Global Data Trends - Introduction
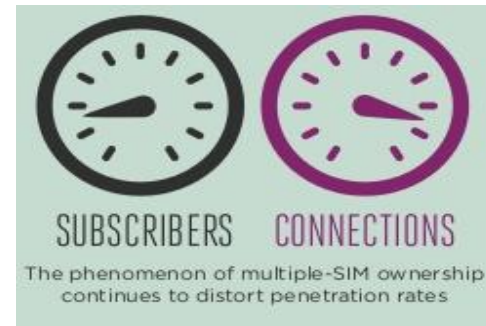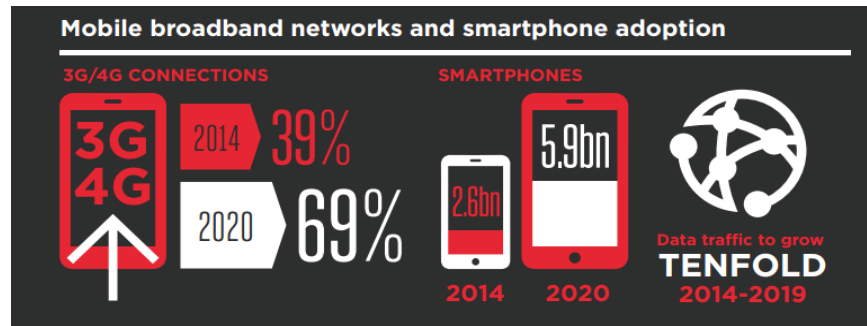
LTE India Conference 2016

Sanjay Sharma — RVP-South Asia

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Mobile broadband networks and smartphone adoption

3G/4G CONNECTIONS — 2014 39% — 2020 69%
SMARTPHONES — 2.6bn 2014 — 5.9bn 2020
Data traffic to grow TENFOLD 2014-2019

SUBSCRIBERS — CONNECTIONS
The phenomenon of multiple-SIM ownership continues to distort penetration rates

LTE Networks
2013 — 256 networks In 97 Countries
2017 — >500 networks In 128 Countries

Video fuelling strong mobile data growth (PB per month)
2,523 / 4,175 / 6,765 / 10,666 / 16,140 / 24,314
Web/data — File sharing — Video — Audio streaming

Proportion of smartphone connections by region
Developed region — Developing region
Smartphones — Basic / feature phones — Data terminals

Mobile operator revenues
Data growth driving revenues and operator investments
US$1.15tn 2014
US$1.4tn 2020
2014 - 2020 3.1% CAGR

Revenues
APPS, CONTENT AND ADVERTISING
US$ 205bn 2013
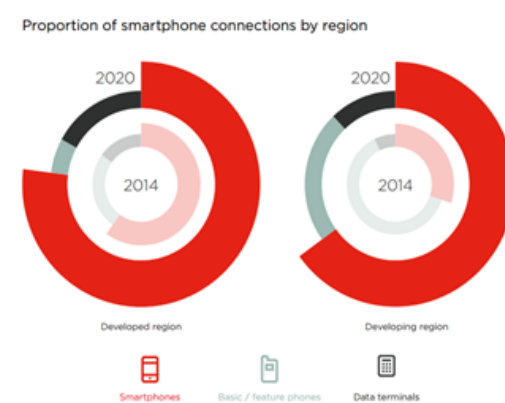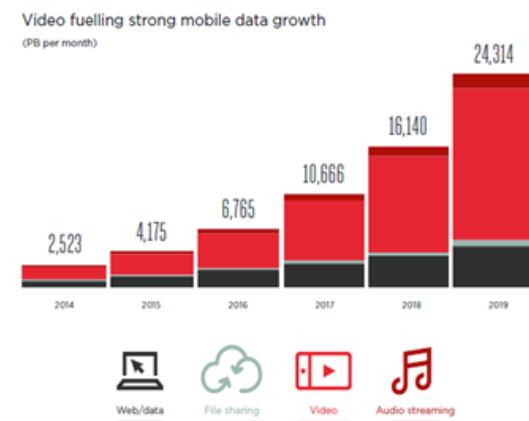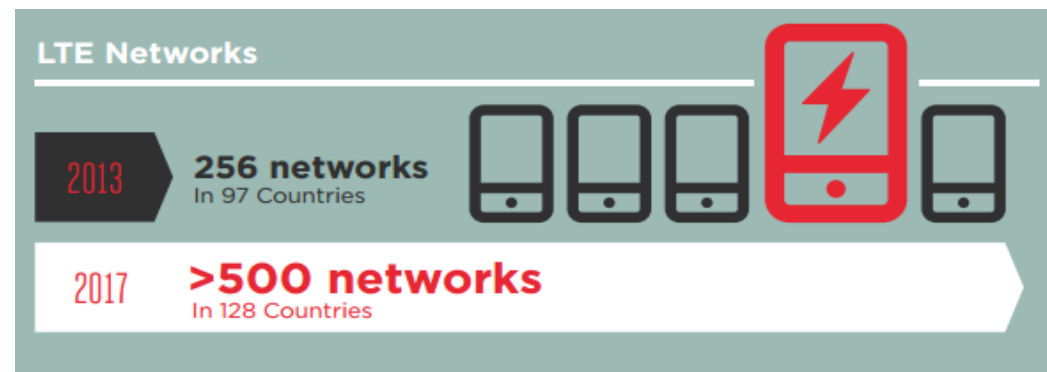US$ 576bn 2020
Annual revenue growth 16%

Data traffic expected to see a **ten-fold** increase by 2019. Subs and SIM numbers growing.

