

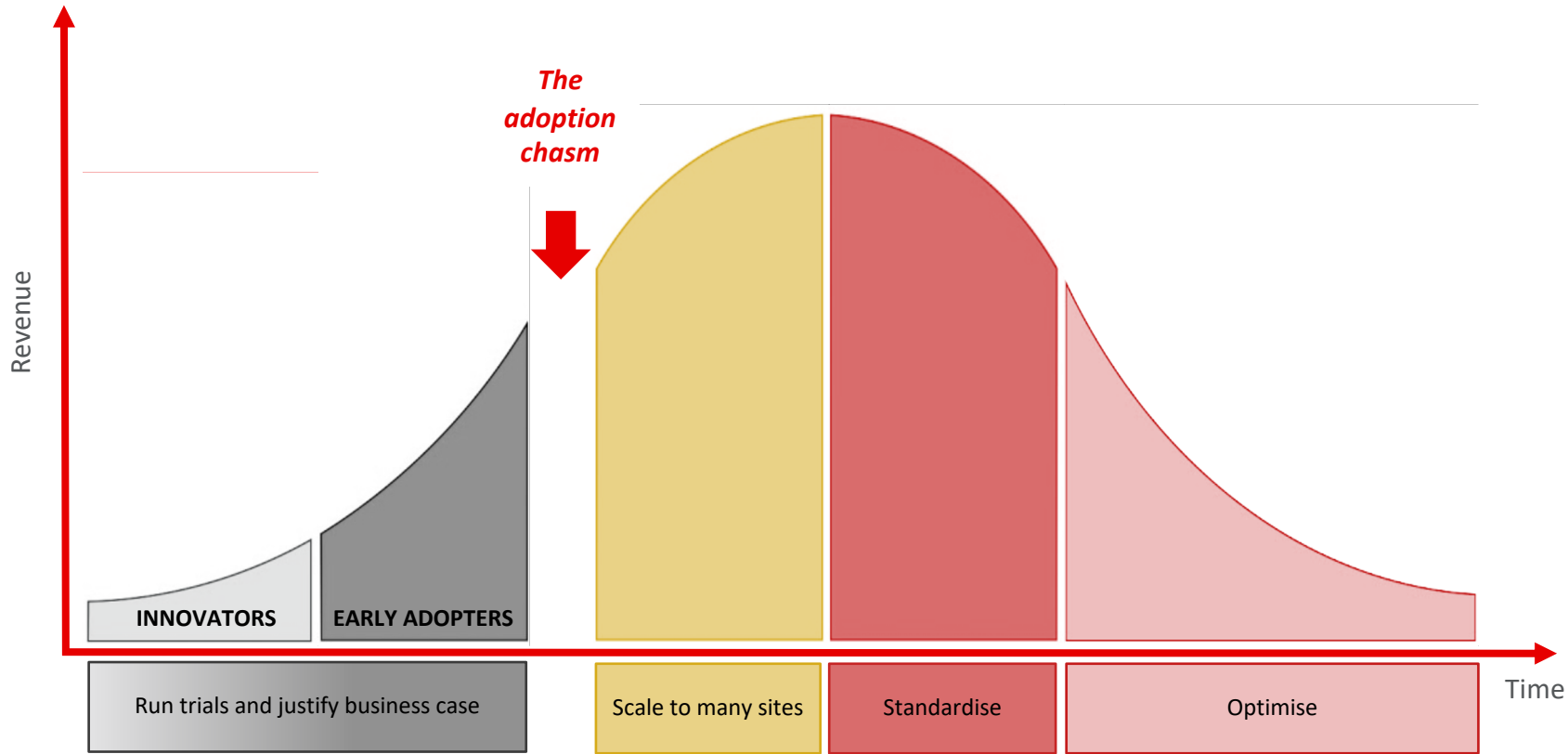
Crossing the chasm: moving from POC to production deployments

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Cloud, Edge & MPN Portfolio,
Vodafone Business

8 June 2023

Customer buying behaviour

How to bridge the adoption chasm



Progress past the “adoption chasm” into scaled deployments

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Omdia, LTE and 5G Private Networks Tracker Report, FY22



Critical needs of our customers

Why does a customer buy a mobile private network?

Scalability

- Deployments are easily scaled up or down to meet changing requirements
- Particularly beneficial for sites with a high density of devices and simultaneous connections
- Our global presence enables the support of customers at scale



Security

- Protected by SIM based authentication and authorisation capabilities
- Provides connectivity only for authorised devices
- Data is processed on-site adding another layer of security to communications



Reliability

- Private networks carry only their own data and are not affected by disturbances in the public networks
- Resilience and redundancy can be implemented to ensure continuous service



Mobility

- The MPN devices can freely move around the campus under the coverage of the MPN
- Can be configured to roam outside the MPN onto the Public Network using a suitable (hybrid) MPN architecture



The key customer needs are addressed with a Mobile Private Network



The private networks market

Evolution of the market landscape

Short Term

- Customers are running trials and pilots to test MPNs (usually for one key use case)
- Isolated single campus deployment
- Security & reliability are key requirements
- Minimal SLAs - time to deliver is the main one
- Key use cases tested: PTT replacements, asset tracking, data transfer (video), employee safety

Differentiators:

- ✓ Price
- ✓ Ease of deployment
- ✓ Ease of integration of devices

Medium Term

- Building business cases for wider-scale deployment
- Multi-site / Multi-country RFPs emerging
- Additional use cases that improve ROI (mixed reality, visual inspection, autonomous AI, robotics)
- Roaming becomes a priority for some customers
- Stricter SLAs become a part of requirements (e.g. Throughput, latency, availability, as well as time to fix)

