

Migrati
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Analyt
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Predict
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Prescriptive

NPS

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

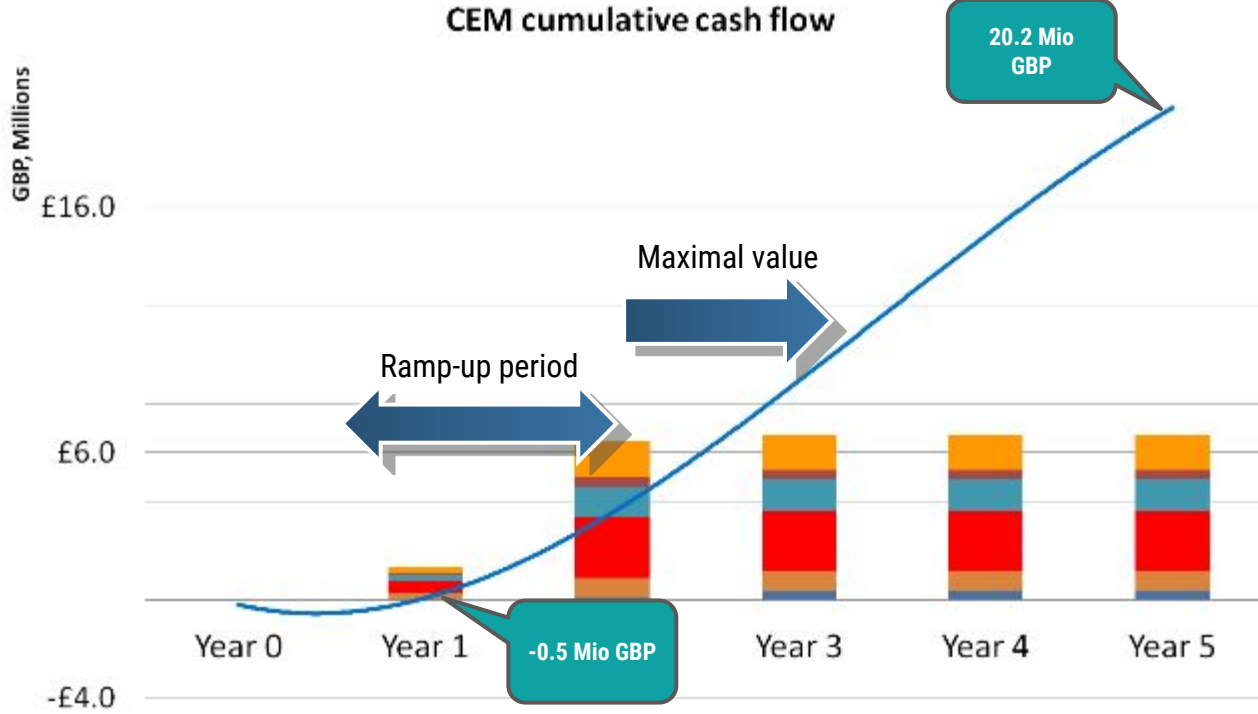
Service Operation Centre
Establishment & Operation
Network Operation
Network Planning

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

Content

1. CEM & SQM & NPM – Huawei's Capability
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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

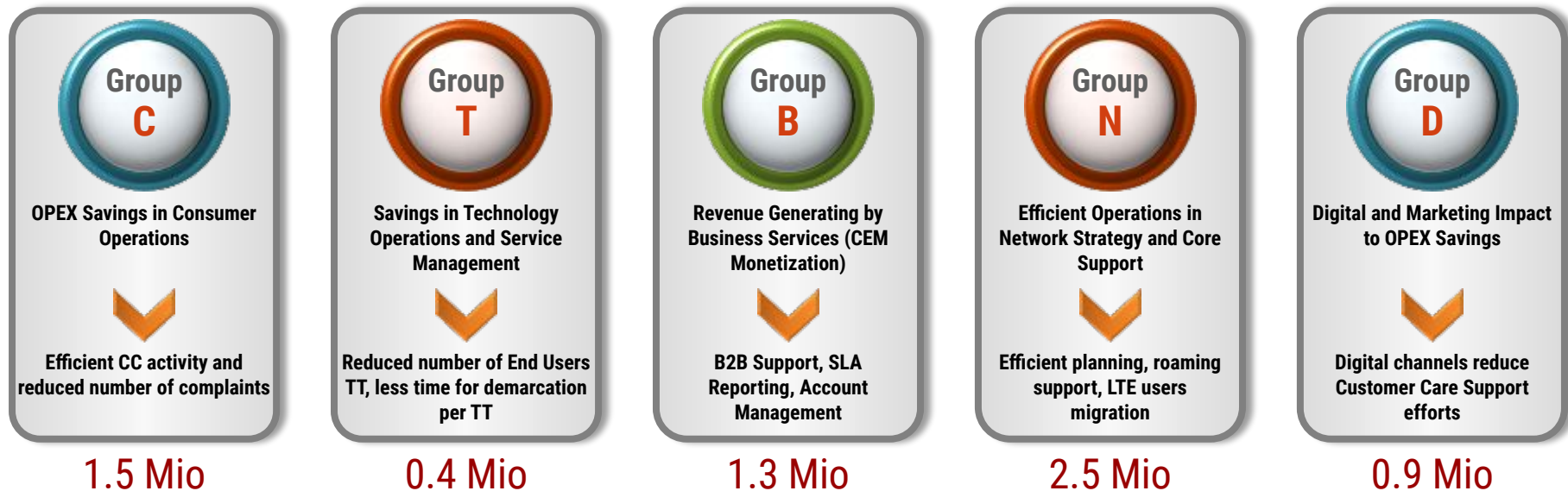
CCF (5th year): 20.2 Mio GBP

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



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

Content

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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

Architecture &
Platform

VVIP Service Quality
Assurance

CEM vs SQM

Digitizing
Customer Care

ARPU Driven
Network Planning

Enterprise (B2B)
Service Quality
Assurance

Persona Based
Experience Assurance

Service Operation
Centre

Value-Experience
Matrix Migration

Content

1. CEM & SQM & NPM – Huawei's Capability
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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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Network quality score No.1 in Denmark 2. Ps data traffic increased by 3 times

HUAWEI SmartCare® 3rd Party Partners



Customer Experience Assurance

Cross-Channel



Feedback Management



CE Consulting



Digital Channel

IT NOS,SQM
And CEA equivalent



Service Quality Management

IT Solutions



Network Optimization Services

Probe



GEO-Location



MV OSS/AFP/ACP



Innovation with Industry Forums



Thank you

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Appendix & Supportive Materials

Group C – OPEX Savings in Consumer Operations



1.5 Mio

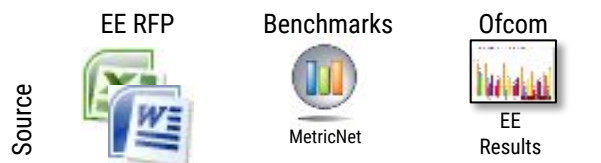
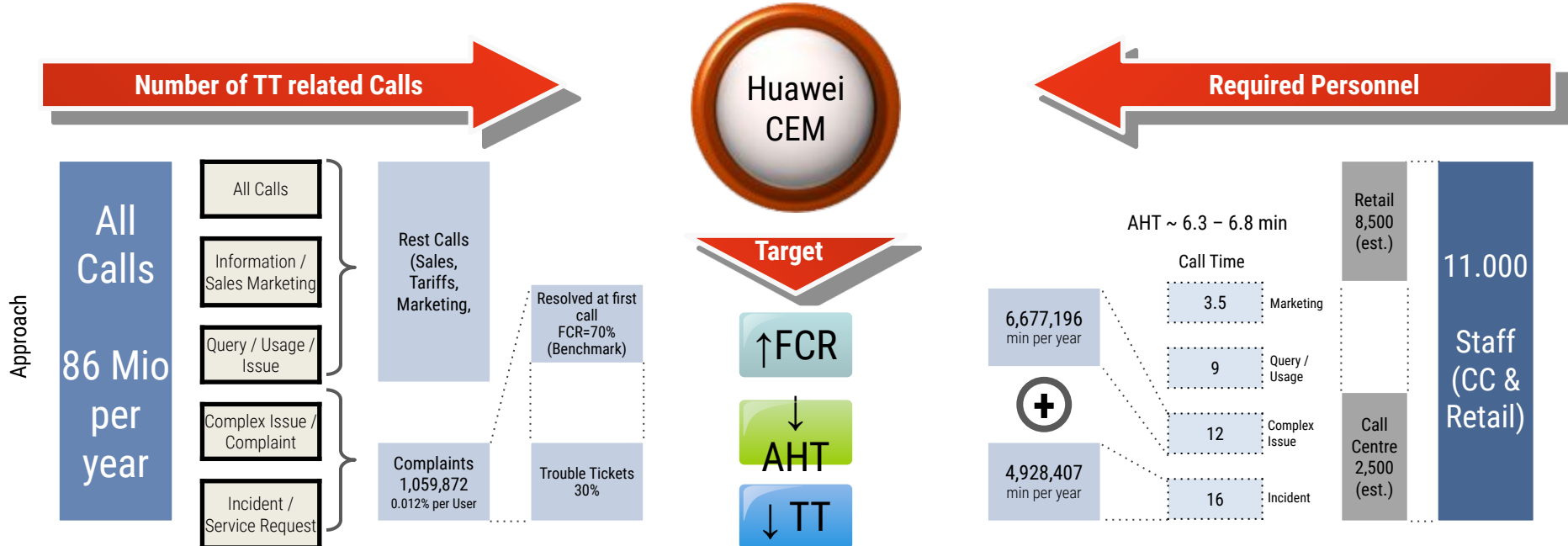
Summary (details in further slides):

- ✓ 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



Huawei expects significant savings in Call Centre by CEM Platform Implementation

Details – please see next page

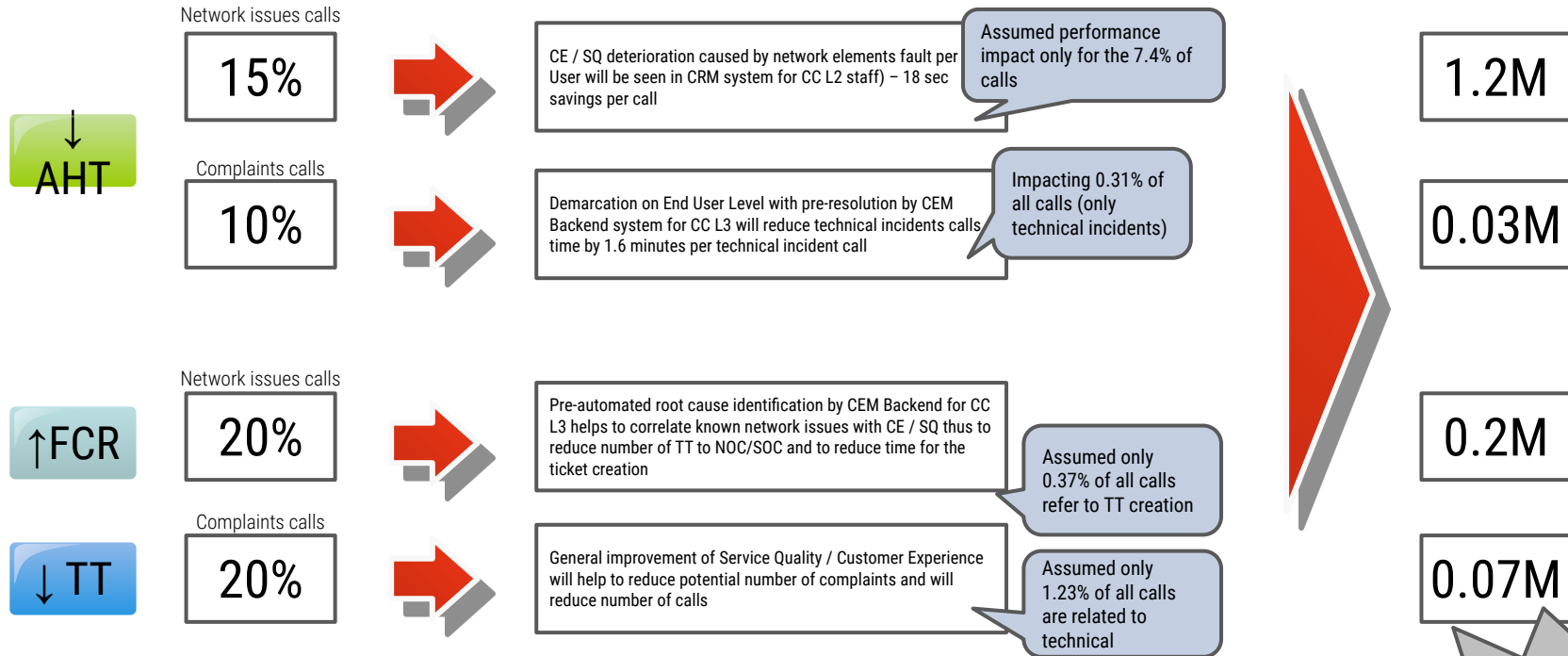


Call Centre OPEX reduction – details and clarifications

What

How

Benefits



Group T – Technology Operations and Service Management Savings



A vertical card with a rounded top and bottom. At the top is a circular icon with a brown border and a white center containing the text 'Group T'. Below the icon is the text 'Savings in Technology Operations and Service Management'. In the center is a downward-pointing chevron icon. Below the chevron is the text 'Reduced number of End Users TT, less time for demarcation per TT'.

Group T

Savings in Technology Operations and Service Management

Reduced number of End Users TT, less time for demarcation per TT

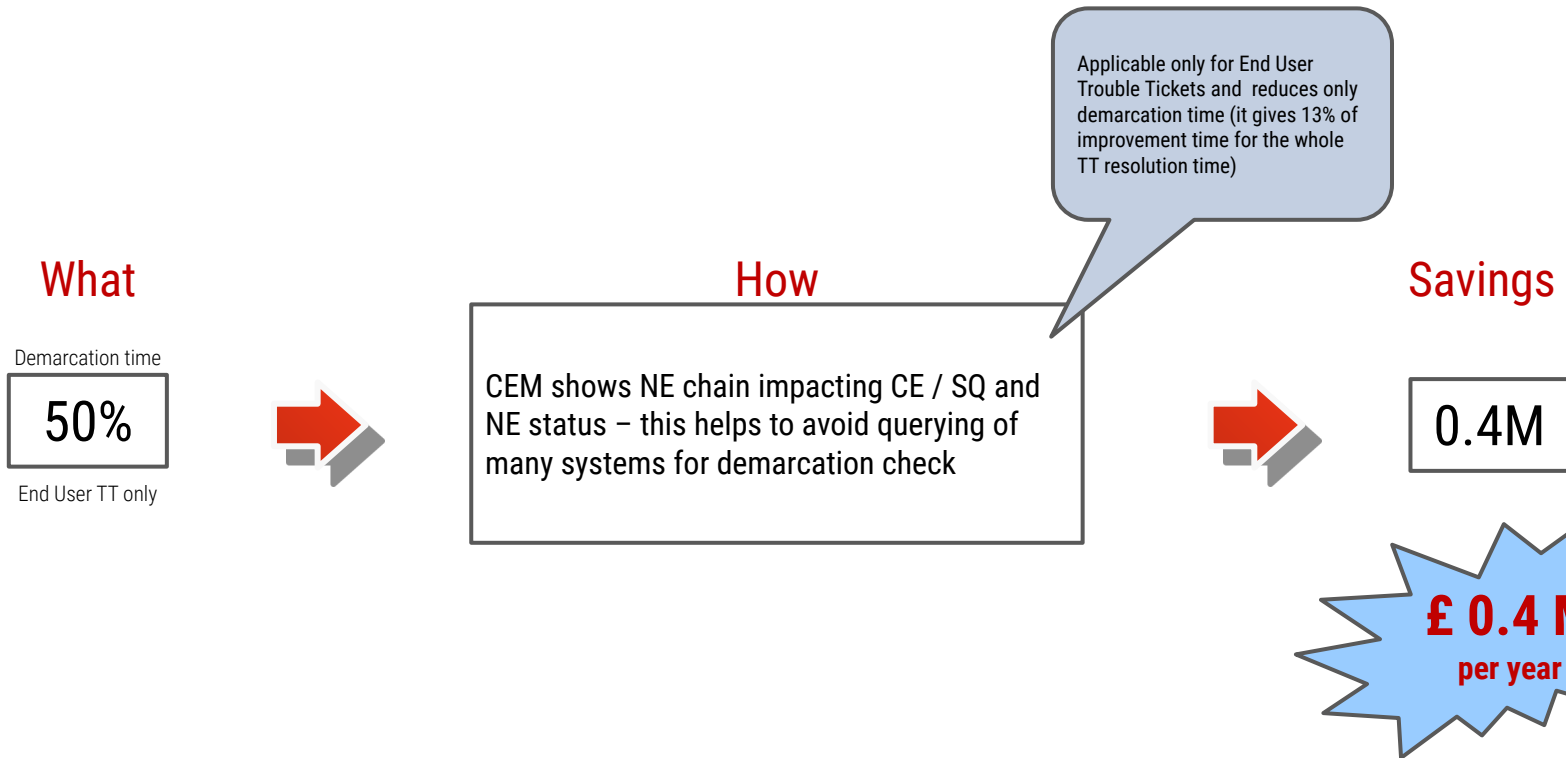
0.4 Mio

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)



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



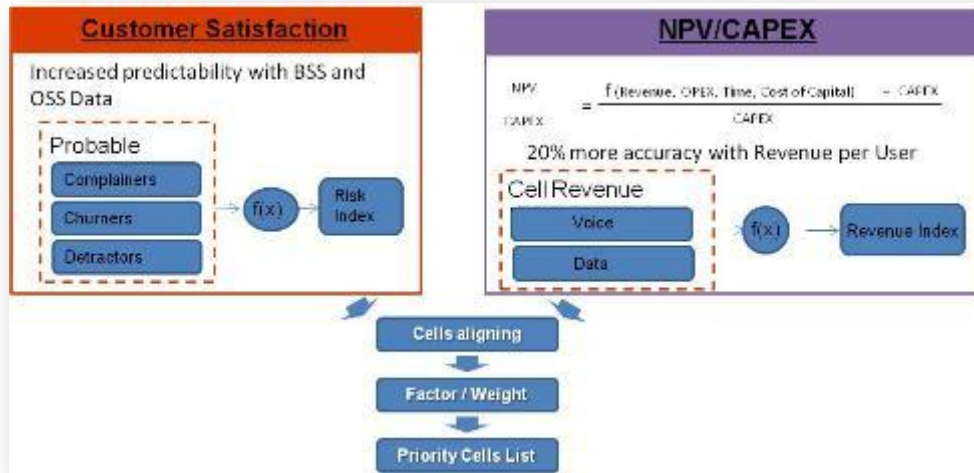
2.5 Mio

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



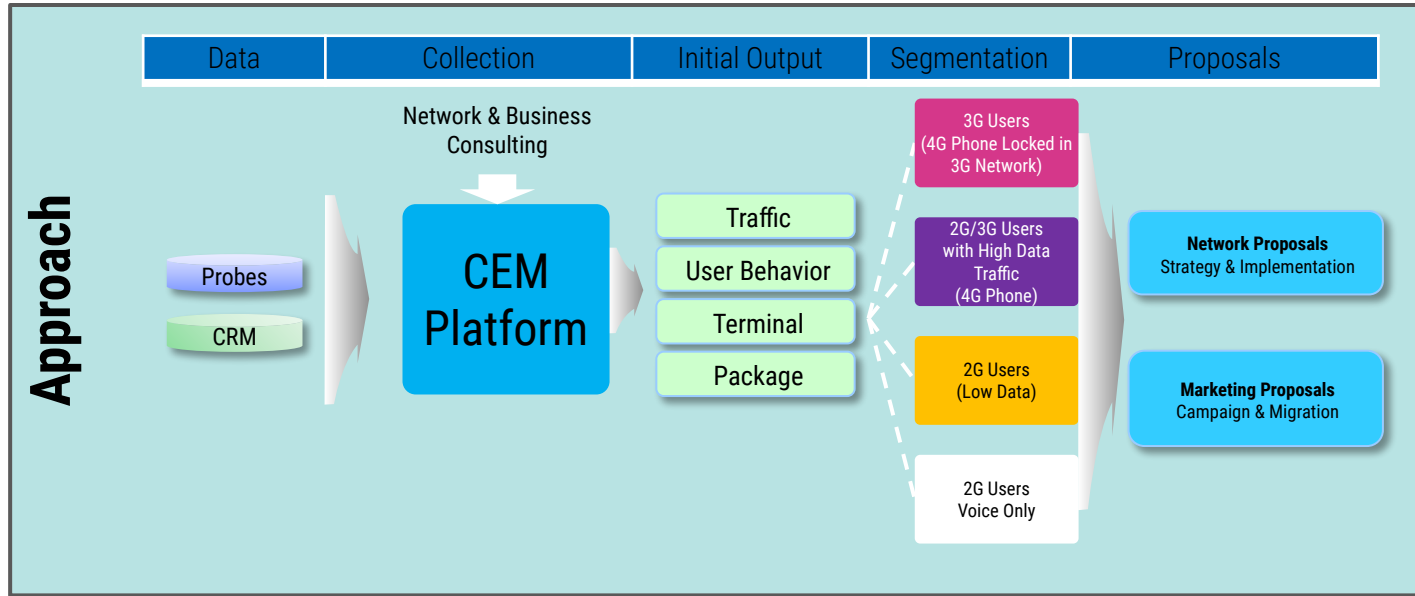
By ARPU / Complaints driven Planning EE can achieve better ROI and generate new revenue streams – all those will bring extra benefits for EE, which are not presented in BC at the moment (extra bonus)

£ 0.17M
per year

Business Case

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

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

Roaming Subscriber Information

ID	Area	Subscriber	Roaming	Loss
1	2014-02-02 00:00 - 00:00	1234	100%	100%
2	2014-02-02 00:00 - 00:00	1234	12%	88%
3	2014-02-02 00:00 - 00:00	1234	5%	95%
4	2014-02-02 00:00 - 00:00	1234	8%	92%
5	2014-02-02 00:00 - 00:00	1234	15%	85%
6	2014-02-02 00:00 - 00:00	1234	10%	90%
7	2014-02-02 00:00 - 00:00	1234	18%	82%
8	2014-02-02 00:00 - 00:00	1234	14%	86%
9	2014-02-02 00:00 - 00:00	1234	11%	89%
10	2014-02-02 00:00 - 00:00	1234	16%	84%
11	2014-02-02 00:00 - 00:00	1234	13%	87%
12	2014-02-02 00:00 - 00:00	1234	17%	83%

Step1: Lost roaming user detection

Roaming Subscriber Information

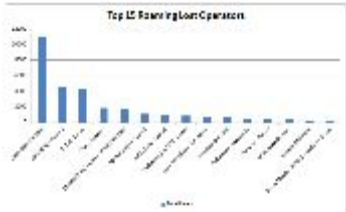
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4	2014-02-02 00:00 - 00:00	1234	8%	92%
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6	2014-02-02 00:00 - 00:00	1234	10%	90%
7	2014-02-02 00:00 - 00:00	1234	18%	82%
8	2014-02-02 00:00 - 00:00	1234	14%	86%
9	2014-02-02 00:00 - 00:00	1234	11%	89%
10	2014-02-02 00:00 - 00:00	1234	16%	84%
11	2014-02-02 00:00 - 00:00	1234	13%	87%
12	2014-02-02 00:00 - 00:00	1234	17%	83%

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*



0.9 Mio

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

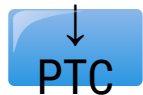
Data Query Calls Efficiency Improvement – OPEX savings

What



Data Query Calls

2 min



Data Query Calls

10%

How



CC Agent can use only one tool for Data Usage query (instead previously 3 tools) – this will help to save 2 minutes per data query call

Impacting 2% of all calls (only data usage queries)



