



Self Organising Network (SON) in Telecommunication Networks

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Have you ever tried to manage
30.000 elements with hundreds
of parameters each by hand?



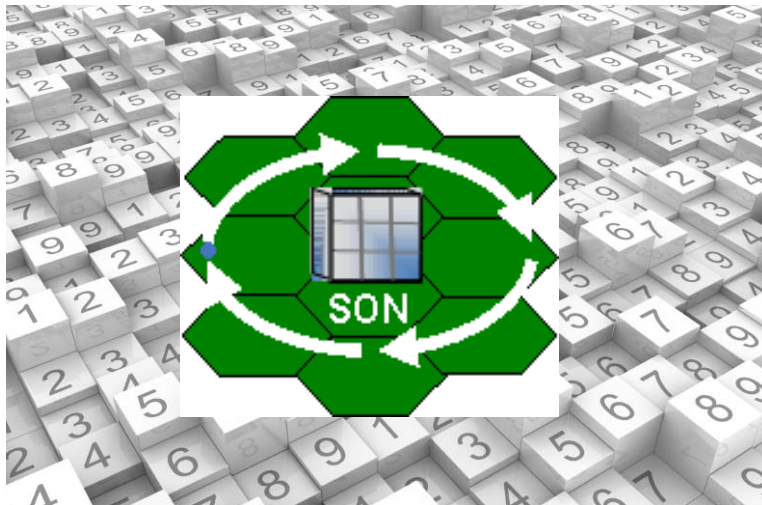
... an impossible task!



... so what is the alternative?



Self Organising

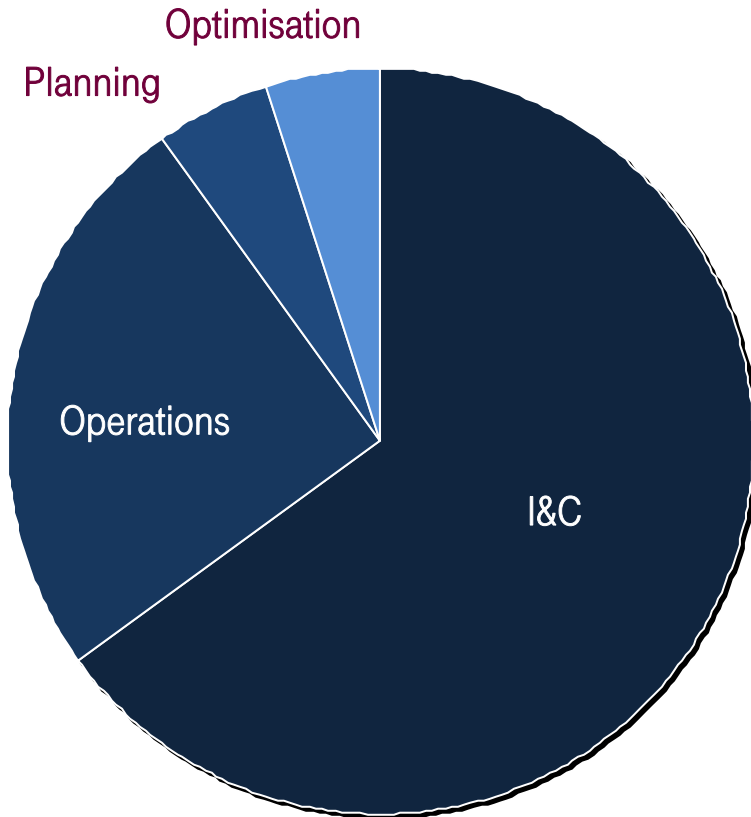


Overview : Next Generation chance: Self Organising Networks?

- Our vision
- The drivers for SON
- What SON is all about
- Examples for SON features
- SON from an Operator Point of View
- The SON Roadmap
- Summary



Analysing cost drivers in site life cycle ...



