

MVNO Performance

Evolution, Business Models, and Optimization



“MVNO Performance” was delivered at a workshop during the [Annual MVNOs World Congress](#) in April 2017.

This presentation covers the history, evolution, and current developments of the MVNO market; MVNO objectives and strategy, and the implications for the MVNO model; and, MVNO business optimization, covering acquisition costs, ARPU, operational costs, churn, retention, and the customer lifetime value.

Agenda

- 1 Introduction
- 2 Evolution of MVNO
- 3 MVNO Business Model
- 4 MVNO Business Optimisation
- 5 Follow-Up

Cartesian is a specialist consulting firm in the telecoms, media and technology sector

Sector Focus

Specialists, not generalists

Experienced Team

Real-world understanding
of business and technology

Practical Thinking

Pragmatic approach
and clear results

Complementary

Broad set of skills and
capabilities to assist

Our services help clients think, plan and operate faster and smarter

Insight & Advice

Better understand critical business factors and make informed decisions

Management & Expertise

Assure the successful delivery of complex, high-profile change initiatives

Solutions & Technology

Improve effectiveness with smart technology and our expert team

We have experience from over 50 MVNO projects across the US, Europe, Middle East and Asia

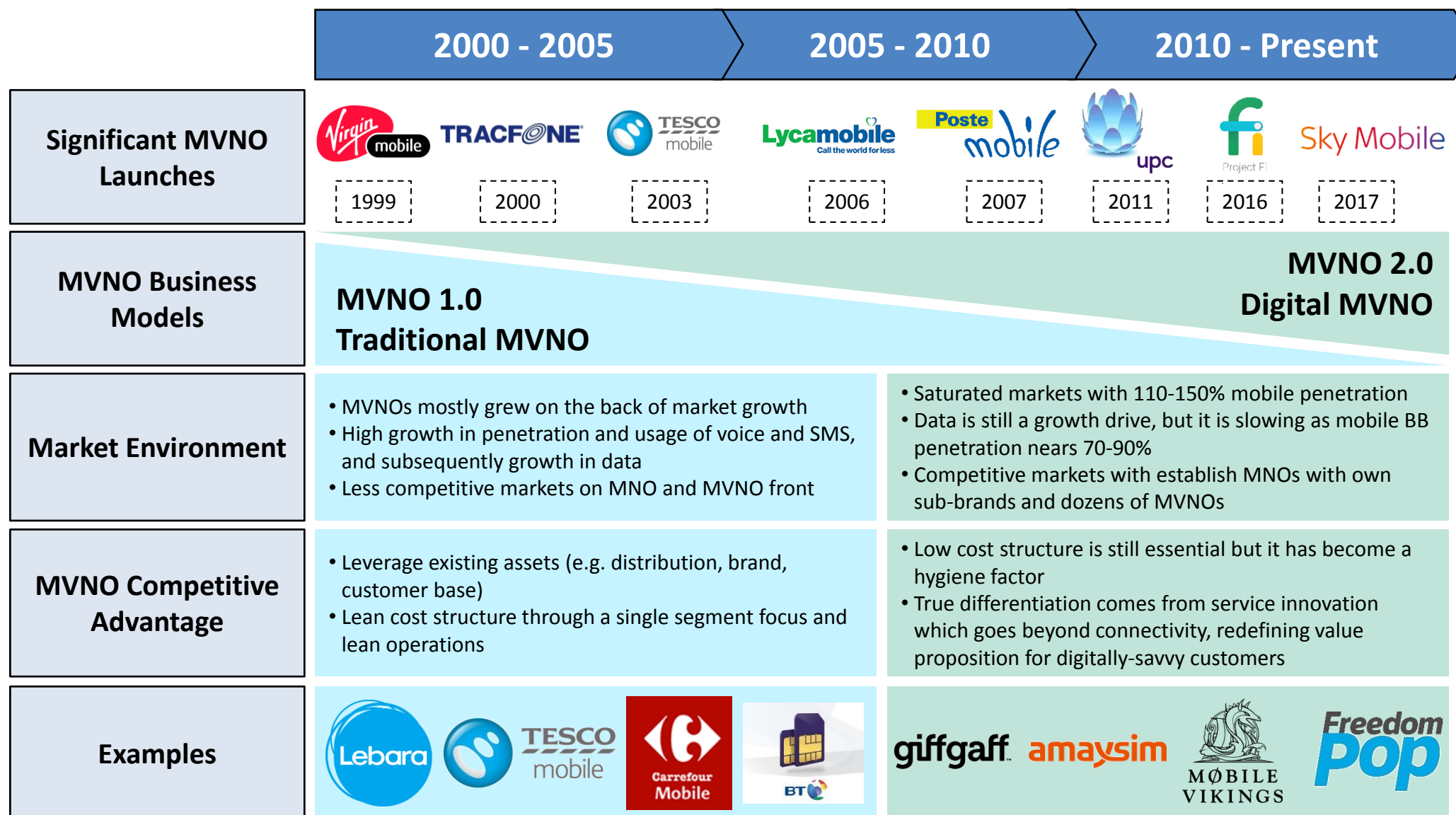
| | |
|-------------------|---|
| MVNOs | <ul style="list-style-type: none"> • Strategy and business case support including detailed cost and revenue modelling • Negotiation support for contracts and commercial terms • Securing funding • Vendor evaluation and selection (e.g. MVNE, content, etc.) • OSS, BSS and network planning and design • PMO and launch support (e.g. proposition development, distribution, platform deployment) |
| MNOs | <ul style="list-style-type: none"> • MVNO and sub-branding strategy including scenario analysis • Cost modelling to determine wholesale pricing • Identification and recruitment of wholesale / MVNO partners • Contractual negotiations with MNOs and vendors • Development of optimal operational and technical architecture • End to end processes / architecture development • Vendor short-list, assessment and selection |
| Regulators | <ul style="list-style-type: none"> • Assessment of MVNO policy, regulation and market impact • International regulatory benchmarking and support with preparation of NRA's regulatory licensing framework • Preparing the MVNO business case, drivers and alternative operational and commercial models • Detailed cost and revenue modelling to calculate MVNO / wholesale commercial terms |



Agenda

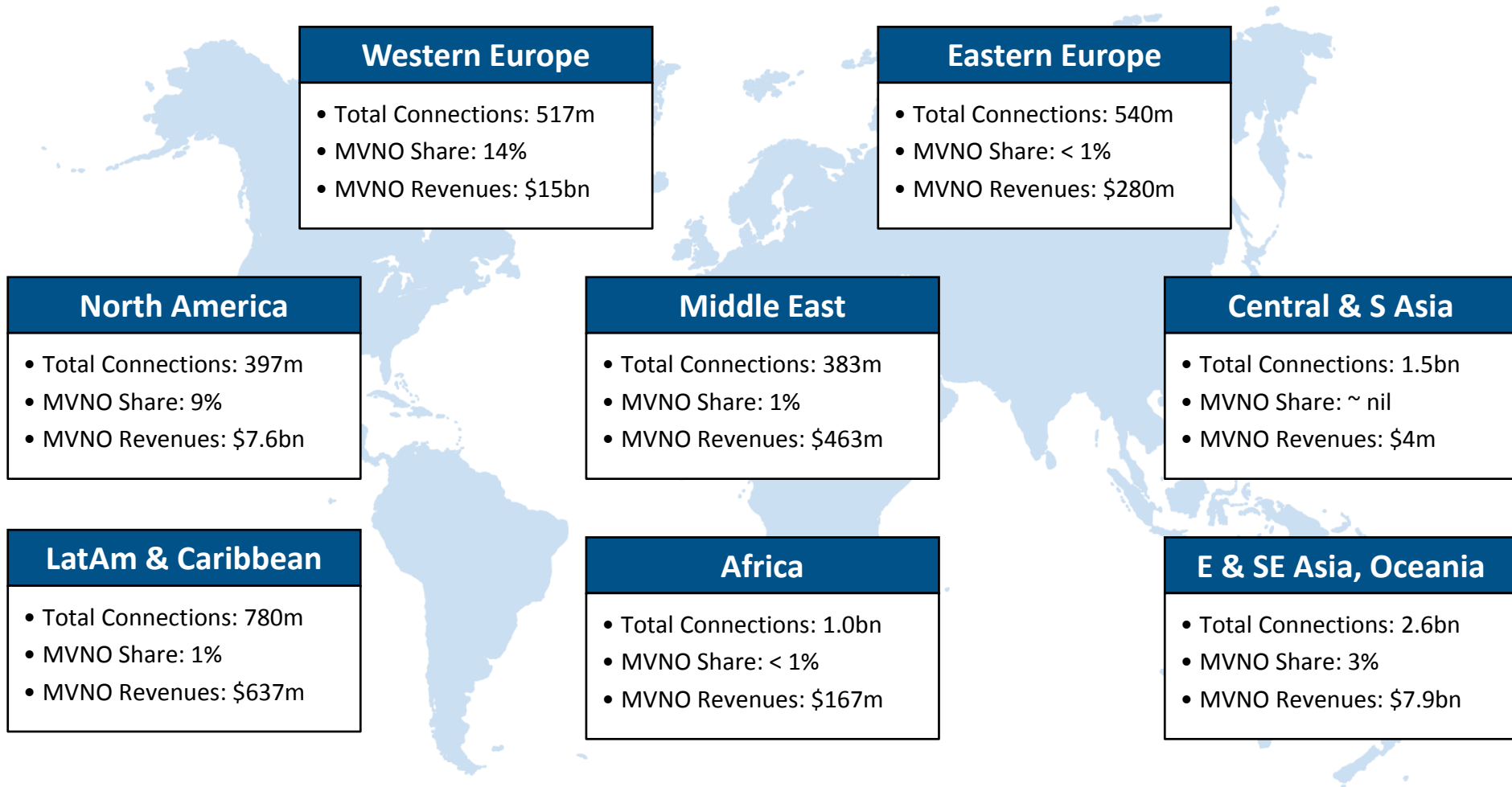
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The MVNO has evolved significantly over the past 17 years



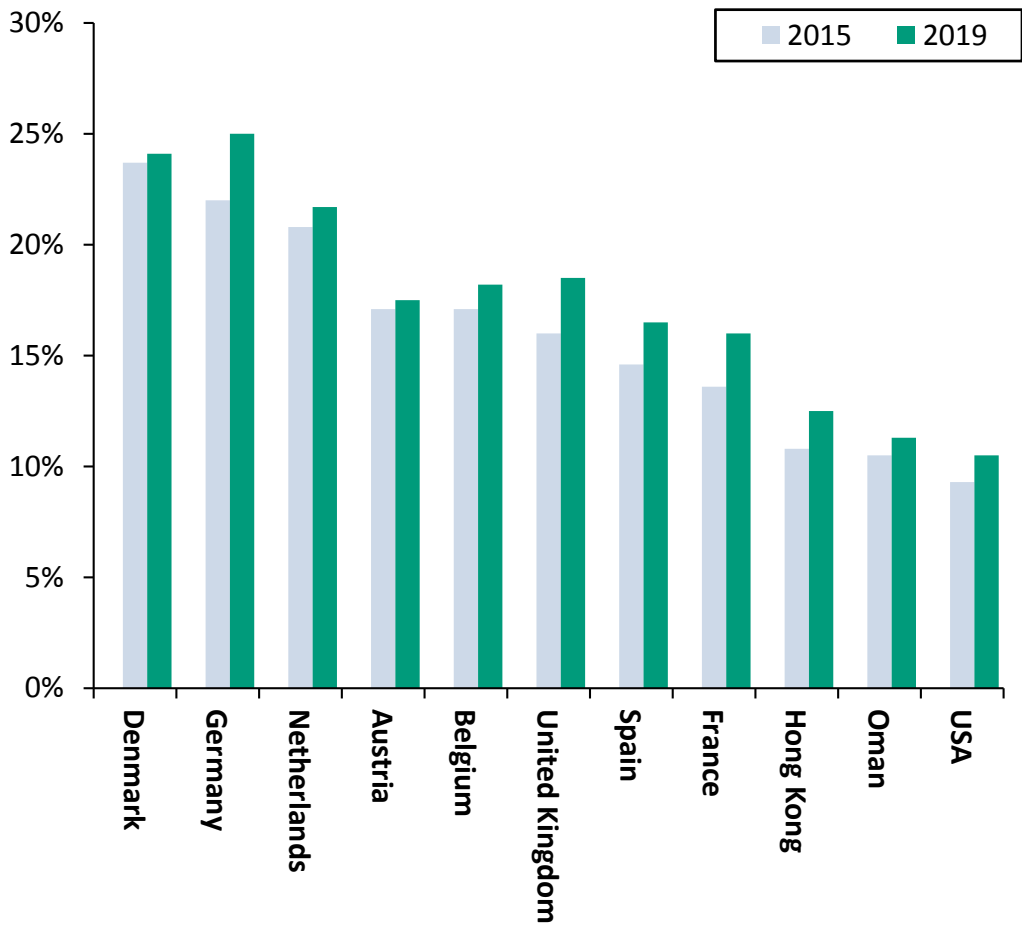
MVNO is a \$32bn global market; MVNO share (of connections) varies dramatically by region with Western Europe and North America showing greatest success to date

MVNO Share of Total Connections and Revenues (2016)

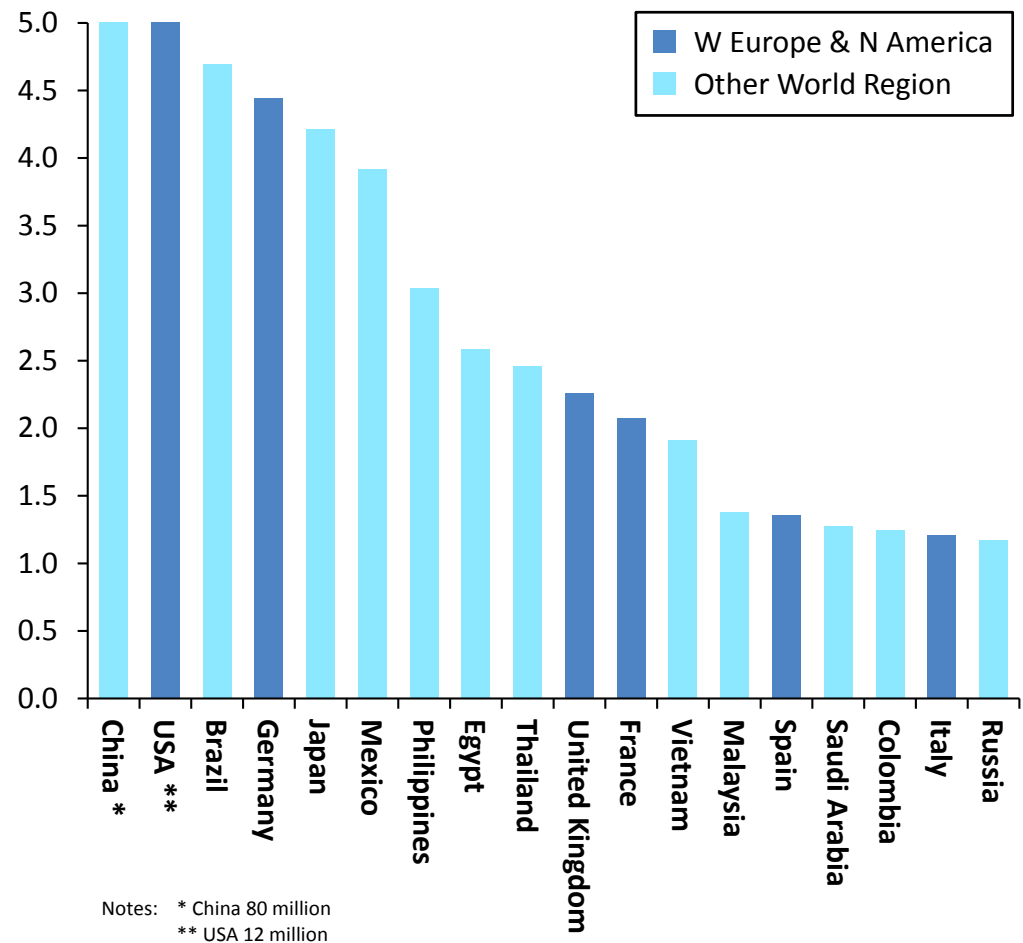


Western Europe and North America account for almost all double-digit MVNO penetration; however most of the large MVNO growth markets lie in other regions

Markets with MVNO Share above 10% (2015, 2019)



Top MVNO Growth Markets (Millions, 2015 to 2019)



While MVNO entry into new markets is being supported by national regulatory authorities, regulators in mature markets are scaling back regulations as MVNOs become more established and competitive with MNOs

Developing



Iran



19 Mobile Virtual Network Operators to Launch in Iran
By **Alireza Jozi** - Jul 18, 2016
Regulations are in place and 19 Iranian companies have passed the criteria check to be granted an MVNO (Mobile Virtual Network Operator) **license**.



India



GADGETS | REVIEW | PHOTOS | VIDEOS | MOBILE & TABS

MVNO Licencing: Virtually endless possibilities for telecom services

The MVNO regime is expected to bring out endless possibilities of services that could be offered.
Written by **Pranav Mukul** | Published: April 13, 2016 2:43 am



Czech Republic



Czech regulator calls for cut in wholesale prices for MVNOs
February 15, 2016

Developed



Spain



Spain's CNMC proposes deregulation of MVNO market
Monday 4 July 2016

Even in mature markets established brands are still coming to market

FierceWireless

With Sprint and T-Mobile, Google opens Project Fi MVNO to all U.S. users

by Colin Gibbs | Mar 8, 2016 10:56am

THE VERGE

Comcast confirms plans to launch mobile phone service in 2017

It will run on Verizon airwaves and also lean on Wi-Fi

by Chris Welch | Sep 20, 2016, 9:27am EDT

PR Newswire a CISION company

China Unicom Global Launches "CUniq" MVNO Business in America

Mar 04, 2017, 03:48 ET

FierceCable

Rutledge: Charter has asked Verizon to activate MVNO agreement

by Daniel Frankel | Sep 21, 2016 5:29pm



Sky launches UK MVNO on O2's network

06 January 2017 | James Pearce

Sky's new MVNO Sky Mobile has launched in the UK, offering data rollovers and synchronisation with the broadband provider's digital TV platform.