Differentiators:

- ✓ Global consistency
- ✓ Service & managed support
- ✓ Scalability
- ✓ Security

Long Term

- SLAs become even more demanding
- API's for integration into 3rd party systems
- Network slices, MPN and SD-LAN (Wi-Fi) increasingly managed through a single interface
- Pre-integrated marketplaces
- Plug and play emerges

Differentiators:

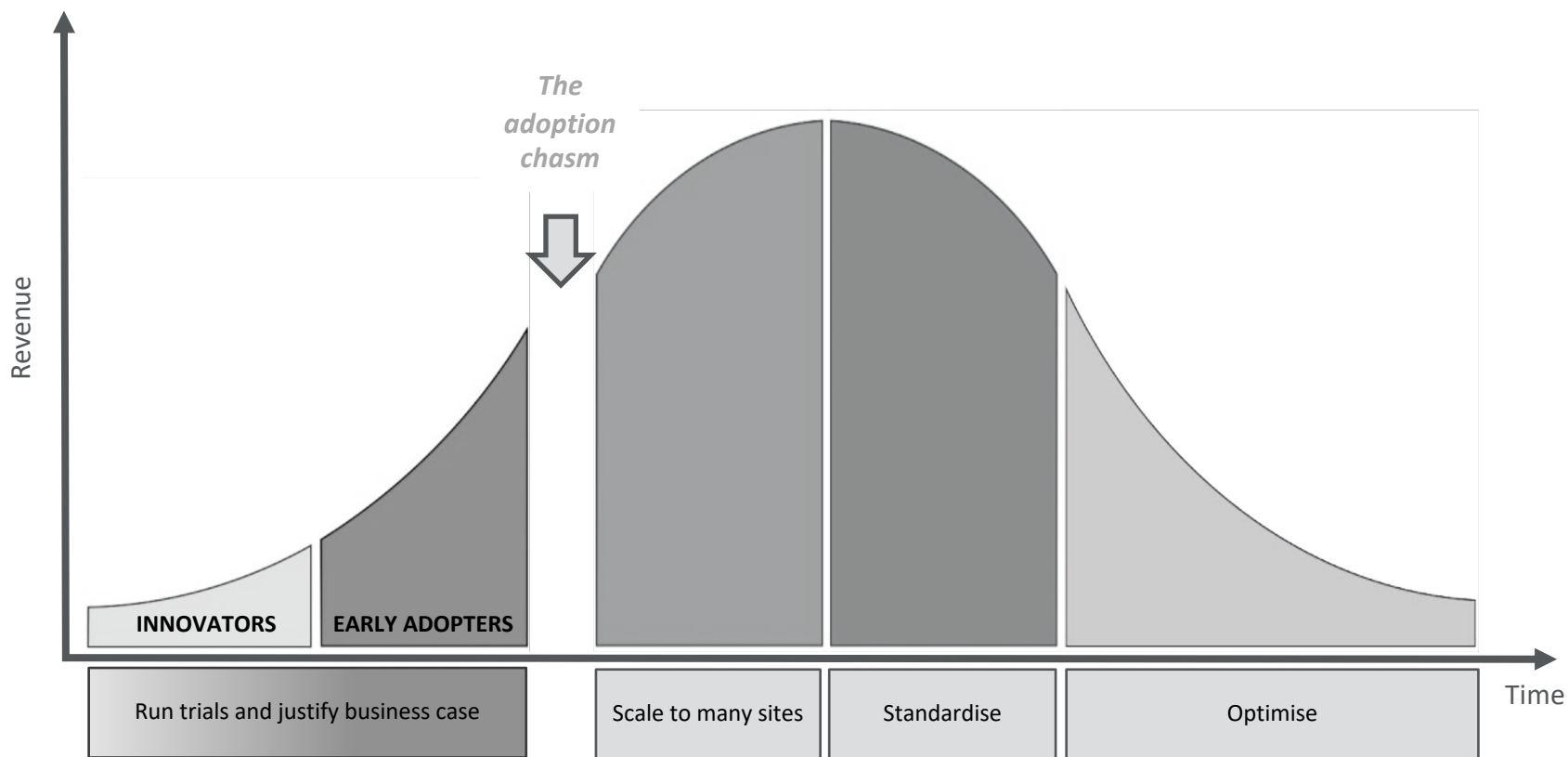
- ✓ Price
- ✓ Ease of use
- ✓ Digital self-service experience and solution catalogue
- ✓ Experience and references with broad range of applications and 3rd party partners