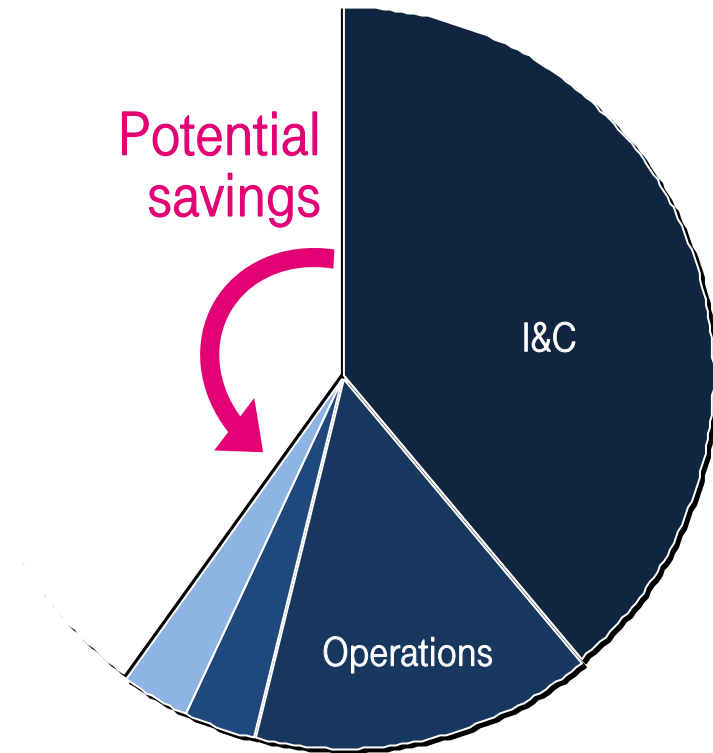
High cost & effort for

- Installation & commissioning
 - Highly manual work
- Operations
 - Repetitive
 - Highly manual work
- Planning
 - Partially automated
- Optimisation
 - Partially automated

