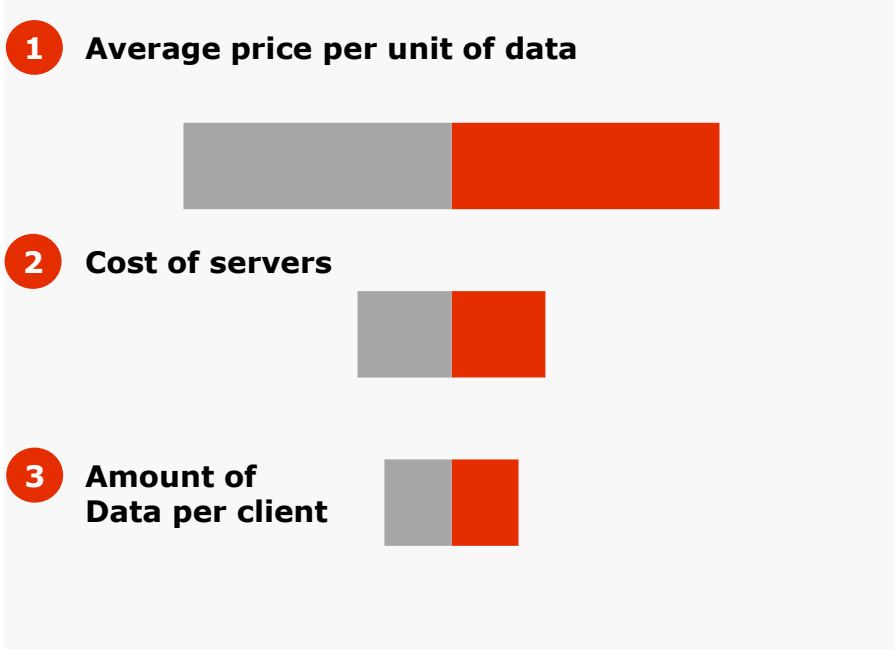
Positive valuation in all cases validates strategic robustness

Net Present Value

(per ± 5% changes)

	Worst NPV	Base NPV	Best NPV
Spain	3.41	**3.86**	4.32
Italy	3.62	**4.18**	4.73
South Africa	1.70	**2.09**	2.47