Customers are looking to scale up cost effectively, without compromising SLAs



Chapter 1 & 2: A clear business and additional use cases

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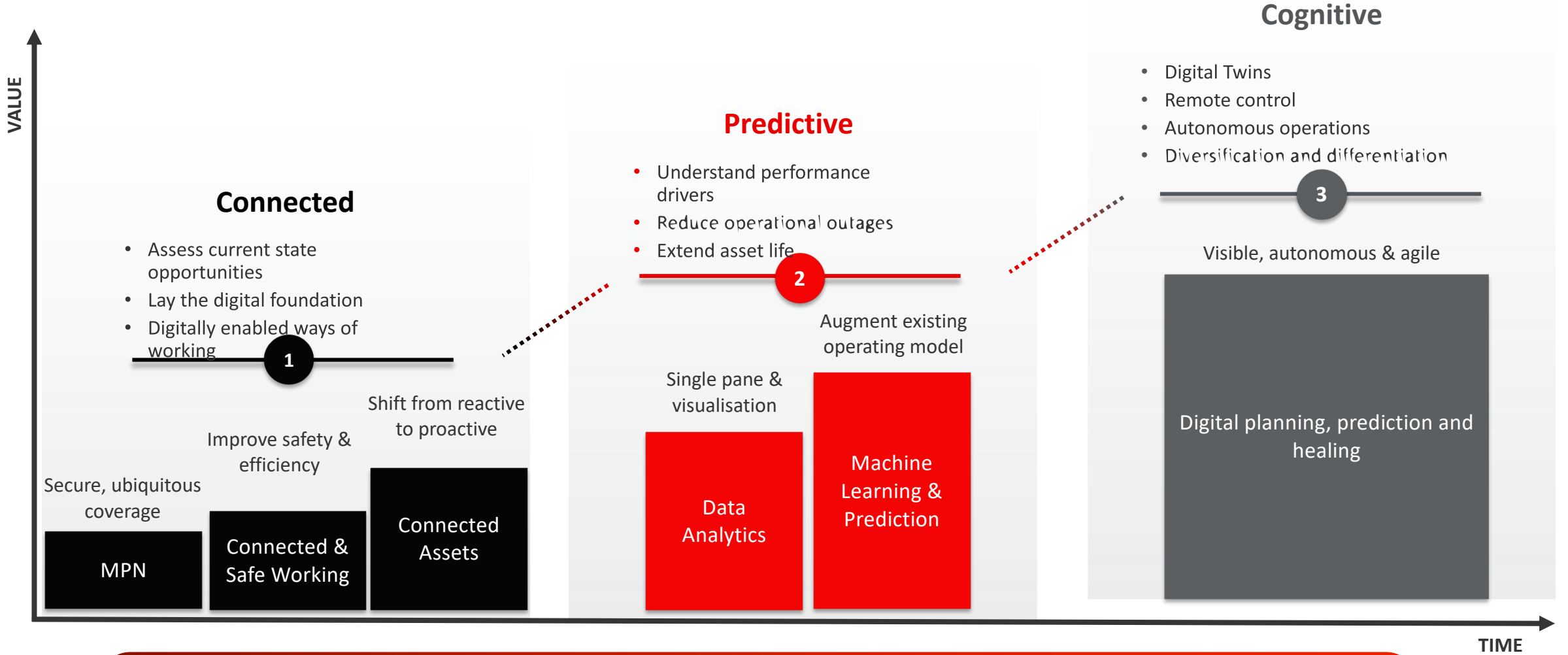
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Omdia, LTE and 5G Private Networks Tracker Report, FY22



