



Faculty of Design

2013

Attempting to fly: Deployment of system-oriented design methodology conducted by the Norwegian Design Council

Wildhagen, Benedicte, Bang, Knut and Paulsen, Adrian

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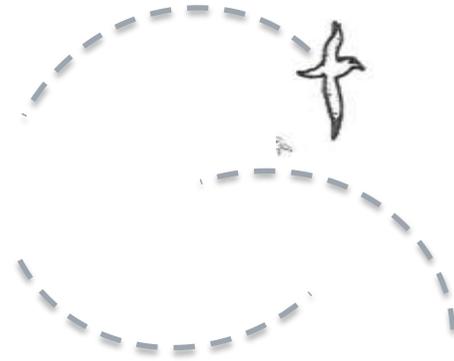
Wildhagen, Benedicte, Bang, Knut and Paulsen, Adrian (2013) Attempting to fly: Deployment of system-oriented design methodology conducted by the Norwegian Design Council. In: Relating Systems Thinking and Design 2013 Symposium Proceedings, 9-11 Oct 2013, Oslo, Norway. Available at <http://openresearch.ocadu.ca/id/eprint/2177/>

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Attempting to fly

Deployment of systems
oriented design methodology –
conducted by the Norwegian
Design Council



RSD2, 11.10.2013

Benedicte Wildhagen, Knut Bang, Adrian Paulsen





Agenda

- Background
- Take off
- Flying
- Landing
- Key observations



Background:

The need for new methodology in the design field

- The Norwegian Design Council and AHO have been collaborative partners for several years



Our contribution

- sensors for the SOD master course
- recruiting business cases
- using SOD in our own work

- deep understanding



Bridging partner

- We see our role as a "bridging partner" between the academic, research-based development at AHO and the "real world".



Ground-braking partnership

- collaborate with other governmental organizations
- navigate within very complex structures
- research + design



Take off:

Orchestrating Celerway

- turning a research result into a commercially viable idea
- product oriented



Why choose systems oriented design?

- wicked problem
- explore and understand
- co-create business- and product concepts



[Celerway video](http://vimeo.com/81847079)