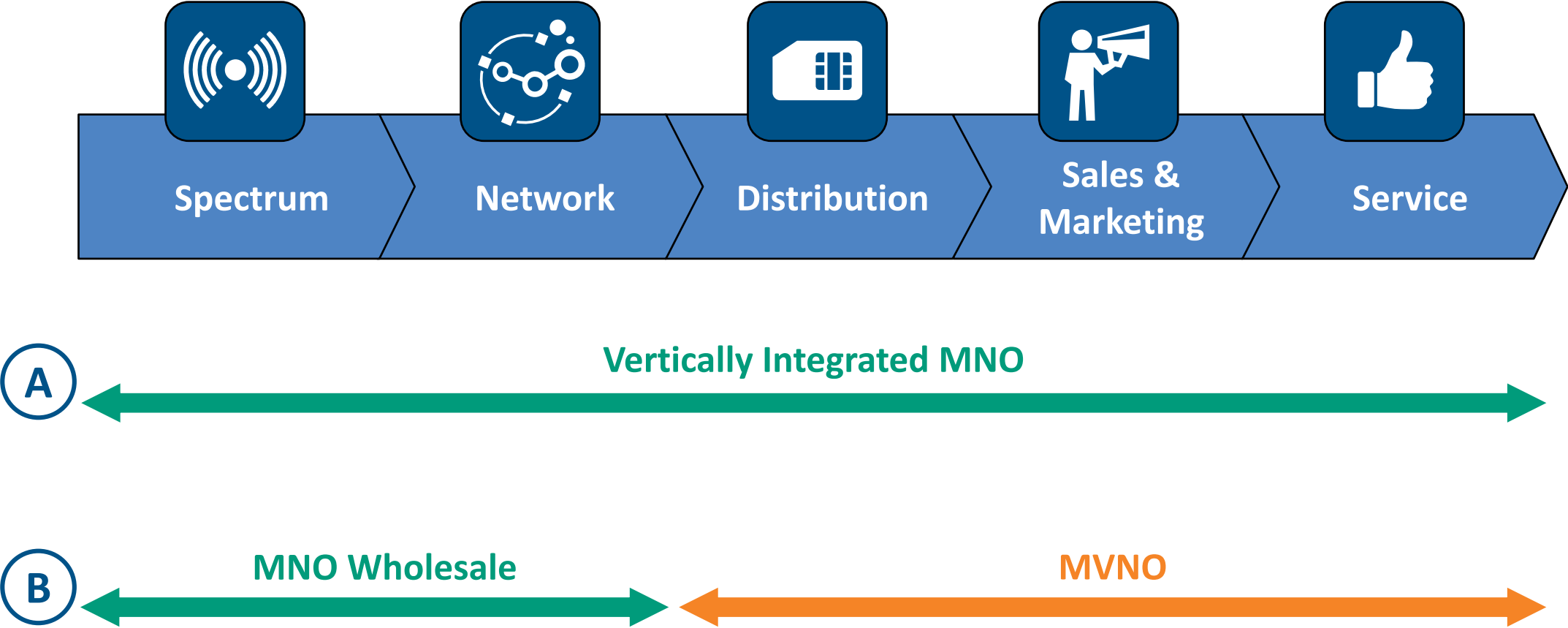
TIM 'to launch MVNO' to compete with Iliad Italy

14 November 2016

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MVNO 101: At its most basic, the MVNO business model enables firms to provide mobile services without owning a (expensive) mobile network

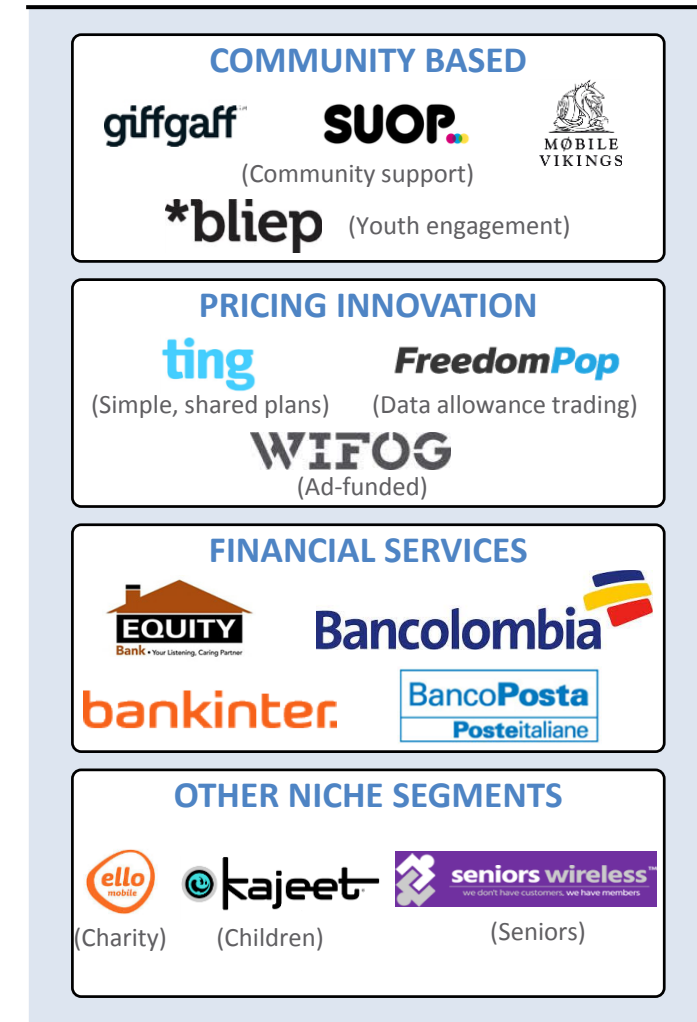


The MVNOs business model therefore allows them to specialise, target specific segments, and explore innovative new services

Established MVNO Segments

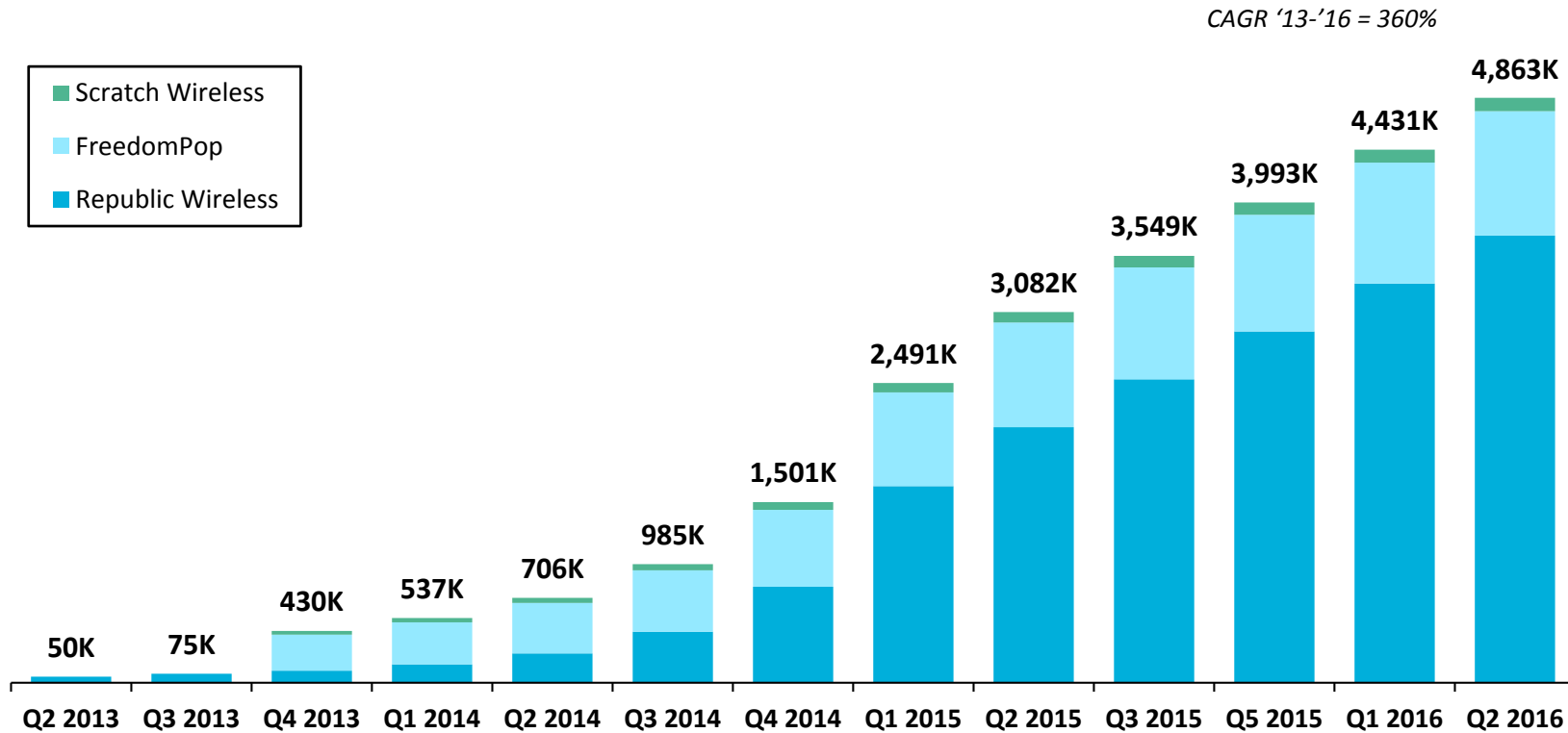


Innovation Examples



With subscriber totals approaching 5M, Wi-Fi based MVNOs are disrupting the U.S. wireless ecosystem

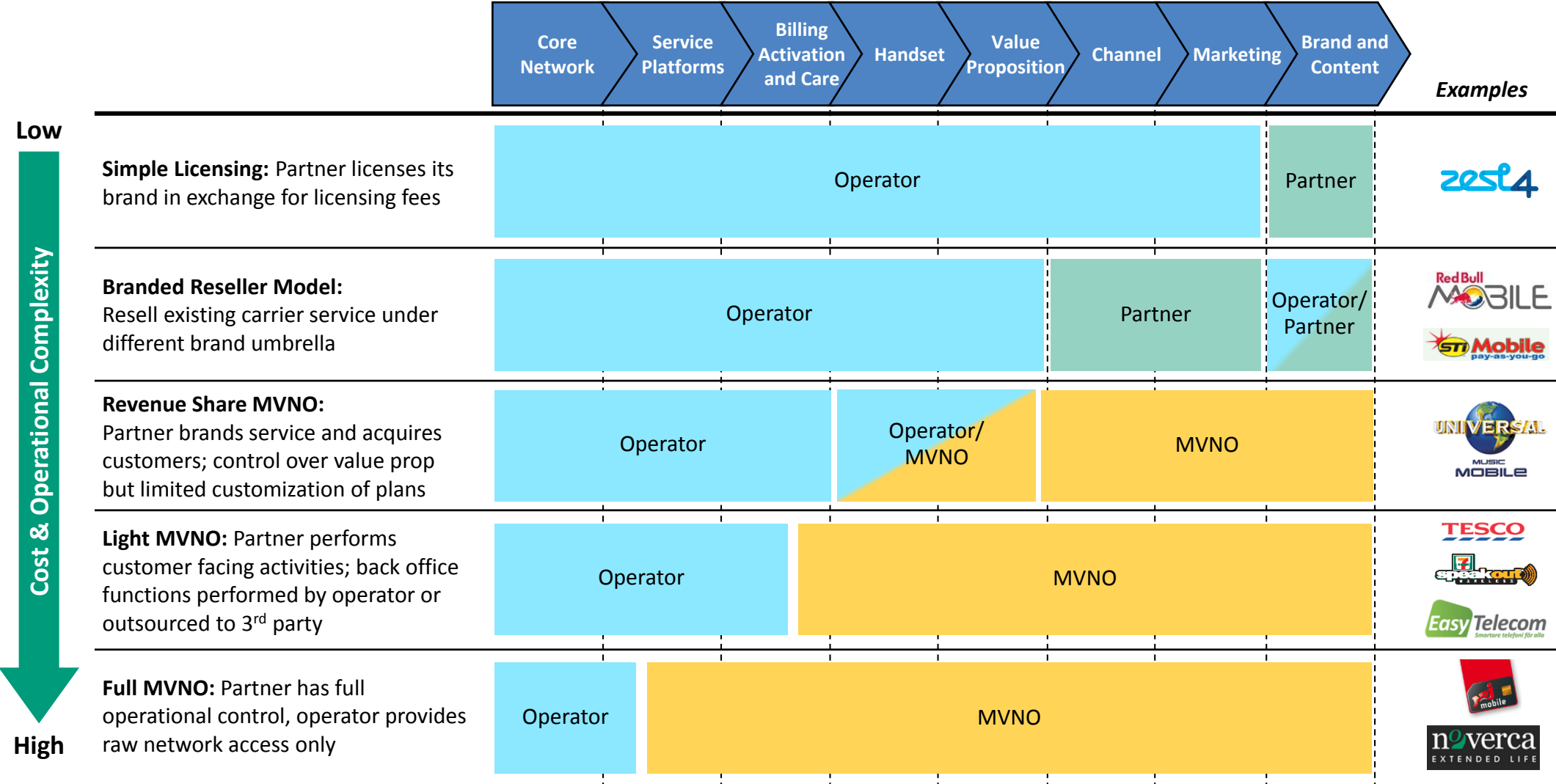
U.S. Top 3 Wi-Fi Based MVNO Wireless Subscribers (Q2'13 – Q2'16)



- Wi-Fi based MVNOs are competing with traditional carriers using competitive pricing models for data
 - Consequently, ARPUs are lower than the industry average
 - Republic Wireless' ARPU is \$17.60 compared to an industry average prepaid ARPU of \$33.40
- However, Wi-Fi based MVNO subscribers are not traditionally value-conscious consumers, but rather college educated, high income early tech adopters

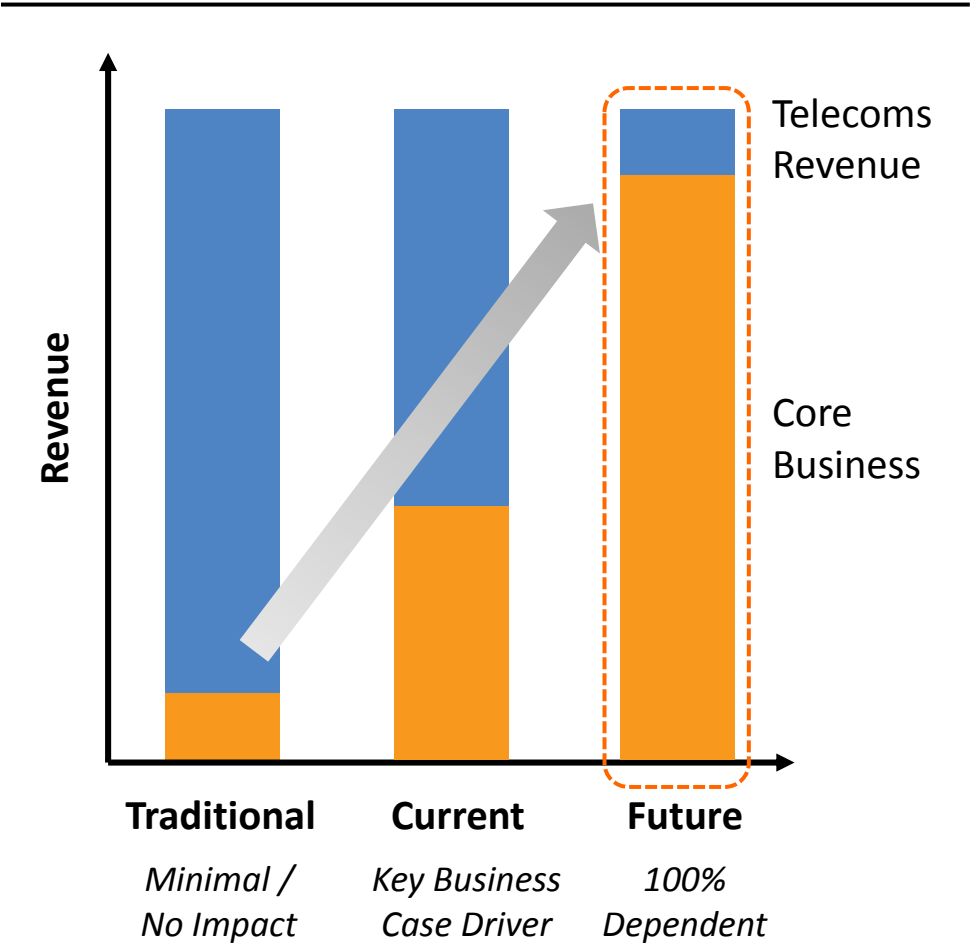
The re-launch of Google's Project Fi, which opens the service to all potential subscribers, should further drive the momentum behind Wi-Fi based MVNOs in the U.S.