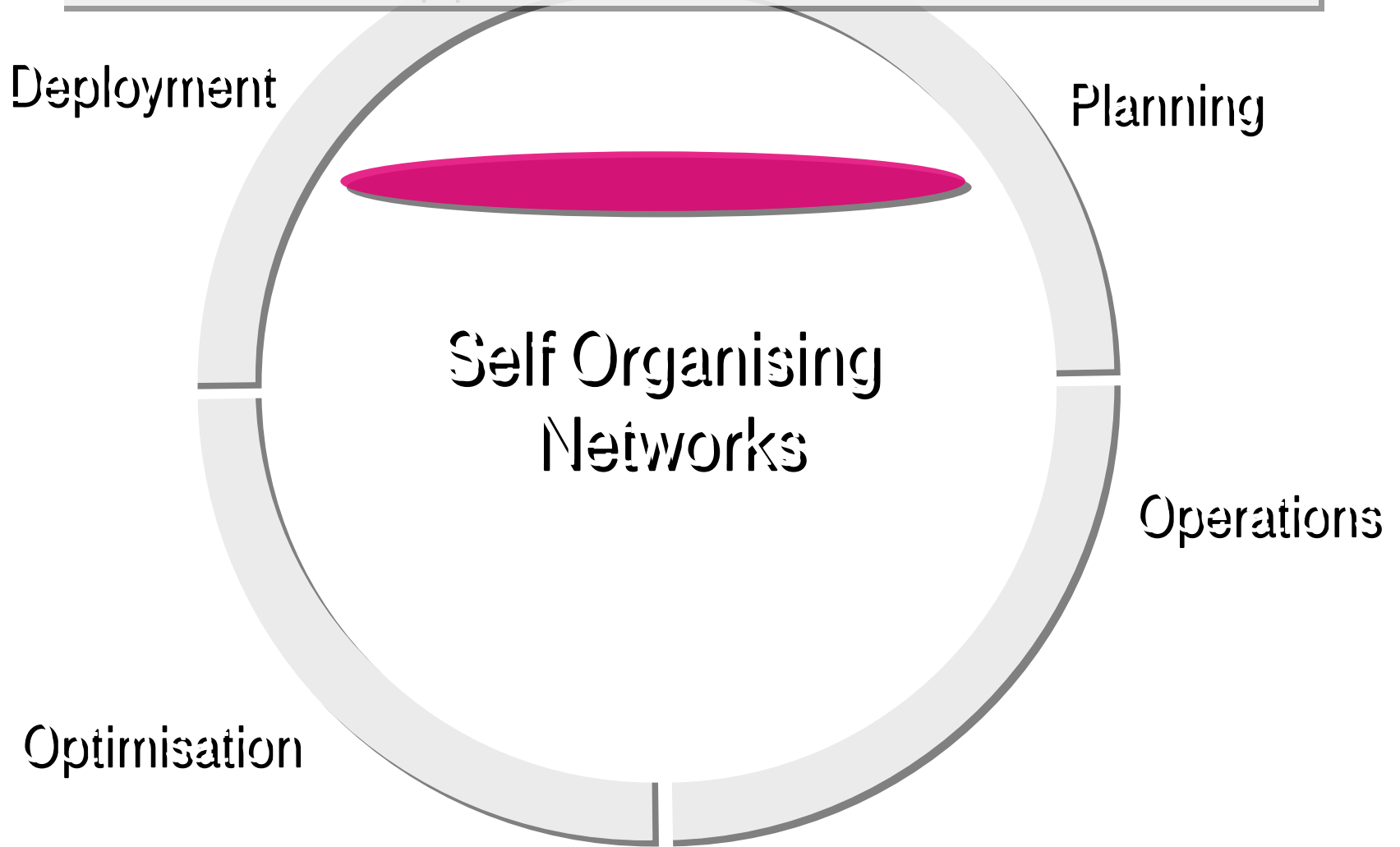


Analysing cost drivers in site life cycle ...