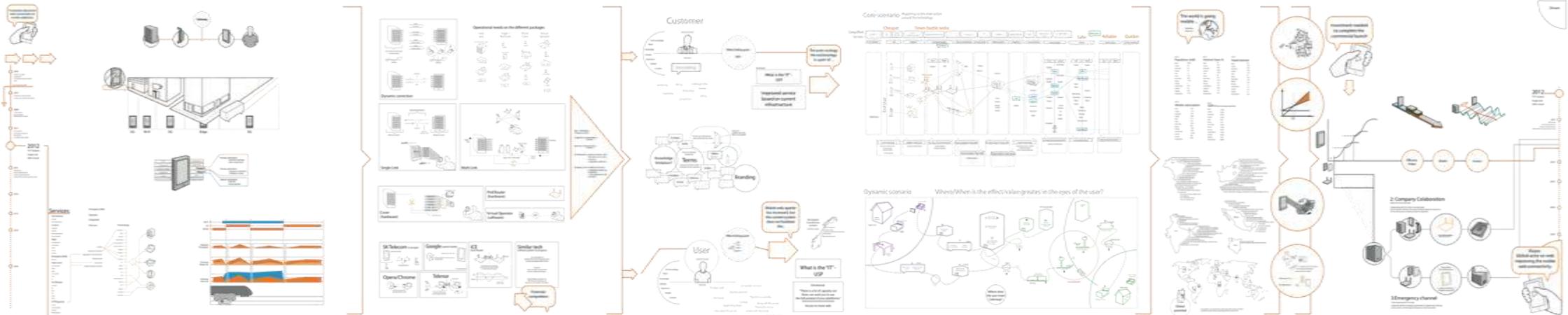
<http://vimeo.com/81847079>



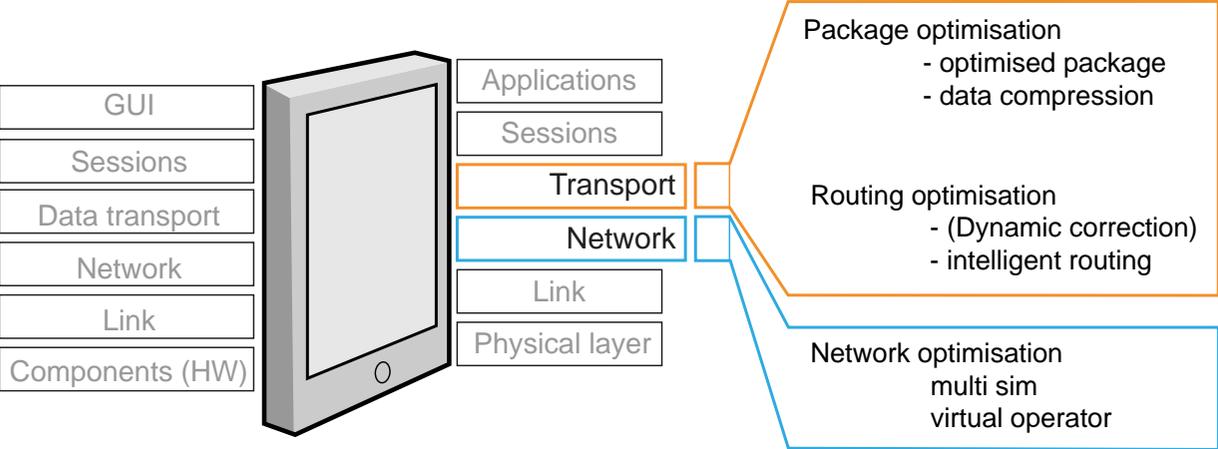
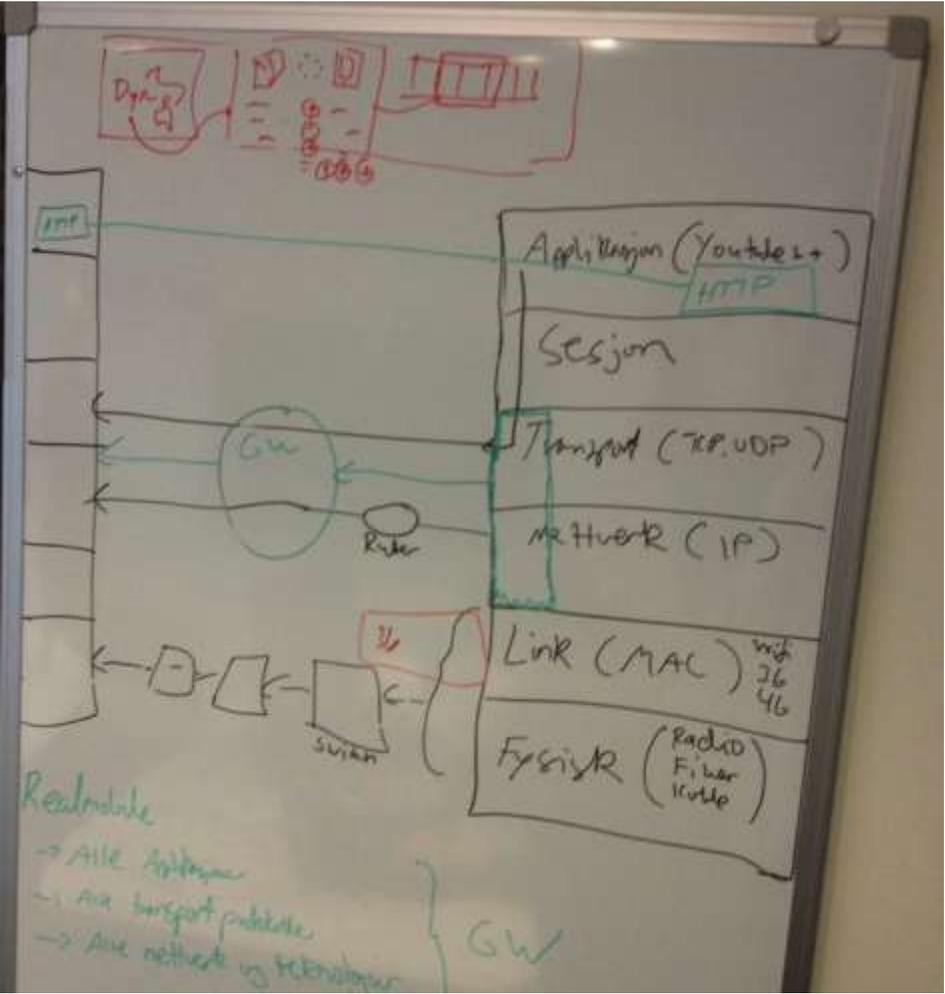
Challenge assumptions



Understanding + Exploration + Scale + Potential = 4,3m

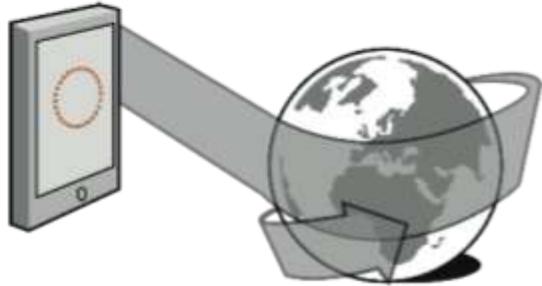


Understanding + Exploration + Scale + Potential = 4,3m



Understanding + Exploration + Scale + Potential = 4,3m

65% mobile penetration (incl WAP)



Cable situation cause 3G boom

South Africa

- average business has several connections
- #1 mobile internet user in Africa
- 95% prepaid users
- mobile operators 30% = non voice income
- over 50% surf the web on the mobile
- 95 mb monthly use
- 735 million mobile subscriptions by end of 2012.
- Mobile is a game changer
- Fastest growing mobile market in the world

Mobile teaching platforms

- 10.000 newly registered m-pesa users every day
- 10.000 newly registered m-pesa users every day
- Arrival of cheap smartphones (from Ethiopia)
- 20% smartphone users
- 2x mobile 3G than 3G USB modems
- Significantly more 3G mobile broadband than DSL subscribers
- 3G mobile network launched in over half of all african contries
- More oceanic fiber cables support mobile broadband growth
- Drivers: handset price, language and education (misunderstanding of services)

"Comfort, convinience and fun"