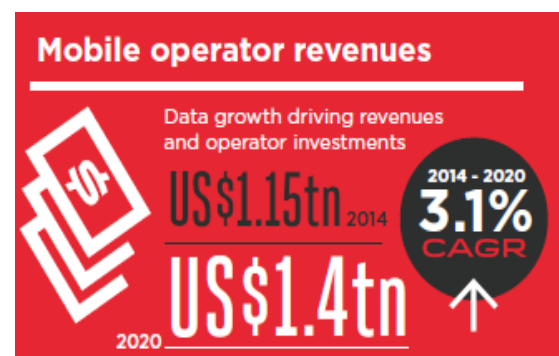**High investments** in the infrastructure, ongoing (LTE rollout, 5th gen ahead).

Smartphones dominate, enabling new services and catering data hungry applications.

The **apps**, content & advertising **business** is realizing significant revenues in the ecosystem.

Traditional voice and SMS revenues erode. Revenue growth only **3.1% CAGR** through to 2020. - *GSMA*
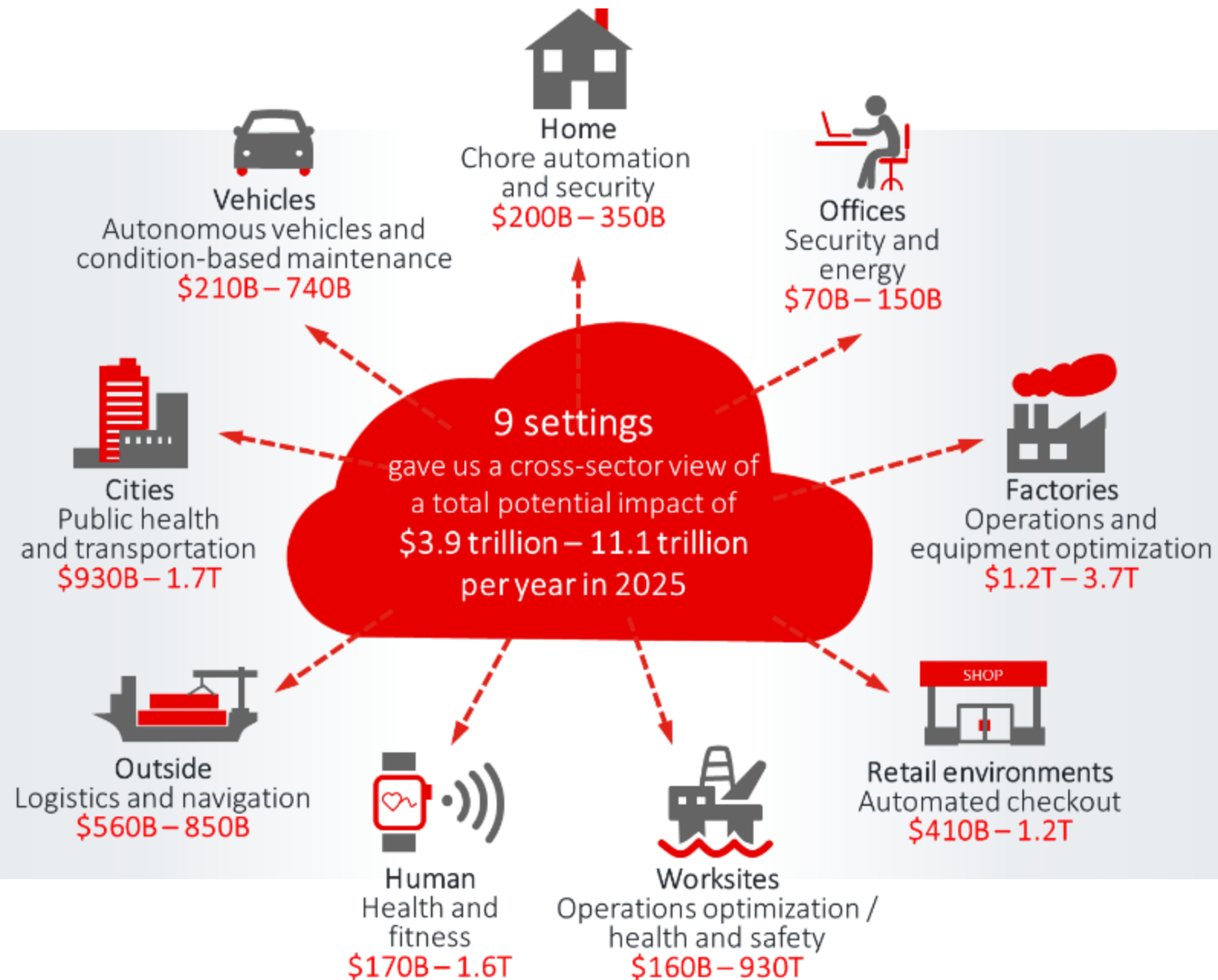
LTE is expected to create **new revenue** streams, extend capacity, build brand - *Informa*

Threatened to become commodity and loose profitability at the same time.

< 2 >

The Internet of Things will transform industries

Monetize consumption data from connected devices

Move from product to service offerings

Vehicles
Autonomous vehicles and condition-based maintenance
$210B – 740B

Home
Chore automation and security
$200B – 350B

Offices
Security and energy
$70B – 150B

Cities
Public health and transportation
$930B – 1.7T

9 settings
gave us a cross-sector view of a total potential impact of
$3.9 trillion – 11.1 trillion
per year in 2025

Factories
Operations and equipment optimization
$1.2T – 3.7T

Outside
Logistics and navigation
$560B – 850B

Human
Health and fitness
$170B – 1.6T

Worksites
Operations optimization / health and safety
$160B – 930T

Retail environments
Automated checkout
$410B – 1.2T

< 2 >

Differentiate By OTT / Application

INTRODUCING
BINGE ON™
Video now streams **FREE** without using your data, only from T-Mobile.
Available on November 15th

Now you can stream all you want for FREE without using your data.