Self Organising

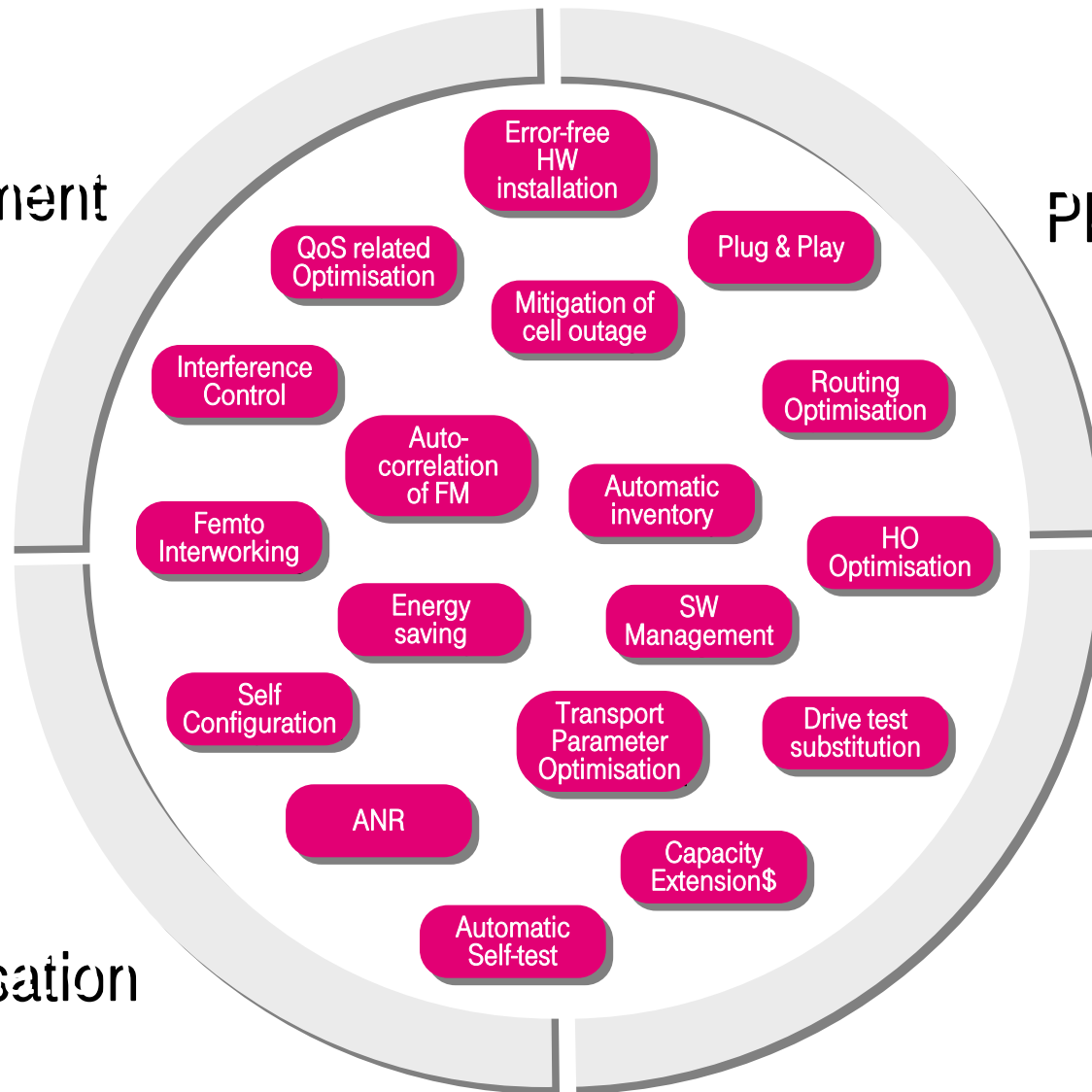


The holistic approach of SON



Deployment

Planning



Operations

Optimisation



The Top 10 SON use cases

1	Plug & Play Installation	Focal point
2	ANR (Automatic Neighbour Relationship Configuration)	
3	OSS Integration (Full standardised northbound Configuration-, Alarm- and Performance- Management)	
4	HO Optimisation (Mobility Robustness Optimisation)	
5	Minimisation of drive tests	
6	Cell Outage Compensation	
7	Load Balancing	
8	Energy Saving	
9	Interaction home/macro BTS	
10	QoS optimisation	



SON concepts & standardisation available

- SON is an important topic in standardisation activities
- 32 SON use cases defined in NGMN
- 21 operators and vendors pushing SON forward (over 100 engineers)
- 9 working groups established dealing with SON related topics
- Resulting concepts and standardisation in **TOP Operational Efficiency Recommendations** published on NGMN webpage:
<http://www.ngmn.org/nc/downloads/techdownloads.html>
- SON in EU funded projects E³ and SOCRATES



Example for SON features coming soon:

The fully automated Plug&Play Installation Process

1	Plug & Play Installation
2	ANR (Automatic Neighbour Relationship Configuration)
3	OSS Integration (Full standardised northbound Configuration, Alarm- and Performance- Management)
4	HO Optimisation (Mobility Robustness Optimisation)
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Conventional installation Process

- 2-3 qualified technician on site
- Hook up to NodeB via Laptop
- Implement configuration files
- Communication between Installer and Operator at OMC Parameter adjustments, testing
- Total duration ca. 2 h

fully automated Plug&Play Installation

- 1 person on site
- NodeB is self-configured & self tested
- Green light indicates node is on air
- Total duration ca. 20 min

