Huawei SmartCare®

Service Quality & Customer Experience Management

Content

1. CEM & SQM & NPM – Huawei's Capability
2. SmartCare® Business Value on a Customer Case
3. Use Cases & Demo & Moscow SQM Pilot
4. Global References & Why HUAWEI

CEM / SQM / NPM / SOC – Huawei's Capability

Customer Experience Management

- NPS
- CSAT
- Churn
- OTT Analysis
- Digital Care
- Monetization

Service Quality Management

- Quality Dashboard
- Traffic Hotspots & Geo-location
- User / Service / Network Mapping
- Benchmarking & Quality
- Proactive Care

Network Performance Management

- Network Planning
- Service based Capacity
- Network Optimization
- Long Term Service Performance
- ARPU driven Planning

Service Operation Centre

- VIP Care
- Automated Root Cause Analysis
- Enterprise Care
- Customer Care Efficiency
- User centric Operation
- Business Transformation
- OPEX Savings
- 3rd Party Services Analysis
- CEM Enabling

What Huawei can deliver

Platform

CEM
SQM
NPM
Geo-Location
Optimization
Tracing

Service

Set of Use Case
NPS prediction
Churn prediction
SOC Establishment
Quality Improvement
Network Optimization

Operation

Service Operation Centre Establishment & Operation
Network Operation
Network Planning

Set of platforms / tools, services and operation support to increase Operator's value

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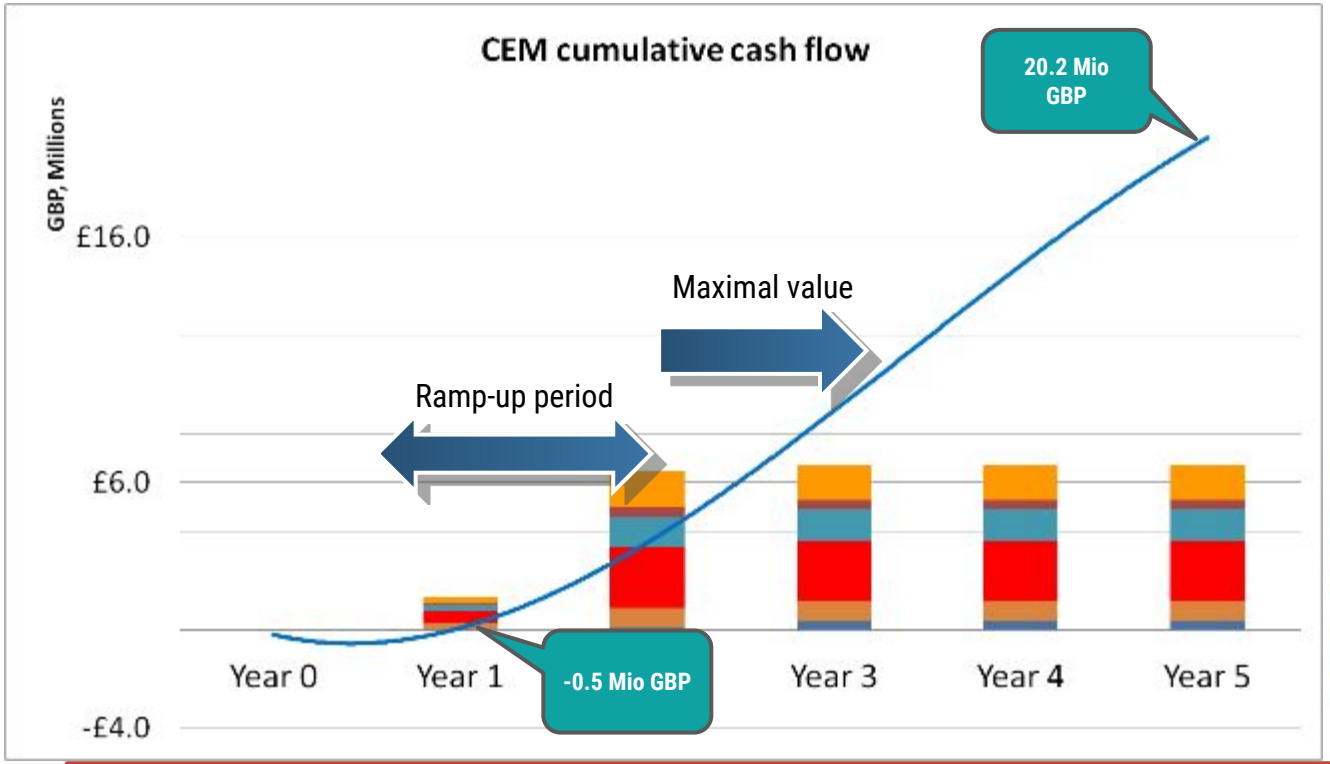
Savings and Earnings by Huawei CEM Platform (CCF)



Period: 5 years

5 groups – OPEX / Revenue

+ Savings on old system replacement

CCF not discounted

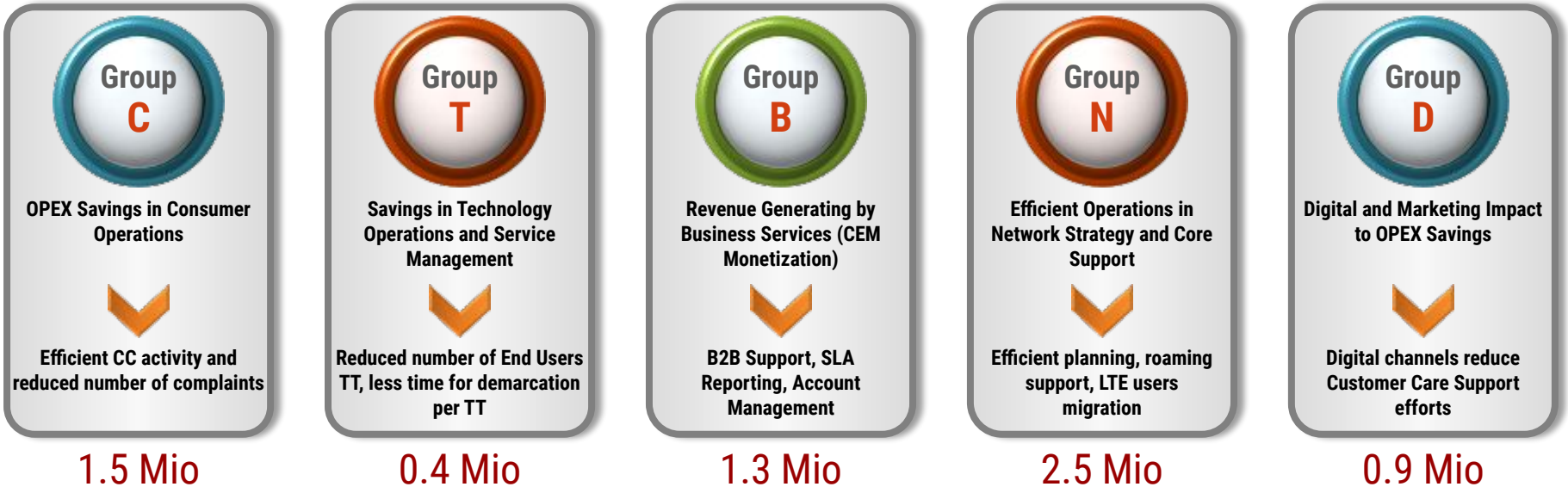
CCF (5th year): 20.2 Mio GBP

Legend:

- Consumer Operations (OPEX)
- Technology Operations and Service Management (OPEX)
- Business Services (OPEX, Revenue)
- Network Strategy and Core Support (OPEX)
- Legacy Tool & System Replacement
- Digital and Marketing (OPEX)
- Accumulated Gross Margin

Details per stream are presented in further slides

Savings and Earnings by Huawei CEM Platform (Overview)



Estimated benefits from CEM Platform on a level of 6.6 Mio per year

- NPS Improvement
- Multi SIM usage
- Third Party Demarcation
- Churn Prediction
- Location based Marketing
- Other cases

+15-25 Mio / year

By additional use cases, not requested in RFP
Huawei is happy to propose / demonstrate / discuss

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Use Cases & Demo

SQM Pilot Moscow

3V Demo

2G/3G/4G User Migration

NPS

Customer Care Assistance

First 30 days journey

Roaming Service Quality Assurance

Churn

CEM vs SQM

Digitizing Customer Care

Architecture & Platform

VVIP Service Quality Assurance

Persona Based Experience Assurance

ARPU Driven Network Planning

Enterprise (B2B) Service Quality Assurance

Value-Experience Matrix Migration

Service Operation Centre

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Huawei SmartCare® is Leading the CEM Industry

…delivered projects with tangible value

Global Market Reference

- Serving 40+ Service Operations Centers for 14 of GSMA Top 30 Operators
- Helped 120+ networks to improve network & service quality

Indonesia: Revenue Improvement

- ~10% revenue increase from high value users

China: Churn Rate Reduction

- Prepaid churn rate reduced from 5.17% to 3.66% within 12 months

Denmark: Quality Benchmarking Improvement

- No.1 in 3rd party quality benchmarking

KSA: Propensity to Call (PTC) Reduction

- VIP service quality issues reduced by 90%+ within 6 months

Ghana: NPS Improvement

- NPS of business elite persona improved by 10pts

Huawei CEM World Class

Customer	Project Technologies Scope	Mobile Subscriber	Covered Vendors (Wireless)	Use Case	Key Benefit
XL Indonesia	GSM/UMTS/LTE	60M	HW, E///	Traffic Insights /SQM/VIP CARE /CCA/CCH	1. Customer Complaint TT reduced by 30% ~ 60% average in different regions 2. MTTH improved 60% average
STC Saudi Arabia	GSM/UMTS/LTE/Fix	27M	HW,E///,NSN	SQM/Roaming Performance Mgmt VIP CARE /Marketing /Campaign Support	1.VIP trouble tickets reduced by ~90% within 24 weeks 2.MKT Support Capability Improved 3. Ramadan & Hajj's successful guarantee greatly improved STC's reliable brand image
PCCW HongKong	GSM/UMTS/LTE	3M	HW	SQM/Roaming Performance Mgmt/VIP CARE /CCH/CCA/OTT Analytics	1.MTTD : from 3 hours to 0.5 hours 2.Billing enquiries / complaints handling time: reduced 60% 3.Provides proactive care to 9000+ high value users
Mobile zhejiang	GSM/UMTS/LTE	55M	HW , NSN , AL, ZTE , Datang	CCA/CCH/Service Quality Management/Smart CAPEX	1.Customer satisfaction improved by 20% 2. Reduced OPEX compared with traditional DT
Unicom Shanghai	UMTS/LTE	6.5M	HW,NSN,ZTE	SQM/Enterprise Assurance /CEI Dashboard/Smart CAPEX/Churn Prediction/NPS Analytics	1.Complaint Rate Reduced by 37.6% 2.VIP Complaint Rate Reduced by 31%
TDC Denmark	GSM/UMTS/LTE	3.2M	HW,E///	End-to-end Session trace /SQM/Roaming Performance Mgmt VIP CARE /OTT Analytics/Smart CAPEX	1.Network quality score No.1 in Denmark 2.Ps data traffic increased by 3 times

HUAWEI SmartCare® 3rd Party Partners

Innovation with Industry Forums

tmforum · QuEST FORUM · The Open Group · CTO FORUM Technology for Growth and Governance · CMO COUNCIL · GSMA

Thank you

Appendix & Supportive Materials

Huawei SmartCare®

Service Quality & Customer Experience Management

Group C – OPEX Savings in Consumer Operations

1.5 Mio

Summary (details in further slides):

✔Reduction of AHT of massive network issues related calls by 15% (1 min savings per call)

✔Reduction of AHT of technical incident related calls by 10% (1.6 min per call)

✔Improved FCR by 20% by automated root cause analysis per End User

✔Improved SQ / CE leads to deduction of complaints by 20% with less complaints calls

✔Expected savings start from 1.5 Mio GBP per annum

Detailed analysis and planning supported BC calculation for OPEX savings

Consumer Operations OPEX Savings Calculation Approach

Approach

Number of TT related Calls

All Calls 86 Mio per year

All Calls

Information / Sales Marketing

Query / Usage / Issue

Complex Issue / Complaint

Incident / Service Request

Rest Calls (Sales, Tariffs, Marketing,

Complaints 1,059,872 0.012% per User

Resolved at first call FCR=70% (Benchmark)

Trouble Tickets 30%

Huawei CEM

Target

↑FCR

↓ AHT

↓ TT

Required Personnel

AHT ~ 6.3 – 6.8 min

Call Time

6,677,196 min per year

+

4,928,407 min per year

3.5 Marketing

9 Query / Usage

12 Complex Issue

16 Incident

Retail 8,500 (est.)

Call Centre 2,500 (est.)

11.000 Staff (CC & Retail)

Source

EE RFP

Benchmarks

MetricNet

Ofcom

EE Results

Huawei expects significant savings in Call Centre by CEM Platform Implementation

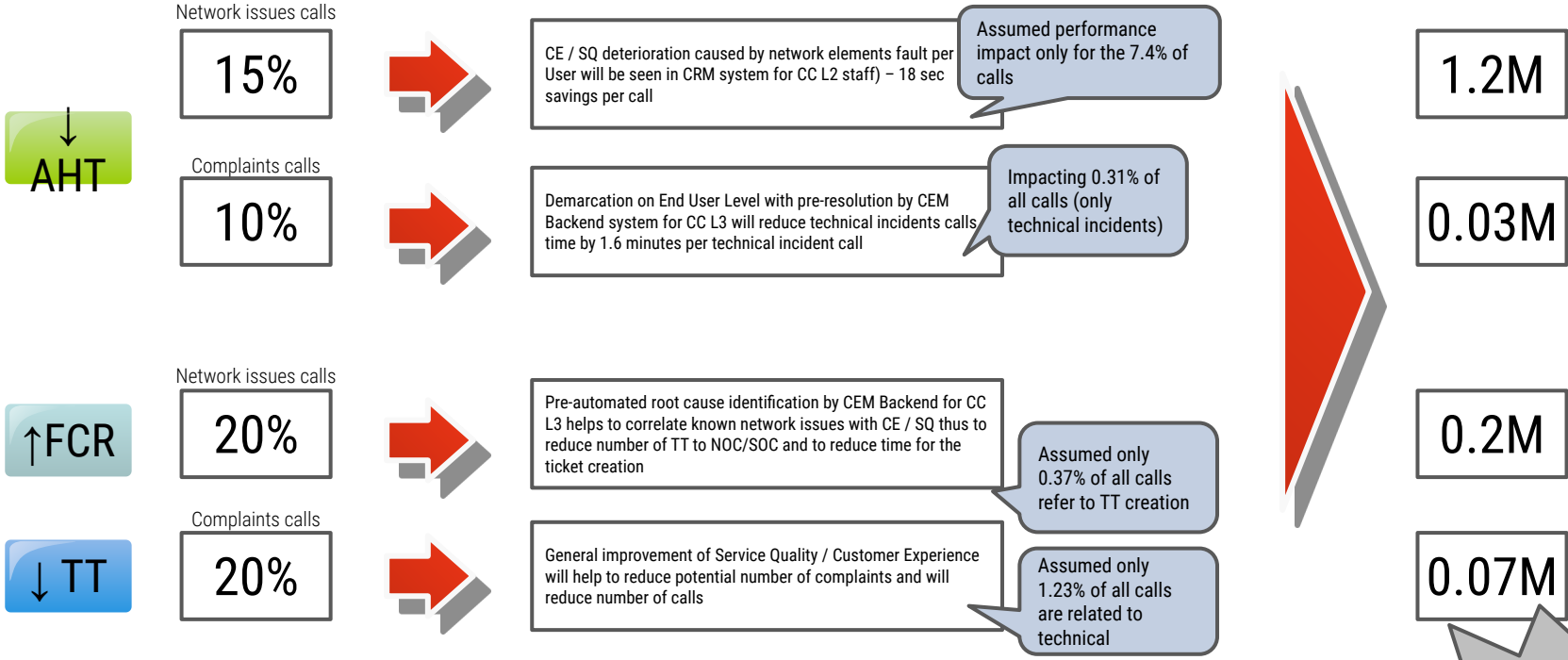
Details – please see next page

Benchmarks

GSMA

EE RFP

Call Centre OPEX reduction – details and clarifications



Group T – Technology Operations and Service Management Savings

Summary (details in further slides):

- ✔Reduction of AHT by automated demarcation within the End User TT resolution
  - ✔CEM Platform allows to demarcate the issue automatically
  - ✔Demarcation includes demonstration of the NE in the chain
  - ✔Demarcation includes statistic and status per NE
  - ✔It helps to save time and not to address to many systems within the demarcation
  - ✔In BC the time reduction (for demarcation only) is counted on 50% level

✔Expected savings start from 0.4 Mio GBP per annum

By experience from many MS projects Huawei foresees even higher benefits

Technology Operations OPEX Savings Estimation (EU TT related)

What

Demarcation time

50%

End User TT only

How

CEM shows NE chain impacting CE / SQ and NE status – this helps to avoid querying of many systems for demarcation check

Applicable only for End User Trouble Tickets and reduces only demarcation time (it gives 13% of improvement time for the whole TT resolution time)

Savings

0.4M

£ 0.4 M per year

Business Services – Efficient Operation and extra Revenue

1.3 Mio

Summary (details in further slides):

- ✔Enterprise Monitoring and SLA Management
  - ✔Automated operations by CEM Platform will allow to significantly save OPEX
  - ✔Additional revenue / benefits were not counted here:
    - ✔Huawei has a dedicated Use Case Enterprise Assurance
    - ✔Estimation of extra revenue by UC Enterprise Assurance requires more input from EE
    - ✔Huawei suggests to have a workshop with EE to estimate additional value for EE
- ✔New SLA offers for EE Enterprise Customers (per year)
  - ✔SLA and KQI* visibility for CE will be given to Enterprises
  - ✔BC calculation includes expenses for the network optimization to fulfill SLA

✔Expected savings start from 1.3 Mio GBP per annum

Extra support for Enterprises / B2B customers and Account Management

* KQI – Key Quality Indicator

Enterprise Monitoring and SLA Management

	W/O Platform	CEM Platform
Preparation of monitoring per VIP / Enterprise User(s)	43.75	6.25
Create / Review set of KPI in an additional report per Enterprise (once a year)	6.25	0.50
Monitor and review KPI per Enterprise (daily)	4.17	0.50
Generate a report on a monthly basis per Enterprise	6.25	0.50
Mandays per year	1041.67	122.75
Man days difference		918

~ 5 people savings

Major Savings

Platforms allows to load IMSI of Enterprise and to get all locations, NE, KPI, and KQI Indicators (otherwise it would be required to find all information, address, find cells and collect manually) – here is example for 100 Enterprises is shown

By CEM Platform alarms will be generated automatically for every VIP / Enterprise user. No need to monitor or to check reports on a daily basis (assumed manually it requires 20 minutes per day per Enterprise – so 4 people in parallel work)

CEM Platform will generate reports automatically on a weekly / monthly with minimal efforts per employee

£ 0.29M per year

Only OPEX savings are counted (Enterprise appreciation – is a bonus)

Enterprise Monitoring and SLA Management

Approach:

✔Enterprise gets SQ reports

✔Either automated reports or online portal can be given*

✔Enterprise pays 5% more on a monthly basis

✔Assumed – 10% of customers would go for it

Benefits:

✔CEA* is a strong differentiation factor for Enterprises

✔Such an approach can help to secure business

✔Either to reduce churn or to increase market share

✔Assumed 0.1% market share increase

Outcome:

✔Accumulated income will be completely spent for dedicated optimization

✔So it will become a Service Quality Assurance approach

or

✔No price increase – optimization costs to be covered by benefits (See above)

£ 0.98M
per year

Only OPEX savings are counted (Enterprise appreciation – is a bonus)

* CEA – Customer Experience Assurance

Network Strategy and Core – Efficient Operation and extra Revenue

2.5 Mio

Summary (details in further slides):

✔Smart Investments Planning Approach (Traffic / ARPU / Complaints driven)

- ✔Analysis and setting up priorities for Cell Planning / Expansion
- ✔Analysis done by ARPU, Complaints, VIP, etc
- ✔Only OPEX savings for ARPU driven Planning Process are counted

✔2G-3G-4G Users Migration (per year)

- ✔Identification of the users having LTE capable handset and not using LTE network
- ✔Analysis can be done either to identify users with no subscription or wrong configuration
- ✔Potential revenue increase (by 5% for 0.5% of only postpaid subscribers)

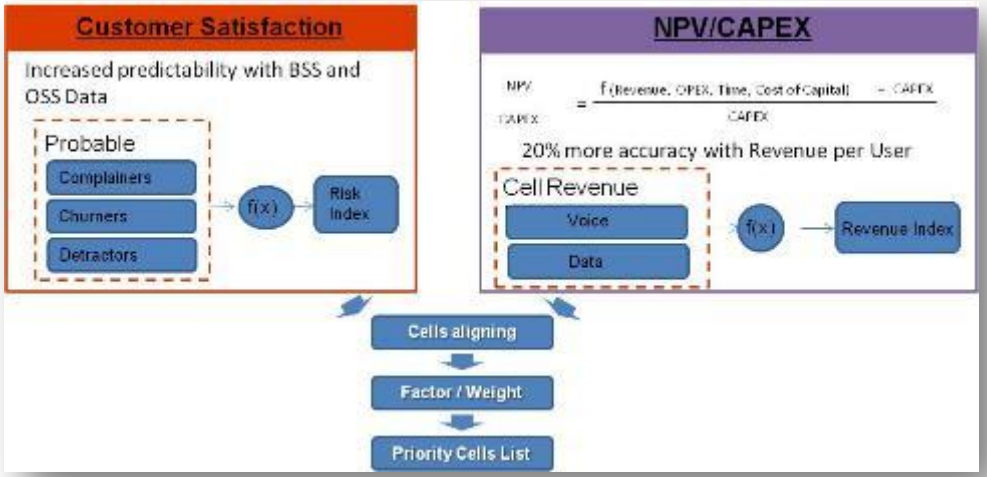
✔Roaming Customers Traffic-Churn reduction

- ✔Analysis of the location / hotspots where EE lose their roamers (due to insufficient coverage)
- ✔Recovery of 1.5% of roamers is considered as a benefit for the use case

✔Expected savings start from 2.5 Mio GBP per annum

Extra support for Enterprises / B2B customers and Account Management

Traffic / ARPU / Complaints Planning driven – OPEX Savings



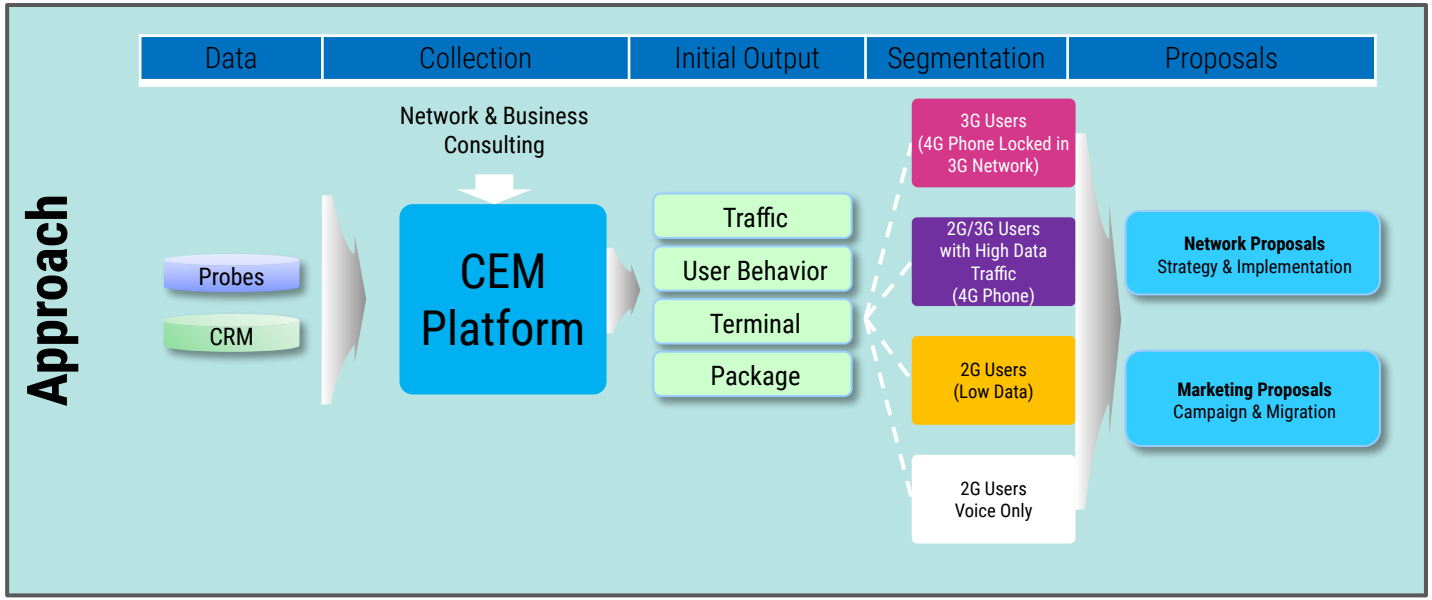
By ARPU / Complaints driven Planning EE can achieve better ROI and generate new revenue streams – all those will bring extra benefits for EE, which are not presented in BC at the moment (extra bonus)

Business Case

Manually with supportive tools		By Huawei CEM Platform
583	VS	60
Man days		Man days

£ 0.17M per year

2G-3G-4G Users Migration – Additional Revenue Generation

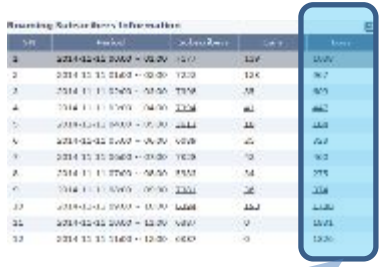


Assumed: 0.5% of current postpaid customers per year to be migrated

Assumed: 5% of monthly ARPU increased per user

1.3 Mio GBP additional revenue per year

Roaming Business Leakage Retention – Additional Revenue

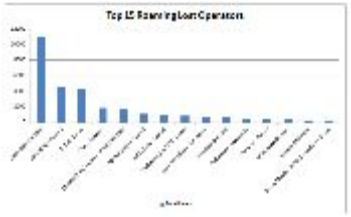


Step1: Lost roaming user detection

Step2: Collect lost roamer location details (Cell ID)

Step3: Prioritize network quality optimization

Huawei CEM Platform can demonstrate areas with last roamers activity – areas of roamers losing



Assumed: due optimized network the number of active inbound roamers will increase by 1.5%

This is expected to bring min 1 Mio GBP per year

Digital Marketing – data usage / CE / SQ Info via MyApp and online*

Summary (details in further slides):

✔Data usage and network experience details to customers via MyEE and online:

- ✔Ability for end users to query / see data usage via EE online or App
- ✔Customer Care efforts reduction due to digital channels migration

✔Simplification of the data queries by CC Agent by only one tool (instead of existing three)