Brazil

- Brand driven development (commercial activity)
- 165% smartphone increase year-by-year
- mobile web means increased inclusion
- Want deals, not annoyances
- 78 mill online population
- 93% of smatphoneowners shop with them
- Android #1
- Not security focused (yet)
- 80% Prepaid subscription
- 78% say: "next will be web enabled"
- 2011: 4 mill subscriptions
- 12% with regular 3G use
- 26.6 mill mobile web access
- 26.6 mill mobile web access
- Not at tipping point yet
- Due to instability, unofficial web actors
- Smartphones becoming less of a luxury item
- 2015: 100 miill mobile web connections

2013: Mobile commercereach 2 billion \$



3 \$ (ARPU)
 1.2 Billion people
 600 mill under age 25
 9th largest economy in the world
 22 languages
 30 mill pc's
 50 mill mobile data subscriptions
 5 mill mobile only web citizens

Rural web Growth

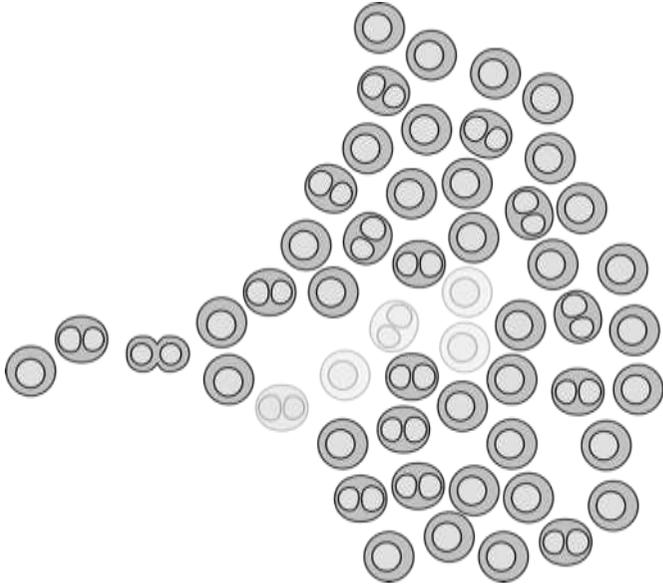
India

- WAP dominated, but changing
- Online revolution, not evolution
- Web 1.0 & 2.0 at the same time
- Government funded Wi-Fi roll-out
- 100 mill mobile internett user mark in 1 year
- 41% preffer mobile internett access
- 250 mill consumer class
- 75% Entertainment (video, music & games)
- 50% Communication
- 2015: 300-400 mill internett users
- 2011: 600 mill unique mobile subscriptions (900 mill total)
- Mobile First

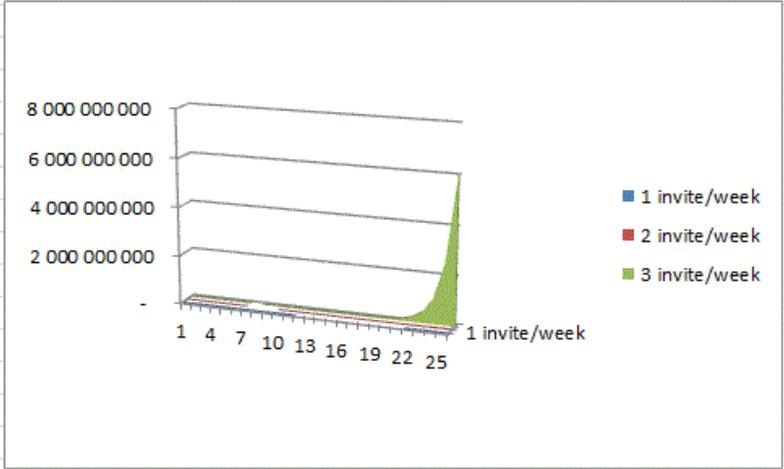
Media hungry (4.5 hours daily)



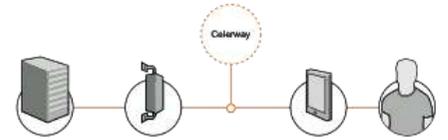
Understanding + Exploration + Scale + Potential = 4,3m



	1 invite/week	2 invite/week	3 invite/week			
1	-	-	-	1	1	1 insertion points
2	-	-	-	100	100	100 initial invites
3	-	-	-	4	4	4 weeks free trial
4	30	30	30	50 %	50 %	50 % % accept trial
5	36	51	66	30 %	30 %	30 % % converting to paid
6	47	95	158	30 %	30 %	30 % % paying users quitting
7	67	186	392			
8	82	340	932			
9	103	628	2 230			
10	130	1 160	5 337			
11	160	2 132	12 753			
12	199	3 922	30 484			
13	246	7 215	72 864			
14	304	13 270	174 154			
15	375	24 409	416 254			
16	463	44 896	994 910			
17	571	82 577	2 377 979			
18	705	151 884	5 683 716			
19	870	279 359	13 584 908			
20	1 073	513 821	32 469 905			
21	1 324	945 064	77 607 794			
22	1 634	1 738 245	185 493 912			
23	2 016	3 197 131	443 357 419			
24	2 487	5 880 442	1 059 688 691			
25	3 069	10 815 819	2 532 810 035			
26	3 786	19 893 393	6 053 784 219			