Over time, several variations on the MVNO model have emerged to meet the needs of firms seeking greater/lesser operational involvement and independence for service design

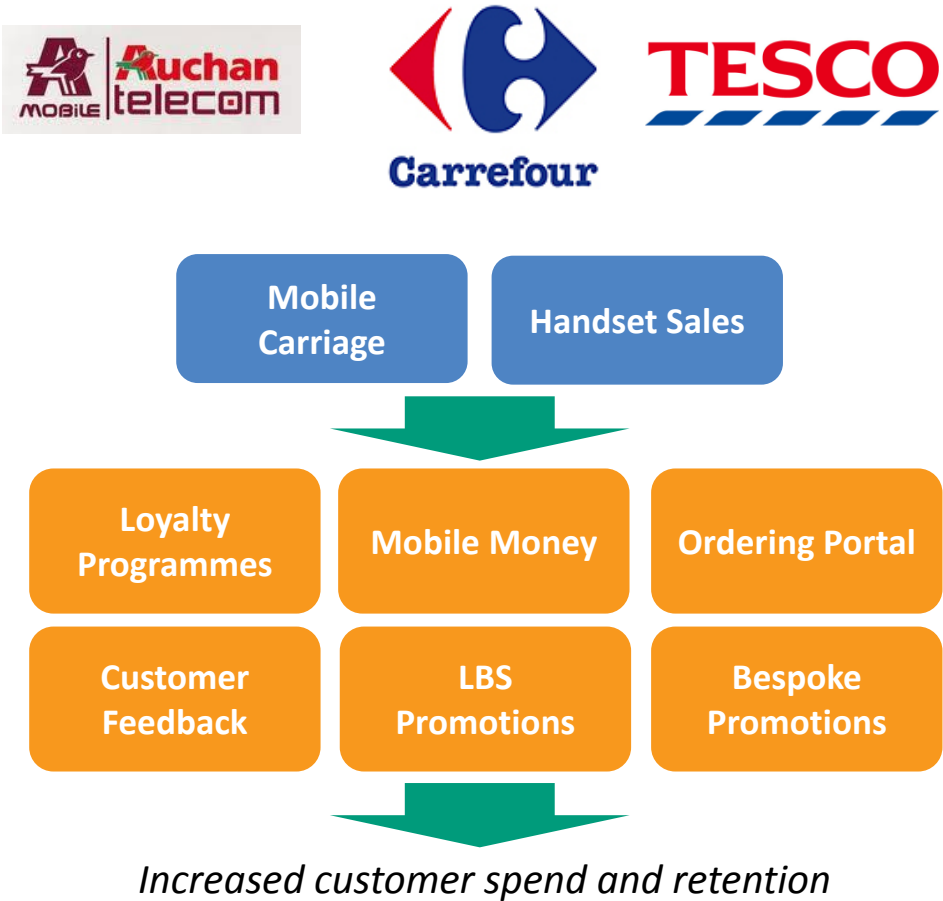


MVNO provides a low-cost entry option for existing brands to launch mobile services as a means to drive revenue to both the core and mobile businesses

Relative Revenue Focus



Retail Examples



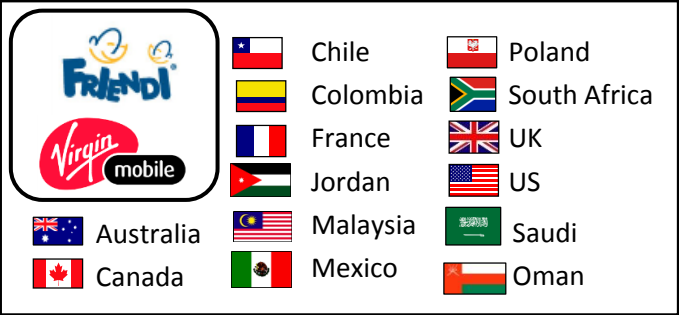
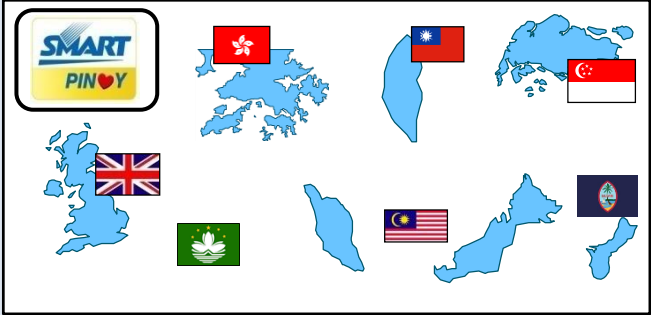
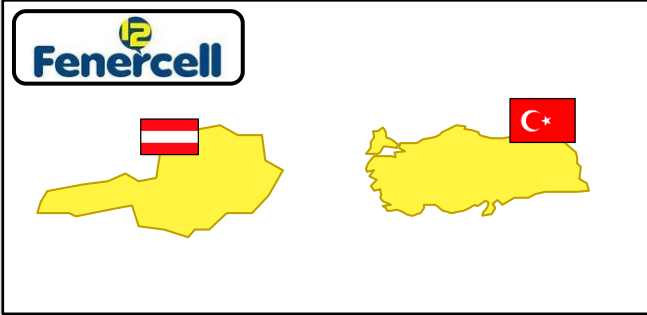
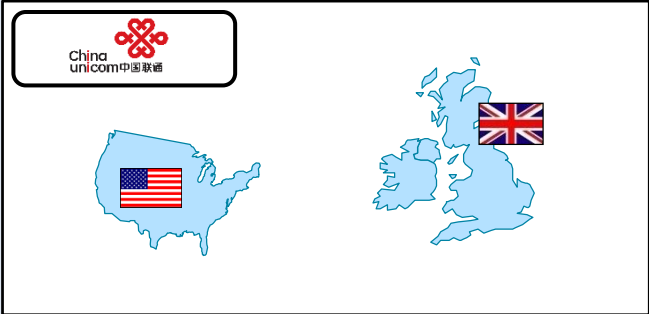
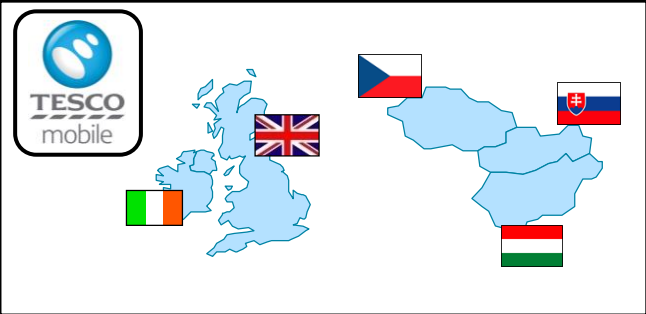
MNOs have launched services as MVNOs, either to target a specific segment with a sub-brand or as a means of international expansion (e.g. to serve ex-pats)

Ethnic Japanese Example (USA)

| Segment | Operator | MVNO Brand | Year |
|------------------|--|--|--------------------------|
| No-Frills |  France |  Spain | 2012 (acquired from KPN) |
| Youth |  Spain |  Mexico, Peru, Ecuador | 2014, 2015 |
| Business |  Taiwan |  US | 2012 |
| Ethnic and Expat |  China |  UK, France | 2012, 2013 |
| |  Japan |  US | 2011 |
| |  Indonesia |  Hong Kong | 2010 |
| |  Philippines |  ~6 countries | 2008-13 |
| |  Netherlands |  Belgium, Germany | 2005 – 2006 |
| |  China |  Americas, UK | 2016 |
| | | | |



Some MVNOs have chosen to expand internationally – typically these have internationally recognized brands, or internationally-oriented services



^ Tata announced it plans to discontinue its alliance with Virgin India

* FRIENDi is now Virgin Mobile MEA but retains the FRIENDi branding in its Middle Eastern markets

Source: Cartesian, press releases, company documents

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4 MVNO Business Optimisation

- ① CLV Definition
- ② Protecting and Growing ARPU
- ③ Reducing CCPU
- ④ Extending the Customer Lifetime
- ⑤ Minimising Acquisition Costs

Customer Lifetime Value (CLV) is a useful metric for communications service providers (CSPs) to understand, providing a basis for maximizing customer base value

What Is Customer Lifetime Value (CLV)?

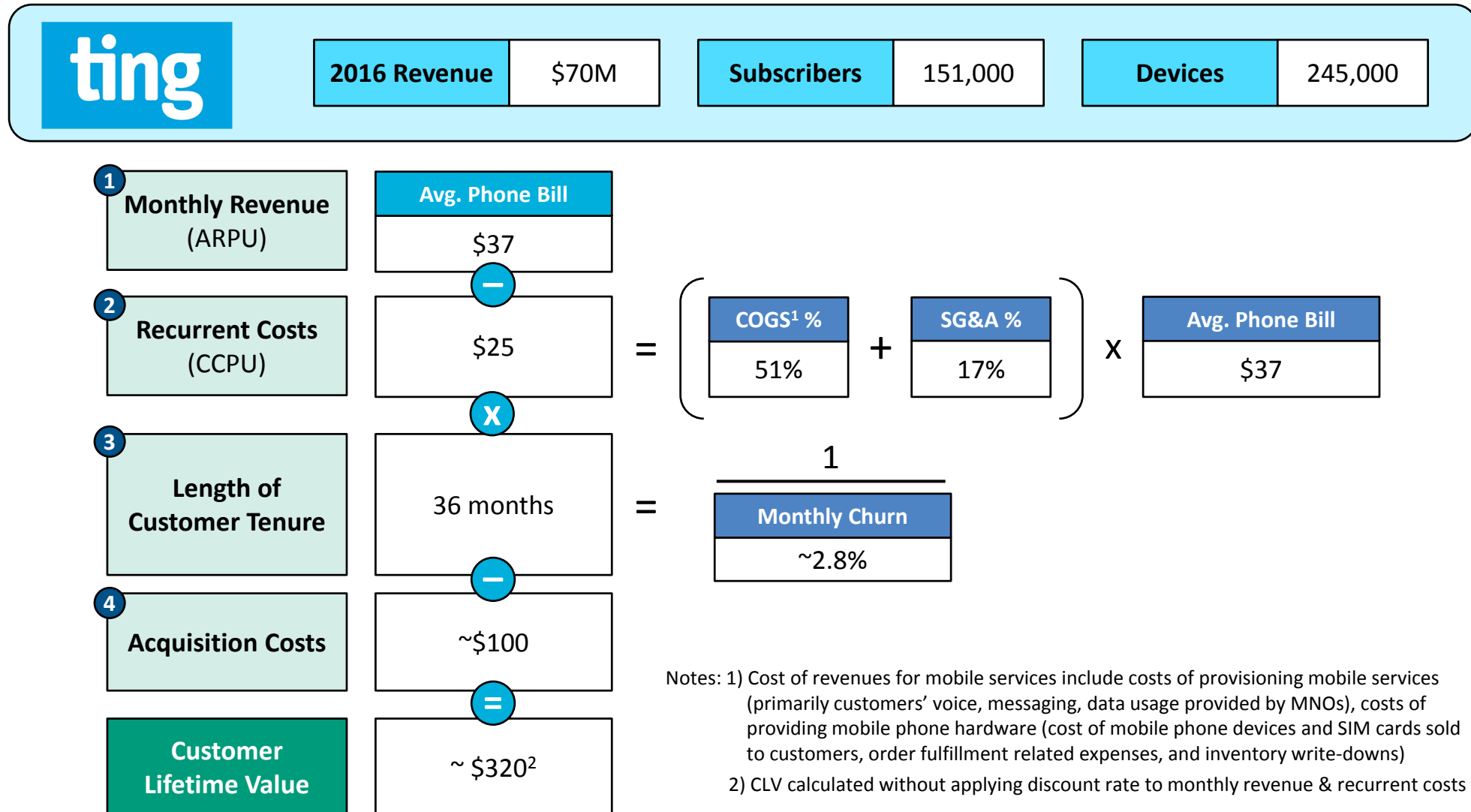
- **CLV is the present value of a customer:** For an individual customer, Customer Lifetime Value (CLV) is the total benefit derived by the business from their relationship with that customer
- **CLV optimization aligns business strategy and processes with financial outcomes:** Optimization of CLV is a primary aim for CSPs, as it results in the most profitable outcome possible

CLV can be used to shape both strategic and tactical initiatives that enable firms to better understand and manage customers

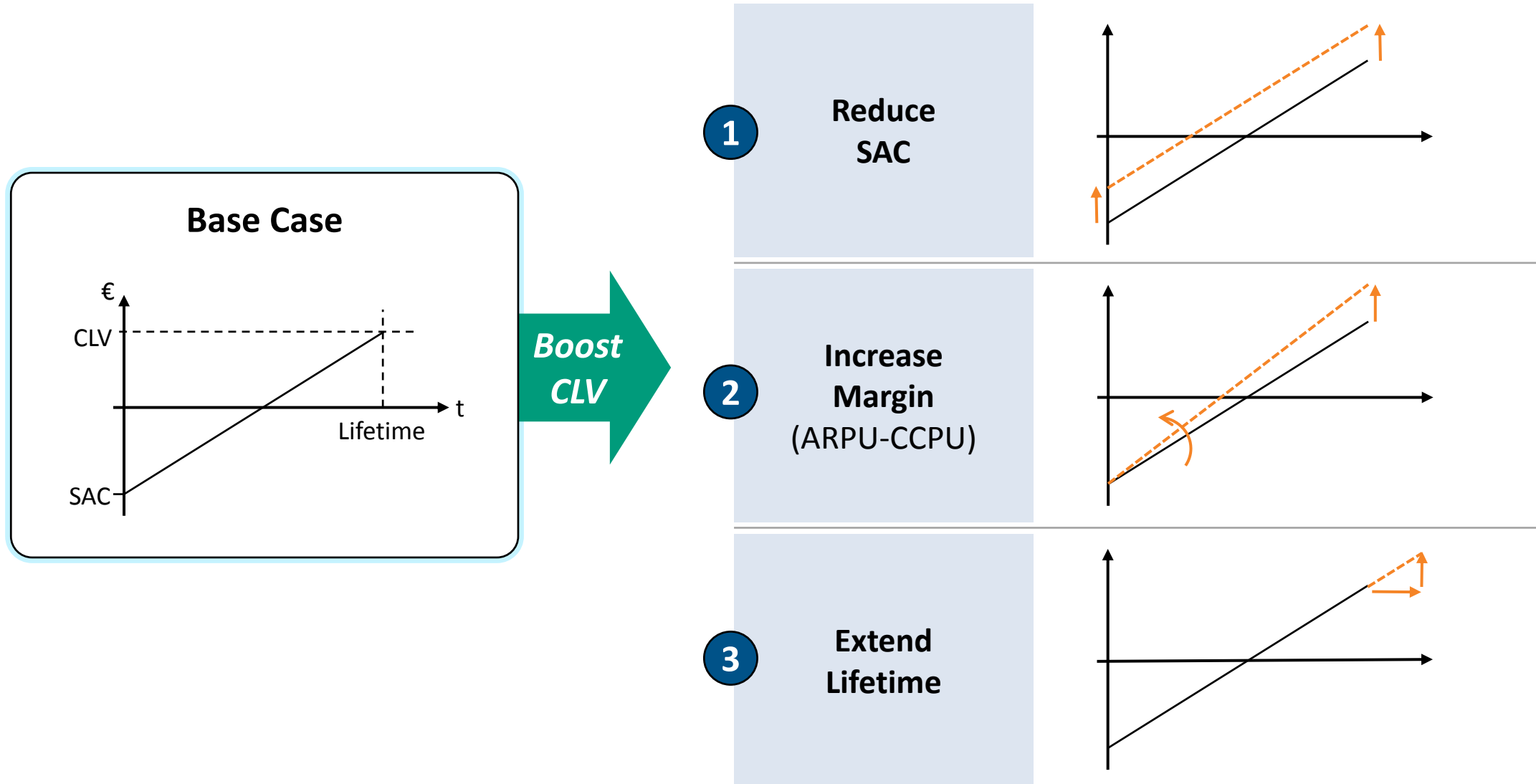
Components of CLV

| | | |
|---|---------------------------|--|
| 1 | Monthly Revenue (ARPU) | All recurrent revenue per user discounted to its present value |
| | − | |
| 2 | Recurrent Costs (CCPU) | All recurrent costs incurred to serve a customer |
| | X | |
| 3 | Length of Customer Tenure | Estimated duration of the customer relationship |
| | − | |
| 4 | Acquisition Costs | One-time costs required upfront to sign a new customer |
| | = | |
| | Customer Lifetime Value | Expected net profit for customer, based on net present value (NPV) of projected cash flows |

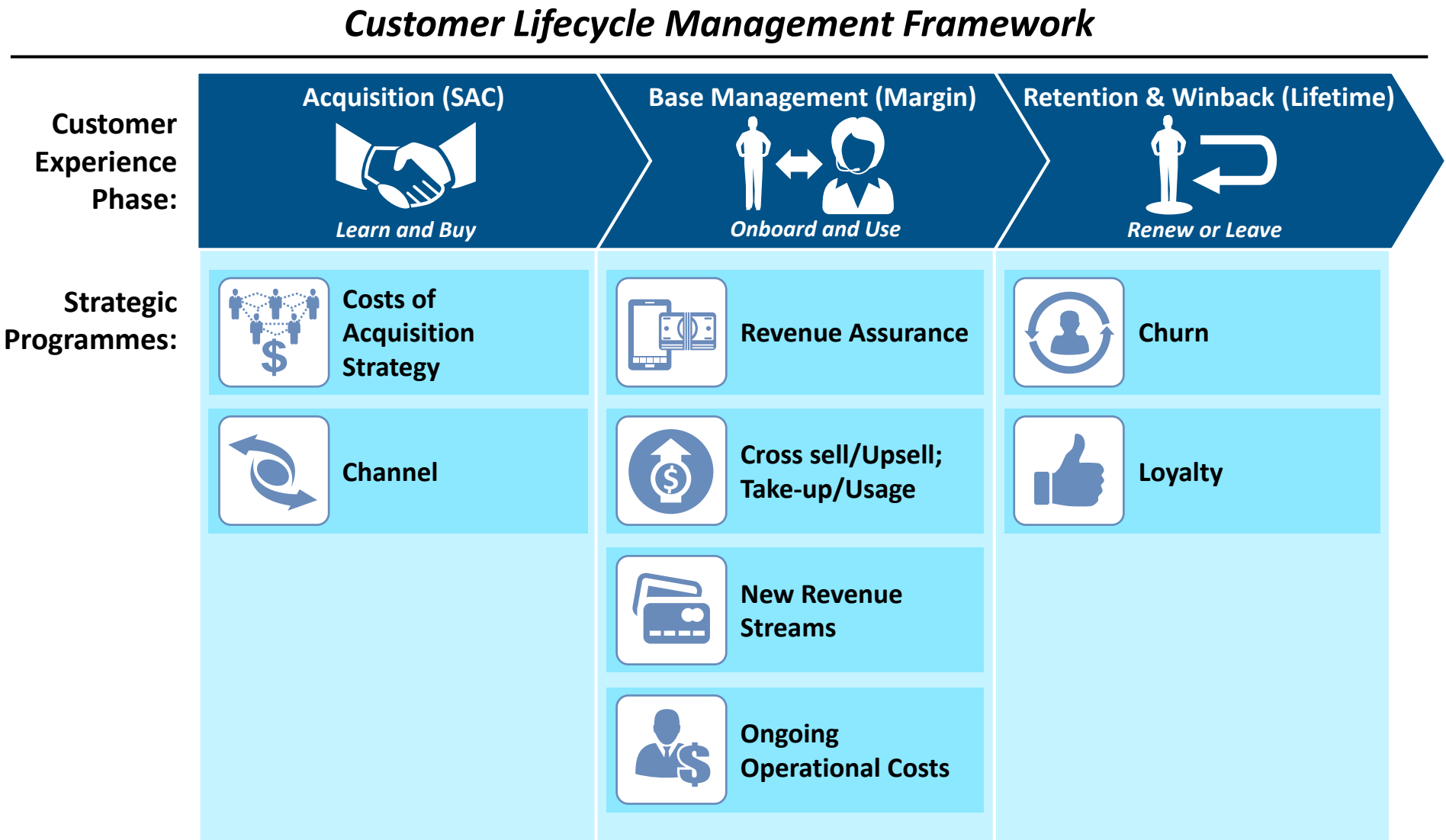
An illustrative CLV calculation for Ting Mobile finds that, with an average monthly phone bill of \$37 and monthly churn of around 3%, CLV comes to around \$320



CLV can be improved through one of three key drivers: reduce SAC, improve margin per subscriber and/or extend lifetime