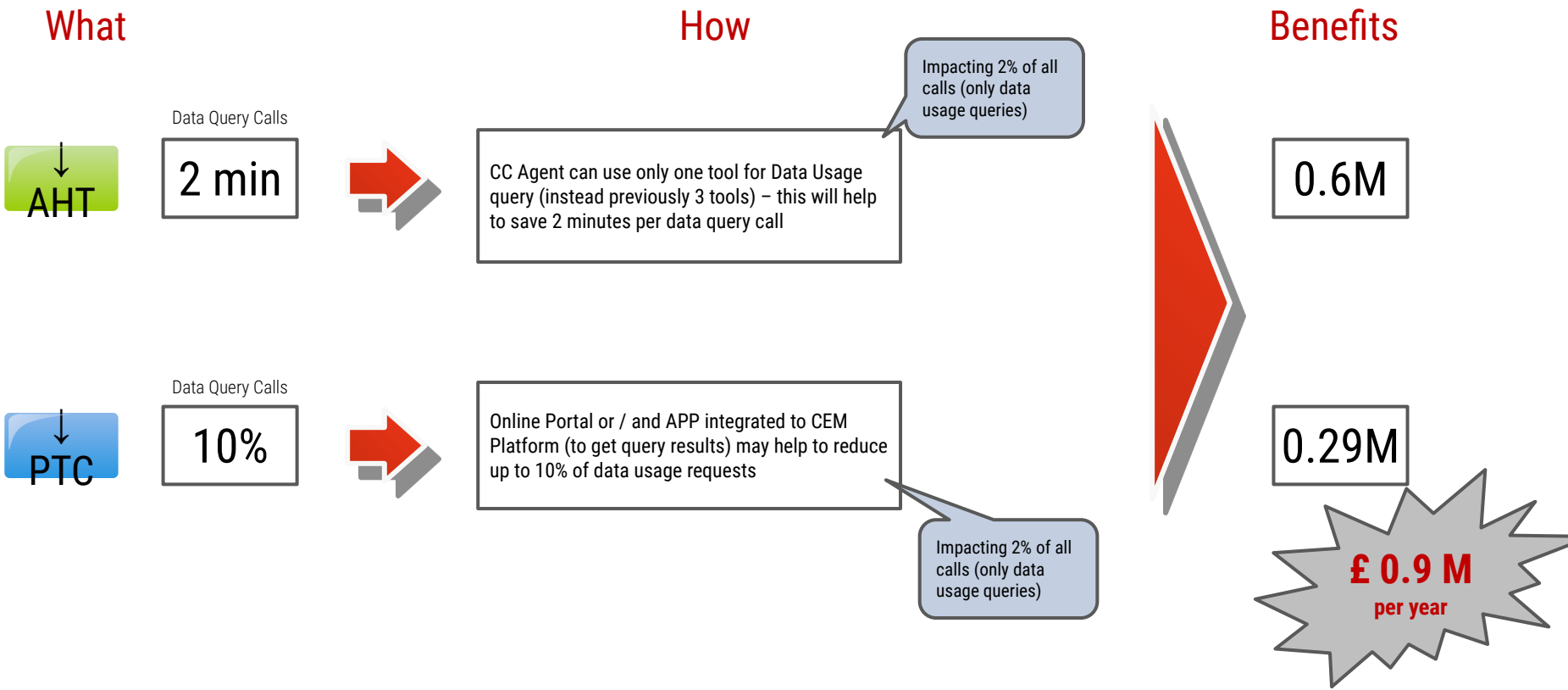
- ✔Assumed agent can query information from IT system by 2 minutes shorter than before
- ✔Applicable only for the data query calls (assumed 1.7% of all calls)

✔Expected savings start from 0.9 Mio GBP per annum

This case requires more detailed analysis dependant on number of queries

* As there is no specific technical requirement in RFP for CEM tool to support MyEE or online complaint, MyEE or online complaint support is out of the proposal scope and needs further discuss with EE

Data Query Calls Efficiency Improvement – OPEX savings



Appendix & Supportive Materials

1. SmartCare® Business Value on a Customer Case
2. Use Cases Set
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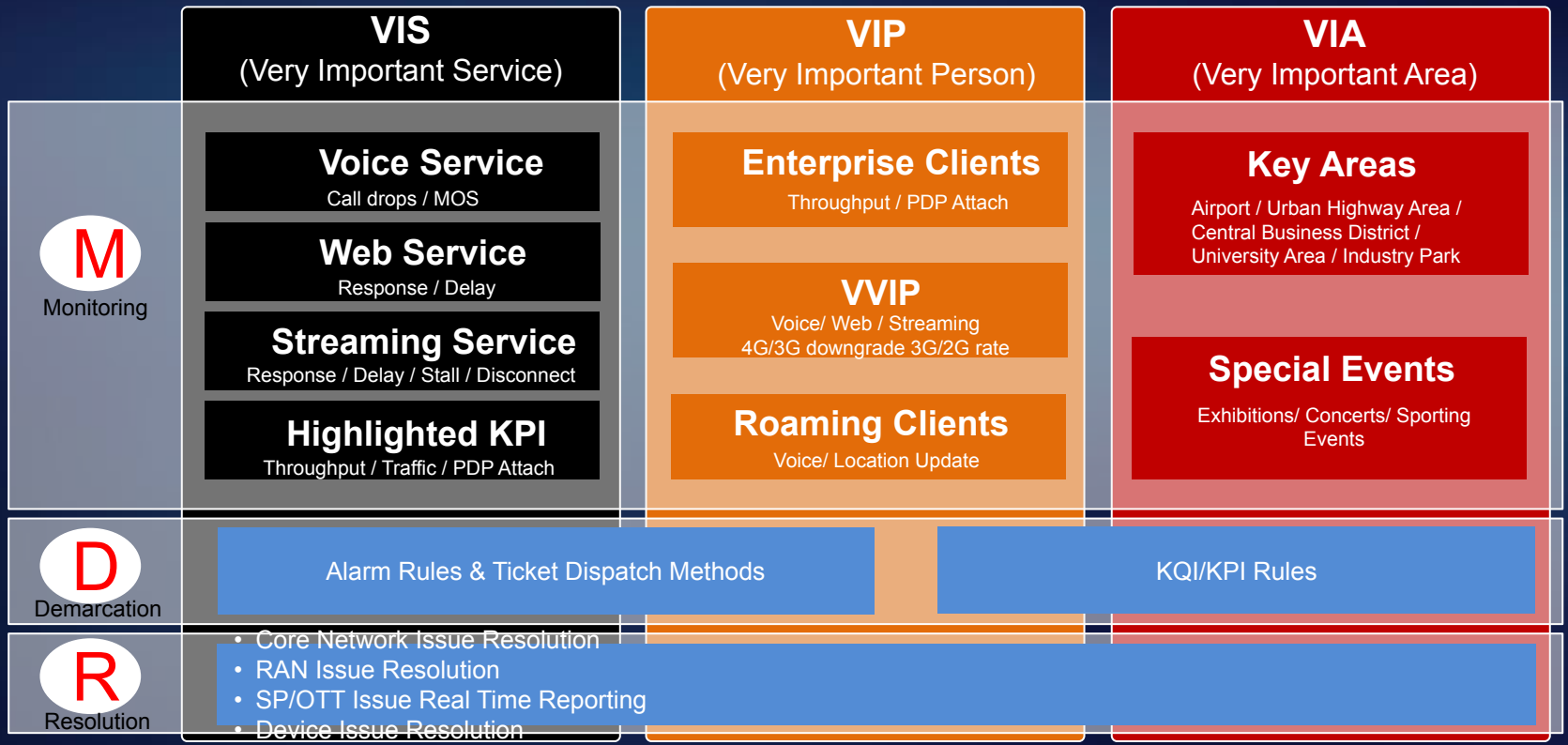
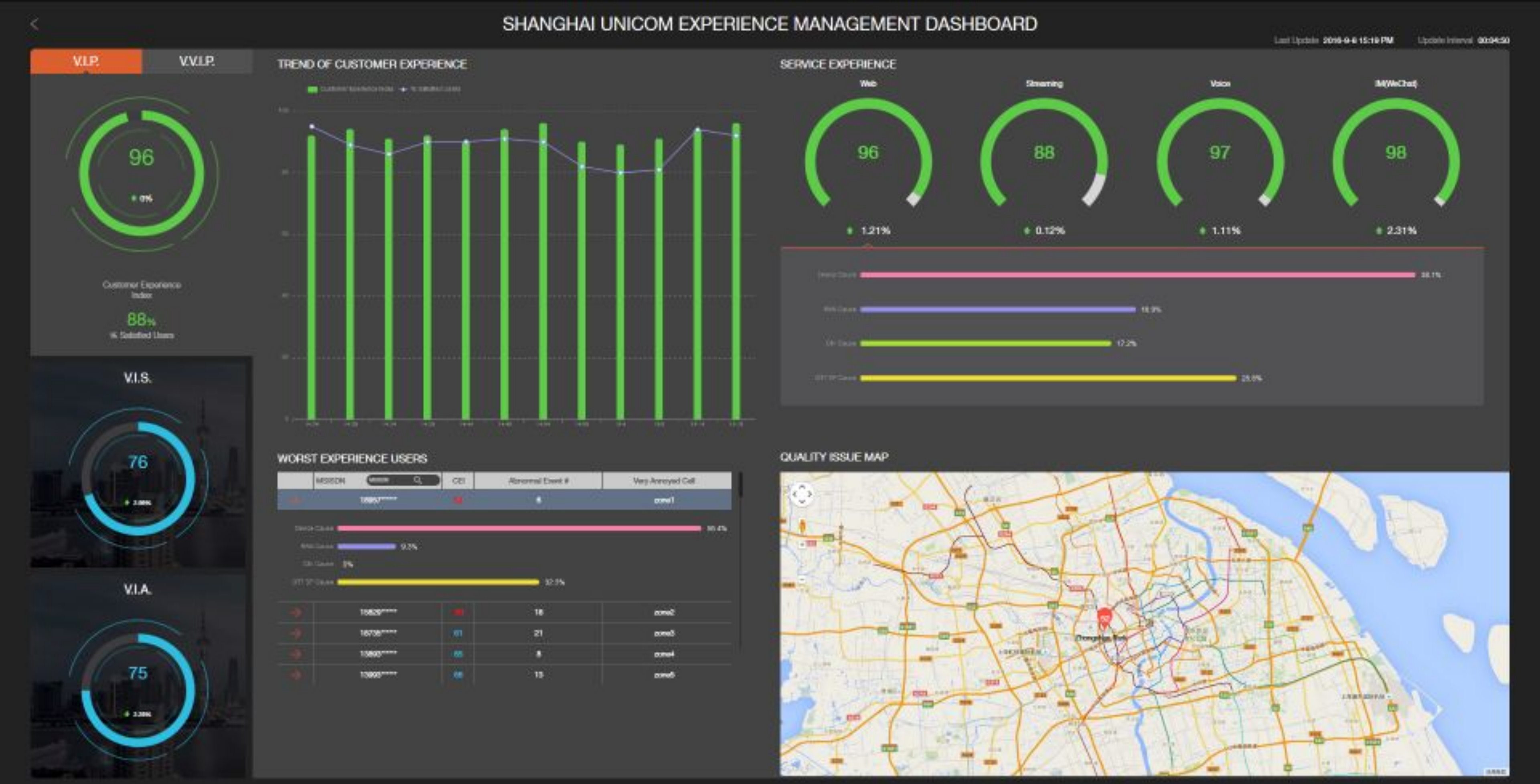
3V Demo – Supportive Materials

VIP / VIS / VIA Proactive Care Overview




Last Update 2016-9-8 15:19 PM
Time Left To Be Refresed 00:04:34
Very Important Person
96
0%
Satisfied Users
92%
V.I.P.
96
V.V.I.P.
98
Very Important Service
76
2.98%
Satisfied Users
73%
WEB
69
VOICE
92
STREAMING
75
WECHAT
74
Very Important Area
75
2.28%
Satisfied Users
72%
CAMPUS
74
HIGH-SPEED RAILWAY
78
HOSPITAL
73
GOVERNMENT
70
INDUSTRY ESTATE
80


SHANGHAI UNICOM EXPERIENCE MANAGEMENT DASHBOARD
V.I.P.
V.V.I.P.
96
Customer Experience Index
88%
% Satisfied Users
V.I.S.
76
V.I.A.
75
TREND OF CUSTOMER EXPERIENCE
SERVICE EXPERIENCE
Web
96
1.21%
Streaming
88
0.12%
Voice
97
1.11%
IM(WeChat)
98
2.31%
WORST EXPERIENCE USERS
MSISDN
CEI
Abnormal Event #
Very Annoyed Cell
QUALITY ISSUE MAP

SHANGHAI UNICOM EXPERIENCE MANAGEMENT DASHBOARD

Last Update 2016-09-08 15:20PM Update Interval 00:04:56

V.I.P.

96

0%

V.I.S.

76

2.88%

Customer Experience Index

68%

% Satisfied Users

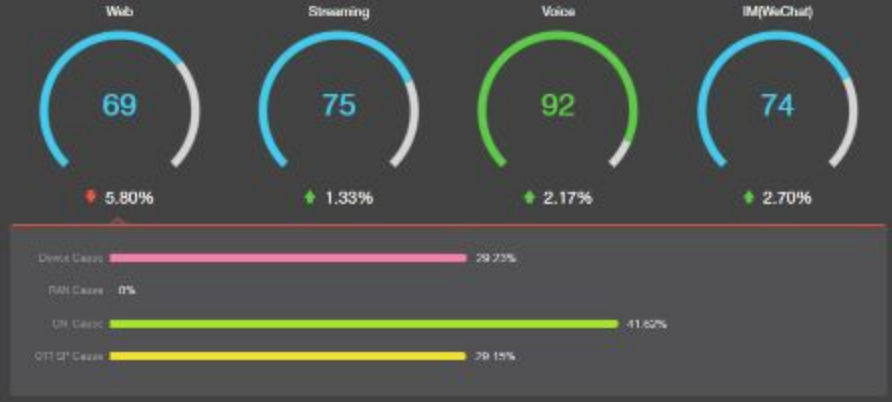
V.I.A.

75

2.28%

TREND OF CUSTOMER EXPERIENCE

SERVICE EXPERIENCE



RNC/BSC/ENB USER EXPERIENCE

	RNC/BSC/ENB	CEI	Web	Streaming	Voice	IM(WeChat)
↓	RNC01	66	68	70	83	88
	Cell01	68	68	65	88	86
	Cell02	66	69	74	81	82
	Cell03	64	67	71	80	84
	Cell04	60	62	70	87	82
	Cell05	69	68	65	88	88
	Cell06	69	61	69	87	85
→	RNC02	68	69	78	85	85
→	RNC03	64	69	70	84	86
→	RNC04	67	64	72	83	83

QUALITY ISSUE MAP

SHANGHAI UNICOM EXPERIENCE MANAGEMENT DASHBOARD

Last Update 2016-09-08 15:21PM Update Interval 00:04:45

V.I.P.

96

V.I.S.

76

V.I.A.

75

2.28%

Customer Experience Index

72%

% Satisfied Users

TREND OF CUSTOMER EXPERIENCE

AREA EXPERIENCE BENCHMARKS

Campus	High-speed Railway	Hospital	Industry Estate	Government
74	78	73	80	70

Web	Streaming	Voice	Wechat
65	70	90	68
3.23%	1.78%	2.65%	4.25%

AREA EXPERIENCE MAP

3V Demo – end of supportive materials

First 30 days journey – Supportive Materials

First 30-Day Journey

Winner of “Best CEM Culture Transformation Program”

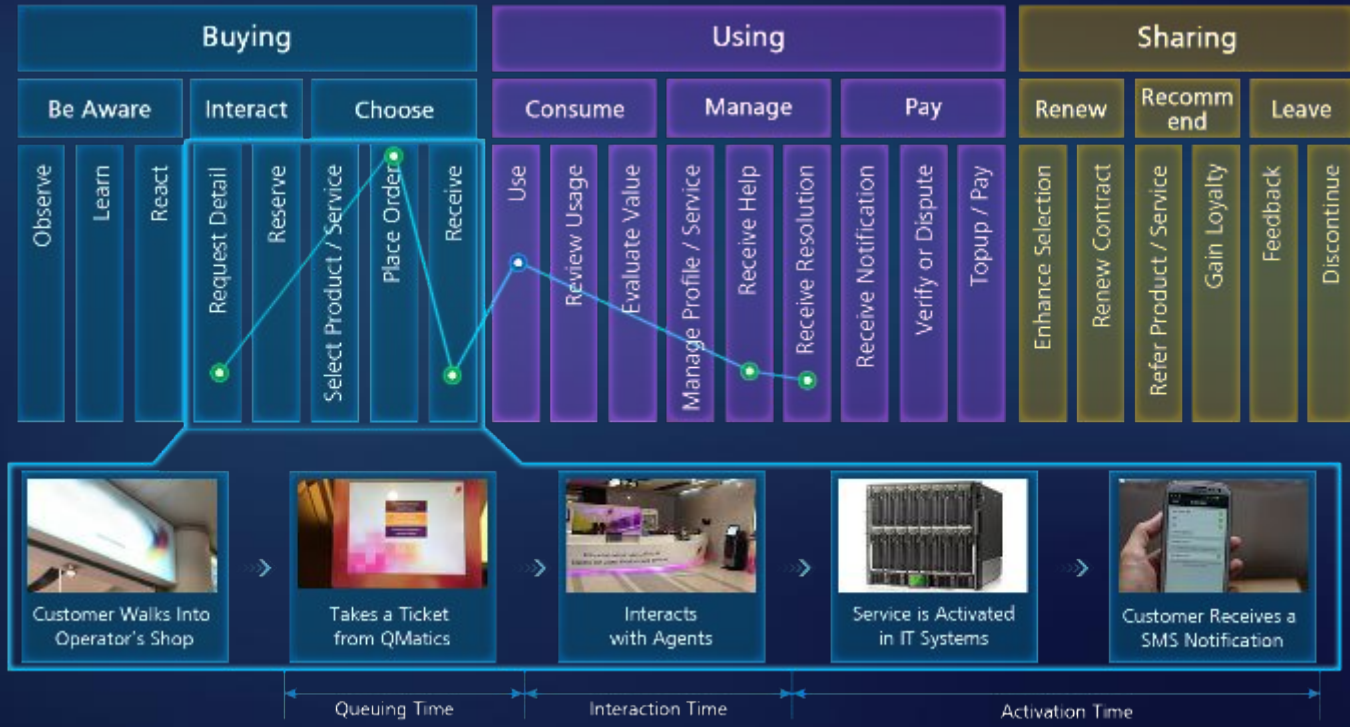
Business Objectives :

- Improve Position in High Value Post-paid Market
- Exploit First Mover Advantage from Early LTE Launch

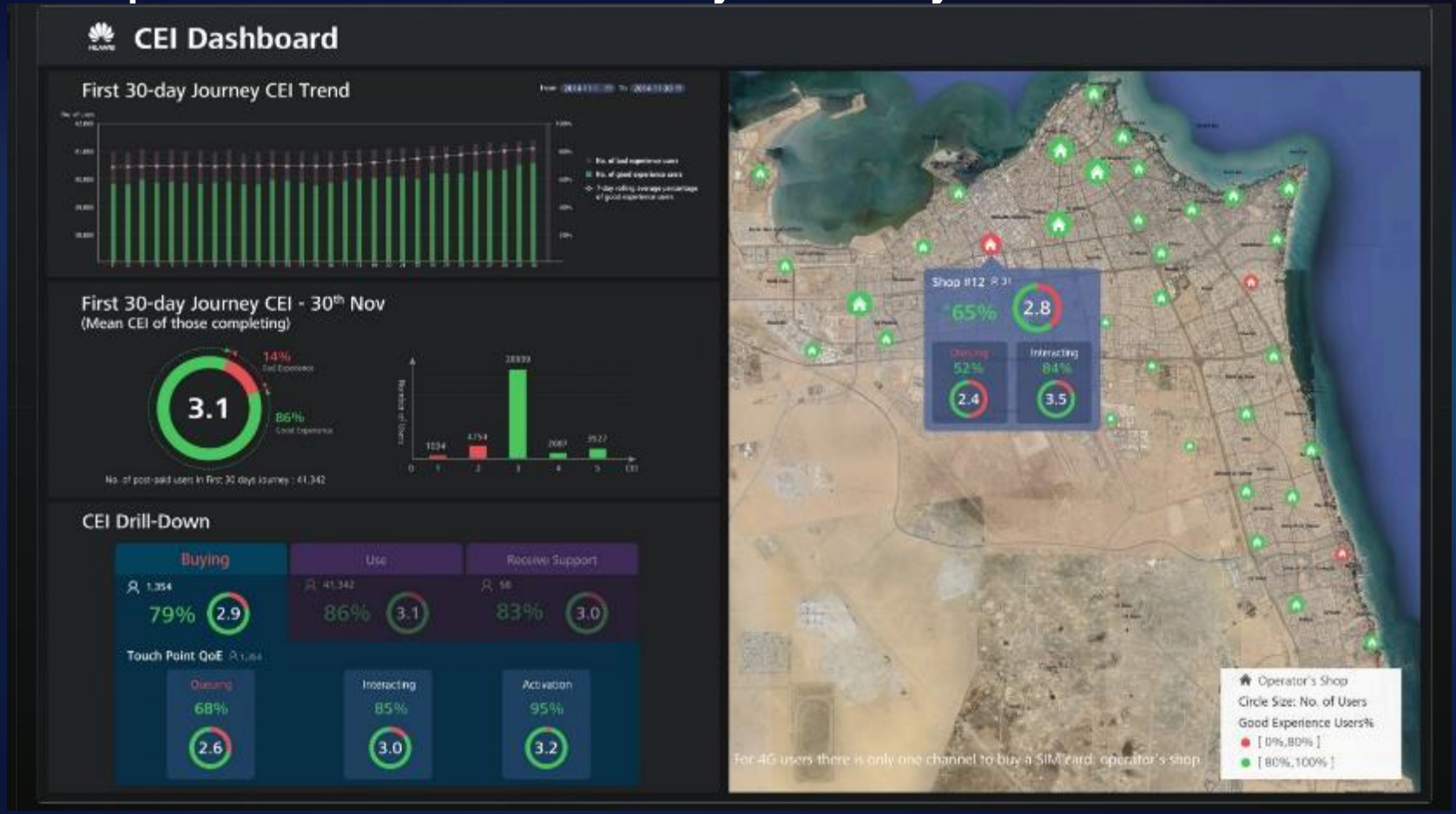
Customer Experience Management :

- First 30-day Experience Assurance (ICT Journey)

Complete View of the 30-day Journey



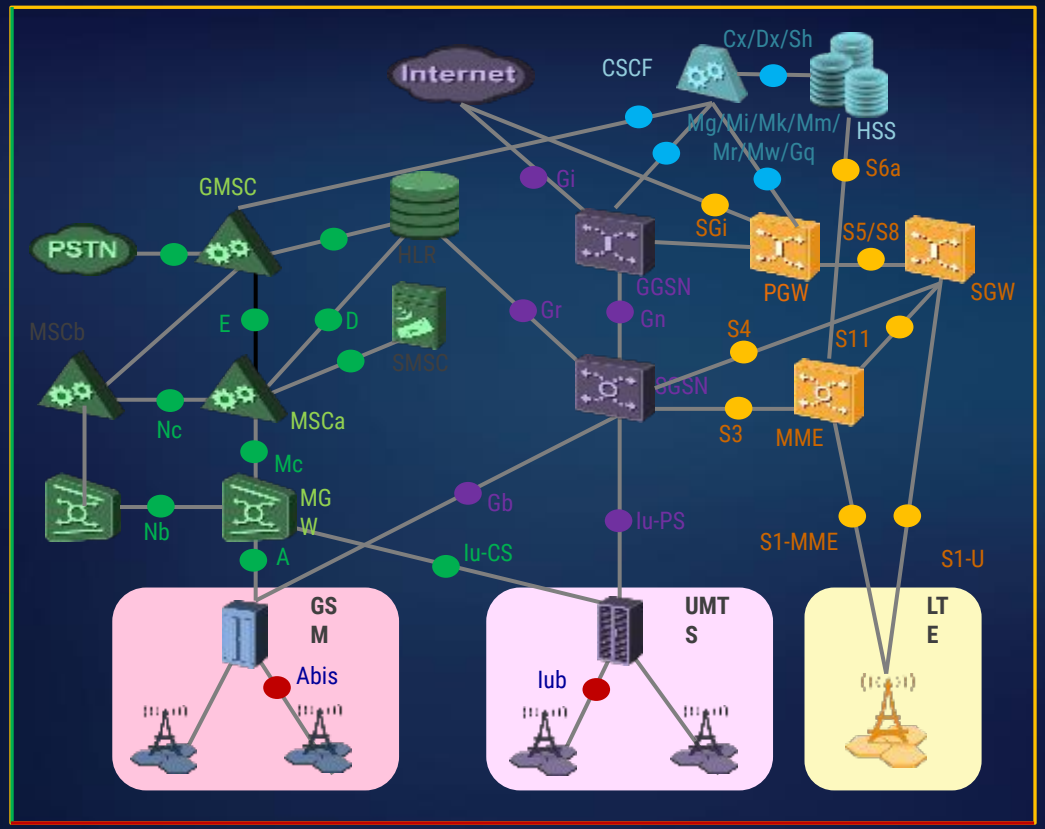
Complete View of the 30-day Journey



First 30 days journey – end of supportive materials

Architecture & Platform – Supportive Materials

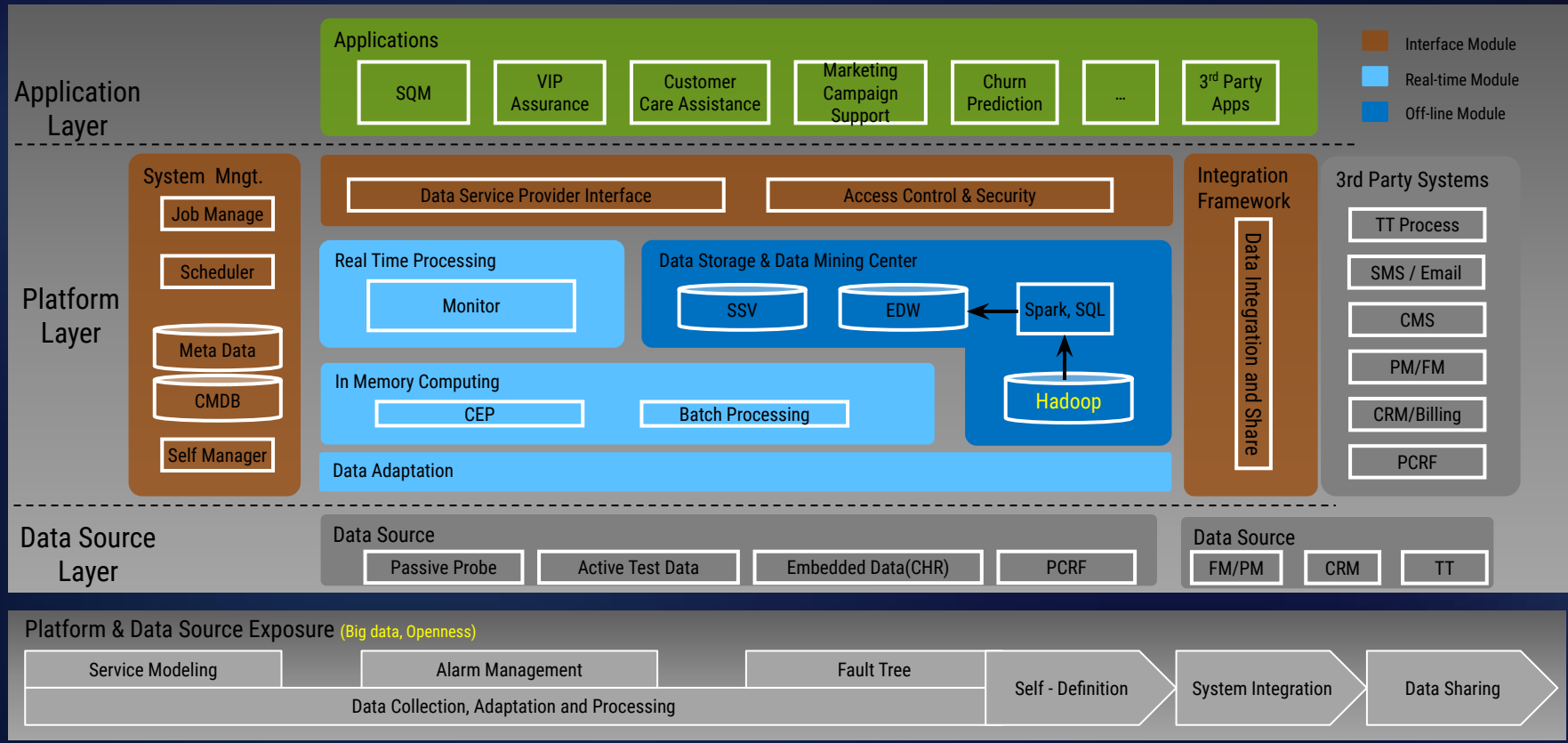
Network Data Sources



Domain	Interface	Protocol
Wireless	Abis	RR/BTSM
	Iub	NBAP
Core CS	A	BSSAP
	IuCS	RANAP
	Nc	BICC/ISUP/SIP
	Nb	RTP/RTCP
	Mc	H.248
	C/D/E/F	MAP
	CAP	CAMEL
Core PS	Gb	BSSGP
	IuPS	RANAP
	Gr	MAP
	Gn	GTP
	Gi	Gi-U, Gi-Radius
IMS	Gm, ISC, Sh/Dh, Cx/Dx, Mr, Mx, Mi, Mj, Mg, Mw DNS	SIP/Diameter
LTE	S1-MME	S1-AP
	S1-U	GTP-U
	S6a	Diameter
	S5/S8	GTP
	S11	GTP-C
	SGi	TCP/UDP
	S4	GTPv2
	S3/S10	GTP

