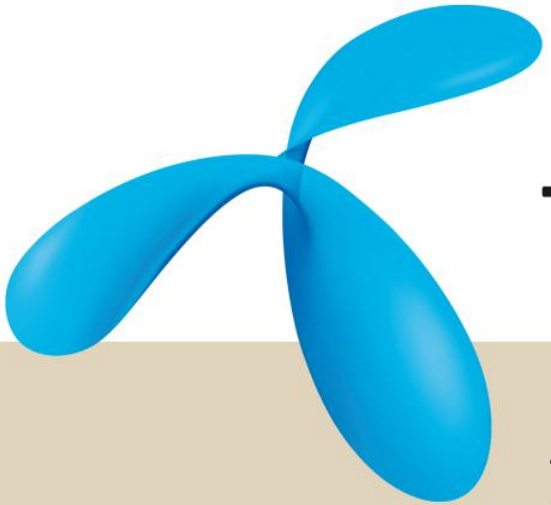

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Internettets økonomi - Nettoperatørers utfordringer og strategier med hensyn til tjenester, trafikk og forretning

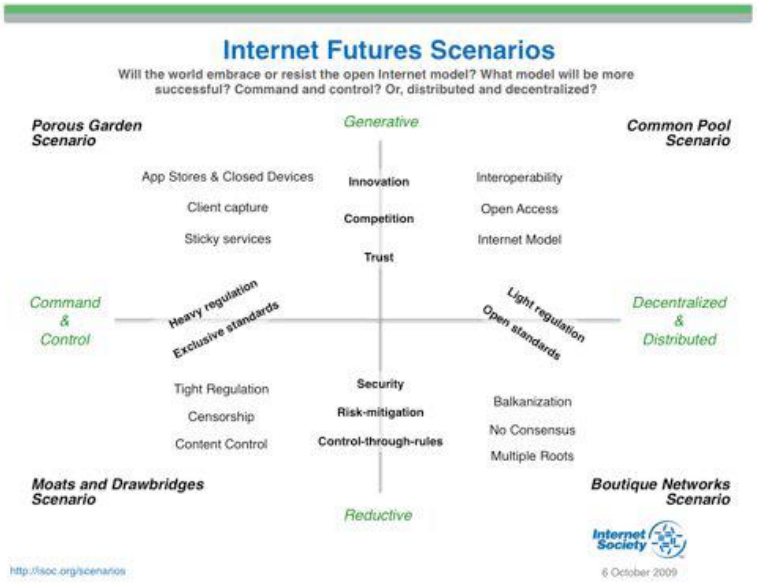
4. september 2013

Hanne-Stine Hallingby, hanne-k.hallingby@telenor.com
Research and Future studies, Telenor ASA

Påstand:
Det er i alle fall to typer Internett

Interessene til forretning og forskning møtes i spørsmålet om hva Internett er

- Nettoperatører må forholde seg til realiteter – ikke myter – når de legger sine strategier
- Forskningsfeltet og den offentlige debatten etterspør fakta om hvordan Internett virkelig fungerer



Source: (Internet Society 2009)

Measuring the Internet is hard. Really hard.
(Internet Society 2011)

"Our scientific knowledge about the Internet is weak, and the obstacles to progress are primarily issues of economics, ownership, and trust (EOT), rather than technical."
(Claffy 2009)

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Disposisjon

1. Kort om Telenor
2. Bakgrunn og problemstillinger
   Internettets økonomi
3. Prosjektet
   Det ”norske” Internettet
   Og andre Internett
4. Hvordan IT-bransjen beveger seg inn i Internett
5. Utfordringer for nettoperatører
6. Noe om Business Ecosystems