Online Portal or / and APP integrated to CEM Platform (to get query results) may help to reduce up to 10% of data usage requests

Impacting 2% of all calls (only data usage queries)

Benefits



0.6M

0.29M

£ 0.9 M
per year

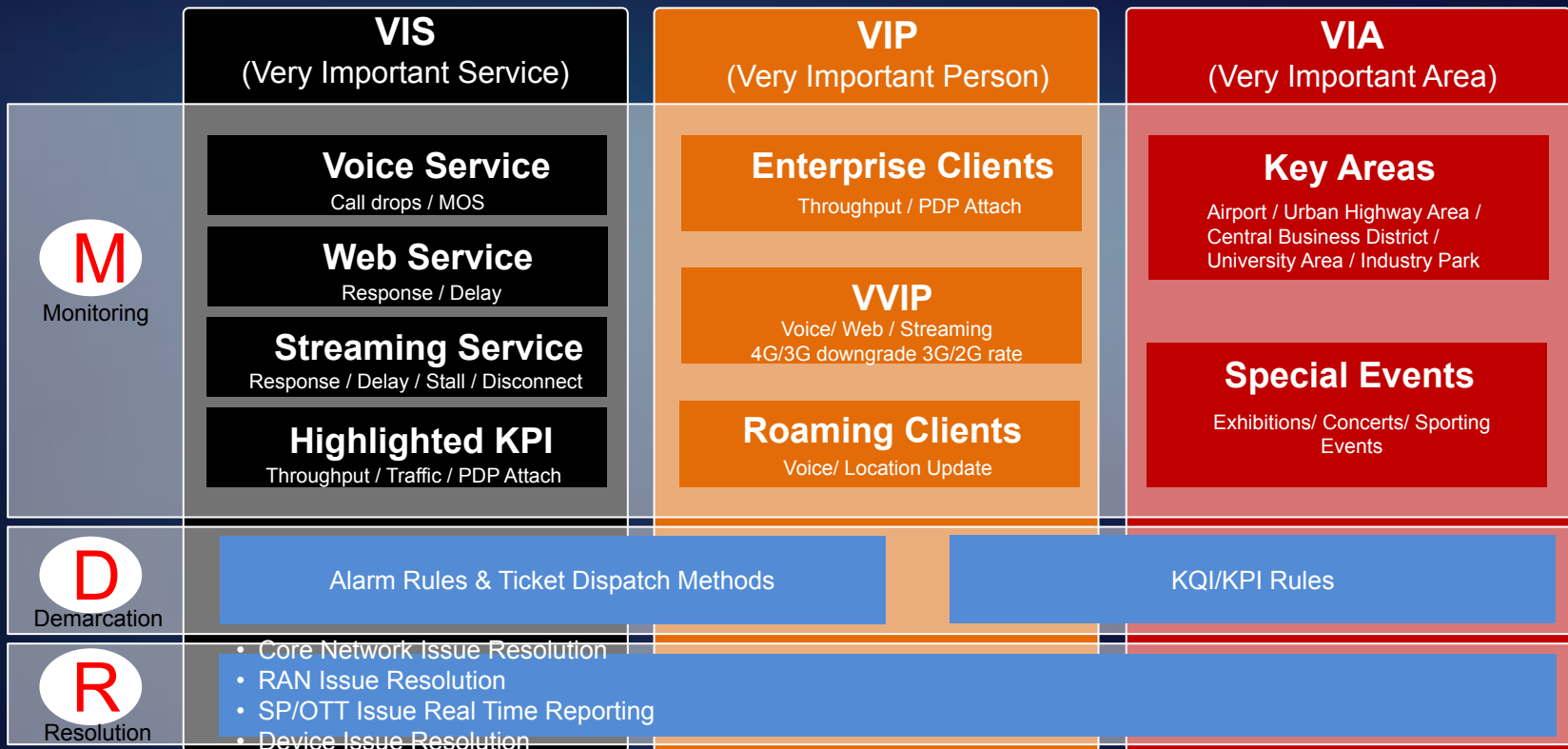
Appendix & Supportive Materials

1. SmartCare® Business Value on a Customer Case
2. Use Cases Set
3. Global References & Why HUAWEI

3V Demo – Supportive Materials



VIP / VIS / VIA Proactive Care Overview



Last Update 2016-9-8 15:19 PM

Time Left To Be Refreshed 00:04:34

Very Important Person



Satisfied Users



V.I.P.



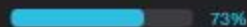
V.V.I.P.



Very Important Service



Satisfied Users



WEB

69

VOICE

92

STREAMING

75

WECHAT

74

Very Important Area



Satisfied Users



CAMPUS

74

HIGH-SPEED
RAILWAY

78

HOSPITAL

73

GOVERNMENT

70

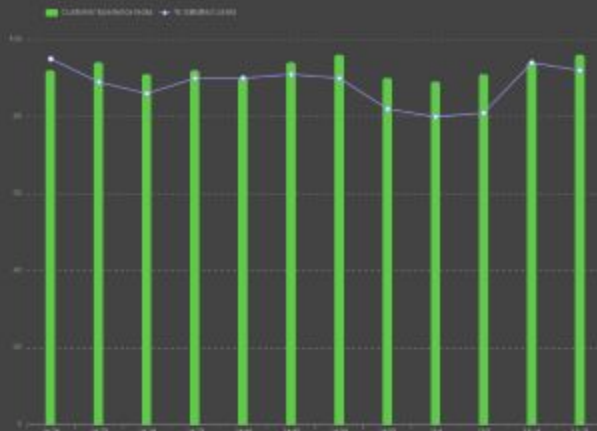
INDUSTRY
ESTATE

80

V.L.P.

V.V.L.P.

TREND OF CUSTOMER EXPERIENCE



Customer Experience Index

88%
% Satisfied Users

V.I.S.



V.I.A.



SERVICE EXPERIENCE

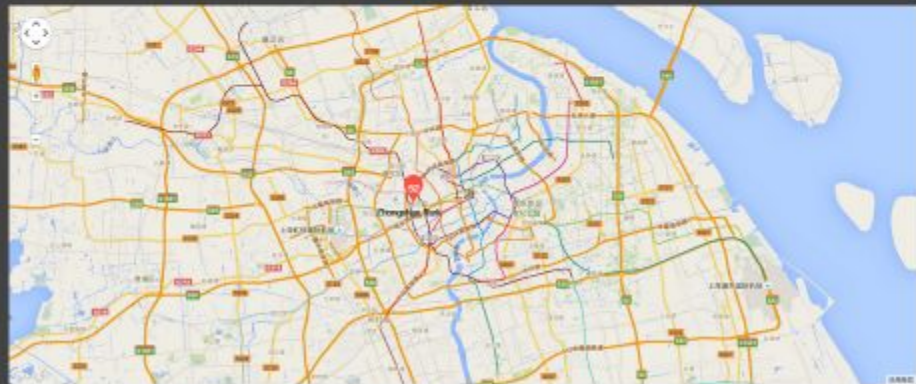


WORST EXPERIENCE USERS

MISSION	Score	CDI	Abnormal Event #	Very Annoyed Call
10890****	80	80	6	zone1
10823****	80	80	16	zone2
10736****	81	81	21	zone3
10860****	85	85	8	zone4
10890****	86	86	13	zone5

Service Case: 38.1%
Web Case: 16.3%
IM Case: 17.2%
Voice Case: 28.5%

QUALITY ISSUE MAP



SHANGHAI UNICOM EXPERIENCE MANAGEMENT DASHBOARD

Last Update: 2016-09-08 15:20PM

Update Interval: 00:04:00

V.I.P.



V.I.S.



Customer Experience Index

68%

% Satisfied Users

V.I.A.



TREND OF CUSTOMER EXPERIENCE



SERVICE EXPERIENCE



RNC/BSC/ENB USER EXPERIENCE

	RNC/BSC/ENB	OTI	Web	Streaming	Voice	IM(Wechat)
→	RNC01	66	65	70	80	85
	Co001	68	65	65	88	86
	Co002	66	69	74	81	82
	Co003	64	67	71	80	84
	Co004	60	62	70	87	82
	Co005	69	68	65	88	88
	Co006	69	61	69	87	85
→	RNC02	68	65	75	85	85
→	RNC03	64	65	70	84	86
→	RNC04	67	64	72	80	83

QUALITY ISSUE MAP



SHANGHAI UNICOM EXPERIENCE MANAGEMENT DASHBOARD

Last Update: 2016-09-08 15:21PM

Update Interval: 00:04:45

V.I.P.



V.I.S.



V.I.A.



Customer Experience Index

72%
% Satisfied Users

TREND OF CUSTOMER EXPERIENCE

Customer Experience Index Industry Estate Campus Government Hospital High-speed Railway



AREA EXPERIENCE BENCHMARKS

Campus High-speed Railway Hospital Industry Estate Government

74

78

73

80

70

Web

65

+ 3.23%

Streaming

70

+ 1.78%

Voice

90

+ 2.65%

Wechat

68

+ 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

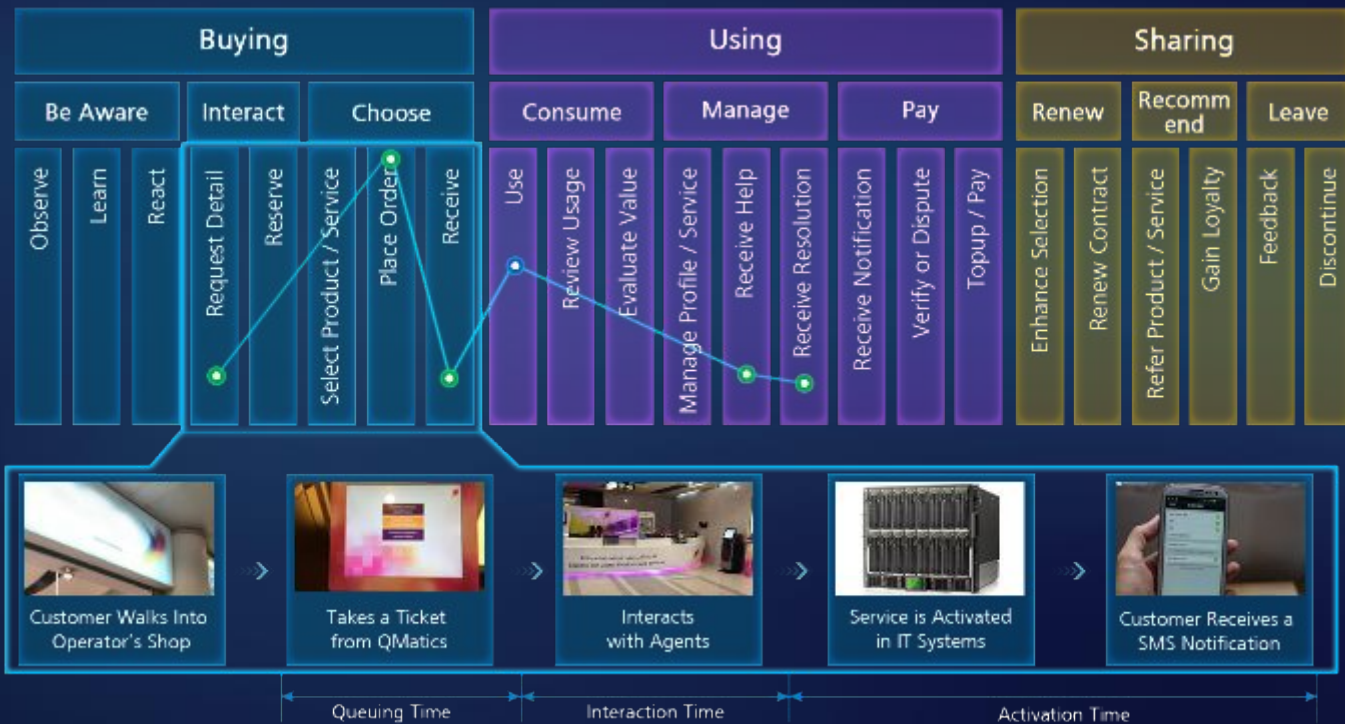


Customer Experience

Management :

- First 30-day Experience Assurance (ICT Journey)

Complete View of the 30-day Journey



Complete View of the 30-day Journey

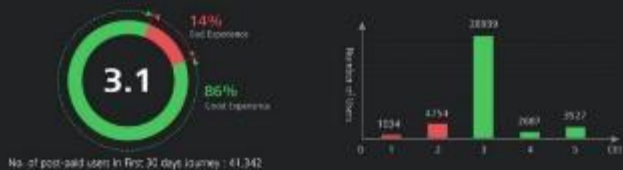


CEI Dashboard

First 30-day Journey CEI Trend



First 30-day Journey CEI - 30th Nov (Mean CEI of those completing)



No. of post-paid users in first 30 days journey : 41,342

CEI Drill-Down



For 4G users there is only one channel to buy a SIM card: operator's shop

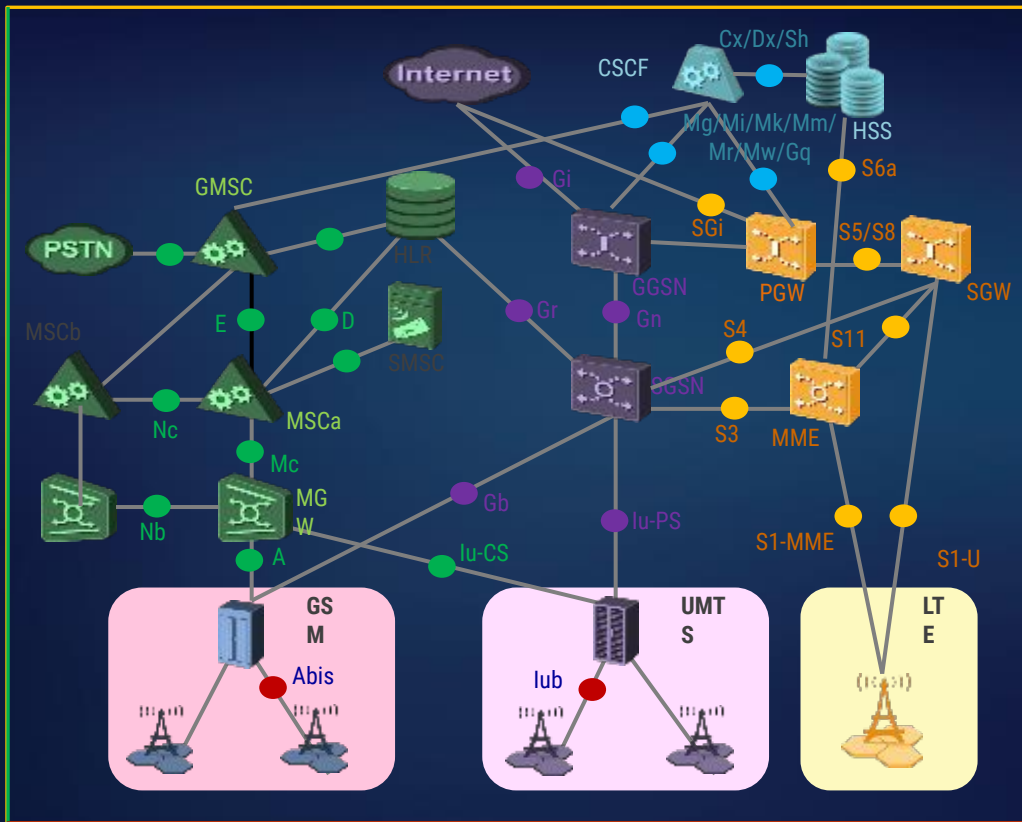
First 30 days journey – end of supportive materials



Architecture & Platform – Supportive Materials



Network Data Sources

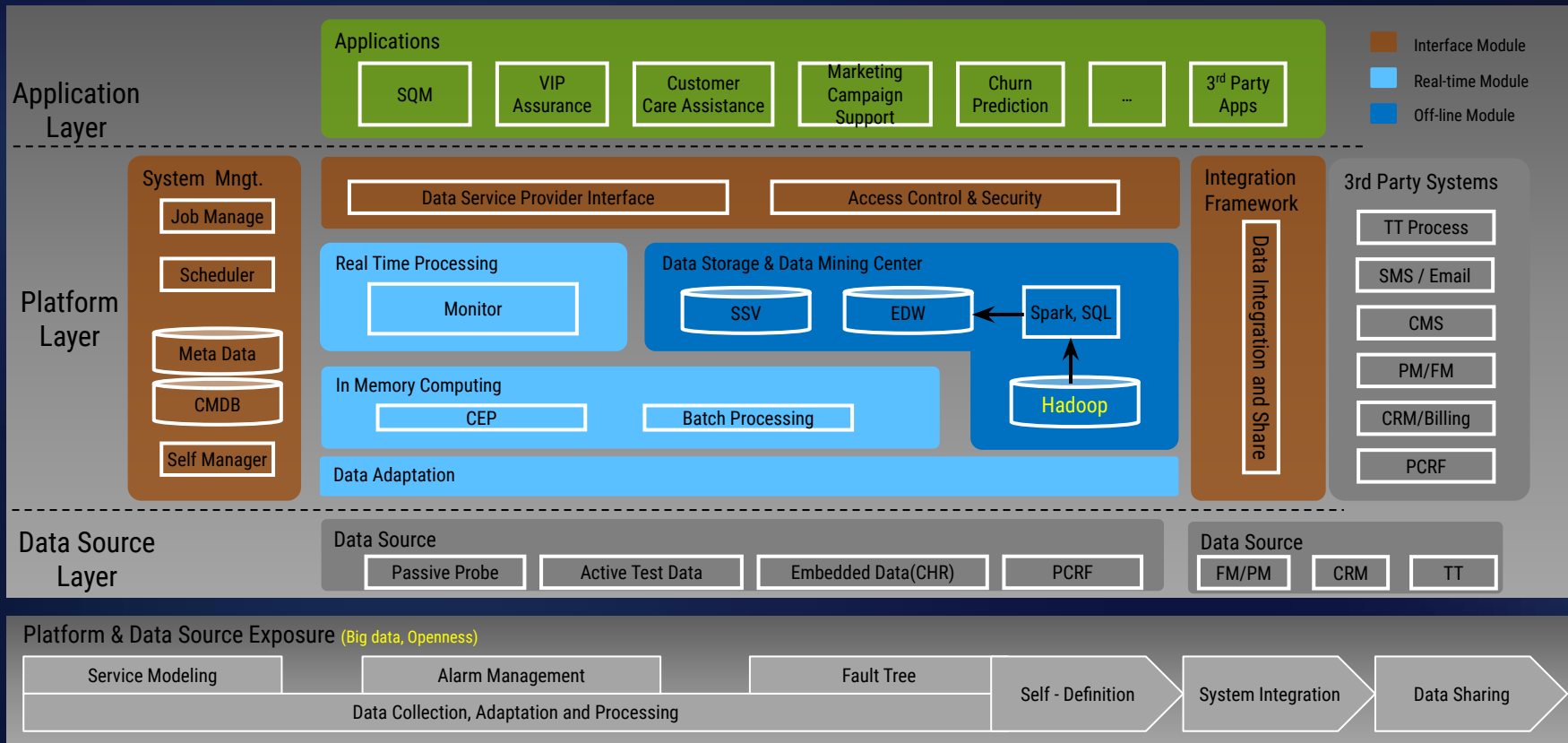


Domain	Interface	Protocol
Wireless	Abis	RR/BTSM
	lub	NBAP
Core CS	A	BSSAP
	luCS	RANAP
	Nc	BICC/ISUP/SIP
	Nb	RTP/RTCP
	Mc	H.248
	C/D/E/F	MAP
	CAP	CAMEL
Core PS	Gb	BSSGP
	luPS	RANAP
	Gr	MAP
	Gn	GTP
	Gi	Gi-U, Gi-Radius
IMS	Gm, ISC, Sh/Dh, Cx/Dx, Mr, Mx, Mi, Mj, Mg, Mw DNS	SIP/Diameter
LTE	S1-MME	S1-AP
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

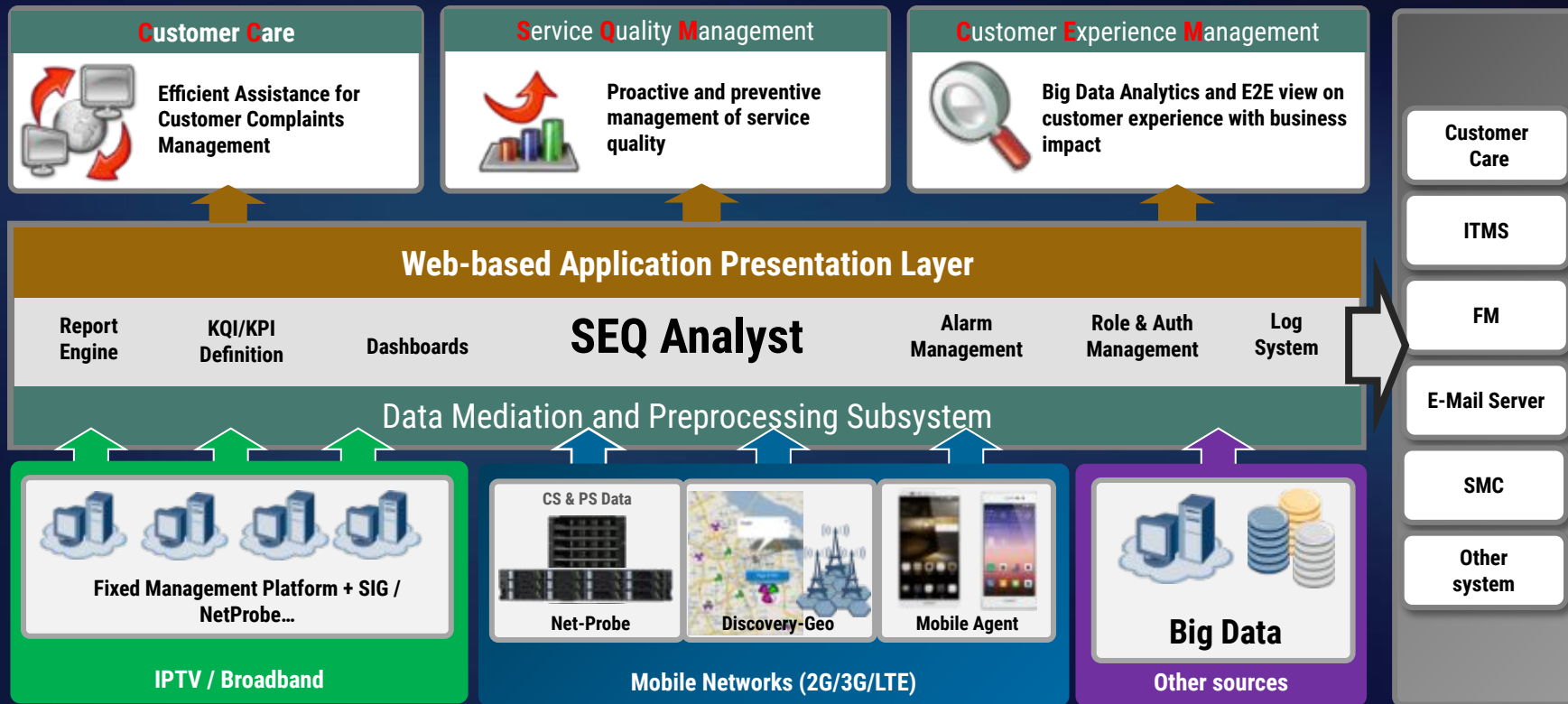
Platform Architecture



500 Gbps probe capability & 1800+ protocols identification



CEM Platform to deliver value through use cases



Value through Use Cases for Operator's needs

Architecture & Platform – end of supportive materials



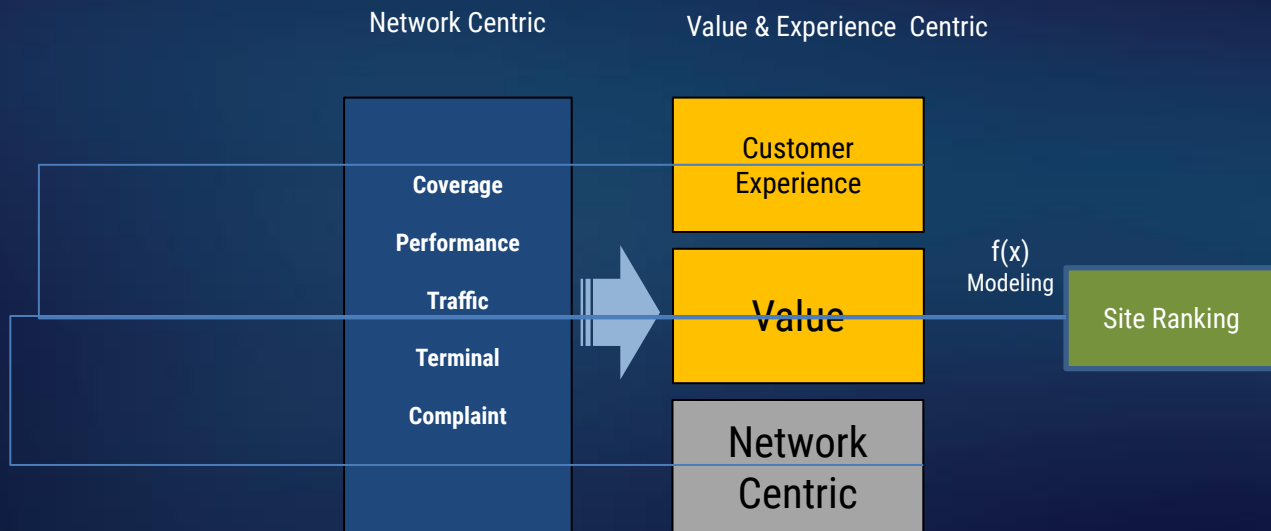
ARPU Driven Network Planning – Supportive Materials



