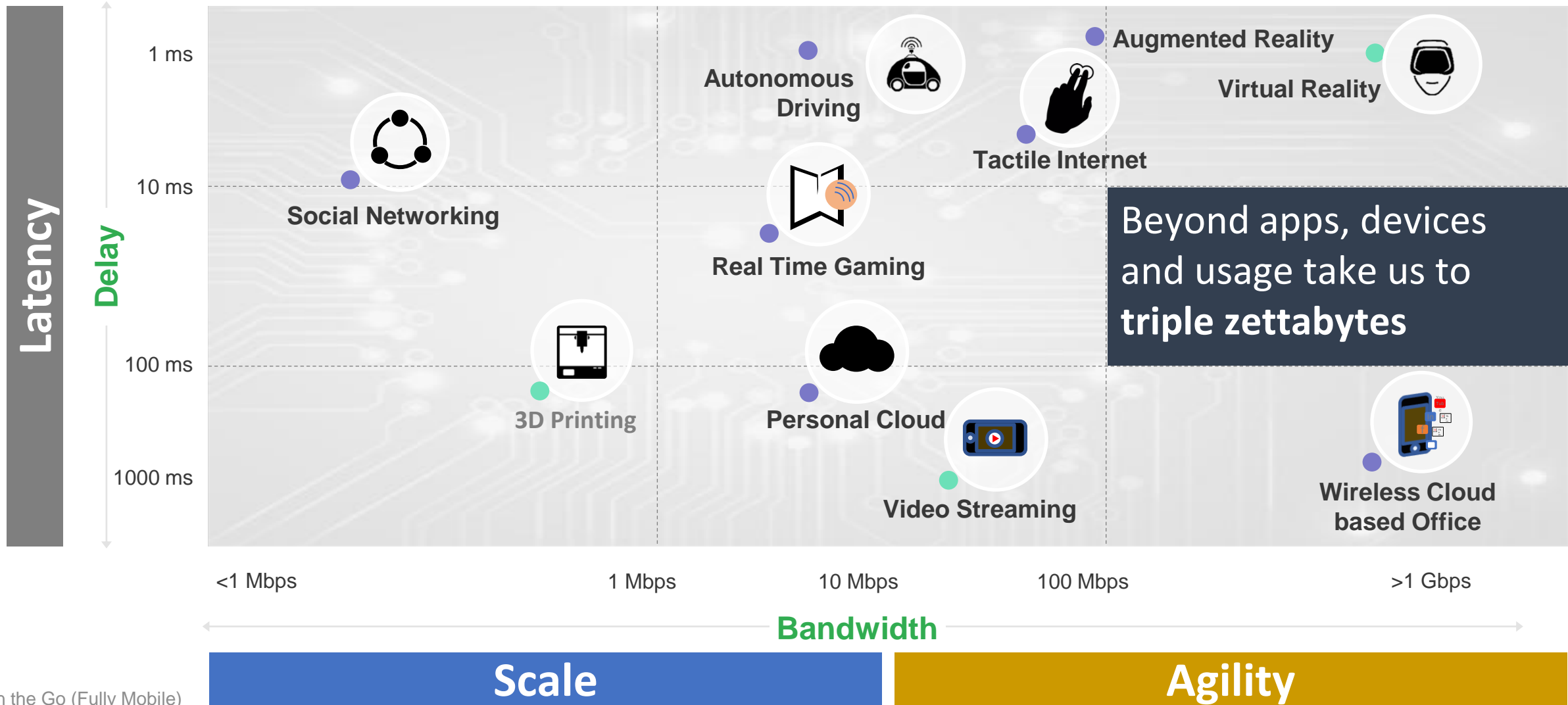# FTTx: Fibre to the eXponential

Strategic Direction and Implementation of Broadband Infrastructure