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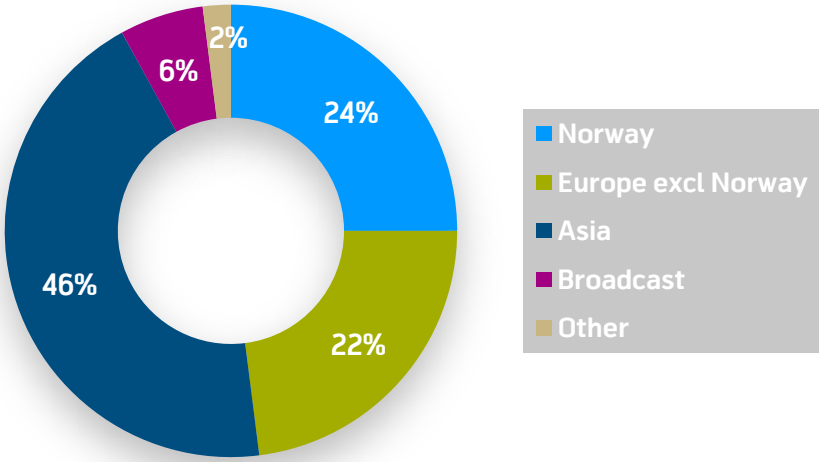
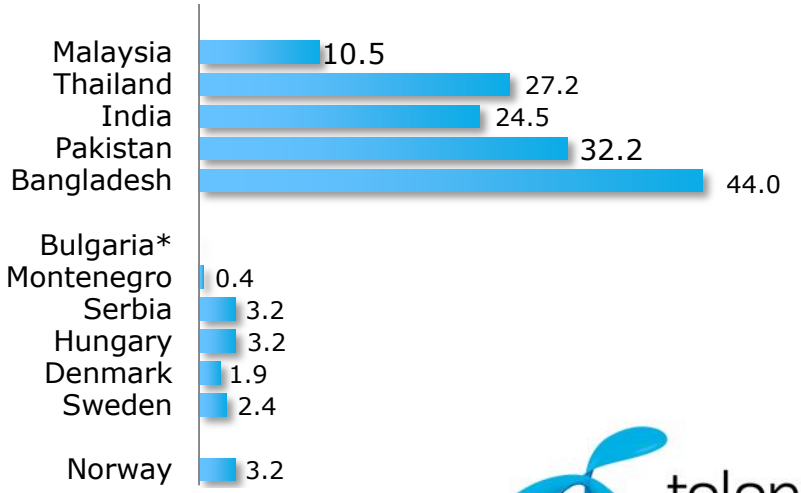
Telenor Group

- Mobile operations in 12 markets in Norway, Europe and Asia
- A voting stake of 43 per cent (economic stake 33 per cent) in VimpelCom Ltd. with 215 mill. mobile subscriptions in 17 markets
- Among the top performers on Dow Jones Sustainability Indexes
- Revenues 2012: NOK 102 bn

Revenue distribution



More than 150 million consolidated mobile subscriptions, Q2 2013



*to be consolidated Q3 2013

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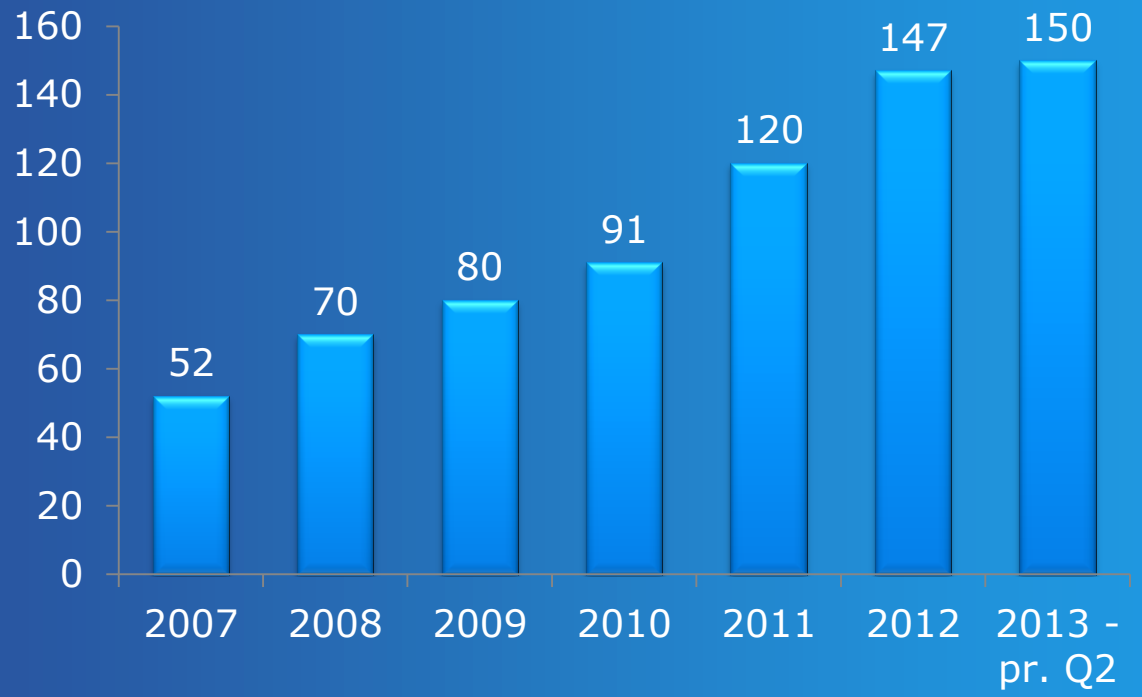
Subscription growth – consolidated companies