Mobile Private Networks

A journey with the customer

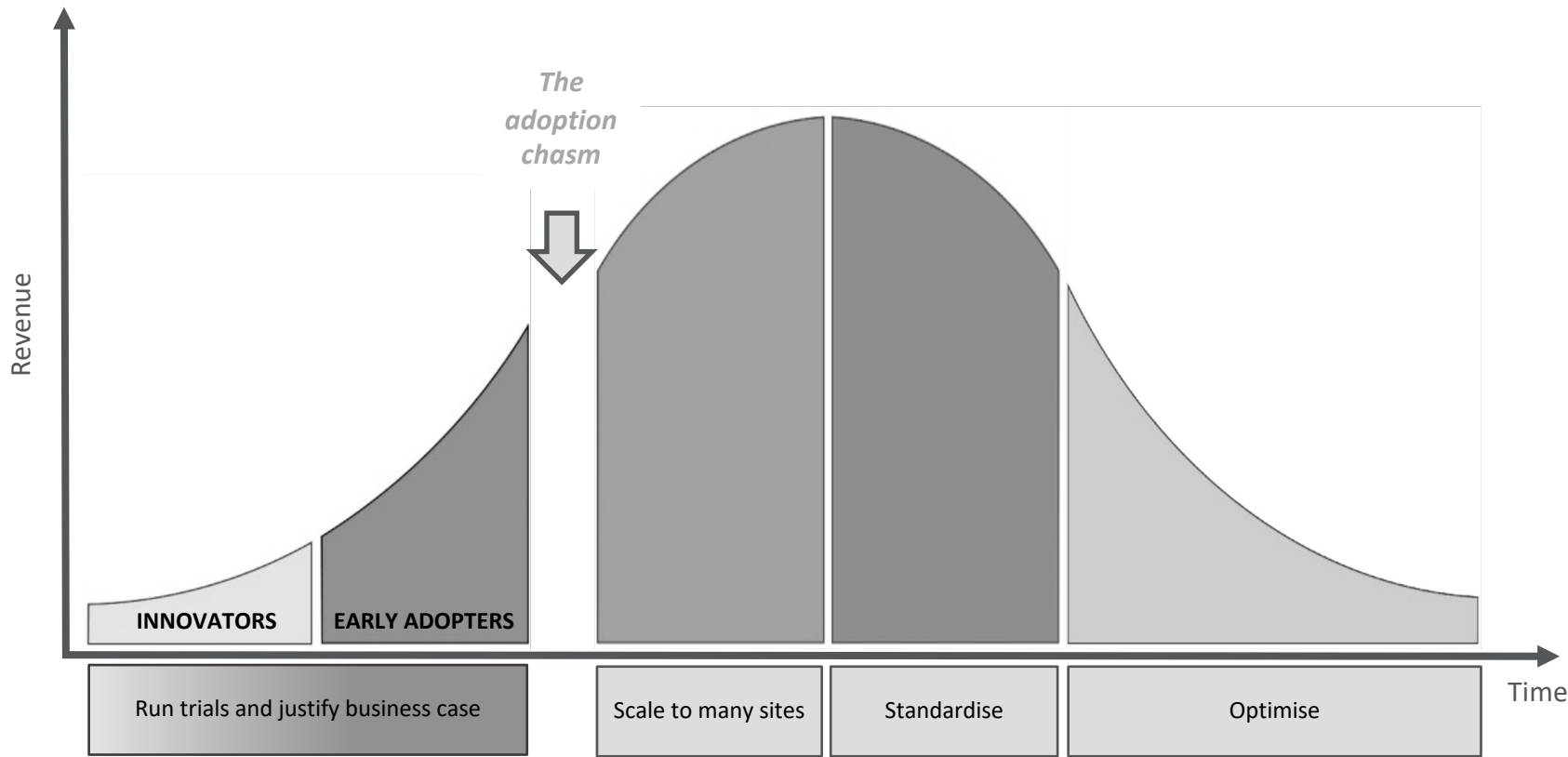


Layer incremental value over the Mobile Private Network through use-case prioritisation



Chapter 3: A single pane of glass and operating model

How to bridge the adoption chasm



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What we offer to our customers

Our MPN offer includes 6 key components

Professional Services

Site surveys, design, installation and end-to-end testing

Managed Services

24/7 help-desk, operations, maintenance, change management and upgrades

Management Plane

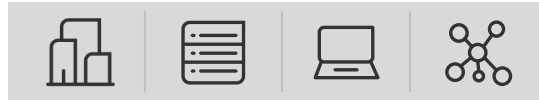
Enables customers to have end-to-end visibility across the MPN network and devices, and across multiple instances (e.g. plants/ports)

Network (Connectivity & Edge Computing)

- Dedicated, hybrid and virtual mobile networks
- 4G / 5G / LPWA
- Public & private assets
- Spectrum
- SD-WAN



- Dedicated MEC onsite or in Vodafone data centres



MPN E2E Solutions

- Digital Worker
- Digital Asset
- Digital Site



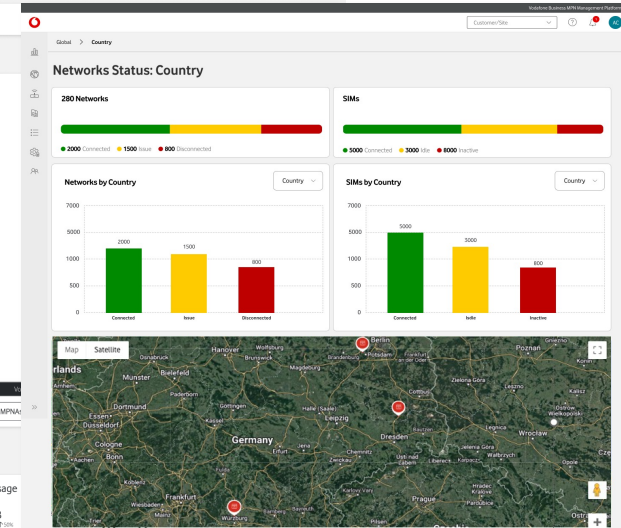
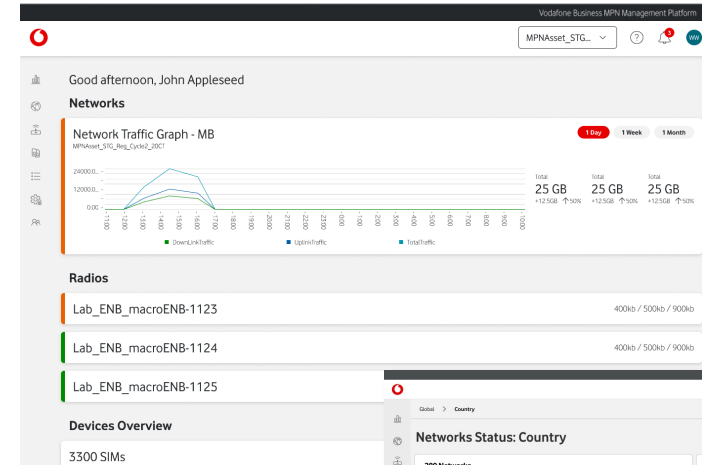
Our portfolio is underpinned with a full Managed Service wrap, to take away risks from our customers



MPN Management Plane

Customer self-service portal

- Many customers require end-to-end visibility and control of their Private Network, as well as the assurance of a Vodafone full managed service wrap
- We have created a **customisable dashboard**, supporting multiple vendor technologies & solutions to provide the capabilities for the customer to do self-service if they prefer
- Self-service features include:
 - **SIM Management** (activate/deactivate SIMs, manage profiles & groups)
 - **Network Reporting** (dashboard, status, reports, alerts) and Device Management
 - **User Management** (add/delete users, set permissions, view audit logs)
- Single channel for all information and services
 - Get help, access to knowledgebase articles, notifications, view bills
- Secure environment to protect data
- Options to access via API for analytics