Quality Brand Experience & Value Driven Site Ranking



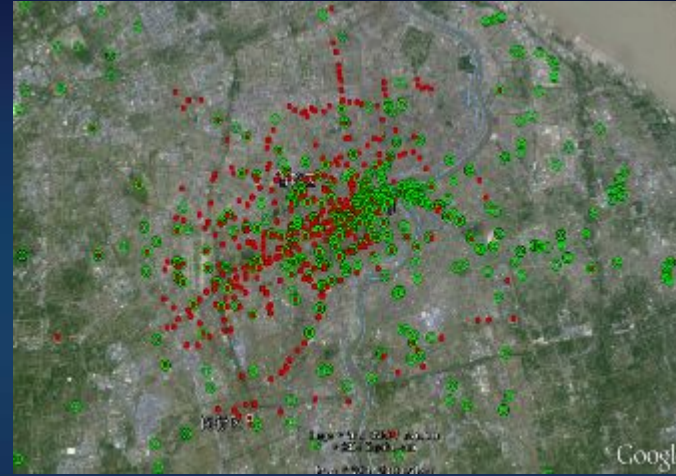
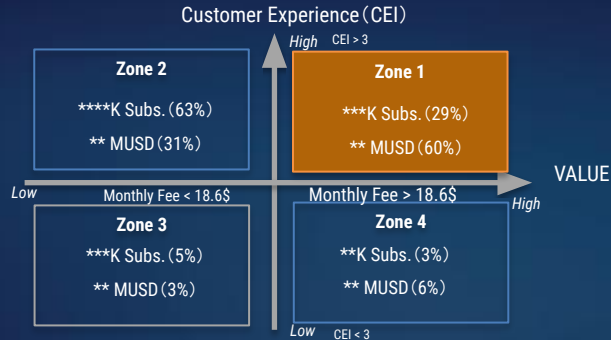
Sites Ranking Model



Quality Brand Experience & Value Driven Site Ranking



Value/experience Classified Model



Network Centric Site Ranking



Disconnect Between Investment and Customer Satisfaction

Experience and Value Driven Site Ranking



23.7%

Matched with Traditional KPI
Focused List

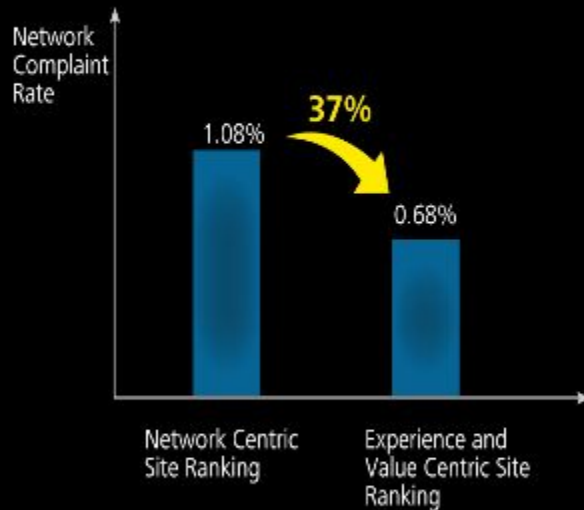
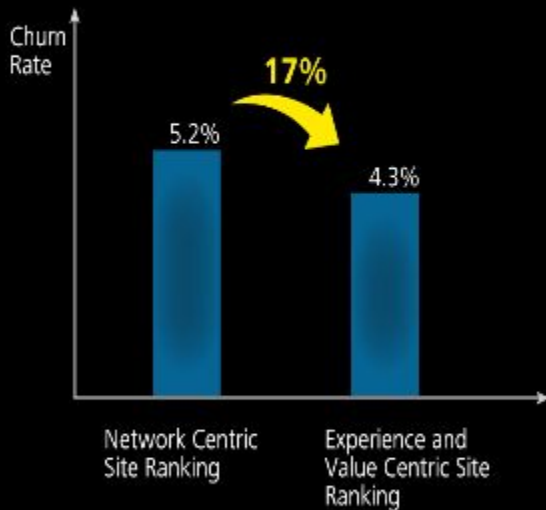
● Zone 4 Target Sites

○ Traditional KPI Focused
TOP 1000 Sites

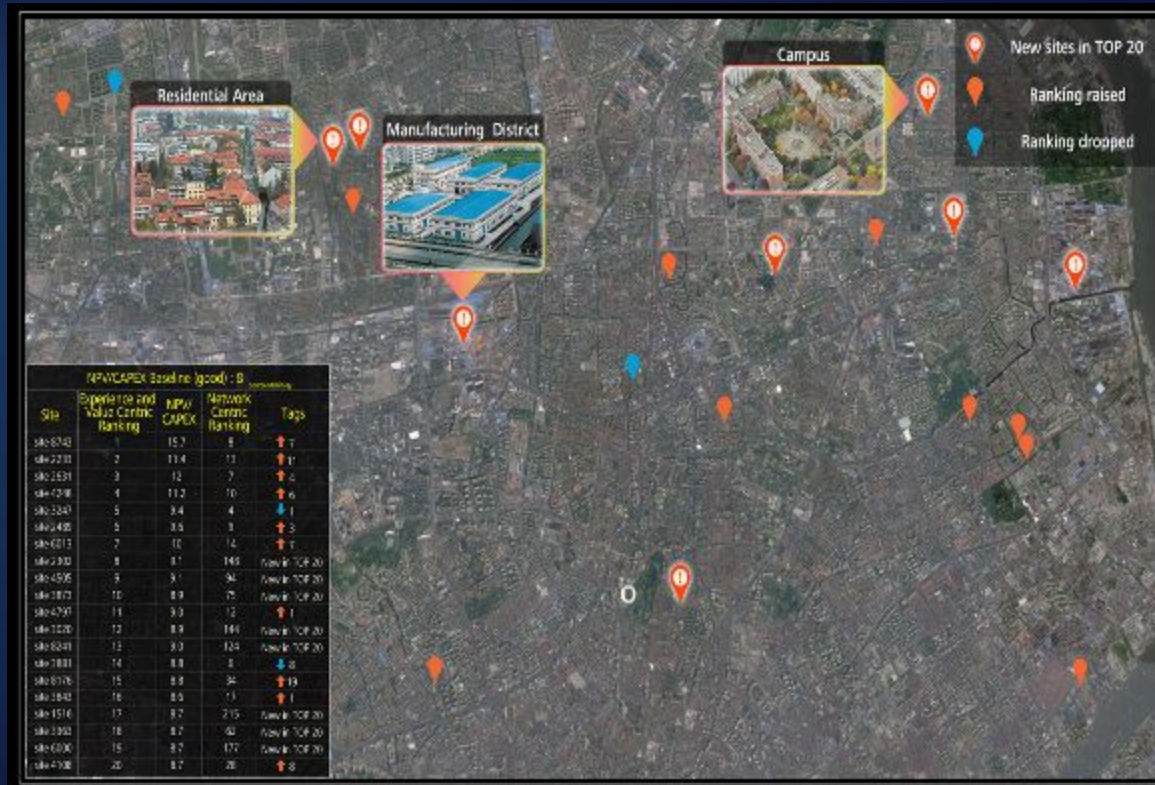
Quality Brand Experience & Value Driven Site Ranking



Value Delivered



Quality Brand Experience & Value Driven Site Ranking



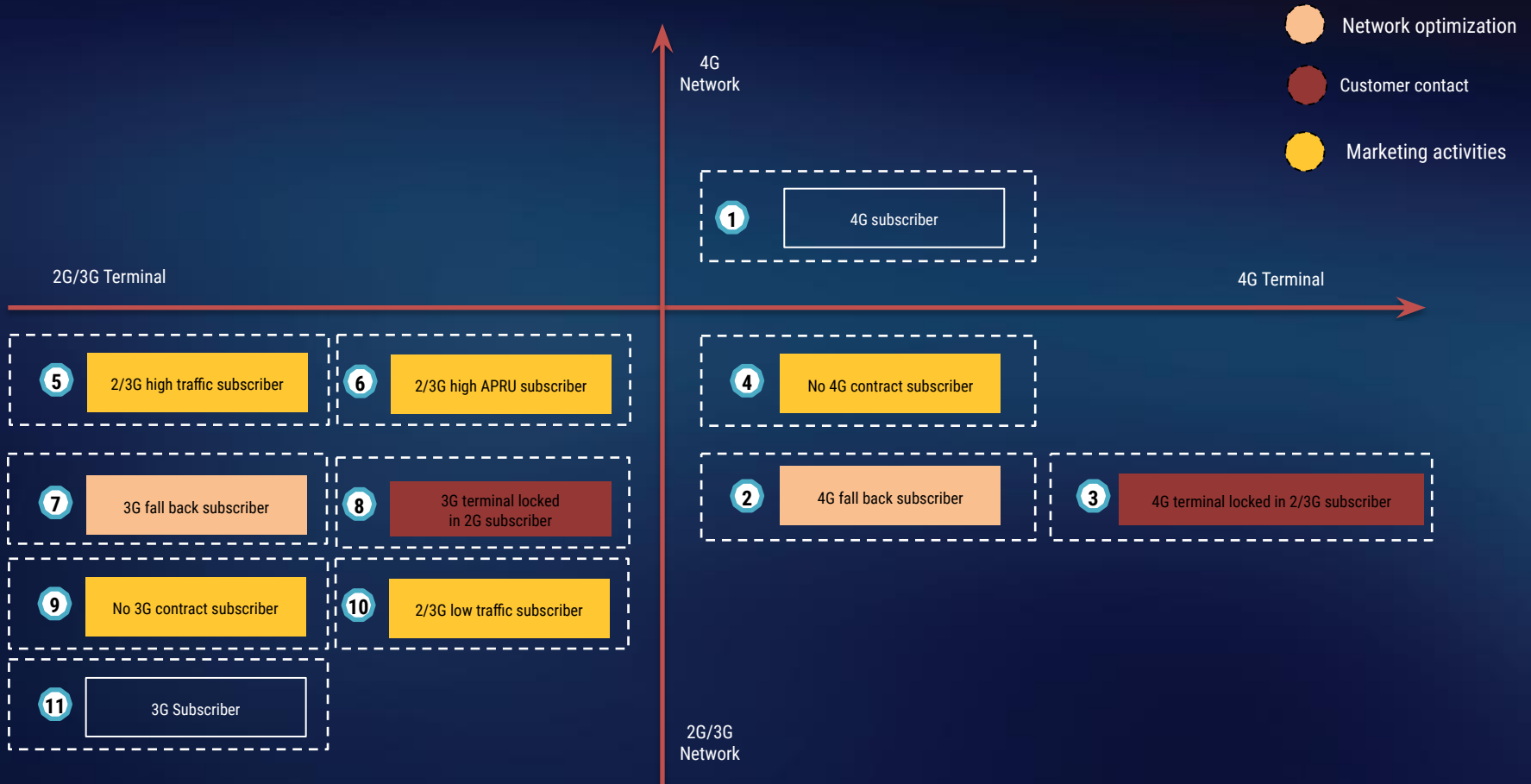
ARPU Driven Network Planning – end of supportive materials



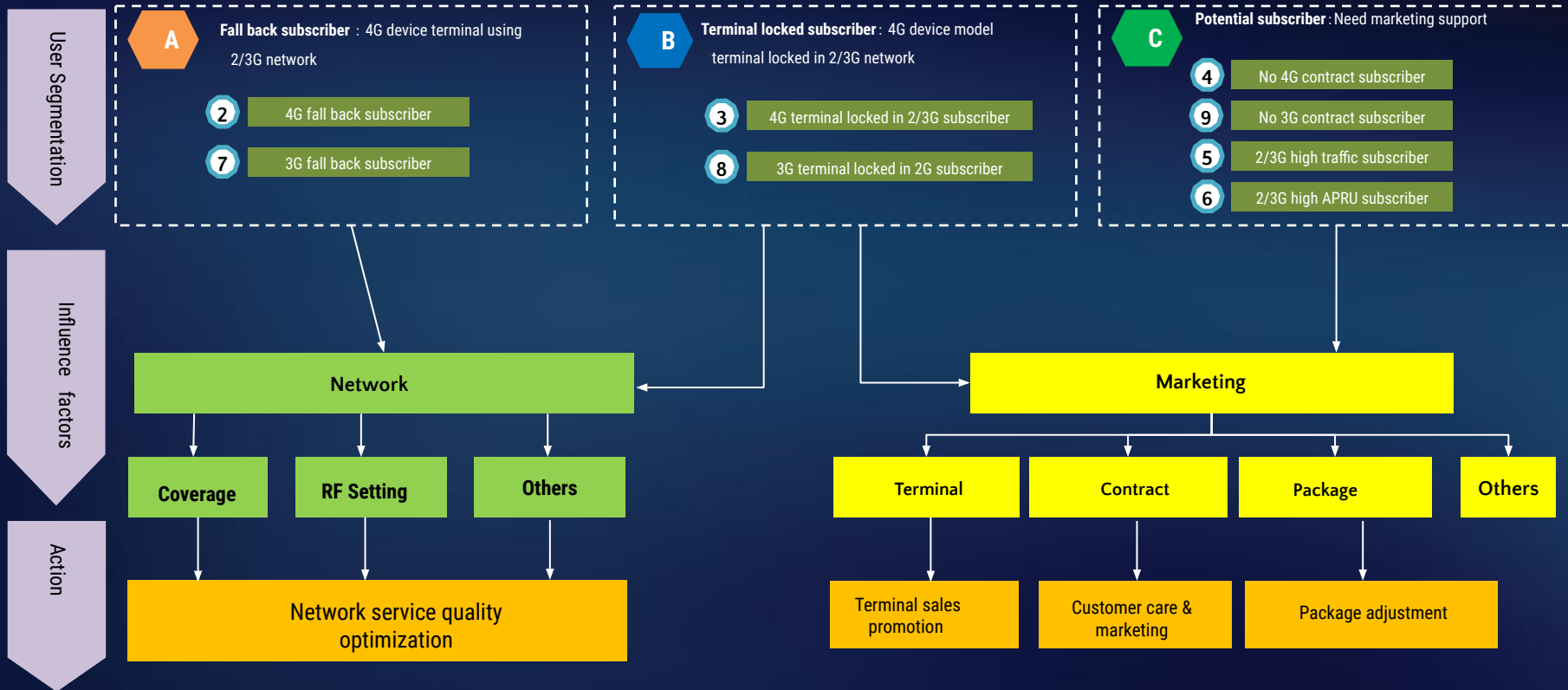
2G/3G/4G User Migration – Supportive Materials



2G to 3G to 4G Subscriber Migration Matrix



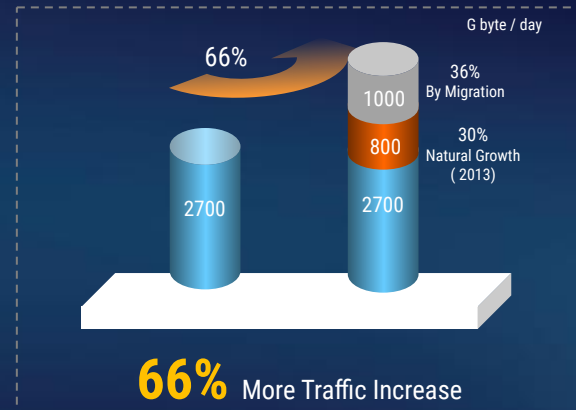
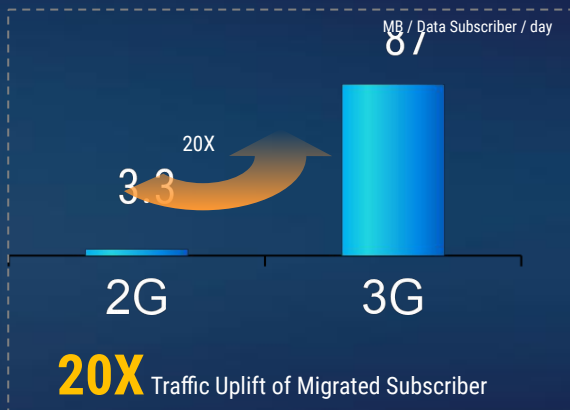
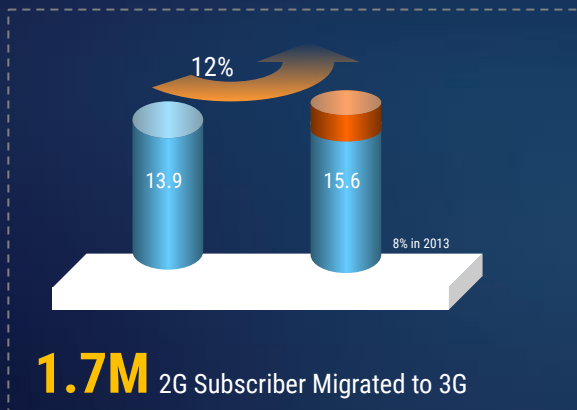
Migration Analytics to Action Overview



Best Practice in Operator U



1.7 million of 2G subscribers migrated to 3G



Operator has **0** cost

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

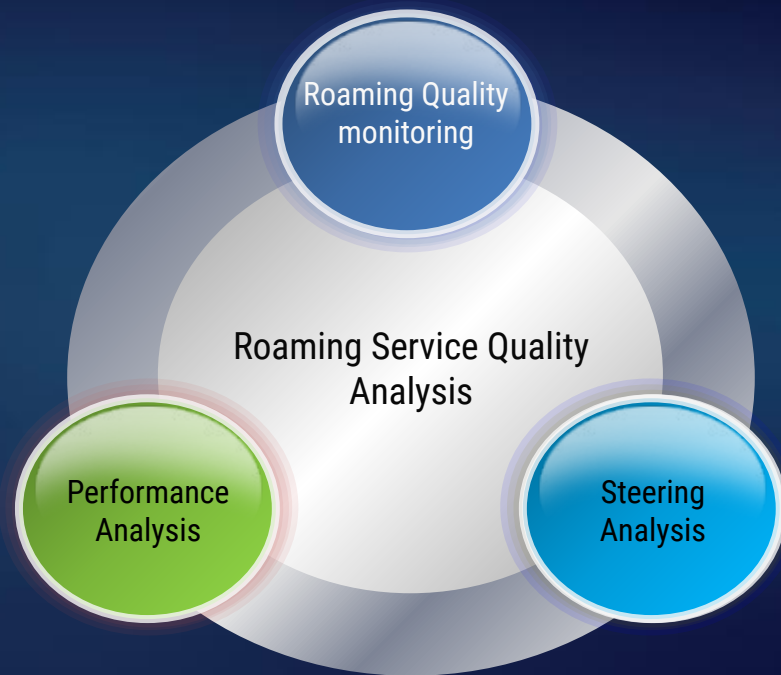
2G/3G/4G User Migration – end of supportive materials



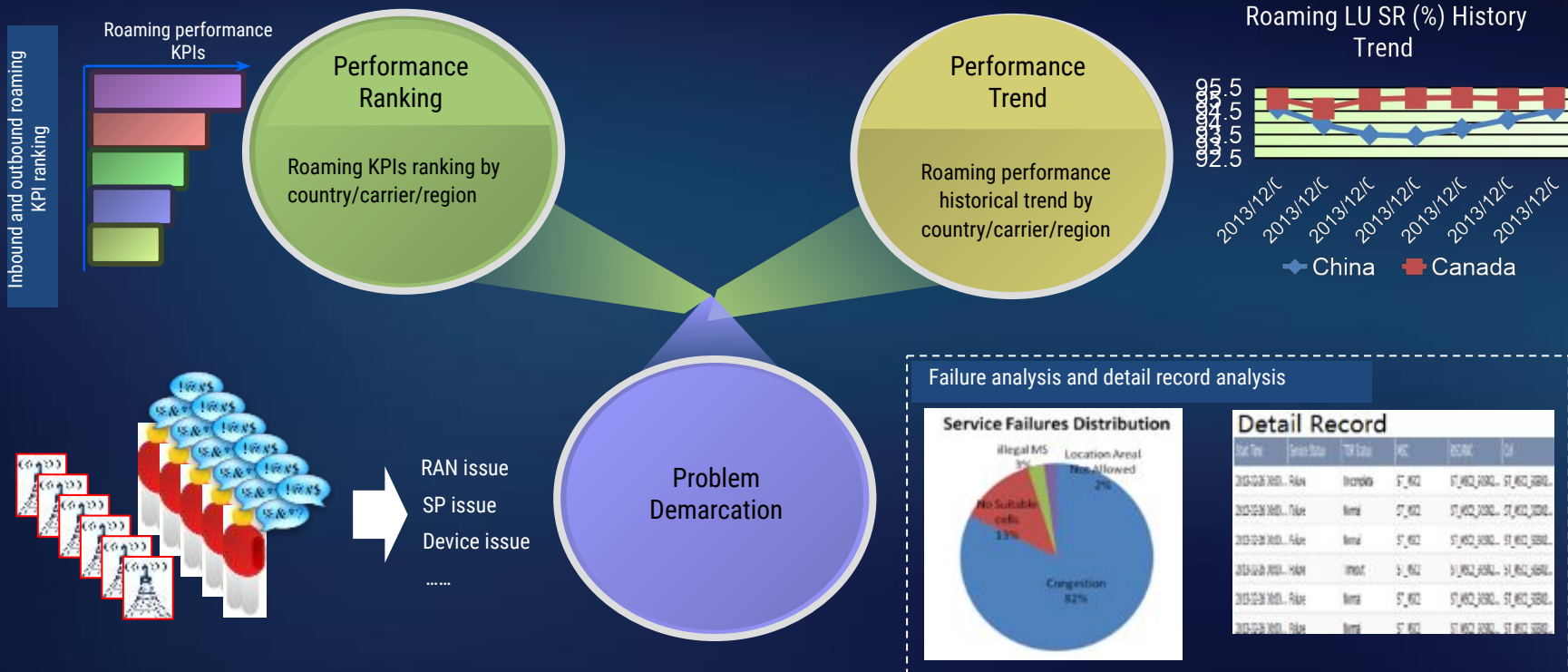
Roaming Service Quality Assurance – Supportive Materials



Solution Overview



Performance Analysis



Steering Analysis



Steering identification

Identify steering status of carriers in different countries

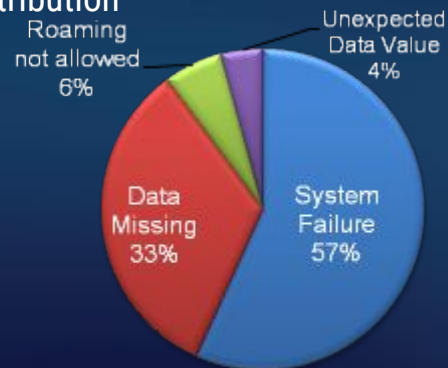
Country	Operator	LU Attempt	Steering	Steering Success Rate
A	XXX	59545	59545	100%
B	XXX	46324	46324	100%
C	XXX	41037	28746	70%
D	XXX	36928	23654	64%
.....