The three CLV drivers can be mapped to major phases of the customer lifecycle

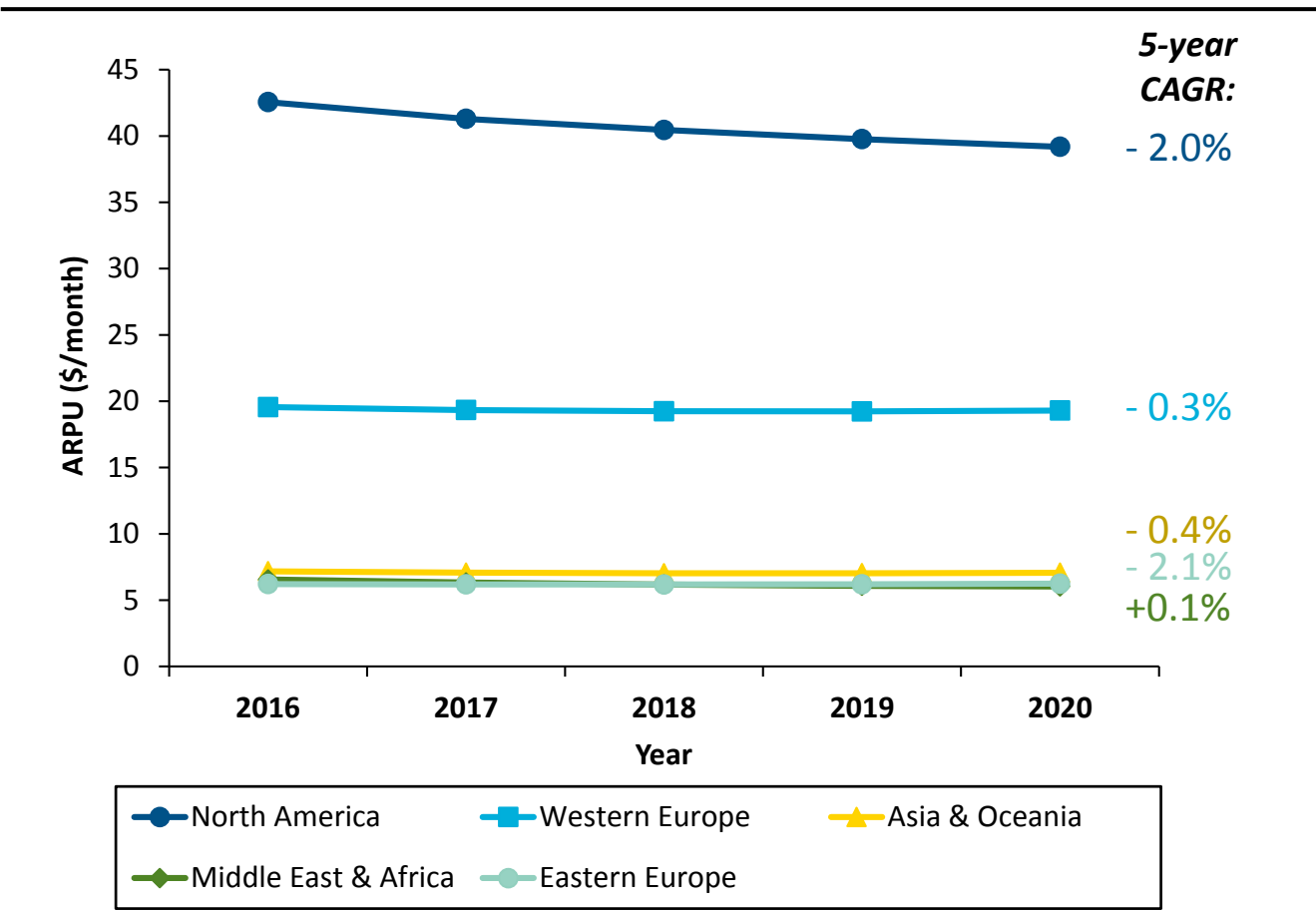


④ MVNO Business Optimisation

- ① CLV Definition
- ② Protecting and Growing ARPU
- ③ Reducing CCPU
- ④ Extending the Customer Lifetime
- ⑤ Minimising Acquisition Costs

At a macro level, mobile ARPU is forecast to remain flat or decline over the next few years, due to high competition and changes to pricing strategies

Forecast of Mobile ARPU by Region (\$/Month)

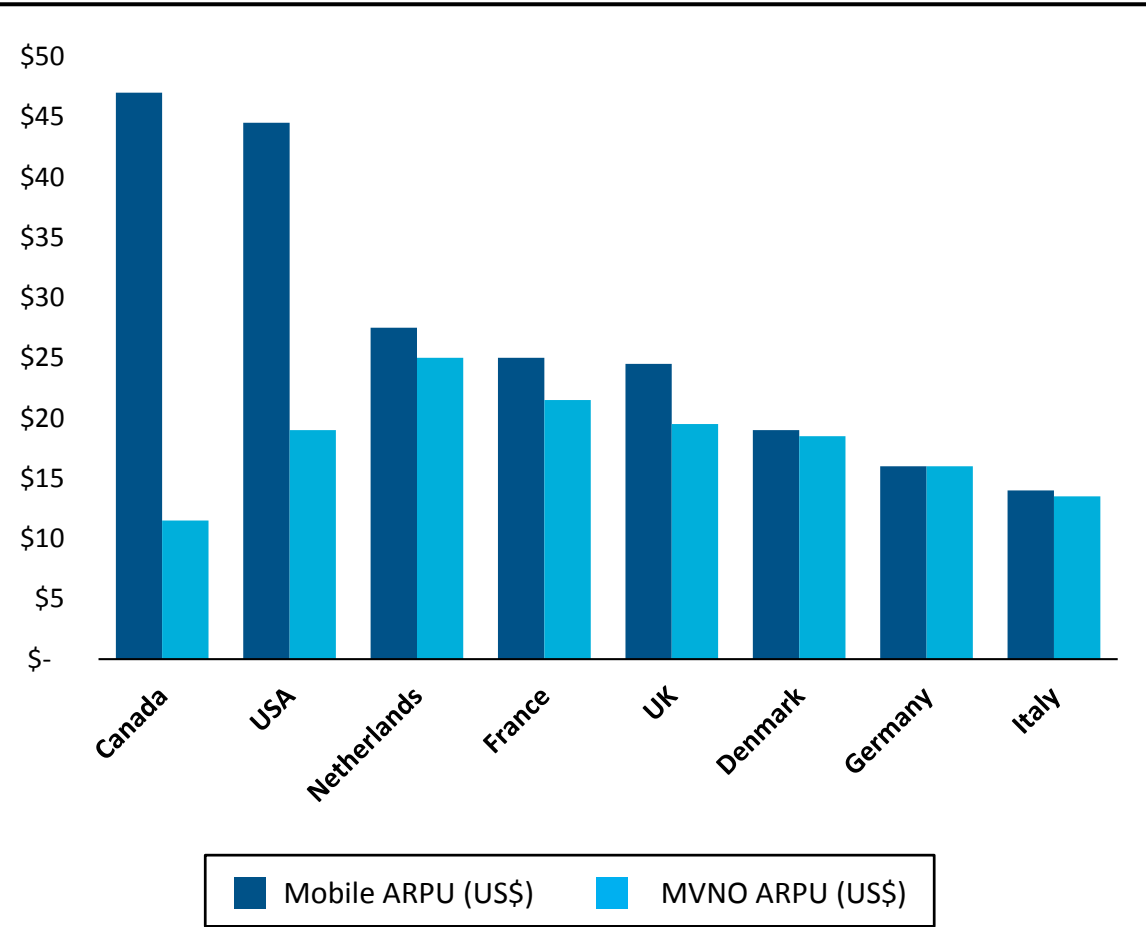


Drivers for Decreasing ARPU

- Traditional competition from MNOs and MVNOs
- Competition from OTTs (e.g. WhatsApp)
- Shift to “all you can eat” plans
- Multi-SIM adoption (in selected markets)

ARPU for MVNOs are typically below market-average; this reflects their “challenger” status, bias towards pre-pay and – for some – a focus on the value end of the market

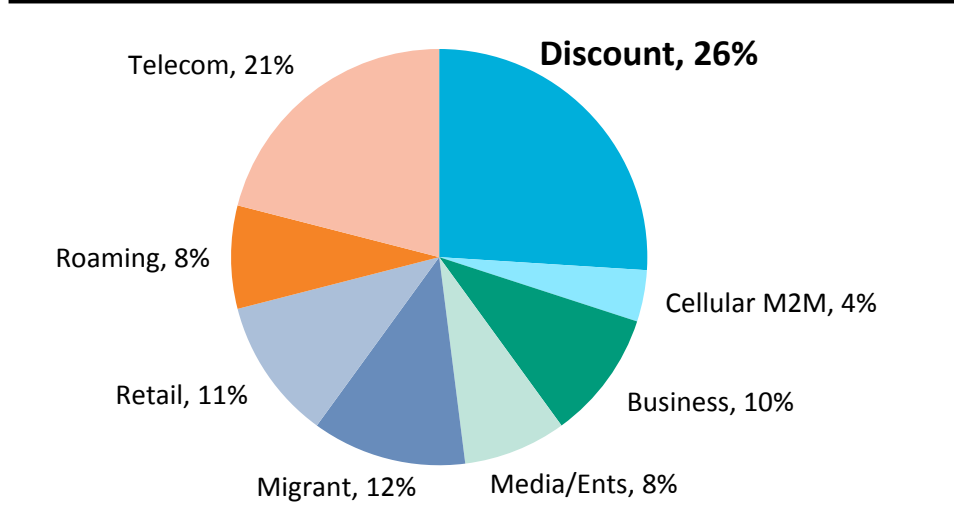
Comparison of MVNO and Market ARPU (\$/month)



Pre-Paid Market Characteristics:

- ARPU can be ~60-70% lower than post-pay
- Subscribers on average are less credit-worthy
- Churn rates high vs. post-pay, driven by:
 - Lack of contract lock-in
 - Ease of switching
 - Low credit scores of subscribers

MVNO Focus by Segment



Illustrative MVNO Offers (Germany, 2016)



ALL-ON L
Surfen und mal telefonieren

1 GB Flat
mit 21,6 Mbit/s Highspeed Internet

200 Min./SMS
in alle deutschen Netze

Jetzt 3 Monate gratis

11
90 Euro/Monat
MEHR INFOS >

ALL-ON XL
Surfen und telefonieren

1 GB Flat
mit 21,6 Mbit/s Highspeed Internet

400 Min./SMS
in alle deutschen Netze

Jetzt 3 Monate gratis

15
90 Euro/Monat
MEHR INFOS >





NEU!

SO VIEL DU
TELEFONIEREN

SURFEN
WILLST + 300 MIN
NUR 19,95 € PRO MONAT

IM TARIFFPAKET INKLUSIVE
NAPSTER MUSIC FLAT,
INTERNET FLAT, 300 MINUTEN IN ALLE NETZE

NUR

19,95 € MTL¹

HOL'S DIR >

| Product | Revenue |
|----------------|---------|
| Simyo XL | €13.36 |
| MTV Plan | €16.76 |
| Market Average | €14.30 |

Notes:

- Revenues exclude VAT at 19%
- Comparison only considers headline rates
- Addition revenues, e.g. from overage and VAS not counted

Source: Operator websites, Ovum, Cartesian

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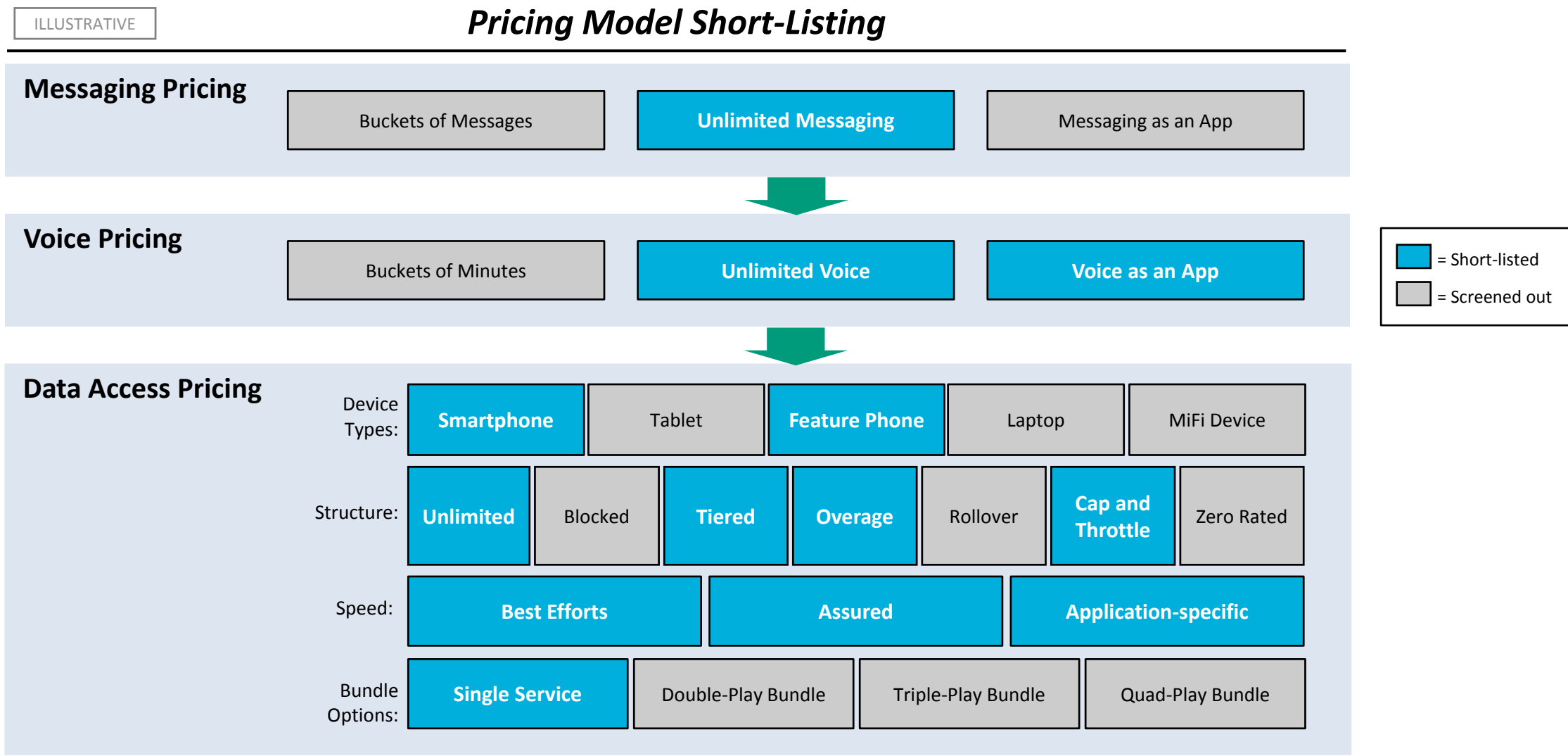
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Example Pricing Plan Considerations

| Strategic Goals | Financial Goals | Customer Perception | Ability to Execute |
|---|---|---|--|
|  |  |  |  |
| <ul style="list-style-type: none"> • Differentiation from competitors • Maintain leadership position, on cost or quality axis • Promote adoption of new services • Maintain quality/user experience • Incent use vs. OTT services • ... | <ul style="list-style-type: none"> • Revenue targets • Subscriber targets • Market share gains • Profit maximization • Margin preservation and/or growth • “Disincentives” to X% of base • Enables serving all or x% of subs profitably • ... | <ul style="list-style-type: none"> • Rapid adoption • Value • Fairness • Simplicity • Choice • Flexibility • Creativity • Complexity • ... | <ul style="list-style-type: none"> • Easy to explain and market • Easy to support • Easy to migrate from legacy technology • Addressable within current network and/or IT roadmap • Billing/rating requirements and timelines to execute • ... |

There are many potential price structures to consider; working through these in a structured fashion enables the operator to exclude options that don't align with the goals



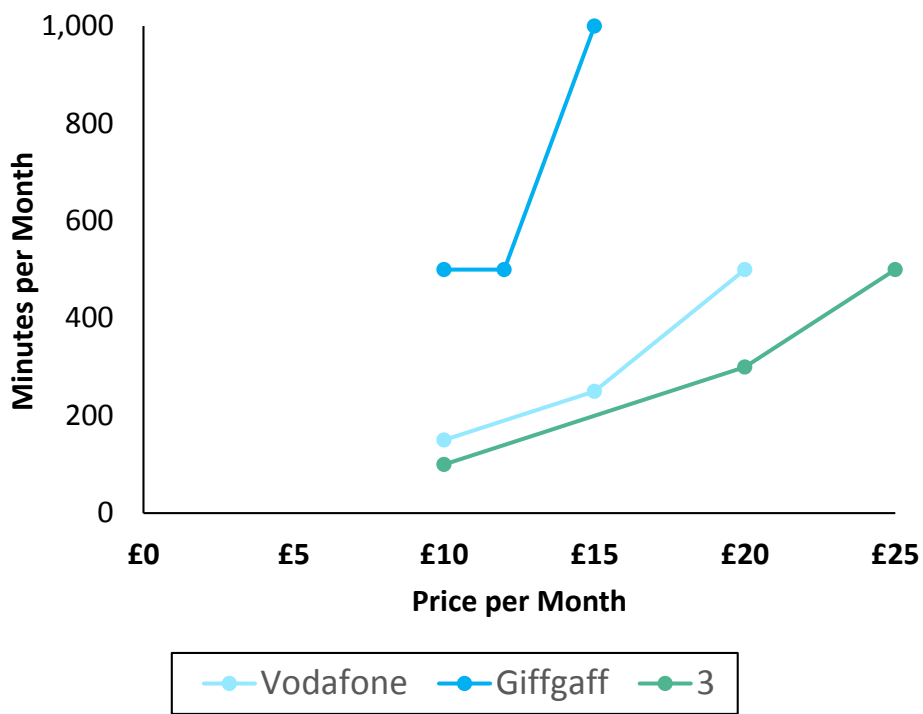
The use of time-limited bundles is a common pricing tool in pre-pay services to incentivize regular top-ups; larger bundles offer greater value with some expectation of breakage

Illustrative Pre-Pay Bundles (UK, 2016)

| Operator | Voice | SMS | Data | Price |
|----------|------------|-----------|-----------|-------|
| Vodafone | 150 mins | Unlimited | 500 MB | £10 |
| | 250 mins | Unlimited | 1 GB | £15 |
| | 500 mins | Unlimited | 2 GB | £20 |
| Giffgaff | 500 mins | Unlimited | 1 GB | £10 |
| | 500 mins | Unlimited | 2 GB | £12 |
| | 1,000 mins | Unlimited | 4 GB | £15 |
| 3 | 100 | 3,000 | 1 GB | £10 |
| | 300 | 3,000 | 12 GB | £20 |
| | 500 | 3,000 | Unlimited | £25 |



Bundled Minutes vs. Price (UK, 2016)



NB. Providing large, discounted bundles is challenging for MVNOs with a variable cost structure

| Illustrative Bundle Profitability Calculation | | | | |
|---|--------|--------|--------|-------|
| Retail price of voice bundle | 24.00 | | | |
| Number of minutes offered in bundle | 500 | | | |
| Wholesale rate | 0.0662 | | | |
| | | | | |
| Bundle utilisation | 40% | 60% | 80% | 100% |
| Minutes used | 200 | 300 | 400 | 500 |
| Wholesale cost | 13.248 | 19.872 | 26.496 | 33.12 |
| | | | | |
| Profit for voice per month per sub | 10.75 | 4.13 | -2.50 | -9.12 |



Implication

- When offering a bundle of minutes for a set price, utilisation of that bundle is the main driver of profitability
- Generally there are two ways to predict utilization:
 - Conduct a pilot and track usage
 - Get advice from tariff developers and experts

Ting and US Mobile allow customers to create their own bundle allowances to fit their budget



US MOBILE




CHOOSE YOUR PLAN OPTIONS

| | | | | | | |
|------|---------------------|---------------------|---------------------|----------------------|----------------------|----------------|
| TALK | 100 Mins \$3.00 | 250 Mins \$5.00 | 750 Mins \$8.00 | 1500 Mins \$10.00 | 5000 Mins \$15.00 | |
| TEXT | 100 Texts \$2.00 | 250 Texts \$3.00 | 500 Texts \$4.00 | 1000 Texts \$5.00 | Unlimited \$7.00 | |
| DATA | 100 MB \$2.00 | 250 MB \$5.00 | 500 MB \$9.00 | 1GB \$14.00 | 2.5GB \$20.00 | 6GB \$35.00 |

- US Mobile is a US MVNO that allows customers to **customise plans** according to their needs
- US Mobile **offers all university students a free SIM card** and partners with universities to provide SIM cards at student services offices
- Users can **change their plan at the beginning of every month**
- Offers a **30 day risk-free trial offer** for up to 100 voice minutes, 100 texts, or 100 MB or data usage

- Ting is a US MVNO, focusing on **transparent usage-based pricing**
 - Customers **create their own mobile plans** by choosing a combination of voice minutes, SMS and data usage
 - If usage exceeds expected level, the customer is charged at the next usage tier (which will have lower rates); **overage is not charged**
 - If usage does not meet expected usage tier, the customer is charged at lower usage tier and issued with credits
- Multiple users/devices on one plan




Why Ting Devices Plans Coverage Savings Calculator

Your Account

22 days until your next bill. [View](#)


Minutes XS S M L XL XXL



Current Usage 0 mins
Estimated 0 mins
Max 107 mins
Average 53 mins
Minimum 0 mins


[View Details](#)

Why would a service treat its best customers like criminals?