In October 2015 were adopted the first EU-wide Net Neutrality rules.

European Commission

Quality differentiation on the Internet has long been common practice. ... In future there will also be the option of booking a service with assured quality in exchange for a few more euros.

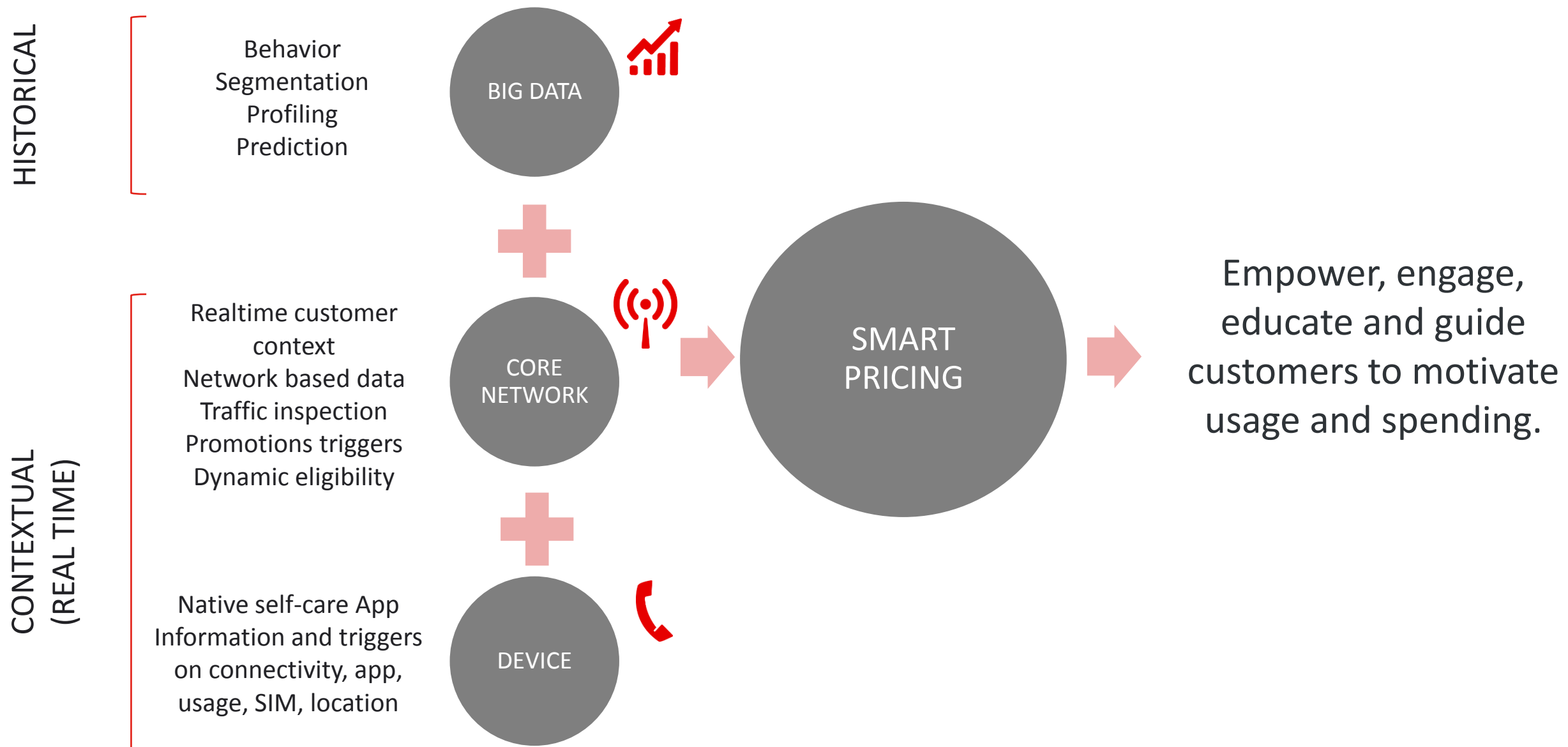## Personalized plans based on OTT awareness

› Prefe NETFLIX HBO NOW™

 › hulu sling WATCH ESPn

› But son YouTube rs aren't included, e.g.

 ›

› Policy control needed to guarantee QoS beside charging

Application based charging according to 3GPP

› Option for new revenue streams while optimizing network infrastructure

› Internet traffic can be treated differently (e.g. throttling)

› Identify the subscriber, the application, content and device

 < 4 >

The "Smarter" Data Monetization Approach

Combine traditional data with real-time, contextual information to "detect" and "capture" more opportunities for monetization. Personalized, valuable offerings at the right time and context.

HISTORICAL

Behavior
Segmentation
Profiling
Prediction

BIG DATA

CONTEXTUAL (REAL TIME)

Realtime customer context
Network based data
Traffic inspection
Promotions triggers
Dynamic eligibility

CORE NETWORK

Native self-care App
Information and triggers on connectivity, app, usage, SIM, location

DEVICE

SMART PRICING

Empower, engage, educate and guide customers to motivate usage and spending.