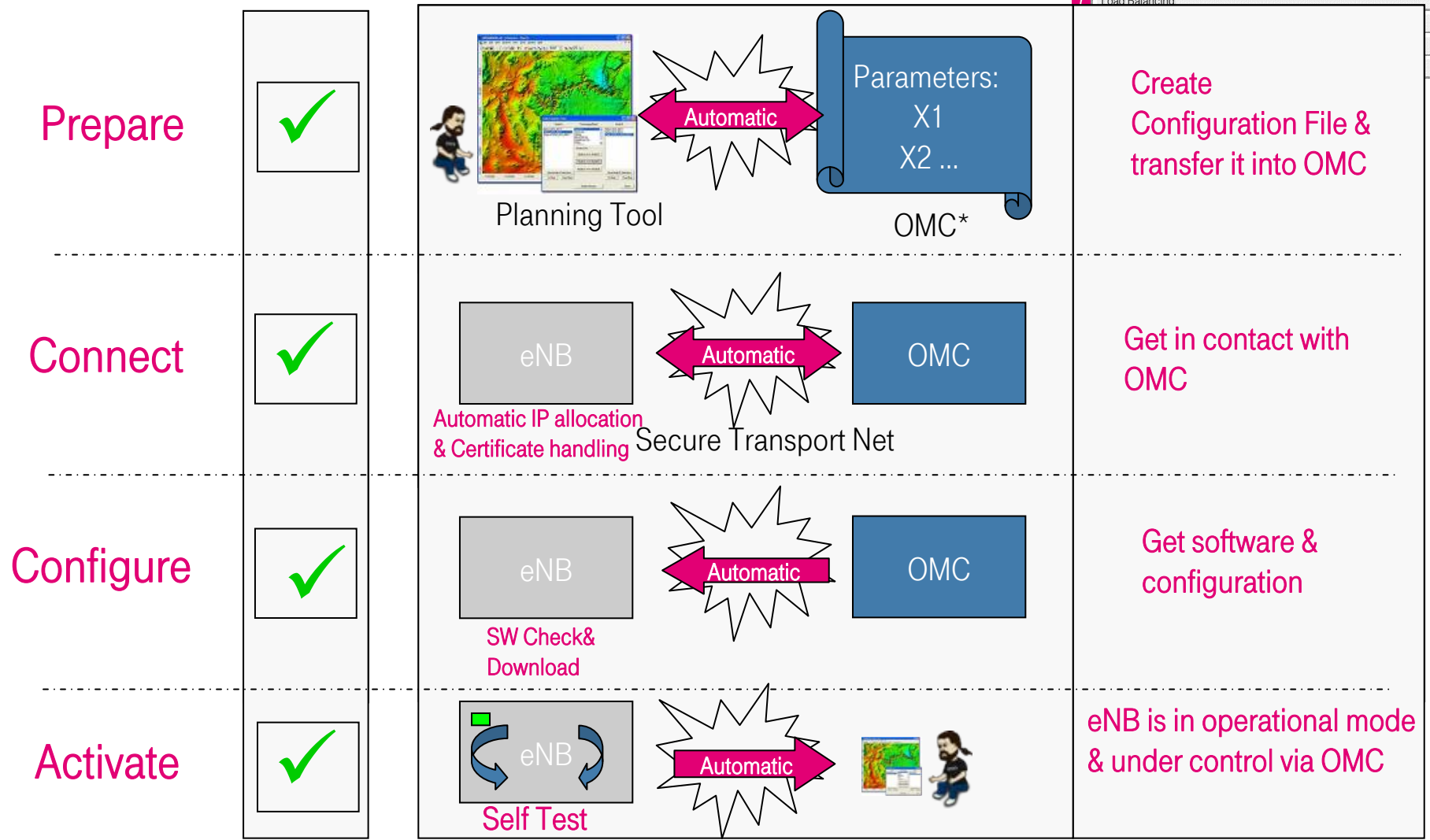


Vision: As simple as installing a WLAN Router



1	Plug & Play Installation
2	ANR (Automatic Neighbour Relationship Configuration)
3	OSS Integration (Full standardised northbound Configuration, Alarm- and Performance- Management)
4	HO Optimisation (Mobility Robustness Optimisation)
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Plug'n Play Proof of Concept is given



