

ITU Workshop on “Monitoring and Benchmarking of QoS and QoE of Multimedia Services in Mobile Networks”

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Linking QoE and QoS on data services

**Esa Vesterinen
Vice President
Omnitele**

esa.vesterinen@omnitele.com

Content

- QoS – QoE framework for data services
- Case studies:
 - WWW browsing
 - Network performance vs YouTube experience
 - Optimisation

our company

omnitele
experience

PIONEERING

founded in 1988 to design and rollout world's first GSM network, 1000+ projects in 80+ countries since then

INDEPENDENT

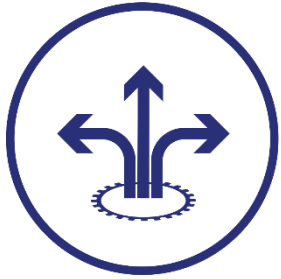
owned by Finnish telecom investors, independent of all operator groups and equipment vendors

CONSULTING

consulting and professional services for telecom service providers and regulators

consulting for mobile industry since 1988

our services



Technology
Strategy



Design and
Optimisation



Audit and
Benchmark



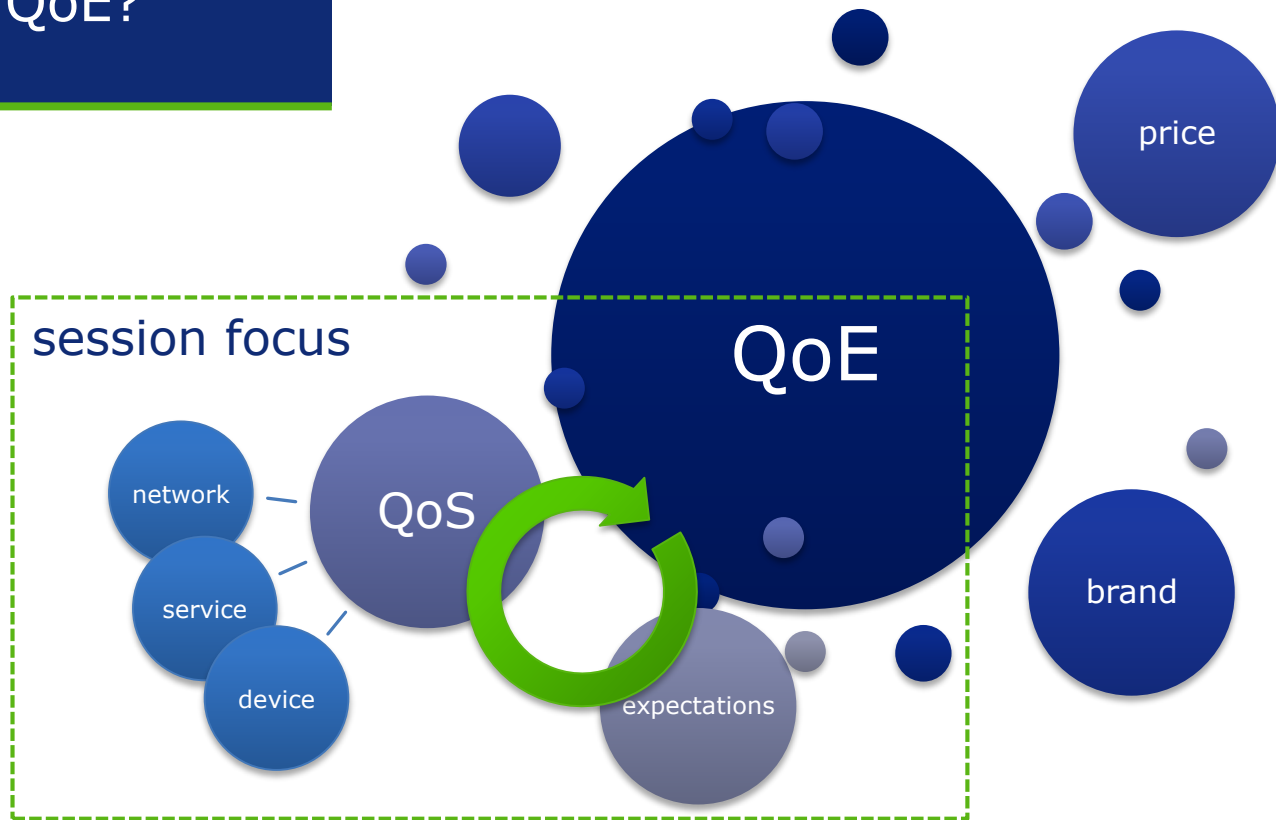
Performance
Management

maximised customer experience
minimised network cost

what are QoS and QoE?

QOE DEPENDS ON...

- expectations
- branding
- socio-economic background
- price
- customer care
- provisioning