www.sterlitetech.com
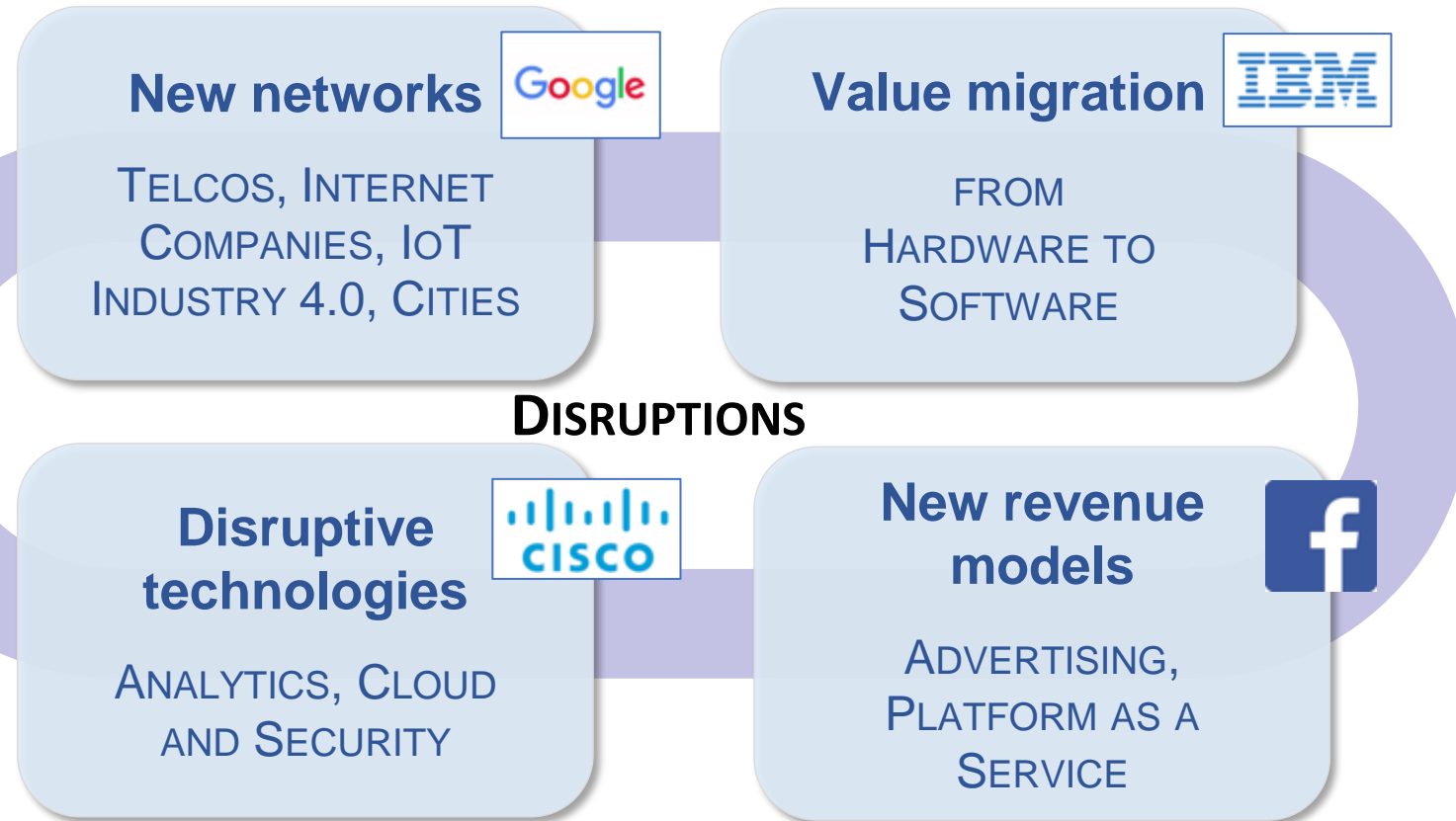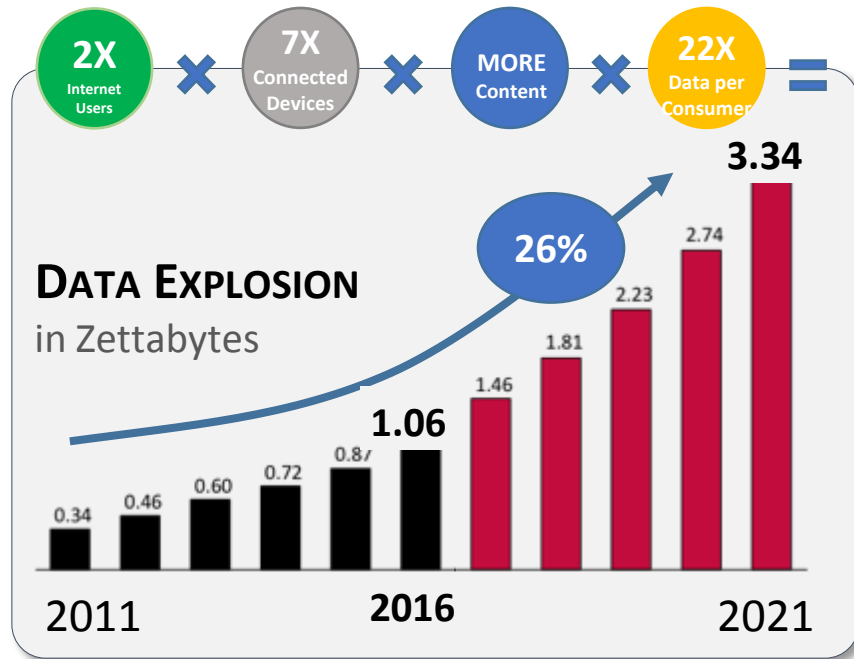
KS RAO
CEO – Telecom Services Business
Sterlite Tech