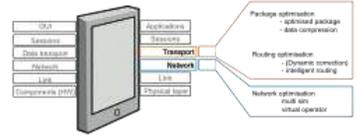
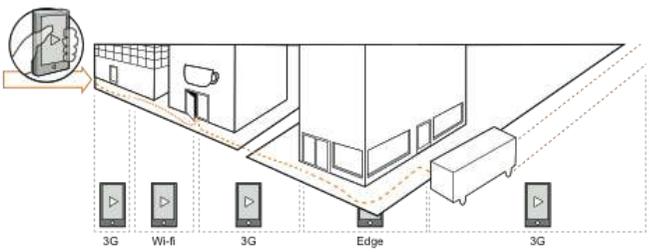


Frustration about bad web connectivity on mobile platforms

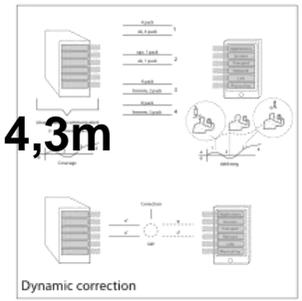
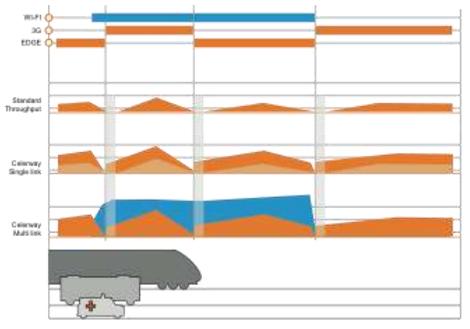
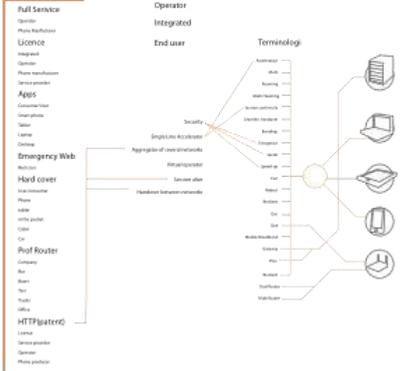


Understanding + Exploration + Scale + Potential = 4,3m

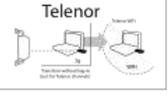
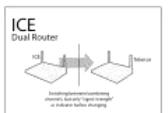
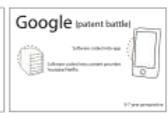
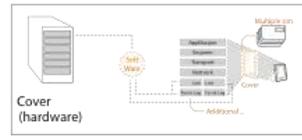
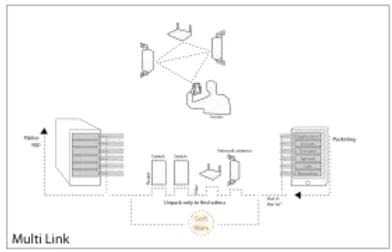
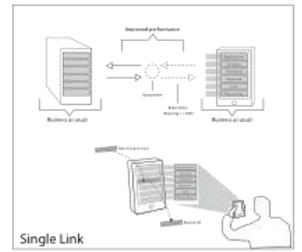
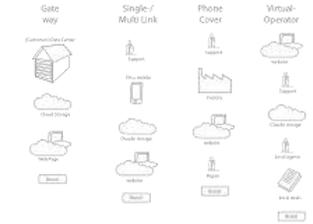
- 2000: 1st generation (GSM/GPRS) - 1st generation (GSM/GPRS) - 1st generation (GSM/GPRS)
- 2007: 2nd generation (EDGE) - 2nd generation (EDGE) - 2nd generation (EDGE)
- 2008: 2nd generation (EDGE) - 2nd generation (EDGE) - 2nd generation (EDGE)
- 2011: 3rd generation (HSPA) - 3rd generation (HSPA) - 3rd generation (HSPA)
- 2012: TCF Solution - Single Link - GW in cloud
- 2013: 4th generation (LTE) - 4th generation (LTE) - 4th generation (LTE)
- 2014: 4th generation (LTE) - 4th generation (LTE) - 4th generation (LTE)
- 2015: 4th generation (LTE) - 4th generation (LTE) - 4th generation (LTE)
- 2016: 4th generation (LTE) - 4th generation (LTE) - 4th generation (LTE)
- 2020: 5th generation (5G) - 5th generation (5G) - 5th generation (5G)



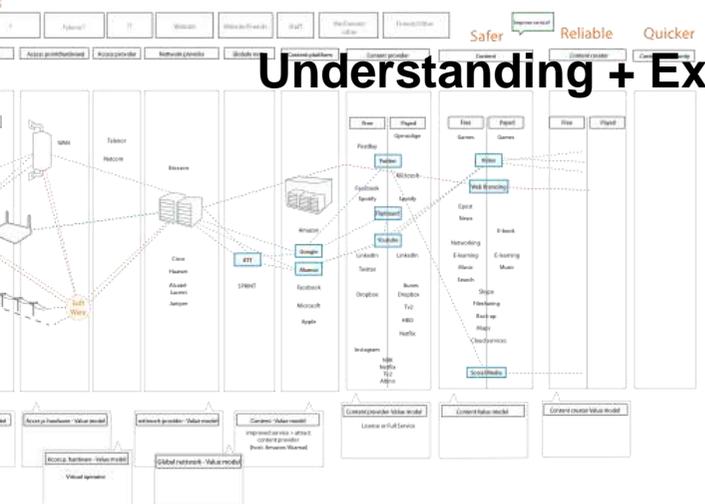
Services:



Operational needs on the different packages



Potential competitors



Understanding + Exploration + Scale + Potential = 4,3m

The world is going mobile ...