SIMs

Status: 300 Active, 1500 Idle, 1500 Inactive

Network Capacity: 500 Active, 1500 Inactive

Data Usage: 25 GB total, 113.5GB ↑ 30%

Change Status, Change QoS Profile, Manage Groups, Set Custom Attributes

Select new QoS Profile

Send me an email notification when the action is completed

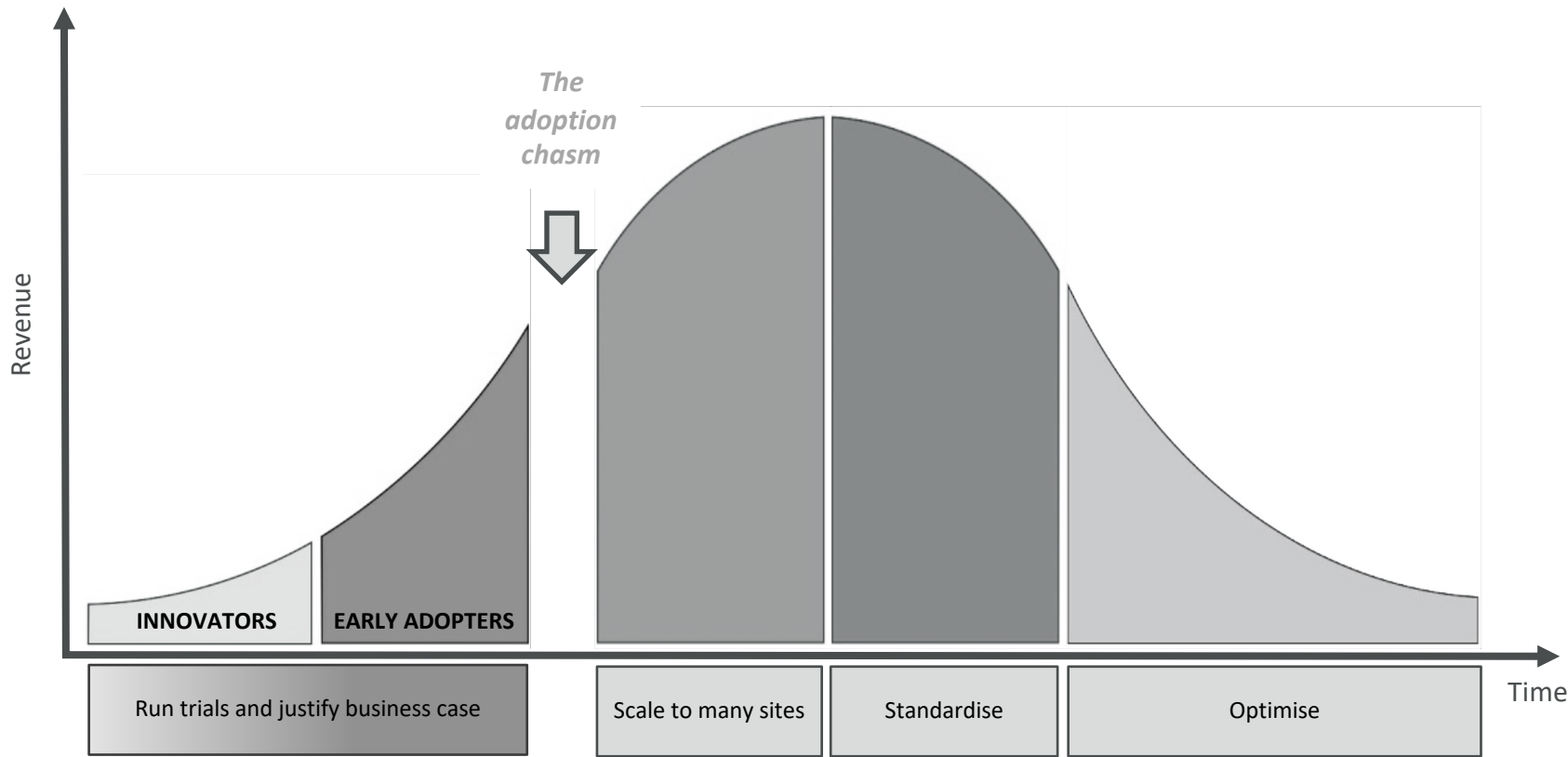
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	Status	State	QoS Profile	Group
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<input type="checkbox"/>	Idle	Data Cell	QoS Profile	Group 1, Group 2
<input type="checkbox"/>	Inactive	Data Cell	QoS Profile	Group 1, Group 2, Group 3
<input type="checkbox"/>	Inactive	Data Cell	QoS Profile	Group 2
<input type="checkbox"/>	Inactive	Data Cell	QoS Profile	Group 2, Group 3
<input checked="" type="checkbox"/>	Active	Data Cell	QoS Profile	Group 1, Group 2, Group 3, Group 4, Group 5
<input checked="" type="checkbox"/>	Active	Data Cell	QoS Profile	Group 2
<input type="checkbox"/>	Idle	Data Cell	QoS Profile	Group 1, Group 2
<input type="checkbox"/>	Idle	Data Cell	QoS Profile	Group 1, Group 2