Sensitive Variables

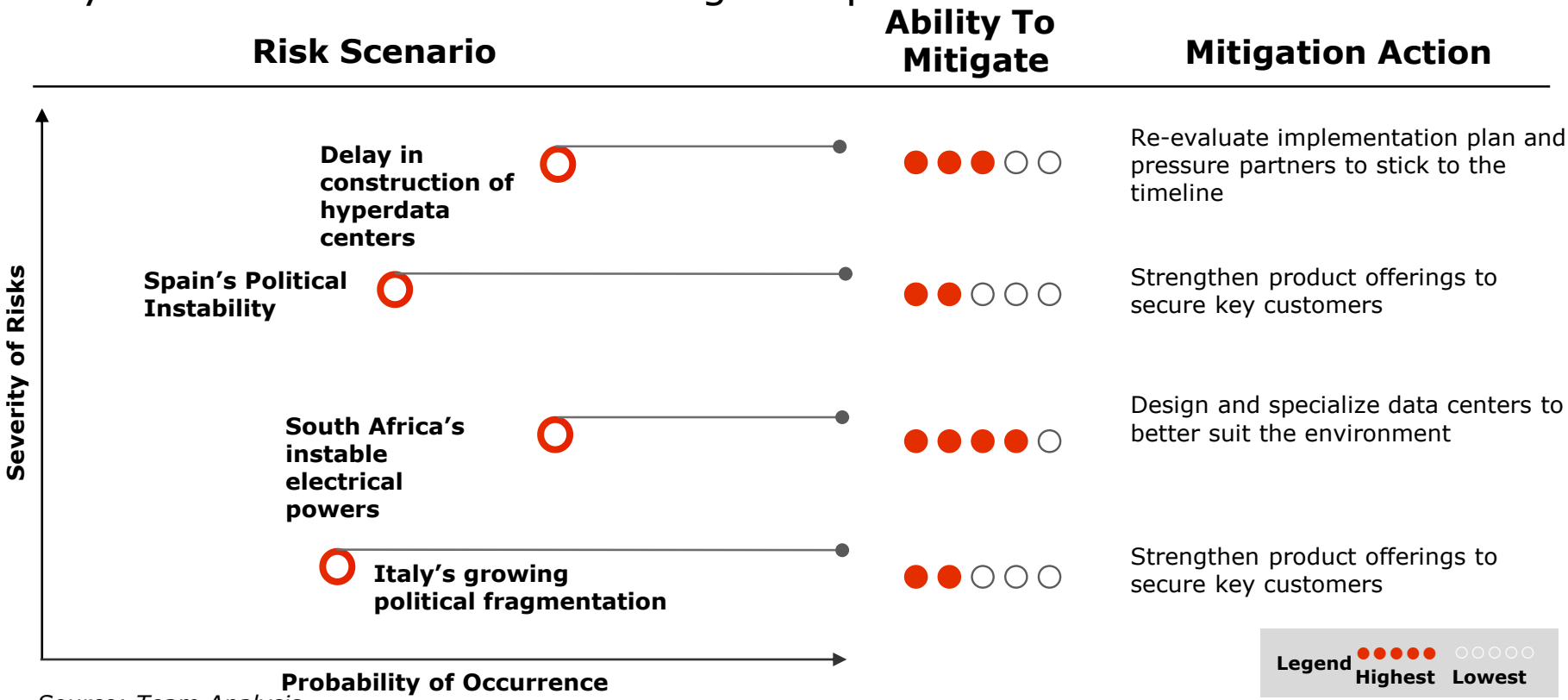


Source: Team Analysis

In Billion USD

Risk and Mitigation

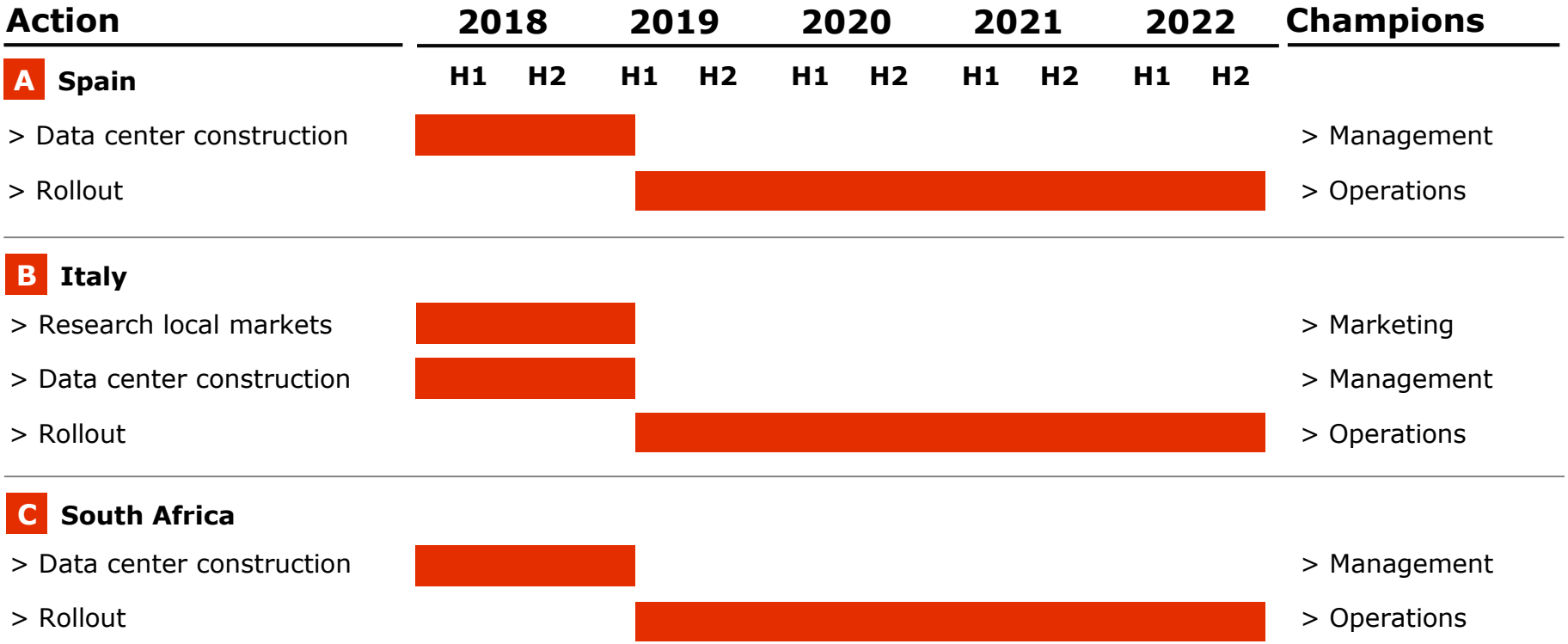
Key risks are identified with mitigation plan



Source: Team Analysis

Implementation Timeline

Ensuring smooth implementation



Source: Team Analysis

Executive Summary

Goal

Successfully expand into three new Regions

Strategic Regions

First-Tier Segment

1	2	3
SPAIN	**ITALY**	**SOUTH AFRICA**
		
>Focusing on startups segment	>Focusing on business enterprise segment	>Focusing on startups segment

Slide Navigator -Main Deck

Situational Analysis
1. Executive Summary
2. Situational Analysis 1
3. Situational Analysis 2
4. Expansion Matrix
5. Prioritization Map

Spain
1. Country Overview
2. Customer Segmentation
3. Potential Offerings
4. Strategic Location

Italy
1. Country Overview
2. Competitive Analysis
3. Customer Segmentation
4. Sector selection
5. Strategic location

South Africa
1. Justification S-Africa
2. Customer segmentation
3. Potential offerings
4. Strategic Location

Finance
1. KPI
2. Revenue Projection
3. Cost Estimation
4. NPV
5. Risk and Mitigation
6. Implementation timeline

Slide Navigator- Backups

General Backups

1. Availability zones
2. Companies shifting to off-premise cloud services
3. BSA
4. EU GDPR
5. EU Cloud Usage
6. Decision Matrix
7. High-level against competitor
8. Other criteria considerations

Spain

1. Key Success Factors
2. Market Share
3. Why not government/ enterprise

South Africa

1. Stakeholder Analysis
2. Data Law
3. Data law continued

Italy

1. Competitive Analysis
2. Data on size and growth
3. IBM
4. Why Milan

Financials

1. Revenue model Spain
2. Expenses Spain
3. CAPEX Spain
4. NPV Spain
5. Revenue model South Africa
6. Expenses South Africa
7. CAPEX South Africa
8. NPV South Africa
9. Revenue model Italy
10. Expenses Italy
11. CAPEX Italy
12. NPV Italy
13. Data Centers
14. KPIS

Why available zone

TRAFFIC LOAD

AWS deploy multiple copies of your resources across AZ's. In other words, if you have a web site, deploy a copy in AZ 1, and another copy in AZ 2, and then load balance the traffic between them