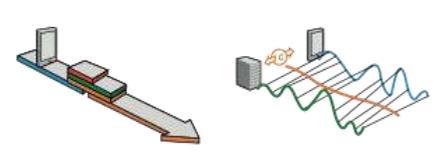
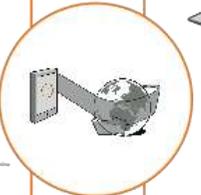
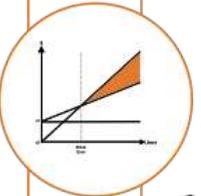


Investment needed to complete the commercial launch



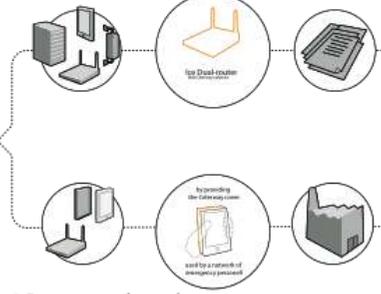
2011	2012	2013
Population (mill)		
World: 7.1	7.5	7.9
China: 1.4	1.4	1.4
USA: 3.1	3.1	3.1
India: 1.2	1.2	1.2
BRICs: 4.8	5.1	5.4
Developing: 5.2	5.5	5.8
Developed: 1.9	2.0	2.1
Latin America: 0.5	0.5	0.5
Europe: 0.7	0.7	0.7
Asia: 2.3	2.3	2.3
Africa: 1.0	1.0	1.0
Middle East: 0.3	0.3	0.3
Oceania: 0.05	0.05	0.05
Other: 0.05	0.05	0.05
United States: 314.5	314.5	314.5

2011	2012	2013
Internet Users %		
World: 23	25	27
China: 14	14	14
USA: 79	79	79
India: 10	10	10
BRICs: 18	18	18
Developing: 12	12	12
Developed: 68	68	68
Latin America: 15	15	15
Europe: 54	54	54
Asia: 12	12	12
Africa: 3	3	3
Middle East: 1	1	1
Oceania: 3	3	3
Other: 1	1	1
United States: 78.1	78.1	78.1



2: Company Collaboration

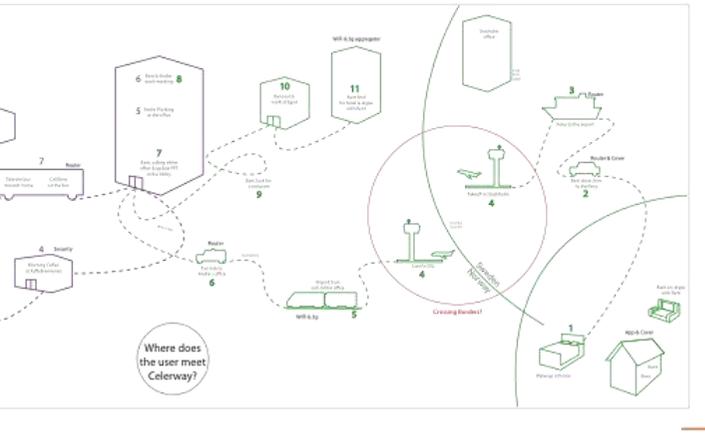
Collaborating with K2 on their new dual star by following the software. The project will gain important experience on how the business model can later be expanded.



3: Emergency channel

Collaborate with the emergency government to explore how Celerey can be used as a technological emergency channel provider.

When is the effect/value greatest in the eyes of the user?