No. of mobile subscriptions world wide, in millions



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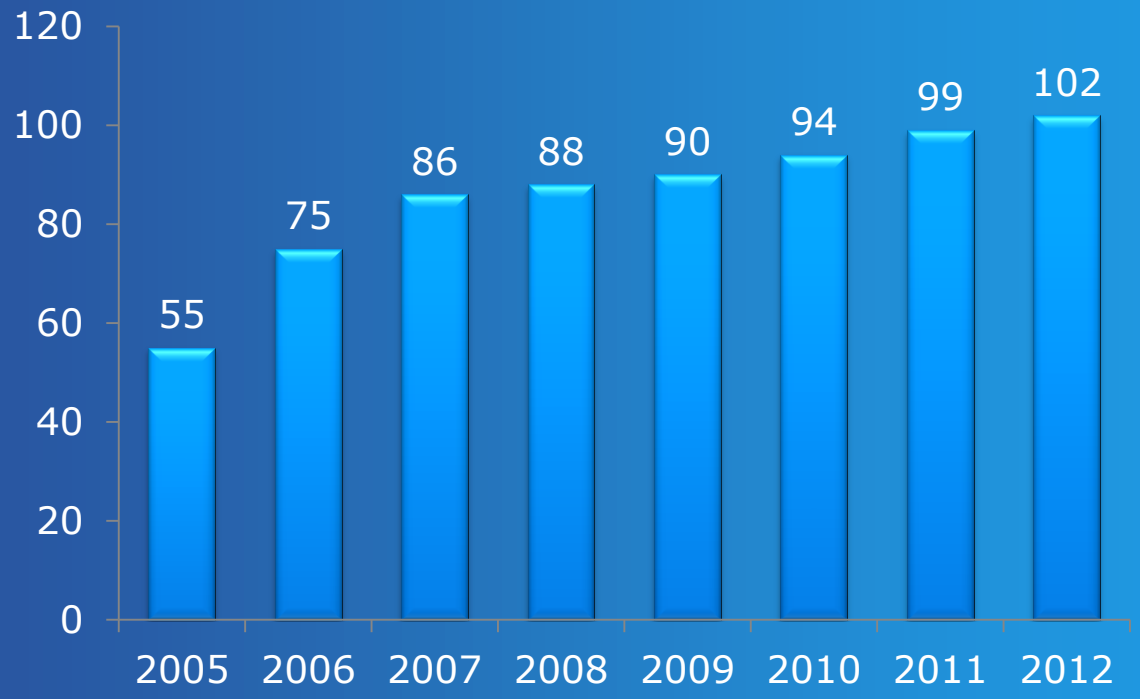
Strong revenue growth



Learning the basics in Norway

Beliefs in the early 1990's:

- **Growth outside Norway**
- **Growth in mobile**

Televerket

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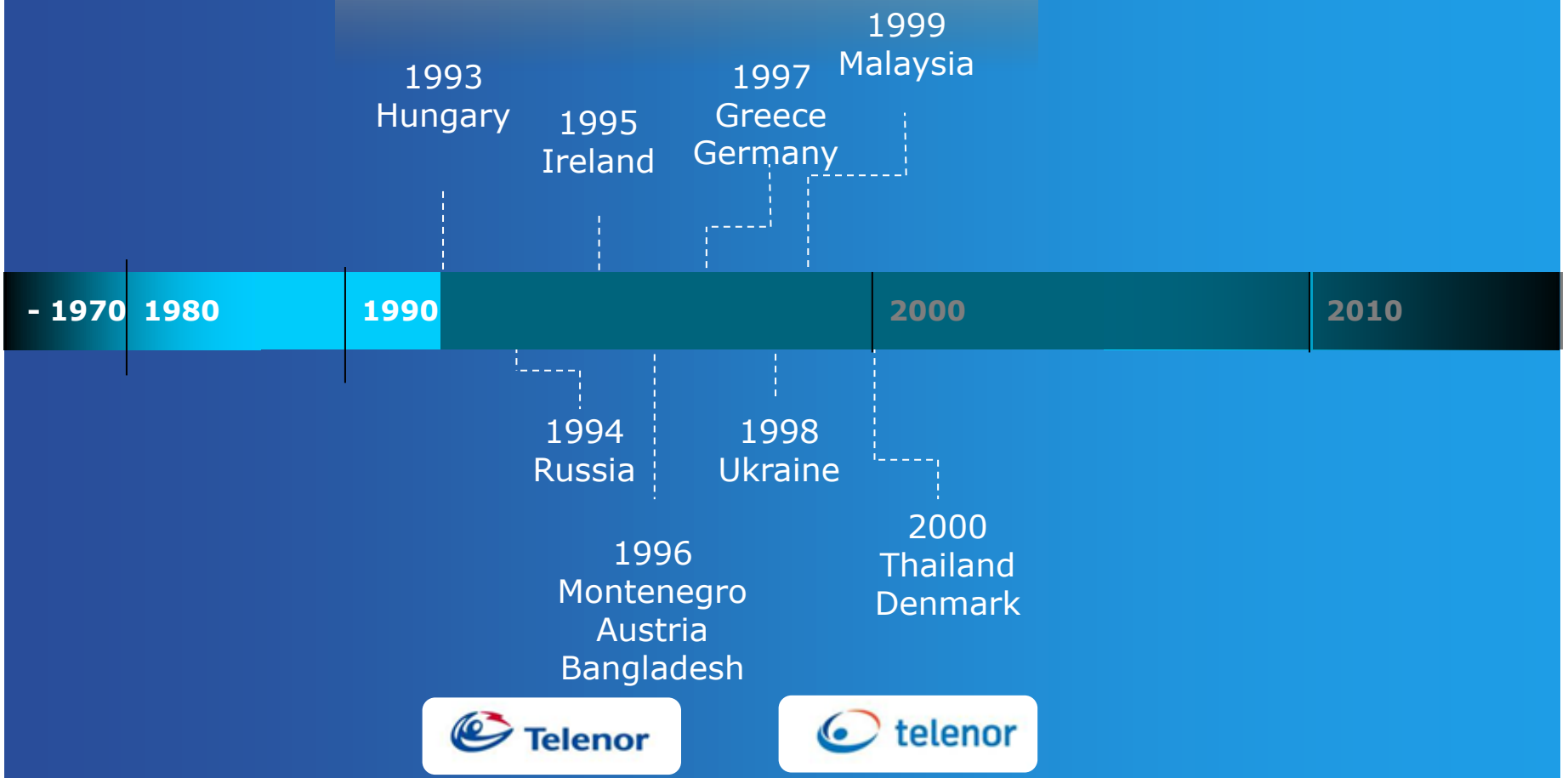
Early international expansion