- **end-user QoS**



QoE, QoS and network performance quantified

QUALITY OF EXPERIENCE

how well service quality meets expectations?

QUALITY OF SERVICE

measured application/service KPIs

NETWORK PERFORMANCE

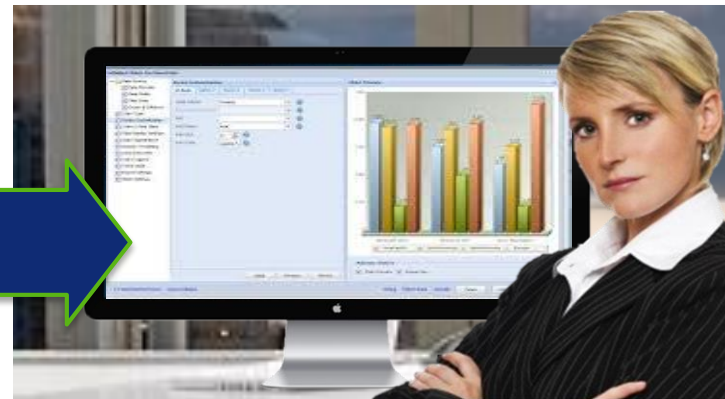
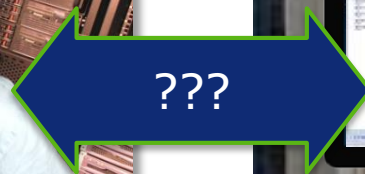
capacity, coverage, functionality, efficiency...



Common challenge: "How is the quality?"



"network is excellent..."



"...customers not satisfied"

► need to find right targets for acceptable QoE!

OPERATOR CASE: CEM FOR WWW BROWSING

Let's take a dive into WWW
browsing Quality of Experience...



OBJECTIVE | sufficient web browsing experience for high value customers

1. QoE targets: define the desired WWW QoE level

2. QoS targets: measure QoE & QoS and cross-correlate to define the relation

3. CTO Targets: Link QoS with NW performance to find right network performance KPI targets



1. QOE TARGET | define the desired WWW QoE

- QoE defined in MOS scale
- Captured with end-user queries:
"On 1-5 scale, what is your WWW browsing experience?"

MOS	QoE	Impairment
5	Excellent	Imperceptible
4	Good	Perceptible but not annoying
3	Fair	Slightly Annoying
2	Poor	Annoying
1	Bad	Very Annoying