Platform Architecture

500 Gbps probe capability & 1800+ protocols identification



Platform & Data Source Exposure (Big data, Openness)

Service Modeling | Alarm Management | Fault Tree | Self - Definition | System Integration | Data Sharing

Data Collection, Adaptation and Processing

CEM Platform to deliver value through use cases

Customer Care

Efficient Assistance for Customer Complaints Management

Service Quality Management

Proactive and preventive management of service quality

Customer Experience Management

Big Data Analytics and E2E view on customer experience with business impact

Web-based Application Presentation Layer

Report Engine | KQI/KPI Definition | Dashboards | **SEQ Analyst** | Alarm Management | Role & Auth Management | Log System

Data Mediation and Preprocessing Subsystem

Fixed Management Platform + SIG / NetProbe…

IPTV / Broadband

CS & PS Data

Net-Probe

Discovery-Geo

Mobile Agent

Mobile Networks (2G/3G/LTE)

Big Data

Other sources

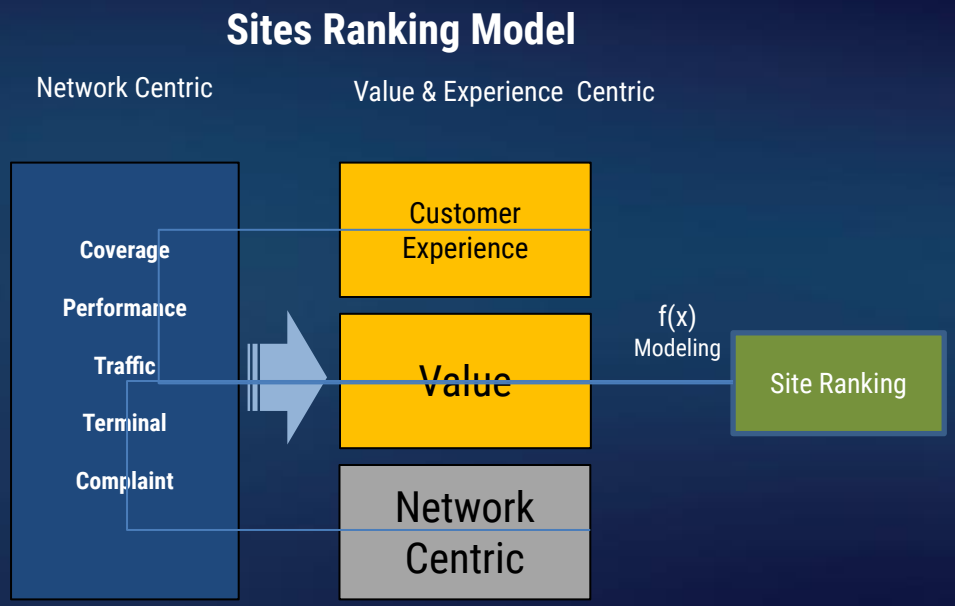
- Customer Care
- ITMS
- FM
- E-Mail Server
- SMC
- Other system

Value through Use Cases for Operator's needs

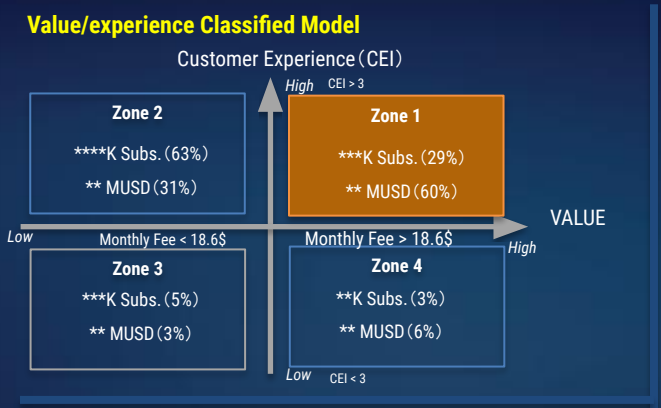
Architecture & Platform – end of supportive materials

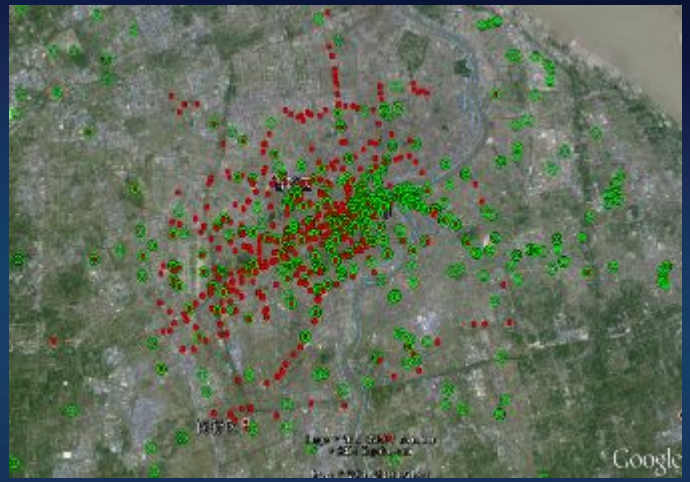
ARPU Driven Network Planning – Supportive Materials

Quality Brand Experience & Value Driven Site Ranking



Quality Brand Experience & Value Driven Site Ranking





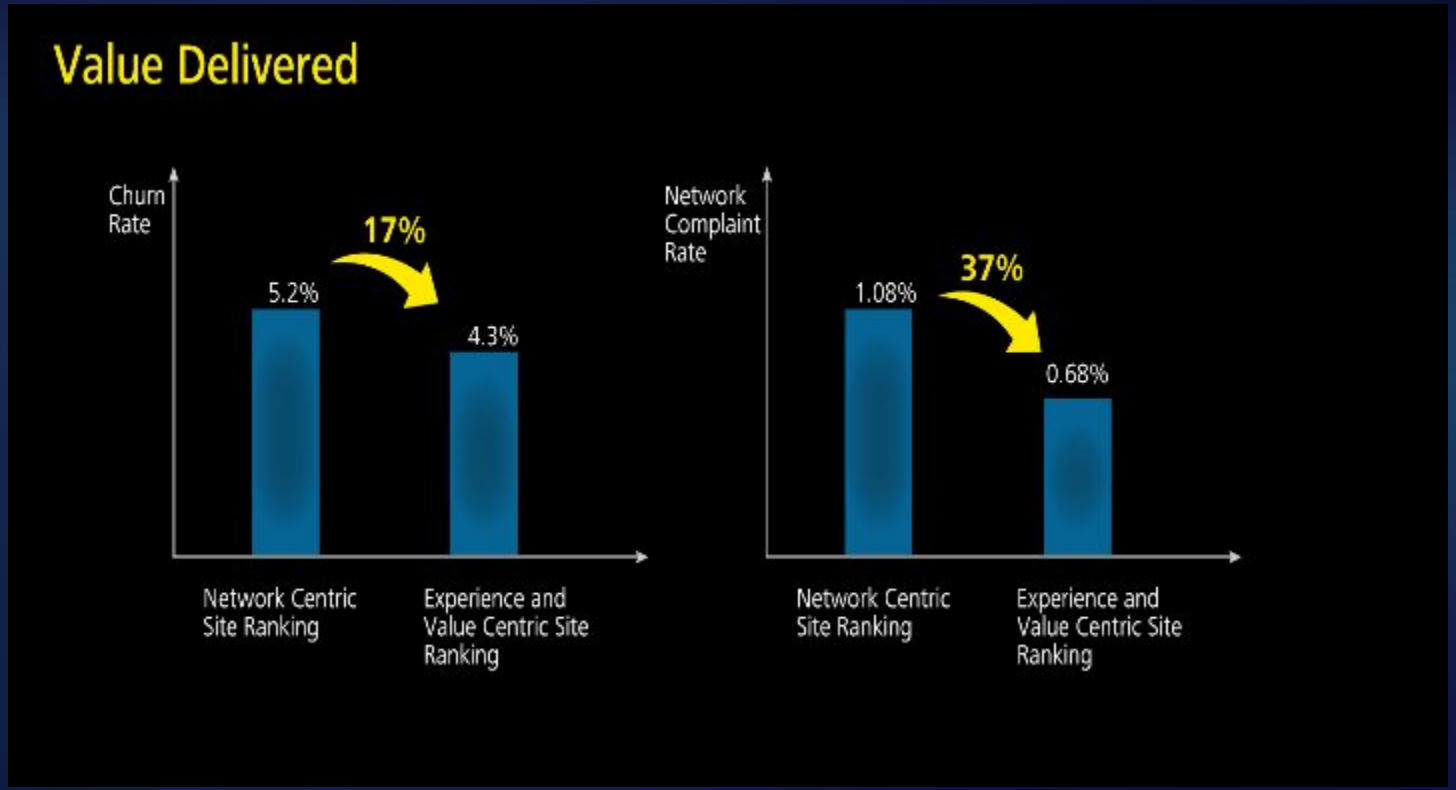
23.7%

Matched with Traditional KPI Focused List

Zone 4 Target Sites

Traditional KPI Focused TOP 1000 Sites

Quality Brand Experience & Value Driven Site Ranking

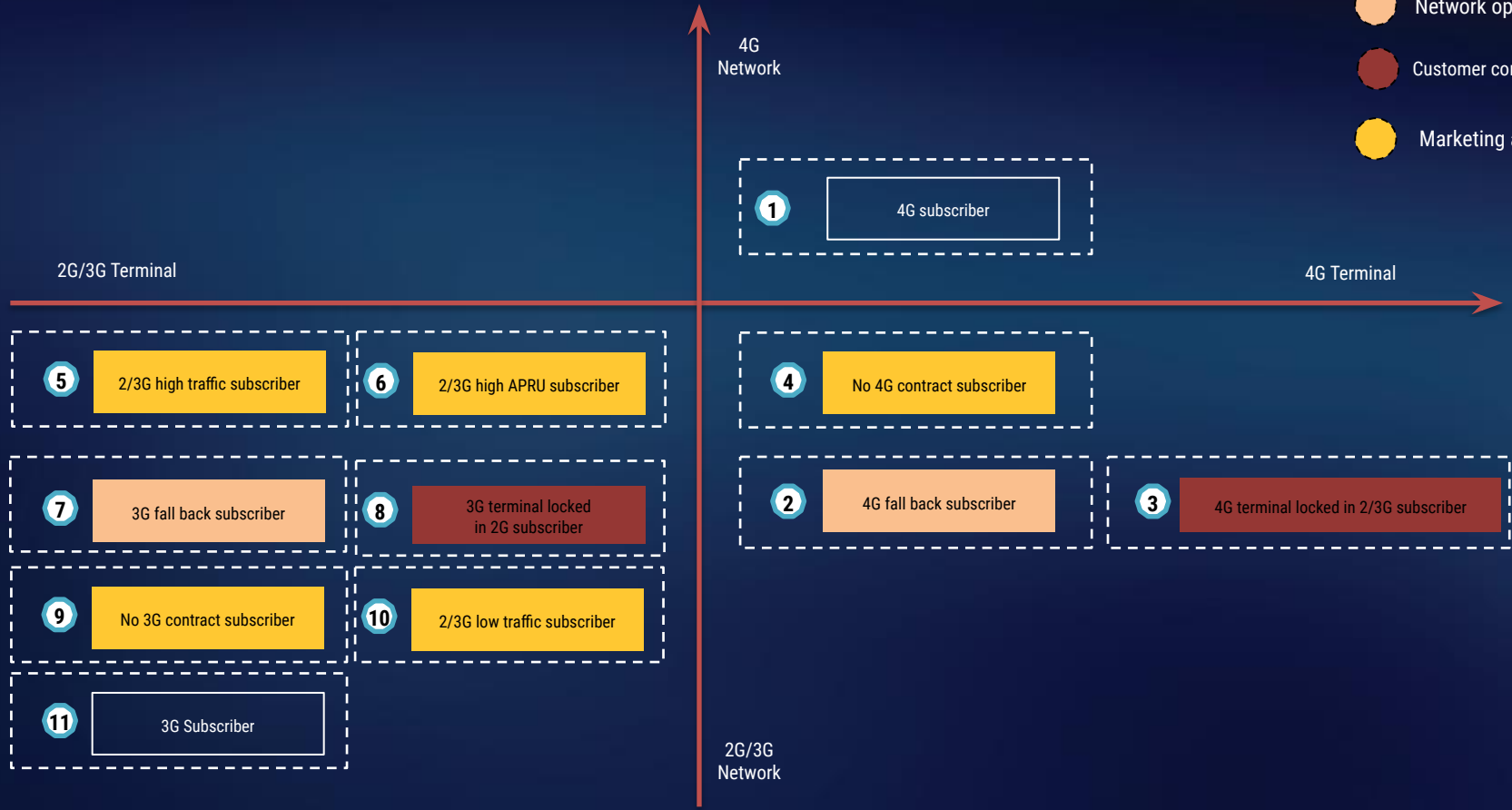


Quality Brand Experience & Value Driven Site Ranking

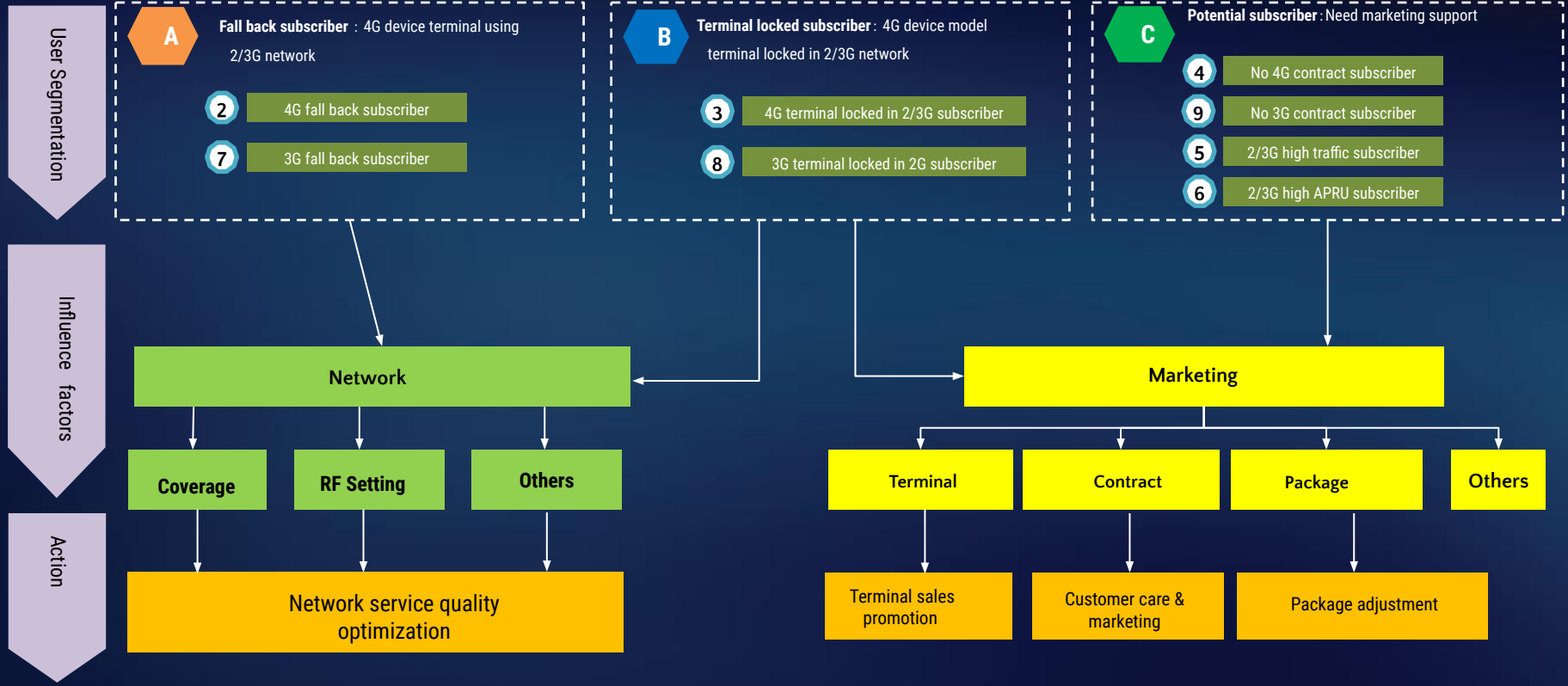
ARPU Driven Network Planning – end of supportive materials

2G/3G/4G User Migration – Supportive Materials

2G to 3G to 4G Subscriber Migration Matrix

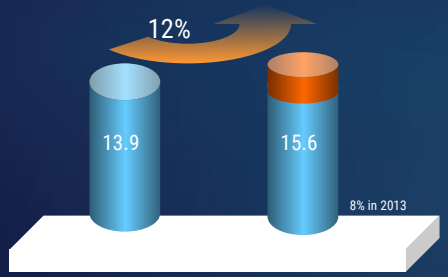


Migration Analytics to Action Overview

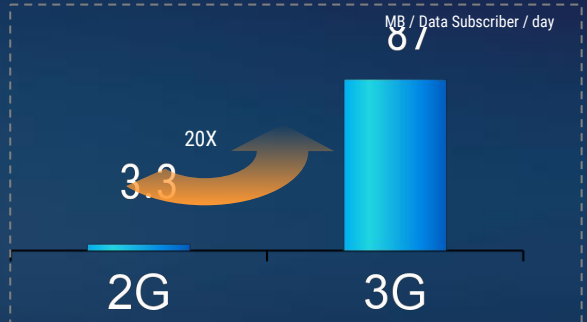


Best Practice in Operator U

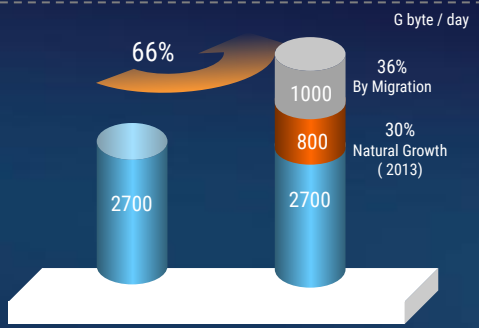
1.7 million of 2G subscribers migrated to 3G



1.7M 2G Subscriber Migrated to 3G



20X Traffic Uplift of Migrated Subscriber



66% More Traffic Increase

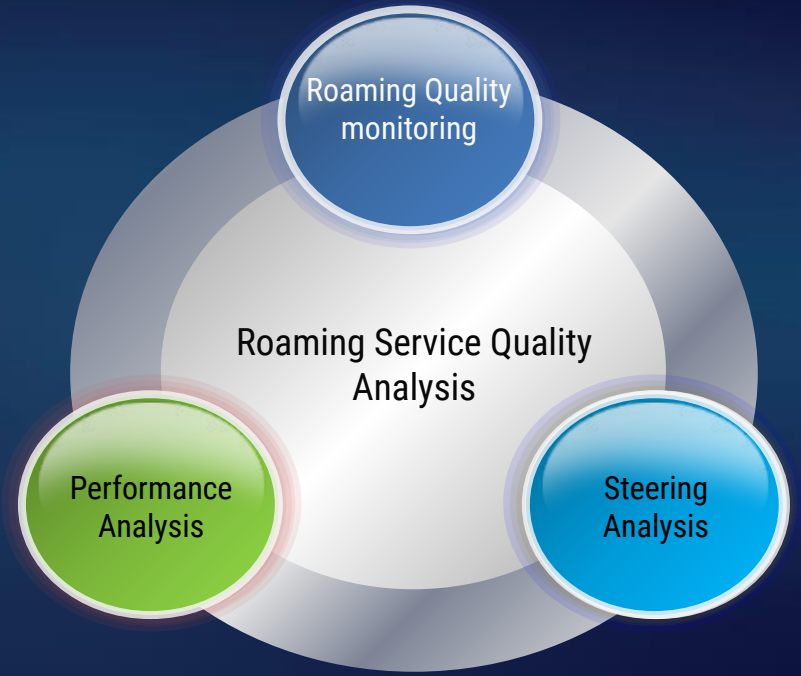
Operator has **0** cost

1. PSPU capability
2. Device type correlated with traffic type
3. Segmentation base on subscriber behavior

2G/3G/4G User Migration – end of supportive materials

Roaming Service Quality Assurance – Supportive Materials

Solution Overview



Roaming Quality Monitoring

Sel ect car

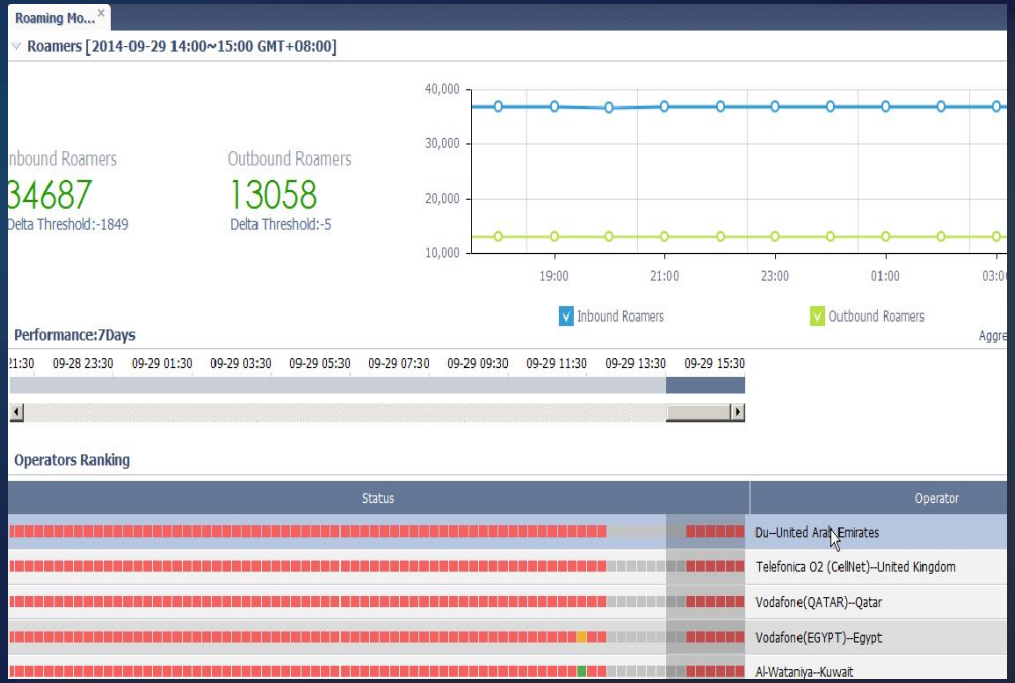
Sel ect KPI

Co nfig ure thr

Per for m mo

Key Monitored Contents:

- Number of inbound and outbound roamers
- Historical trend for the number of inbound and outbound roamers
- Specified KPIs and carrier
- Top poor-quality carriers ranking
- Supports drilldown to trend analysis.
- Interfaces include MAP, CAP, ISUP, Gp, IuPS, S1MME, S8, and S6a.
- KPIs of LU, Voice, SMS, and Data services



Performance Analysis

Inbound and outbound roaming KPI ranking

Roaming performance KPIs

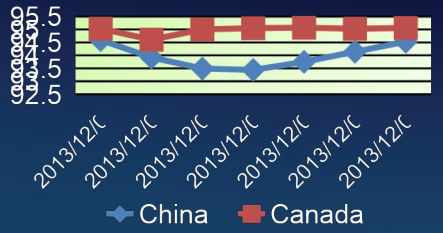
Performance Ranking

Roaming KPIs ranking by country/carrier/region

Performance Trend

Roaming performance historical trend by country/carrier/region

Roaming LU SR (%) History Trend



RAN issue

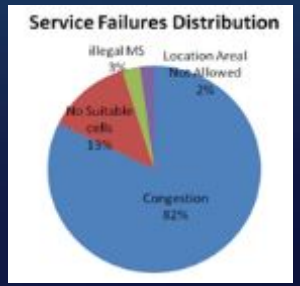
SP issue

Device issue

……

Problem Demarcation

Failure analysis and detail record analysis



Steering Analysis

Steering identification

Identify steering status of carriers in different countries

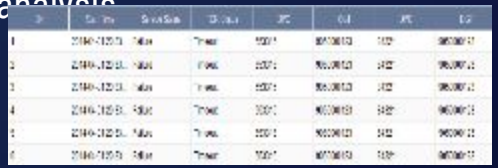
Country	Operator	LU Attempt	Steering	Steering Success Rate
A	XXX	59545	59545	100%
B	XXX	46324	46324	100%
C	XXX	41037	28746	70%
D	XXX	36928	23654	64%
.....	...	...	...	

Steering Analysis

Steering failure analysis

Steering failure code distribution

Steering detail record analysis

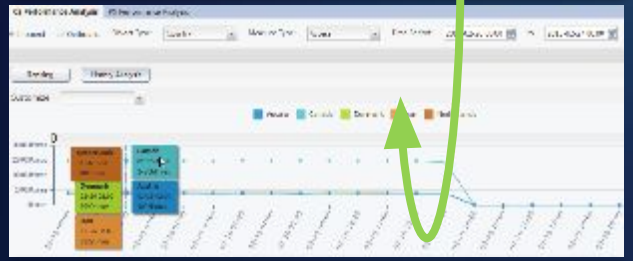


Best Practice

Roaming KPI Analysis

Select query criteria, including Time Period, RAT, Roam Type.

Top 10 country/Carrier list. And then select the indicator such as Location Update Success Rate.



Using History Analysis function to see the indicator history trend.

Roaming KPI Demarcation

Using failure analysis and detail record analysis to demarcation Roaming failure.

Failure cause category and cause analysis distribution for demarcation roam failure.

Detail Record analysis to see the detail failure information and signal flow

Suggestions:

1. Confirm the roaming user has been configured in the network.
2. Need check MAP log for detail reason of network failure.