Current Usage 0 texts
Estimated 0 texts
Max 1 texts
Average 0 texts
Minimum 0 texts

[View Details](#)



Current Usage 3 MB
Estimated 0 MB
Max 1 MB
Average 1 MB
Minimum 0 MB

[View Details](#)

To gauge customer interest and price tolerance, various forms of primary research – from surveys to focus groups – can be used, either alone or in combination

Customer Research Options

| | Surveys | Interviews | Focus Groups |
|--------------------------|---|--|--|
| Purpose | <ul style="list-style-type: none"> Gauging customer interest in product Gauging willingness to pay Gauging customer awareness Segmenting customers Mass-market services | <ul style="list-style-type: none"> Discovering price levels for illiquid or non-transparent markets Holistic or forward-looking views on pricing | <ul style="list-style-type: none"> Customers' qualitative perceptions Allows for deeper interaction between purchaser and brand Understanding customer psychology around purchasing decisions |
| Options | <ul style="list-style-type: none"> Likert scale <ul style="list-style-type: none"> Defined responses: 5="Very likely," 4="Likely", etc. Price sensitivity measurement <ul style="list-style-type: none"> Open-ended responses used to determine price vs. quality perception Choice modelling & conjoint analysis <ul style="list-style-type: none"> Allows dynamic modelling of customers' willingness to pay across multiple dimensions | <ul style="list-style-type: none"> Subject matter expert interviews Buyer interviews Seller interviews | <ul style="list-style-type: none"> Single-moderator focus groups Double-moderator focus groups Online focus groups Client participant focus groups |
| Example Use Cases | <ul style="list-style-type: none"> New product categories New pricing structures | <ul style="list-style-type: none"> Enterprise services Wholesale services Channel insights | <ul style="list-style-type: none"> Brand perception Channel perceptions Emotional factors affecting purchases |

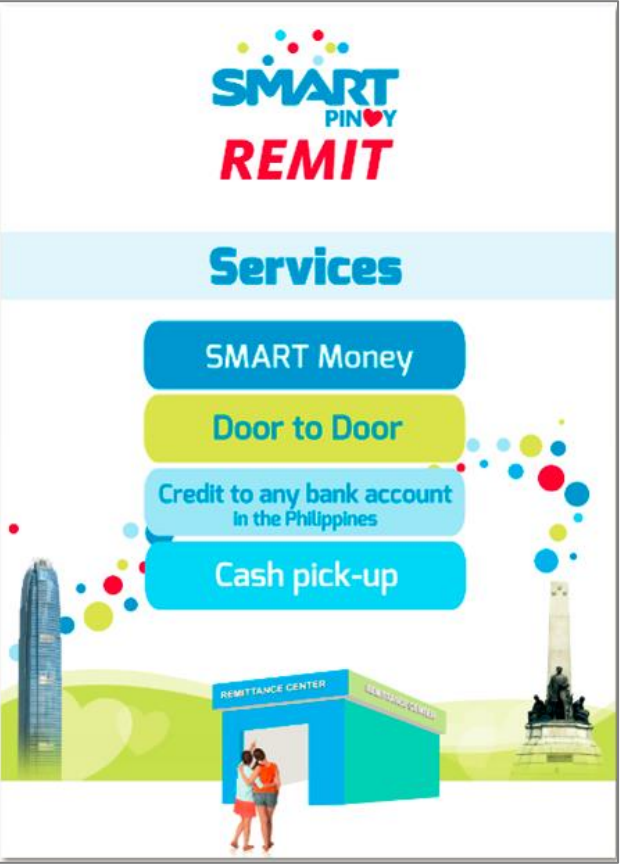
More Comprehensive

Most Quantitative

Most Qualitative

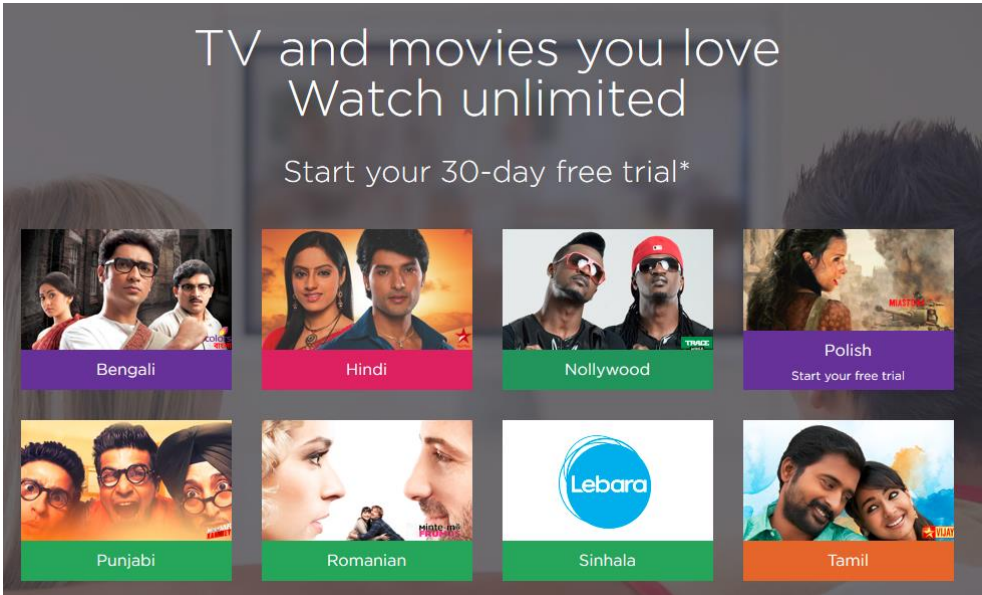
ARPU can also be increased through the cross-sell of additional services: in addition to traditional mobile VAS, some MVNOs have moved into financial and content services

Example: Smart Pinoy Remittance



- Smart Pinoy (PLDT) serves Filipinos overseas, many of whom send money back home
- Launched remittance services in 2006, with rates up to 65% less than traditional providers

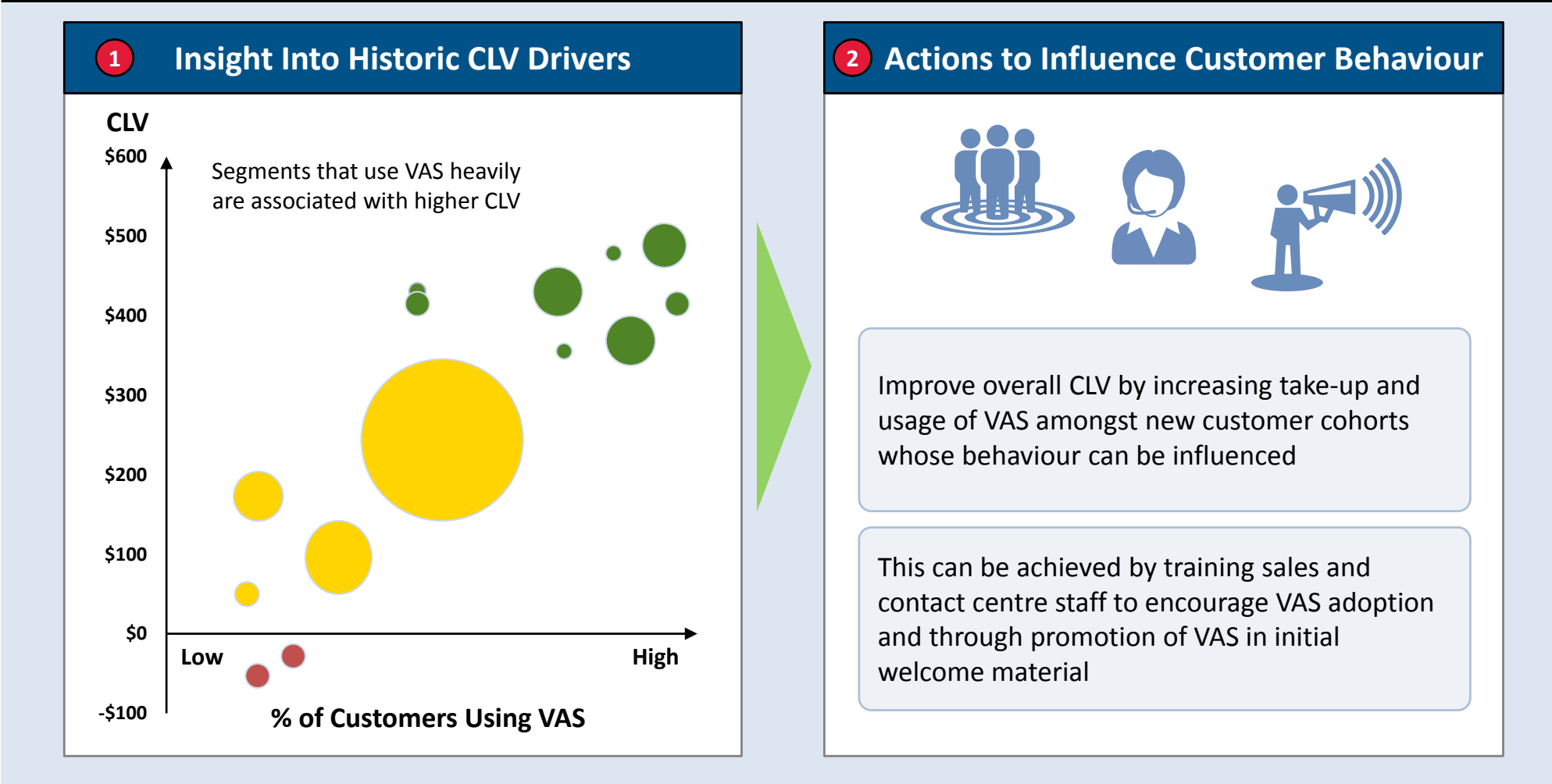
Example: Lebara Play



- Lebara focusses on ethnic groups overseas in with low cost international calls
- Lebara Play targets the same customer base with access to TV shows and films from their home markets

Identification of key historic CLV drivers can be used to design engagement initiatives that guide customers into forming desirable behavioural patterns

Example: Using CLV to Design New Customer Engagement Initiatives



Revenue leakage is a common problem for telecoms operators; even pre-pay MVNOs can experience issues with their internal application of business rules

MVNO Revenue Assurance Challenges

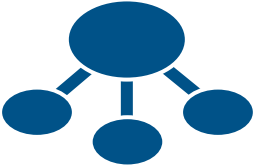



| | | |
|---|---------------------------------------|---|
| 1 | New Services and Technology Platforms | Delivery of new or evolved services e.g. updated tariffs and new revenue streams to maintain relevance to customers and stimulate usage/adoption will present risks |
| 2 | Legacy / Heterogeneous RA Platforms | Many MVNOs with limited resources are managing RA issues on legacy and aging platforms that are unable to keep up with the changes in industry |
| 3 | Rapid Deployment of Services | Rapid deployment of new offers and tariffs are critical for an MVNO's competitiveness when responding to needs and in tactical campaigns |
| 4 | Lack of End-End RA Coverage | Limited resources mean MVNOs are managing RA with gaps and in-coherent systems |
| 5 | Lack of In-House RA Expertise | Limited resources mean MVNOs are managing RA with gaps and in RA capabilities, knowledge and expertise |

Recent surveys suggest that most operators are leaking at least 1% of revenue with ~15% losing more than 3%. With lean operations and poor ability to scale, there are suggestions MVNOs may leak over 5% of revenue.



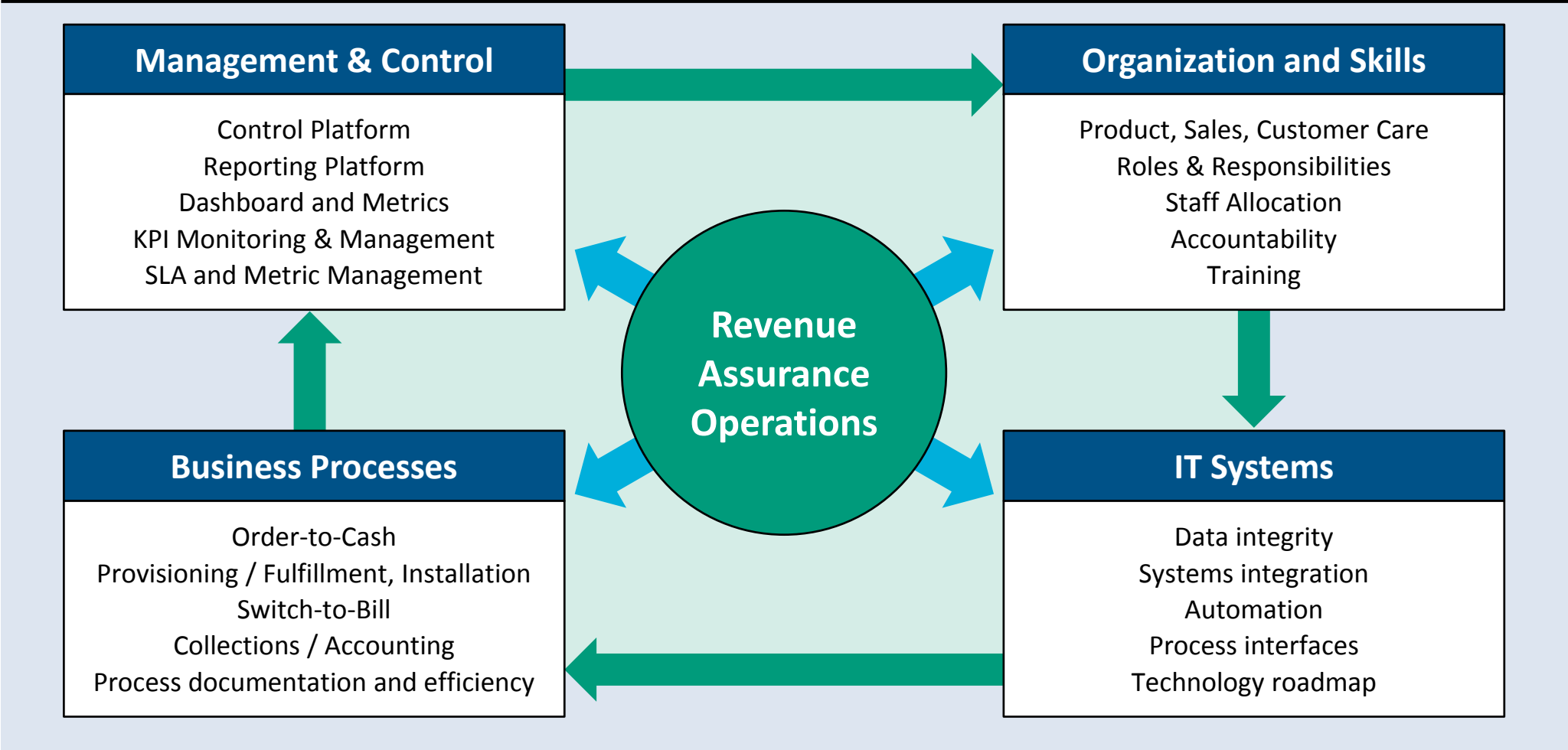
A review of existing control frameworks can help MVNOs identify areas for improvement and reduce revenue loss from factors such as poorly integrated systems, increased sophistication in billing/bundling, and lack of standardization

Cartesian Revenue Assurance Framework

| Current State Assessment | Identification of Gaps & Risks | Opportunity Analysis | Opportunity Prioritization & Implementation |
|--|--|---|--|
|  |  |  |  |
| <ul style="list-style-type: none">• Understand current high-level architecture and operating model• Document current state RA business rules & processes• Develop end to end process map indicating control point gaps and status of existing control points | <ul style="list-style-type: none">• Analyze KPIs, metrics and control points• Identify:<ul style="list-style-type: none">– Gaps (missing or misplaced controls)– Low value controls– Areas of risk• Score risks based on likelihood and impact | <ul style="list-style-type: none">• Identify opportunities for improvement based on current state findings• Perform audit of highest risk areas• Quantify outputs of controls testing to demonstrate proof of leakage and business case benefits of production implementation | <ul style="list-style-type: none">• Develop strategies to address priorities based on results of controls testing/risk scoring• Define initiatives to implement strategies• Estimate implementation costs and timeline• Rank initiatives based on cost / benefit analysis |

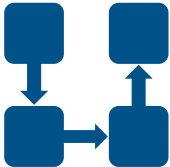


Revenue Assurance operations involve the continuous management and improvement of processes, people and systems incorporating industry standards and best practices

Revenue Assurance Operations Cycle



Establishing proper control points and key performance metrics is a critical step to manage risks and ensure revenue stability