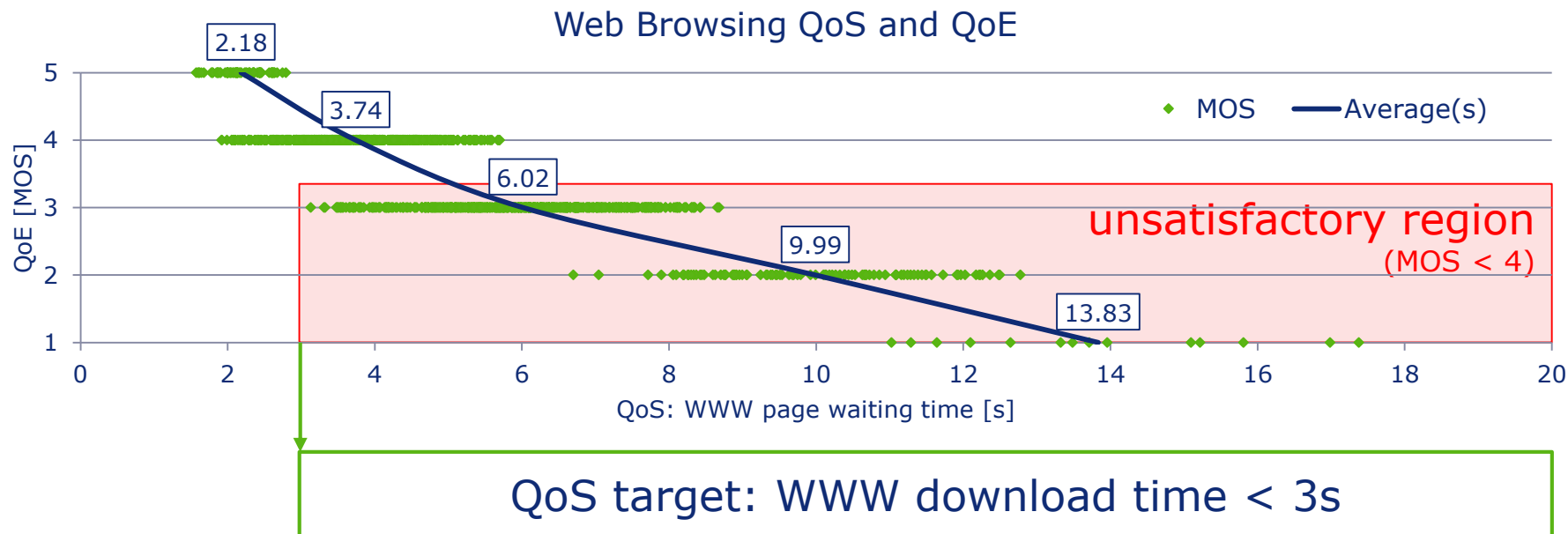


SUFFICIENT
QoE TARGET

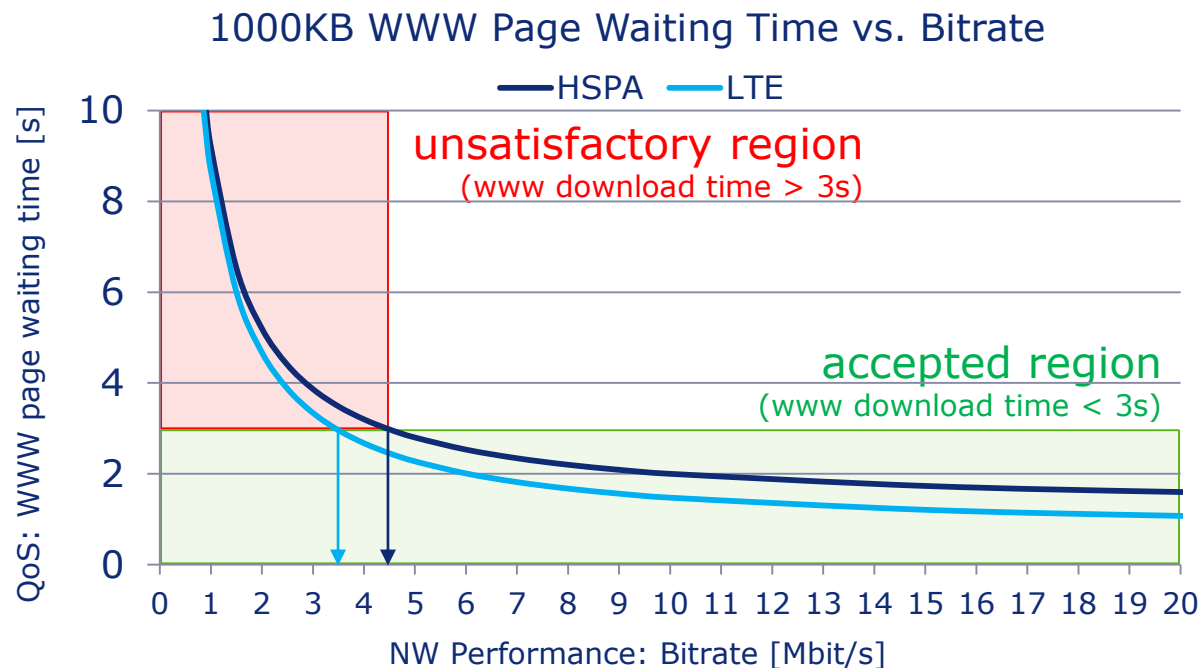
90% of high value
customers MOS ≥ 4

2. QOS TARGET | correlate QoS with QoE

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3. CTO TARGETS | find required NW performance



CTO TARGET

90% of subs get
>3.5 Mbit/s in 4G
>4.5 Mbit/s in 3G

Case summary

1. QoE targets: define the desired WWW QoE level

MOS ≥ 4

2. QoS targets: measure QoE & QoS and cross-correlate to define the relation