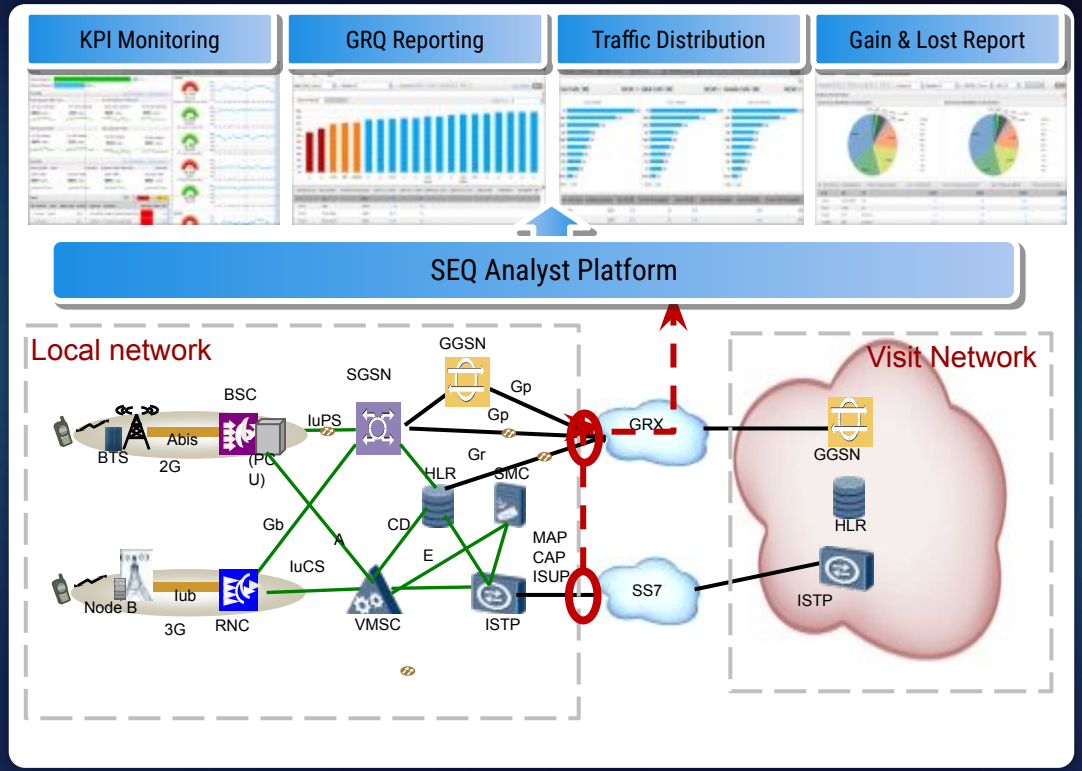
International Roaming Analysis

Background:

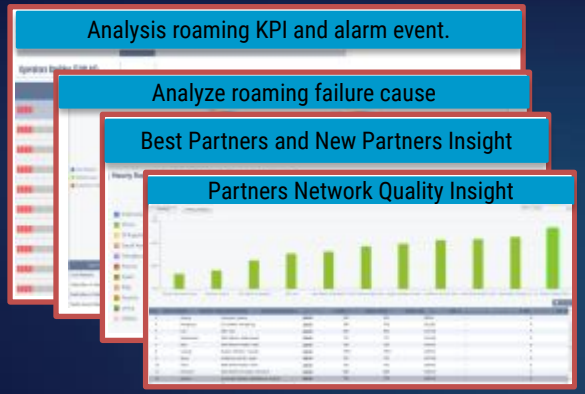
- The right partnerships are critical for optimal roaming revenues(Best Roaming Experience and Appropriate Rate);
- The operator need detailed, prioritized and actionable information to avoid roaming revenues lost;
- The operator need finely solution to optimize network for increase roaming traffic

Value Proposition:

- Increase roaming traffic
  - Fast fine and locate inbound roaming barriers
  - Indentify the outbound roaming destination gaps
- Avoid roaming revenue lost
  - Detect roaming fraud behaviors
  - Provide proofs for controversial roaming billing settlement
- Reduce MTTR of roaming issue
  - Real-time roaming traffic and performance monitoring
  - Deeply root cause analyze base on per roamers
- Gain new business opportunity
  - Provide competitive SLA to gain more roaming partners
  - Up-sell promotion base on rich roaming service analysis



Roaming Business More Effectively



Roaming Analyses help operator run roaming network more effectively

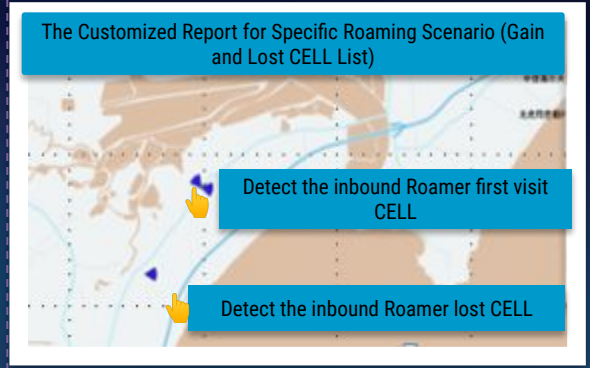
- Real-time roaming traffic and performance analysis, deeply cause analyze base on per roamers, It can help operator reduce MTTR of roaming issue and gain new business opportunity
  - ✔ Which operators have the bad or best networks? Why cannot connect to network?
  - ✔ Which operators should be your best partner with?
  - ✔ Which operators should be your new partner with?

1. Fraud: HPLMN send bar to VPLMN to limit the calling right , but VPLMN not receive the bar
2. Steering: HPLMN steer roamers onto best partners networks to ensure QoS and cut costs
3. Anti-Steering: VPLMN reserve the inbound roamers onto network to increase revenue

Anti-steering is proscribed by the GSMA

Roaming Audit help operator avoid roaming revenue lost

- Roaming audit can help operators to prevent revenue losses through find:
  - ✔ Fraud calls: Cast back the lost revenue
  - ✔ Steering: Perfect QoS and cut costs
  - ✔ Anti-steering: Visit PLMN Increase roaming revenue , but Home PLMN is a casualty



Roaming Gain & Lost analyses help operator promote the roaming traffic

- Roaming Gain & Lost analyses can help operator to increase number of first visiting roamers and roaming traffic through optimize following cells:
  - ✔ Top cells for roamers may be lost to competitors
  - ✔ Hot cells for first visiting roamer

Roaming Service Quality Assurance – Supportive Materials

VVIP Service Quality Assurance – Supportive Materials

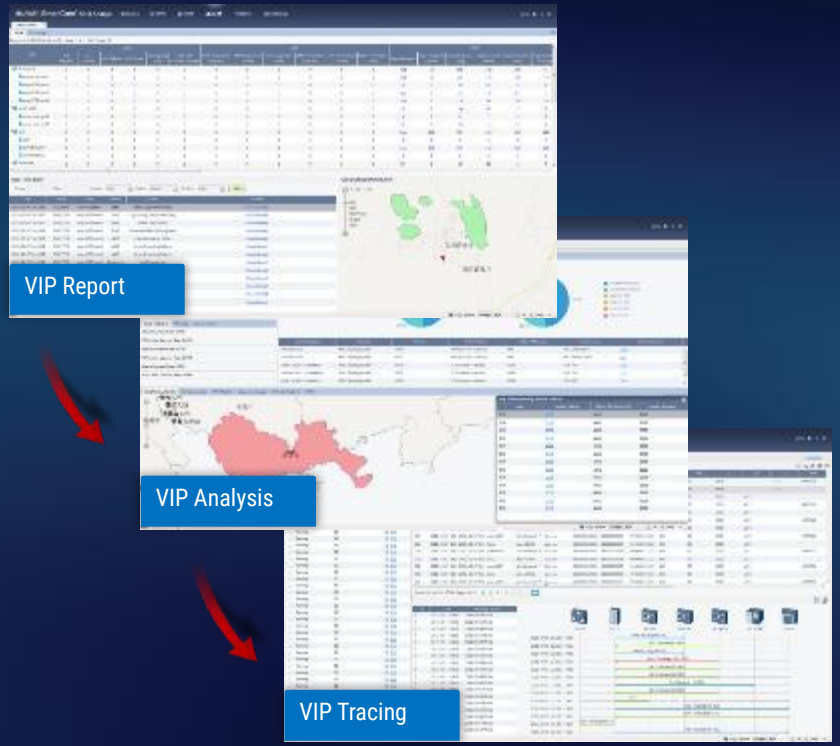
VIP Assurance

360°VIP Understanding:

- What application the VIP is using.
  - HTTP, Video, MMS, WAP, FTP, Email, Voice, SMS
- Where the VIP is.
- What handset the VIP using.
- What network assets are being using.
- What errors the customer experiencing.

Used to:

- Understand the VIP Failure in real-time.
- Fast analyze any problem of VIP.
- Measure the impact of service decline to VIP.
- Provide data source to evaluate the QOE of VIP.
- Steer the optimization to improve VIP experience.



VIP and VIP Groups Real Time Monitoring

VIP Management :

- 1 000 VVIPs Real-time Care
- 2 000 VIP Groups Under Real-Time Care
- Voice service and packet service.
- Drill down analysis to call trace

Customer Group Management:

- Grouping customer by data consumption volume, spending characteristics, device, etc.
- Analysis by distribution, terminal, root cause

VIP Group CS Weekly Report

VIP Group PS Weekly Report

VVIP Monitoring --1 minute interval

CS Service : Voice, SMS
PS Service : MMS, Web, WAP, Streaming, Email ...

VIP Group Management –5 minutes interval

VIP Group CS and PS Service Quality monitoring

VVIP/VIP G... | Customer/C...

VVIP | VIP Group

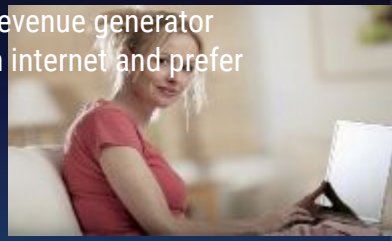
Period: 2012-06-21 00:00-15:15 Area: XL

VIP Group	WEB						WAP				
	Page Requests	Page Response Failures	Page Response Delay	Page Browsing Failures	Page Browsing Delay	Page Download Throughput	Page Requests	Page Response Failures	Page Response Delay	Page Browsing Failures	Page Browsing Delay
XL IPHONE VIP	1059	282	23	337	32	513	4	0	0	0	0
XLVIP	2919	571	83	768	129	1468	261	48	65	15	16

VIP Experience Insight

Start from 21:00,09 May 2016
Her video stalled frequently

User 1, High revenue generator
Like surfing in internet and prefer Youtube



Real-time KQI alarm triggered

Time	User	Service	Failures
2012-10-09 21:00	User 1	Youtube	Streaming Stall Frequency over threshold
2012-10-09 21:01	User 1	Youtube	Streaming Stall Frequency over threshold
2012-10-09 21:03	User 1	Youtube	Streaming Stall Frequency over threshold

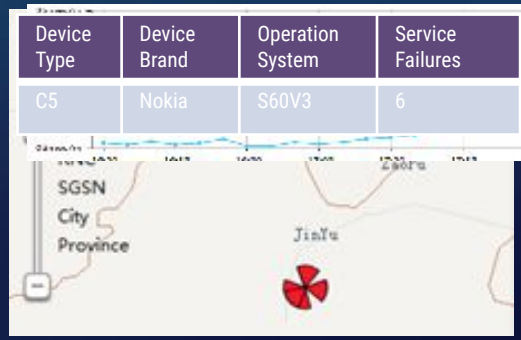
Experience Insight

Failure history analysis

Location Analysis

Device Analysis

Device Type	Device Brand	Operation System	Service Failures	Service Requests	Service Failure rate(%)
C5	Nokia	S60V3	6	10	60%



Discover VIP's service abnormity within 1 minute

VVIP Service Quality Assurance – Supportive Materials

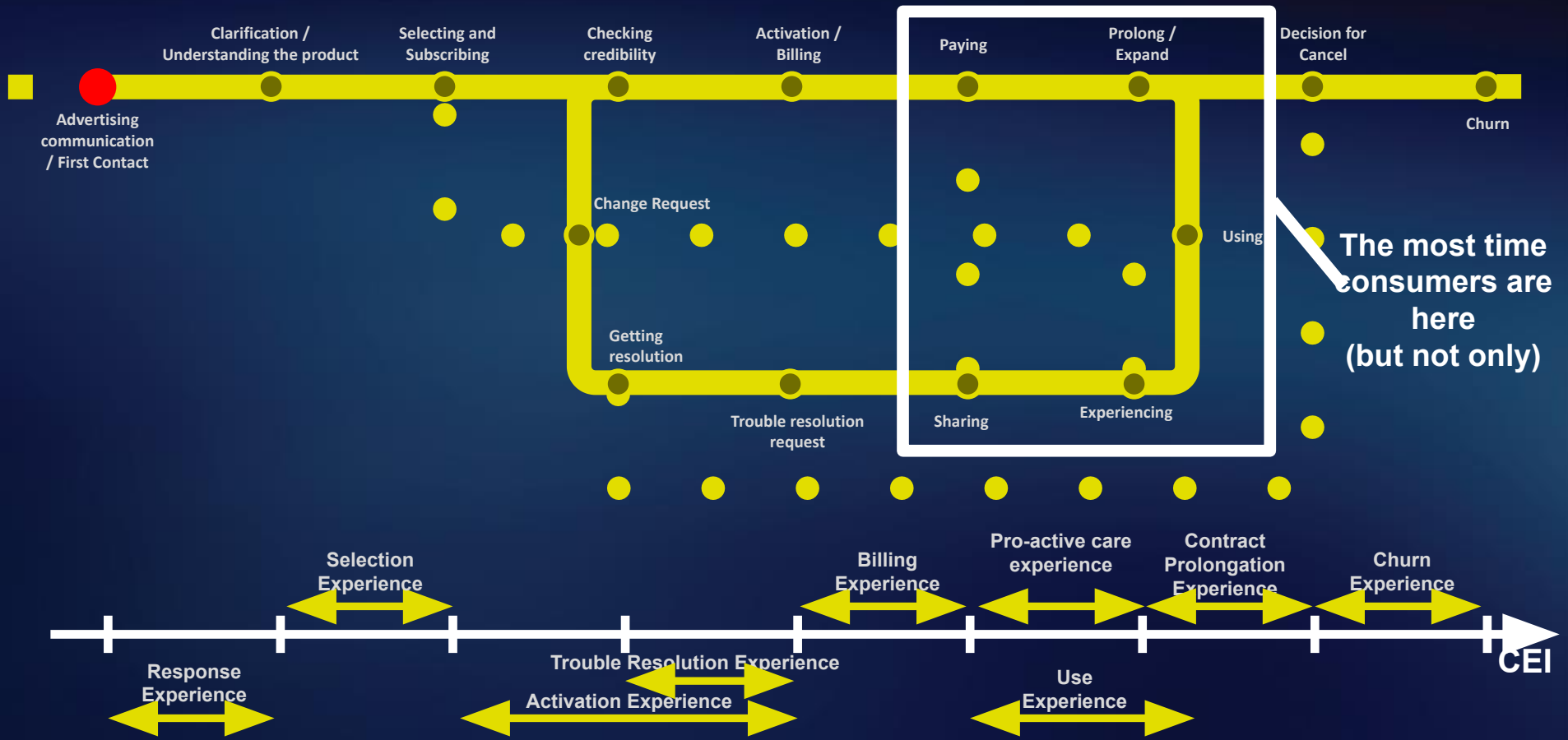
Customer Experience from whole Customer Journey

Consumer

- ✔ Advertisement
- ✔ Product Information
- ✔ Product Comparison
- ✔ Subscribing
- ✔ Activating
- ✔ Using
- ✔ Paying
- ✔ Requesting for Help
- ✔ Resolving
- ✔ Prolonging / Canceling

Here are touch points within a complete Customer Journey

Journey and Touch Points – Experience is in between

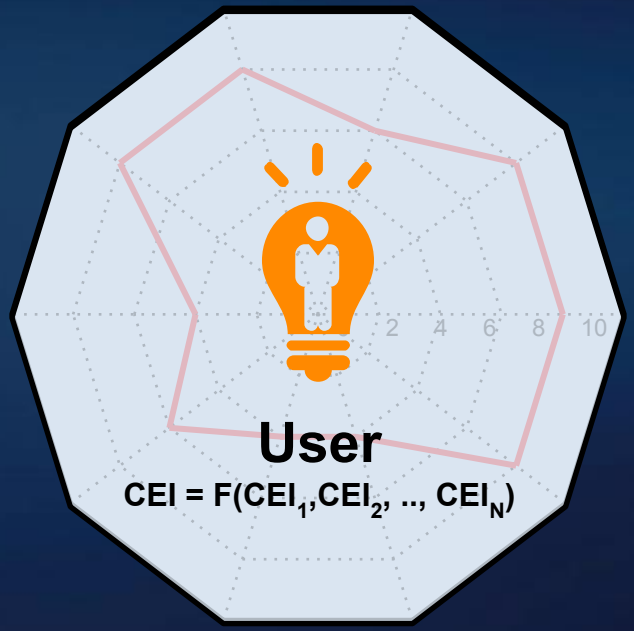


KPI from each Point to create CEI of End User

- Expecting
- Selecting
- Buying
- Using
- Sharing
- Prolonging

Some Touch Points examples

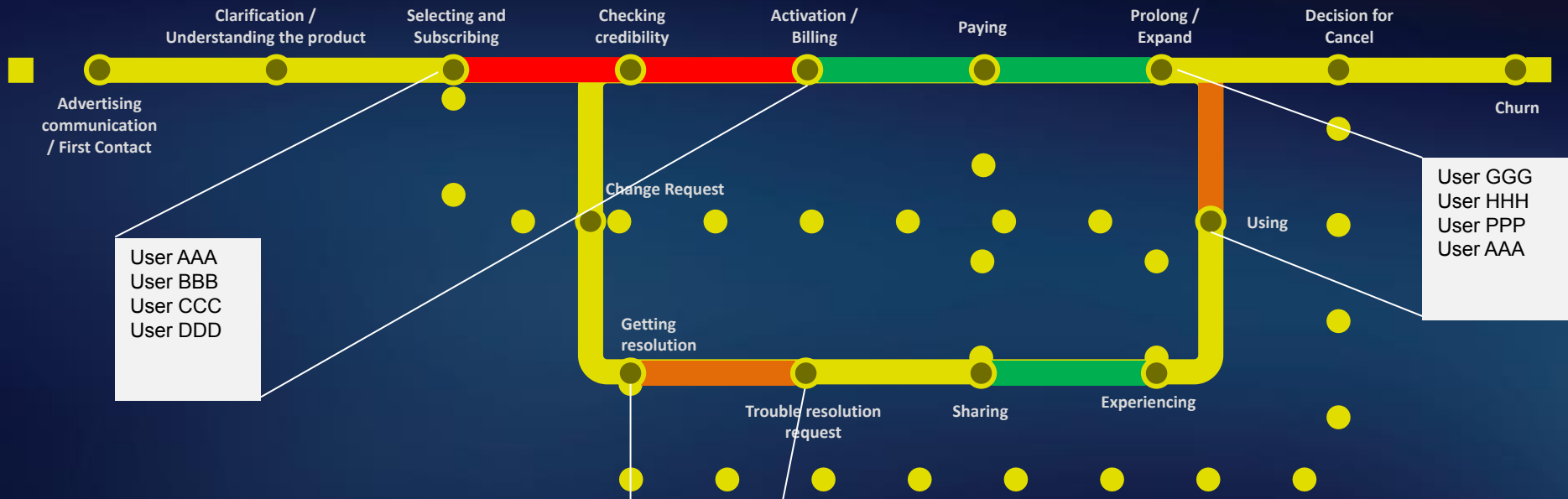
CEI – Customer Experience Indicator



Do you already cover complete Customer Journey for your CEM?

HUAWEI

Snapshot to show Impact to User Experience

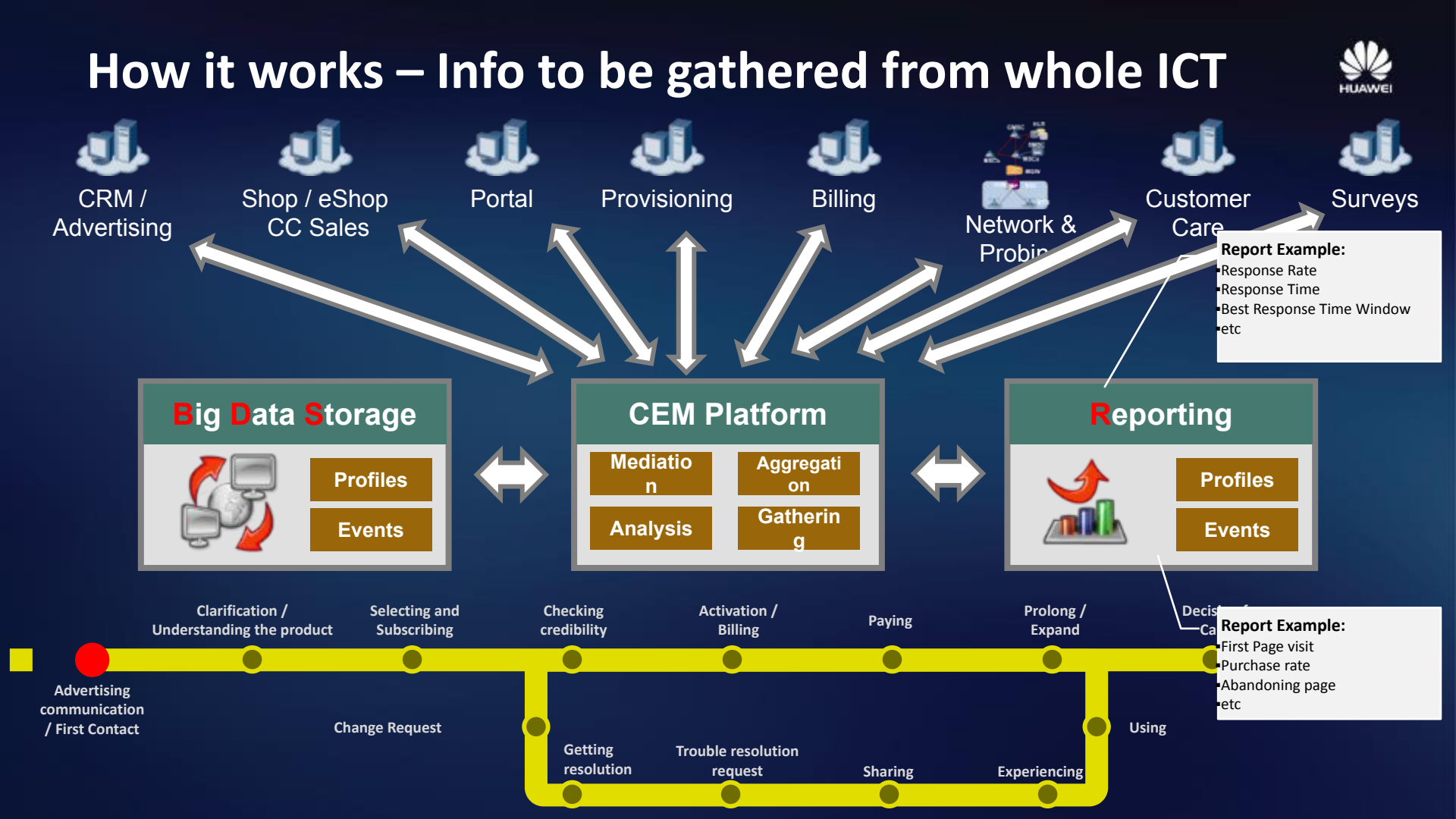


What is the real most concerned factor for majority of Users?

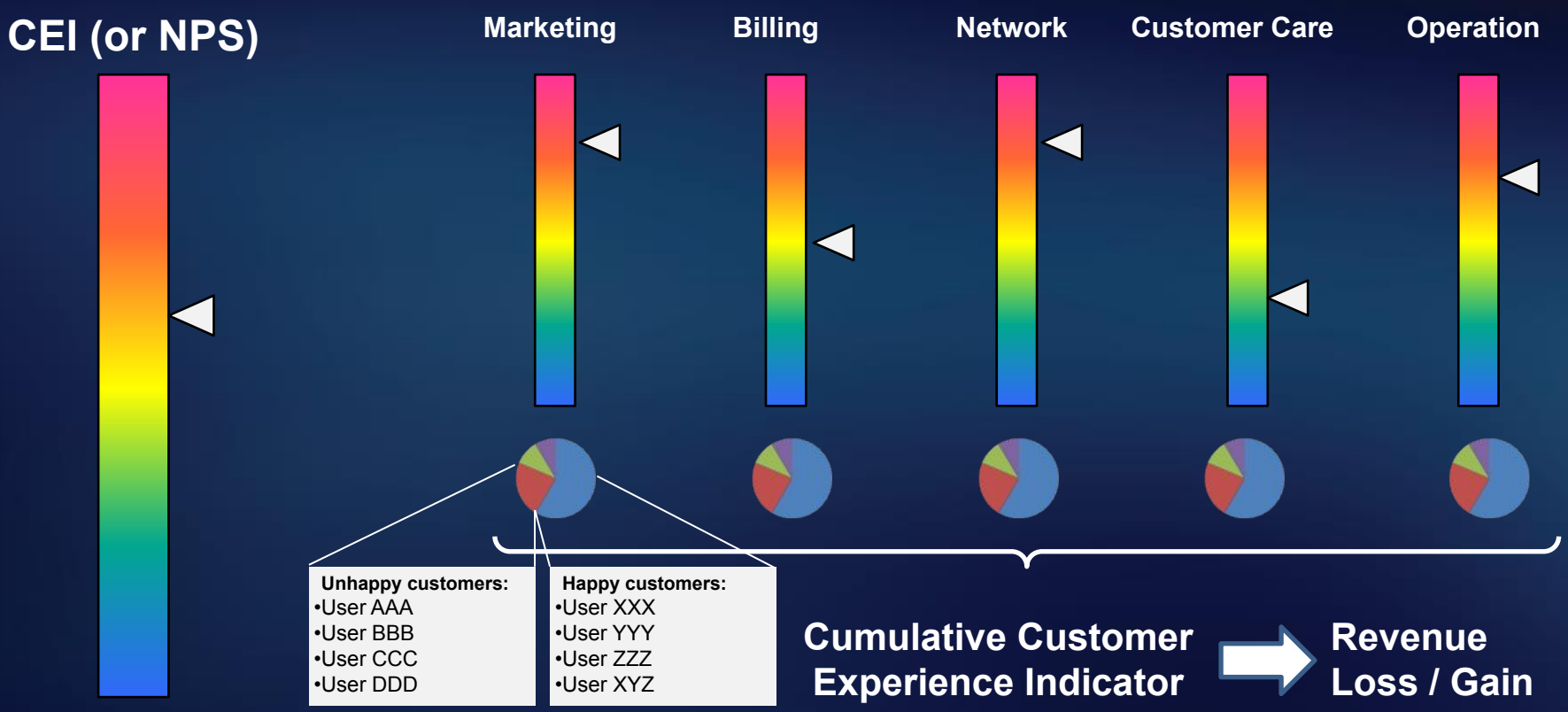
Have you got a system to see CEI for all Touch Points?

How many users at this moment stuck in Activation or waiting for Trouble Resolution?

How it works – Info to be gathered from whole ICT



See at whole and by details to improve by Influencer



Huawei's CEM Solution under the name SmartCare®

Experience Visualization

- Customer Journey definition, E2E experience gathering and visualization

Experience Problems Quick Demarcation

- Experience Problem demarcation to decrease customer complaints

Service Quality Management

- Huge application analysis with real-time monitoring for the service quality visualization

Various Report/Use Case

- Various report generation based on Big Data Analysis

CEM or SQM
What is the difference?

What kind of service we manage quality for?

Simple Question

What kind of services you deliver to your End Users?

- Voice
- SMS
- Internet
- WAP / MMS
- M2M
- YouTube?
- Facebook?
- Instagram?