Taking positions in Europe and Asia



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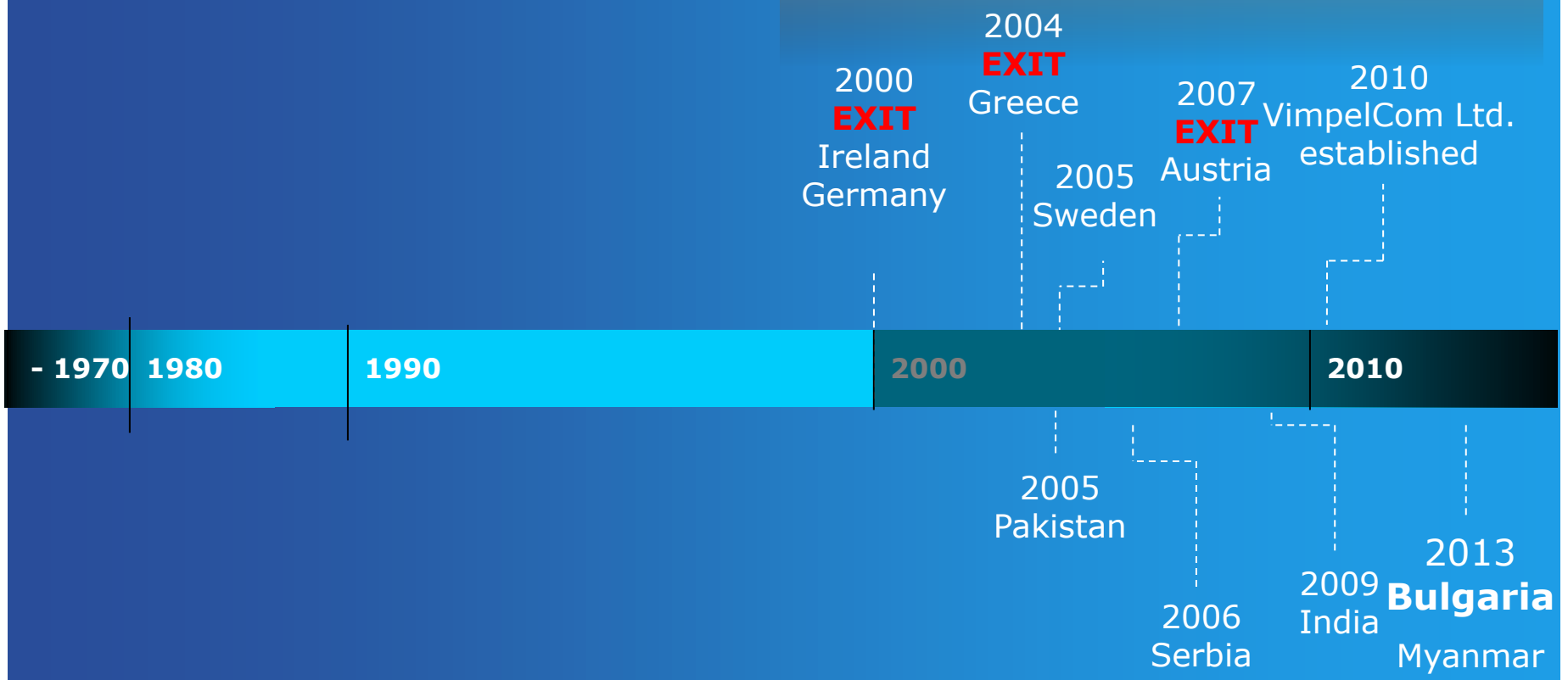
From minority to majority positions



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Preferred by customers

- Customer orientation drives growth and profitability
- Increasing competition for existing customers
- Need to stay relevant to the end consumer
- Monetize on mobile data
- Take positions in new services

Cost efficient operator

- Profitability in telecoms under pressure
- Low costs vital to stay competitive
- New operating models appearing in the industry
- Continuous improvement
- New operating models

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Key innovation areas

Mobile broadband

Access to the Internet will contribute significantly to productivity, FDI, GDP growth, job creation and government revenues

Over the top services

Spanning from enabling new applications to close cooperation on innovations with partners

Mobile financial services

Serving the unbanked - low and variable cost structure through telecom distribution – and in advanced markets

Internet of things

A potentially significant market. We become a vital part of our customers' own product offering