WWW DL time
< 3 s

3. CTO Targets: Link QoS with NW performance to find right network performance KPI targets

NW performance
> 3.5 Mbit/s in 4G
> 4.5 Mbit/s in 3G

OPERATOR CASE: CUSTOMER EXPERIENCE BENCHMARK

competitive positioning of YouTube experience

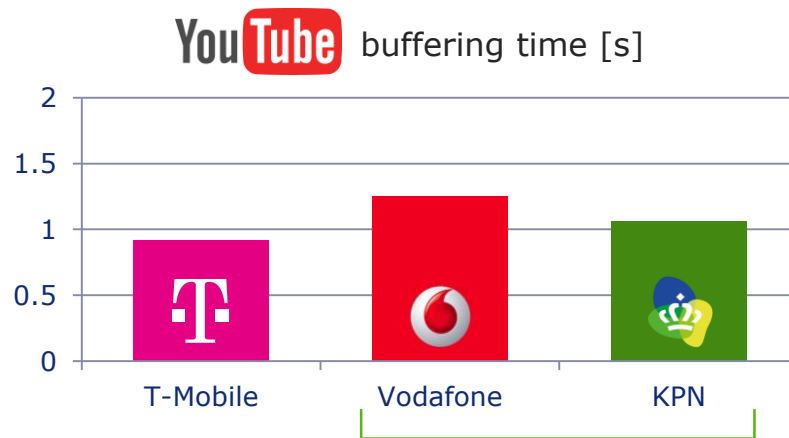
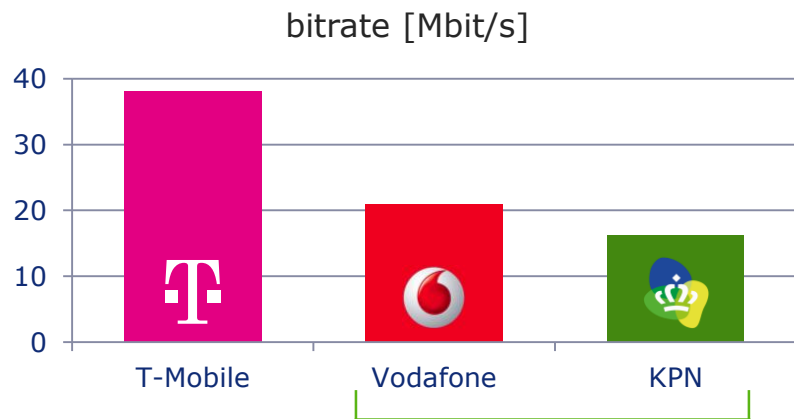


4G smartphone benchmark in Netherlands

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big difference in NW performance...

