



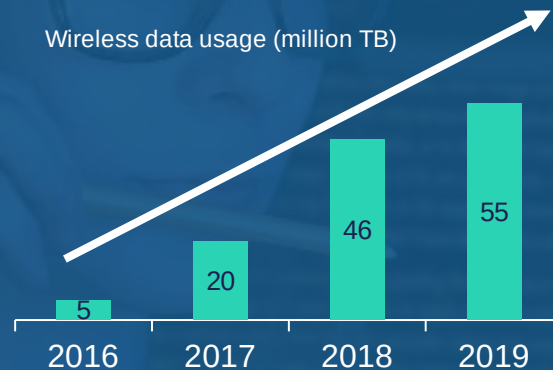
Key Trends in Datacenter and Cloud

Sharad Sanghi, MD&CEO, NTT-Netmagic

Context Setting

India's Data Revolution: Always-on

India has
2nd highest share
of world's internet users
at 12% of
3.8 billion people
: Mary Meeker



Wireless internet usage more than
doubled in the last 3 years

**66 crore
Indians are
now online!**

65% of India's internet users
access internet everyday

Explosive Growth in the Internet Economy

Digital payments have grown at a CAGR of 61% over the past three years: RBI

OTT market grew by 63% in 2019: KPMG

At 51% p.a. India is the fastest growing market for E-Commerce :CCI

India's internet economy is expected to hit US\$ 250 billion by 2020: IBEF

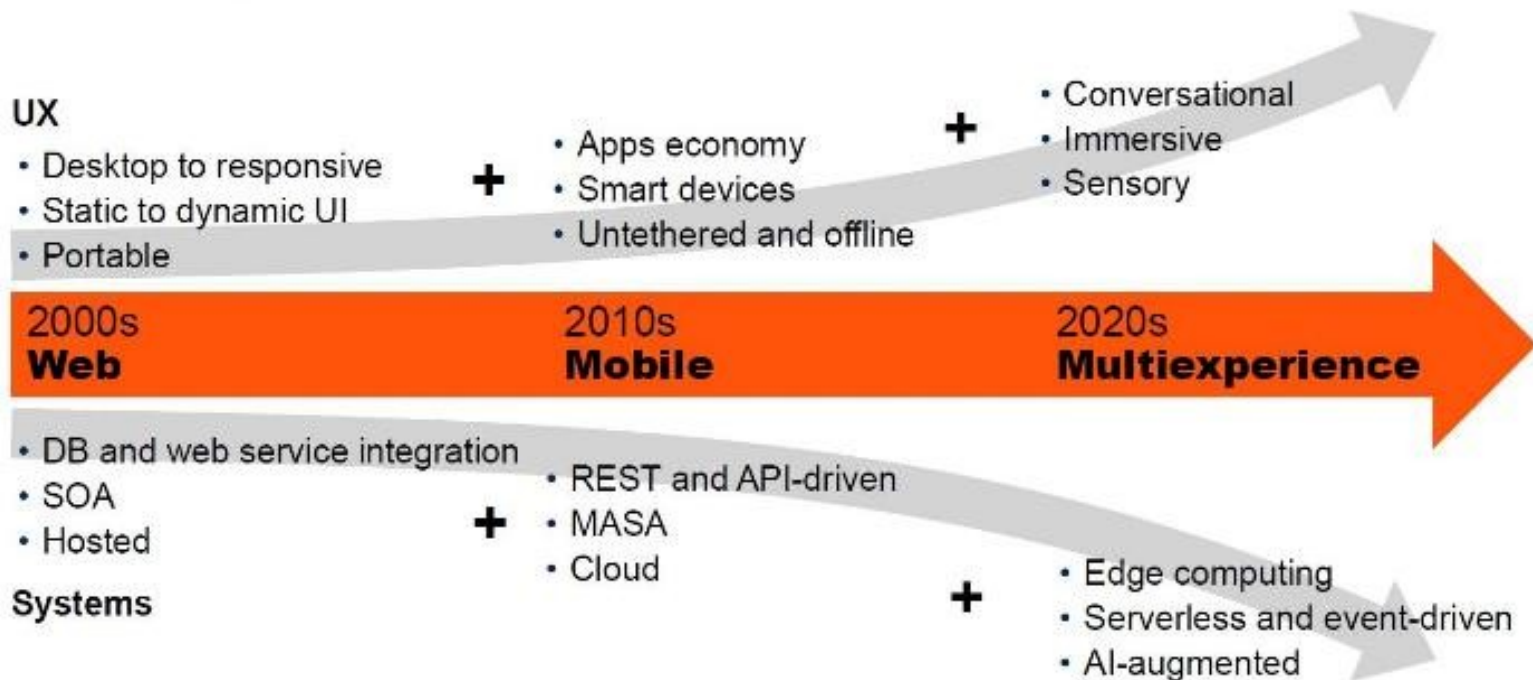
4X growth in Retail Digital transactions between 2015 and 2019: RBI

Smart TV sales on their platform grew 3X in 2019: Amazon

Indians spent an average of 2.5 hours daily on Social media: Global Web Trends

Strategic Trends

Evolving From Web to Multiexperience



The Policy Play: Mandating Storage of Personal Data Within the Country

DATA CLASSIFICATION

Envisages a framework for classification of data generated within the country as –
General | Sensitive | Critical

DATA STORAGE

Sensitive and critical country including payment data and banking data must be stored within the country.