Chapter 4: meeting the needs of both IT & OT

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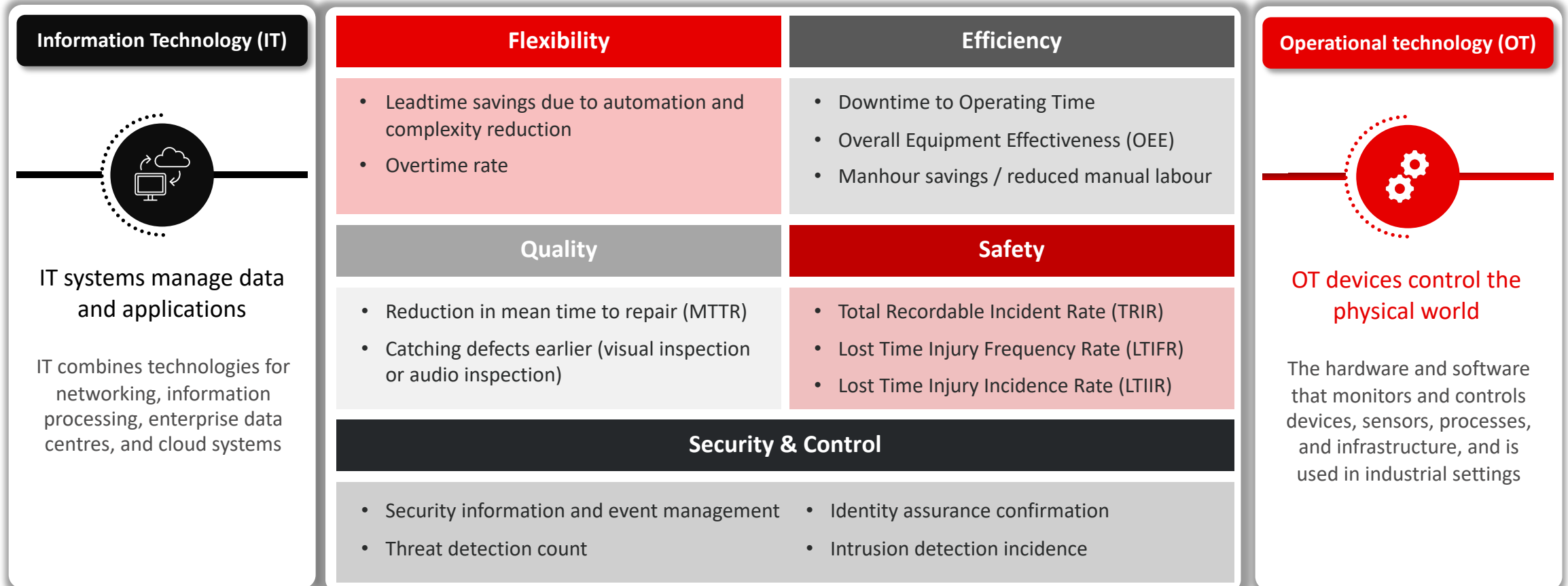
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Providing real operational benefits to customers

Private networks cross the boundary between IT & OT

We must measure the value an MPN offers in terms that affect the customer objectives – improvements in efficiency & flexibility, increased safety, better quality control



For MPN's to scale, we need to satisfy both stakeholder groups



Professional Services & Assurance

End to End Service Management

Advisory, Build & Configuration, Operate & Maintain

Spectrum

Devices

Radio network

Core network

Cloud & edge

Connectivity

Application

Security



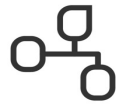
Licensed
Shared
Industrial



Routers
Phones
Tablets
Cameras



Antennas
Base Stations
Small Cell
Network Design



4G LTE
5G
Packet Core



Private Cloud
Public Cloud
Edge Computing



IP transit
SD-WAN
LAN



System
Integration
Digital
Ecosystem



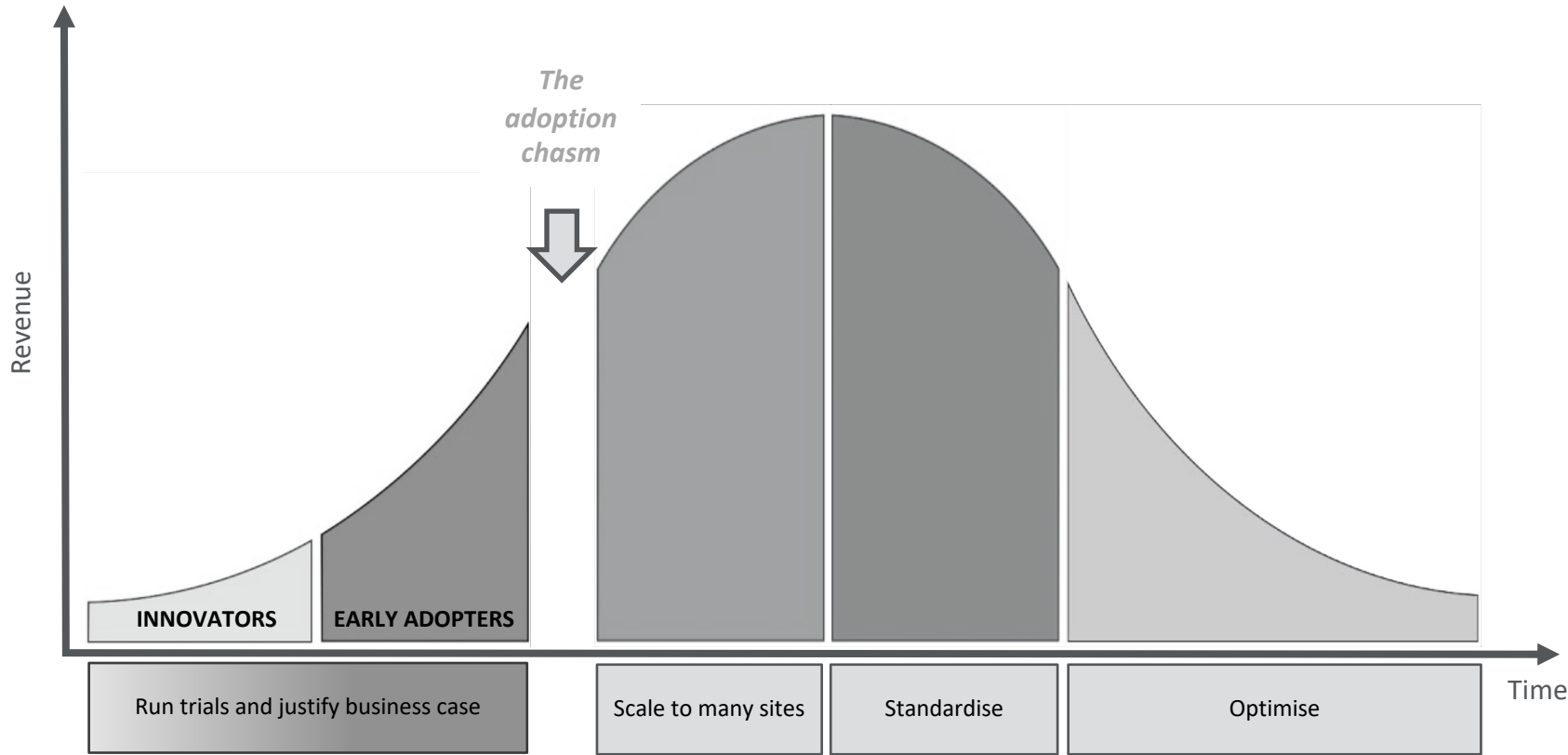
Threat Detection
SIEM
Security Visibility