The India Market in the Next Five Years

ABSORBING DISRUPTION

- It's all about social
- Partnerships with OTT players is on the rise
- Smartphone is central to our life
- New viewing habits redefine the TV experience
- LTE and FTTx deployments are growing
- Cloud-based service adoption accelerates
- Big data focuses on organizing data
- Video is Booming
- E- commerce is growing in India

THE ERA OF INDIVIDUALIZATION

- Individualization is the name of the game
- Wearable devices become more common
- Big data supports service personalization
- Battle for premium video content expands to new players
- Small cells and LTE-A deployment accelerates
- More software functions shift to the cloud
- Network virtualization is heavily adopted for telco networks

BREAKING DOWN BOUNDARIES

- Sensors and analytics add intelligence to our life
- Network goes to All-IP, increasing the need to optimize
- 5G is beginning to emerge
- Platform players pushing for network assets
- Virtual presence is emerging
- Service providers disrupt new verticals

Today (2015-16) | **Mid-Term (2017-18)** | **Long-Term (2019-21)**

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One of the largest independent provider
of real-time monetization software

1,800+
employees

250+
customers

2.8+ bn
subscribers

Our Mission

Redknee's mission is to enable the
real-time monetization of digital services across any industry, regardless of application, device or connectivity.

Our monetization platform connects the people and things that are powering today's digital economy.

Global Customer Footprint

❯ Redknee supports some of the biggest names across all corners of the globe
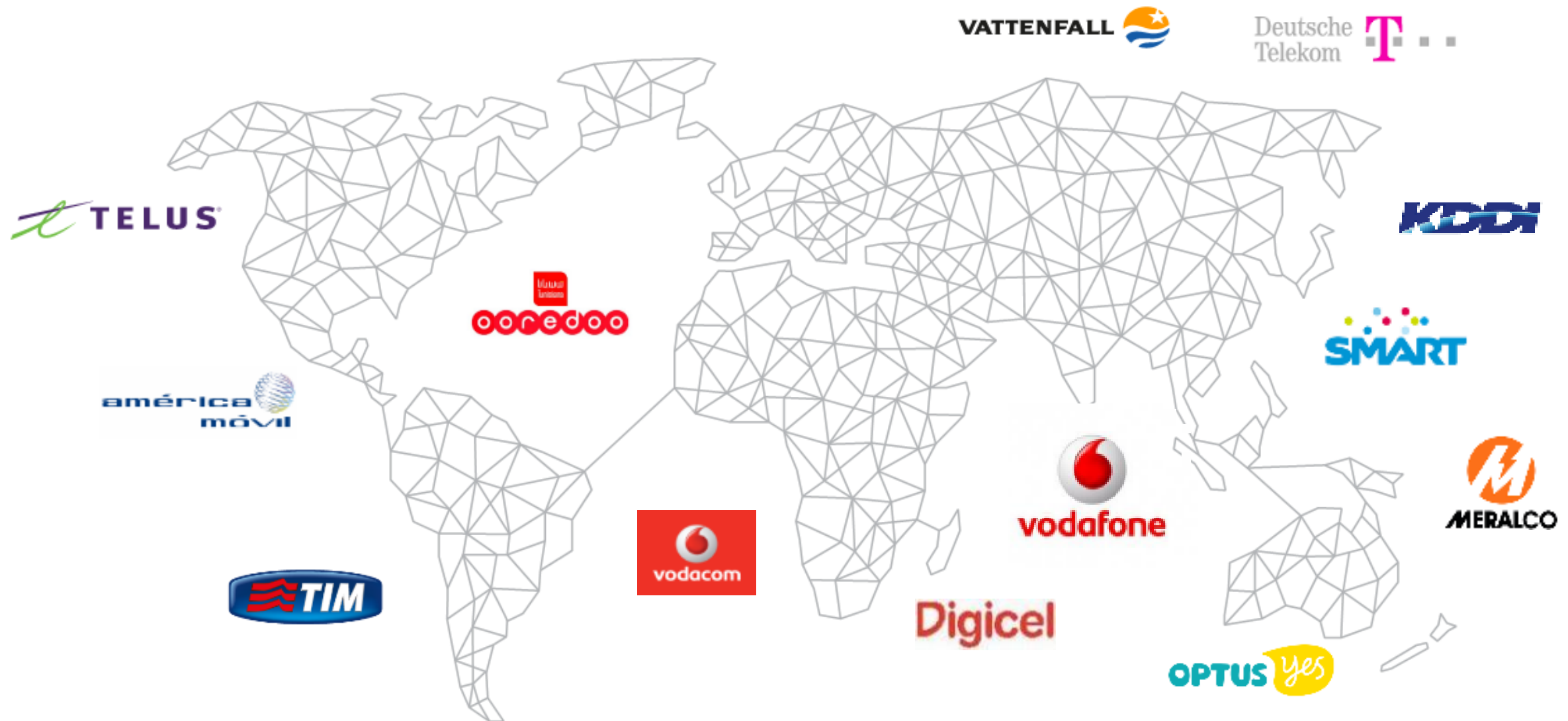
Redknee provides innovative real-time monetization and subscriber management solutions to more than **250 customers** across a variety of industries, including **communications**, **transportation**, **utilities** and **automotive.**

Committed to Excellence

"Best OSS/BSS Provider"

Telecom Review

"Mobile Star Award "

Mobile Village

"Innovation & Leadership Award "

Frost and Sullivan

"Technology Fast 50 Award "

Deloitte

"Leading BSS Vendor "

Ovum

"Outstanding BSS Vendor of the Year "

Light Reading

Powering the Digital Economy

❯ Real-time monetization solutions for any type of market

COMMUNICATION SERVICE PROVIDERS:

REDKNEE
COMMUNICATIONS SUITE
Providing solutions for monetizing communications and data services for hundreds of the world's leading communication service providers
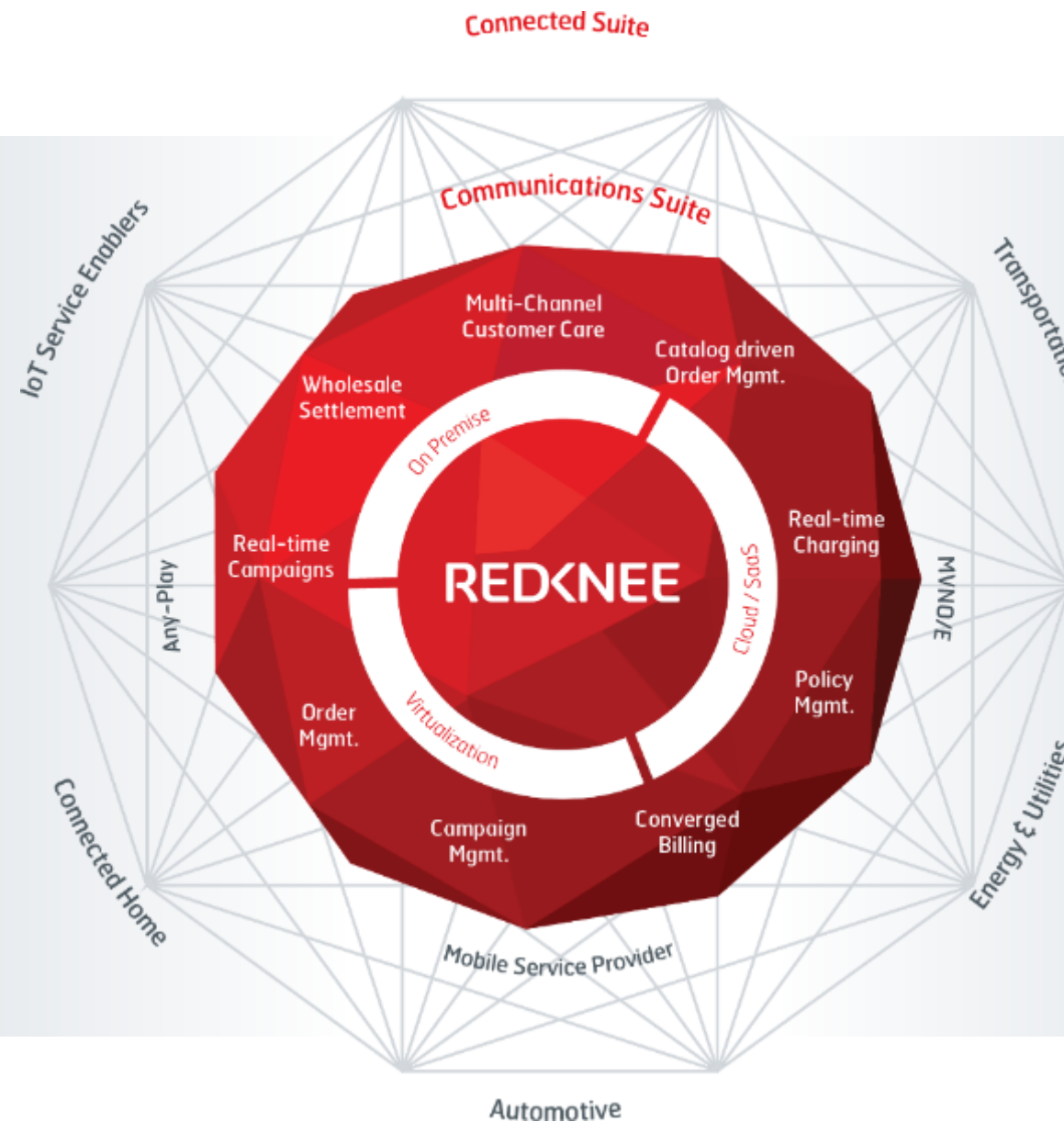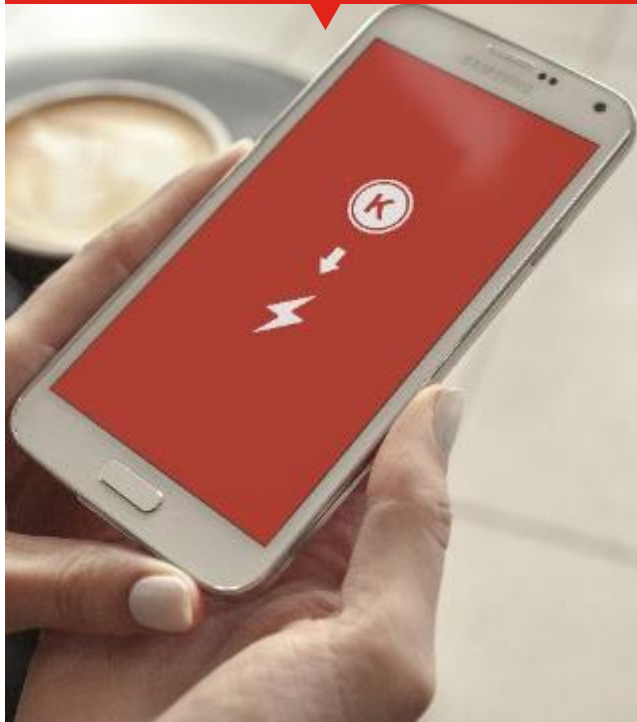
IoT & ENTERPRISE:

REDKNEE
CONNECTED SUITE

Redknee drives the business side of the Internet of Things – monetizing transactions across industries and across devices.

Helping the World Connect in New and Innovative Ways

REDKNEE Looking Beyond

MOBILE ENERGY PAYMENTS

With Redknee, Digicel's customers can prepay for home energy services right from their mobile phones.