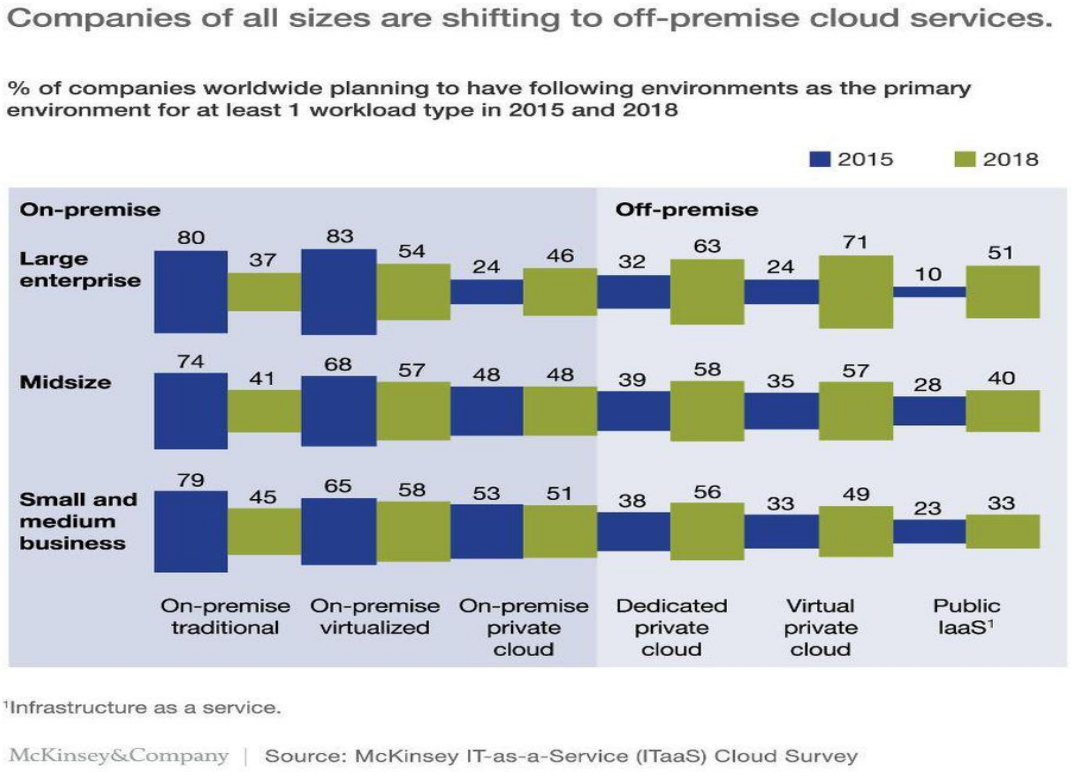
POWER OUTAGE

These data centers are geographically far enough apart that most natural disasters will only affect one AZ at a time, but close enough that AWS can connect them together with a high speed network backbone.

AVAILABILITY

Should one AZ go down or become unavailable, the other AZ will handle all the load, giving you high-availability.

Companies shifting to off-premise cloud services



BSA

Countries

The first-of-its-kind BSA Global Cloud Computing Scorecard ranks 24 countries based on seven policy categories that measure the countries' preparedness to support the growth of cloud computing. Together, these countries account for 80 percent of the global ICT market.

The Scorecard aims to provide a platform for discussion between policymakers and providers of cloud offerings, with a view toward developing an internationally harmonized regime of laws and regulations relevant to cloud computing. It is a tool that can help policymakers conduct a constructive self-evaluation, and determine the next steps that need to be taken to help advance the growth of global cloud computing.

Key success factor

Adoption Cloud

the market growth of cloud services in Spain stands out, presenting an exceptional boost of almost 23 per cent compared with the previous year.
This demonstrates the growing importance of cloud services

Rising Startup

28%

28% growth in the past year leaves the door open to optimism and tremendously positive results, **both in terms of quantity and quality.**

IT development

GOVERNMENT SPEND ON IT INFRASTRUCTURE IN MANY DEPARTMENT E.G. EDUCATION,HEALTH

Market Share

International player

Microsoft, Google, Amazon Web Services, IBM and Salesforce make up the 75 percent of the current market in Spain for cloud-based services.

Local player

1.Several **Spanish companies** provide cloud-based services:

1. Acens
2. Arsys
3. Hostalia

Why government and Enterprise is not attractive??

GOVERNMENT

1. They already partner with TESTA which operated ny European Commission

ENTERPRISE

1. Low adoption rate
    1. Conservative Market
2. Regulation limiting the transfer of customer information

Stakeholder engagement-Africa

Ensuring success in capturing startups in Africa

CREATING AND MAINTAINING RELATIONSHIP WITH CLIENT

Key stakeholder : Trainers and Services Consultant

Getting started

> Engage with customers in the adoption process

Gaining speed

> Grow with clients during to create brand loyalty

Standing proud

> Maintain relationship with clients

Activities:

> Actual visits

> Online tutorial & training

> Monitor & feedback

KEY SKILLS

Source: Team Analysis

Back up

Competitor analysis

Players	Description	How to win
Microsoft	No data center in Italy	Provide better service (Low-latency)
Google	No data center in Italy	Provide better service (Low-latency)
IBM	Target small- emerging business	Leverage on core competency of serving MNC or big enterprise
Equinix Aruba.it Interoute	Smaller size players	More integrated solution

Back up

Data size and growth

ICT Market size and growth

The ICT sector has a 1.6% share in the Italian economy, with approximately 75,000 companies and 460,000 employees. According to the industry association Assinform, the Italian ICT market grew 1.8% to **EUR 66.1 billion** in 2016, and in 2017 another 2.3% increase is expected.

ICT for government spending size and growth

ICT spending by Italian public authorities rose by 0.5 percent in 2015 **to EUR 5.57 billion,** reversing several years of decline, according to industry group Assinform.

Source: Atradius, Assinform

Back up

Why Italy?