Steering Analysis



Steering failure analysis

Steering failure code distribution



Steering detail record analysis



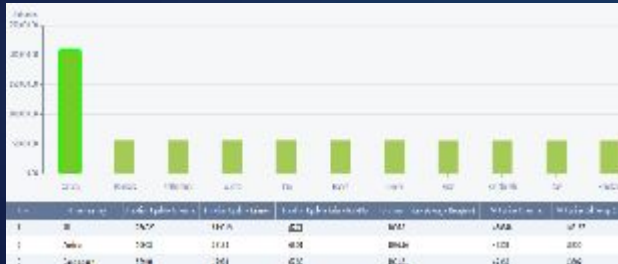
ID	Country	Steering	Operator	PLMN	PLMN	PLMN	PLMN
1	2144-11013	Fail	Thom	100%	00706113	1101	00706113
2	2144-11013	Fail	Thom	100%	00706113	1101	00706113
3	2144-11013	Fail	Thom	100%	00706113	1101	00706113
4	2144-11013	Fail	Thom	100%	00706113	1101	00706113
5	2144-11013	Fail	Thom	100%	00706113	1101	00706113
6	2144-11013	Fail	Thom	100%	00706113	1101	00706113

Best Practice

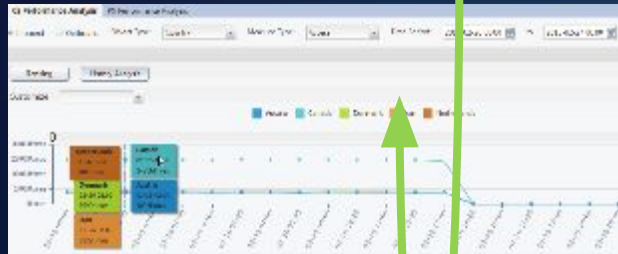


Roaming KPI Analysis

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.



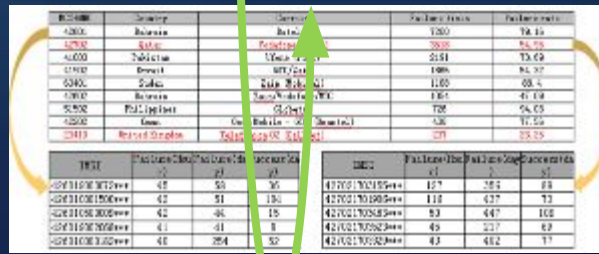
Using History Analysis function to see the indicator history trend.

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

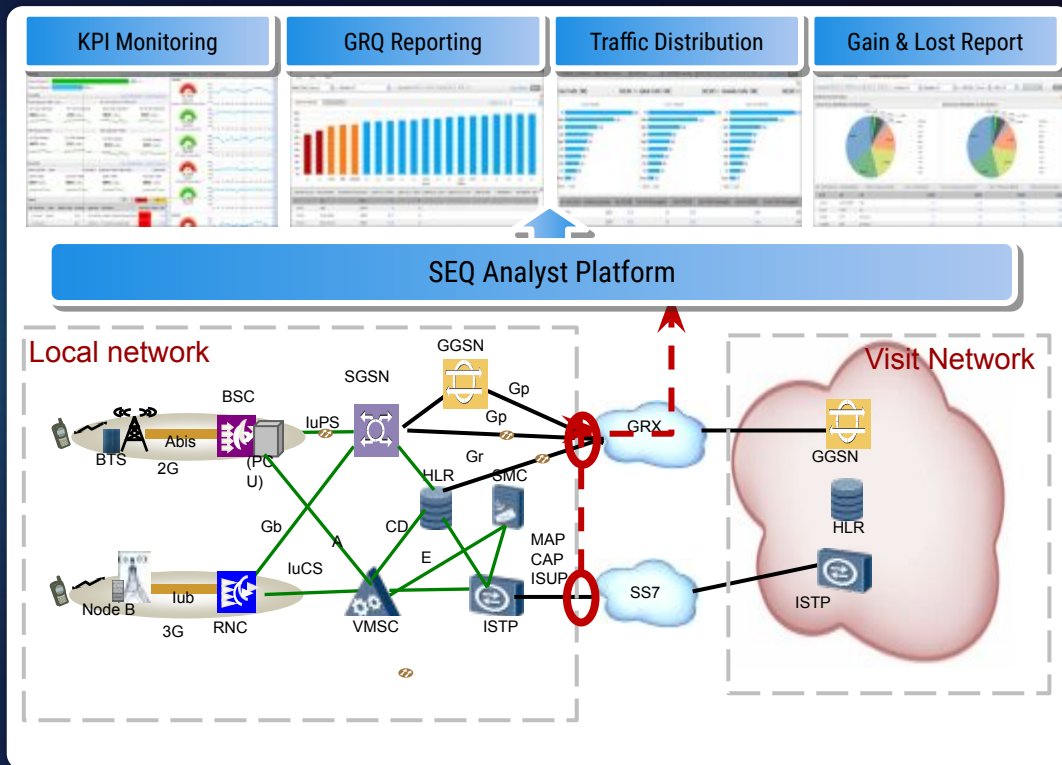
Operation	Customer Service
Marketing & Sales	Digital Service
HUAWEI	

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
 - Identify 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

Operation	Customer Service
Marketing & Sales	Digital Service
HUAWEI	

Analysis roaming KPI and alarm event.

Analyze roaming failure cause

Best Partners and New Partners Insight

Partners Network Quality Insight



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?

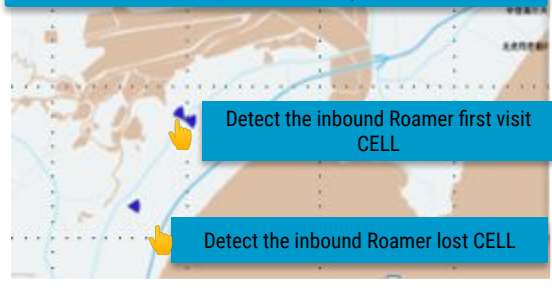
1. Fraud: HPLMN send bar to VPLMN to limit the calling right, but VPLMN not receive the bar
2. Steering: HPLMN steer roamers onto best partners networks to ensure QoS and cut costs
3. Anti-Steering: VPLMN reserve the inbound roamers onto network to increase revenue

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

The Customized Report for Specific Roaming Scenario (Gain and Lost CELL List)



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



SQM

VIP Care

Customer Care

Churn Predict

NPS Analysis

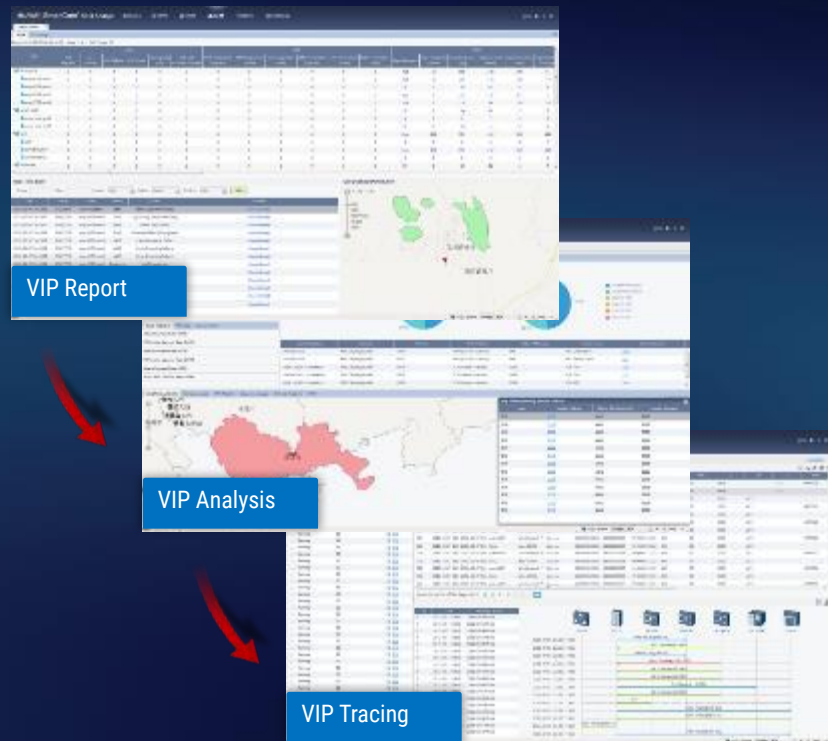
CEI

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

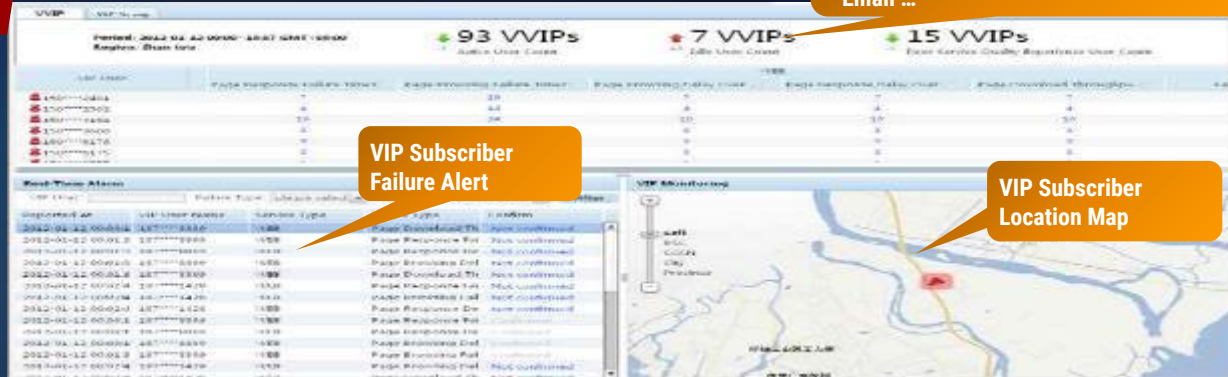


VIP Group CS
Weekly Report



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

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	758	129	1468	261	48	65	15	16

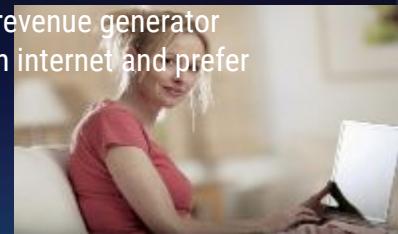
VIP Group CS and PS Service Quality monitoring

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



Experience Insight

Failure history analysis

Location Analysis

Device Analysis

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

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

SGSN City Province
JinYu

Discover VIP's service abnormality within 1 minute

VVIP Service Quality Assurance – Supportive Materials



Customer Experience from whole Customer Journey

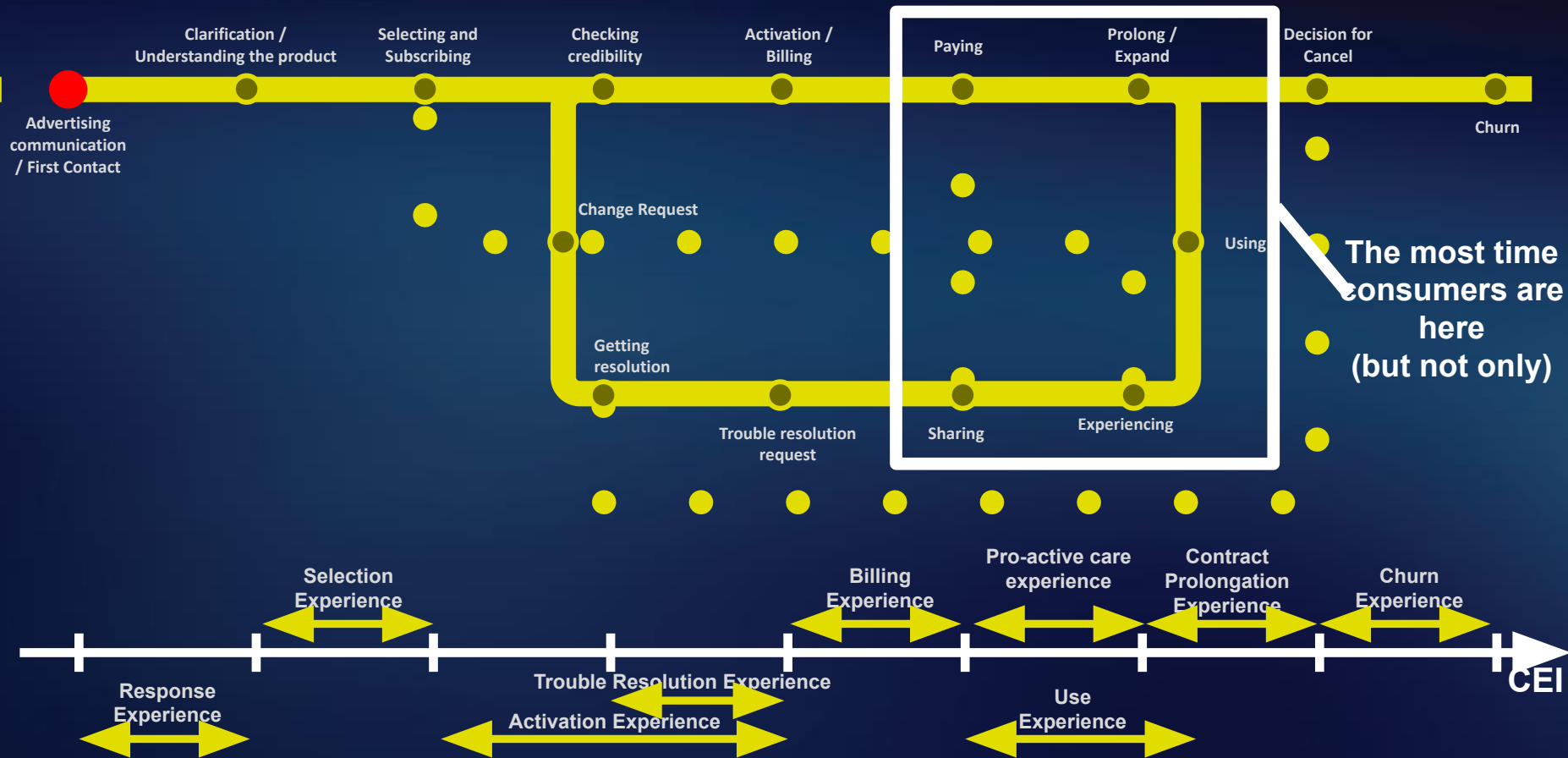


Consumer

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

Here are touch
points within a
complete
Customer
Journey

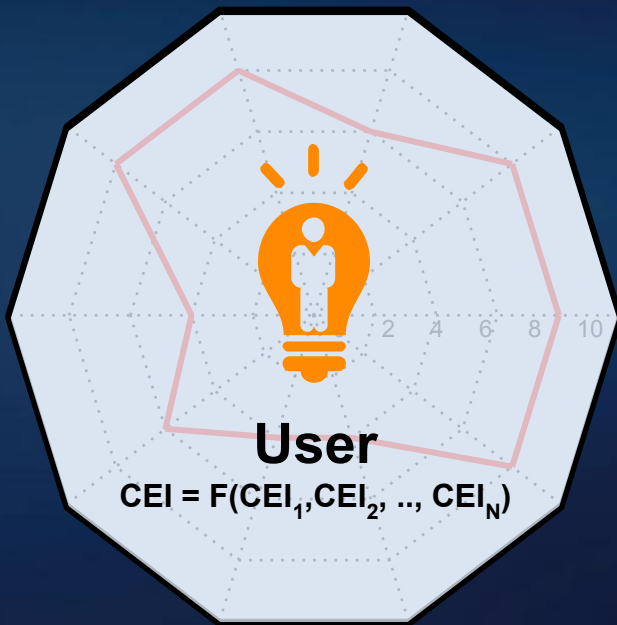
Journey and Touch Points – Experience is in between



KPI from each Point to create CEI of End User

CEI – Customer
Experience Indicator

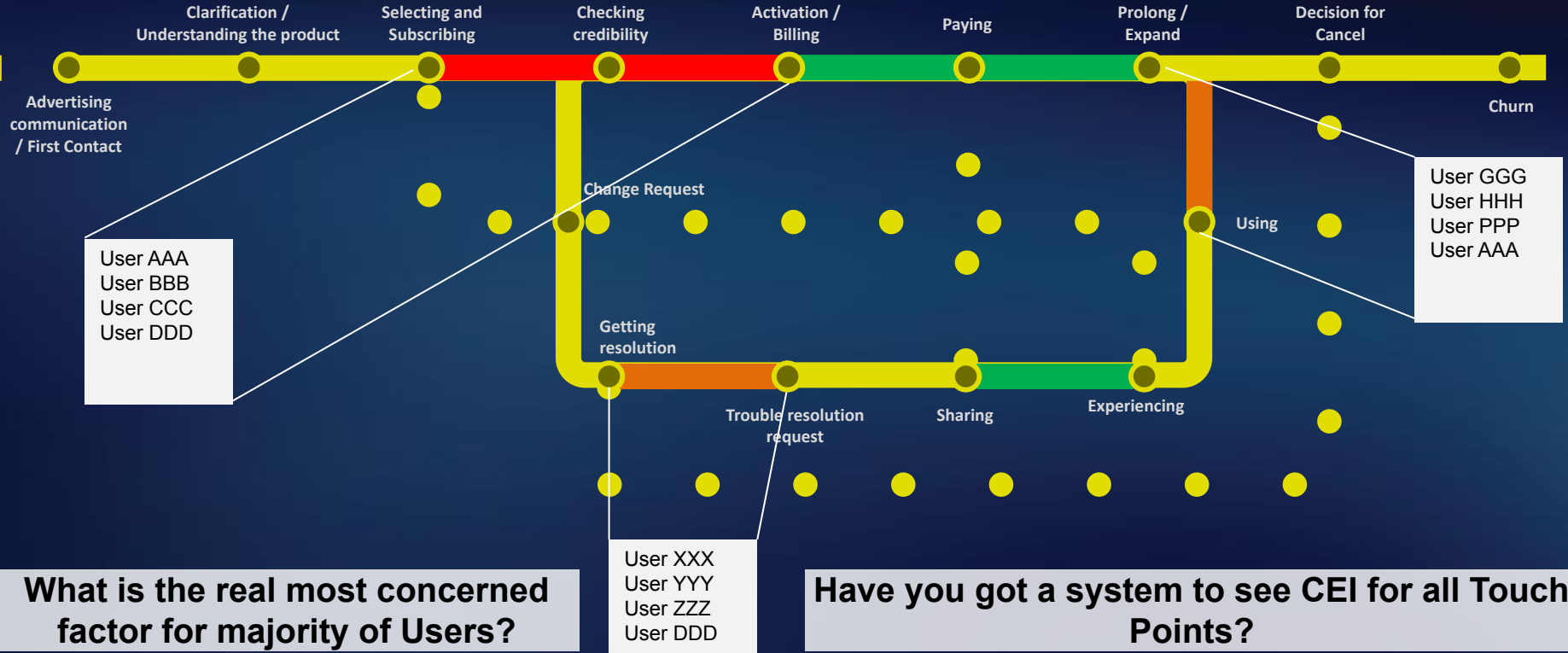
- Expecting
- Selecting
- Buying
- Using
- Sharing
- Prolonging



Do you already
cover complete
Customer
Journey for your
CEM?

Some Touch
Points
examples

Snapshot to show Impact to User Experience

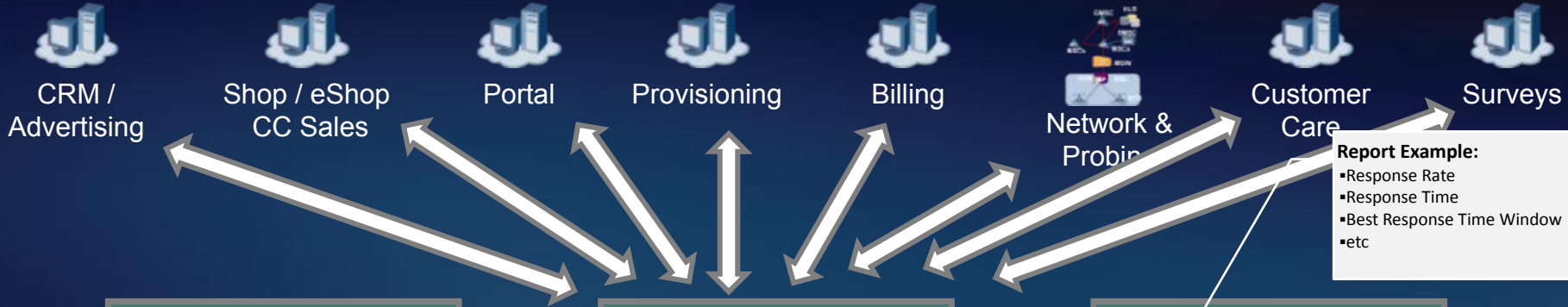


What is the real most concerned factor for majority of Users?