DATA PROCESSING

Critical data should not only be stored, but also be processed within the country.

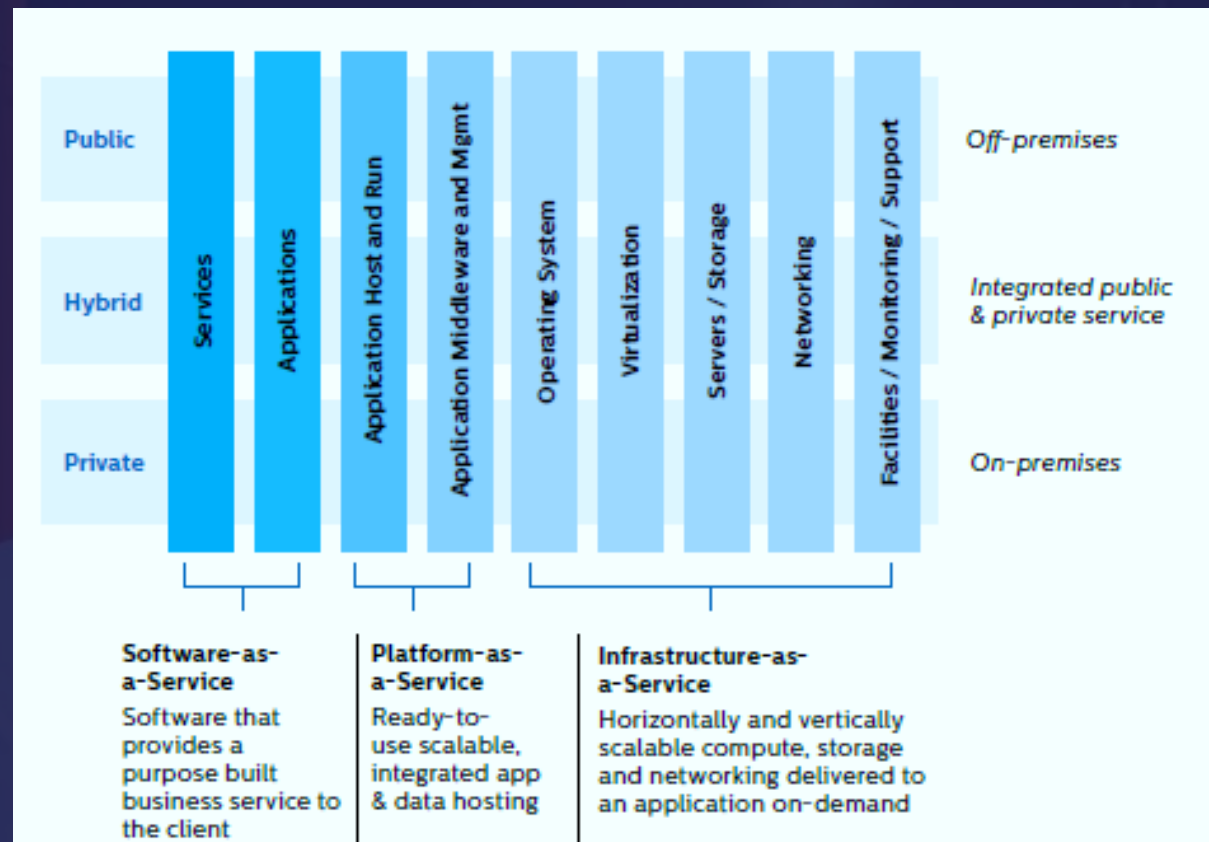
Cloud Adoption Fuelling Growth for Hyperscale Infrastructure

Cloud	Compute intensive applications	Digital Transformation	Aggressive Connectivity Rollout	Policy support
• SAAS • PaaS • IaaS	• Big Data • AI • Machine Learning	• Continue to digitize and move applications and businesses processes to the cloud • Automation	• 4G Expansion • 5G trials • BharatNet Expansion	• Data Protection and localisation • Incentives to Data Centers in IT Policies of several states • Central policy for Data Center parks