1. Growth and size

2. Well-established infrastructure
   :9th/24 rank by cloud-readiness from BSA The 2018 BSA Global Cloud Computing Scorecard
   :**Criteria** = Data privacy, security, cybercrime, intellectual property rights, standard and international harmonization, promoting free trade and IT readiness

3. Competitive advantage over existing players

4. Lower latency and increase stability

Source: Atradius, Assinform

Back up

Case study - IBM

IBM case expansion in Milan

- has opened its first cloud data center in Italy. Located in Cornaredo, a municipality in the Province of Milan,
- The Milan location **supports an emerging cloud-computing market in Italy**,
- 31 percent year-over-year growth in 2014, with a total market spend of more than €1.18 billion (US$1.33 billion).
- "The Italian IT sector is changing as startups and enterprises alike are increasingly turning to the cloud **to optimize infrastructure, lower IT costs**, create new revenue streams, and spur innovation," said Marc Jones, chief technology officer for SoftLayer, an IBM Company. "The Milan data center extends the unique capabilities of our global platform by providing a fast, local onramp to the cloud.
- "This data center represents a financial and technological investment made by a multinational company that has faith in this country's potential," said Nicola Ciniero, General Manager, IBM Italy. "Having an IBM Cloud presence in Italy will provide local businesses with the right foundation to innovate and thrive on a global level."
- From the new location, connections to SoftLayer services within Europe are less than 30 milliseconds, which means data can be transmitted quickly—key for a wide range of computing needs, including real-time bidding (RTB), big data, and analytics applications.
- **KEY CLIENT: start up and emerging company**

Source: IBM

Back up

Why Milan? Aruba launches first phase of Milan data center campus

”A few years ago, the idea of American companies, or the larger enterprises or multinational companies, was to serve Europe from a single point. Right now, the approach is to serve customers locally as much as possible, from within the country and even from multiple points within the country, because we also have to face that for some services, there is still a bit of a lack of telecommunications.”

http://www.datacenterdynamics.com/content-tracks/design-build/aruba-launches-first-phase-of-milan-data-center-campus/98427.fullarticle

Souce: Datacenter

Revenue Model Spain

Revenue from startups								
							2.00	
# of startups	startups	1,000.00	1,020.00	1,040.40	1,061.21	1,082.43	%	g
% of market captured	%		5%	8%	12%	15%		
# of startups captured	startups	-	51.00	83.23	127.34	162.36		
# of users per startup	users	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00		
Data storage per user	GB/users	2.00	2.00	2.00	2.00	2.00		
Data storage per startup	GB	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00		
Data storage per startup in TB	TB/users	20.00	20.00	20.00	20.00	20.00		
Amount of data stored for startups	TB	-	1,020.00	1,664.64	2,546.90	3,247.30		
Average Price per TB	USD	200,000.00	204,000.00	208,080.00	212,241.60	216,486.43	2%	g
Revenue from startups		-	208,080,000	346,378,291	540,557,961	702,995,629		

Revenue Model Spain

Enterprise			4,080,000.00	4,161,600.00	4,244,832.00	4,329,728.64		
% of exits		0.02	0.02	0.02	0.02	0.02		
# of exits company sold to		-	1.07	1.75	2.67	3.41		
# of users per exit company	users	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00		
Data storage per user	GB/users	6.25	6.25	6.25	6.25	6.25		
Amount of data storage per exit company	GB	1,875,000.00	1,875,000.00	1,875,000.00	1,875,000.00	1,875,000.00		
Amount of data storage per exit company	TB	1,875.00	1,875.00	1,875.00	1,875.00	1,875.00		
Data storage of exited companies		-	2,008.13	3,277.26	5,014.21	6,393.11	20,890.41	
Average Price per TB		50,000.00	51,000.00	52,020.00	53,060.40	54,121.61		2% g
Revenue from exited companies		0	102,414,375.00	170,483,065.20	266,055,871.55	346,005,660.95		
in millions			102.41	170.48	266.06	346.01		

Revenue Model Spain

Revenue from enterprises						
# of enterprises	enterprises					3
# of users per enterprise	users	600,000	600,000	600,000	600,000	600,000
Data storage per user	GB/users	6	6	6	6	6
Data storage per entreprise	GB	3,750,000	3,750,000	3,750,000	3,750,000	3,750,000
Amount of data stored for enterprises	GB	-	-	-	-	11,250,000
Amount of data stored for enterprises	TB	-	-	-	-	11,250.00
Average Price per TB	USD	40,000.00	40,800.00	41,616.00	42,448.32	43,297.29
Revenue from enterprises		-	-			487,094,512.50
Revenue from enterprises in millions	1,000,000		-			487.09

Expenses Spain

Electricity Costs									
Total IT Power	Kw		104,452	104,452	104,452	104,452			
Power Usage effectiveness		2.00							
Total Facility power	Kw	-	208,904	208,904	208,904	208,904			
Total Facility power	kWh	-	1,830,000,041	1,830,000,041	1,830,000,041	1,830,000,041			
% of power usage			20%	40%	60%	100%			
Actual Total Facility power usage			366,000,008.17	732,000,016.33	1,098,000,024.50	1,830,000,040.83			
Cost per KwH	USD/KwH	0.3	0.306	0.31212	0.3183624	0.324729648		2%	g
Cost of electricity per year	USD	-	111,996,002	228,471,845	349,561,923	594,255,269	1,284,285,040		

Expenses Spain

Cost of hiring sales									
# of sales hired	Salesperson	25.00	50	60	70	80			
Commission fees %	%	5%	5%	5%	5%	5%			
Incremental revenue	USD	-	208.08	346.38	540.56	703.00			
Commission fees	USD	-	10.40	17.32	27.03	35.15			
Commission fees in million	1,000,000 USD/		10,404,000.00	17,318,914.56	27,027,898.06	35,149,781.43			
Annual salary per sales	Salesperson	70,000.00	70,000.00	71,400.00	72,828.00	74,284.56		2%	g
Total Annual Salary paid	USD	1,750,000.00	3,500,000.00	4,284,000.00	5,097,960.00	5,942,764.80			
Total cost of hiring sales	USD		13,904,000.00	21,602,914.56	32,125,858.06	41,092,546.23	108,725,318.85		