An expanded ecosystem of apps requires hyperscale network

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Latency

Delay

1 ms

10 ms

100 ms

1000 ms

Augmented Reality

Virtual Reality

Autonomous Driving

Tactile Internet

Social Networking

Real Time Gaming

Beyond apps, devices and usage take us to **triple zettabytes**

3D Printing

Personal Cloud

Wireless Cloud based Office

Video Streaming

<1 Mbps   1 Mbps   10 Mbps   100 Mbps   >1 Gbps

Bandwidth

Scale	**Agility**

● On the Go (Fully Mobile)

● Nomadic (Fixed Access with Limited Mobility)

2

2X Internet Users ✕ **7X** Connected Devices ✕ **MORE** Content ✕ **22X** Data per Consumer =

DATA EXPLOSION in Zettabytes

26%

0.34 0.46 0.60 0.72 0.87 **1.06** 1.46 1.81 2.23 2.74 **3.34**

2011 **2016** 2021

DISRUPTIONS

New networks Google

TELCOS, INTERNET COMPANIES, IOT INDUSTRY 4.0, CITIES

Value migration IBM

FROM HARDWARE TO SOFTWARE

Disruptive technologies CISCO

ANALYTICS, CLOUD AND SECURITY

New revenue models f

ADVERTISING, PLATFORM AS A SERVICE

But current network design and topology is constrained

Future network will be virtualized and fibre dominant

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Today's Network
Complex and expensive

Future Network
Flexible and agile

Today's Network	Future Network
Proprietary software	**Vendor neutral & software driven**
Customised and dedicated hardware	**Commoditised and virtualised hardware**
Wireless dominant	**Fibre dominant**

Industry Govt. collaboration on Ease of Business

Process
Simplification

Stringent
Compliance

Technology
Support

Accelerated readiness of Hyperscale Network and faster implementation of NDCP

Govt recognizes need with the NDCP framework

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Connect India

- 50 Mbps citizen coverage,
- fixed line BB access to 50% households
- 10M Wi-Fi hotspots
- National broadband mission -BharatNet, GramNet, NagarNet, Jan Wifi
- Fibre first initiative, National Digital Grid, BB Readiness Index