It is hard to manage quality of services for non-own services

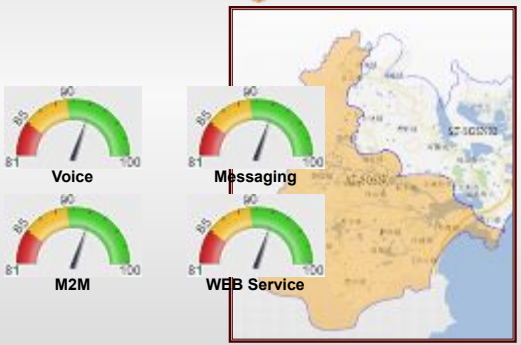
From QoS via Service Quality to Customer Experience

QoS

Defined by ITU many years ago:

- ✔ Throughput
- ✔ Latency
- ✔ Packet Loss
- ✔ Jitter

Service Quality



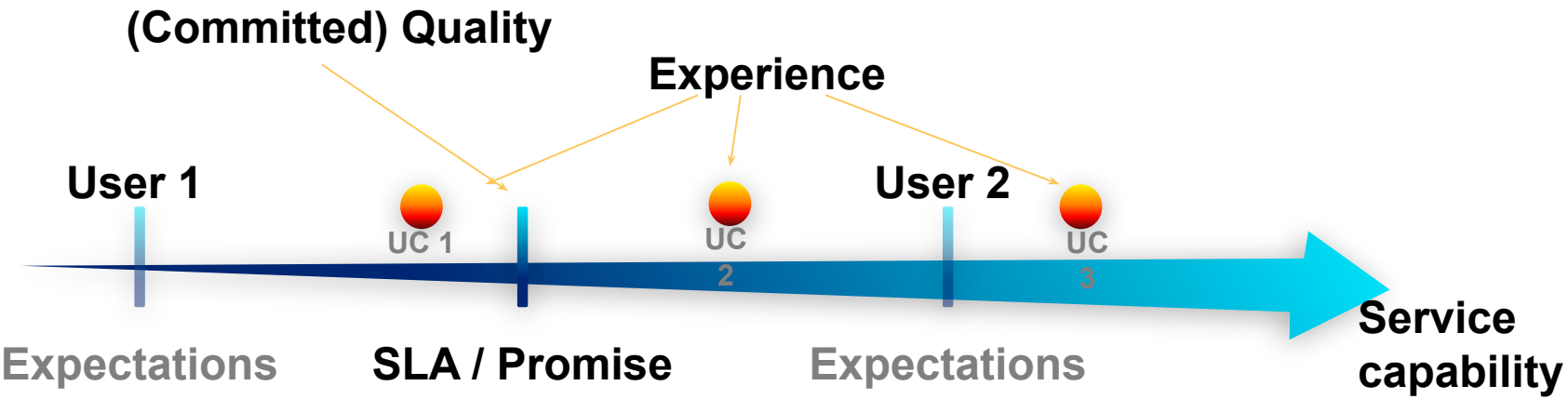
VS

QoE

Customer Experience

SQM is a typical entity existing almost in all network operators

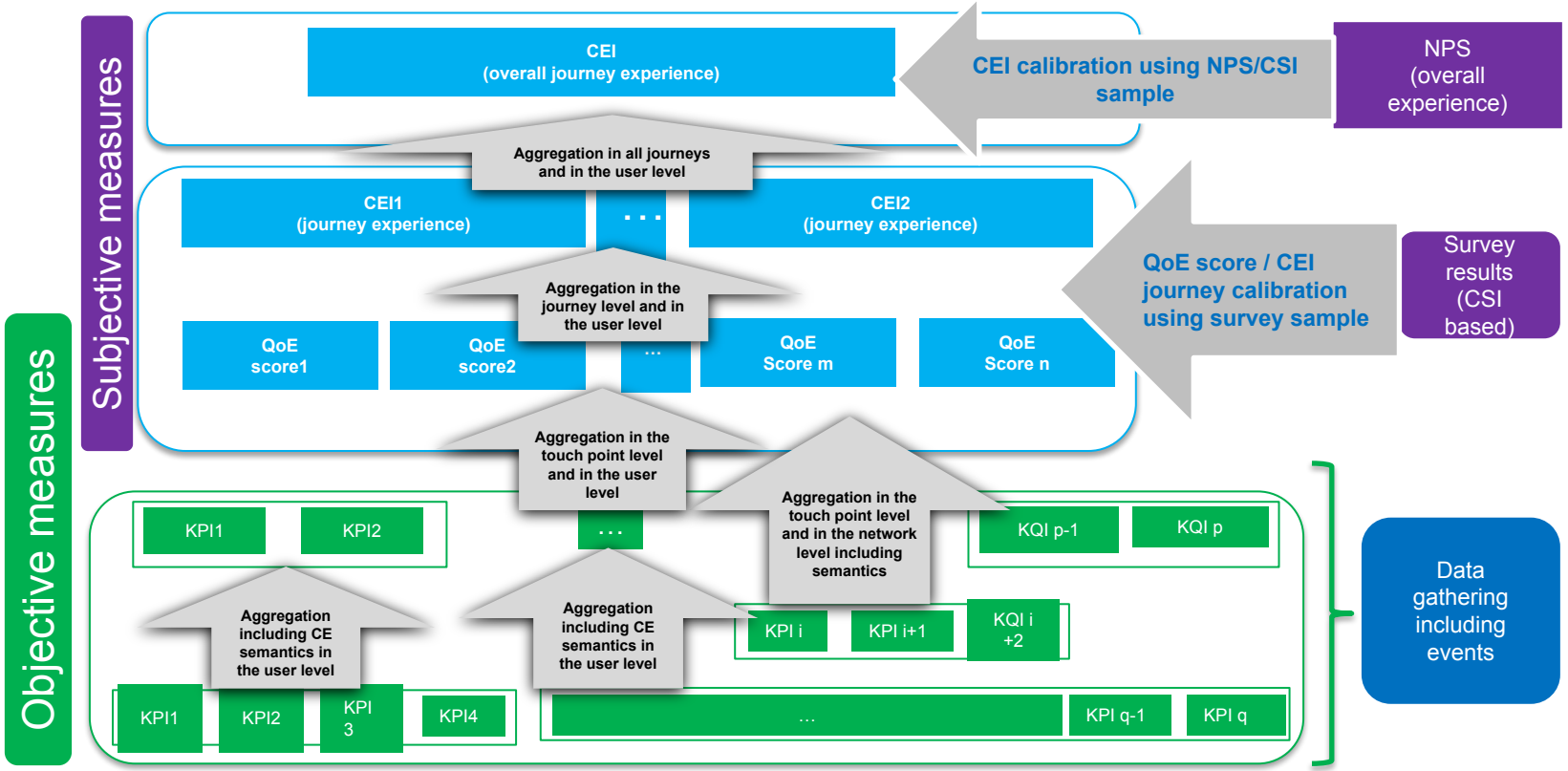
From Service Quality to Customer Experience



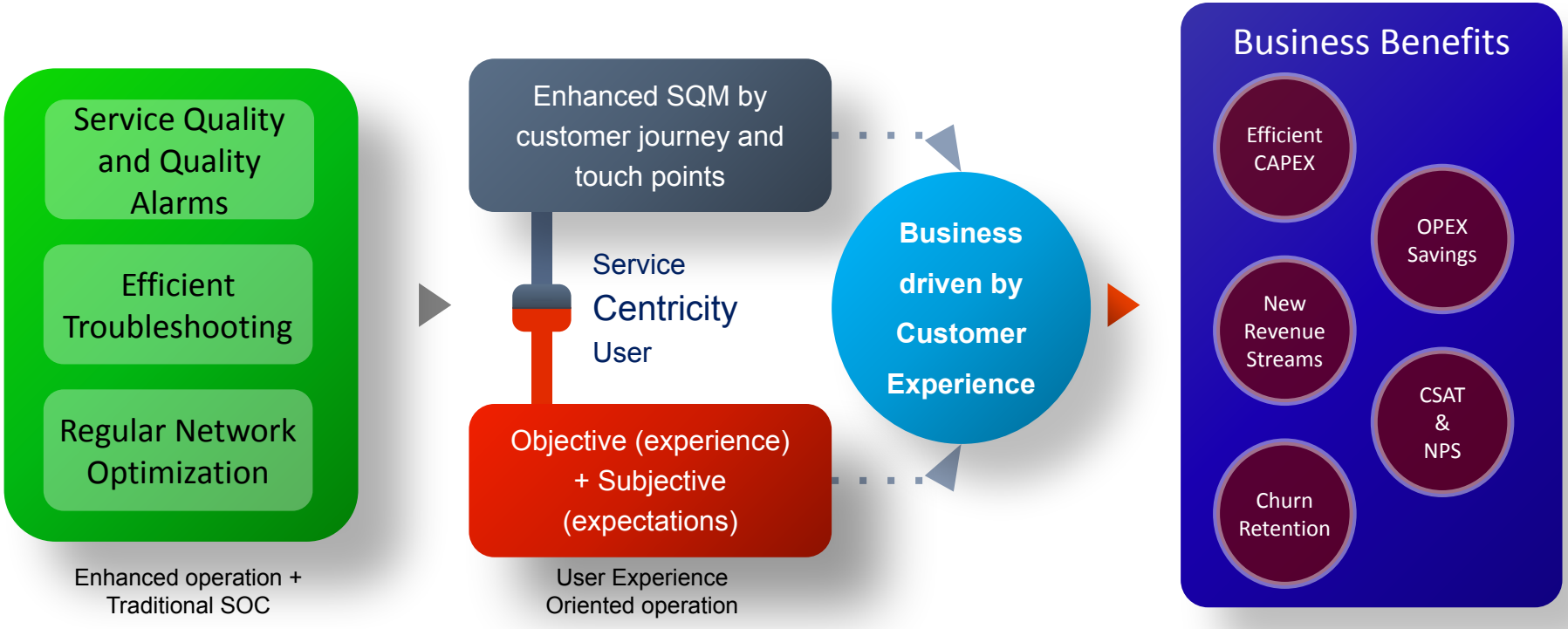
Quality versus Experience	User 1		User 2	
	Quality	Satisfaction	Quality	Satisfaction
Use Case 1	☐	✔	☐	☐
Use Case 2	✔	✔	✔	☐
Use Case 3	✔	✔	✔	✔

CEM correlates real Experience and Customer Expectations

Merge of subjective and objective to have real CEI



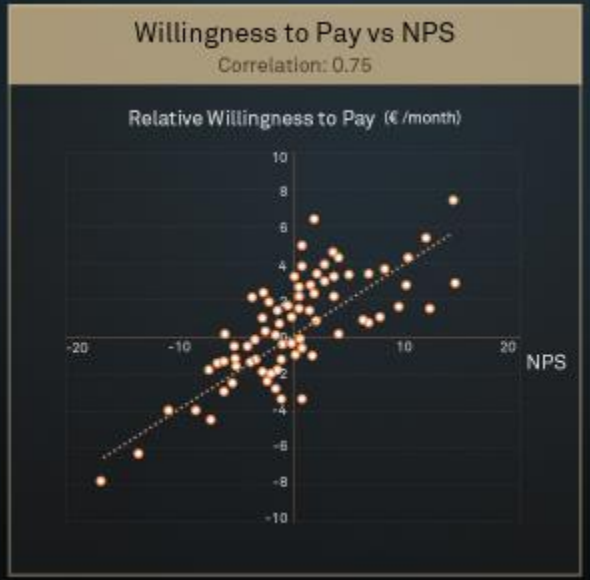
CEM Summary – from traditional QoS to QoE driven CEM

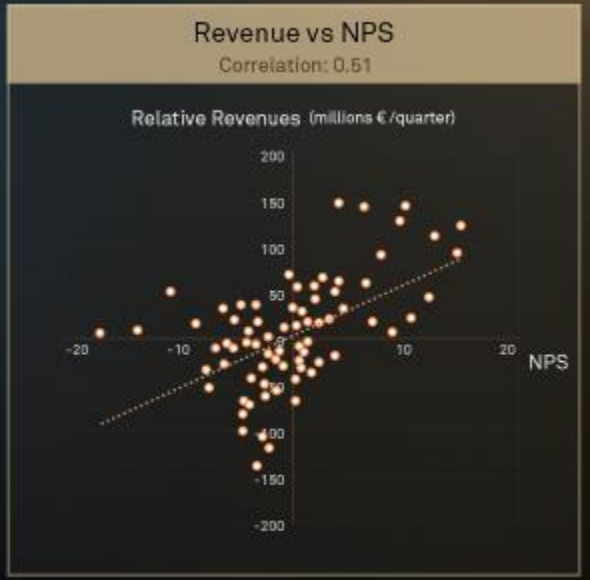


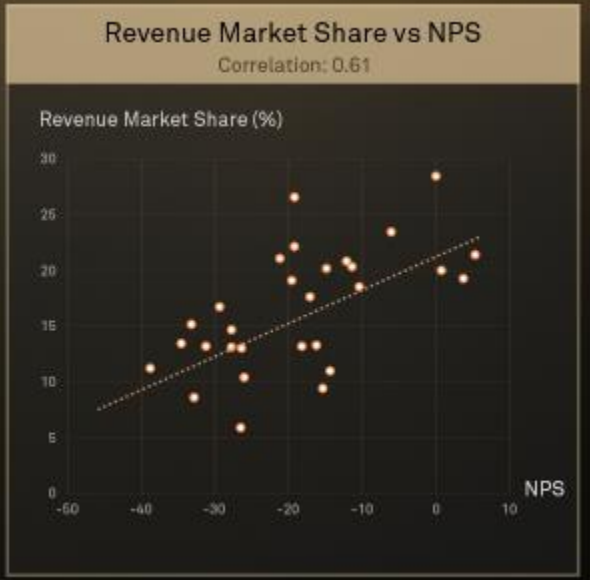
CEM is a new way of Business in Digital Telco World

Net Promoter Score

VALIDATE POSITIVE IMPACT OF IMPROVING NPS







Source: "Empirical evidence from European mobile market", 132 observations

Source: AC Nielsen, 2015, Telecom Industry

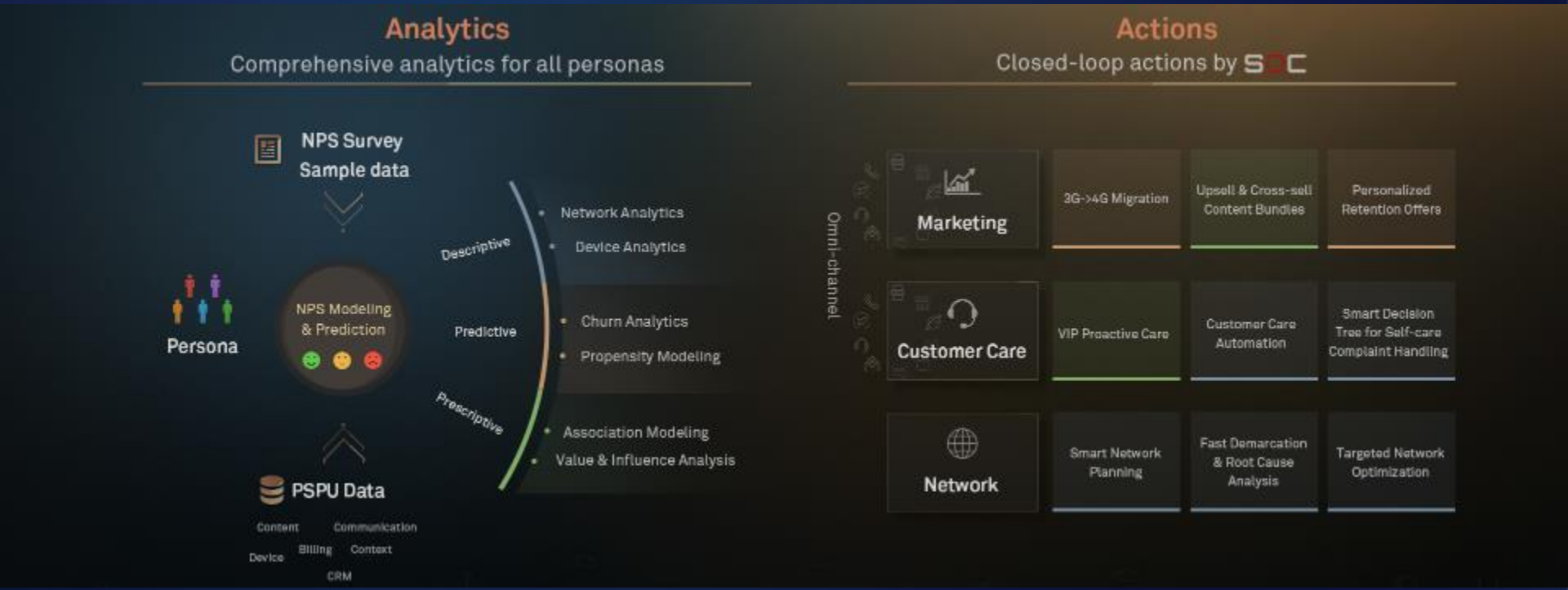
UNCOVER NPS INFLUENCING FACTORS PER PERSONA

- Factors Where The Customer Expectation is High are HYGIENE FACTORS. Good Performance Reduce Detractors and Negative WoM.
- Factors Where The Customer Expectation is Low Offer an Opportunity to Delight. Good Performance Creates Promoters and Positive WoM.

Source: CETC Persona Research & Bain Company, 2015

PERSONA BASE NPS IMPROVEMENT APPROACH

Reduce Detractors & Monetize Promoters



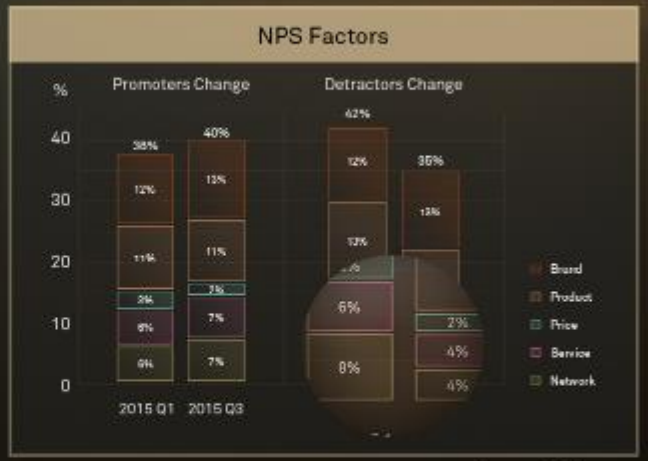
VALUE DELIVERED IN PRACTICE WORLD

NPS Improved 10pts with $1.2 Additional Earning

NPS improved 10pts for Tier1 operator

$1.2M additional earnings from Business Elite focused NPS improvements

Source: Bain Company

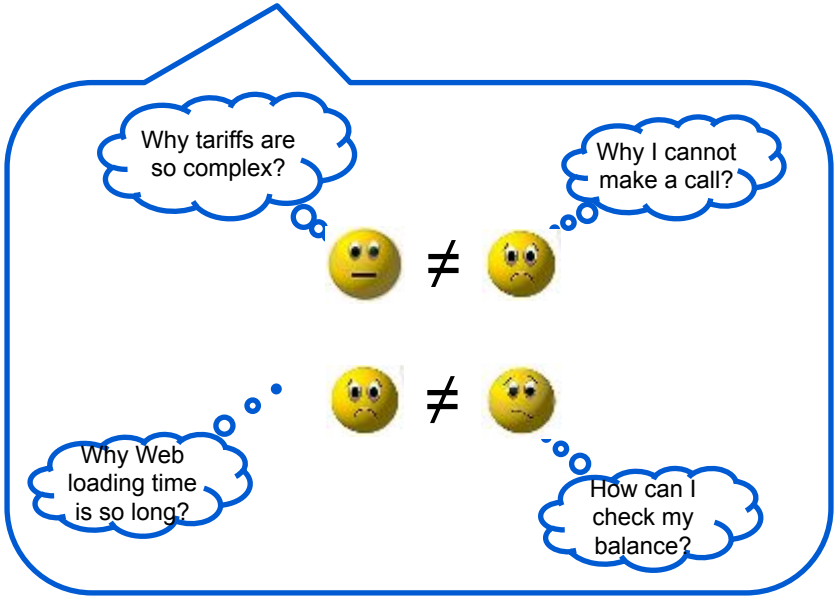


Source: Bain Company

Business Elite Persona Targeted for Closed Loop Action

- Improve Coverage and Capacity
- VIP Proactive Care
- Customer Care Assistance

NPS Detractors – not a one but many different groups



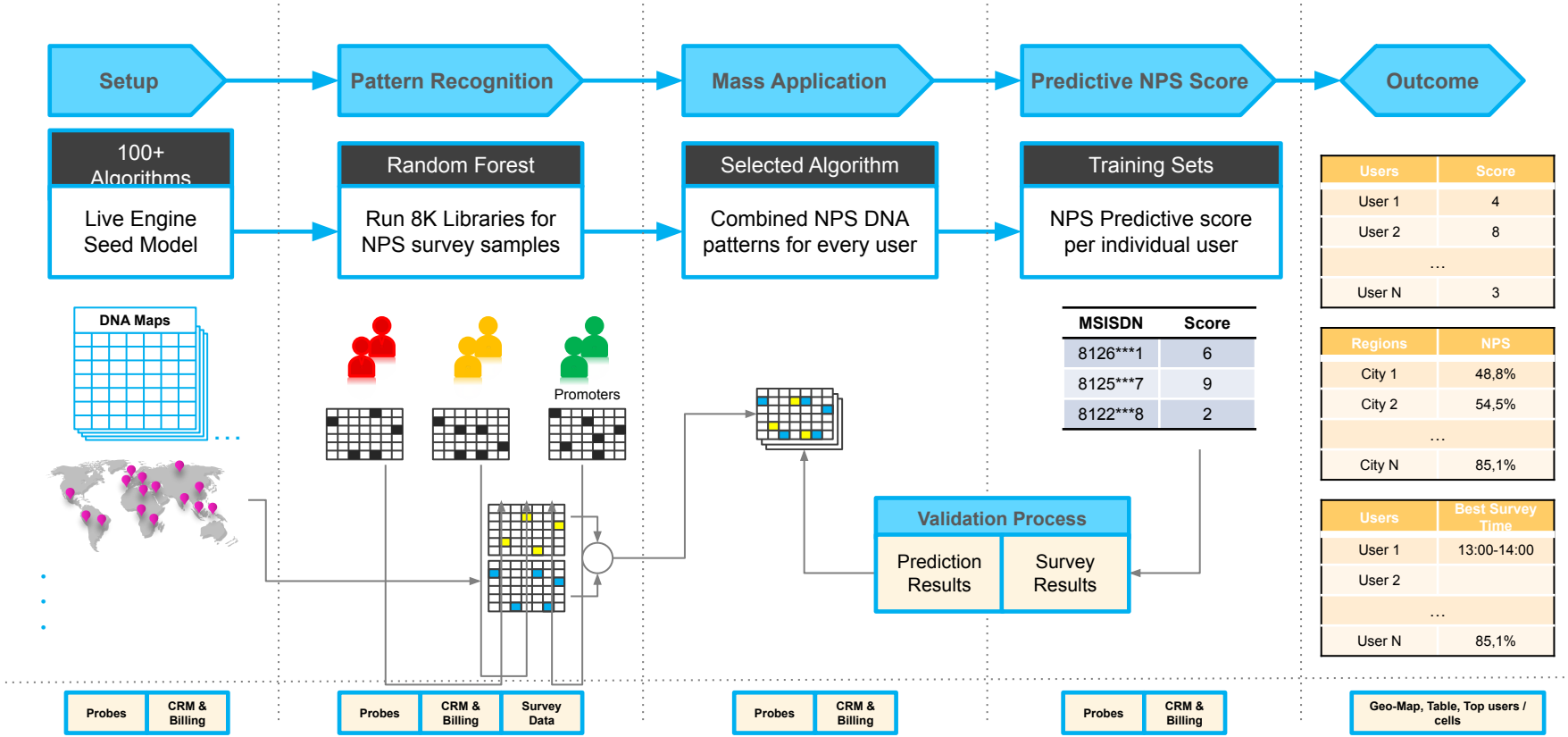
All Users are different and their concerns are different

We cannot simply improve NPS by same / one action(s) for all users

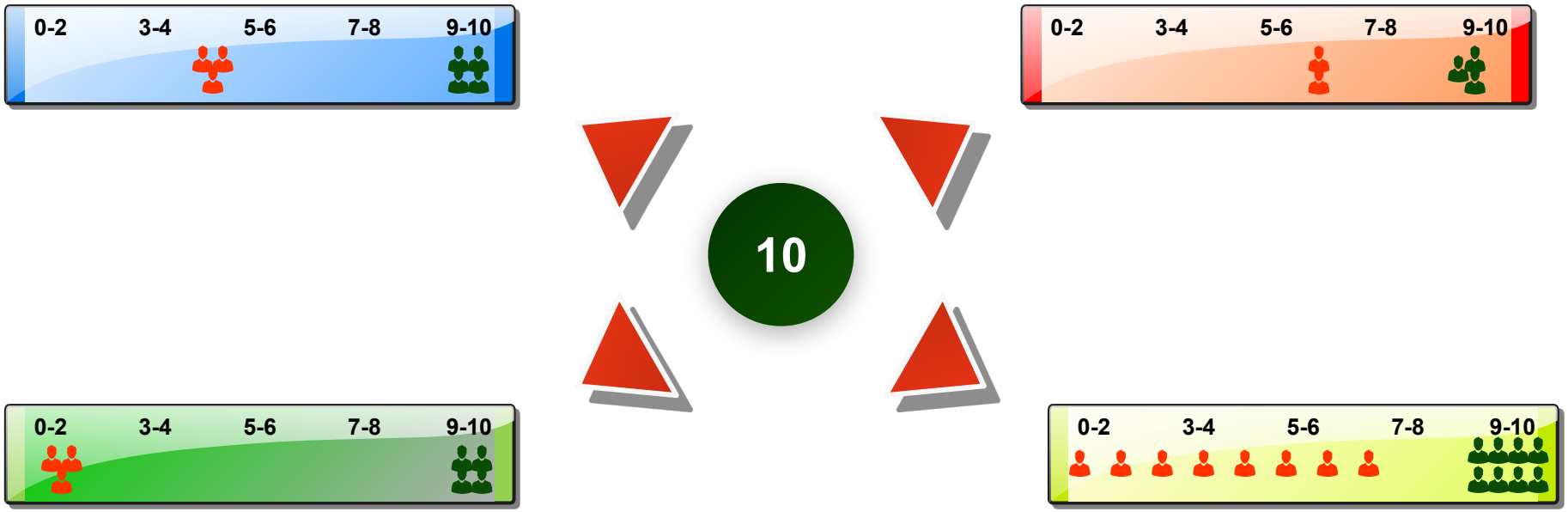
What to do and where to start?

Detailed view on Promoters and Detractors with particular step(s) for every group

Net Promoter Score Prediction Framework

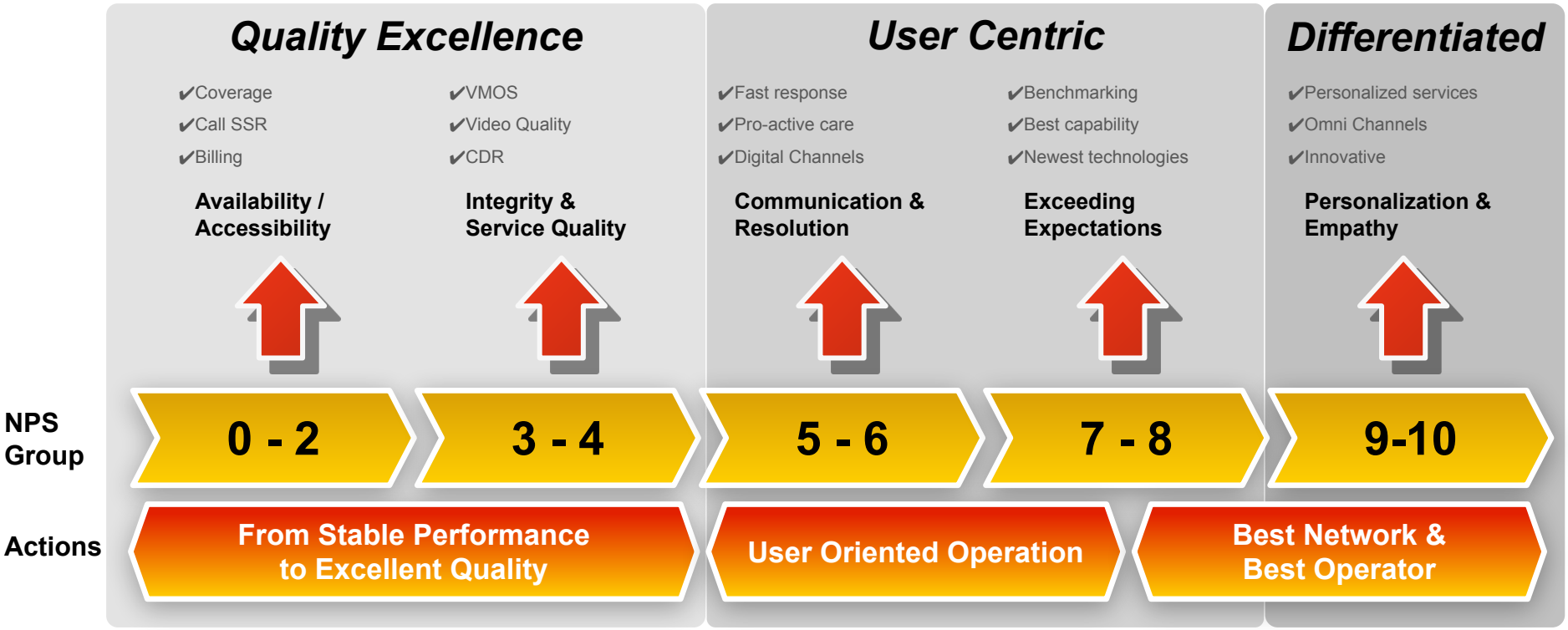


Let us imagine – measured NPS is 10 (%)



Shall we use same improvement mechanism for every case?