Maintenance costs						
Incremental revenue	USD	-	208.08	346.38	540.56	703.00
% of other operating expenses	%		0.15	0.20	0.25	0.25

Expenses Spain

Maintenance costs						
Incremental revenue	USD	-	208.08	346.38	540.56	703.00
% of other operating expenses	%		0.15	0.20	0.25	0.25
			31	69	135	176

CAPEX Spain

Cost of hyperdata center		
Land cost		
# of racks	racks	20,890.41
Amount of squarefeet per rack		31.25
# of square feet		652,825.36
Cost per square feet	USD	20.00
Total Land Costs	USD	13,056,507.14
Computer room		
Cost per square feet	USD	300.00
# of square feet	racks	652,825.36
Total cost of computer room		195,847,607.11
Server costs		
# of data needed	TB	20,890.41
TB/ Rack	TB	2.00
# of racks	racks	10,445.21
Electricity consumption per server	Kw	10.00
Total electricity consumption	Kw	104,452.06
Price per kW	USD/ kw	20,000.00
Cost of servers		2,089,041,142.50
Total hyperdata center costs	USD	2,297,945,256.75
in USD million	1,000,000	2,297.95
	in USD billion	2.30

NPV Spain Base

SPAIN NPV						
Revenue		-	310	517	807	1,536
EBITDA	USD		153	198	290	725
Depreciation and Amortization	USD	460	460	460	460	460
EBIT	USD	-460	-306	-262	-170	265
Terminal Value	USD					5616.560763
Initial Investment						
FCFF			-306.21	-262.08	-169.80	5,881.97
Terminal growth	%	2%				
WACC		7%				
NPV	USD	$3,862.00				
		$3.86				

NPV Spain Worse

SPAIN NPV	EBIT	#DIV/0!	-1.048117184	-0.550638496	-0.242079815	0.160435604
Revenue		-	300	500	780	1,501
EBITDA	USD		145	185	271	700
Depreciation and Amortization	USD	460	460	460	460	460
		-	-	-	-	
EBIT	USD	460	315	275	189	241
Terminal Value	USD					5095.877279
Initial Investment						
			-	-	-	
FCFF			314.53	275.07	188.72	5,336.68
Terminal growth	%	2%				
WACC		7%				
NPV	USD	$3,408.49				
		$3.41				

NPV Spain Best

SPAIN NPV	EBIT	#DIV/0!	-0.928279798	-0.466301248	-0.180992572	0.184576414	
Revenue		-	321	534	834		1,571
EBITDA	USD		162	211	309		750
Depreciation and Amortization	USD	460	460	460	460		460
EBIT	USD	- 460	- 298	- 249	- 151		290
Terminal Value	USD					6137.244248	
Initial Investment							
FCFF			- 297.88	- 249.09	- 150.88		6,427.26
Terminal growth	%	2%					
WACC		7%					
NPV	USD	$4,315.51					
		$4.32					

Revenue model South Africa

Revenue from startups								
# of startups	startups	1,500.00	1,530.00	1,560.60	1,591.81	1,623.65	2%	g
% of market captured	%	0%	5%	8%	12%	15%		
# of startups captured	startups	0	76.5	124.848	191.01744	243.547236		
# of users per startup	users	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00		
Data storage per user	GB/users	2.00	2.00	2.00	2.00	2.00		
Data storage per startup	GB	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00		
Data storage per startup in TB	TB/users	20.00	20.00	20.00	20.00	20.00		
Amount of data stored for startups	TB	-	1,530.00	2496.96	3820.3488	4870.94472		
Average Price per TB	USD	200,000.00	204,000.00	208,080.00	212,241.60	216,486.43	2%	g
Revenue from startups			312,120,000.00	519,567,436.80	810,836,941.87	1,054,493,442.90		

Revenue model South Africa

Exits						
% of exits		0.02	0.02	0.02	0.02	0.02
# of exits company sold to		-	1.61	2.62	4.01	5.11
# of users per exit company	users	300,000.00	300,000.00	300,000.00	300,000.00	300,000.00
Data storage per user	GB/users	6.25	6.25	6.25	6.25	6.25
Amount of data storage per exit company	GB	1,875,000.00	1,875,000.00	1,875,000.00	1,875,000.00	1,875,000.00
Amount of data storage per exit company	TB	1,875.00	1,875.00	1,875.00	1,875.00	1,875.00
Data storage of exited companies		-	3,012.19	4,915.89	7,521.31	9,589.67
Average Price per TB		50,000.00	51,000.00	52,020.00	53,060.40	54,121.61
Revenue from exited companies		-	153,621,562.50	255,724,597.80	399,083,807.33	519,008,491.43
in millions		-	153.62	255.72	399.08	519.01

Revenue model South Africa

Revenue from enterprises						
# of enterprises	enterprises				2	3
# of users per enterprise	users	600,000	600,000	600,000	600,000	600,000
Data storage per user	GB/users	6	6	6	6	6
Data storage per entreprise	GB	3,750,000	3,750,000	3,750,000	3,750,000	3,750,000
Amount of data stored for enterprises	GB	-	-	-	7,500,000	11,250,000
Amount of data stored for enterprises	TB	-	-	-	7,500.00	11,250.00
Average Price per TB	USD	40,000.00	40,800.00	41,616.00	42,448.32	43,297.29
Revenue from enterprises		-		-	318,362,400.00	487,094,512.50
Revenue from enterprises in millions	1,000,000			-	318.36	487.09