Vodafone Services can be applied across the Mobile Private Network Value Chain



Chapter 5: Future needs of connected assets and workers

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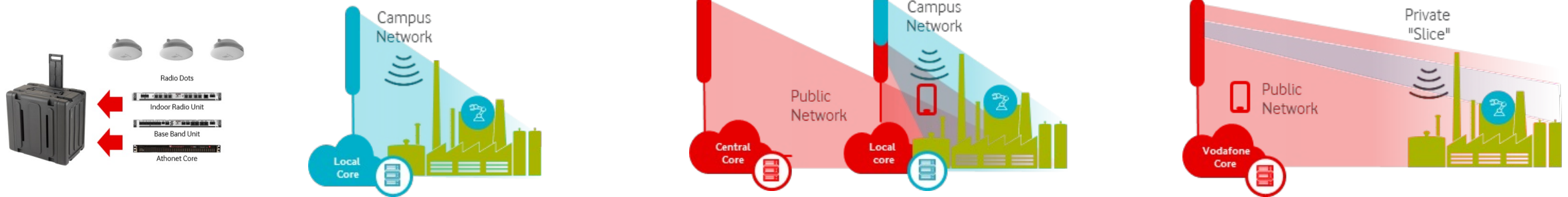
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Mobile Private Networks

Mobile Network Operators have an advantage



Proof of Concept/Trial MPN

Dedicated MPN

Local Hybrid MPN

Global Hybrid MPN

Network Slice

Ideal for customers exploring what cellular connectivity can offer

Ideal for customers that need high throughput/low latency linked to strict SLAs, in an autonomous environment

Ideal for more mobile customers, where devices are likely to roam off campus onto the public network. Also offers public voice services

Ideal for international mobility, where devices are likely to roam between locations in different countries

Ideal for temporary priority access for specific use cases in a specific area or continuous priority access across regional/national coverage areas

Private SIMs

Private SIMs

Network Operator local SIMs, or Multi-IMSI SIMs

Multi-IMSI SIMs enabled with Global IoT profiles

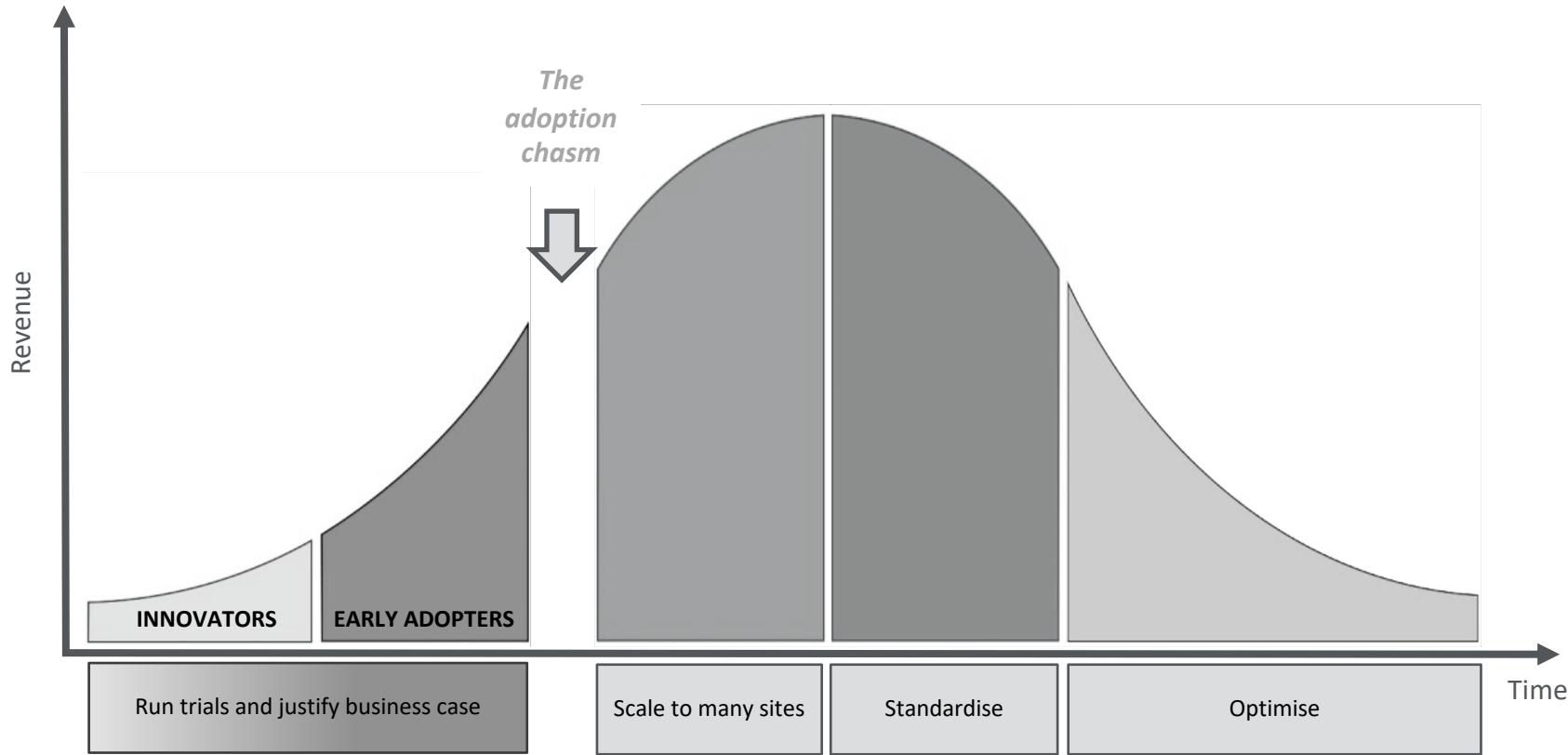
Network Operator local SIMs, or Multi-IMSI SIMs