Propel India

- BB Infra essential status
- License reforms and ease of business
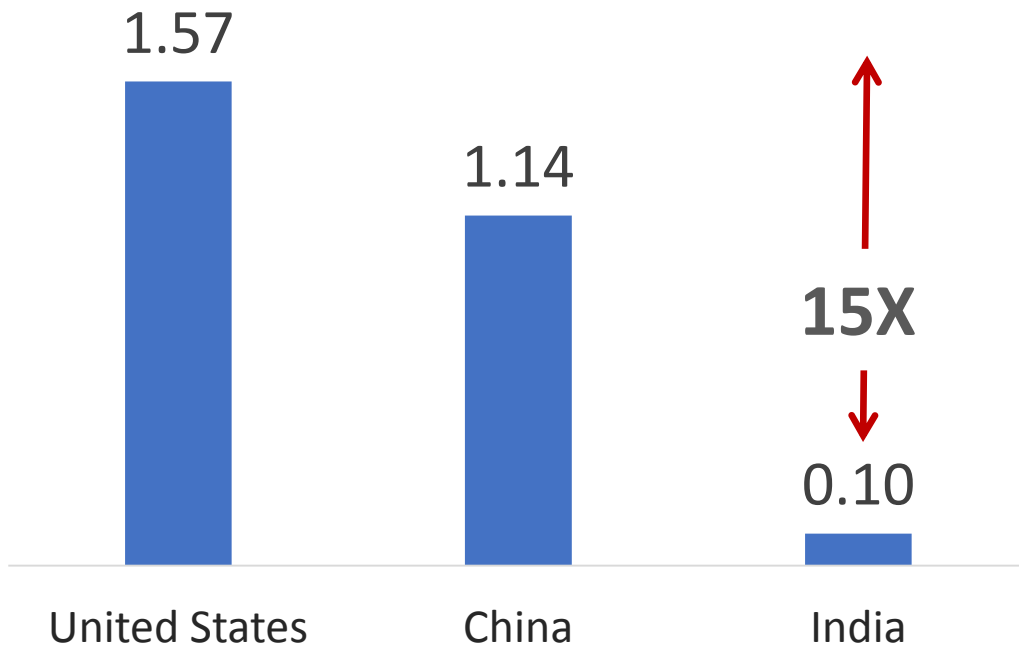- Expanding local manufacturing and R&D for innovation

Secure India

- Assuring security framework to infrastructure
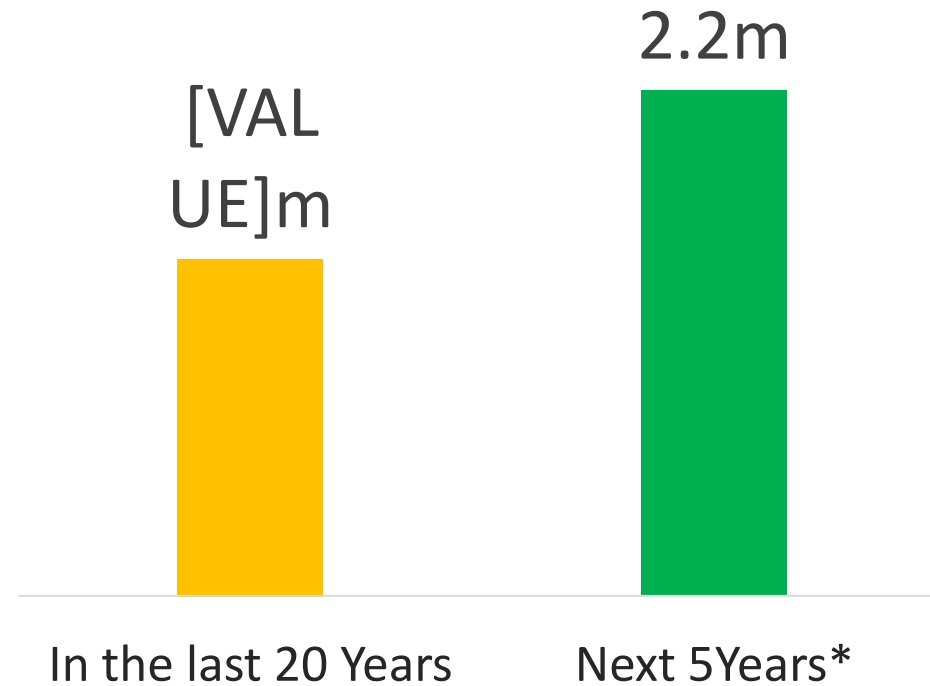- Provisions for physical and cyber security

Establishing BB Infra essential Status and Fibre a Public Utility

Deep fiberization is the natural next step

Fibre consumption (fkm) per capita

In next **5 years** India must deploy **2.2 million km** at **~5X speed**

United States: 1.57
China: 1.14
India: 0.10

15X

In the last 20 Years: [VALUE]m
Next 5Years*: 2.2m

But India offers some unique challenges

Shallow trenches ½ meter?