...thin margins in customer experience



Vodafone higher bitrate,
but KPN faster YouTube

OPERATOR CASE: CUSTOMER EXPERIENCE OPTIMISATION

improving QoE for Kuwaiti operator

objective: customer experience improvement

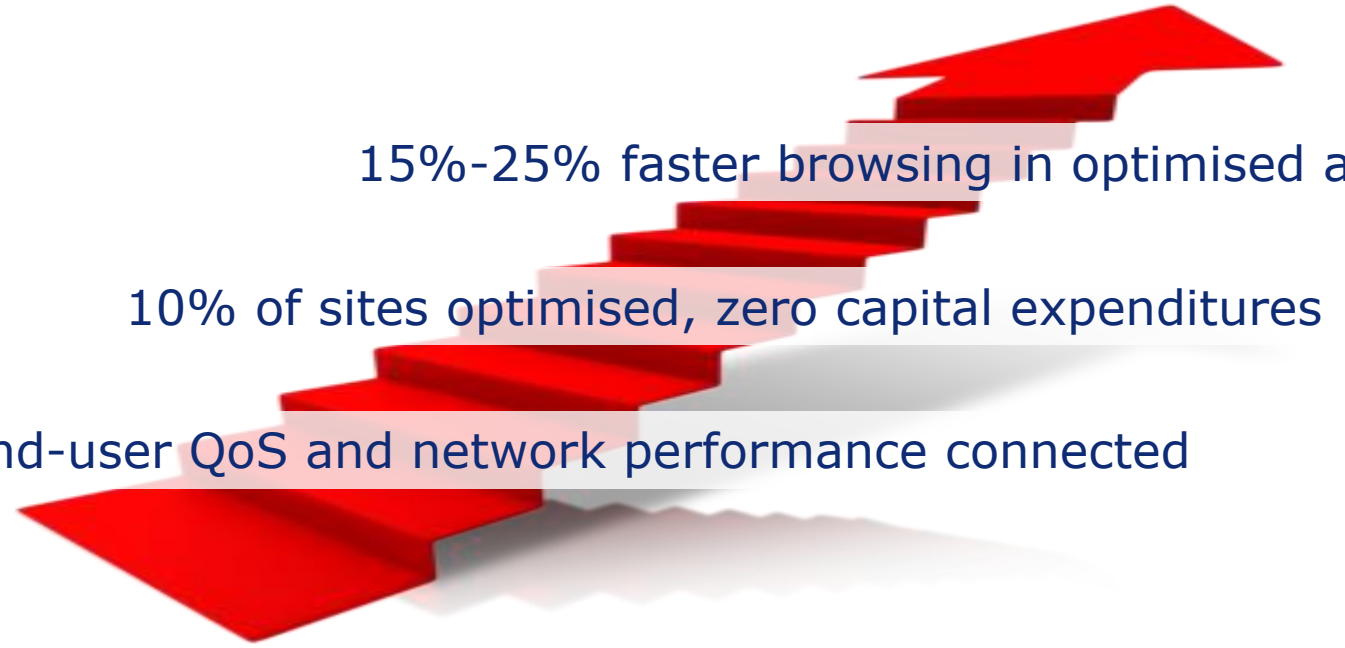
1. Measure end-user QoS of smartphone voice and data
2. Measure network performance
3. End-to-end troubleshooting & improvement recommendations



customer centric optimisation area prioritisation



improved **customer experience** with zero CapEx



15%-25% faster browsing in optimised areas

10% of sites optimised, zero capital expenditures

end-user QoS and network performance connected

recap & takeaway messages

- 1 common challenge: CTO team & CMO team targets often not fully aligned
- 2 linking network performance to customer experience challenging but not impossible
- 3 proper CEM framework results in maximised customer experience & minimised network cost

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