Digicel

DATA MONETIZATION

Redknee supports one of the world's largest data networks - Vodafone India, and helped deliver life-saving communication service to victims of India's 2015 floods.

vodafone

CROWD-SOURCED SERVICE PROVIDER

Public Mobile
› Crowd Sourced
› Social media driven
› SIM only service
› BYOD
› Game changer in the Canadian market

Public MOBILE

CONNECTED CAR

Redknee is powering BMW's Connected Drive services by monetizing their digital in-car offerings.
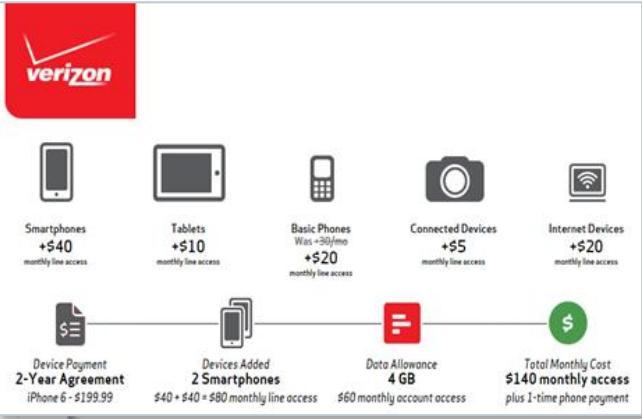
BMW

Shared Data, Communities, Crowd

Shared data is great. We see plans to extend to:

› sharing over communities

› social gifting

› social recommendations

› crowd sourced care

Community Sharing

A donator shares a portion of his allowance – to a community. The shared amount is made available to all users of the community.

Donator can be part of the users – but does not have to be (charity)

Gift CARRY OVER

Use carry over to motivate purchase of larger bundles.

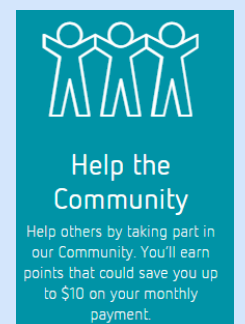Allow on conditional, on demand sharing/ gifting of carry over allowances.

Crowd Sourced Care

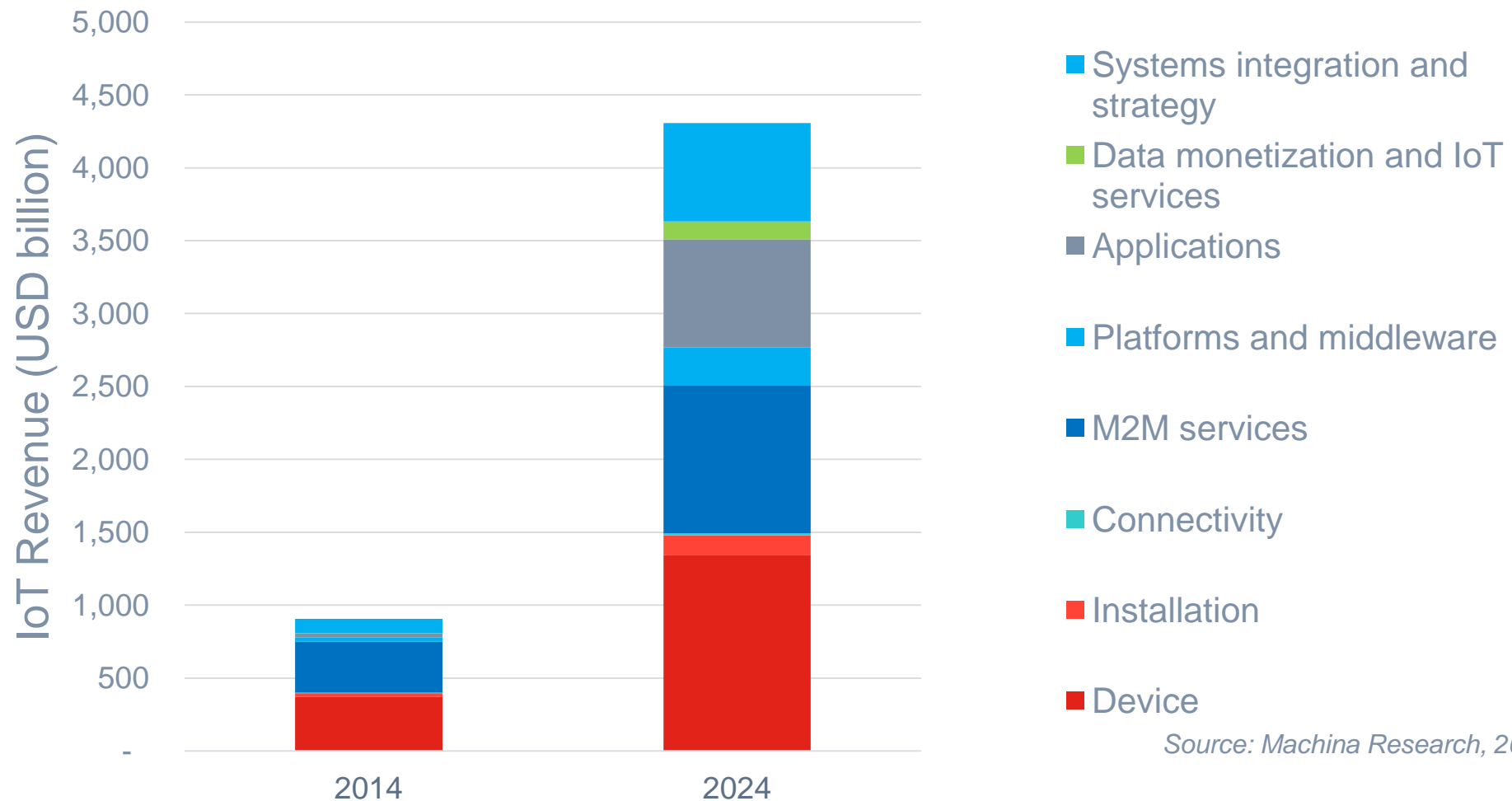No call center – just community (and supervision)