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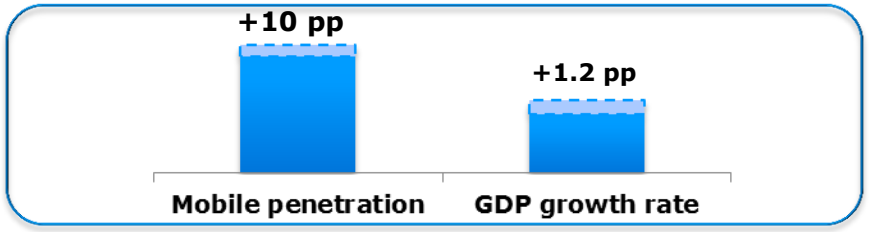
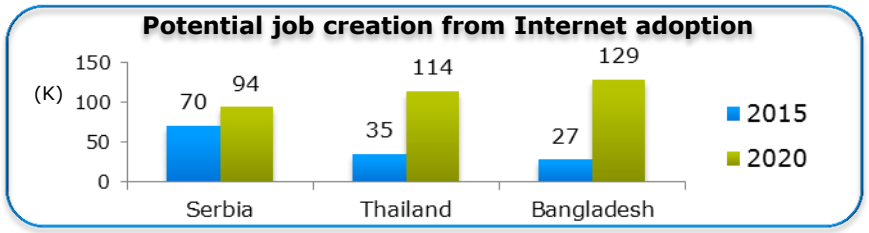
The communications opportunity

Access to Communications



Mobile access

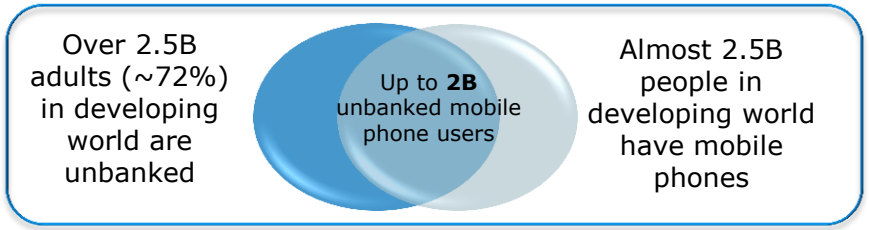
- Increased mobile penetration can contribute to faster economic growth
- Mobile phones can improve access to social services – e.g. health and education



Internet

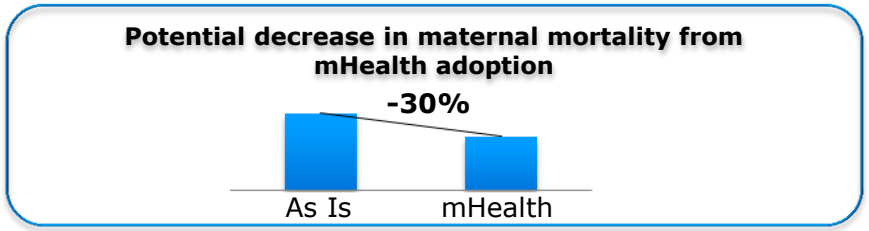
- A 10 pt increase in Internet penetration can create:
  - 3-10% productivity increase
  - 1% increase in new business creation

Enabling services



Financial Services

- Two billion unbanked mobile users could be served by mobile financial services (MFS)
- MFS can help families overcome income uncertainty and financial shocks



Mobile health services

- Can reduce maternal mortality by up to 30%
- Doctors can treat twice as many rural patients per doctor
- Data collection costs can be reduced by 25%

* Source: Telenor/Deloitte/Boston Consulting Group

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Bakgrunn og problemstillinger
Internettets økonomi

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Prosjekt 2010-2012: Internet Economy, Value Networks and traffic measurement

Overordnede prosjektmål:

1. To explore
   - How values, power and innovation are really created and distributed within the Internet economy
   - How this may affect various stakeholders like network operators, service providers and enterprises being dependent on Internet
   - The future of the Internet

2. To develop an Internet Economy Research Community

LSE Enterprise

UNIVERSITY OF OSLO

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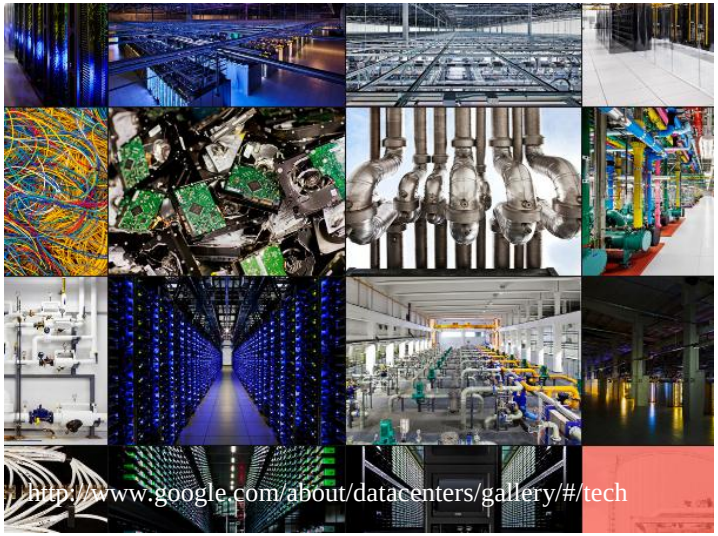
Hvorfor studere Internet økonomien?