Rock conditions

Poor trench bed preparation

Open manholes

Information NA

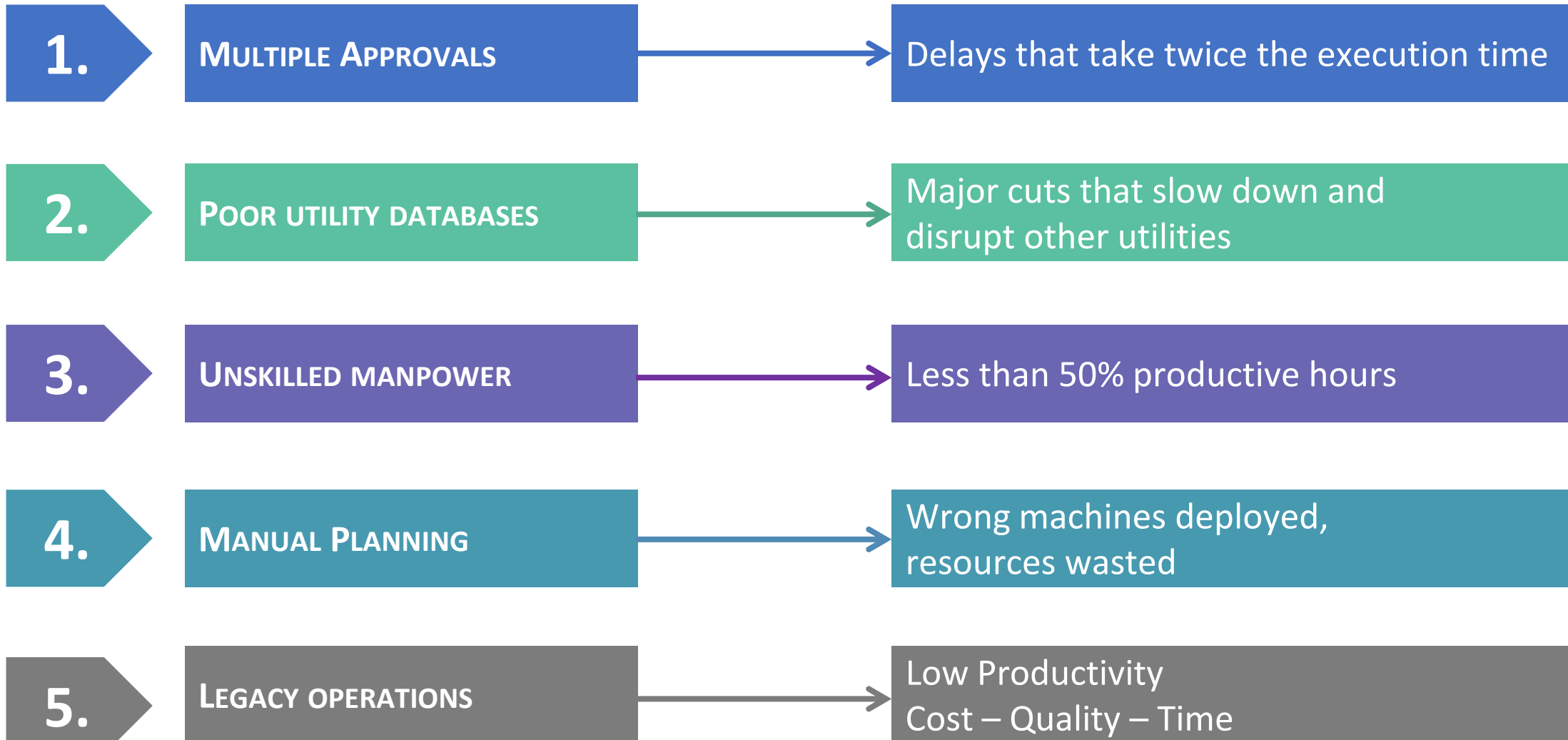## Operational Challenges

POOR DATABASES

UNSKILLED MANPOWER

MULTIPLE APPROVALS

MANUAL PLANNING

INITIATION

DESIGN

DEPLOYMENT

LEGACY OPERATIONS
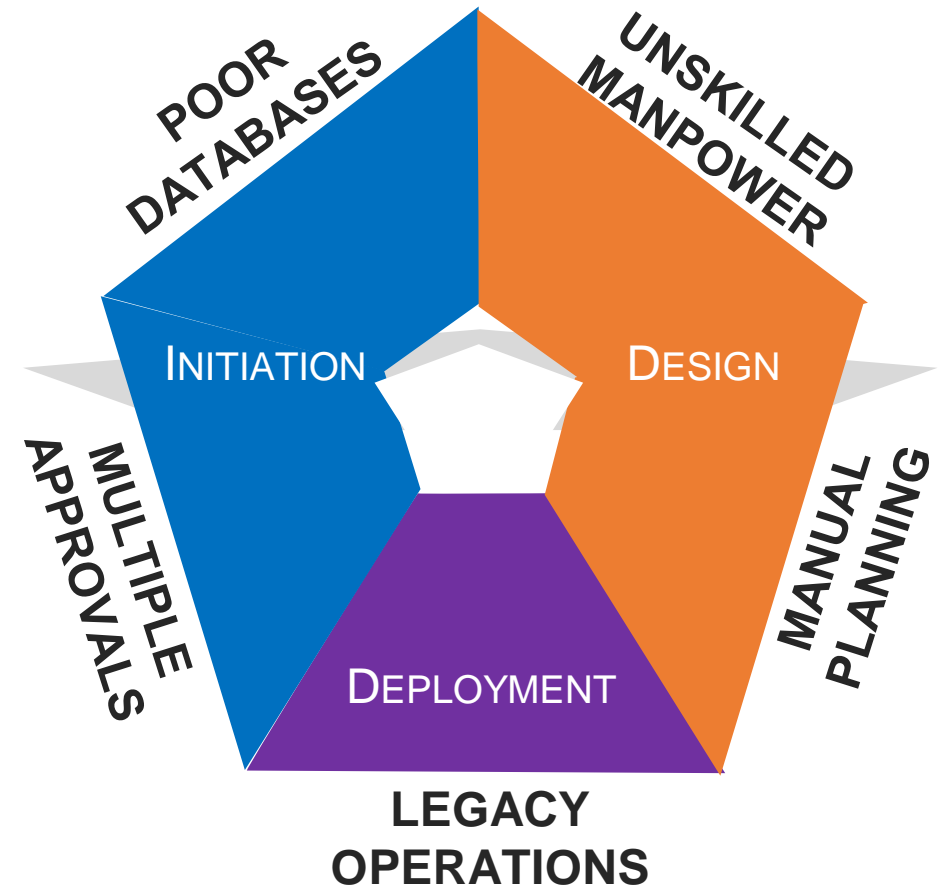
Deployment Challenges impacting cost and timelines

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CHALLENGES

IMPACT

1. **MULTIPLE APPROVALS** → Delays that take twice the execution time

2. **POOR UTILITY DATABASES** → Major cuts that slow down and disrupt other utilities