Infrastructure & Application Landscape



Cloud Computing Service Types



Key Trends in Cloud Computing



Technology

- Edge computing
- Server less computing
- Containerization
- Low latency connectivity
- Machine learning
- Real time analytics
- Distributed systems



Customer

- Immersive experiences
- Hyper Personalized
- IoT – Data eruption
- Cloud managed services



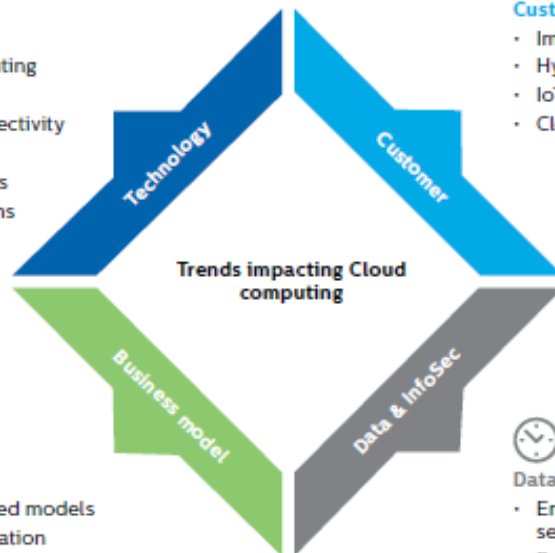
Business model

- Consumption based models
- Accelerated innovation
- XaaS – Everything as a service



Data & InfoSec

- Emphasis on data security/privacy
- Regulations on data localization

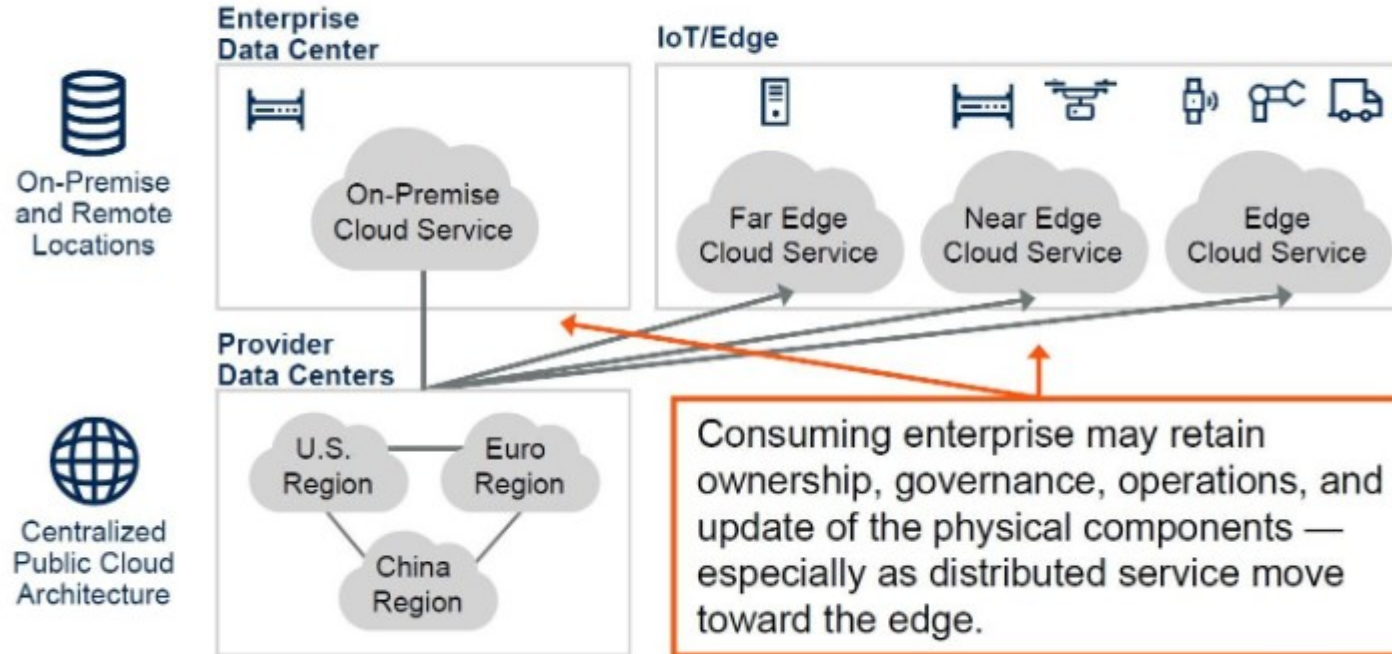


India Public Cloud Services Revenue

Forecast 2018-2020 (Mn, \$)