Address Expectations of every NPS Score Group



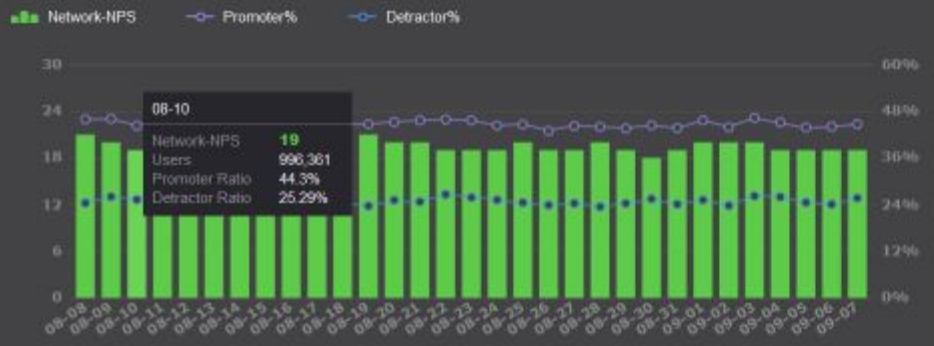
NPS Demo

Network-NPS Distribution

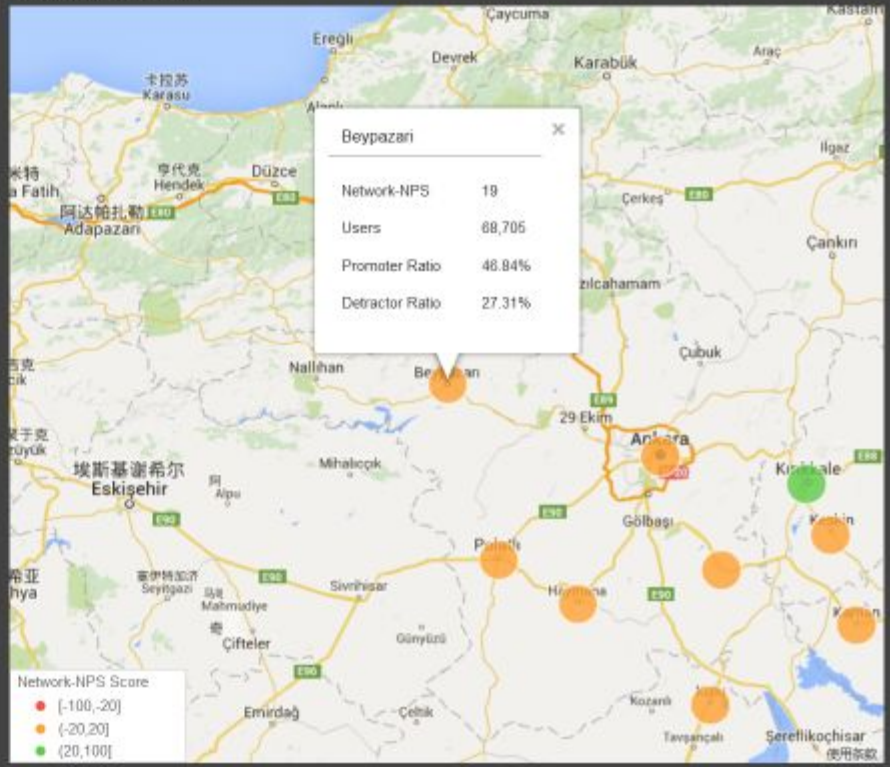
DATE : 2016-09-07

	Ratio	Users
Promoter	44.70%	446,194
Passive	29.62%	295,668
Detractor	25.68%	256,337

Network-NPS Trend



Network-NPS By City



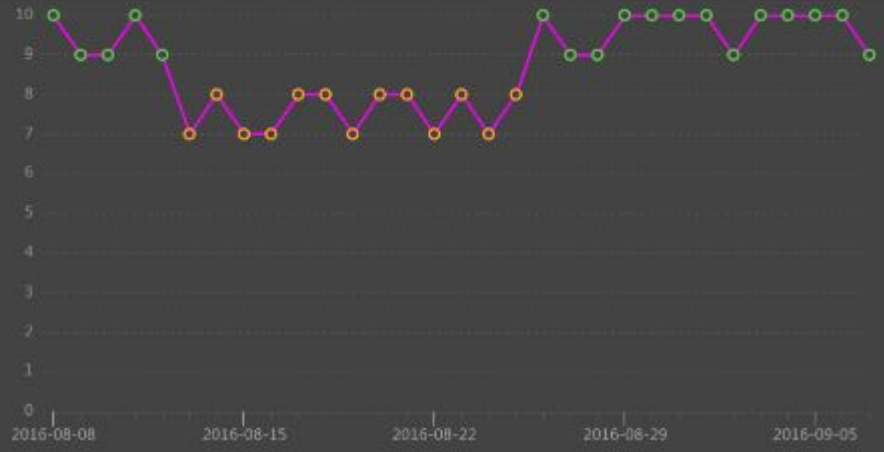
MSISDN 0090E58FG9143E 2016-08-08 - 2016-09-07 Submit

User Score

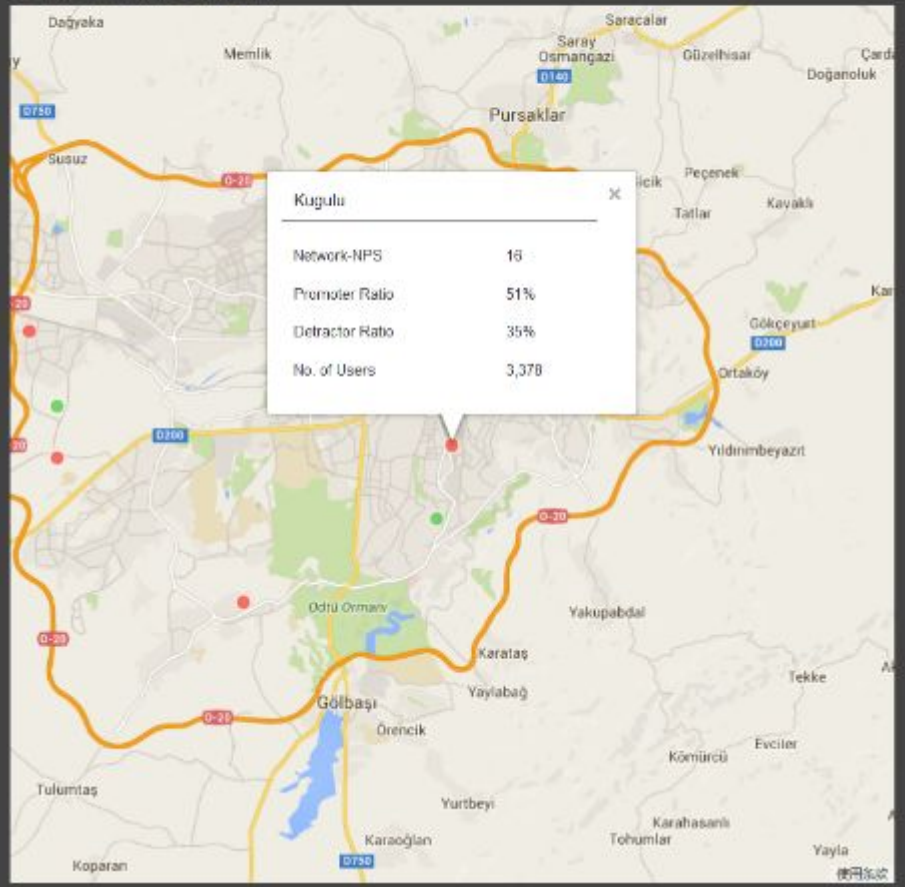
Date : 2016-08-08 -- 2016-09-07

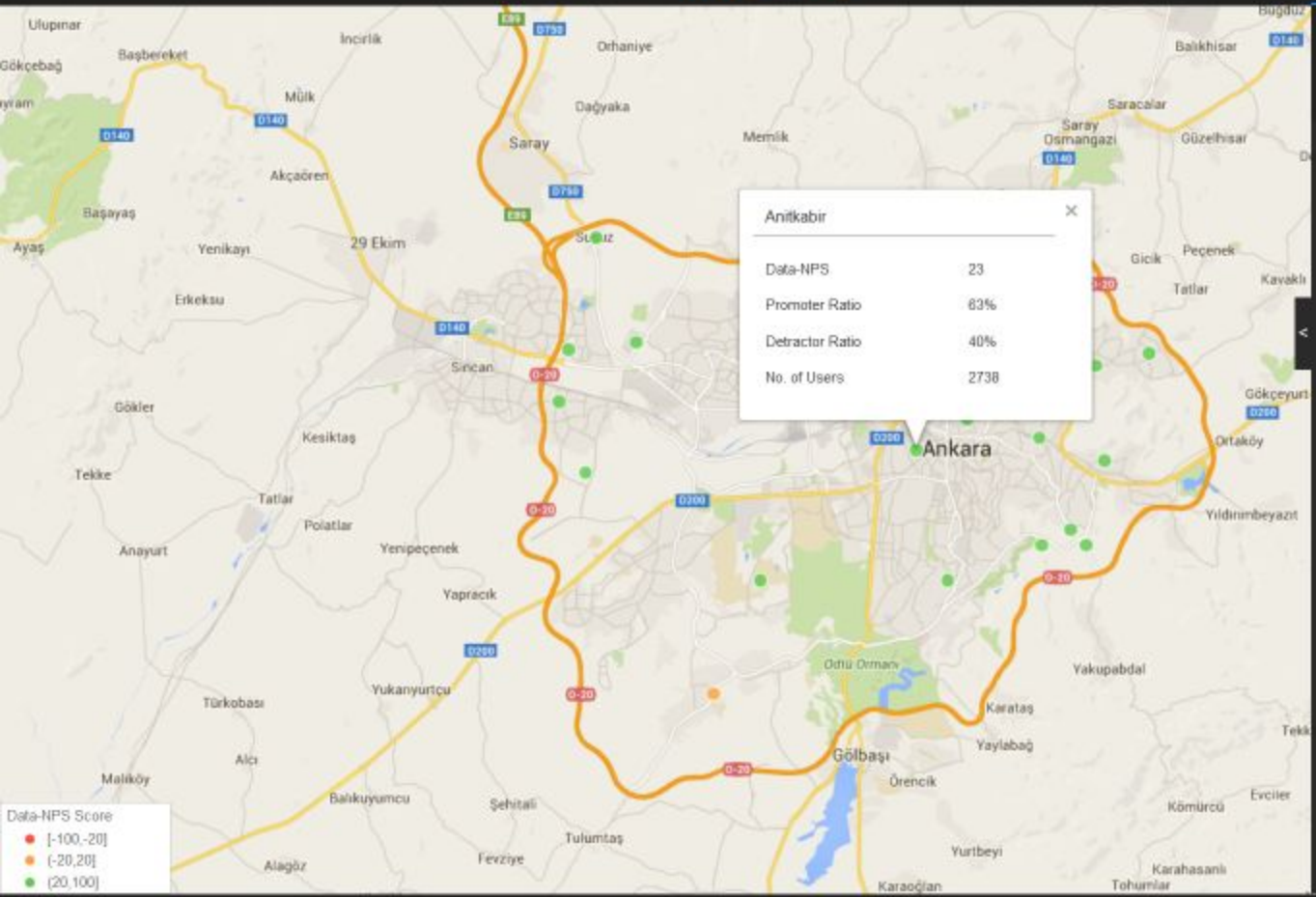
	Ratio	Days
Promoter	58.06%	18
Passive	41.94%	13
Detractor	0.00%	0

User Score Distribution



Site Network-NPS Distribution





2018-08-08 - 2018-09-07 Day Submit

NPS Type

○ Network-NPS ○ Voice-NPS ◉ Data-NPS

No.	Cell	Data-NPS	No. of Users
1	Anatolium	25	3,614
2	Kalesi	25	3,201
3	Araplar	25	2,647
4	Ahi Elvan	25	2,572
5	Susuz	25	3,390
6	Arafat Cami	24	2,468
7	Bilkent	24	3,198
8	peyami Safa	23	2,149
9	Mamak Cd	23	2,345
10	Tayland	23	2,910
11	Anitkabir	23	2,738
12	Kepir	23	3,990
13	Orhan Bey	23	2,489
14	Yukari	21	3,976
15	Natoyolu	21	2,641
16	Trt Verici	21	2,471

Data KQI Trend

Survey Best Chance Survey Window Busy Hours TOP 100 TOP 500 Export All

No.	Avatar Code	F1 Score	Ave.Margin	Network-NPS	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00
1	3462J9S5IU4EF6	1	152.7	0													
2	5UA0V78LZ88T1I	0.97	144	0													
3	729A3V5MP90P50	0.88	133.4	1													
4	MF9EHM1W00D8IX	0.81	113.4	1													
5	6F8S0H1H9BUH16	0.8	123.6	2													
6	5603QWPB1NQ438	0.78	135.6	3													
7	GMPYK143GD1S3P	0.77	96.9	0													
8	A37BQ63BN34Y8Z	0.76	101.6	1													
9	25S8JS1V24R7T3	0.74	105	2													
10	MOWL472069W4RI	0.74	107	2													
11	YI4T3F107RPT05	0.73	88.1	0													
12	K057DBRF3F81C9	0.72	138.9	4													
13	2WZ5GEW3G8XUK1	0.7	83.1	0													
14	FI819CD4K05JS0	0.7	95.8	2													
15	628W0EM546AE81	0.69	81	0													
16	6UV2879E9E9253	0.69	85.9	1													

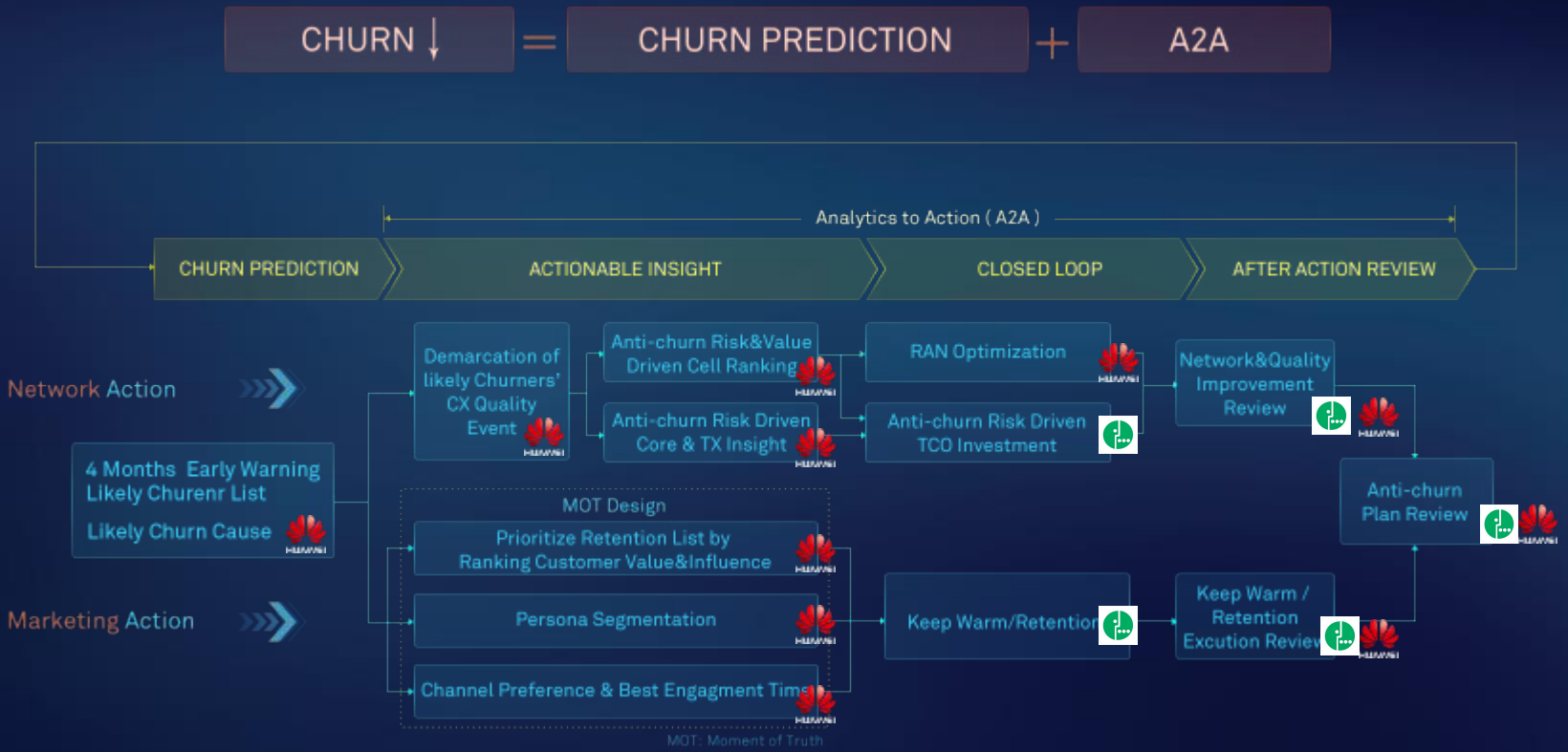
First Next Last

Churn Prediction – Details

Why we should manage Churn?

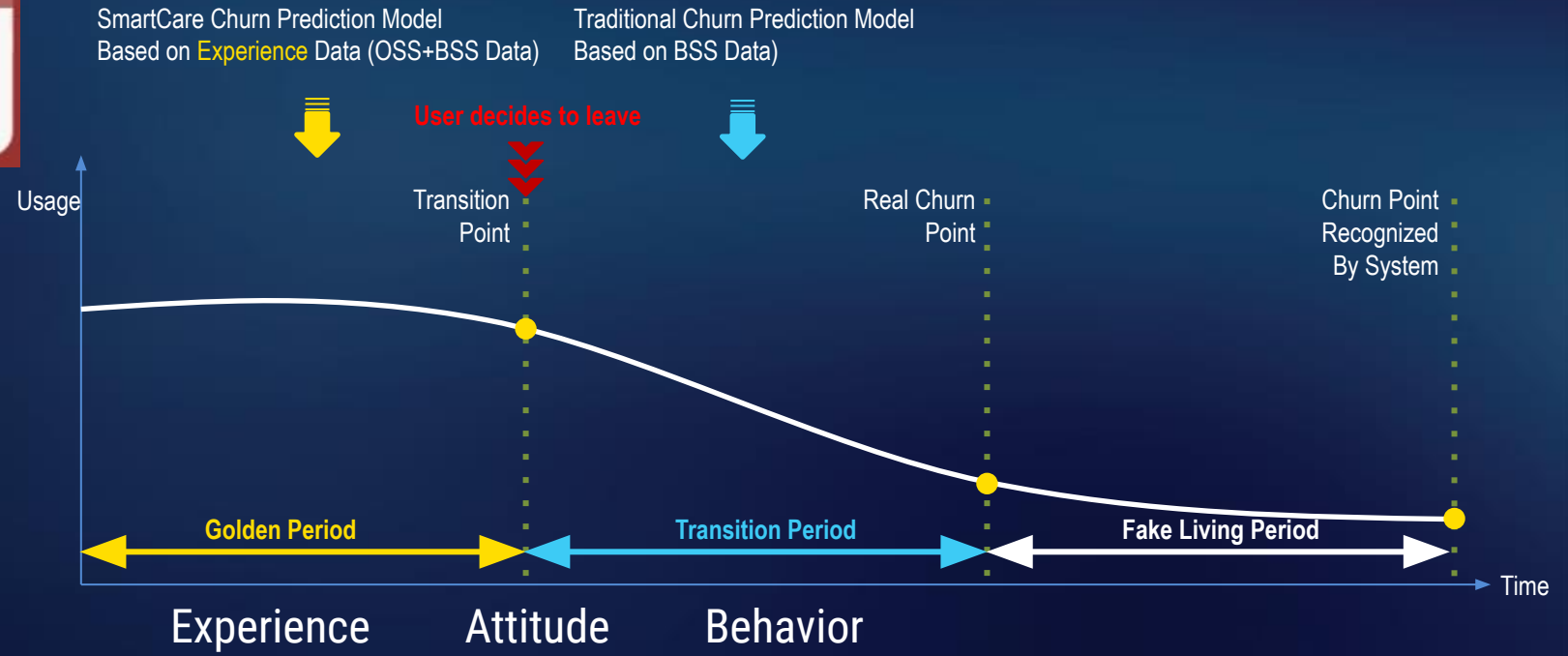
- New subscriber attraction cost is 3..10 times higher than retention cost
- Loyalty decrease of 5% causes 25% revenue loss
- Packages/tariffs promotion success rate is only 15% for new subscribers, while for existing subscribers it's 50%
- Annual churn decrease of 5% might increase revenue by 25-85%

FORMULA OF ANTI-CHURN

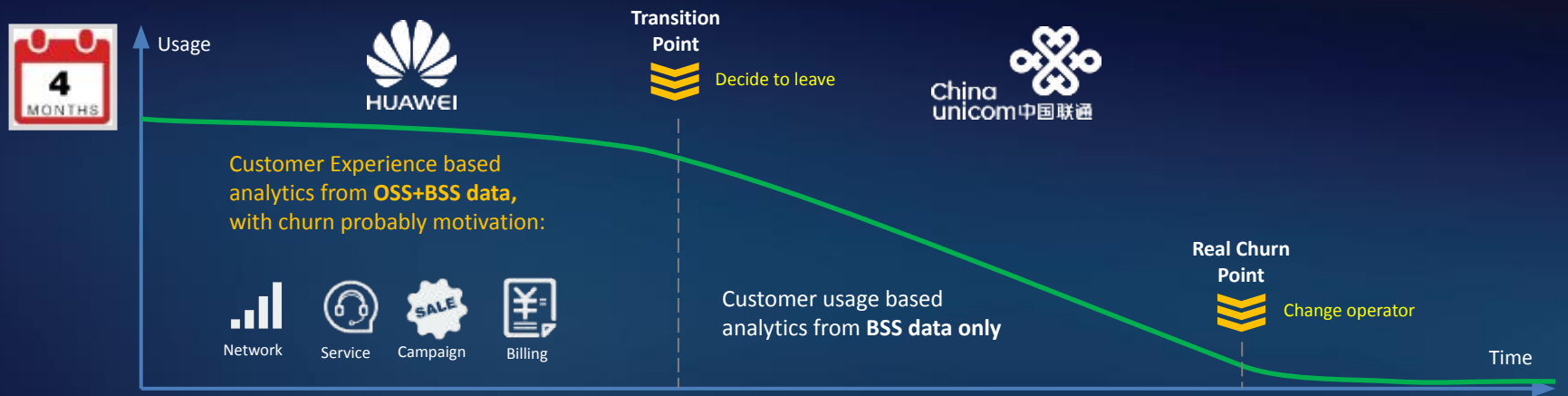


Methodology

Better Result by Experience Oriented Churn Detection



HUAWEI Churn Prediction Solution Highlight

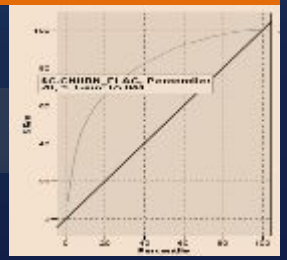


4 Months advanced

2-4 weeks advanced

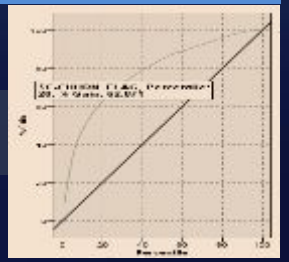
Churn Prediction Model on both OSS+BSS Variables:

Recall Rate: **43%**
Top 20% Precision: **65%**



Churn Prediction Model on BSS Variables:

Recall Rate: 38%
Top 20% Precision: 62%



Source: China Unicom SH

Marketing Closed Loop
- Retention Process Consulting Enriched By Analytics

Retention Ranking

From customer value only

Customer Value & Influence

- Current Value
- Potential Value

- Influence

Customer Segmentation

From contract based segmentation

MOT Design 1: 6 types of persona based customer segmentation *

*IPR apply processing

Retention Offer

From one-offer-fits-all

MOT Design 2: Various personalized retention offers for personas

persona

root cause

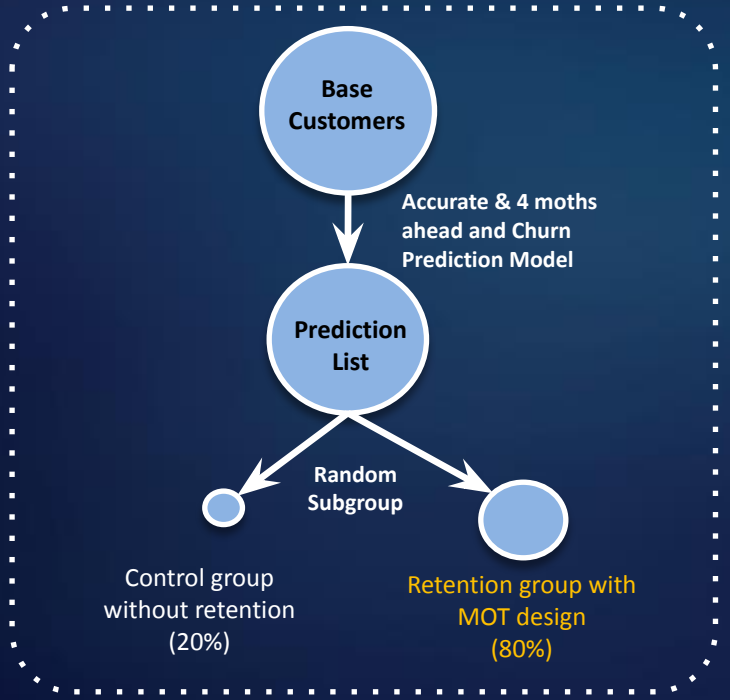
Channel & Time

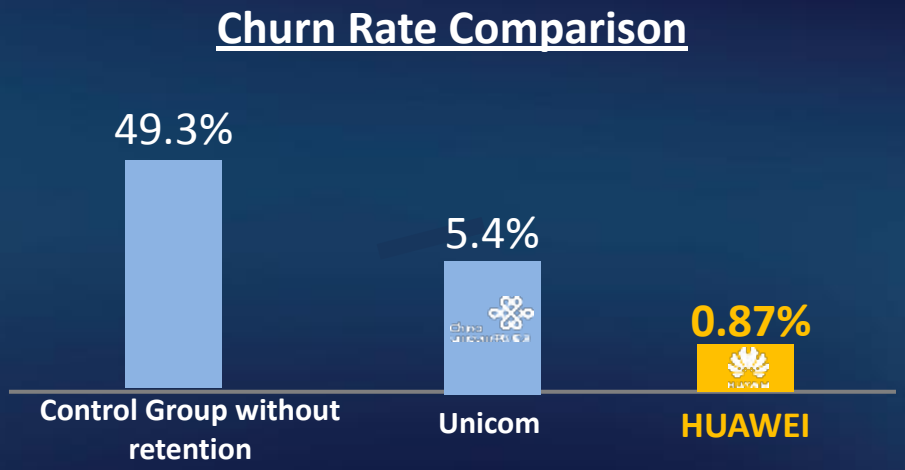
Inside-out Channel & Timing Allocation

MOT design 3: Outside-in preferred channel & time allocation

Reference Case
- early predication & MOT improve retention effect greatly

The churn rate of “Retention Group” is much lower than the ones of “Base Case” and “Control Group” based on **accurate & 4 months ahead churn predication with MOT designed retention offer**





- Base case churn rate was sourced as Ave. of 2013.
- The prediction list was generated in Aug 2015.
- Control group & Retention group’s churners were verified in Feb 2016

Source: China Unicom SH

Achieved 2.4% Churn Rate Reduction

~49,000

Subscribers successfully retained during 7 months (Jun-Dec 2015)

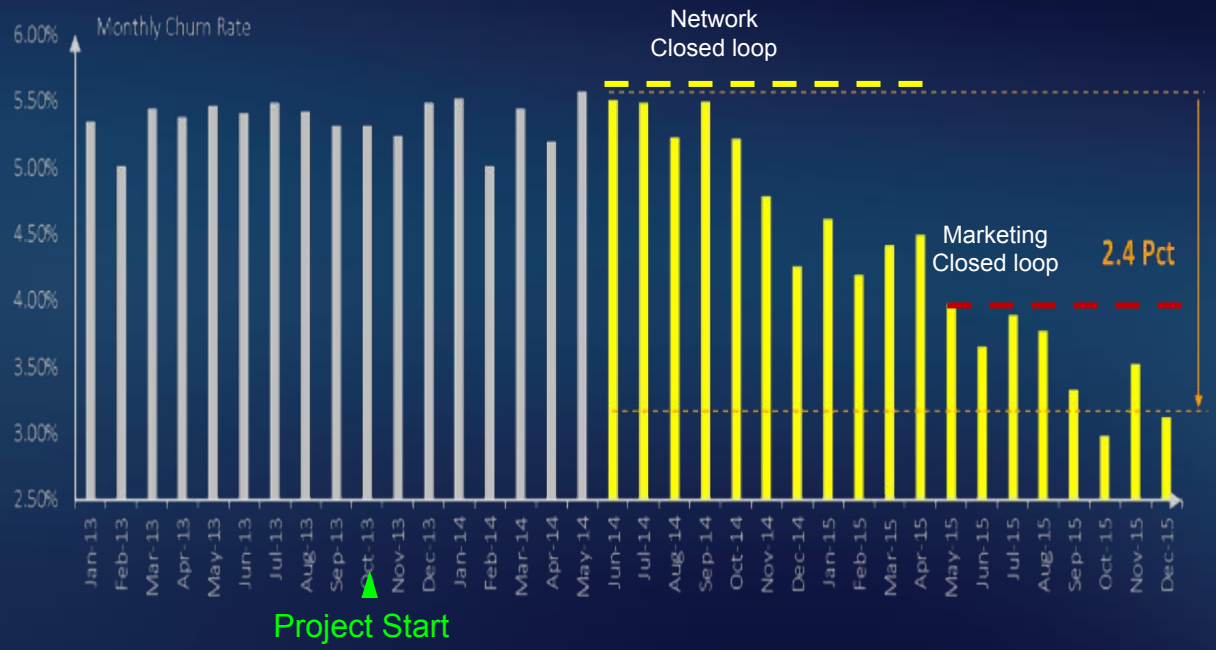
2.4 Pct.