3. **UNSKILLED MANPOWER** → Less than 50% productive hours

4. **MANUAL PLANNING** → Wrong machines deployed, resources wasted

5. **LEGACY OPERATIONS** → Low Productivity
Cost – Quality – Time

Solution to deployment challenges

STerlite Tech

CHALLENGES	SOLUTION

1. MULTIPLE APPROVALS →
- RoW blanket approval
- Minimum touch points

2. POOR UTILITY DATABASES →
- Central database for GIS mapping
- Electrical resistivity surveying

3. UNSKILLED MANPOWER →
- Fibre certification program
- Program management certification

4. MANUAL PLANNING →
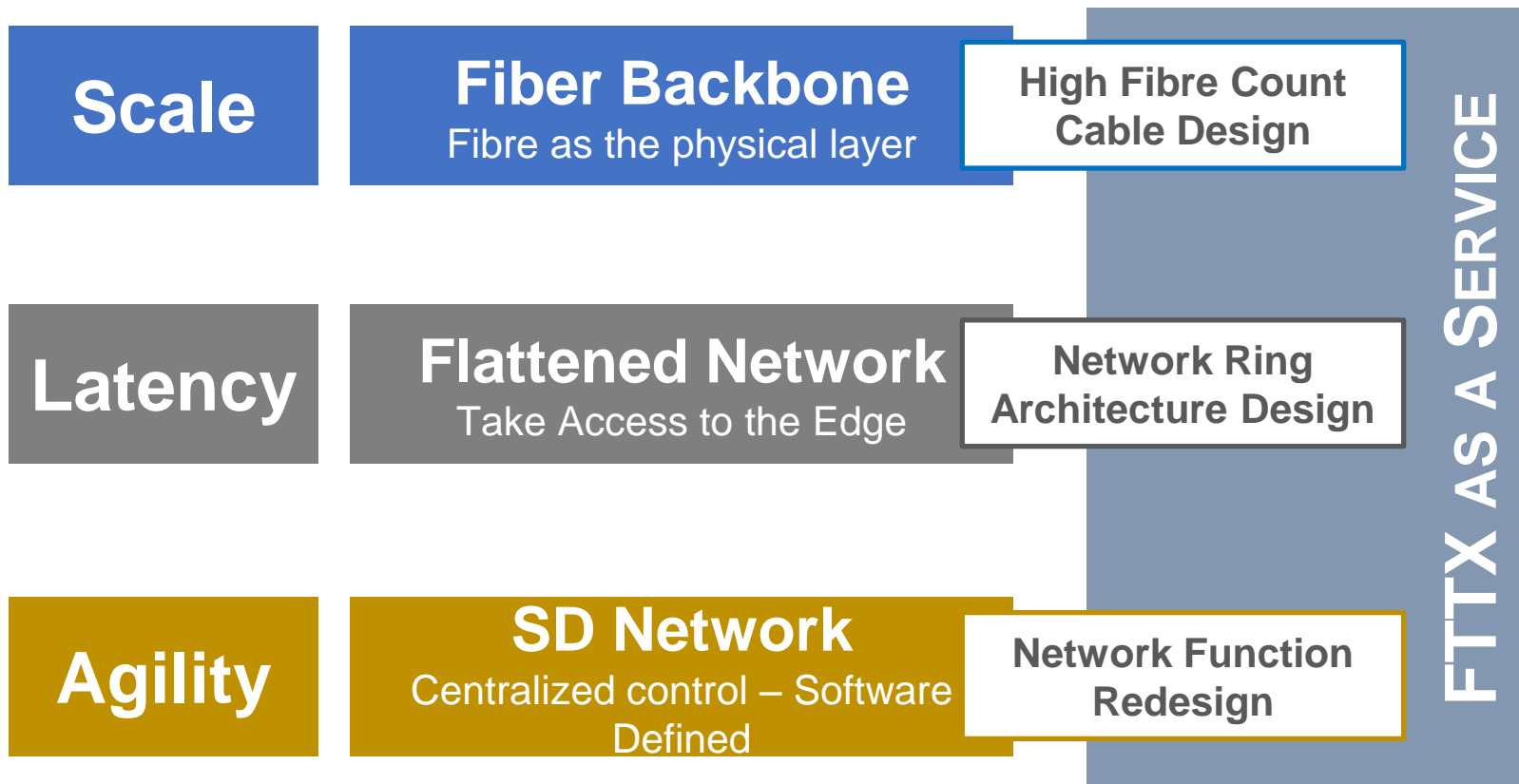- Design led planning
- Risk mapping

5. LEGACY OPERATIONS →
- Mechanization in daily operations
- Incentive based pay system

Recommendations and design framework for implementation of hyperscale networks

DESIGN FRAMEWORK