Rewards for support
(rating of support activity - earn your monthly fee back)

Rewards for referrals

DON'T WASTE YOUR UNUSED GIGS! DATA ROLLOVER IS NOW AVAILABLE ON PREPAID MONTHLY. Roll over your unused data up to 10GB

Help the Community
Help others by taking part in our Community. You'll earn points that could save you up to $10 on your monthly payment.

AT&T

Add more devices	Features	Monthly Access Charge
Tablets, connected devices & gaming devices	Shared data	$10/mo.
Connected wearables[5]	Unlimited Talk & Text + Shared data	$10/mo.
Laptops, netbooks & hotspot devices	Shared data	$20/mo.
AT&T Wireless Home Phone[6]	Unlimited Nationwide Calling	$20/mo.
AT&T Wireless Home Phone & Internet[6] (Only on 10GB plans or higher.)		

verizon

Smartphones +$40 monthly line access
Tablets +$10 monthly line access
Basic Phones Was +$30/mo +$20 monthly line access
Connected Devices +$5 monthly line access
Internet Devices +$20 monthly line access

Device Payment 2-Year Agreement iPhone 6 - $199.99
Devices Added 2 Smartphones $40+$40 = $80 monthly line access
Data Allowance 4 GB $60 monthly account access
Total Monthly Cost $140 monthly access plus 1-time phone payment

I have unused data amount this month. You can have it.

I used a lot of data this month and now I don't have enough. I hope next month will be okay.

If the data amount is not used up, the data amount that is provided with Data Gift can also be carried over and used by the end of the next month! (If the monthly data amount of the current month is provided with Data Gift)

あたらしい自由。au

Father   Child

CSP examples, as advertised on own web presence

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**Machina
Research**

IoT Revenue (USD billion)