Churn Rate Reduction in 24 Months

136 USD

Subscriber CLV captured

Precision Rate : 77.0%
Recall Rate : 49.1%
Warning Period : 4 Months advance



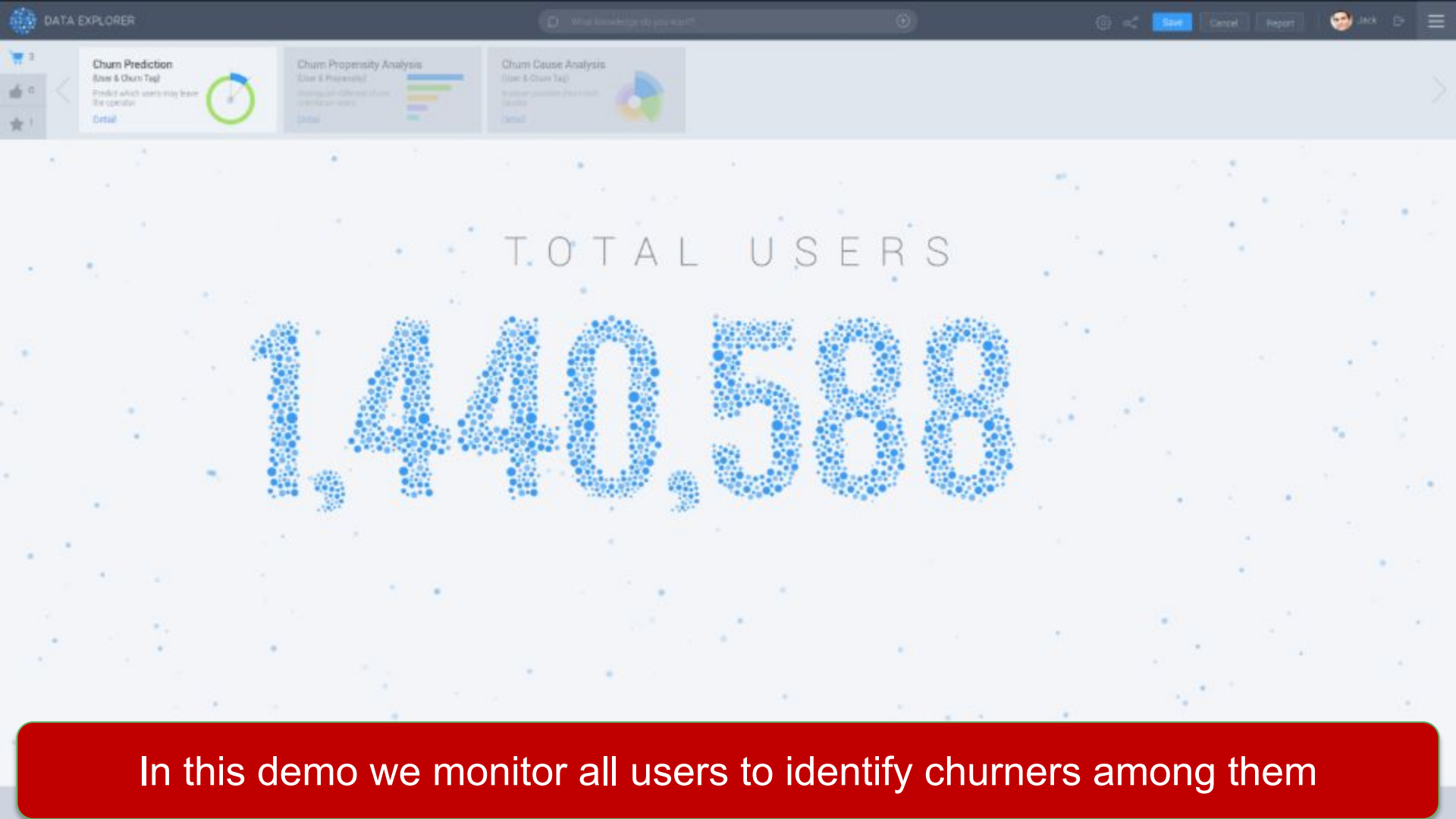
Source: China Operator S, Churn Rate

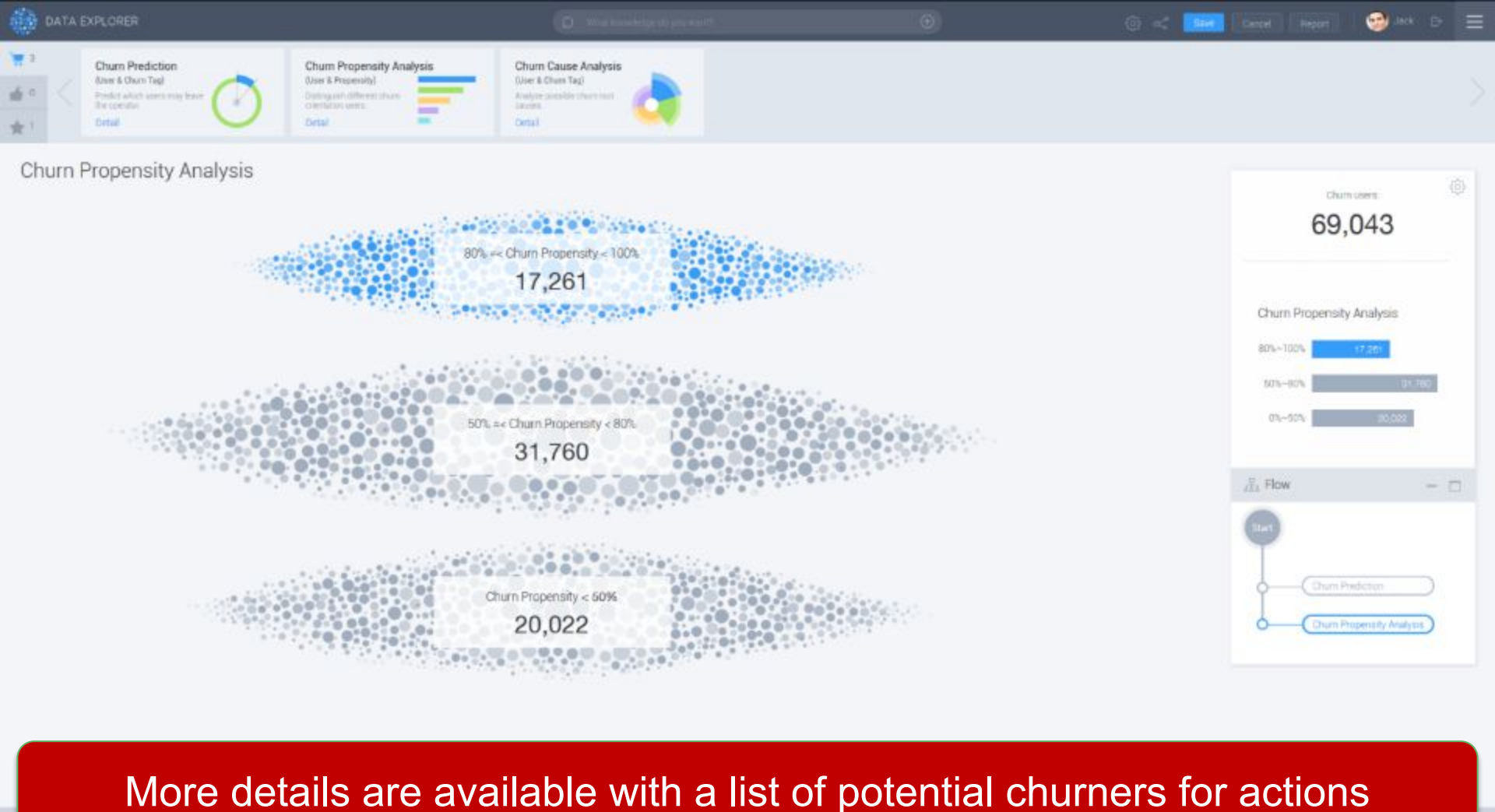
Output


Churn Prediction
Users
Cells
26.3K
35%
3%
23%
38%
User
Churn Probability
91NUS7
YWYCZN
M3LS9G
EQCDME
9TXYS0
T9GVX
S3LXRH
LN4ZER
W13NP
UYDKYU
Number of Potential Churners Per Cell
(0 , 20]
(21 , 100]
(101 , ∞)


Churn Prediction
User
Cell
374
35%
3%
23%
38%
Cell ID
Potential Churners
58280
135
50923
135
90528
130
12130
130
85632
130
22531
127
20125
127
96207
127
83077
123
56309
123
Number of Potential Churners Per Cell
(0 , 20]
(21 , 100]
(101 , ∞)

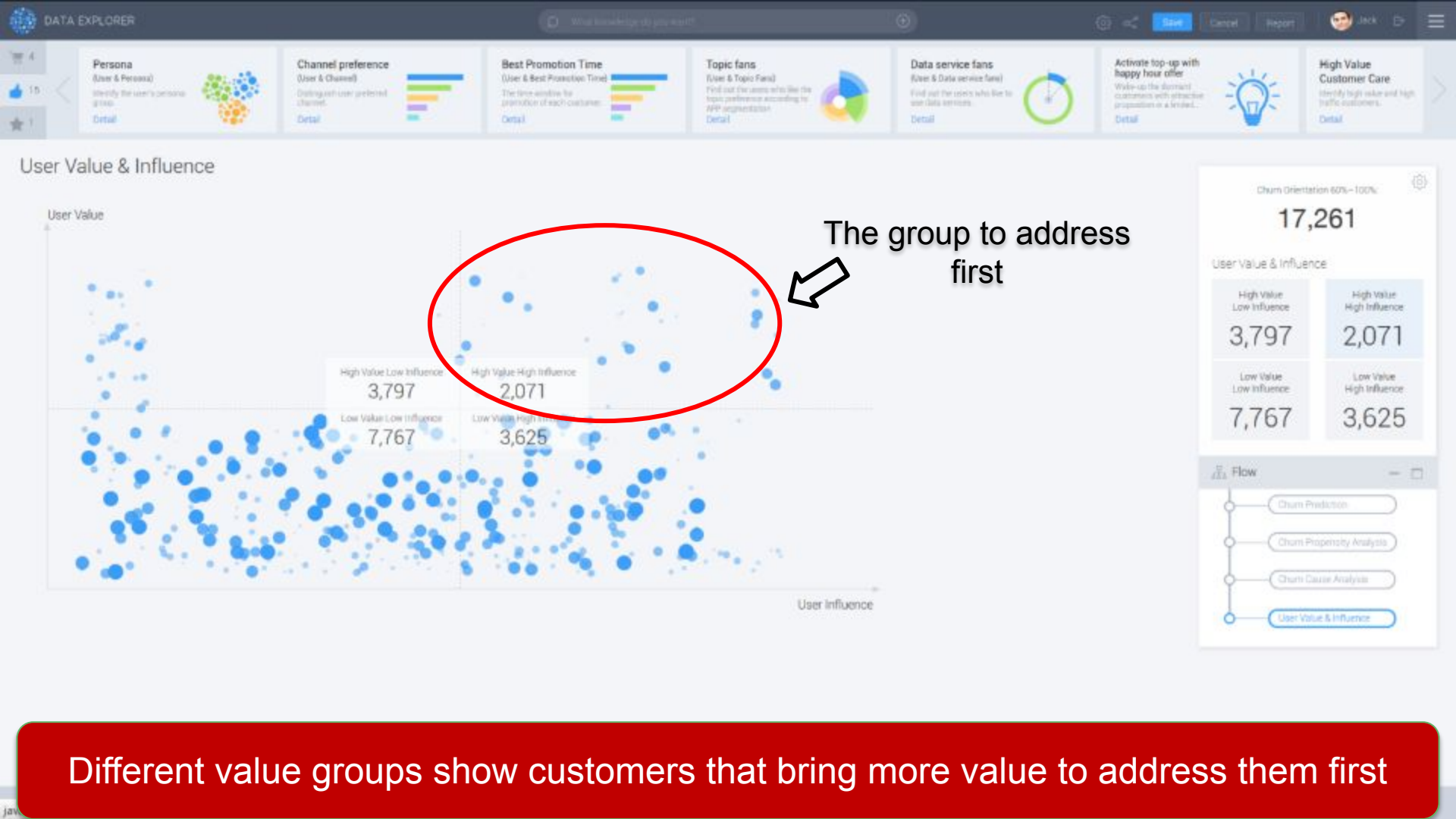
Data Explorer Demo – Churn


DATA EXPLORER
Churn Prediction
Churn Propensity Analysis
Churn Cause Analysis
TOTAL USERS
1,440,588
In this demo we monitor all users to identify churners among them



More details are available with a list of potential churners for actions

Churn Cause Analysis helps to identify Root Causes for churners



Different value groups show customers that bring more value to address them first

DATA EXPLORER

Best Promotion Time
(User & Best Promotion Time)
Detail

Topic fans
(User & Topic Fans)
Detail

Data service fans
(User & Data service fans)
Detail

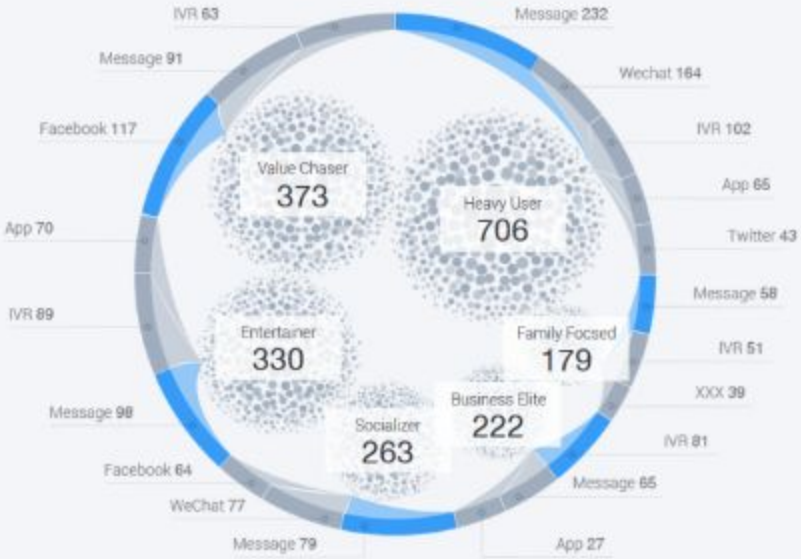
Activate top-up with happy hour offer
Detail

High Value Customer Care
Detail

Expected results
Detail

Bad experience cells for each customer
(User & Cell)
Detail

Channel preference



High Value & High Influence
2,071

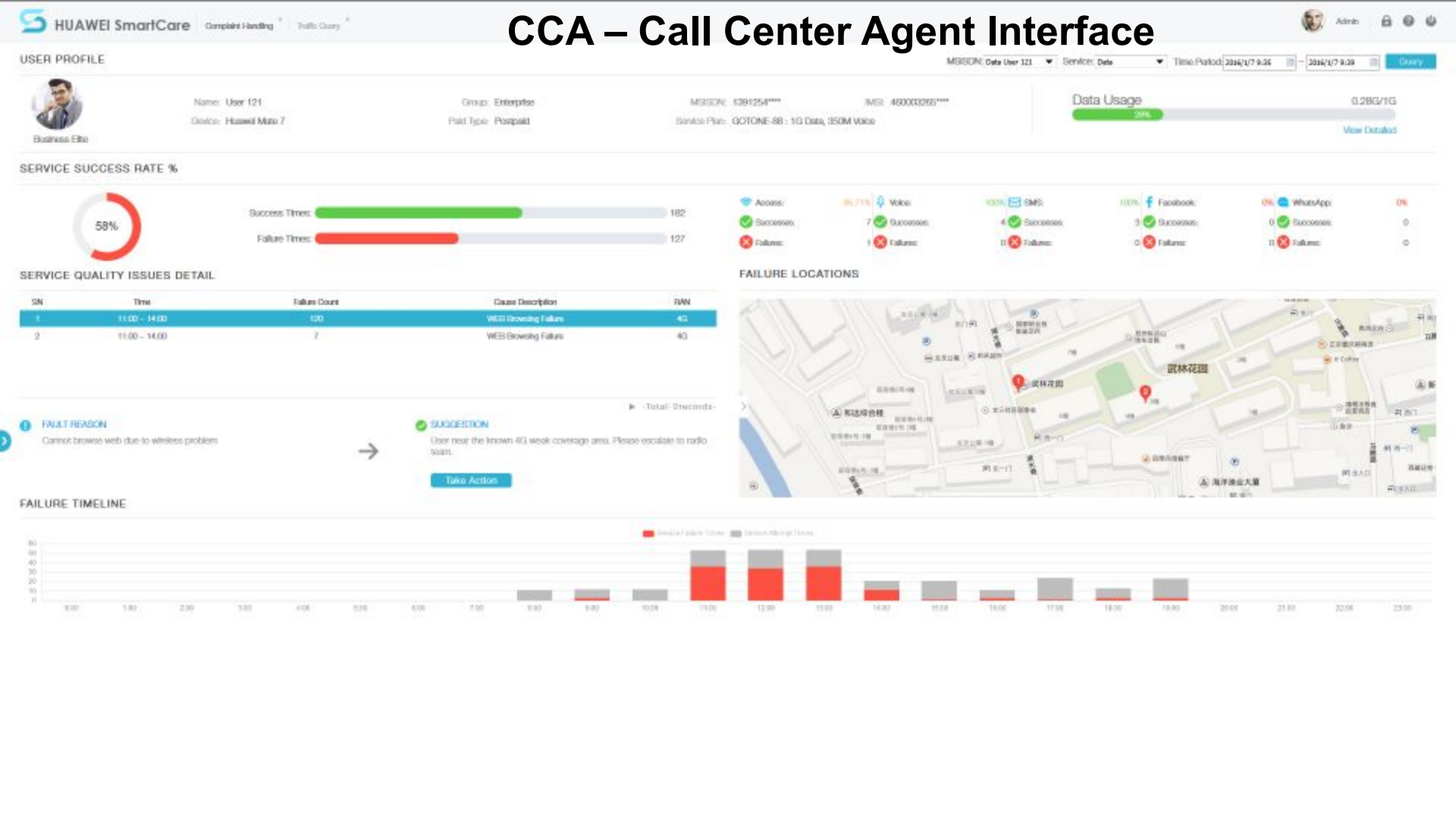
Prefer Service Channel

Flow

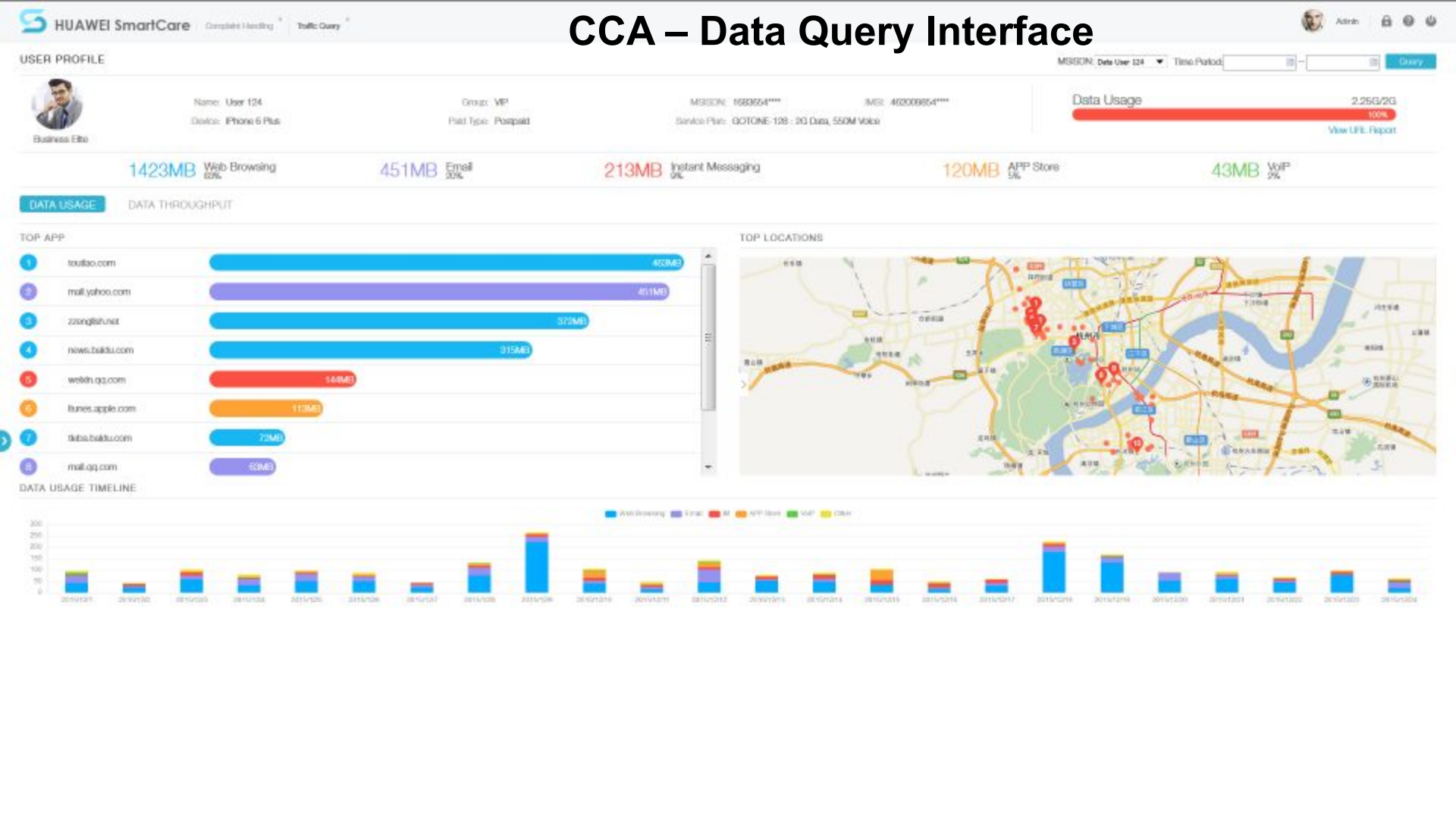
Even the most preferred communication channel identified & recommended

Customer Care Assistance Module

CCA – Call Center Agent Interface



CCA – Data Query Interface



Customer Service Experience Management

Sizable reduction in OPEX for complaint handling by 10~30%, Significant improvement in CSat by 10~15%

Digital Channel Usage	Propensity to Call	Average Handling Time	First Call Resolution
(digital channel) 60%↑	(digital channel) 30%↓	(traditional channel) 20%↓	(traditional channel) 60%↑

Integrated Customer Complaint Experience Management

SOC to close the loop in the whole Customer Lifecycle Journey

Service Centric Operations -> Network + Service

SOC

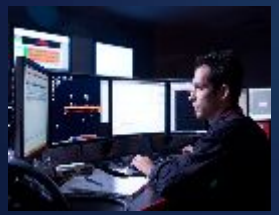
Experience

Service | Content

KQI | CSAT | NPS

+

NOC



Network

KPI | SLA | MTTR

Benefits

- Service Quality Monitoring
- Service Quality Alarm Consolidation
- Closed-loop complaint handling
- KQI Demarcation for Data Service
- VIP Care
- Partner with Customer Care
- Fast Response to New Service launch
- …..

External Operation Driven By SOC

Organization | Processes | Tools

Network Centric → Service Centric → Customer Centric

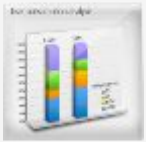
First Time Fault Resolution

Precise Fault Demarcation

VIP Care

Visibility

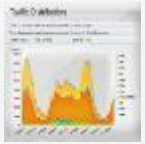
User Visibility



Service Visibility

Terminal Visibility

Network Visibility

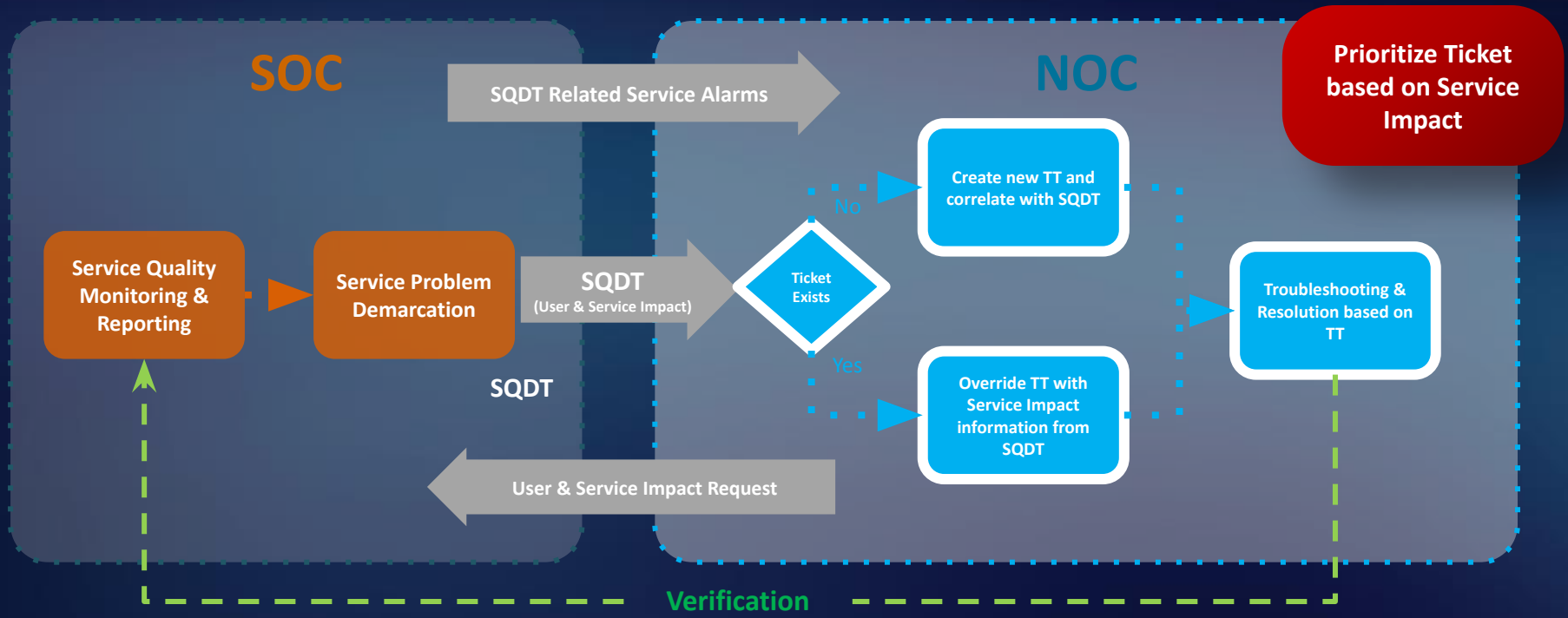


Attract & Retain Customers

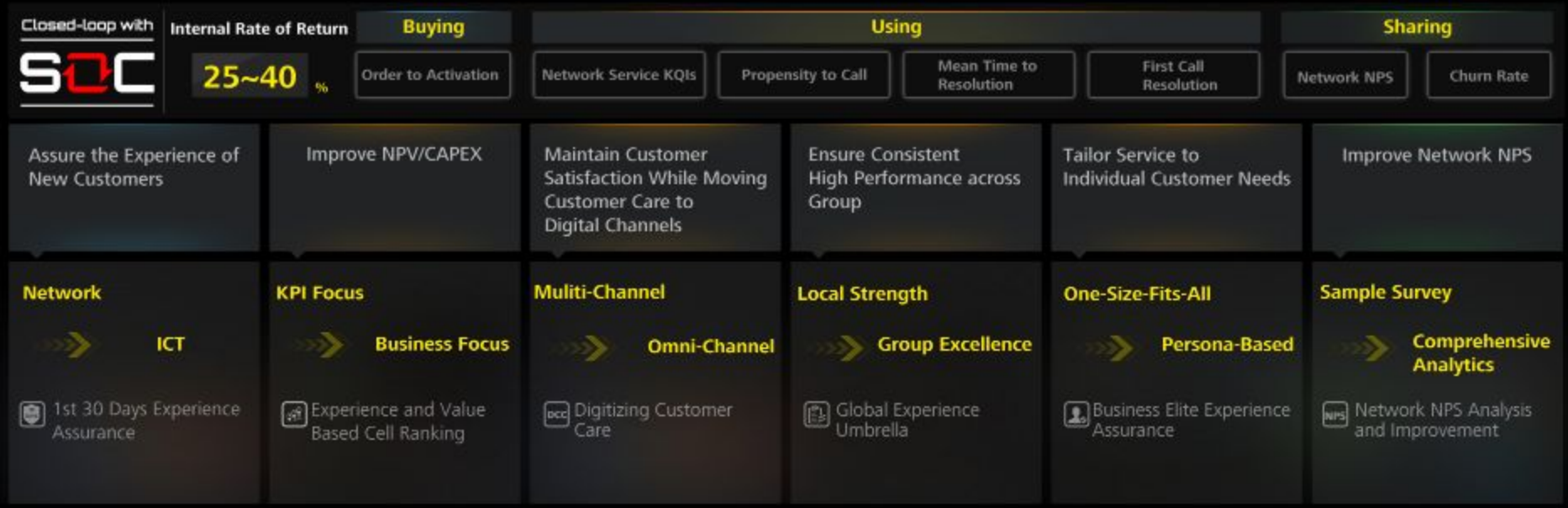
SMART CAPEX Investments

Increase Resource Utilization

Example of NOC-SOC Synergy



Service Operation Centre will enhance customer life cycle management towards Buying & Sharing Domains