Internett er en nøkkel drivkraft i økonomien:

- McKinsey (2011) «*finds that the Internet has delivered substantial economic growth and created jobs on a large scale.*"
- FI3P (2012) has found: *"The Internet's contributions to the European economy are substantial, profound and pervasive."*



Men vi vet lite om Internett:

- …"*There is remarkably little reliable information about the size and shape of the Internet infrastructure or its daily operation" (ENISA report, Hall&Clayton 2011)*
- ….*There are methodological challenges to actually measure value creation in the Information/Internet economy. (OECD 2011: Guide to Measuring the Information Society)*

Og det skjer ting som fører til større behov:

Satsious and Tassiulas (2011: 7) viser til de drivkreftene som former Internett : *"Given the increasing number, power and disparity of these players, the complexity and the plasticity of their roles, duplication, gaps and contention come as no surprise. The results, however, can be surprising:* ***well-intentioned actions that produce perverse consequences****, disproportionate influence and discontinuous change, and emergent behaviour…".*

Faratin et al (2007) redegjør for hvordan innholdsleverandører er direkte knyttet til brukere og hvordan dette endrer trafikkstrøm, forretningsrelasjoner og markedsmakt for peering og transit. Data om dette er en utfordring. De sier også: *"With the growth of Internet the diversity of ASes has expanded and* ***the presumption of symmetry has eroded****.".*

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Timeglass modellen forteller mye om Internet økonomien – og telekoms dilemma

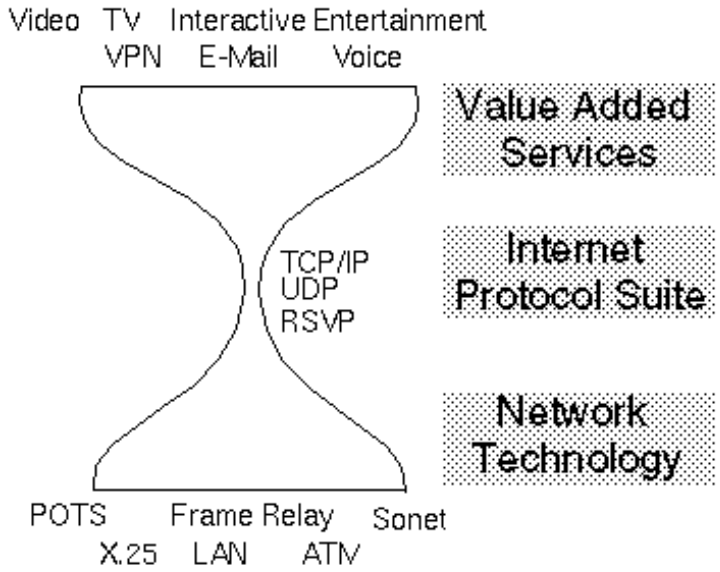
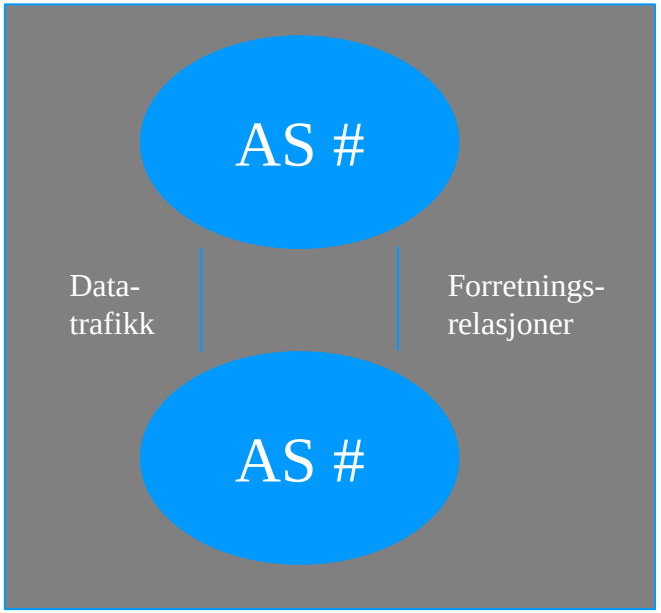