Legend:
- ■ Systems integration and strategy
- ■ Data monetization and IoT services
- ■ Applications
- ■ Platforms and middleware
- ■ M2M services
- ■ Connectivity
- ■ Installation
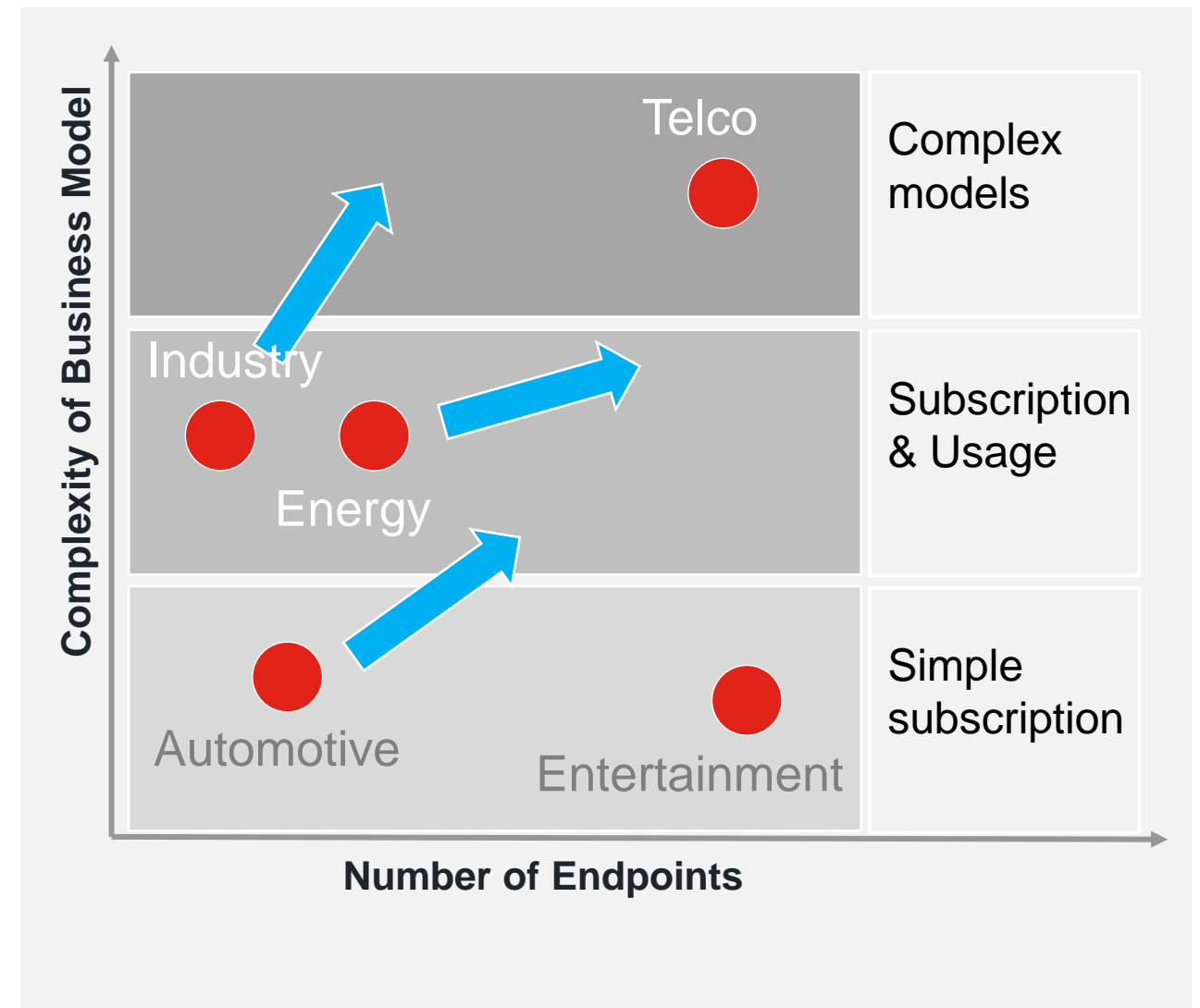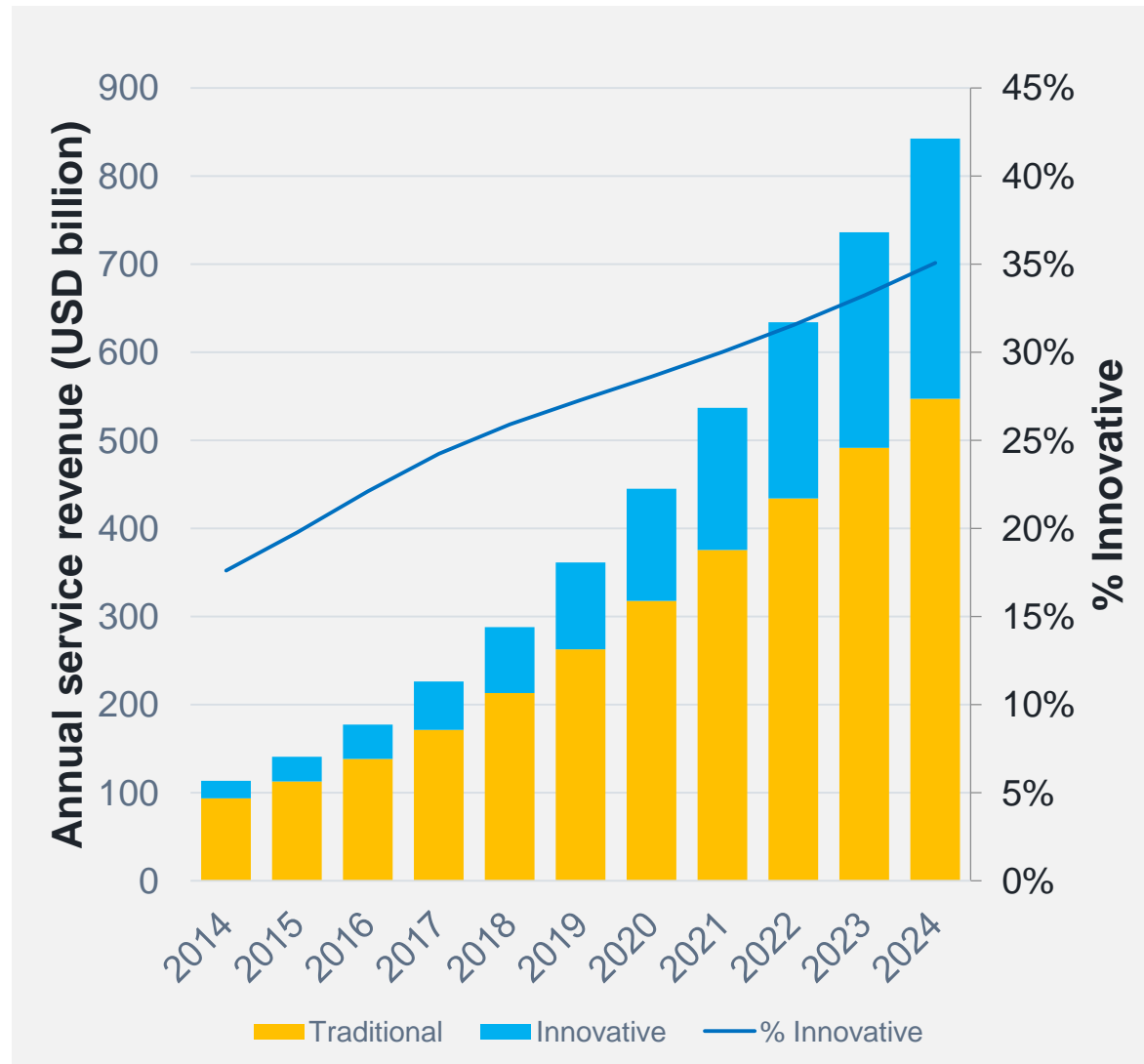- ■ Device

Source: Machina Research, 2015

> Platforms play an increasing part in IoT services

> Applications have the strongest revenue growth

 < 15 >

Business Model Complexity

Complex business models on the rise

Typical Smart Pricing Use Cases

Promote, empower, upsell, educate

Promotions based on insight

› collected by the apps residing on the phone

› collected by network components – chg, DPI, lightweight DPI, VAS, etc

Promotions triggered by the app or by network components

Promotions considering

› RT trigger info and customer context

› Customer profile data

› Aggregated customer data

› Available product, packages, offers

Examples

› Usage level based promotions (thresholds reached, recurring over- or under usage)
› Promotions based on action in self care app (interest in certain type of information / products)
› Promotions based on used apps / content
› Network / WiFi status / Location / roaming based promotions
› QoS based promotions
› Promotions for product / packs in case of unsuccessful service usage (missing options in plan etc)
› Promotions for higher plans based on usage
› Promotions based on option / product / service/ contract expiry