2012
TCP Solution
Single Link
OW in cloud

2013
TCP Solution
Single Link
OW in cloud

2014

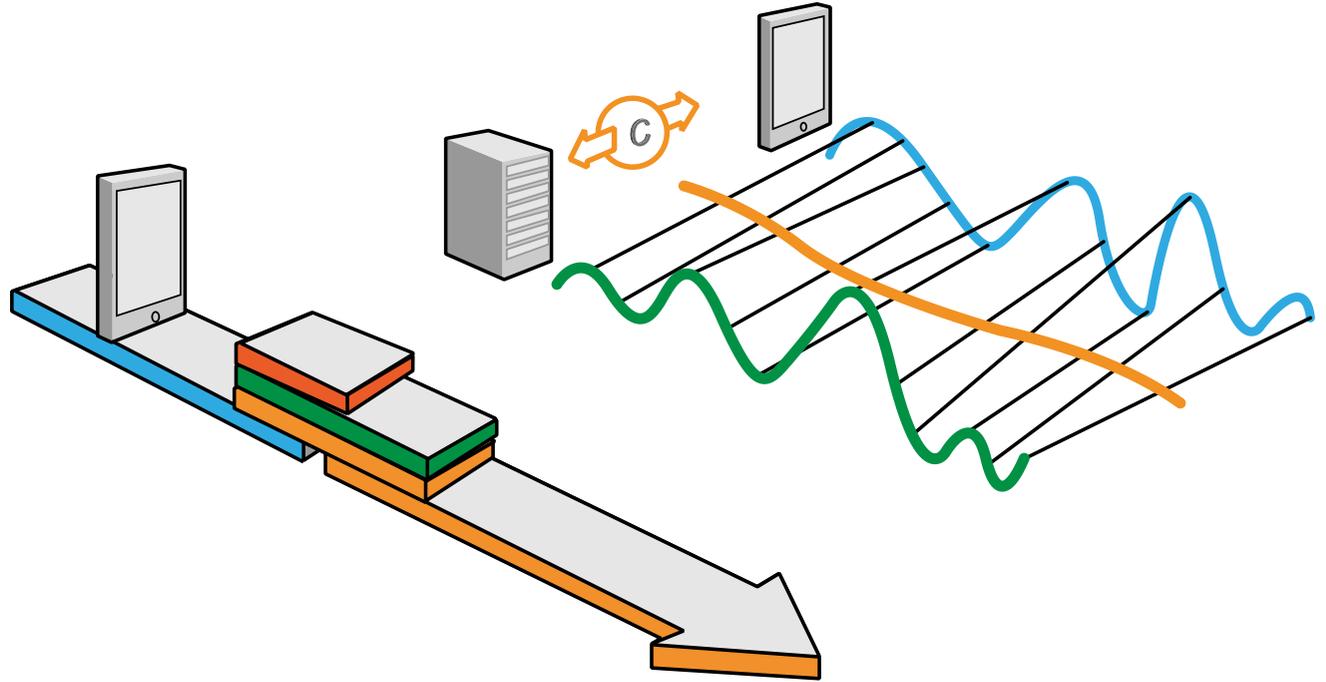
2015

2016

2020

Vision
Global actor on web
improving the mobile
web connectivity.



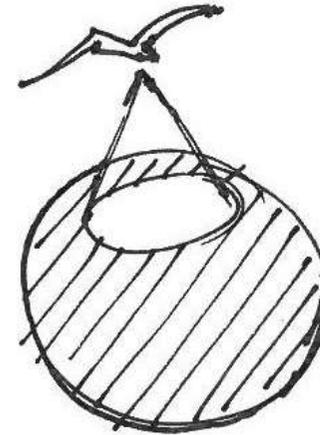


Landing:

The client perspective

Audun Fosselie Hansen, CEO Celerway

- Stepping out of the technology-silo
- The companys first year

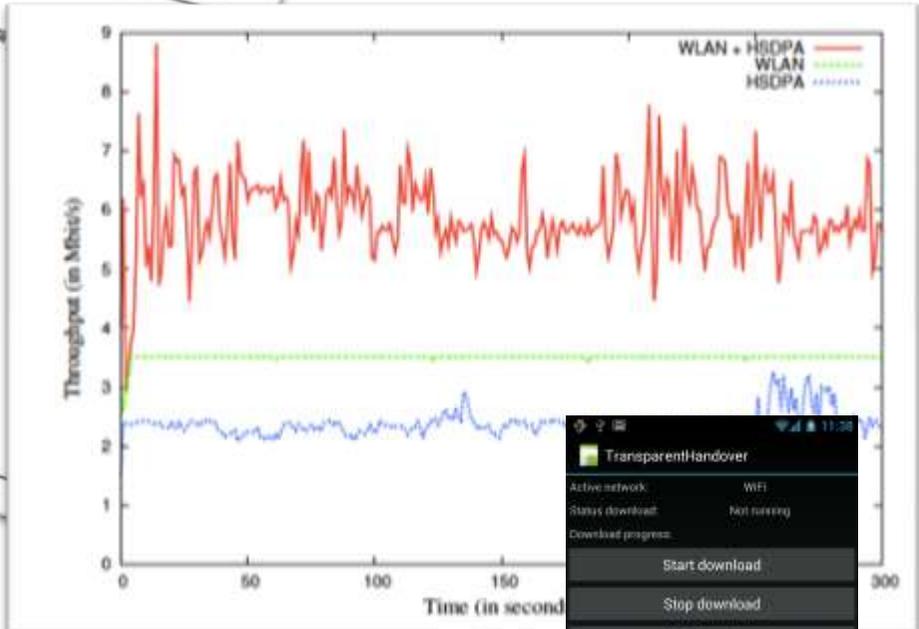


R&D description

```

Algorithm 1 Packet scheduler
1: max_capacity = MIN
2: scheduled_link = None
3: links = {set of links with an open congestion window}
4:
5: if links == Empty then
6:   drop packet
7:   return None
8: end if
for all links do
9:   if capacity_link > max_capacity then
10:    max_capacity = capacity_link
11:    scheduled_link = link
12:   or
13:   scheduled_link