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



Report Example:

- Response Rate
- Response Time
- Best Response Time Window
- etc

Big Data Storage

Profiles

Events

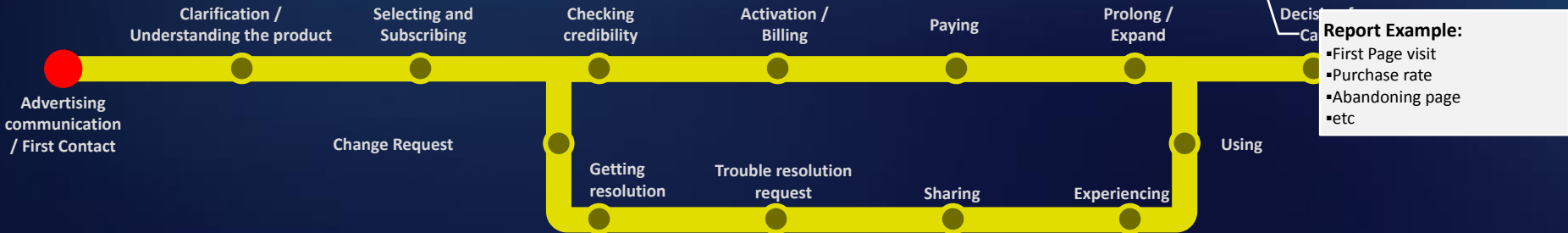
CEM Platform

Mediation	Aggregation
Analysis	Gathering

Reporting

Profiles

Events



Report Example:

- First Page visit
- Purchase rate
- Abandoning page
- etc

See at whole and by details to improve by Influencer



CEI (or NPS)

Marketing

Billing

Network

Customer Care

Operation



Unhappy customers:

- User AAA
- User BBB
- User CCC
- User DDD

Happy customers:

- User XXX
- User YYY
- User ZZZ
- User XYZ

Cumulative Customer Experience Indicator



Revenue Loss / Gain

Huawei's CEM Solution under the name SmartCare®



Experience Visualization

- **Customer Journey** definition, E2E experience gathering and visualization



Service Quality Management

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



Experience Problems

- **Quick Experience Problem** Demarcation demarcation to decrease customer complaints



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

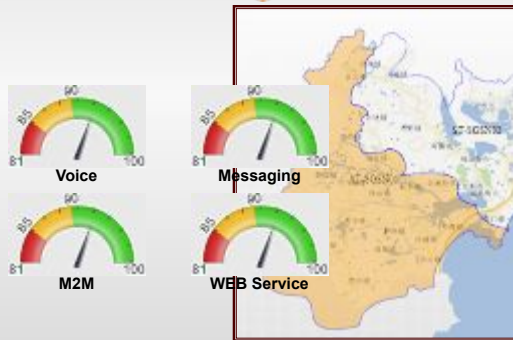
From QoS via Service Quality to Customer Experience

QoS

Defined by ITU many years ago:

- ✓ Throughput
- ✓ Latency
- ✓ Packet Loss
- ✓ Jitter

Service Quality



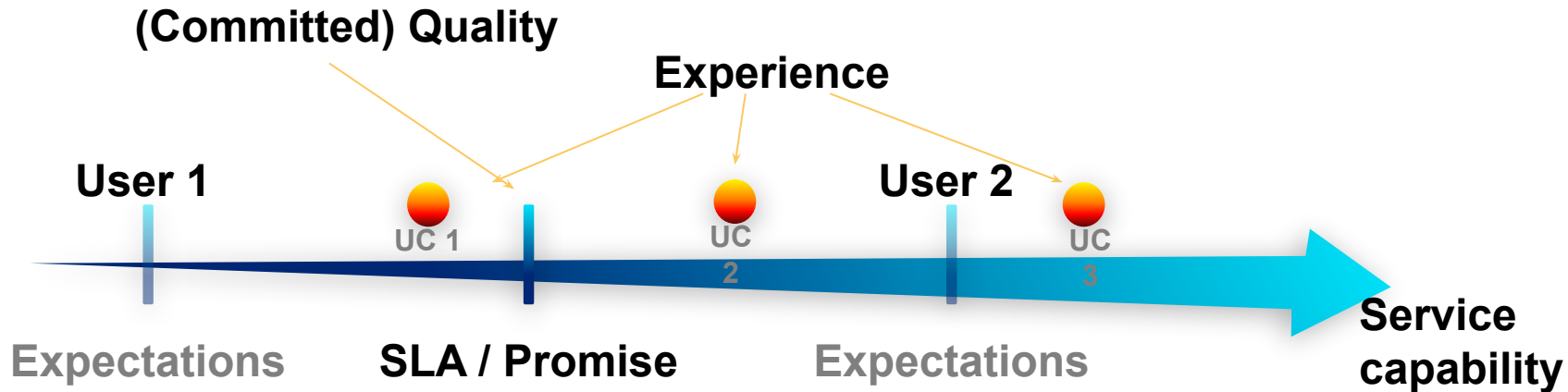
VS

QoE

Customer Experience

SQM is a typical entity existing almost in all network operators

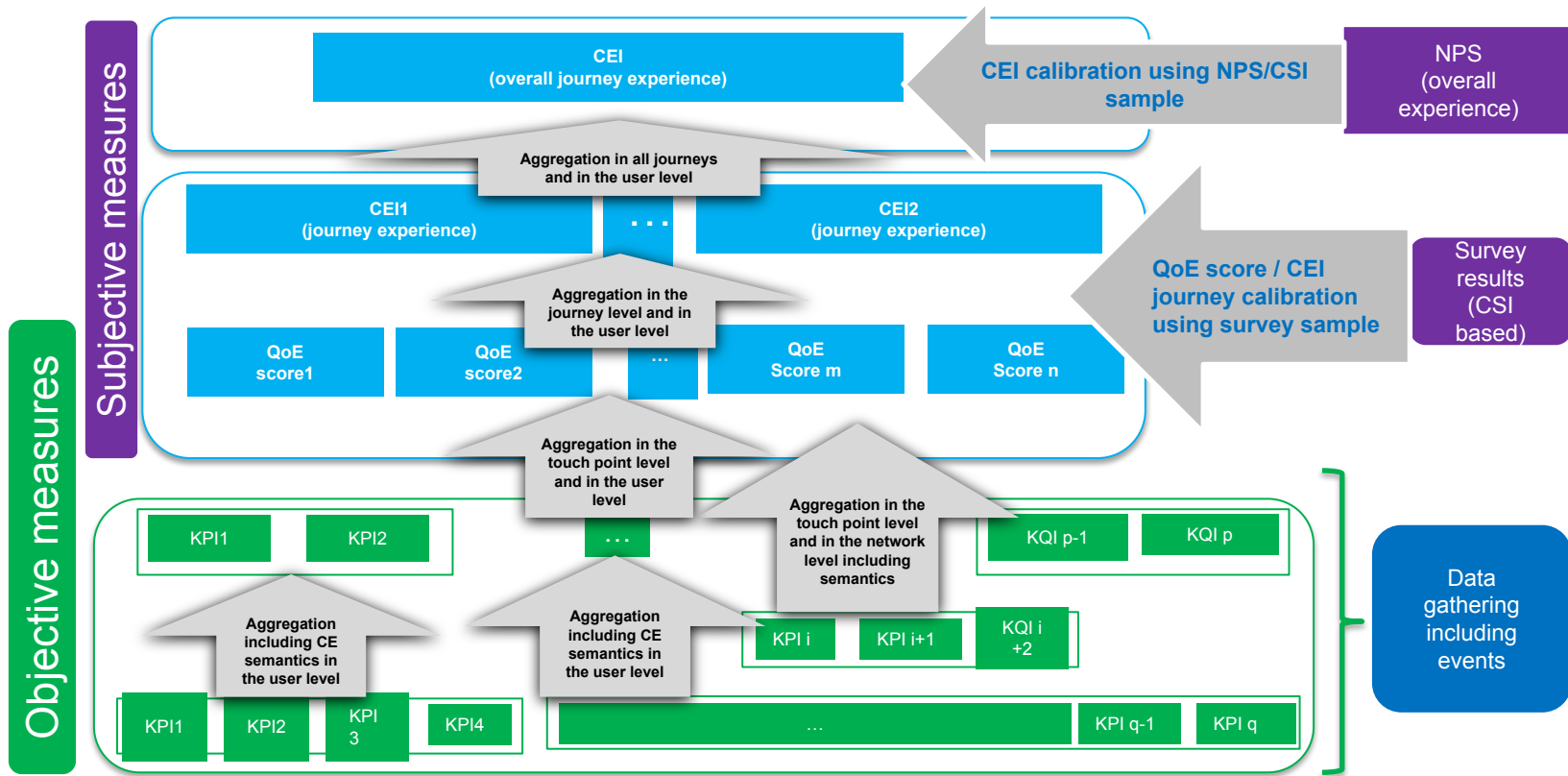
From Service Quality to Customer Experience



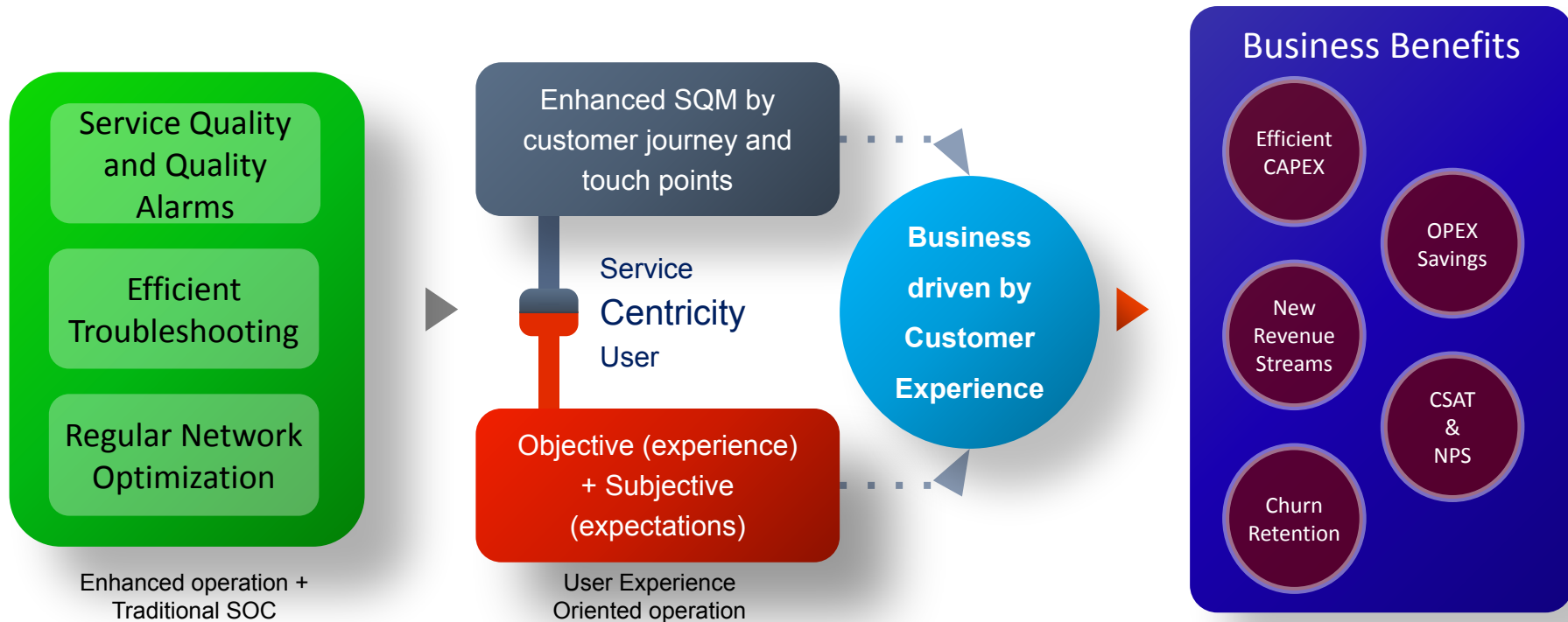
Quality versus Experience	User 1		User 2	
	Quality	Satisfaction	Quality	Satisfaction
Use Case 1	☐	✓	☐	☐
Use Case 2	✓	✓	✓	☐
Use Case 3	✓	✓	✓	✓

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



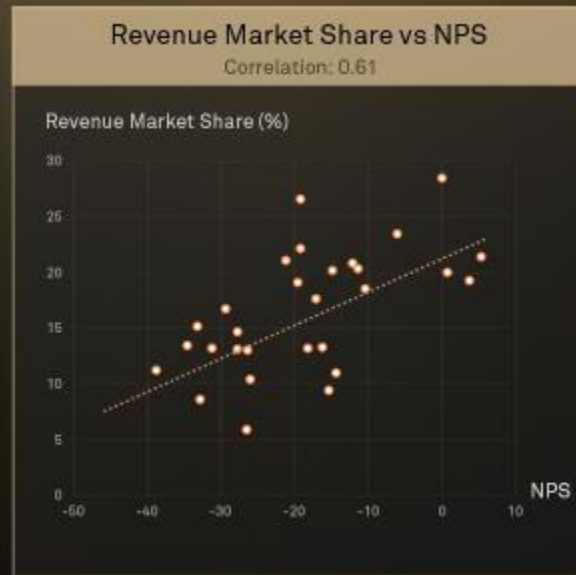
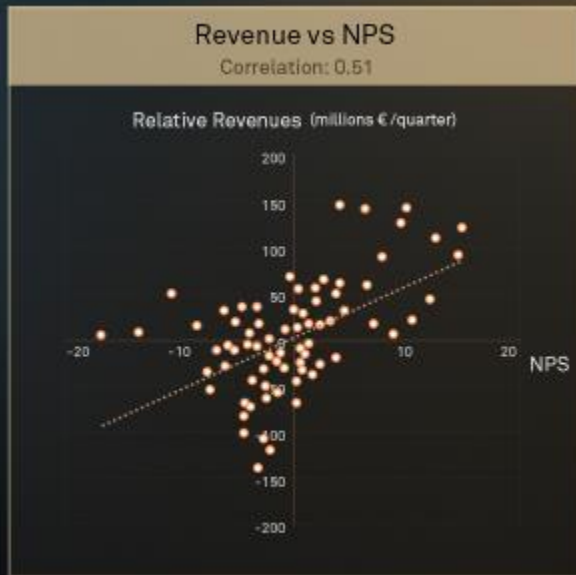
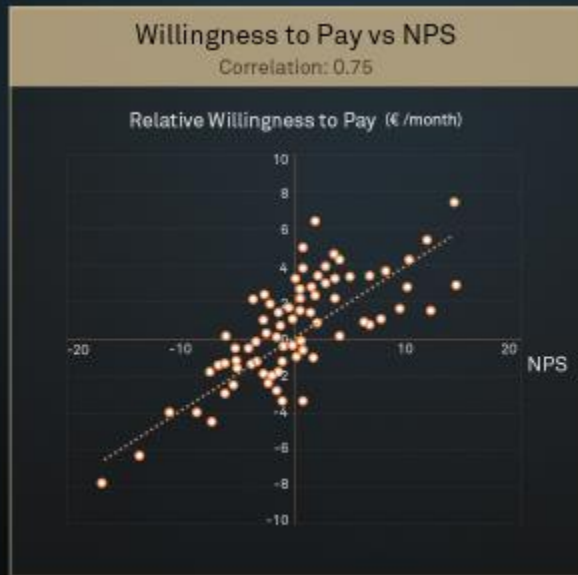
CEM is a new way of Business in Digital

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.

Impact on being a Promoter or a Detractor [%]



Impact on being a Promoter or a Detractor [%]



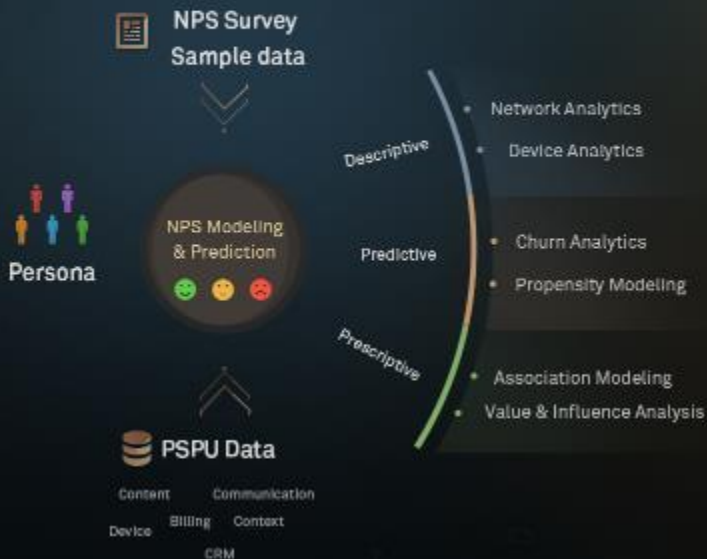
Source: CETC Persona Research & Bain Company, 2015

PERSONA BASE NPS IMPROVEMENT APPROACH

Reduce Detractors & Monetize Promoters

Analytics

Comprehensive analytics for all personas



Actions

Closed-loop actions by **SSC**

Omni-channel	Marketing	3G->4G Migration	Upsell & Cross-sell Content Bundles	Personalized Retention Offers
	Customer Care	VIP Proactive Care	Customer Care Automation	Smart Decision Tree for Self-care Complaint Handling
	Network	Smart Network Planning	Fast Demarcation & Root Cause Analysis	Targeted Network Optimization

VALUE DELIVERED IN PRACTICE WORLD

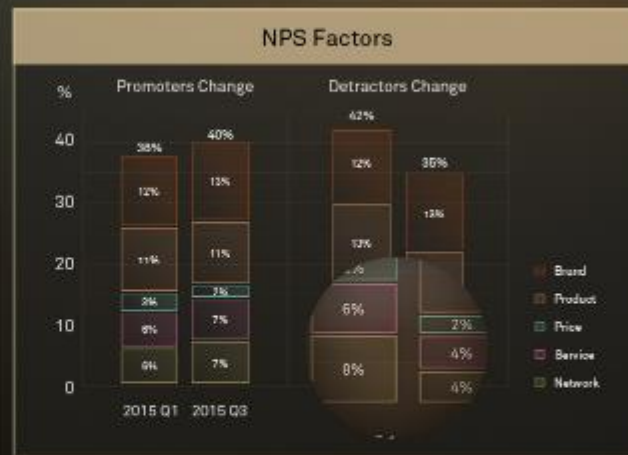
NPS Improved 10pts with \$1.2 Additional Earning

NPS 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

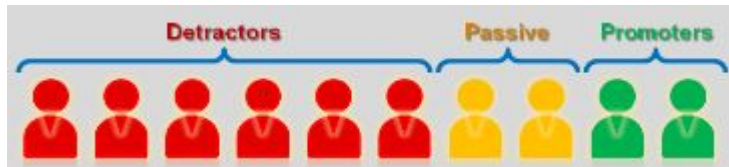


VIP Proactive Care



Customer Care Assistance

NPS Detractors – not a one but many different groups



What to do?

All Users are different and their concerns are different

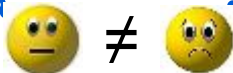
We cannot simply improve NPS by same / one action(s) for all users

What to do and where to start?



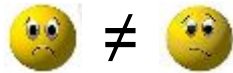
Detailed view on Promoters and Detractors with particular step(s) for every group

Why tariffs are so complex?



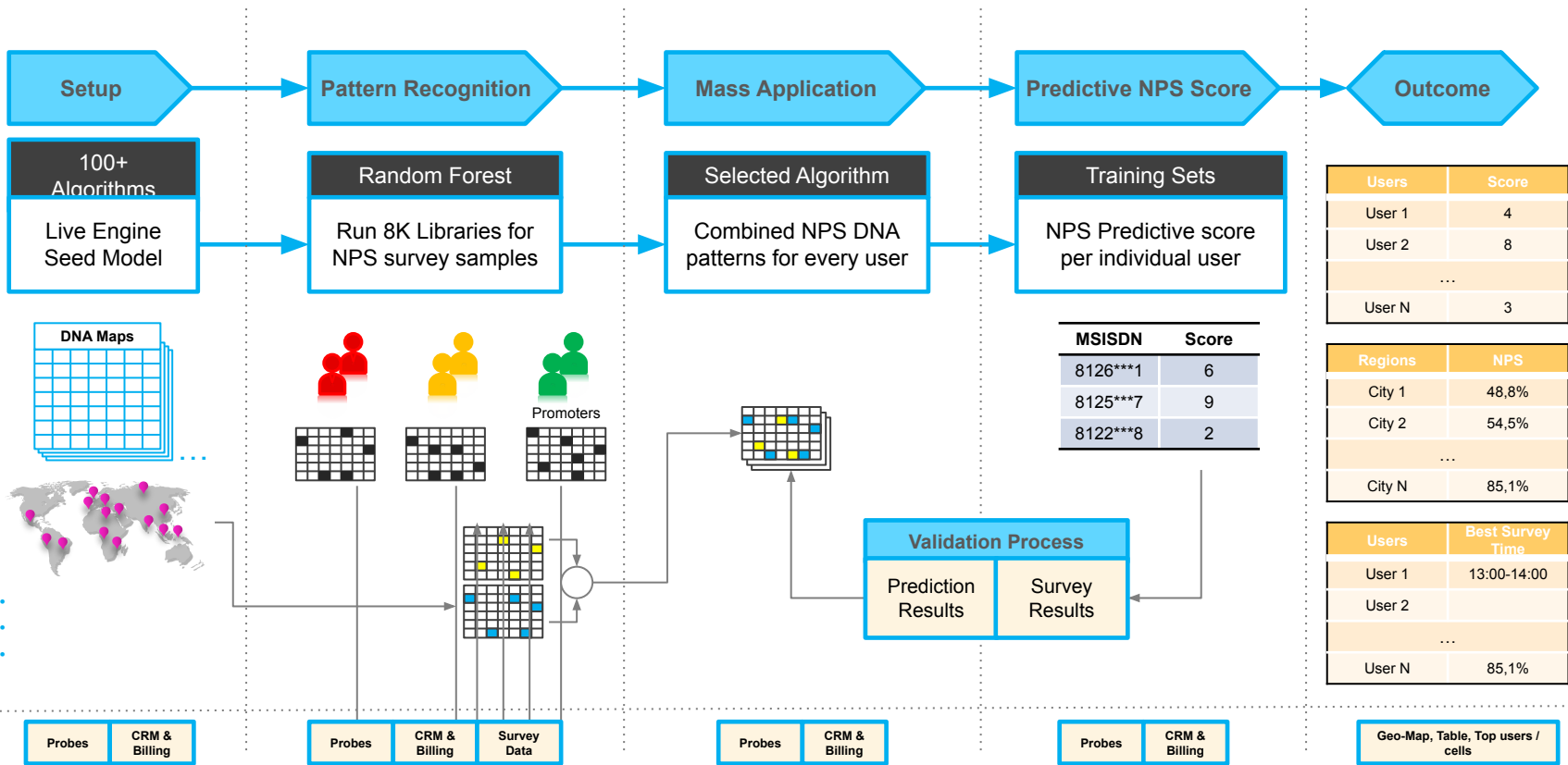
Why I cannot make a call?

Why Web loading time is so long?

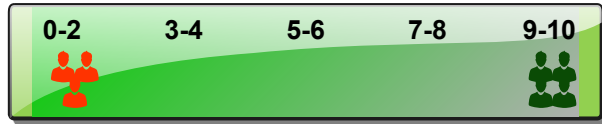
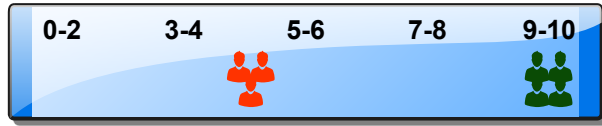


How can I check my balance?