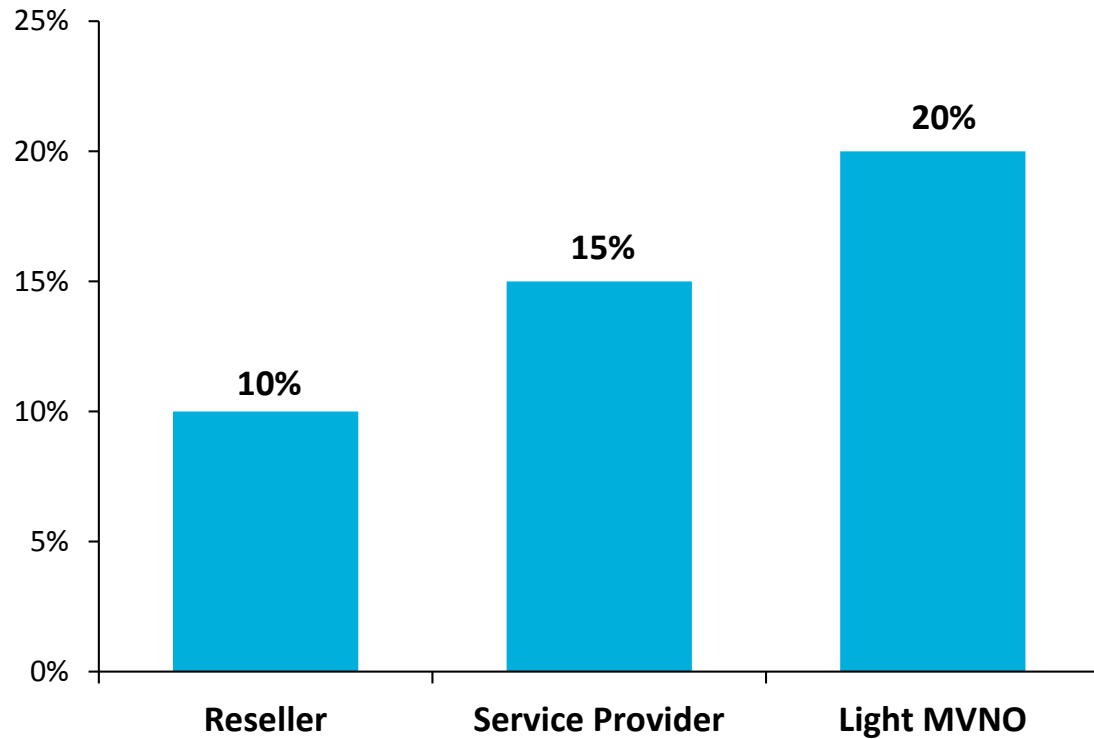
Critical Success Factors

| Process Management | People Management | Systems Management |
|--|--|---|
|  |  |  |
| <ul style="list-style-type: none">• Objective and documented processes• Defined control points with metrics along the entire RA value-chain• Timely implementation of policies and corrective actions• Regular comprehensive audits to confirm the integrity of processes• Anomalies and errors resolution process | <ul style="list-style-type: none">• A single, empowered and accountable owner of the switch-to-bill process• Sufficient qualified staff to manage the RA process• Clear expectations from the RA process• Management support and scrutiny of RA process | <ul style="list-style-type: none">• Regular reference data synchronization• Established baseline of key volumes and metrics—a starting point• Ongoing monitoring of the key volumes and metrics |

4 MVNO Business Optimisation

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- ③ Reducing CCPU
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Typical Prepaid MVNO EBITDA Margins (%)



Top MVNO Cost Items

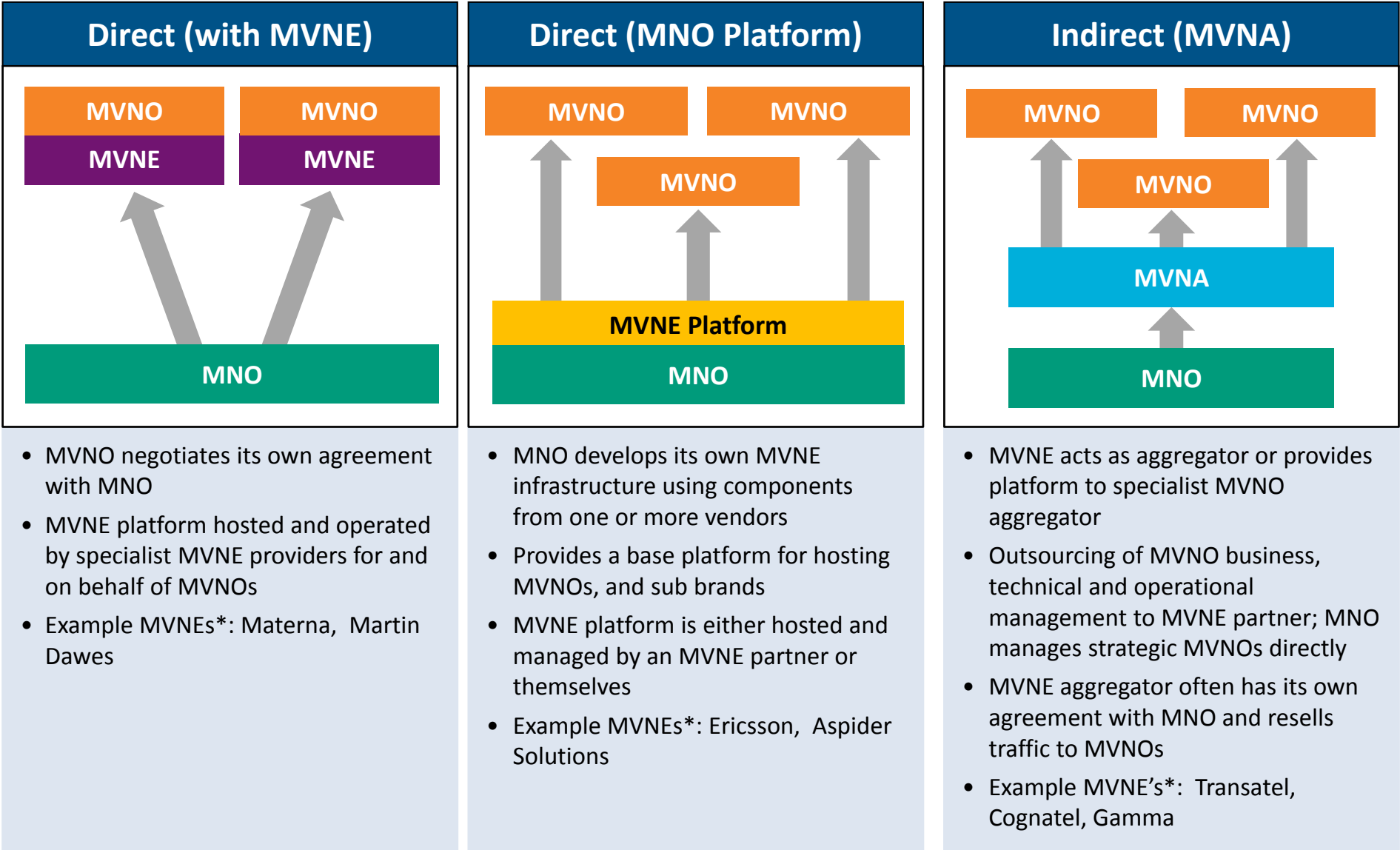
| | |
|-----------------------|---|
| Wholesale Rates | <ul style="list-style-type: none">Go direct to MNO (if sufficient scale)Scale will drive bargaining powerAbility to reforecast and re-negotiate rates (based on thresholds)Potential to capture termination rates (although less interesting now in many markets due to MTR decline) |
| Customer Care | <ul style="list-style-type: none">Minimise inbound callsOTA set-up and provisioningSelf-service where possibleNo paper billsOutsourcing (onshore vs. offshore) |
| Other Opex Components | <ul style="list-style-type: none">Consider using an MVNA / MVNEMove back office functions to outsourced model (e.g. HR, legal, etc.)Leverage cloud models for BSS (e.g., CRM) |

There are many different wholesale pricing components to take into account

| Typical Pricing Elements | | |
|--------------------------|-------|---|
| Capex | | <ul style="list-style-type: none">• Upfront investment costs |
| Upfront Per Sub Fee | | <ul style="list-style-type: none">• Set-up cost per subscriber |
| Usage | Voice | <ul style="list-style-type: none">• Set-up fee per call• On-net / off-net rates• Peak / off peak• Interconnect rates• International and roaming• Inbound rates |
| | Data | <ul style="list-style-type: none">• Per MB (domestic and roaming)• Overage charges• Bundled charges |
| Other Services | | <ul style="list-style-type: none">• SIM cost• White label / managed services (e.g. call centre)• Change requests (e.g. tariff change)• VAS• Termination costs |

MVNOs should also seek contractual mechanisms to benchmark and adjust wholesale prices during the contract

MNOs may chose to serve MVNOs directly, or indirectly via an aggregator



When it comes to technical and operational partners, MNOs and MVNOs have a greater than ever choice of MVNEs to support them

Specialist MVNE Providers



- Provision of full solution or components of turnkey MVNE platform
- Targeted at MVNO and MNO customer base, although focus tends to be on servicing MVNOs
- Smaller vendors often easier to work with
- However, most MVNEs lack international scale

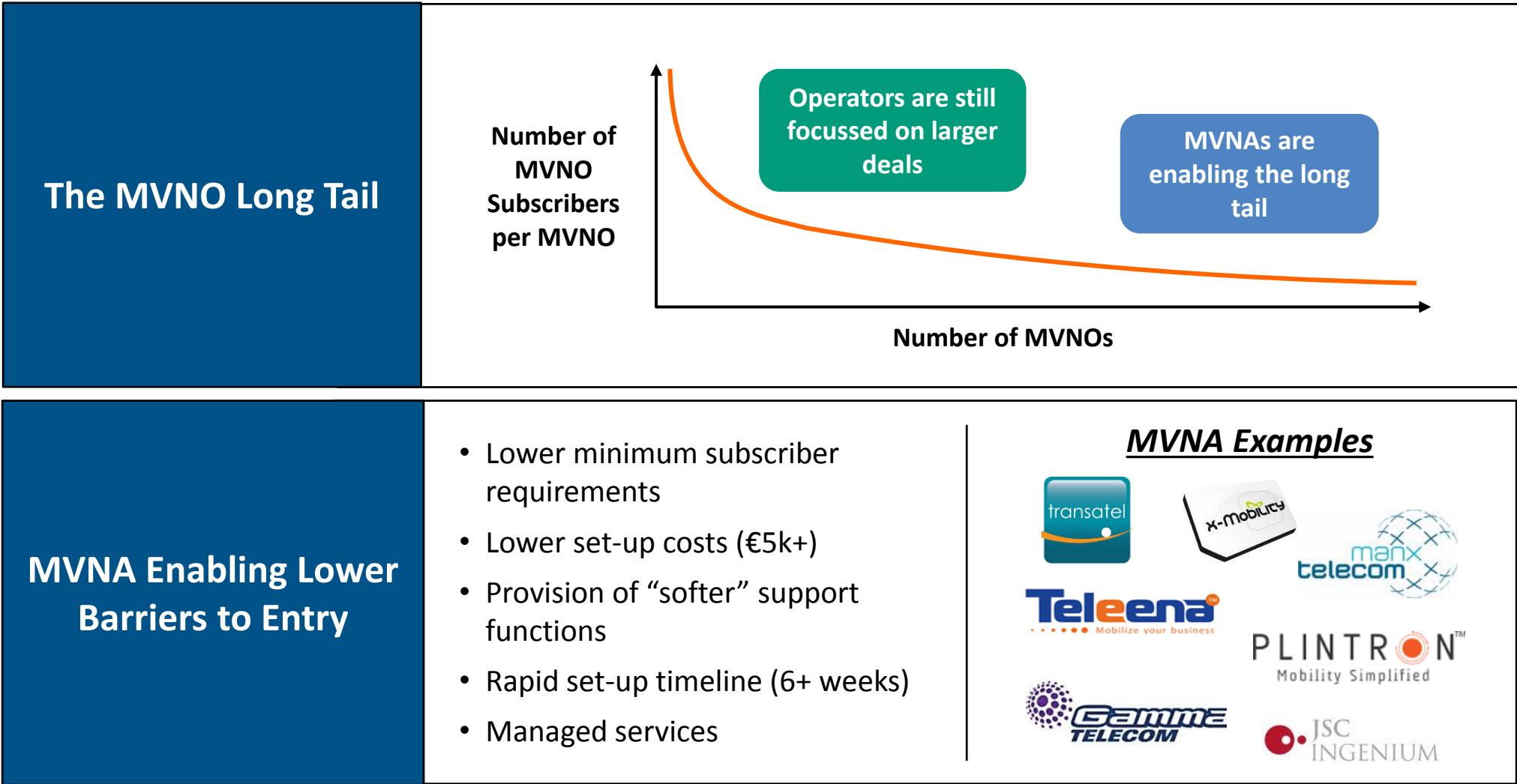
Vendors and System Integrators














- Focused on enabling MNOs to build their own MVNE platform
- Higher likelihood of being existing supplier to MNO
- Provide international presence
- Often have more flexibility / willingness to bespoke core platform components to fit MNO's requirements

- Increasing number of MVNEs in the market, supporting both MVNOs and MNOs
- MNOs are aligning themselves to MVNE partners
- MVNEs are generally able to provide:
 - A full solution or components of a turnkey MVNE platform
 - An operator in a box model where the MVNE will provide the MVNE or MNO most / all of the technical elements to host and manage an MVNO
 - Options for either “MVNO-led” or “MNO-led” model



MVNAs have become common place in some markets, driving significant growth in the number of niche / micro MVNOs



Cost assurance is important to ensure that MVNOs are not being charged in excess of actual usage – both for MNO airtime and any usage-based MVNE/MVNA services

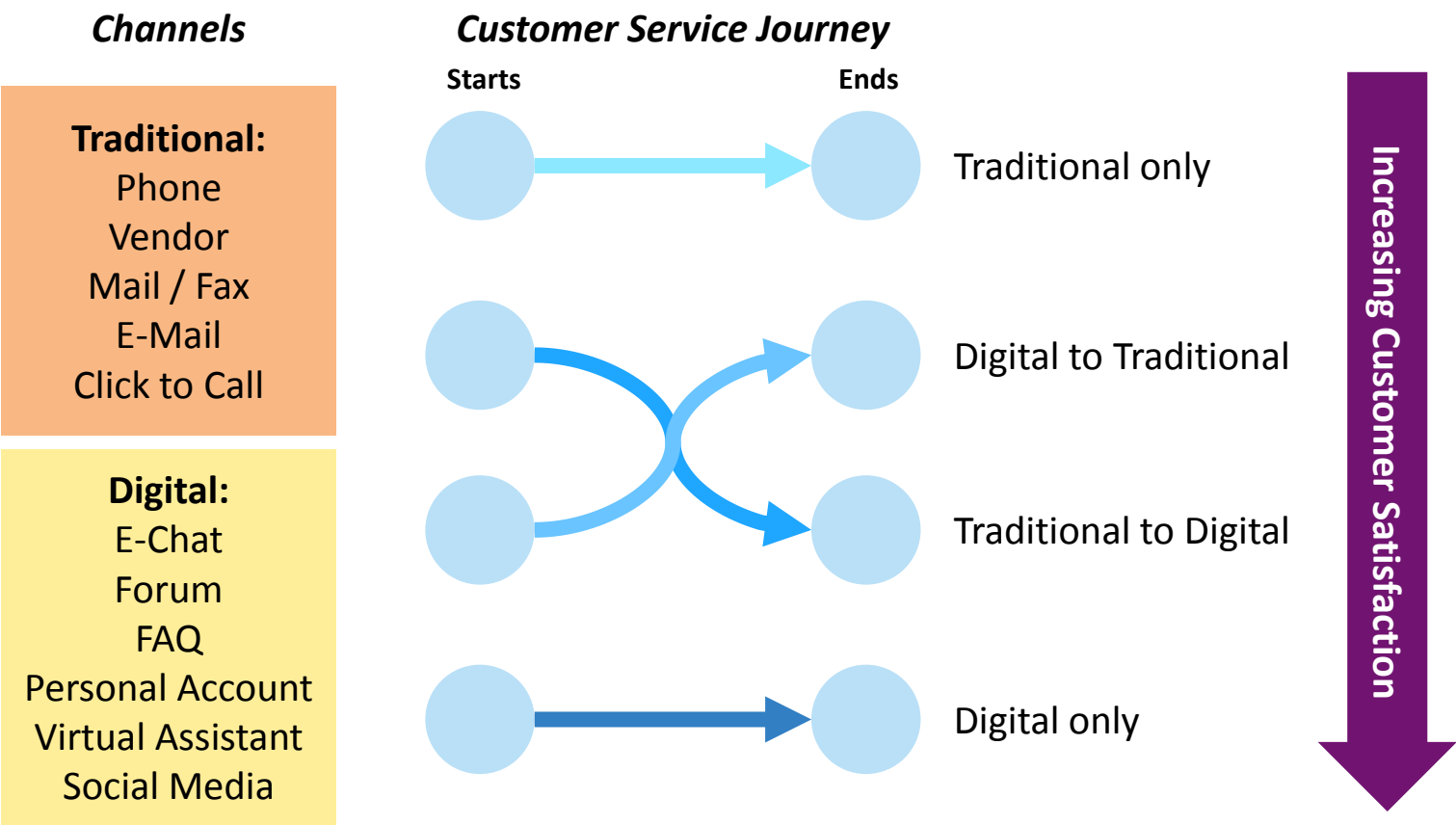
| NON-EXHAUSTIVE | Issue | Description | MVNO Services Impacted | | | |
|----------------|--|--|--|---|--|--|
| | Data Volume Mismatch | Data volumes do not match between MVNO retail systems and MNO/MVNA/MVNE wholesale systems |  Domestic Data |  Int'l Data | | |
| | Erroneous Record Generation | MNO/MVNA/MVNE wholesale systems erroneously generate records not captured in MVNO retail systems |  Domestic Data |  Int'l Data |  Voice |  SMS |
| | Incorrect Retail Cost Assigned to International Activity | MVNO retail systems erroneously assign a domestic or zero-rated cost to international activity | |  Int'l Data |  Voice |  SMS |
| | Voice Minute Miscalculations | Voice minutes do not match between MVNO retail systems and MNO/MVNA/MVNE wholesale systems | | |  Voice | |
| | Lower Retail Voice Rate | Retail rate for a voice record is lower than wholesale rate charged by MNO wholesale system | | |  Voice | |

Example of Providers Prioritizing Wi-Fi

|  | |  | |
|---|--|---|---|
| Service Description | <ul style="list-style-type: none"> US MVNO launched by Google Prepaid mobile services with simple pricing and plan proposition Focus on service quality and customer experience Multiple cellular networks and Wi-Fi Roaming in 120 countries with flat rate | Service Description | <ul style="list-style-type: none"> US MVNO that uses Wi-Fi first Handset automatically switches over from Sprint's network to Wi-Fi for calls and data when in range of known Wi-Fi network Limited selection of handsets: Moto E, Moto G (1st gen), Moto X (1st gen) and Moto X (2nd gen) |
| Offer | <ul style="list-style-type: none"> Unlimited voice and SMS + 1GB data from \$30 (significantly cheaper than other US providers) Wi-Fi connectivity (prioritized network) including Wi-Fi Calling Roaming included | Offer | <ul style="list-style-type: none"> Monthly plans come with unlimited calls and texts, with a variable amount of data on top per plan 'size' The XXS size is entirely minutes and texts (\$10/month), with the XXL size offering 5 GB (\$85/month) Users can add more data on the dedicated app and are refunded for unused cell data |
| Market Impact | <ul style="list-style-type: none"> The MVNO leverages T-Mobile and Sprint network (market challengers) to compete against AT&T and T-Mobile Wi-Fi is a major feature to reduce costs and improve customer experience | Market Impact | <ul style="list-style-type: none"> Reviews have generally been favourable, however some criticism about the transition from Wi-Fi to the network In May 2016, added T-Mobile (a GSM-based carrier) to complement its initial CDMA-based carrier, Sprint |