Segment	2018	2019	2020
Cloud application infrastructure services (PaaS)	204	251	313
Cloud application services (SaaS)	935	1,149	1,396
Cloud business process services (BPaaS)	178	213	261
Cloud management and security services	187	224	269
Cloud system infrastructure services (IaaS)	462	605	809
Total revenue	1,965	2,442	3,048

Distributed Cloud Extends to the Edge



India's Journey to Hyperscale DCs

Stage 1 2000-2002

Dot-Com boom/bust

Stage 2 2002-2011

Outsourcing from captive to
3rd party data centers

Stage 3 2011-2015

Cloud awareness gains
momentum

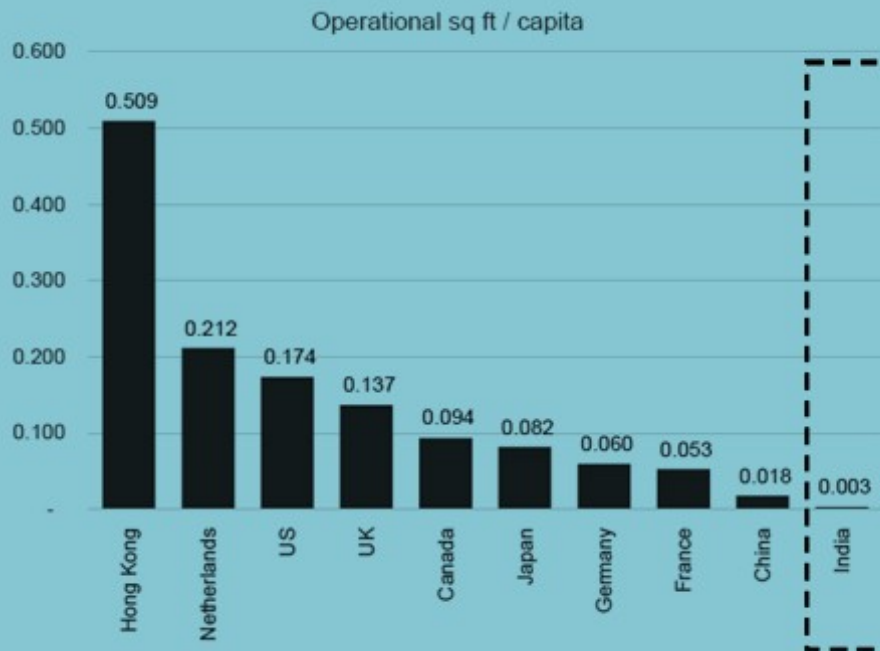
Stage 4 2015 onwards

Emergence of Hyperscale
Data Center Campus/ Parks



Poised for Massive Growth

Undersupplied for a market its size



- India's DC market has doubled since 2013
- Likely to further double in the next 4 years
- One of the fastest growing markets in Asia
- Currently, #6 globally
- Global Top 3 entering India

On a per-capita basis there is scope for a market several multiples its current size

Poised for Massive Growth



Industry capacity grow from

350

MW* in FY 2019

to

781

MW in FY 2024

118% capacity additions
in next 5 years

Significant PE investment



New capacity additions
in India to provide USD

4.1
billion opportunity



Industry revenues to grow from

USD **1.0**
billion in FY 2019

to

USD **3.2**
billion in FY 2024

Core Data Centers: Compute & Storage

- Cloud computing for digital transformation of businesses
- Video streaming
- E-commerce
- Compute intensive applications fuelled by Big Data Analytics, AI/ML
- Enterprise applications

The Case for Edge Data Centers: Content close to consumer

- Industrial Automation
- Augmented Reality (AR) and Virtual Reality (VR)
- Retail Mobility
- IOT – Autonomous vehicles, Connected homes and offices
- Blockchain
- Video and multi-media content access

Data Centers: Customer Classification

CLOUD-NATIVE

ENTERPRISE

GOVERNMENT

HYPERSCALERS

Key Takeaways

In last 5 years, Data Center capacity has doubled in India. Likely to further double in the next 4 years

Hyperscalers, Enterprises, Governments and Cloud-native companies driving DC growth in India

Emerging technology, commercial & consumer trends like Edge computing, Machine learning, on-demand models, Immersive experiences and XaaS will further drive adoption and innovative use cases

5G, mobility and time sensitive applications propelling adoption of Edge DCs

Cloud computing demand drivers in India : Growing opportunities from world IT outsourcing market, increased awareness of Cloud computing benefits, consumerization of IT, requirement of agile IT spending, proliferation of start-up ecosystem, and emerging technologies in India

The background of the top half of the image shows silhouettes of several people walking in front of a large window. The window is divided into vertical panels of different colors: orange, yellow, green, and blue. The people are walking from left to right, and their silhouettes are dark against the bright, colorful background.

Thank You

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