Expenses South Africa

Electricity Costs						
Total IT Power	Kw	128,553	128,553	128,553	128,553	128,553
Power Usage effectiveness	PUE	2				
Total Facility power	Kw	257,106	257,106	257,106	257,106	257,106
Total Facility power	kWh	2,252,250,061.25	2,252,250,061	2,252,250,061	2,252,250,061	2,252,250,061
% of power usage		-	0.18	0.29	0.73	1.00
Actual Total Facility power usage		-	397,895,625	649,365,660	1,650,529,460	2,252,250,061
Cost per KwH	USD/KwH	0.15				
Cost of electricity per year	USD	-	59,684,343.75	97,404,849	247,579,418.97	337,837,509.19

Expenses South Africa

Cost of hiring sales						
# of sales hired	Salesperson	20.00	50.00	60.00	70.00	80.00
Commission fees %	%	5%	5%	5%	5%	5%
Incremental revenue	USD	-	465.74	775.29	1,528.28	2,060.59
Commission fees	USD	-	23.29	38.76	76.41	103.03
Commission fees in million	1000000	-	23,287,078.13	38,764,601.73	76,414,157.46	103,029,596.72
Annual salary per sales	USD/ Salesperson	70,000.00	70,000.00	71,400.00	72,828.00	74,284.56
Total Annual Salary paid	USD	1,400,000.00	3,500,000.00	4,284,000.00	5,097,960.00	5,942,764.80
Total Annual salary paid in million	1000000	1.40	3.50	4.28	5.10	5.94
Total cost of hiring sales	USD	1.40	26.79	43.05	81.51	108.97

Expenses South Africa

Maintenance Costs						
Incremental revenue	USD	0	465.7415625	775.2920346	1528.283149	2060.591934
Maintenance costs as a % of sale			20%	20%	20%	20%
Maintenance costs		0	93.1483125	155.0584069	305.6566298	412.1183869

CAPEX South Africa

Cost of hyperdata center		
Land cost		
# of racks	racks	25,710.62
Amount of squarefeet per rack		31.25
# of square feet		803,456.79
Cost per square feet	USD	13.60
Total Land Costs	USD	10,927,012.28
Computer room		
Cost per square feet	USD	300.00
# of square feet	racks	803,456.79
Total cost of computer room		241,037,035.66
Server costs		
# of data needed	TB	25,710.62
Size of servers	TB	2.00
# of servers	servers	12,855.31
Electricity consumption per server	Kw	10.00
Total electricity consumption	Kw	128,553.09
Price per kW	USD/ kw	20,000.00
Cost of servers		2,571,061,713.75
Total hyperdata center costs	USD	2,823,025,761.70
in USD million	1,000,000	2,823.03
	in USD billion	2.82

NPV South Africa Base

South Africa						
EBITDA	USD	-2	286	480	894	1,103
Depreciation and Amortization	USD	729	729	729	729	729
EBIT	USD	-731	-443	-250	164	374
Terminal Value	USD					4,766
FCFF		-731	-443	-250	164	5,140
Terminal growth	%	2%				
WACC		10%				
NPV	USD	$2,085.34				
	NPV	$2.09				

NPV South Africa Worse

South Africa						
EBITDA	USD	-2	274	460	863	1,064
Depreciation and Amortization	USD	729	729	729	729	729
EBIT	USD	-731	-455	-269	134	334
Terminal Value	USD					4,262
FCFF		-731	-455	-269	134	4,596
Terminal growth	%	2%				
WACC		10%				
NPV	USD	$1,702.65				
	NPV	$1.70				

NPV South Africa Best

South Africa						
EBITDA	USD	-2	298	499	924	1,143
Depreciation and Amortization	USD	729	729	729	729	729
EBIT	USD	-731	-431	-230	195	413
Terminal Value	USD					5,270
FCFF		-731	-431	-230	195	5,684
Terminal growth	%	2%				
WACC		10%				
NPV	USD	$2,468.02				
	NPV	$2.47				

Revenue model Italy

Revenue from enterprises						
# of enterprises	enterprises		3	6	8	10
# of users per enterprise	users	600,000	600,000	600,000	600,000	600,000
Data storage per user	GB/users	6	6	6	6	6
Data storage per entreprise	GB	3,750,000	3,750,000	3,750,000	3,750,000	3,750,000
Amount of data stored for enterprises	GB	-	11,250,000	22,500,000	30,000,000	37,500,000
Amount of data stored for enterprises	TB	-	11,250.00	22,500.00	30,000.00	37,500.00
Average Price per TB	USD	40,000.00	40,800.00	41,616.00	42,448.32	43,297.29
Revenue from enterprises		-	459,000,000.00	936,360,000.00	1,273,449,600.00	1,623,648,240.00
Revenue from enterprises in millions	1,000,000		459.00	936.36	1,273.45	1,623.65

Expenses Italy

Electricity Costs						
Total IT Power	Kw	187,500	187,500	187,500	187,500	187,500
Power Usage effectiveness	PUE	2				
Total Facility power	Kw	375,000	375,000	375,000	375,000	375,000
Total Facility power	kWh	3,285,000,000.00	3,285,000,000.00	3,285,000,000.00	3,285,000,000.00	3,285,000,000.00
% of power usage		0%	30%	60%	80%	100%
Actual Total Facility power usage		-	985,500,000	1,971,000,000	2,628,000,000	3,285,000,000
Cost per KwH	USD/KwH	0.2142				
Cost of electricity per year	USD	-	211,094,100	422,188,200	562,917,600	703,647,000