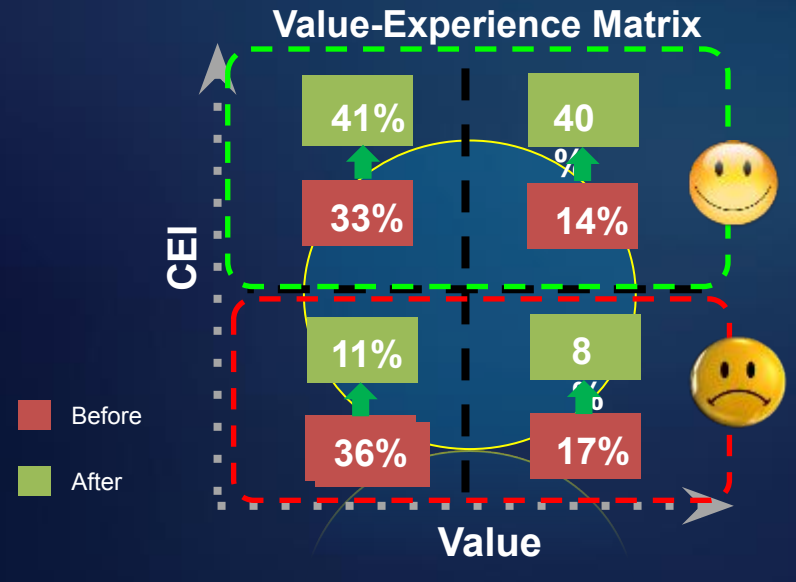


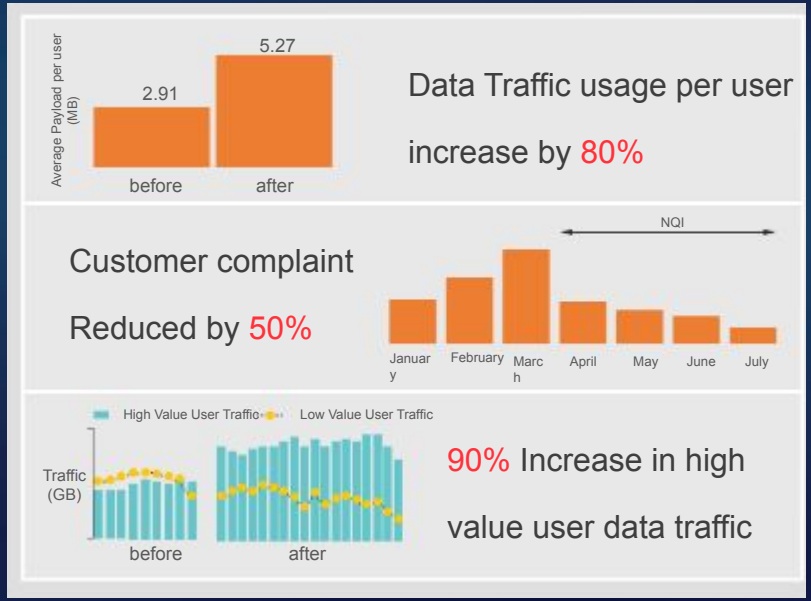
Huawei has delivered already 30+ SOC over the world

Separator

Value-Experience Matrix Migration Result in Operator X

Subscriber are shifting towards good customer experience and **inline with the customer lifecycle** to grow more traffic volume





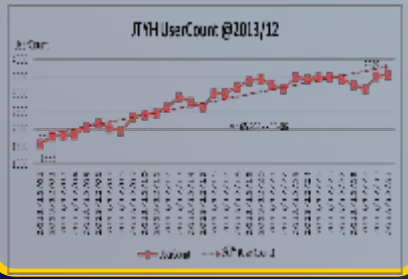
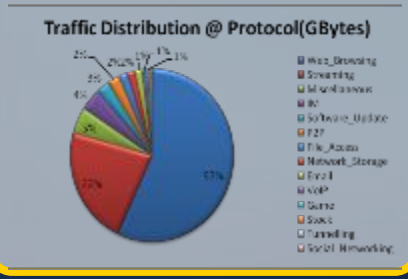
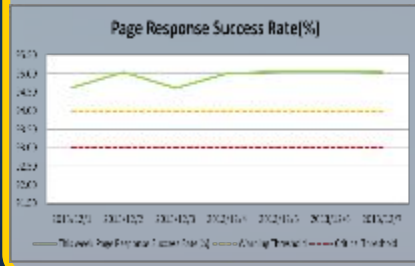
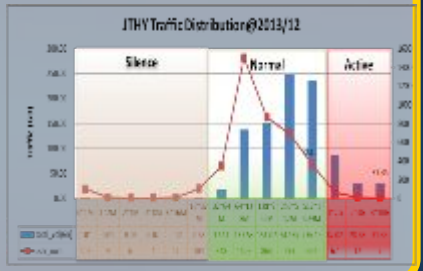
1X.x% improvement in revenue

Separator

General Description

Use Case Name:	Enterprise Service Quality Assurance
Description: ▪ For Enterprise Users SLA Assurance, this service will periodically monitor and analyze the KQIs/KPIs of voice and data services used by different Enterprise Users with whom the carriers have signed service level agreements (SLAs). ▪ Enterprise Users SLA Assurance consists of SLA Task Management, SLA Monitoring, and SLA Analysis.	
Benefits: ▪ This Enterprise Users SLA Assurance shows the service quality of Enterprise Users with whom the operators have signed SLAs, helping the operators to evaluate the fulfillment of SLA commitments to their customers within the validity periods of the SLA contracts. ▪ Improved Enterprise Users satisfaction and loyalty.	
Data Source: ▪ Passive probe data ▪ CRM	System Integration: ▪ Passive probes ▪ CRM
Activities: ▪ Enterprise Users SLA Violation Alarm Monitoring ▪ Enterprise Users SLA Violation Demarcation with indicative suggestions ▪ Enterprise Users SLA Violation Tracking and Manage ▪ Enterprise Users SLA Reporting	

Solution Overview

Customer quantity	Traffic analysis	Service KQI analysis	Modeling analysis
User quantity trend	Range-based traffic distribution	Overall KQI information	Traffic model
			
• User distribution • User quantity trend	• Traffic trend • Application-based traffic distribution • Range-based traffic distribution • User-based traffic distribution	• KQI trend • Failure cause distribution • TOP VAPs	• Traffic model • Abnormal user identification

Methodology

Problem import

EC

service

quality

monitoring

Is the problem resolved?

Demarcation and analysis of service quality-related problems

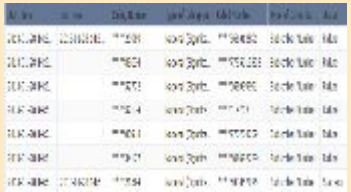
Exception statistics

Service Failures	Count
Call Failures	229
Call Drops	2
E2E Call Connection	72

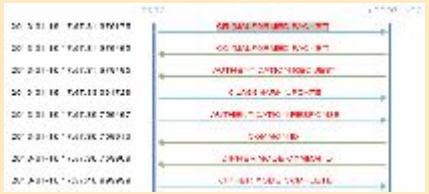
Failure cause identification

- Terminal problem analysis
- RAN problem analysis
- CN problem analysis
- SP problem analysis

Failure xDR analysis



Original signaling analysis



Problem locating and optimization by network Management departments

- RAN problem locating and optimization
- CN problem locating and optimization
- Terminal problem locating and optimization
- SP problem locating and optimization

KPIs and xDR are analyzed and problem scenarios are reproduced to quickly locate and isolate problems.

Best Practice

Enterprise service monitoring

EC monitoring information

Customer name: Shanghai LKL
Counter name: PDP active success rate
Date: 2013/11/12
Location: Shanghai
Exception: PDP active success rate abruptly drops by 10% after 15:00.

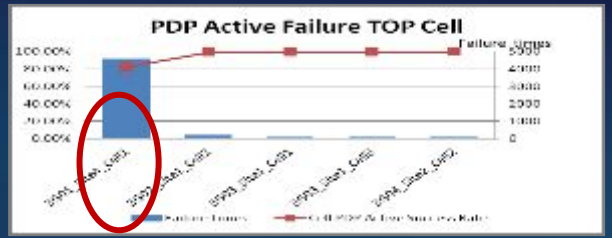
Service failure analysis

Failure analysis results
Failure category: Wireless access failure is the main category, accounting for 68%.

Cause Category: Long duration of 1000 RAB assignment is the main cause.

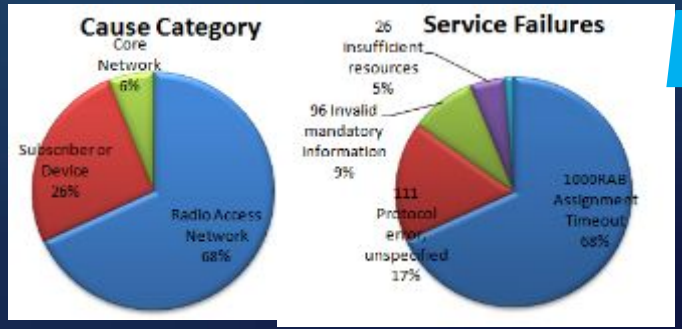
In-depth drilling analysis

Analysis on the long duration of 1000 RAB assignment time
Analysis Period: (15:00 – 16:00)



Trend of PDP Activation Success Rate

Failure Analysis on PDP Activation Success Rate



Conclusion

Long duration of wireless RAB assignment time is the main reason that causes PDP active success rate exception after 15:00 in Shanghai LKL on November 12, 2013. Wireless access failure mainly occurs in 3G01_Site4_Cell1. NOC team is advised to check wireless access RAB counter in 3G01_Site4_Cell1 and further locate the problem.

The monitoring result shows the problem, and then the problem can be gradually demarcated through multi-dimensional failure analysis.

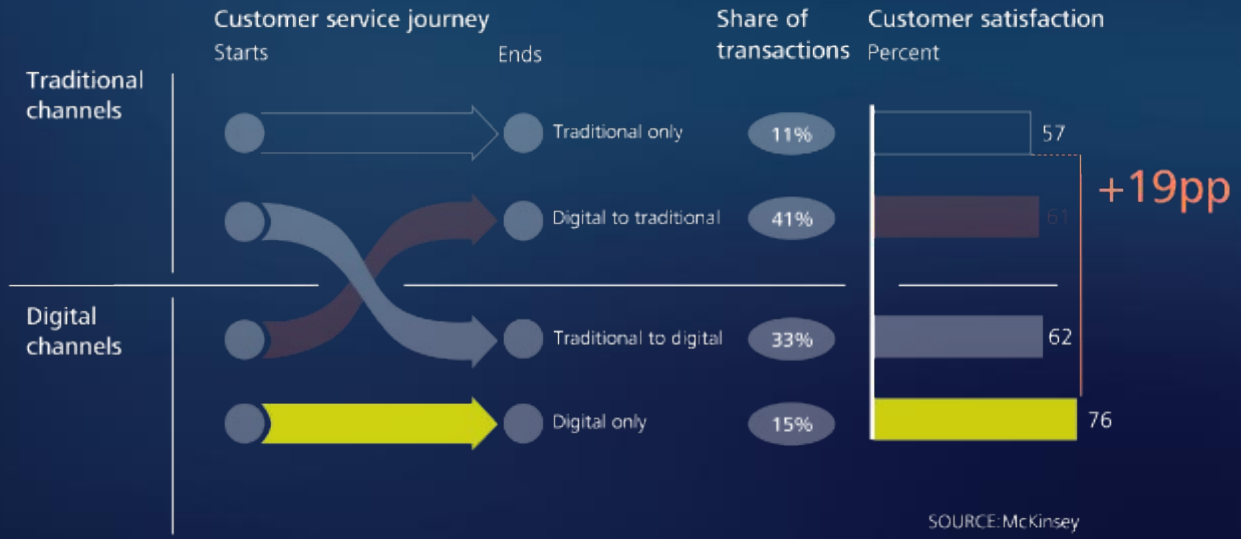
Separator

Digitizing Customer Care

Digitizing Customer Care

Digitalization Challenge

* A Purely Digital Journey Drives Higher Customer Satisfaction
* Fallback From Digital Channel to Traditional Channel without Closed-loop Brings Customer Dissatisfaction.



SOURCE:McKinsey

Digitizing Customer Care

Executive View

› Omni-Channel Care
Performance Monitoring

Backend

› Fast Demarcation
Using Smart Fault Tree

Digitizing Customer Care

Value Delivered by Digitizing Customer Care

50%~70%
OPEX Saving

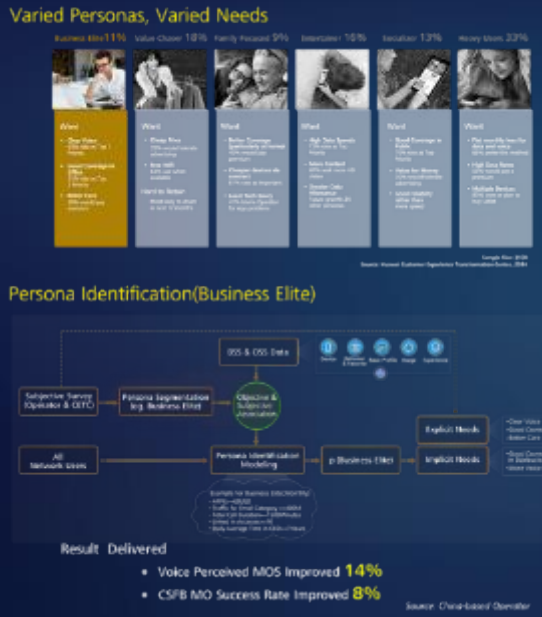
19%
Customer Satisfaction Improved

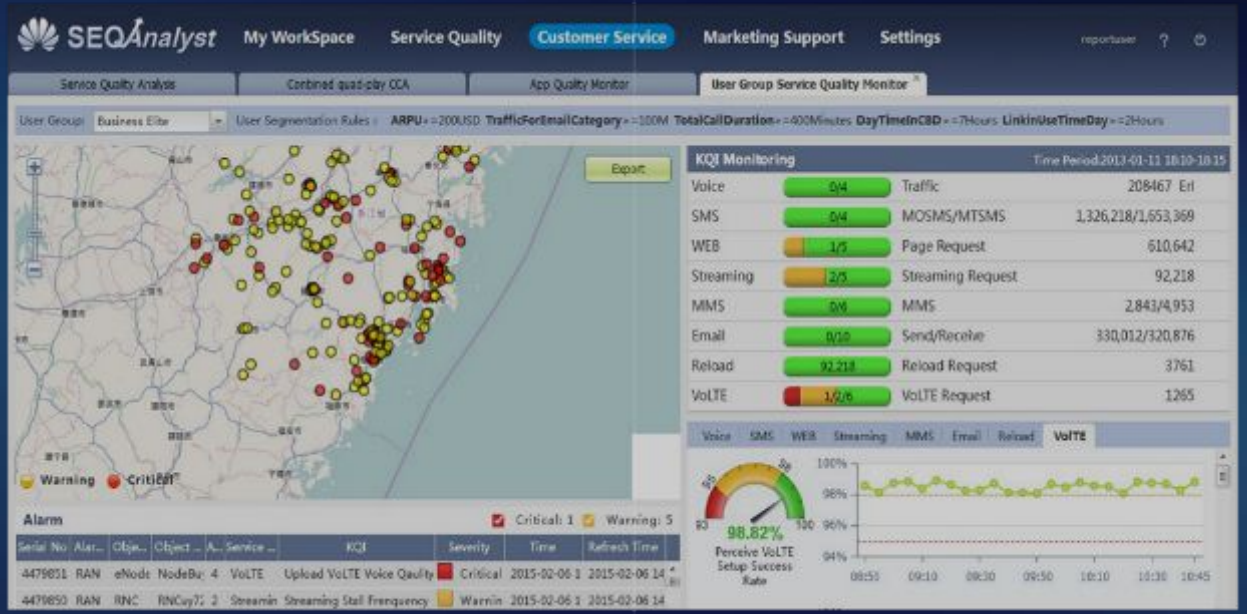
24*7
Self-care

~15 mins
Fast Complaint Handling

Separator

Persona–based Experience Assurance





Persona–based Experience Assurance

Varied Personas, Varied Needs

Business Elite 11%

Want

- **Clear Voice**
  60% rate as Top 1 Priority
- **Good Coverage in Office**
  51% rate as Top 2 Priority
- **Better Care**
  36% would pay premium

Value Chaser 18%

Want

- **Cheap Price**
  35% would tolerate advertising
- **Free Wifi**
  63% use when available

Hard to Retain

Most likely to churn in next 12 months

Family Focused 9%

Want

- **Better Coverage (particularly at home)**
  40% would pay premium
- **Cheaper devices via contract**
  61% rate as important
- **Least Tech-Savvy**
  41% blame Operator for App problems

Entertainer 16%

Want

- **High Data Speeds**
  72% rate as Top Priority
- **More Content**
  47% seek more HD Video
- **Greater Data Allowance**
  Future growth 2X other personas

Socializer 13%

Want

- **Good Coverage in Public**
  70% rate as Top Priority
- **Value for Money**
  30% would tolerate advertising
- **Good reliability rather than more speed**

Heavy Users 33%

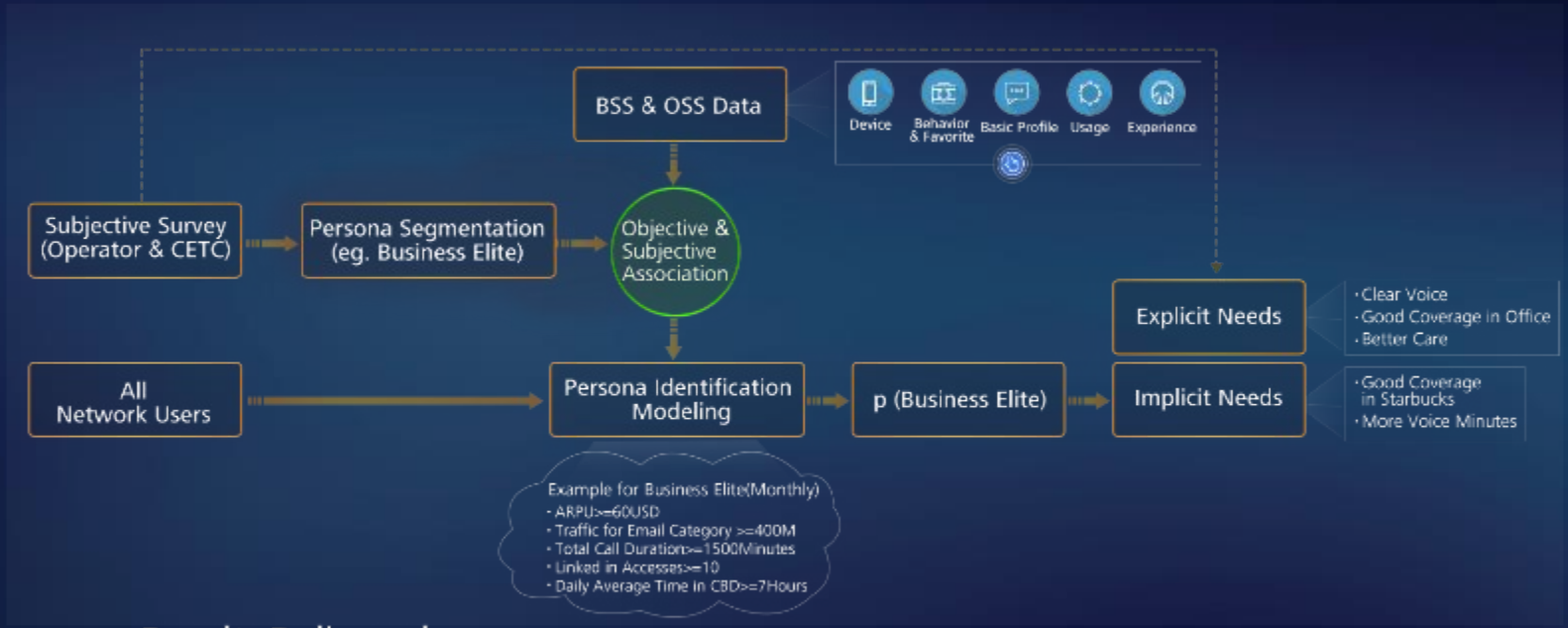
Want

- **Flat monthly fees for data and voice**
  65% prefer this method
- **High Data Rates**
  55% would pay a premium
- **Multiple Devices**
  83% own or plan to buy tablet

Sample Size: 3100
Source: Huawei Customer Experience Transformation Center, 2014

Persona-based Experience Assurance

Persona Identification(Business Elite)



Result Delivered

- Voice Perceived MOS Improved **14%**
- CSFB MO Success Rate Improved **8%**

Source: China-based Operator

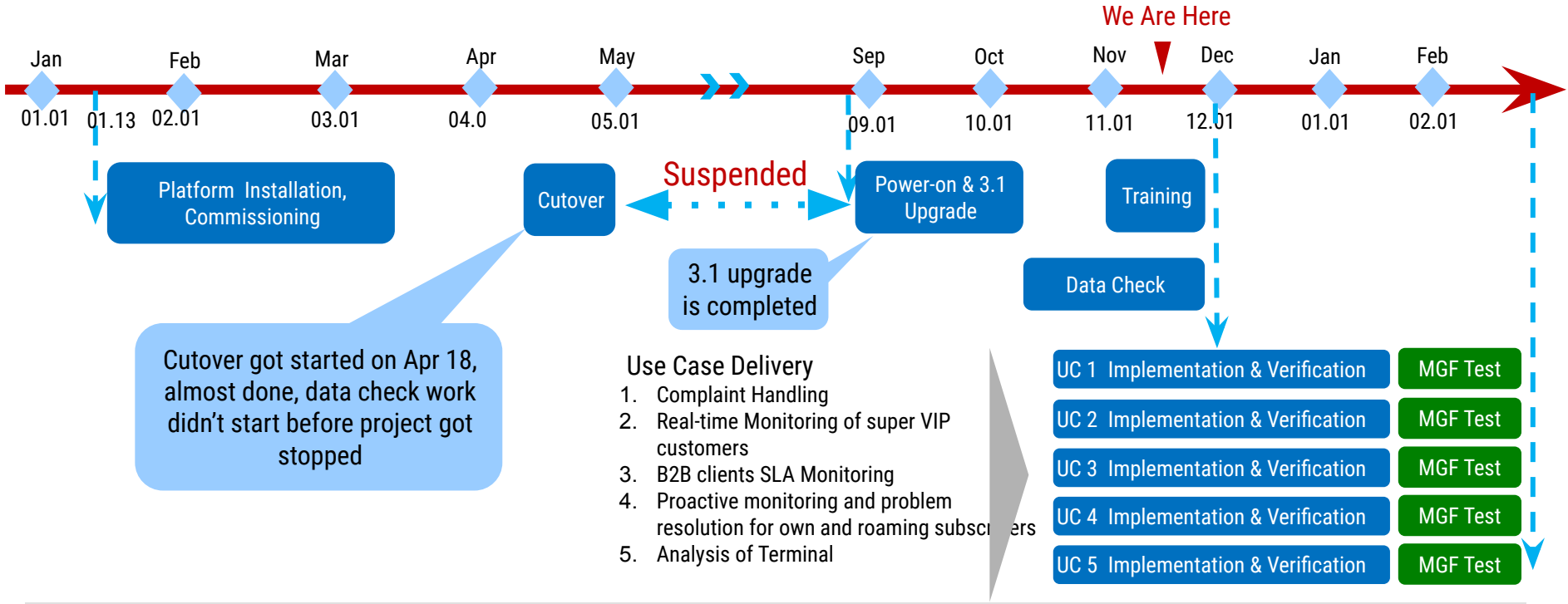
Separator

Scope of Pilot – Use Case Delivery

No.	Use Case Name	Description
1	Customer complaint handling	• Implement Customer Care system integration with SQM system, help Call Center agents L1/L2 quickly make reply to complaint calls, decrease FCR, improve complaint handing efficiency • Integration with Megafon HPSM system to improve compliant handling efficiency
2	Proactive monitoring and problem resolution	• Proactive monitoring of service quality of Megafon Moscow mobile network in different dimensions, such as cell level, network level, location level, etc. • Quick problem demarcation and root cause resolution for service quality problems
3	Real-Time Monitoring of VIP & super-VIP subscribers	• Real-time (5 minutes) proactive monitoring of service quality problems for VVIP users • Quick problem demarcation root cause resolution for service quality problems
4	B2B clients SLA monitoring	• Proactive monitoring of B2B users service quality problems violating SLA • Quick problem demarcation and root cause resolution for service quality problems
5	Analysis of Terminals	• Analysis reports of terminal ranking in brands, traffic, service qualities, etc. • Customized reports

5 Use Cases supporting operation & maintenance has been defined as the scope of Use Cases delivered in pilot
There is also planned Churn and NPS detractors analytics after 4 months of collected data.

Milestones & Progress



- MegaFon requested to have preliminary trial results by end of Oct. 2016
- It's proposed to focus on Use Case 1 Complaint Handling delivery for phase 1, due to limited time left for delivery

Выполненные работы

1) Оборудование смонтировано, включено и настроено
2) Программное обеспечение установлено
3) Произведены отладочные работы
4) Завершена интеграция с различными IS/IT системами (CC, NRI, TT)
5) Сформирована и русифицирована экспертная система рекомендаций для L1/L2
6) Настроена и русифицирована система root cause analysis для L3
7) Проведено обучение сотрудников МегаФон
8) Предоставлен доступ к решению сотрудникам МегаФон

Текущие и запланированные работы

1) Проверка полноты и целостности входных данных

2) Калибровка KPI/KQI, установка пороговых значений аварий

3) Реализация, имплементация и демонстрация пяти юзкейсов

4) Расширение проб-серверов и установка TDM-конвертеров

5) Передача системы в пользование

6) Подготовка и реализация юзкейсов по анализу NPS и оттока абонентов

7) Интеграция с Metricell Agent

Собираемые KPI

Voice:
- Perceived Call Success Rate
- E2E Call Connection Delay
- Perceived Call Drop Rate

SMS:
- SMS Origination Success Rate
- SMS Origination Delay
- SMS Termination Success Rate
- SMS Termination Delay

Email:
- Email Login Success Rate
- Email Login Delay
- Email Send Success Rate
- Email Send Throughput
- Email Download Success Rate

WEB:
- Page Response Success Rate
- Page Response Delay
- Page Browsing Success Rate
- Page Browsing Delay
- Page Download Throughput

MMS:
- MMS Send Success Rate
- MMS Send Delay
- MMS Send Throughput
- MMS Download Success Rate
- MMS Download Delay
- MMS Download Throughput

Streaming:
- Video Streaming Start Success Rate
- Video Streaming Start Delay
- Video Streaming Stall Frequency
- Video Streaming Stalled Time Rate
- Video Streaming Plays

Thank you