+ the potential to include roaming and interoperability with the macro network



Chapter 6: Getting to plug and play

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Get ready for the future

2023: Cost-effective scaled deployments

Scaled deployments

Roaming devices in-country

RAN Share

Global managed service

Customer self-service

2024: A low-cost, differentiated solution utilising cloud and slicing techniques

Roaming globally, on and off multiple campuses

Dynamic Network Slicing

SME scaled deployments

Open RAN

Service based pricing

Network-as-a-platform orchestration

2025: A mature, optimized and fully flexible solution to match customer needs

Subscription based solutions

Slice-as-a-service

Value-based pricing

Open APIs

Seamless ordering

Extensive service catalogue

Menu driven

Extreme SLAs



The roadmap for private networks is evolving towards high mobility, extreme SLAs, and integration with 3rd party solutions

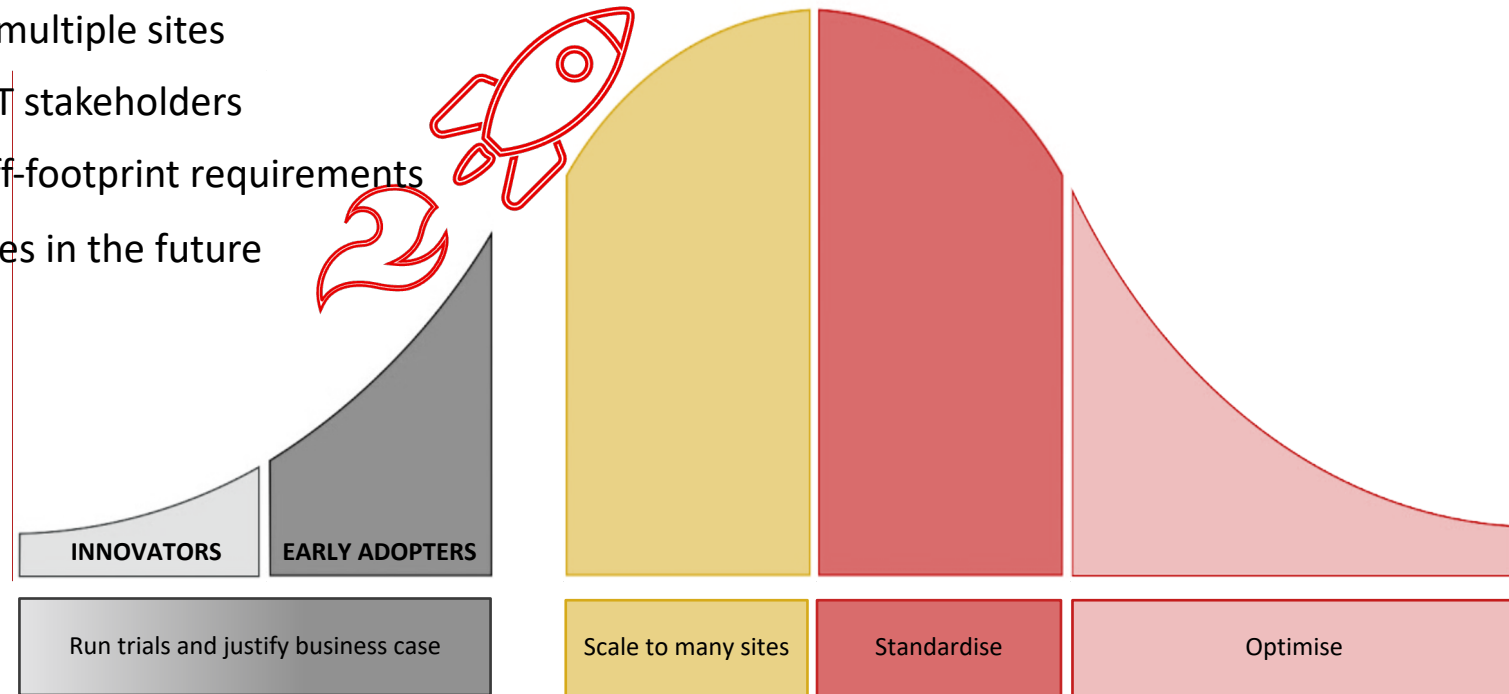


Key messages: from POC to production

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Together we can