*OMC: Operation & Maintenance Center

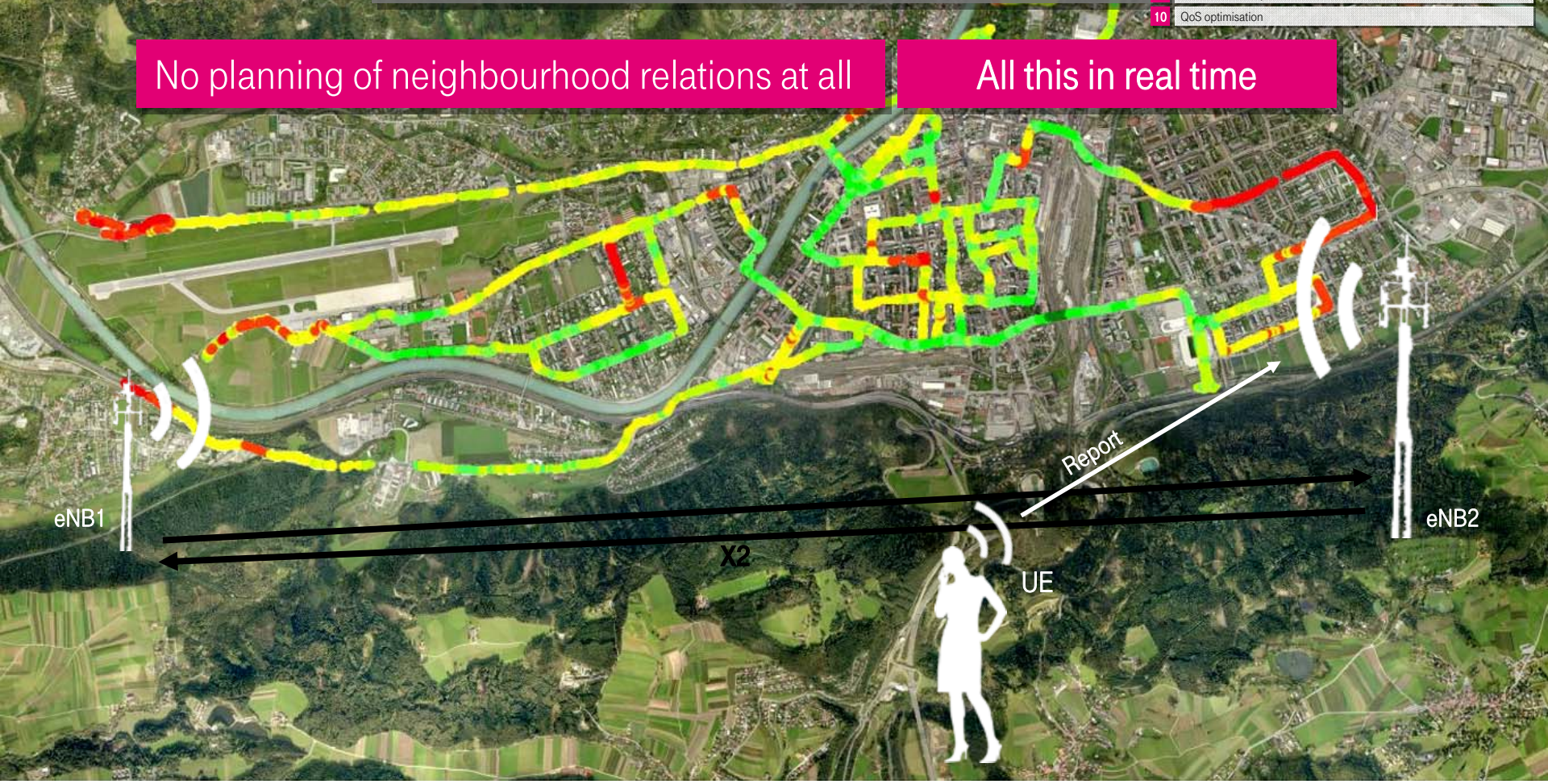
Example for SON features coming soon:

Automatic Neighbourhood Relations (ANR)

- 1 Plug & Play Installation
- 2 ANR (Automatic Neighbour Relationship Configuration)
- 3 OSS Integration (Full standardised northbound Configuration, Alarm, and Performance Management)
- 4 HO Optimisation (Mobility Robustness Optimisation)
- 5 Minimisation of drive tests
- 6 Cell Outage Compensation
- 7 Load Balancing
- 8 Energy Saving
- 9 Interaction home/macro BTS
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No planning of neighbourhood relations at all

All this in real time



1	Plug & Play Installation
2	ANR (Automatic Neighbour Relationship Configuration)
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ANR successfully tested in trial networks