Expenses Italy

Cost of hiring sales						
# of sales hired	Salesperson			5.00	20.00	30.00
Commission fees %	%	5%	5%	5%	5%	5%
Incremental revenue	USD	-	459.00	936.36	1,273.45	1,623.65
Commission fees	USD	-	22.95	46.82	63.67	81.18
Annual salary per sales	USD/ Salesperson	70,000.00	70,000.00	71,400.00	72,828.00	74,284.56
Total Annual Salary paid	USD	-	-	357,000.00	1,456,560.00	2,228,536.80
Total Annual salary paid in million	1000000	-	-	0.36	1.46	2.23
Total cost of hiring sales	USD	-	22.95	47.18	65.13	83.41

Expenses Italy

Maintenance Costs						
Incremental revenue	USD	-	459.00	936.36	1,273.45	1,623.65
Maintenance costs as a % of sale			20%	25%	25%	25%
Maintenance costs		-	91.80	234.09	318.36	405.91

CAPEX Italy

Cost of hyperdata center		
Land cost		
# of racks	racks	37,500.00
Amount of squarefeet per rack		31.25
# of square feet		1,171,875.00
Cost per square feet	USD	20.00
Total Land Costs	USD	23,437,500.00
Computer room		
Cost per square feet	USD	300.00
# of square feet	square feet	1,171,875.00
Total cost of computer room		311,349,535.66
Server costs		
# of data needed	TB	37,500.00
Size of servers	TB	2.00
# of servers	servers	18,750.00
Electricity consumption per server	Kw	10.00
Total electricity consumption	Kw	187,500.00
Price per kW	USD/ kw	20,000.00
Cost of servers		3,750,000,000.00
Total hyperdata center costs	USD	4,084,787,035.66
in USD million	1,000,000	4,084.79
	in USD billion	4.08

NPV Italy Base

Italy NPV

EBITDA	USD	-0.3	133.16	232.9068	327.04056	430.6782312
Depreciation and Amortization	USD	0.816957407	0.816957407	0.816957407	0.816957407	0.816957407
EBIT	USD	-1.116957407	132.3389426	232.0898426	326.2236026	429.8612738
Terminal Value	USD					5480.731241
FCFF		-1.116957407	132.3389426	232.0898426	326.2236026	5910.592515
Terminal growth	%	2%				
WACC		10%				
NPV	USD	$4,175.56				
	in billion	$4.18				

NPV Italy Worse

Italy NPV

EBITDA	USD	-0.3	115.94	200.1342	282.469824	373.8505428
Depreciation and Amortization	USD	0.816957407	0.816957407	0.816957407	0.816957407	0.816957407
EBIT	USD	-1.116957407	115.1264426	199.3172426	281.6528666	373.0335854
Terminal Value	USD					4756.178214
FCFF		-1.116957407	115.1264426	199.3172426	281.6528666	5129.211799
Terminal growth	%	2%				
WACC		10%				
NPV	USD	$3,621.09				
	in billion	$3.62				

NPV Italy Best

Italy NPV

EBITDA	USD	-0.3	150.37	265.6794	371.611296	487.5059196
Depreciation and Amortization	USD	0.816957407	0.816957407	0.816957407	0.816957407	0.816957407
EBIT	USD	-1.116957407	149.5514426	264.8624426	370.7943386	486.6889622
Terminal Value	USD					6205.284268
FCFF		-1.116957407	149.5514426	264.8624426	370.7943386	6691.97323
Terminal growth	%	2%				
WACC		10%				
NPV	USD	$4,730.02				
	in billion	$4.73				

Datacenter Costs

Mid-sized Enterprise Data Center (5,000 square feet)

- Tier II level facility with 160 racks at 5.0 kW/rack (800 kW of UPS-protected power) @ 5.0kW/rack. (5,000 sq. ft. X $300/sq. ft.) + (800 kW x $12,500/kW) = $11.5 million
- Tier III level facility, with 160 racks at 10.0 kW/rack (1,600 kW of UPS-protected power) @ 10.0kW/rack. (5,000 sq. ft. X $300/sq. ft.) + (1,600 kW x $23,000/kW) = $38.3 million

Datacenter Costs

The "kW" Cost Component by desired level of functionality

- **Tier I**: $11,500/kW of redundant UPS capacity for IT
- **Tier II:** $12,500/kW of redundant UPS capacity for IT
- **Tier III**: $23,000/kW of redundant UPS capacity for IT
- **Tier IV:** $25,000/kW of redundant UPS capacity for IT

The **"Computer Room" Component** in all cases is $300/sq. ft. of computer floor and this cost must be added to the "kW cost" shown above.

KPIs

	2017	2018	2019	2020	2021	2022	
Revenue from US	106,110.00	123,087.60	142,781.62	165,626.67	192,126.94	222,867.25	16%
Revenue from Inter	54,297	62,984.52	73,062.04	84,751.97	98,312.29	114,042.25	
AWS Revenue		24.13988739	1266.611968	2267.257038	3654.216899	5272.815891	
		186,096.26	217,110.27	252,645.90	294,093.44	342,182.32	
% of AWS		0.00	0.01	0.01	0.01	0.0154	

South Africa data law

Who are the Role Players?

The Protection of Personal Information Act (POPIA) involves three parties (who can be natural or juristic persons):

- **The data subject**: the person to whom the information relates.
- **The responsible party:** the person who determines why and how to process. For example, profit companies, non-profit companies, governments, state agencies and people. Called controllers in other jurisdictions
- **The operator:** a person who processes personal information on behalf of the responsible party. For example, an IT vendor. Called processors in other jurisdictions.

The Protection of Personal Information Act places various obligations on the responsible party, which is the body ultimately responsible for the lawful processing of personal information. Responsible parties should only use operators that can meet the requirements of lawful personal information processing prescribed by the Protection of Personal Information Act.

European data law

The General Data Protection Regulation (GDPR) which is designed to enable individuals to better control their personal data. It is hoped that these modernised and unified rules will allow businesses to make the most of the opportunities of the Digital Single Market by reducing regulation and benefiting from reinforced consumer trust.