RECOMMENDATIONS

Scale

Fiber Backbone
Fibre as the physical layer

High Fibre Count Cable Design

Latency

Flattened Network
Take Access to the Edge

Network Ring Architecture Design

Agility

SD Network
Centralized control – Software Defined

Network Function Redesign

FTTX AS A SERVICE

- Fibre deployment synergies with other utilities

- BB infra expert as part of city planning

- Building codes must include fibre

- RFP reforms in large scale Govt. deployment

11

Our capabilities across value chain

Presence in over 100 Countries

Partnering with 8 of top 10 Global Telcos

Optical Fibre

Fibre Roll out

Software

Fibre Cables

System Integration
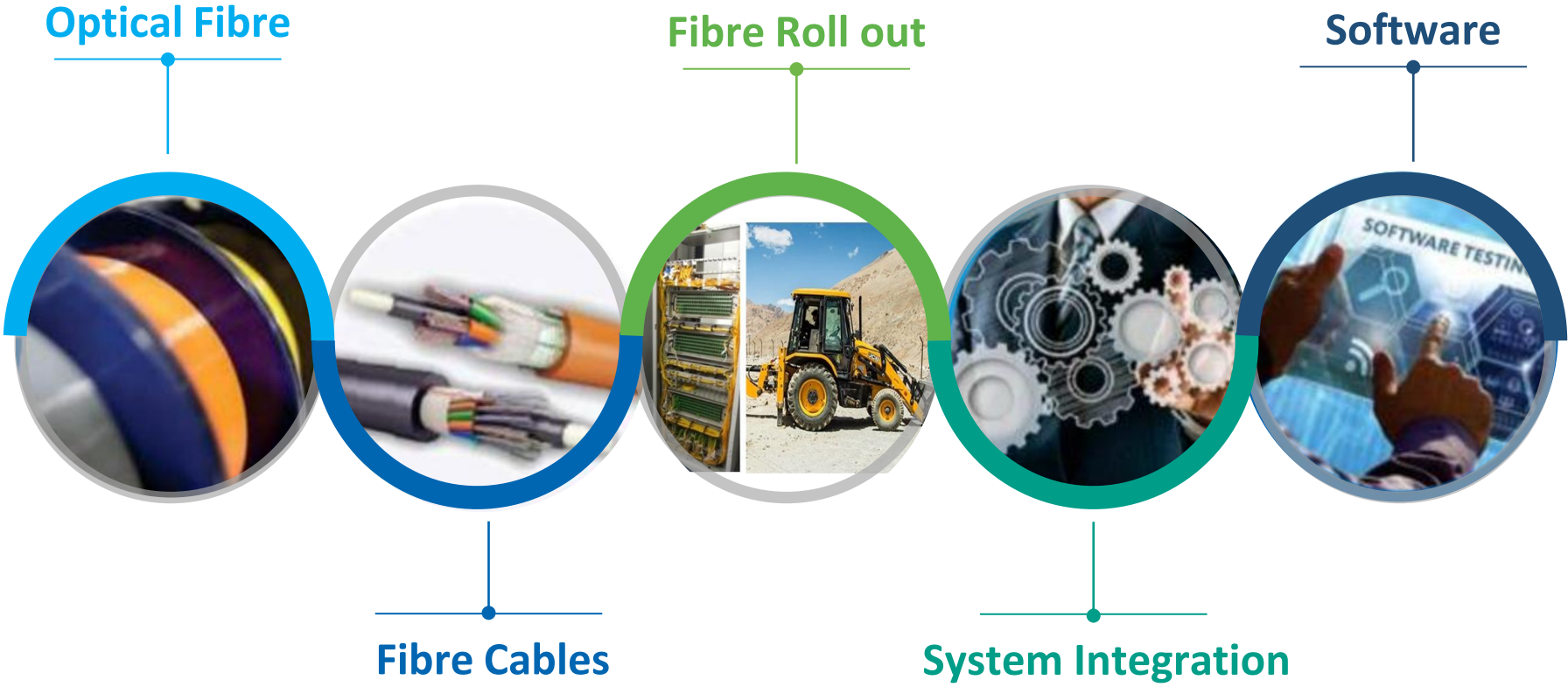
3 RESEARCH LABS, 7 PRODUCTION FACILITIES

Sterlite Tech : Designing, Building and Managing Smarter Networks