Net Promoter Score Prediction Framework

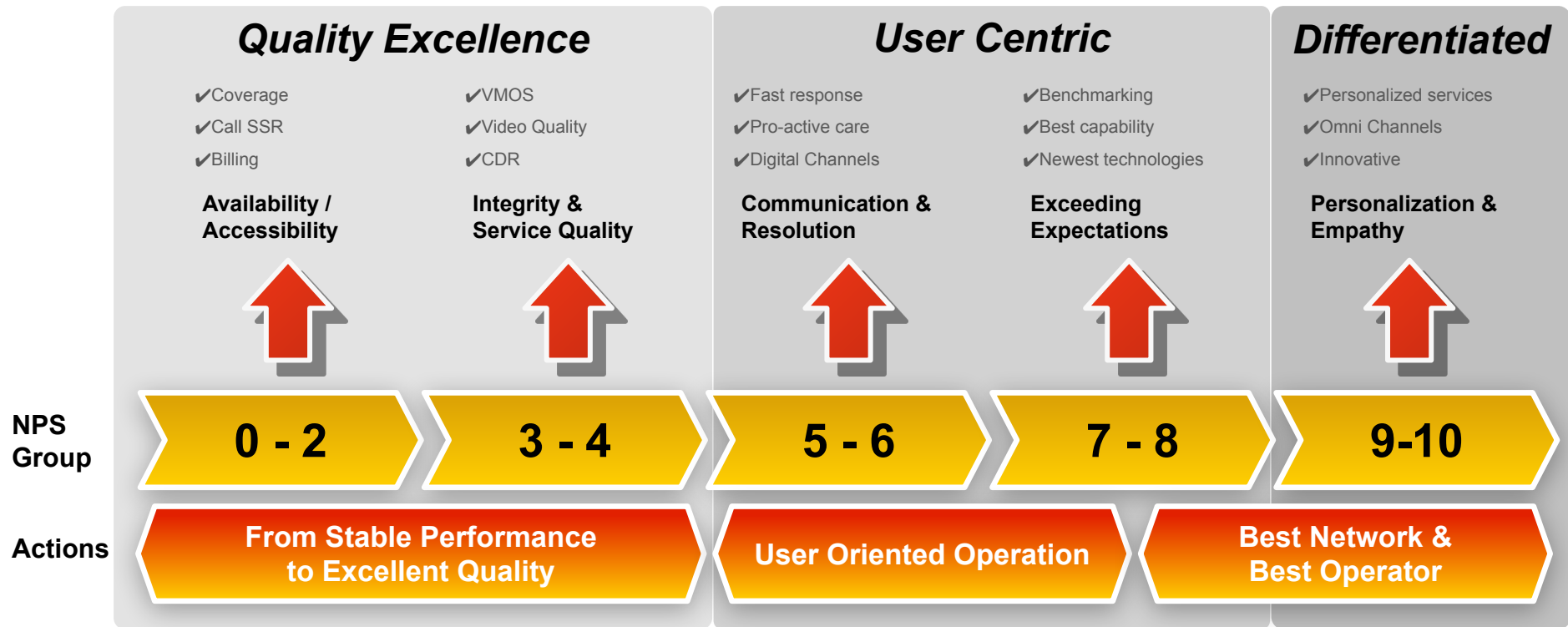


Let us imagine – measured NPS is 10 (%)



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

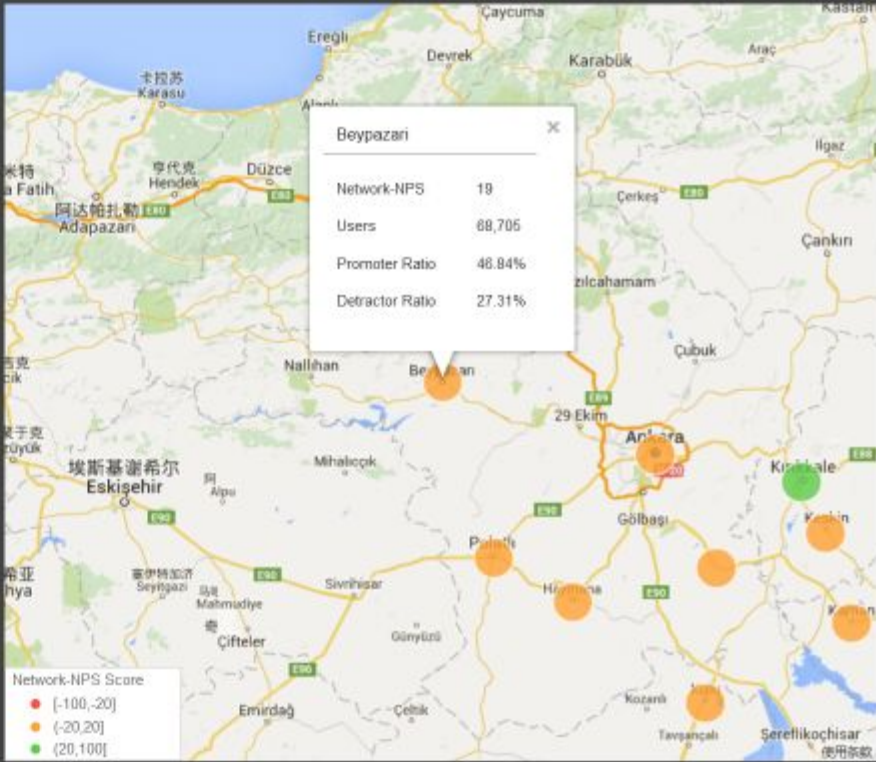


	Ratio	Users
Promoter	44.70%	446,194
Passive	29.62%	295,668
Detractor	25.68%	256,337

Network-NPS Trend



Network-NPS By City



MSISDN 0090E58FG9143E

2016-08-08

2016-08-07

Submit

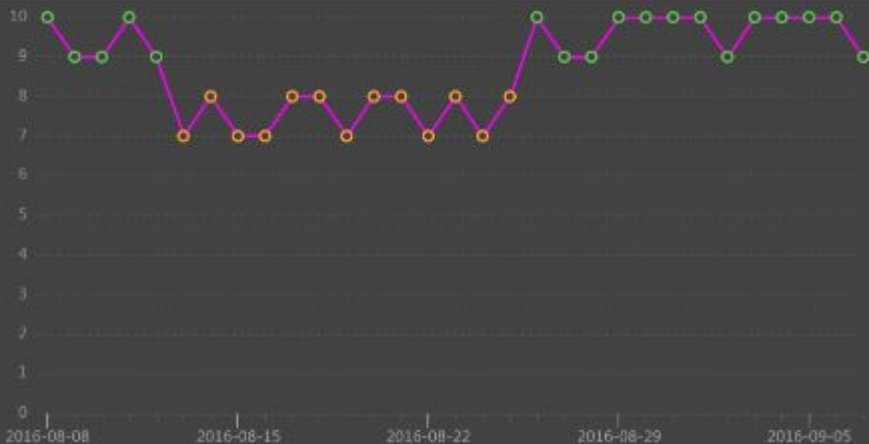
User Score

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

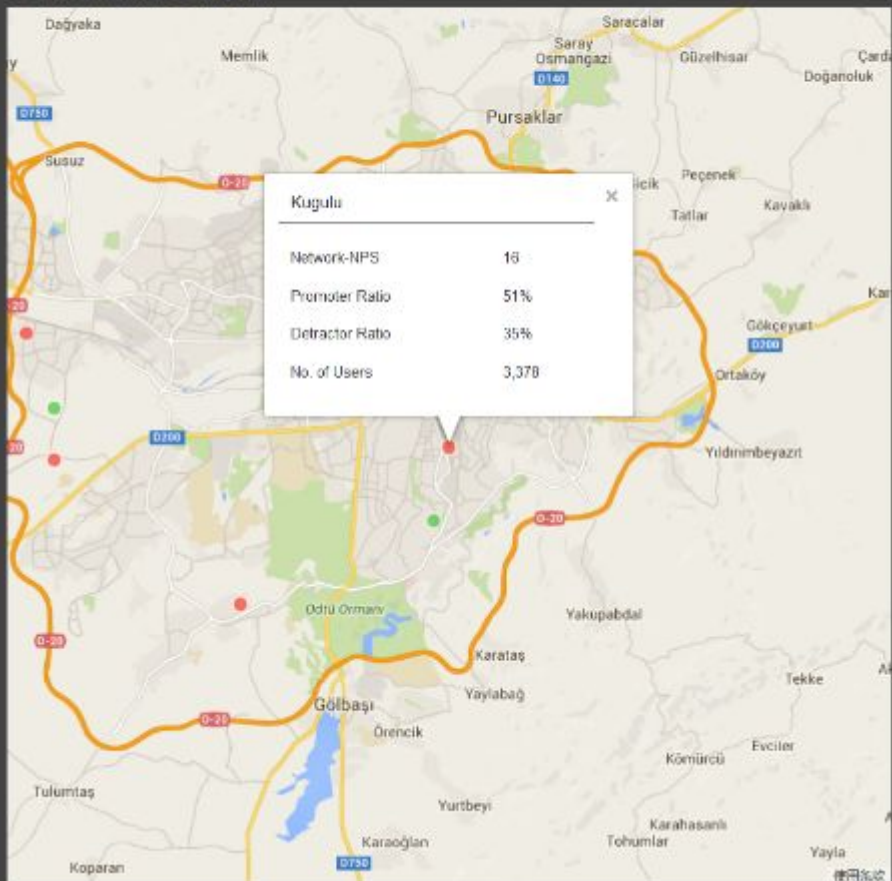


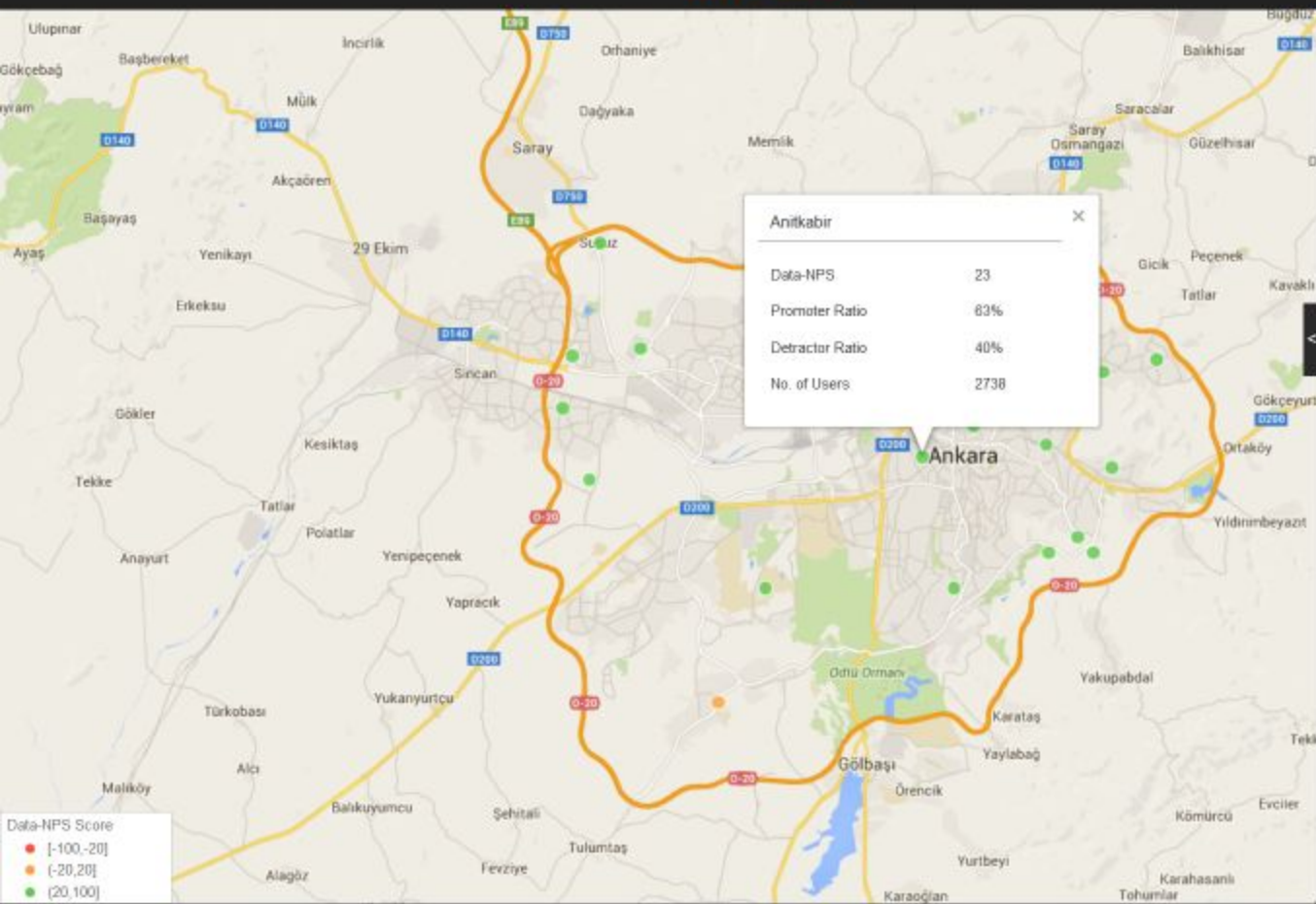
	Ratio	Days
■ Promoter	58.06%	18
■ Passive	41.94%	13
■ Detractor	0.00%	0

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	Marnak Cd	23	2,345
10	Tayland	23	2,910
11	Anıtkabir	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

■ 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	Red	Red	Red	Green	Red	Red	Red	Green	Orange	Red	Green	Red	Red
2	5UA0V78LZ88T1I	0.97	144	0	Red	Orange	Red	Red	Red	Green	Red	Green	Green	Red	Orange	Red	Red
3	729A3V5MP90P50	0.88	133.4	1	Green	Red	Red	Red	Green	Green	Red	Red	Red	Red	Orange	Red	Red
4	MF9EHM1W00D8IX	0.81	113.4	1	Red	Green	Red	Red	Green	Red	Red	Orange	Red	Green	Orange	Red	Red
5	6F8S0H1H9BUH16	0.8	123.6	2	Red	Orange	Red	Red	Red	Red	Red	Orange	Green	Orange	Red	Red	Red
6	5603QWPB1NQ438	0.78	135.6	3	Red	Red	Red	Green	Green	Red	Orange	Red	Red	Red	Red	Red	Red
7	GMPYK143GD1S3P	0.77	96.9	0	Green	Red	Red	Green	Red	Orange	Red	Red	Red	Red	Red	Red	Red
8	A37BQ63BN34Y8Z	0.76	101.6	1	Red	Red	Red	Red	Red	Red	Red	Red	Red	Orange	Red	Red	Green
9	25S8JS1V24R7T3	0.74	105	2	Orange	Green	Red	Green	Red	Red	Red	Red	Red	Red	Green	Red	Red
10	MOWL472069W4RI	0.74	107	2	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Green	Orange	Green
11	Y4T3F107RPT05	0.73	88.1	0	Orange	Green	Red	Red	Red	Orange	Green	Red	Red	Orange	Red	Red	Red
12	K057DBRF3F81C9	0.72	138.9	4	Red	Red	Orange	Orange	Red	Red	Red	Red	Orange	Red	Red	Green	Green
13	2WZ5GEW3G8XUK1	0.7	83.1	0	Green	Red	Red	Red	Red	Red	Red	Red	Red	Red	Green	Red	Orange
14	FI819CD4K05JS0	0.7	95.8	2	Red	Orange	Orange	Red	Green	Red	Orange	Red	Green	Red	Red	Red	Red
15	628W0EM546AE81	0.69	81	0	Red	Red	Red	Green	Orange	Green	Red	Red	Green	Red	Red	Red	Red
16	6UV2879E9E9253	0.69	85.9	1	Red	Red	Red	Orange	Red	Green	Red	Orange	Orange	Red	Red	Green	Green

Churn Prediction – Details



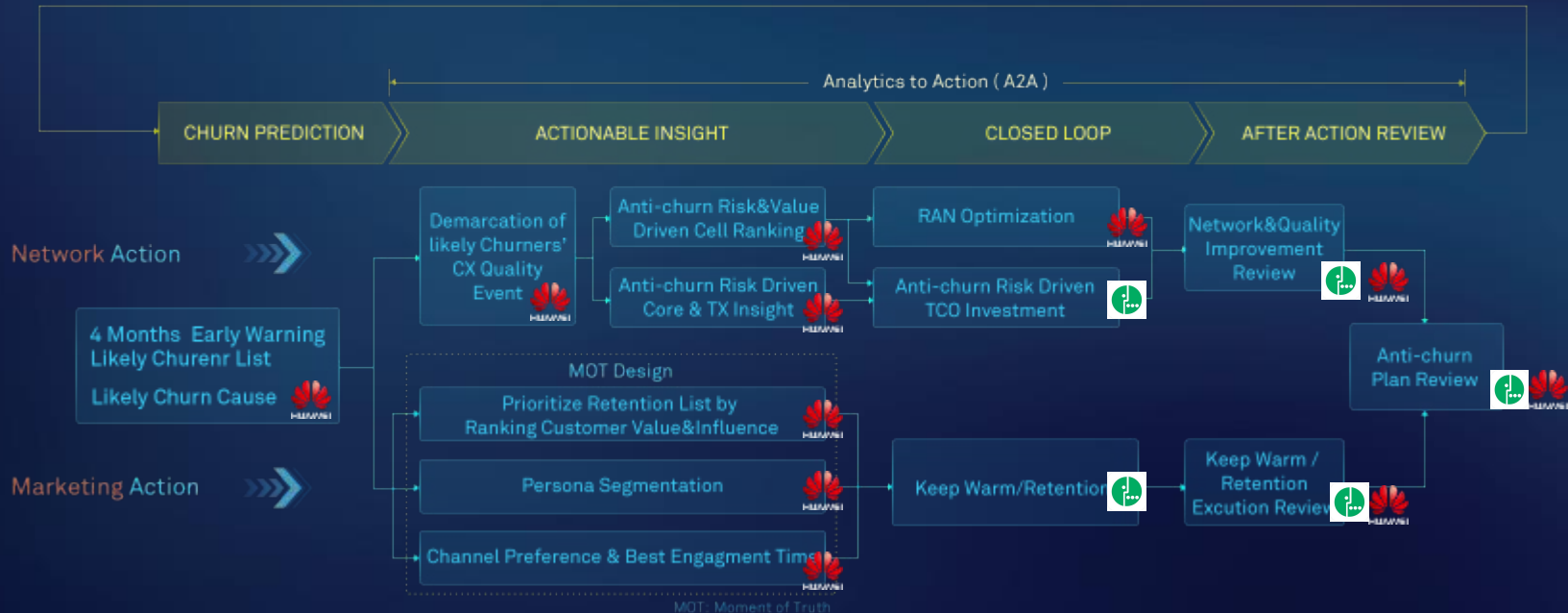
Why we should manage Churn?

- 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

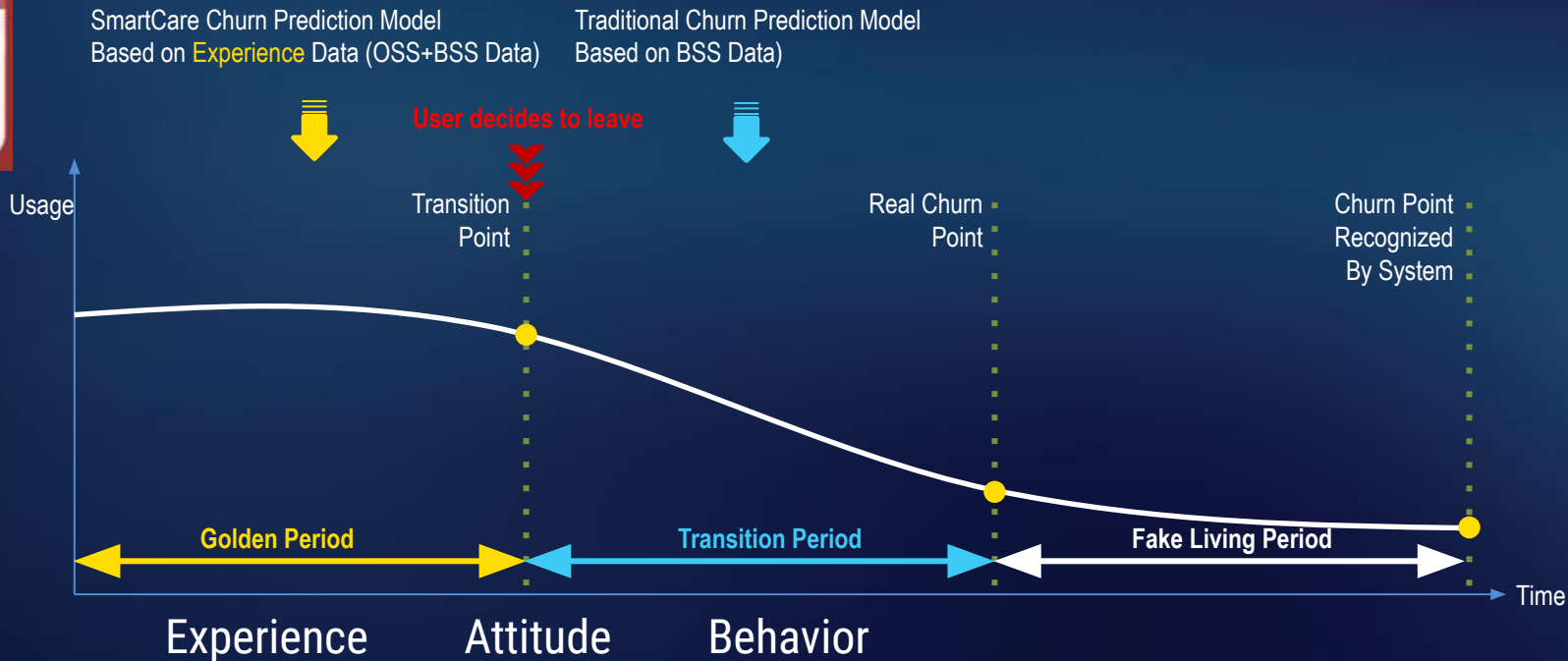


$$\text{CHURN } \downarrow = \text{CHURN PREDICTION} + \text{A2A}$$

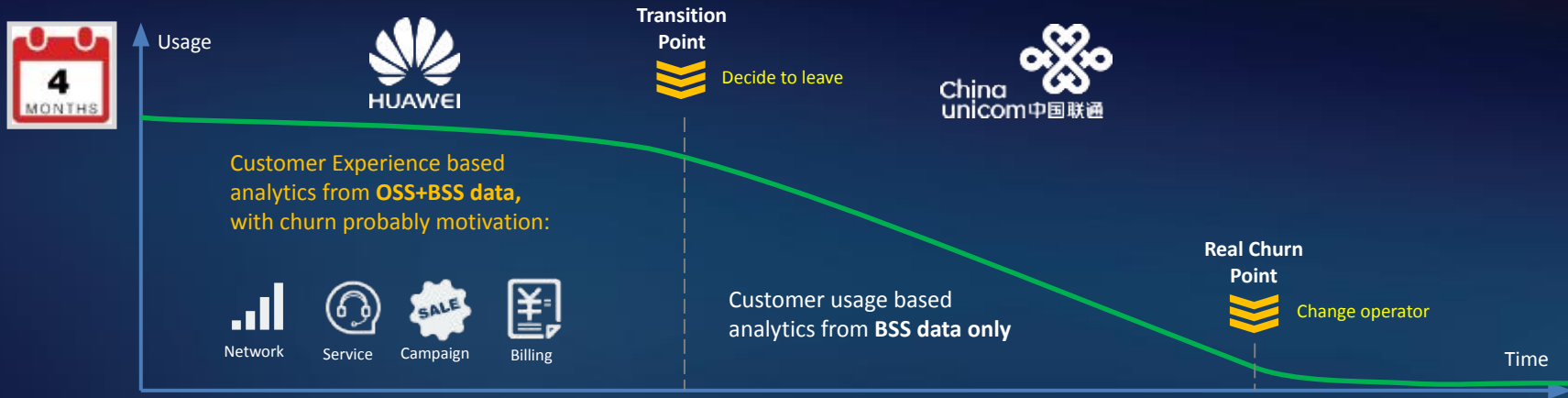


Methodology

Better Result by Experience Oriented Churn Detection



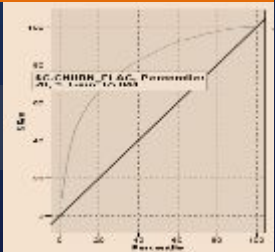
HUAWEI Churn Prediction Solution Highlight



4 Months advanced

Churn Prediction Model on both OSS+BSS Variables:

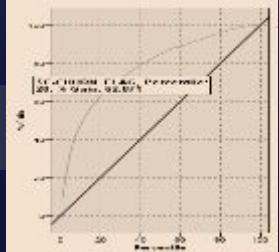
Recall Rate: **43%**
Top 20% Precision: **65%**



2-4 weeks advanced

Churn Prediction Model on BSS Variables:

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



Marketing Closed Loop

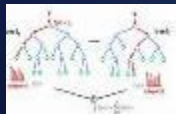
- Retention Process Consulting Enriched By Analytics