The Data Protection Directive: The police and criminal justice sectors will ensure that the data of victims, witnesses, and suspects of crimes, are duly protected in the context of a criminal investigation or a law enforcement action. At the same time more harmonised laws will also facilitate cross-border cooperation of police or prosecutors to combat crime and terrorism more effectively across Europe.

European Enterprise Cloud Usage

	Use of cloud computing	E-mail	Storage of files	Hosting the enterprise's database(s)	Office software	Financial or accounting software applications	CRM software applications	Computing power for enterprise's own software
	% enterprises	% enterprises using the cloud						
EU28	21	65	62	44	41	32	27	21
Belgium	28	57	66	47	47	47	33	28
Bulgaria	7	65	58	57	44	30	20	17
Czech Republic	18	76	49	31	40	31	22	21
Denmark	42	68	70	52	49	45	33	33
Germany	16	49	63	33	31	26	18	19
Estonia	23	64	53	25	45	53	17	25
Ireland	36	70	75	46	48	35	30	21
Greece	9	68	58	45	50	18	23	27
Spain	18	69	69	59	39	27	29	29
France	17	61	69	55	36	28	29	18
Croatia	23	76	56	47	50	45	15	23
Italy	22	85	41	39	35	19	19	10
Cyprus	15	72	72	33	52	26	29	18
Latvia	8	68	53	49	33	38	23	25
Lithuania	17	74	56	53	38	45	26	36
Luxembourg	19	64	69	51	47	30	28	24
Hungary	12	69	54	37	49	34	26	22
Malta	28	73	64	38	48	20	21	19
Netherlands	35	59	64	65	48	55	40	20
Austria	17	55	61	36	36	25	26	24
Poland	8	69	57	43	37	28	26	19
Portugal	18	76	62	37	45	32	26	34
Romania	7	68	52	51	37	43	19	27
Slovenia	22	61	49	37	48	33	23	22
Slovakia	18	82	48	35	50	45	18	23
Finland	57	74	63	45	51	46	34	14
Sweden	48	66	68	45	44	44	28	24
United Kingdom	35	62	69	41	49	35	31	24
Norway	40	70	71	64	54	53	39	31
FYR of Macedonia	7	71	56	54	47	39	22	25
Turkey	10	:	:	:	:	:	:	:

Turkey: data for subquestions not available.

Source: Europa.eu

Decision Matrix

	Financial Impact			Competition Intesity		Environmental Readiness
	ICT Expnediture	Growth	Cost			
Unit	in Trillion USD	% growth in ICT industry	Scored from	Existing Center # of competitor existing data centers	Capability	Environmental Readiness
Country Group1						
Italy	0.09	5.80%	2	0	13.20%	9
Spain	0.06	3.30%	7	0	7.90%	10
Poland	0.03	6.70%	7	0	0%	11
Mexico	0.05	4%	5	0	5.50%	13
Malaysia	0.03	12%	6.5	0	0%	14
South Africa	0.03	7.00%	6.5	2	6%	15
Turkey	0.03	7.40%	6	0	0%	16
Argentina	0.03	20%	5.5	0	0%	17
Russia	0.05	2.50%	3	0	0%	21

Source: Europa.eu

Decision Matrix

	Electricity prices (cents/ KwH)		Property Price to income ratio		
Weight	0.5	RANKS	0.5	RANKS	SCORE
	14.6	4	6.12	9	6.5
Italy	28.39	1	9.88	3	2
Spain	8	7	8	7	7
Poland	0.18	10	9.77	4	7
Mexico	19.28	2	7.8	8	5
Malaysia	7.59	8	9.62	5	6.5
South Africa	15	3	3.49	10	6.5
Turkey	11.29	6	8.95	6	6
Argentina	3.1	9	10.68	2	5.5
Russia	14	5	11.44	1	3

Principles of POPI

The eight principles

People often provide information for one reason and do not realise that it may be used for other purposes as well. Therefore POPIA prescribes eight specific principles for the lawful processing and use of personal information. In a nutshell, the POPIA principles are:

- The processing of information is limited which means that personal information must be obtained in a lawfully and fair manner.
- **The information can only be used for the specified purpose** it was originally obtained for.
- The POPI Act **limits the further processing** of personal information. If the processing takes place for purposes beyond the original scope that was agreed to by the data subject, the processing is prohibited.
- The person who processes the information must **ensure the quality of the information** by taking reasonable steps to ensure that the information is complete, not misleading, up to date and accurate.
- The person processing the personal information should have a degree of openness. The data subject and the Information Regulator must be notified that data is being processed.
- The person processing data must ensure that the proper security safeguards and measures to safeguard against loss, damage, destruction and unauthorised or unlawful access or processing of the information, has been put in place.
- The data subject must be able to **participate**. The data subject must be able to access the personal information that a responsible party has on them and must be able to correct the information.
- The person processing the data is accountable to ensure that the measures that give effect to these principles are complied with when processing personal information.

The introduction of these defined principles will limit the processing of personal information to a very large extent, subject to the exclusions provided for in the POPI Act.

Pros and cons benefit vs. competitors

PRIVATE CLOUD COMPUTING

High initial investment for small firms

Unable to reap the tax benefits from having operational expenses

Need to manage maintenance

Lower usage flexibility

LOCAL OUTSOURCING

Lower general security

Limited product offerings

Lower reliability

Source: Europa.eu

Other considerations for Criteria

BUSINESS SPECIFIC CRITERIA

Labor costs

Edge connectivity

Availability of raw material/ hardware

Latency

Data and privacy issues

IT Equipment prices

OVERALL CRITIREA

Ease of doing business

Political risk

Economic risk

Tax laws

Cost of capital