```



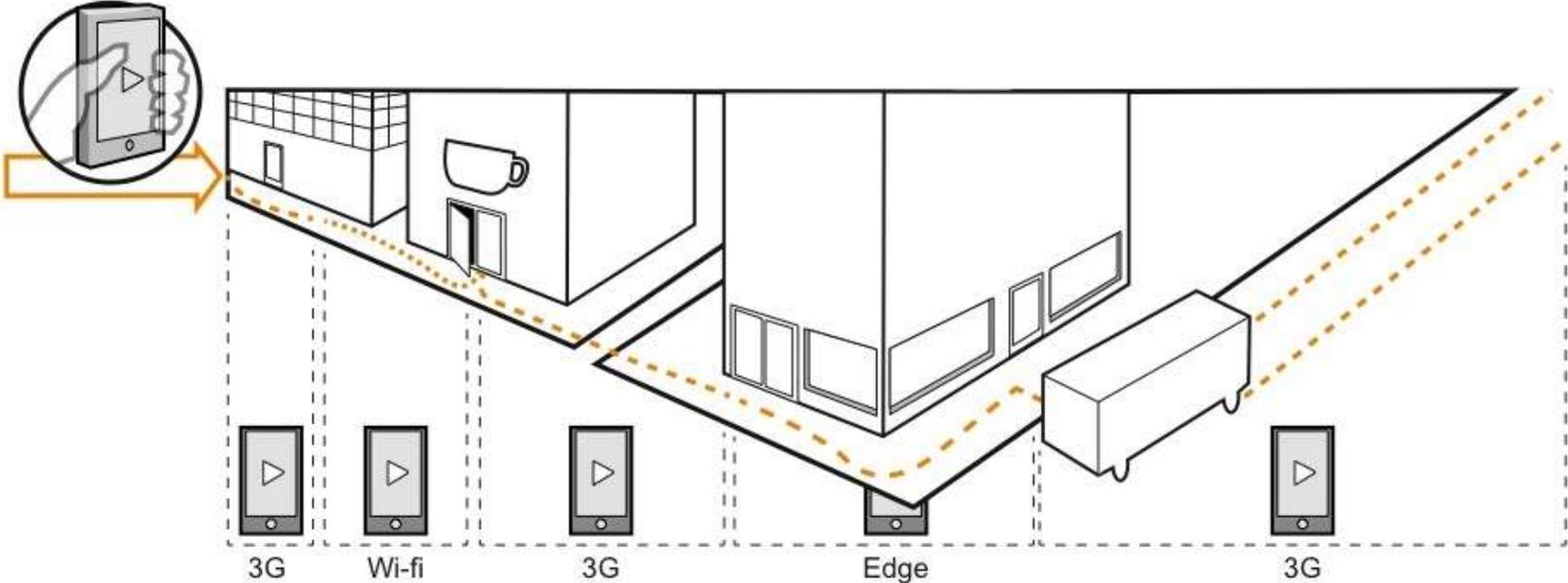
There is a global need for low cost utilization of existing infrastructure for better quality and robustness for mobile services



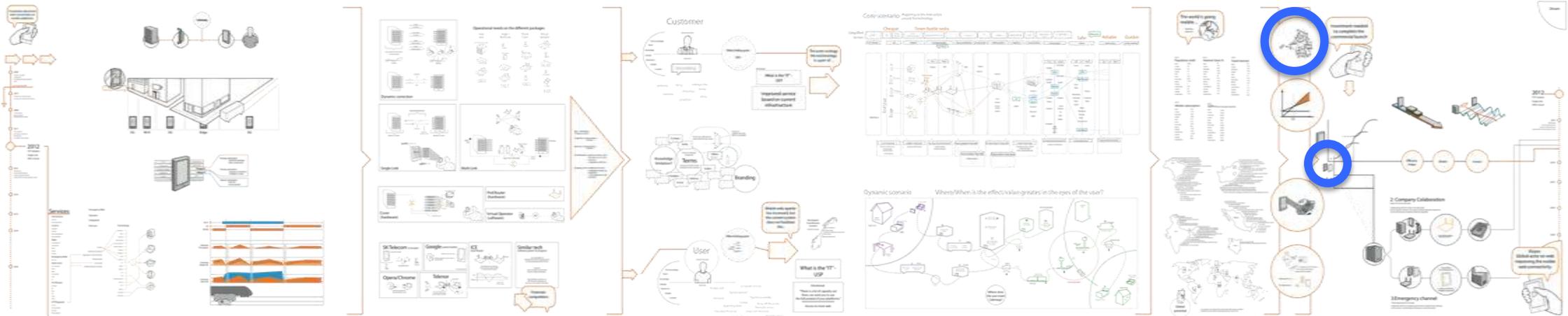
We see several viable business models and positions in the value chain



Design description



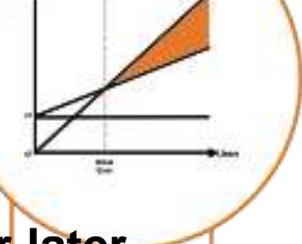
Roadmap



DPI's GDP (Purchasing power parity)

Brazil	12 600
China	9800
France	4200
India	3900
Japan	3600
UK	2700
USA	1600
Germany	3400
South Africa	1000
Sweden	4000
Spain	1200
United States	4800