Retention Ranking

From customer value only

➔ Customer Value & Influence



- ✓ Current Value
- ✓ Potential Value



- ✓ Influence

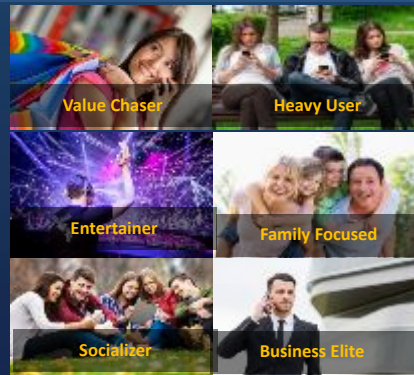


Customer Segmentation

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

Persona	Value Chaser	Heavy User	Entertainer	Family Focused	Socializer	Business Elite
Retention Offer	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services
Retention Offer	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services
Retention Offer	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services
Retention Offer	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services
Retention Offer	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services
Retention Offer	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services	1. Offer special rewards and services

root cause



Channel & Time

Inside-out Channel & Timing Allocation

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

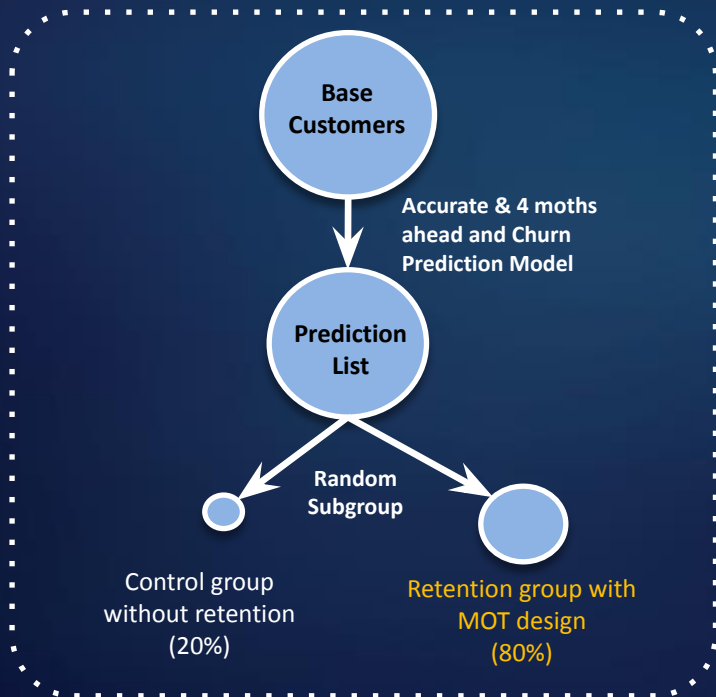


Reference Case

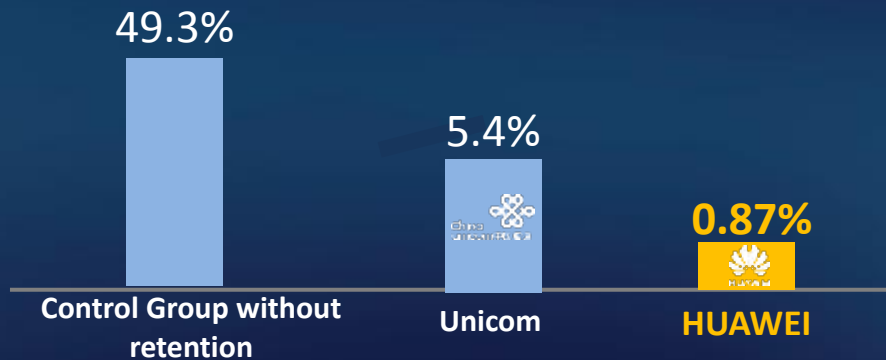
- early predication & MOT improve retention effect greatly



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**



Churn Rate Comparison



- 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

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

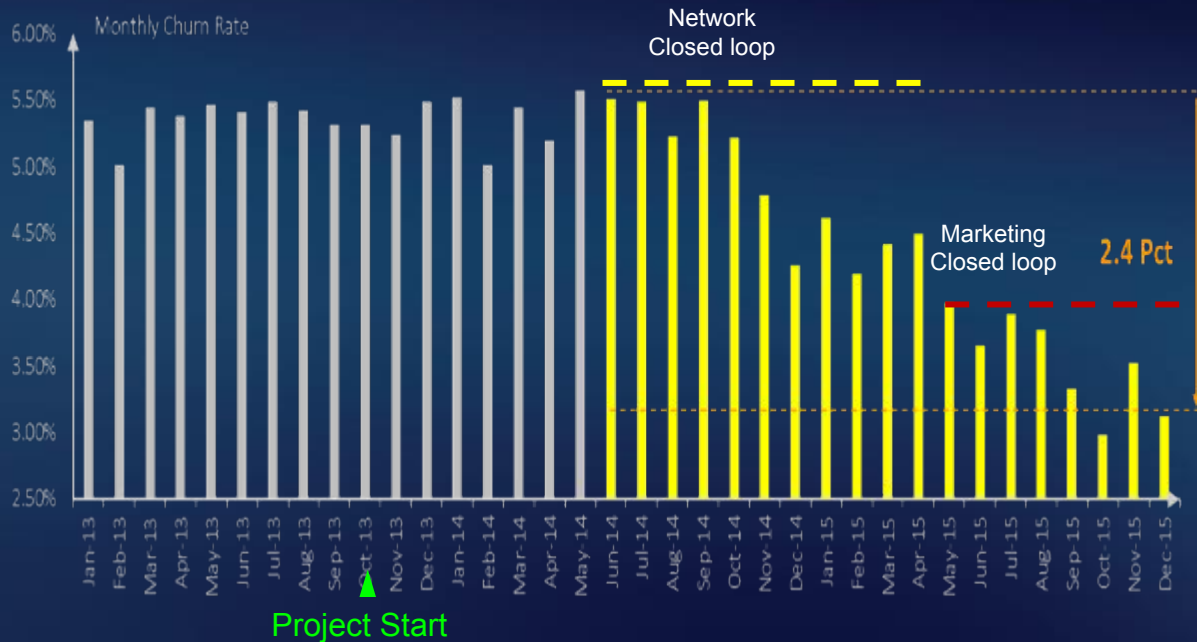
136 USD

Subscriber CLV captured

Precision Rate : 77.0%

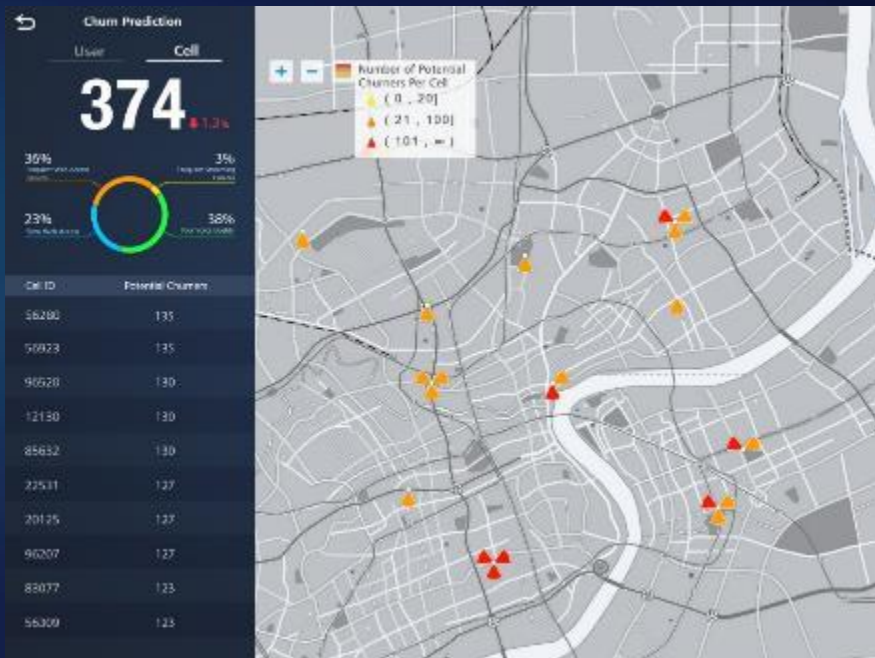
Recall Rate : 49.1%

Warning Period : 4 Months advance



Source: China Operator S, Churn Rate

Output



Data Explorer Demo – Churn



TOTAL USERS

1,440,588

In this demo we monitor all users to identify churners among them

Churn Propensity Analysis



Churn users: **69,043**

Churn Propensity Analysis

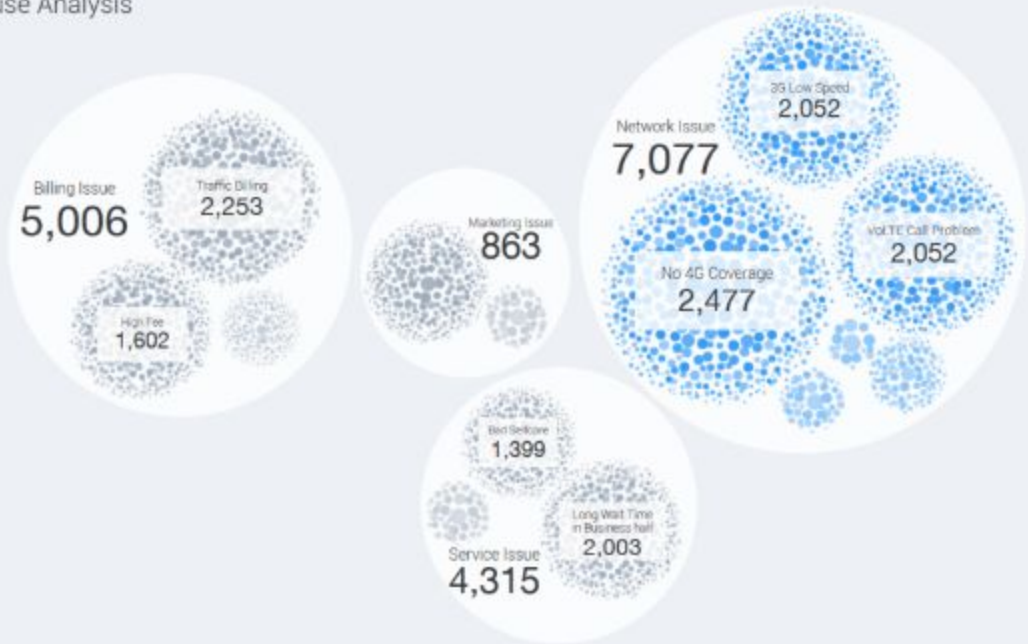
80%-100%	17,261
50%-80%	31,760
0%-50%	20,022

Flow

- Start
- Churn Prediction
- Churn Propensity Analysis

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

Churn Cause Analysis



Churn Propensity 80%-100%

17,261

Churn Cause Static

Flow

- Churn Prediction
- Churn Propensity Analysis
- Churn Cause Analysis**

Churn Cause Analysis helps to identify Root Causes for churners

User Value & Influence



The group to address first

Churn Orientation 60% - 100%

17,261

User Value & Influence

High Value Low Influence: 3,797	High Value High Influence: 2,071
Low Value Low Influence: 7,767	Low Value High Influence: 3,625

Flow

- Churn Prediction
- Churn Propensity Analysis
- Churn Cause Analysis
- User Value & Influence**

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

Best Promotion Time
(User & Best Promotion Time)

The time window for promotion of each customer.

Detail

Topic fans
(User & Topic Fans)

Find out the users who like the topic preference according to APP segmentation.

Detail

Data service fans
(User & Data service fans)

Find out the users who like to use data services.

Detail

Activate top-up with happy hour offer

Make-up the dormant customers with attractive promotion in a forecast.

Detail

High Value Customer Care

Identify high value and high traffic customers.

Detail

Expected results

Analyze the expected result.

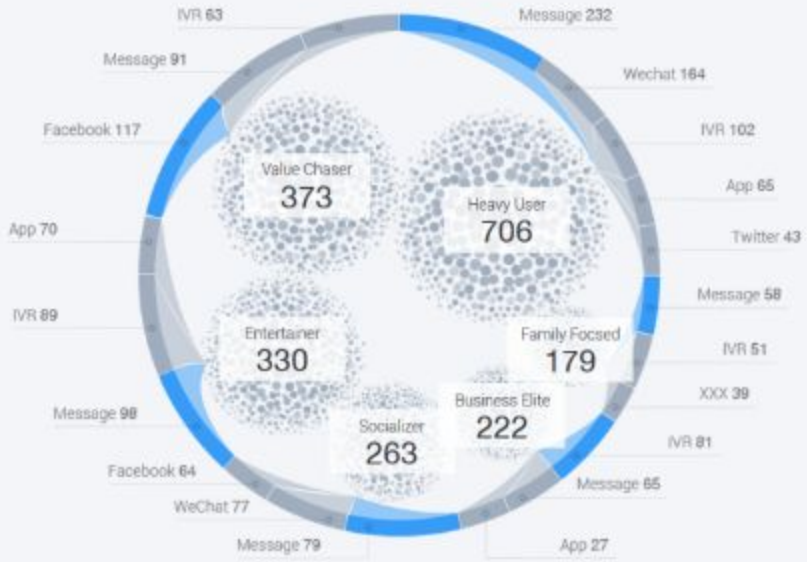
Detail

Bad experience cells for each customer
(User & Cell)

List all bad experience cells for each customer.

Detail

Channel preference



High value & High influence

2,071

Prefer Service Channel

SMS	646
IVR	414
Wechat	290
APP	228
Twitter	116
Facebook	104

Flow

- Churn Cause Analysis
- User Value & Influence
- Persona
- Channel Preference**

Even the most preferred communication channel identified & recommended

Customer Care Assistance Module



CCA – Call Center Agent Interface

USER PROFILE

MGRSON: Data User 121 | Service: Data | Time Period: 2014/1/7 9:35 | 2014/1/7 9:39 | [Query](#)



Business Elite

Name: User 121
Device: Huawei Mate 7

Group: Enterprise
Plan Type: Postpaid

MGRSON: 1381254****
Service Plan: GQ-TONE-58 : 1G Data, 350M Voice

MSR: 460000269****

Data Usage 0.28G/1G



30%

[View Details](#)

SERVICE SUCCESS RATE %



SERVICE QUALITY ISSUES DETAIL

SN	Time	Failure Count	Cause Description	RAN
1	11:00 - 14:00	130	WEB Browsing Failure	41
2	11:00 - 14:00	7	WEB Browsing Failure	40

FAILURE LOCATIONS



FAULT REASON

Cannot browse web due to wireless problem

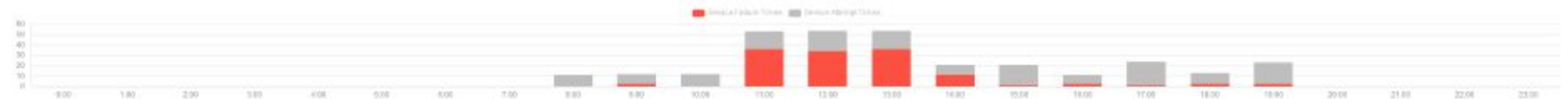


SUGGESTION

User near the known 4G weak coverage area. Please escalate to radio team.

[Take Action](#)

FAILURE TIMELINE



CCA – Data Query Interface

USER PROFILE

MSISDN: Data User 124 Time Period: Query



Name: User 124
 Device: iPhone 6 Plus
 Group: VP
 Plan Type: Postpaid

MSISDN: 1888654**** IMSI: 460008654****
 Service Plan: GQONE-128 : 3G Data, 550M Voice



1423MB Web Browsing 62%

451MB Email 20%

213MB Instant Messaging 9%

120MB APP Store 5%

43MB VoIP 2%

DATA USAGE DATA THROUGHPUT

TOP APP



TOP LOCATIONS



DATA USAGE TIMELINE



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

Digital Channel Usage

(digital channel)

60%↑

Propensity to Call

(digital channel)

30%↓

Average Handling Time

(traditional channel)

20%↓

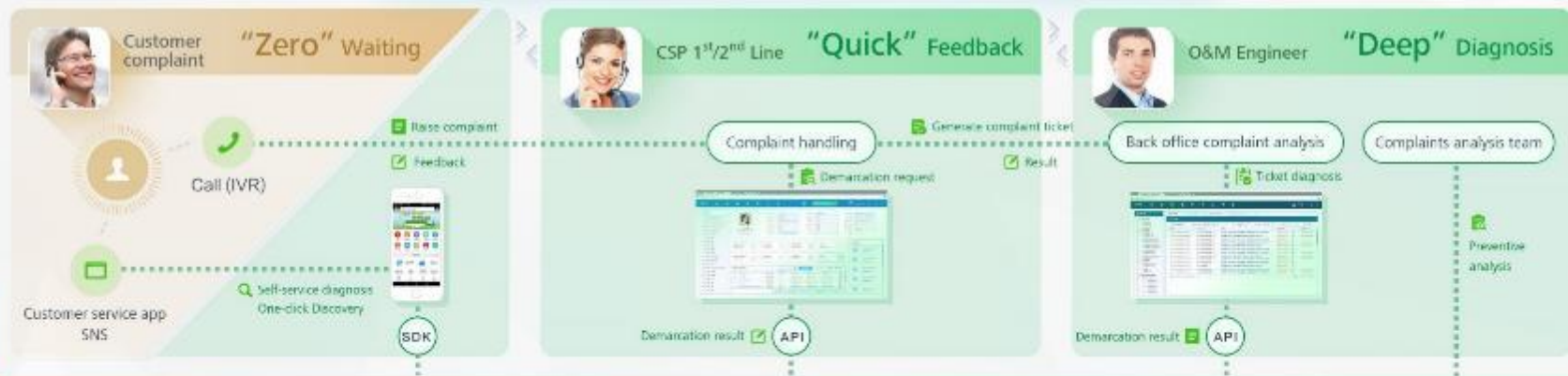
First Call Resolution

(traditional channel)