In an increasingly crowded market, differentiating through customer service is seen as a strong value-add to an MVNO's service offering

The More Digital the Journey, the Higher the Satisfaction



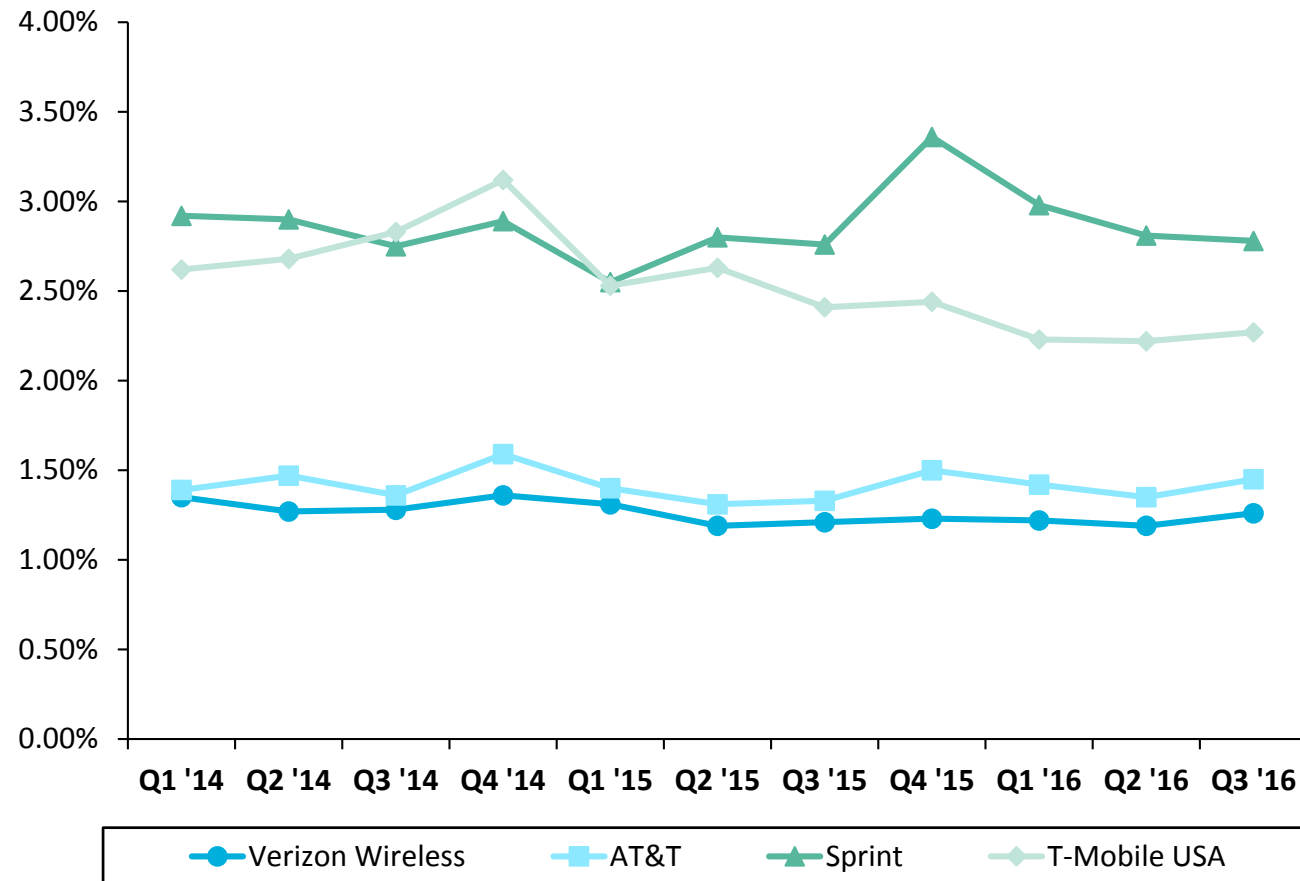
- It is not simply a matter of adding digital options to traditional customer-service channels
- Careful thought must be given to the degree of digitisation desired: digital care can be fully self-serve or involve a mix of live customer-service agents; not all options need to be available on every digital platform, and e-care should not be implemented as aggressively where there is significant potential for upselling

4 MVNO Business Optimisation

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Even within a developed market, individual operators can have quite different churn rates

Monthly Mobile Churn Rates (US, 14Q1 – 16Q3)

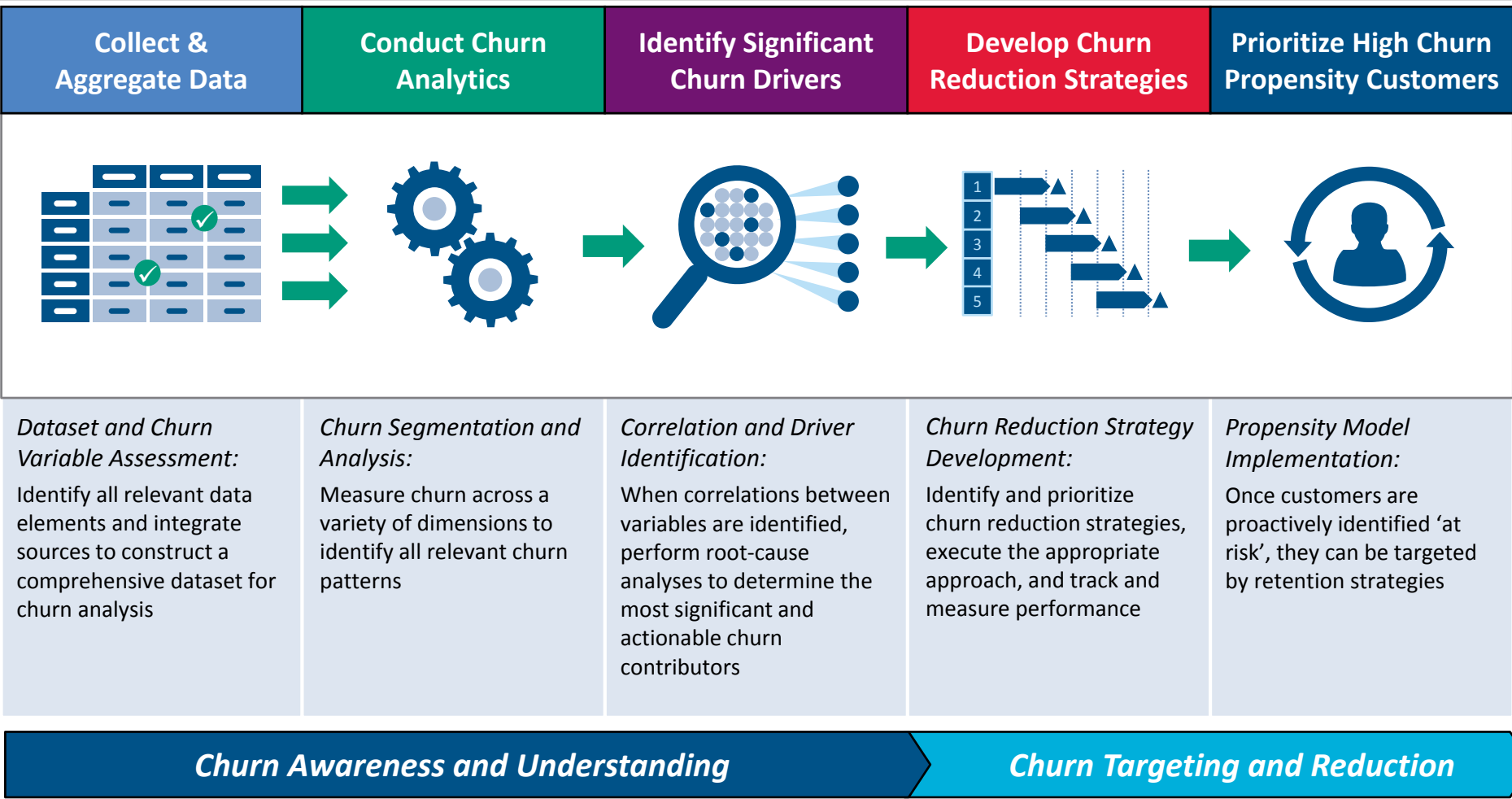


Example Factors Affecting Churn

- **Product**
 - Mix of post-pay vs. pre-pay
 - Contract lengths
 - Service bundles
- **Service**
 - Network coverage
 - Service quality / performance
 - Quality of support
- **Competition**
 - Promotional offers
- **Demographics**
 - Credit worthiness

Established MVNOs should consider implementing a churn management framework so that they can respond quickly when churn indicators start to show

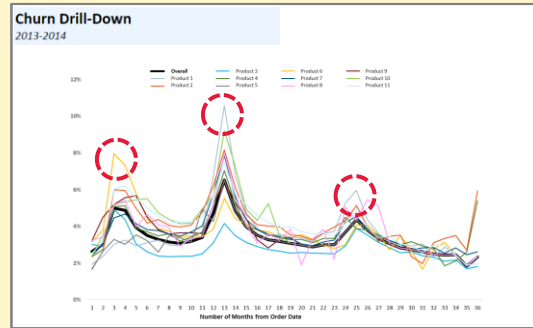
Cartesian Churn Management Framework



Measuring churn across a variety of dimensions will highlight important churn trends and patterns for further investigation

Examples of Churn Measurement across Various Dimensions

Churn by Customer Tenure and Product



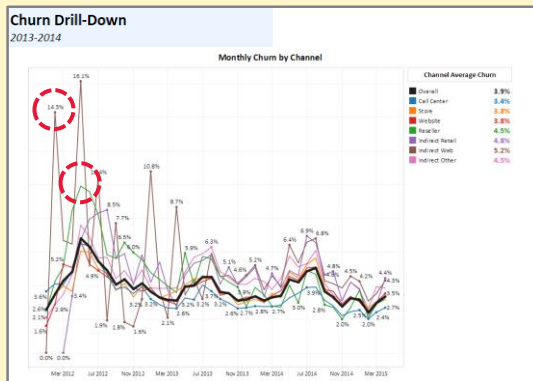
Example Trend Identified: Across all products, churn typically experiences a spike 3, 12 and 24 months into the customer tenure

Churn by Geography



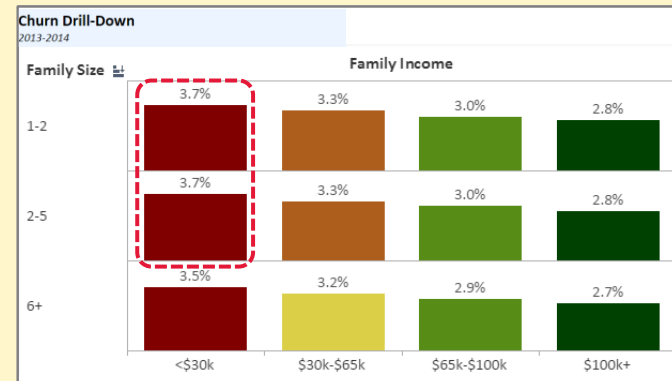
Example Trend Identified: The highest churn occurs in a select few states, highlighting the need to further investigate these states

Churn by Sales Channel








Example Trend Identified: Two channels had outsized churn rates relative to other channels at the start of the observed period

Churn by Demographics



Example Trend Identified: Churn is highest amongst subscribers of lower income levels with smaller family sizes

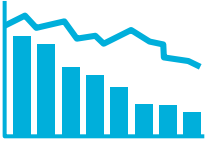



Churn Reason Categorization and Churn Drivers

| Churn Theme | Churn Reasons Cited by Customers | | Example Churn Drivers |
|-------------------------|--|---------------------------------|--|
| Unmet Needs | <ul style="list-style-type: none">• Service doesn't meet need• Competitor products have more features• Unhappy with bundle | + Early Tenure Churn |  'Right Sizing' Error |
| Product Issues | <ul style="list-style-type: none">• Persistent service disruption/outages• Confusing or hard-to-use product features• Lack of product flexibility (e.g., contracts, locked devices) | + Subsequent Churn |  Poor Product Performance |
| Customer Service Issues | <ul style="list-style-type: none">• Activation process was unsatisfactory• Lengthy or frustrating service issue resolution times• Conflicting information provided by different reps | + Early Tenure Churn |  Negative Onboarding Experience |
| Pricing | <ul style="list-style-type: none">• Unexpected price increase• Competitor prices are cheaper• Product price is too high | + Churn After Price Increase |  Promotion Expiration |
| Non-pay | <ul style="list-style-type: none">• Service termination after non-pay• Bankruptcy/financial difficulties | + Low Utilization of Auto Debit |  Auto-Debit Issues |

For pre-pay, churn reasons can often be deduced from behaviour

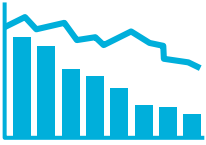



Examining churn trends alongside other data elements enables MVNOs to pinpoint specific churn drivers

Potential Churn Drivers for a Typical MVNO

| Churn Driver: | 'Right Size' Error | Negative Onboarding Experience | Poor Product Performance | Promo Pricing Expiration |
|----------------------------|---|--|---|---|
| |  |  |  |  |
| Business Unit Responsible: | <i>Sales & Marketing</i> | <i>Customer Care</i> | <i>Product Management</i> | <i>Sales & Marketing</i> |
| Example Trends Observed: | <ul style="list-style-type: none"> • Early Disconnects: Customer disconnects early in the lifecycle indicating dissatisfaction with bundle • Segmentation Mismatches: Mismatches between customer demographics/segmentation and purchased bundles | <ul style="list-style-type: none"> • Activation Issues: Documented issues with activation process, insufficient information about activation process • Limited Product Usage: Data shows minimal or intermittent use of service immediately after installation | <ul style="list-style-type: none"> • Coverage Issues: High levels of churn for specific geographies • Network Outages: Products and geographies also associated with high levels of network errors and/or customer complaints about service outages | <ul style="list-style-type: none"> • Promo End Churn Spikes: Churn spikes at the end of introductory promotion periods (e.g., 12/24 months) • Service Downgrades: Bundle downgrades increase with the expiry of promotional pricing |

Churn reduction strategies can then be developed to address the specific drivers

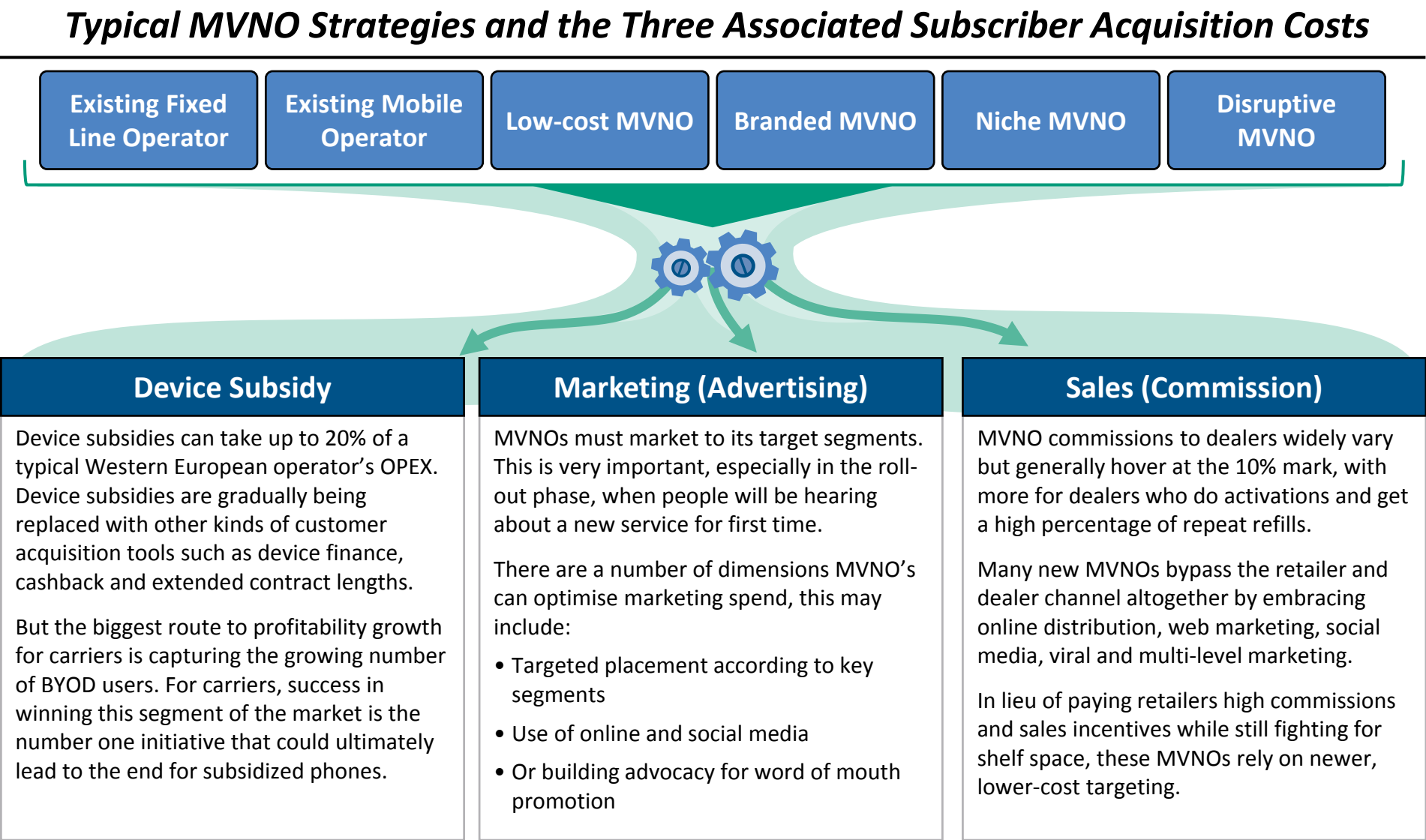
Developing Effective Churn Reduction Strategies

| | | | | |
|--------------------------|---|--|---|--|
| Churn Driver: | <div>'Right Size' Error</div> <div></div> | <div>Negative Onboarding Experience</div> <div></div> | <div>Poor Product Performance</div> <div></div> | <div>Promo Pricing Expiration</div> <div></div> |
| Business Unit Impacted: | Sales & Marketing | Customer Care | Product Management | Sales & Marketing |
| Strategy Description: | <ul style="list-style-type: none">• Sales Training: Train sales reps to identify and sell segment appropriate products• Marketing: Improve marketing messaging and product definitions | <ul style="list-style-type: none">• Automated Escalation: Create automated workflows that trigger escalation• Root Cause Analysis: Pinpoint root cause for failed activations and remediate• KPI refinement: Improve customer service KPIs | <ul style="list-style-type: none">• Wi-Fi Calling: Provide solution to use Wi-Fi indoors to augment network coverage• Customer Education: Provide better information regarding network outages | <ul style="list-style-type: none">• Targeted 'Saves' Campaign: Offer to extend promotion for subset of customers with high value and high price sensitivity• Make Products 'Sticky': Include 'sticky' add-ons as part of promo packages |
| Example Success Metrics: | <ul style="list-style-type: none">• Early tenure churn reduction• Product engagement and usage | <ul style="list-style-type: none">• Customer satisfaction• Service metric improvement | <ul style="list-style-type: none">• Product performance-related churn reduction• Reduction in service complaints | <ul style="list-style-type: none">• Promotion pricing customer retention• Use of complementary add-ons |