One year later



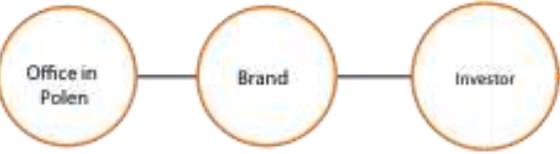
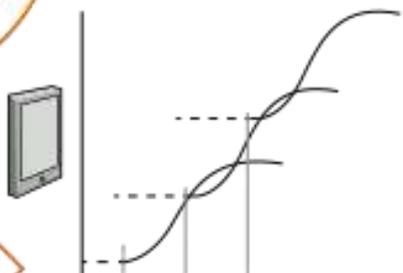
2012
TCP Solution
Single Link
GW in cloud

2013
M2M
Mobile Design/Production
Software 20% to 40% higher operations

400 million people live in sub-Saharan Africa
Difficult mobile internet access (2G based)
Average income for internet connections
40 million internet users in Africa
70% of population are mobile operators: 30% = non-users receive
over 80% use the mobile or the mobile
70% use monthly use
70 million mobile subscriptions by end of 2013
Mobile is a game changer
Fastest growing mobile market in the world
Mobile teaching platform
100,000 users registered in past year every day
100,000 registered in past year every day
Amount of cheap smartphones from Ethiopia
20% smartphone usage
20% mobile to internet (2G based) network
Significantly more smartphone to internet than 2G, subscription
to mobile network launch faster rate than 2G or 3G in countries
More users than tablet supports mobile broadband growth
Growth: number price, language understanding (no understanding of internet)

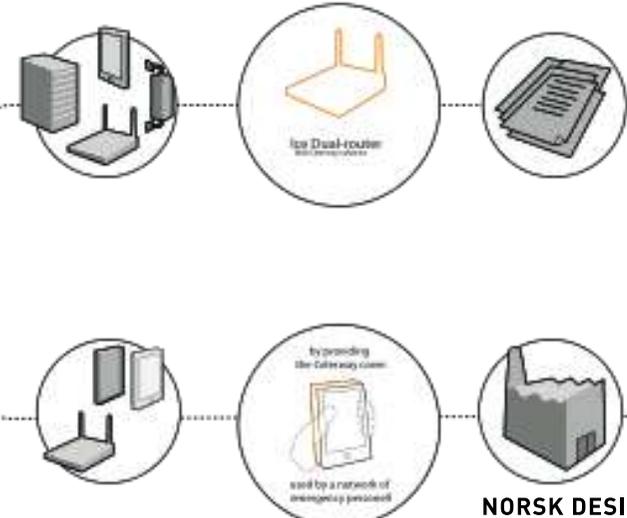
Very pessimistic
Top 100 mobile operators in the world
Corruption challenge
Africa use smartphone market potential
Ready for mobile top
Currently developing 2G with no other setting
Emerging population 20%
mobile web usage 10%
mobile web usage 10%
20% internet usage 10%
20% internet usage 10%
High smartphone usage
decent mobile internet adoption
20% internet usage 10%
20% of mobile use to internet
30% email
40% music download
40% dual screen
30% smartphone
30% online games

Kenya
40% internet usage 10%
40% internet usage 10%



2: Company Collaboration

Explore the financing model
Collaborating with ICE on their new deal roster
by licensing the software. This project will give important experience
on how this business model can later be expanded.



3: Emergency channel

Technological proof of concept
Collaborate with the Norwegian government to explore how Celentary
can be used as a technological emergency channel provider.

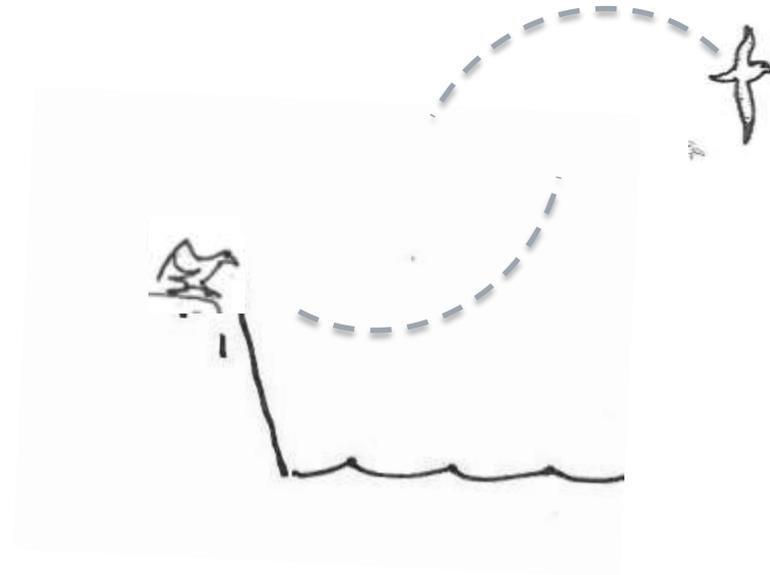
Vision
Global actor on web
improving the mobile
web connectivity.

NORSK DESIGNRÅD
NORWEGIAN DESIGN COUNCIL



Key observations

- Pain points
- Framework
- Facing complexity



The future...

“...as a designer, if you want to get to the big issues of today, the systemic issues, you got to find a way to work with governments”

Patrick Frick

Global Agenda Council on Design & Innovation

(September, 2013)



A harbinger of good fortune...