60%↑



Integrated Customer Complaint Experience Management



Experience based complaint handling platform



Smart fault decision tree




NSPJ®
For service for user data



Network & terminal analysis engine



Expert knowledge 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

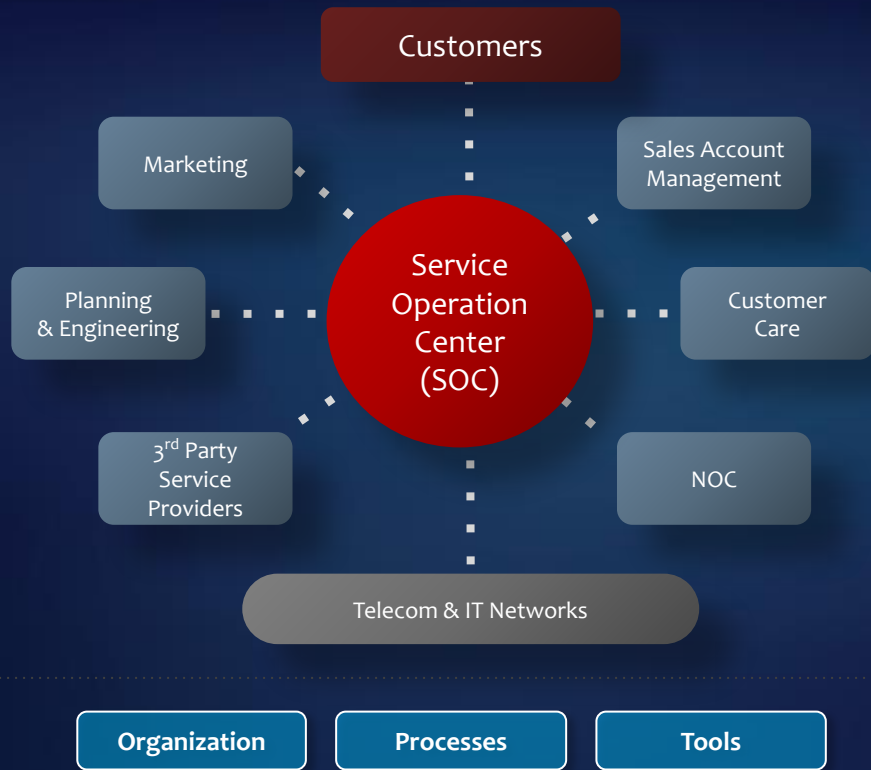
SLA

MTTR

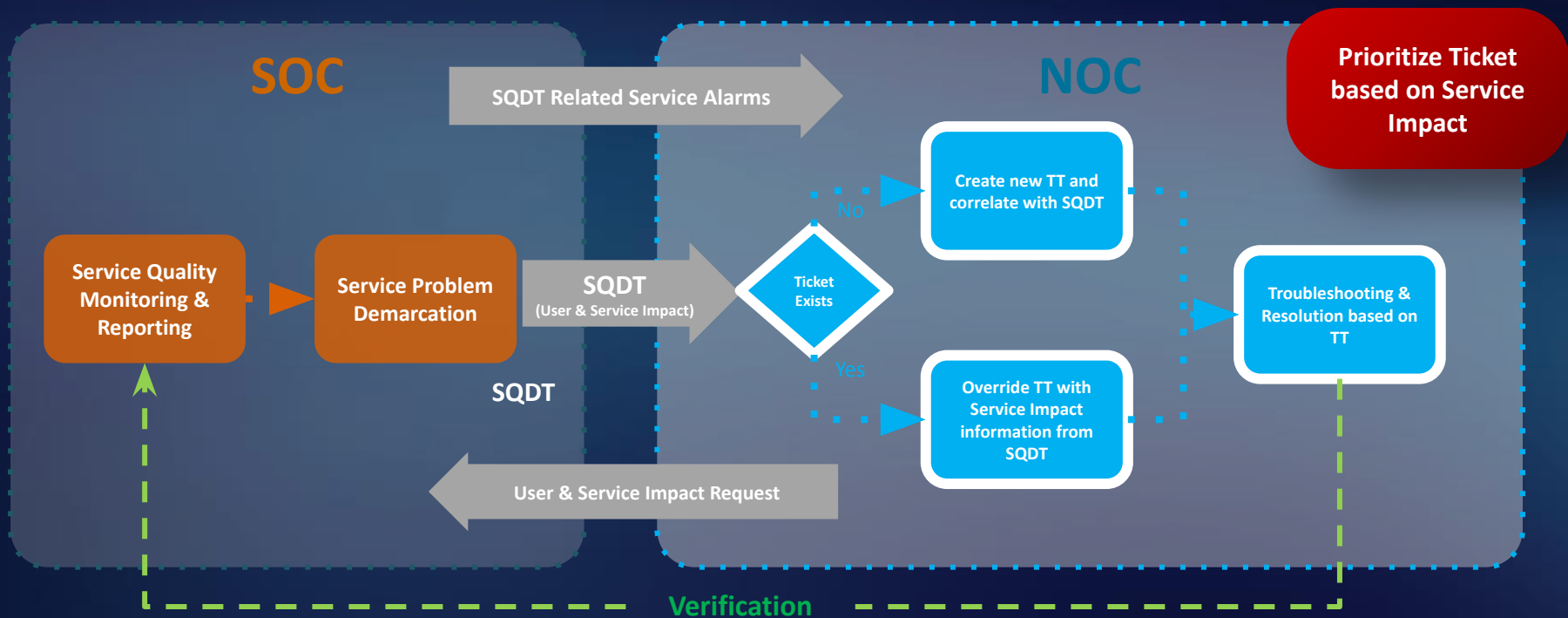
Benefits

- 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
-

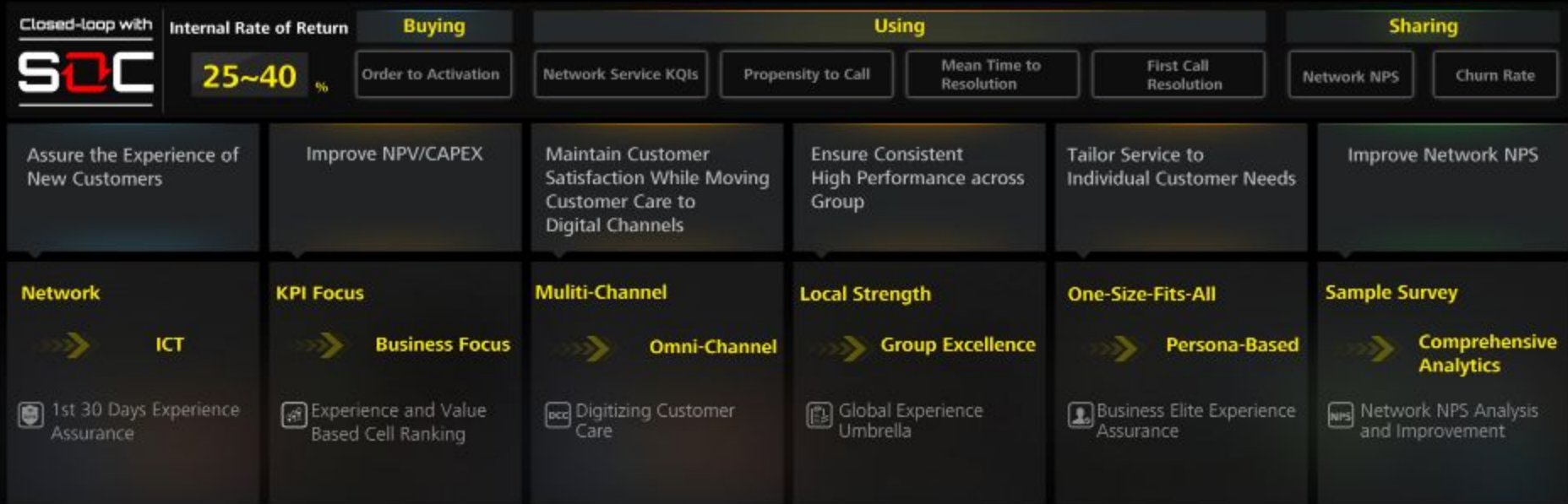
External Operation Driven By SOC



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

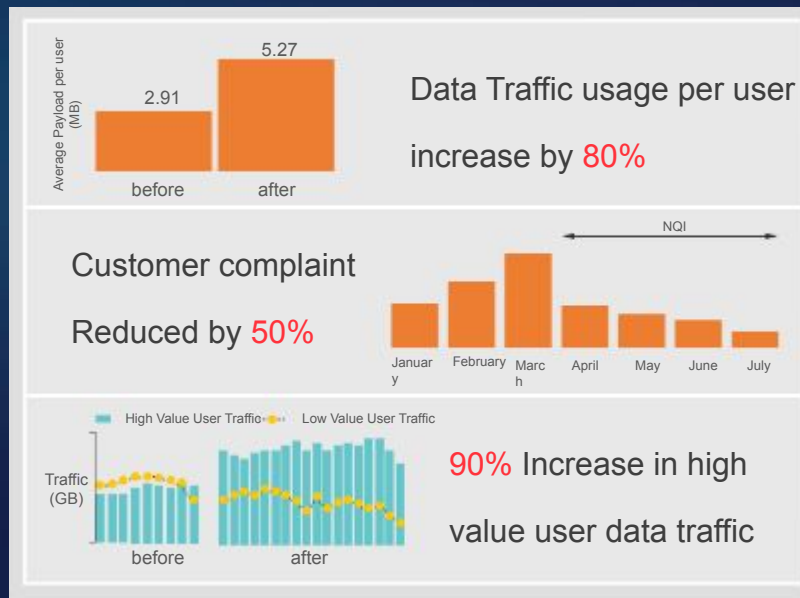
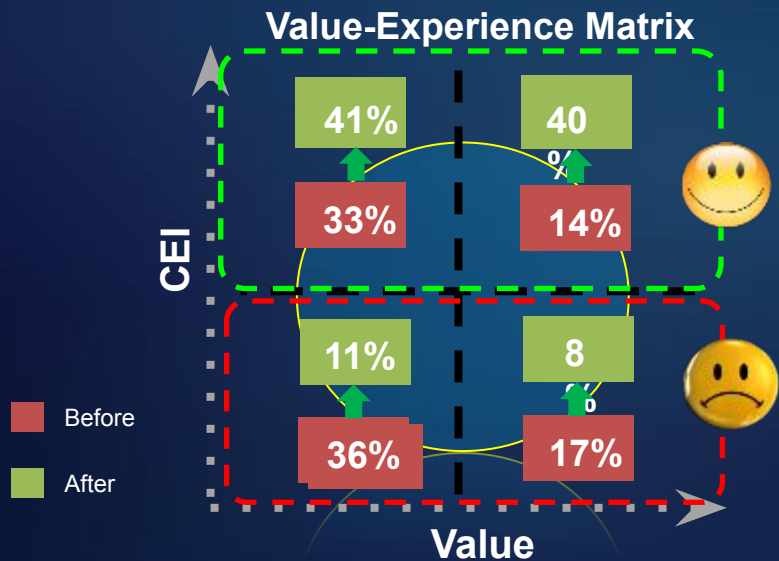
Separator



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



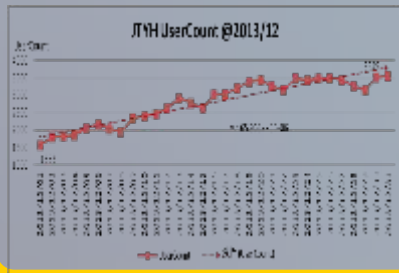
Use Case Name:	Enterprise Service Quality Assurance	
Description: <ul style="list-style-type: none">▪ For Enterprise Users SLA Assurance, this service will periodically monitor and analyze the KQIs/KPIs of voice and data services used by different Enterprise Users with whom the carriers have signed service level agreements (SLAs).▪ Enterprise Users SLA Assurance consists of SLA Task Management, SLA Monitoring, and SLA Analysis.		
Benefits: <ul style="list-style-type: none">▪ 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: <ul style="list-style-type: none">▪ Passive probe data▪ CRM	System Integration: <ul style="list-style-type: none">▪ Passive probes▪ CRM	
Activities: <ul style="list-style-type: none">▪ 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

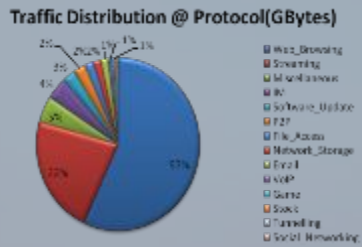
User quantity trend



- User distribution
- User quantity trend

Traffic analysis

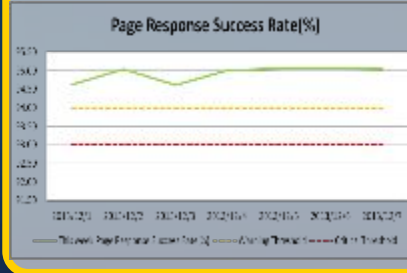
Range-based traffic distribution



- Traffic trend
- Application-based traffic distribution
- Range-based traffic distribution
- User-based traffic distribution

Service KQI analysis

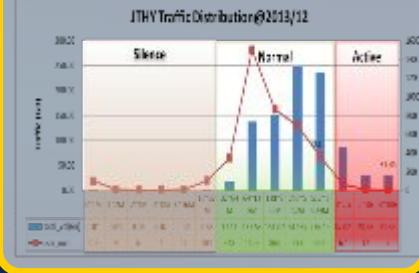
Overall KQI information



- KQI trend
- Failure cause distribution
- TOP VAPs

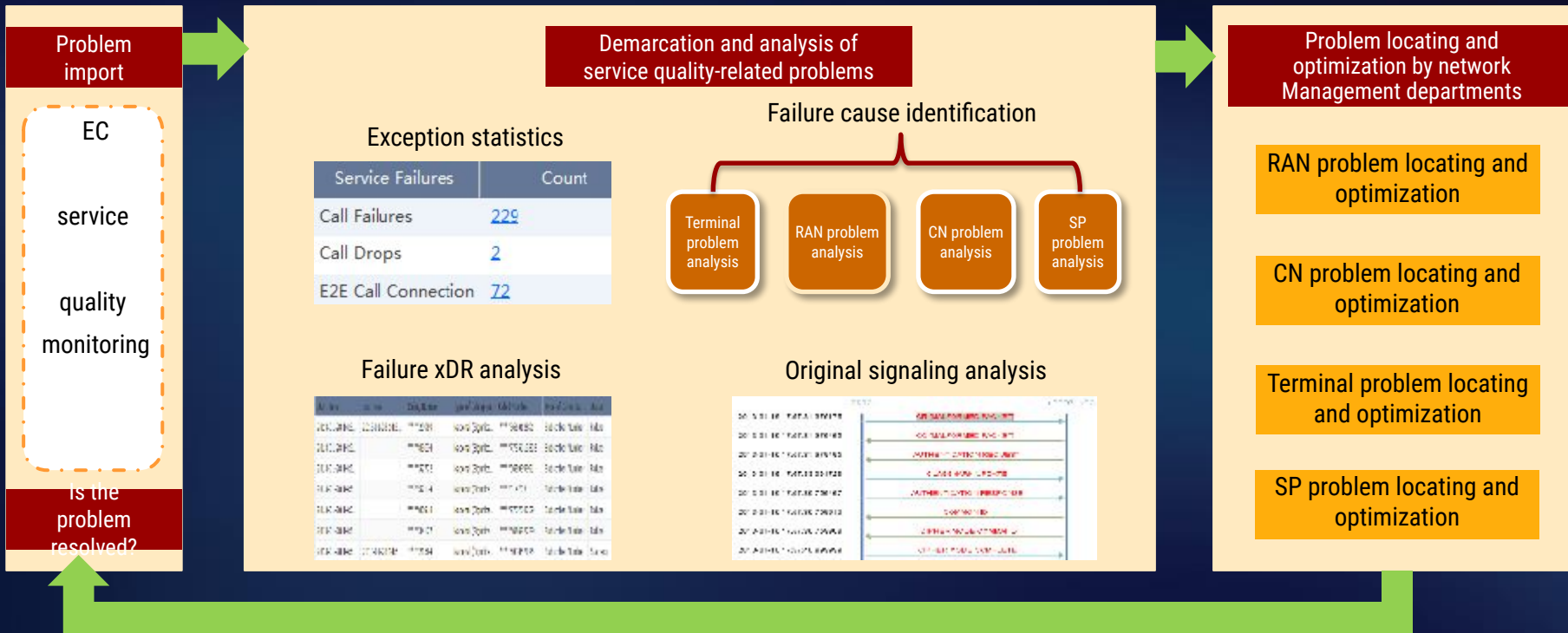
Modeling analysis

Traffic model



- Traffic model
- Abnormal user identification

Methodology



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

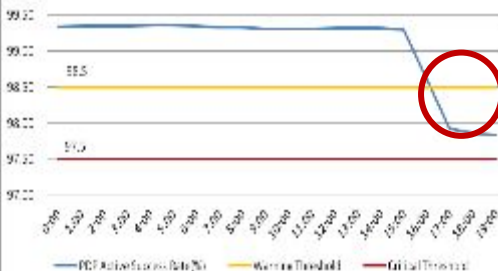
Date: 2013/11/12

Location: Shanghai

Exception: PDP active success rate abruptly drops by 10% after 15:00.

Trend of PDP Activation Success Rate

Shanghai LKL PDP Active Success Rate



Service failure analysis

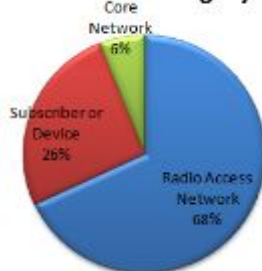
Failure analysis results

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

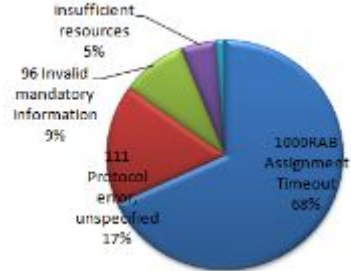
Cause Category: Long duration of 1000 RAB assignment is the main cause.

Failure Analysis on PDP Activation Success Rate

Cause Category



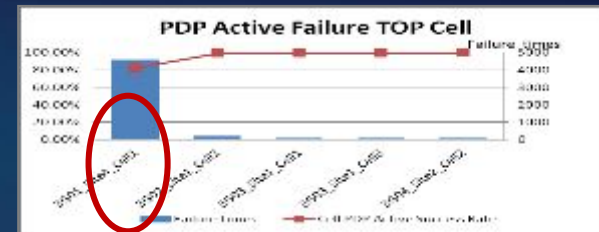
Service Failures



In-depth drilling analysis

Analysis on the long duration of 1000 RAB assignment time

Analysis Period: (15:00 – 16:00)



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



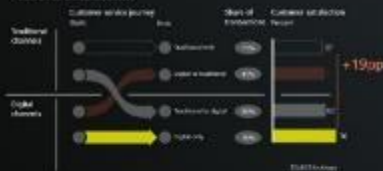
Digitizing Customer Care



Digitizing Customer Care From Multi-Channel to Omni-Channel

Digitalization Challenge

- A Purely Digital Journey Drives Higher Customer Satisfaction
- Fallback from Digital Channel to Traditional Channel without Close-loop brings Customer Dissatisfaction



Value Delivered by Digitizing Customer Care

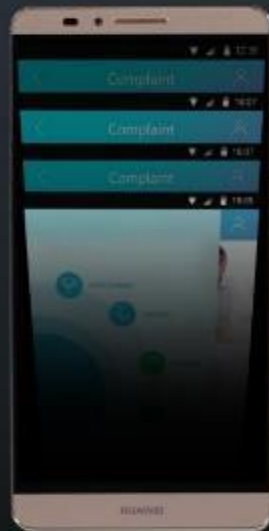
50%~70%
OPEX Saving

19%
Customer Satisfaction Improved

24*7
Self-care

~15 mins
Fast Complaint Handling

User View



- > One-Touch Care
- > Continuous Visibility
- > Personalized Compensation

Executive View

- > Omni-Channel Care Performance Monitoring



Backend

- > Fast Demarcation Using Smart Fault Tree

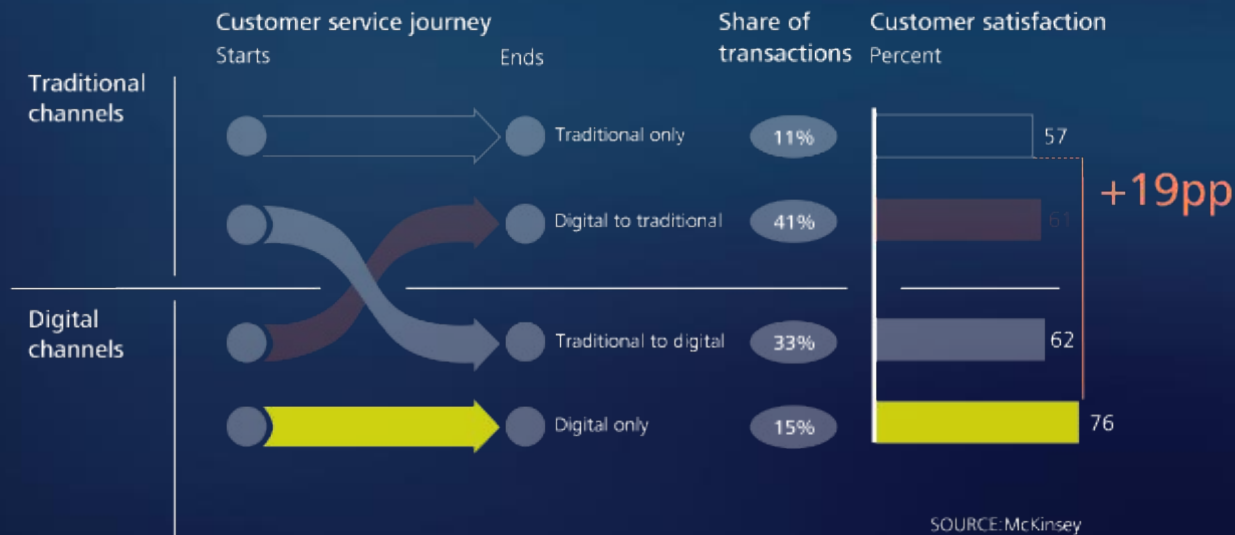


Digitizing Customer Care



Digitalization Challenge

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



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



Varied Personas, Varied Needs

Business Elite 11% Value Observer 18% Family Protected 9% Internet User 16% Location 12% Heavy Users 23%

- Business Elite:** High-quality service, fast response, high-end network, high-quality service, high-quality service.
- Value Observer:** Low cost, high quality, high quality, high quality, high quality.
- Family Protected:** High-quality service, high-quality service, high-quality service, high-quality service, high-quality service.
- Internet User:** High-quality service, high-quality service, high-quality service, high-quality service, high-quality service.
- Location:** High-quality service, high-quality service, high-quality service, high-quality service, high-quality service.
- Heavy Users:** High-quality service, high-quality service, high-quality service, high-quality service, high-quality service.

Persona Identification(Business Elite)



SEQAnalyst My Workspace Service Quality Customer Service Marketing Support Settings

Service Quality Analyse Combined quad-play CCA App Quality Monitor **User Group Service Quality Monitor**

User Group: Business Elite User Segmentation Rules: ARPU>=200USD TrafficForEmailCategory>=100M TotalCallDuration>=400minutes DayTimeInCBD>=7Hours LinkInUseTimeDay>=2Hours

KQI Monitoring Time Period: 2013-01-11 18:10-18:15

Voice	0/4	Traffic	208467 Erl
SMS	0/4	MOSMS/MTSMS	1,326,218/1,653,369
WEB	1/5	Page Request	610,642
Streaming	2/5	Streaming Request	92,218
MMS	0/0	MMS	2,843/4,953
Email	0/0	Send/Receive	330,012/320,876
Reload	91,218	Reload Request	3,761
VoLTE	1,026	VoLTE Request	1,265

Perceive VoLTE Setup Success Rate: 98.82%

Serial No.	Alert	Objec...	Object ...	A... Service ...	KQI	Severity	Time	Refresh Time
4479801	RAN	eNodeB	NodeB...	4 VoLTE	Upload VoLTE Voice Quality	Critical	2015-02-06 1	2015-02-06 14
4479850	RAN	RNC	RNC...	2 Streamin	Streaming Stall Frequency	Warnin	2015-02-06 1	2015-02-06 14

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%



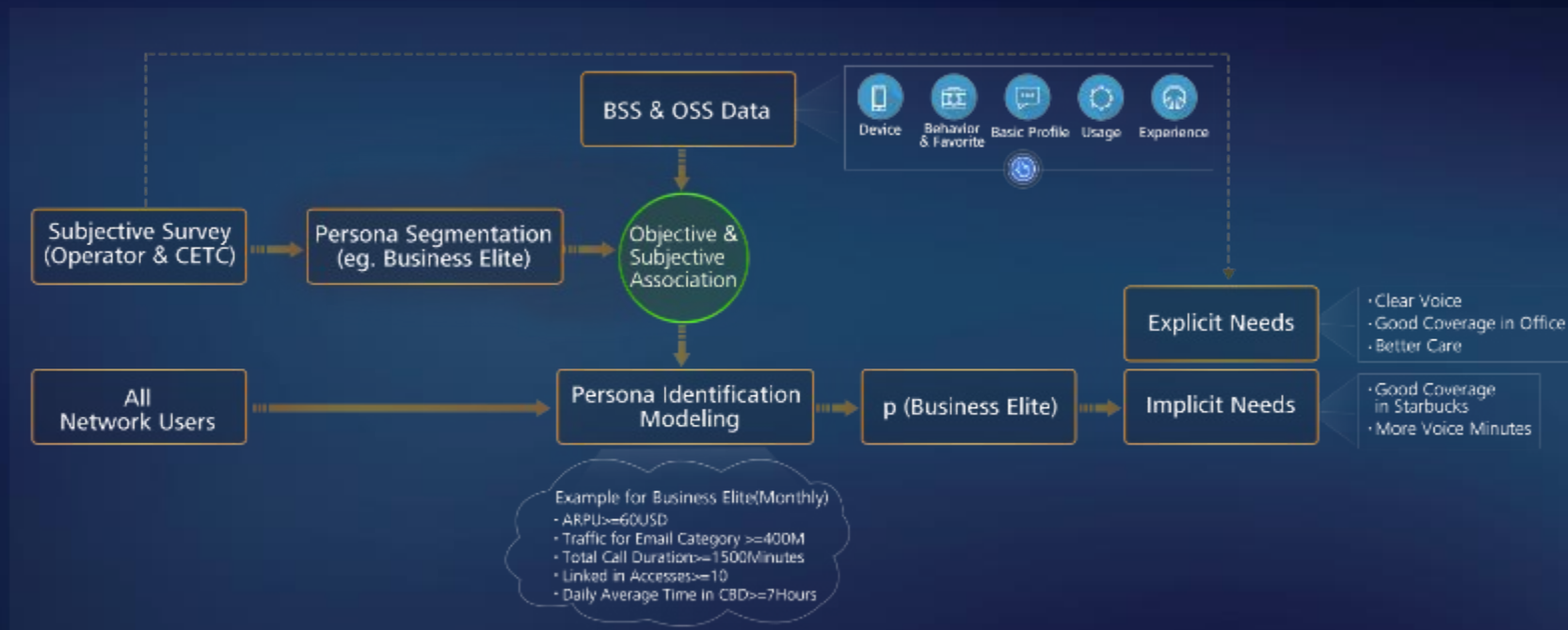
Want

- **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

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

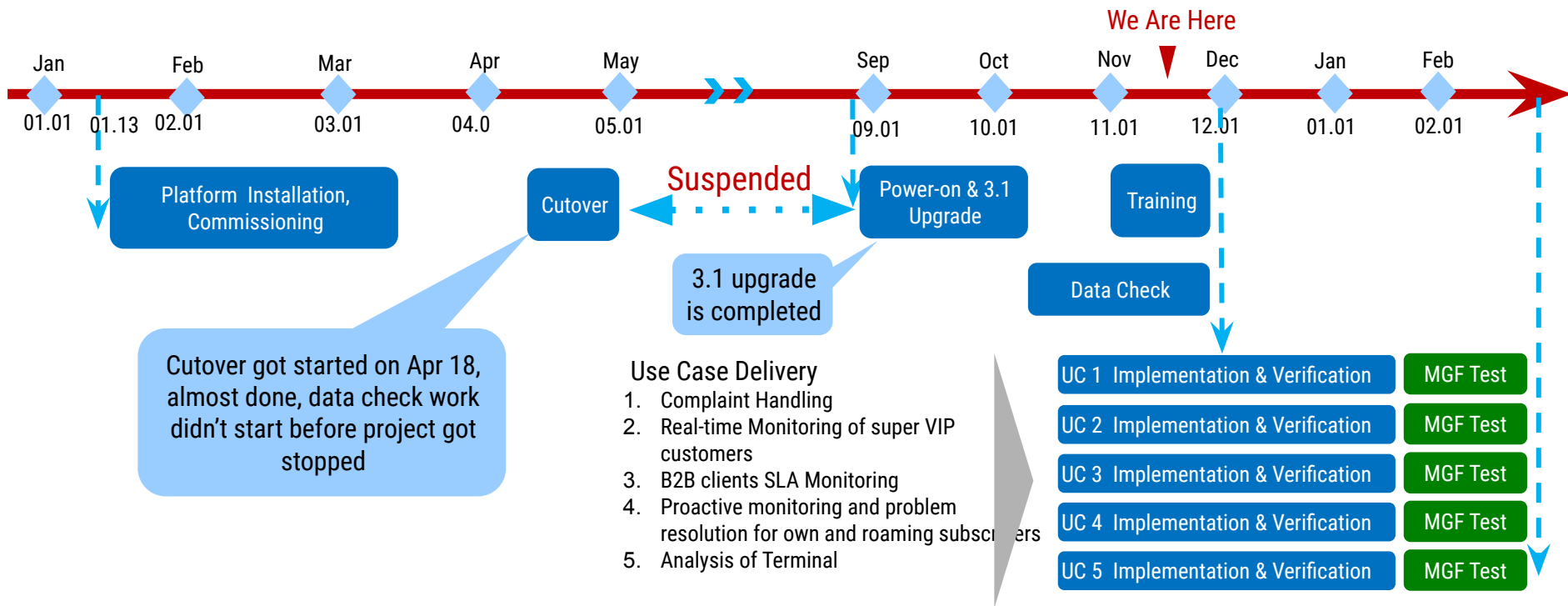


Scope of Pilot – Use Case Delivery

No.	Use Case Name	Description
1	Customer complaint handling	<ul style="list-style-type: none">• Implement Customer Care system integration with SQM system, help Call Center agents L1/L2 quickly make reply to complaint calls, decrease FCR, improve complaint handling efficiency• Integration with Megafon HPSM system to improve complaint handling efficiency
2	Proactive monitoring and problem resolution	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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 (СС, NRI, ТТ)
- 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

WEB:

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

SMS:

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

MMS:

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

Email:

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

Streaming:

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

Thank you

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