HO performance without NR pre-planning



without ANR

- NR configured manually
- typical number of HO
- typical number of call drops
- manually optimised network

with ANR

- Results in two trials with two different infrastructures
 - No change of typical HO number
 - Quality on same level as with planned configuration
 - ANR works on the fly: neighbour is identified, configured and HO can take place in nearly real time
 - ANR is reactive on network changes

Serving_RSRP	
●	-60 to -50
●	-70 to -60
●	-80 to -70
●	-90 to -80
●	-100 to -90
●	-110 to -100
●	-130 to -110

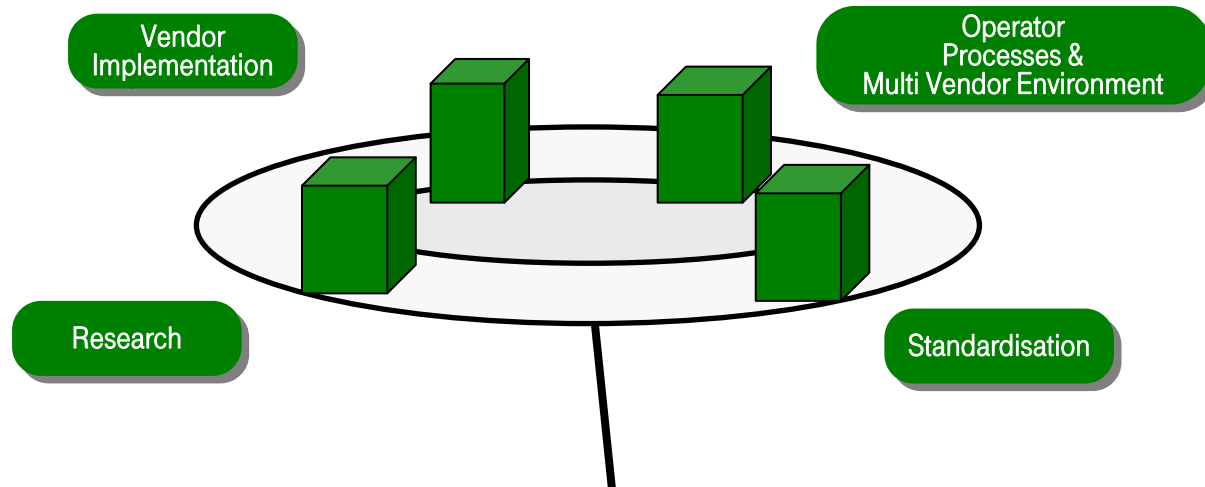
With ANR: high quality can be achieved without spending effort for planning & optimization



SON realization needs balance

Operator To Do's:

- push creation of SON concepts and its standardization
- agree in contracts with vendors on SON realization
- balance out implementation and operator's specifics in "Proof of Concept" (PoC)
- earn the benefits and savings in production



SON is coming

(Status in October 2010)

Plug & Play Installation	C ✓	A ✓	PoC ✓	iP
ANR (Automatic Neighbour Relationship Configuration)	C ✓	A ✓	PoC ✓	iP
OSS Integration (Full standardised northbound Configuration-, Alarm- and Performance- Management)	C ✓	A ✓	PoC ✓	iP
HO Optimisation (Mobility Robustness Optimisation)	C ✓	A ✓	PoC	iP
Minimisation of drive tests	C ✓	A ✓	PoC ✓	iP
Cell Outage Compensation	C ✓	A ✓	PoC	iP
Load Balancing	C ✓	A ✓	PoC	iP
Energy Saving	C ✓	A ✓	PoC ✓	iP



SON is real!

- ▶ SON is crucial for the whole mobile industry (operators & vendors)
- ✓ SON is real!! First features of SON expected soon:
 - proof of concept done in field and lab tests
 - availability in live networks in 2010
 - improvements and further SON features to follow soon
- ▶ We have to live the SON idea to make it happen
- ▶ We are at the beginning of the road – keep on pushing



Thank you for your attention.