4 MVNO Business Optimisation

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Acquisition costs can be divided into three categories; device subsidies will not apply to all MVNOs



Many MVNOs have taken the SIM-only route to avoid the cost and complexity of offering handsets; however, options do exist for MVNOs to become channels for white label stores

Handset Distribution Challenges for MVNOs













| | |
|-------------------|---|
| Cost of Inventory | Holding stock of a competitive range of handsets ties up a lot of capital |
| Minimum Order Qty | OEMs may require minimum orders of e.g. 50,000 units |
| Operations | Need to set-up and operate processes for outbound and inbound logistics |

Example White Label Websites





Partnering with a finance firm to offer device leasing is potential option to offer handsets without an upfront cost to the consumer, without the balance sheet risk


The Benefits of a Leasing Model

| Customer / MNO Needs | | | | Leasing Model | |
|--|--|---|---|---|---|
| <div>Customer Needs</div> <div></div> | <div></div> | Keep up to date with new handset models |  | <div></div> | Captures residual value of handset by selling in secondary market |
| | <div></div> | Handset costs spread evenly over time without early termination fees | | <div></div> | Provides financing for handset subsidy to improve cash flows and margins of MNO |
| <div>MNO Needs</div> <div></div> | <div></div> | Reduced device subsidy costs | | <div></div> | No cost to carrier of program deployment or management |
| | <div></div> | Improved customer satisfaction from ability to allows customer to upgrade every 12 months | | <div></div> | Financial risk born by third party |
| | <div></div> | Reduced device driven churn provided by no down payment, no penalty offer | | | |

Example Giffgaff Devices and Payment Option

 All our phones are **unlocked**

 **No contracts** so we don't tie you down

 Get your phone [the giffgaff way](#)

Get the Sony Xperia Z5 Compact for an amazing price, while stocks last. [Buy yours now.](#)

Displaying 39 phones

Show Sort

Samsung Galaxy S7 edge



Available in:

 (4)

£629 (or pay monthly)

Apple iPhone 6S



Available in:

 (54)

£519 (or pay monthly)

Sony Xperia Z5 Compact



Available in:

 (4)

was ~~£349~~
£299 (or pay monthly)

What is peer-to-peer (P2P) lending?

Sometimes we just don't have the money when we need it, and that's no fun. Peer-to-peer (P2P) lending is a genius way of borrowing money without involving those greedy, money-hungry banks. Instead of a traditional loan from the bank, peer-to-peer lending matches folks who have some spare cash to lend with responsible fellows who want to borrow money. Hooray for the sharing attitude.

There are 4 key pillars to consider in channel strategy

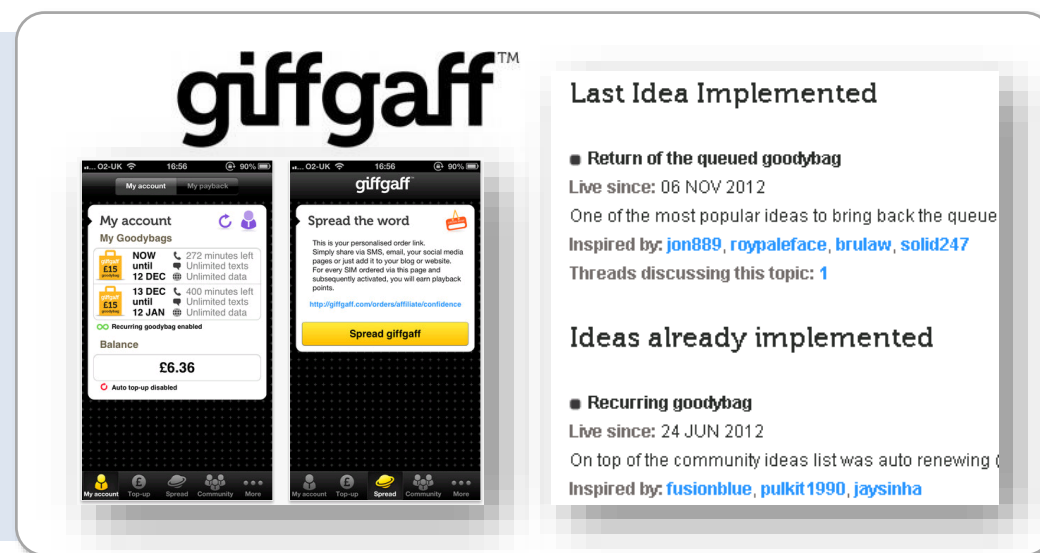


FreedomPop and Giffgaff socially focused MVNOs that reward their customers for referrals; FreedomPop also allows trading of unused data allowances



- FreedomPop is a 4G mobile broadband MVNO
- Freemium model: Without contractual commitments, customers receive a **free mobile broadband service**, if they do not exceed 500MB of usage; metered charging starts after this threshold
- Customers can **trade unused data allowances** by using a social dashboard
- Customers can **earn free data allowances** by making customer referrals and signing up to partner promotions

- Giffgaff, a UK MVNO, encourages customers to make **customer referrals (£5 bonus)**, participate in forums, and get involved in service improvements
- Various **customers have designed apps on their own initiative** for Giffgaff and made them available for sale on app stores
 - Giffgaff recently commissioned a customer to create an official version of balance-checking app he privately created



Some MVNOs have large retail channel footprints, either indirect or through their parent



Lebara Mobile provides PAYG mobile SIM cards for international phone calls out of 10 countries.

It has been extremely successful in signing deals with retail partners and already has over 90,000 outlets selling top-ups and SIM cards. The company has got some big names on board, including Tesco, Phones 4u and Esso.

Over past 15 years, Lebara now has 250,000 networks throughout Europe and across all its mobile countries today.



Lycamobile is focused on two main parts of the market: users for whom making international calls is a priority and value-focused users of core in-market telephony services.

It has an extensive distribution network, initially garnered from its fixed calling card business. It has good channels into ethnic supermarkets and other stores.

Among MVNOs, Lycamobile has the largest international footprint, with operations in 20 markets.



PosteMobile is the largest MVNO in Italy, and is owned by the country's post office, Poste Italiane.

PosteMobile used its in-house developed payments services along with its extensive distribution network as a foundation to create a strong brand presence in Italy.

It is now the largest MVNO in Italy with more than 3.5M users and over 50% share of the entire Italian MVNO market.

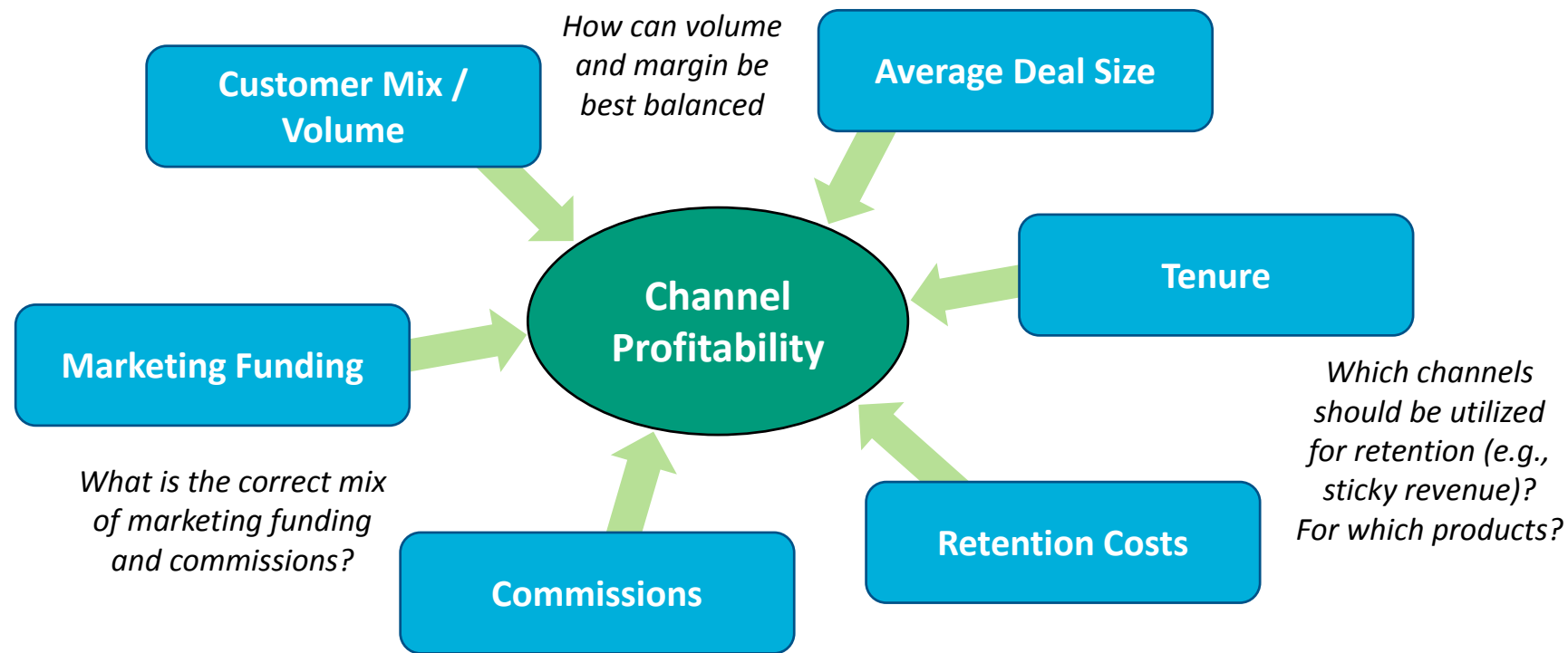
MVNOs marketing their services through partners need to optimize a variety of offer elements for the indirect channel

Indirect Channel Optimization Opportunities

| | | |
|-------------------|-------------------------------------|---|
| Offering | Product | Product overview including core product and service wrap components (e.g. capacity, SLAs, service, etc.); standard, bespoke and managed services (e.g., MDM) |
| | Pricing | Price points and structure for products (e.g., pooled data plans, complementary product add-ons such as international messaging) |
| Operational | Payment Model | Partner payment model (commission, referral, wholesale); commission rates/structure (e.g. up front, ongoing); extent to which commissions designed to drive sales/margins |
| | Ordering and Provisioning | Sales tools by which to price, order and provision products; pre-sales support; length of time to price and provision |
| | Customer Support | Post sales support including product configuration and troubleshooting; dedicated customer care contact |
| Sales & Marketing | S&M Support | Marketing development funds, collaborative sales (e.g. shared leads, joint pitches), sales toolkits, geographic considerations, specialist sales support and collateral |
| | Training & Outreach | Commercial, technical and operational content (e.g. provisioning, differentiators, competitor intelligence, etc.) and delivery (e.g. “road shows”, webinars, face 2 face, etc.) |
| | Account Management | Dedicated named resource, level of support provided to partners |
| | SLA / Contract | SLAs offered to partners (e.g. uptime, capacity, etc.); negotiated contract terms |
| | Self-Provisioning and Configuration | Provision of tools via online portal (e.g. pricing tool, provisioning, sales toolkits, sales and commissions reporting) |

Ultimately, indirect channel profitability can be influenced by a range of factors including commission structure, channel behavior, and customer mix

Channel Profitability Considerations



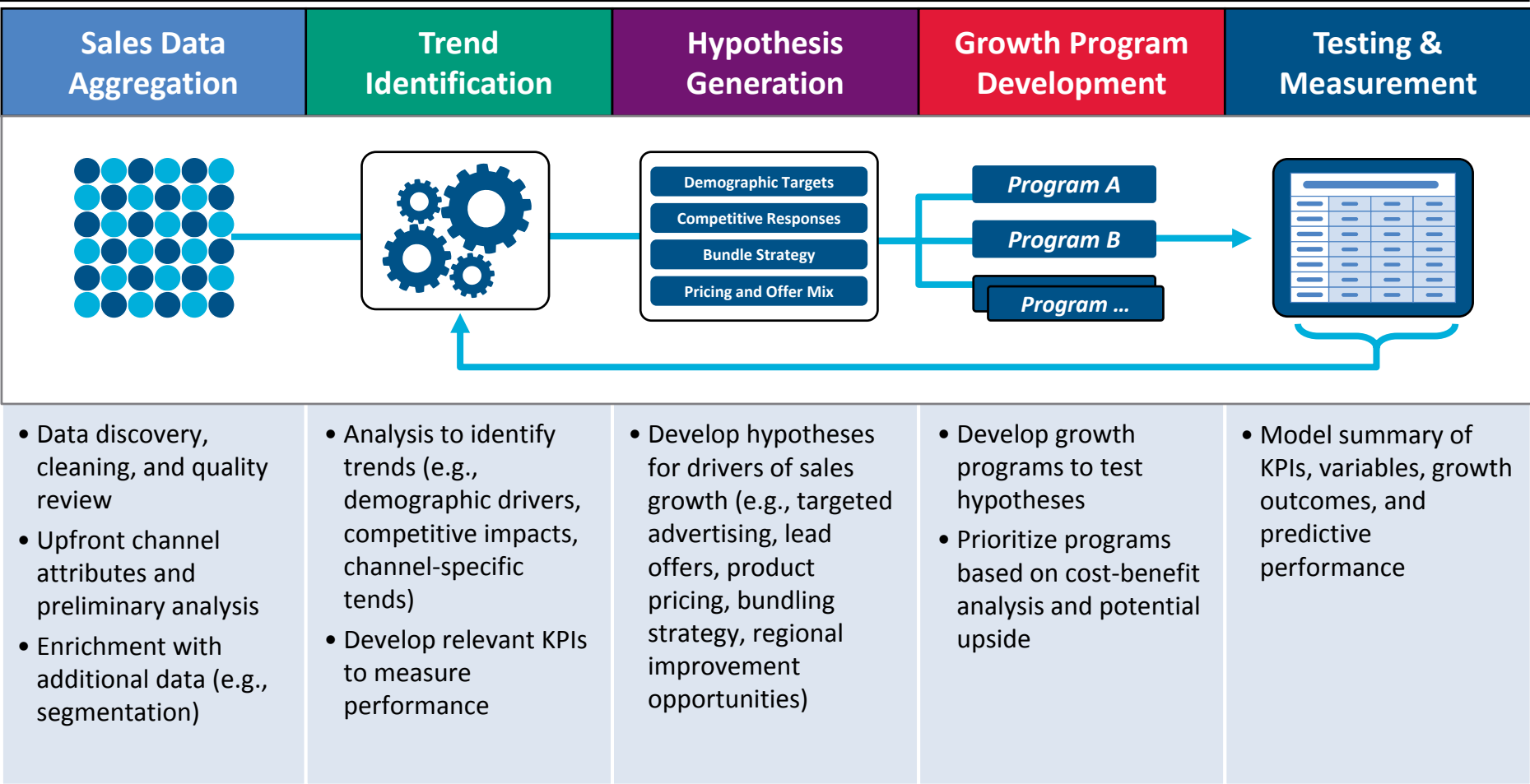
Monitoring these metrics and their impact is key in managing channels efficiently

MVNOs can leverage advanced analytics to evaluate end-to-end sales and onboarding processes and identify performance optimization opportunities across the channel

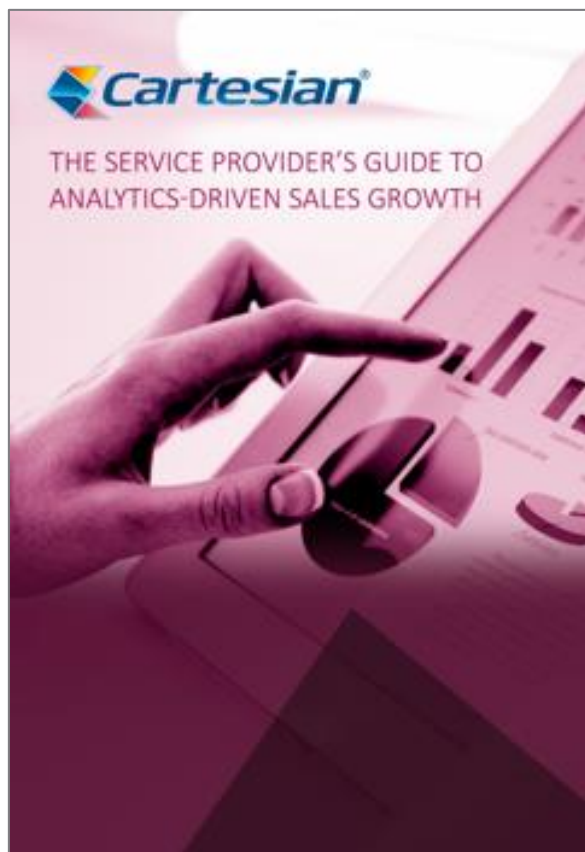


Effective sales channel optimization is underpinned by a comprehensive and robust framework for data discovery, analysis, hypothesis generation, testing, and refinement

Cartesian Channel Optimization Framework



To learn more about the importance of sales analytics and how it can improve the MVNO sales channel performance, download Cartesian's latest eBook on analytics-driven sales growth



The Service Provider's Guide to Analytics-Driven Sales Growth

This eBook discusses the benefits of advanced sales analytics in the telecommunications industry, including:



- Right package, Right Customer – How sales performance analytics can boost sales volumes and improve customer LTV
- Insights to Action – How you can leverage sales analytics to develop ROI positive programs
- Product Recommendation Engines – How you can increase conversion and reduce churn with predictive analytics
- Improve the Customer Experience – How to adopt a data-drive approach to upselling

To download the eBook, go to: <http://content.cartesian.com/telecom-analytics-guide-sales-growth-ebook>

Agenda

- 1 Introduction
- 2 Evolution of MVNO
- 3 MVNO Business Model
- 4 MVNO Business Optimisation
- 5 Follow-Up

Questions? Comments?



How can we help deliver on your MVNO objectives?



<http://www.cartesian.com/contact-us/>

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