Figure 1: Hourglass-model of the Internet



ASN=Autonomous System Number

"*a basic architecture point: the structure of the industry is induced by the network architecture, in particular by the points at which open interfaces are specified.*", Clark et al (2004: 2)

Source for picture: http://www.isoc.org/inet98/proceedings/3e/3e_2.htm

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Autonomous system number
Kontroll innenfor – ikke kontroll utenfor

An AS number is a unique **identifier** of a collection of connected Internet Protocol - **IP-routing prefixes** under the **control** of one or more network **operators** that presents a common, clearly defined **routing policy** to the Internet (Hawkinson, 1996)

Source Hawkinson, J. and T. Bates (1996) Guidelines for creation, selection, and registration of an Autonomous System (AS) -Available URL: http://tools.ietf.org/html/rfc1930

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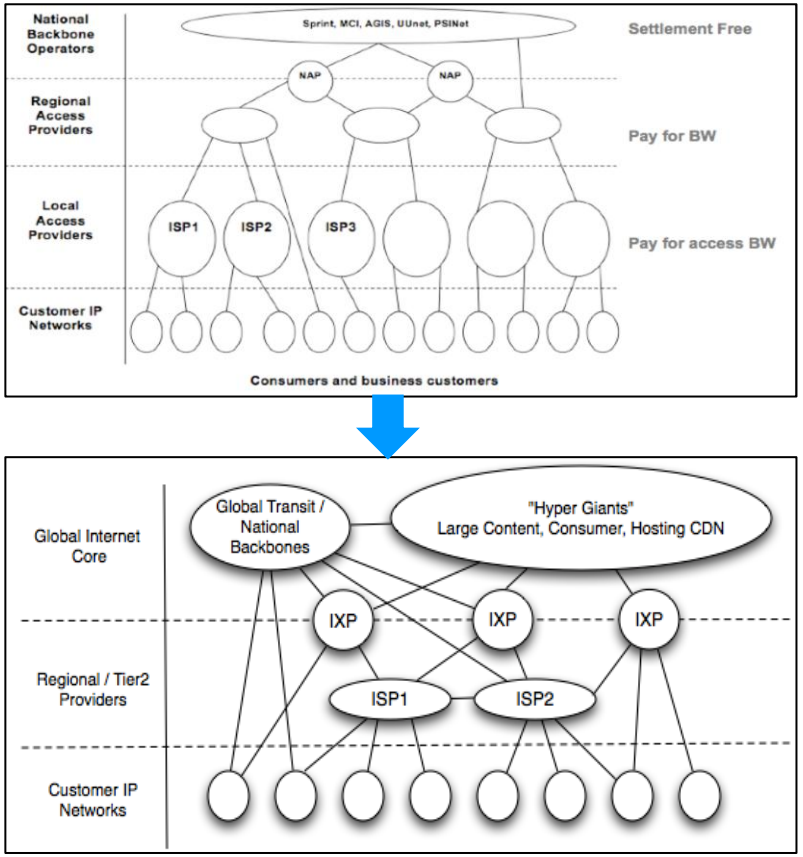
Vi må forstå at Internett er et nettverk av logiske nettverk – og at det endrer seg

- Mer enn 40.000 Autonomous System Number (ASN) nettverk
- 215 millioner web domener
- 2,1 milliarder brukere
- Trafikken kommer hovedsaklig fra "off-net" siden brukere og tjenester er lokalisert i ulike nettverk
- Inter-connectivity business endres
  - IP transit
  - Settlement-free peering
  - Paid peering
  - Content Delivery Networks
  - Managed Cloud connectivity
  - ++



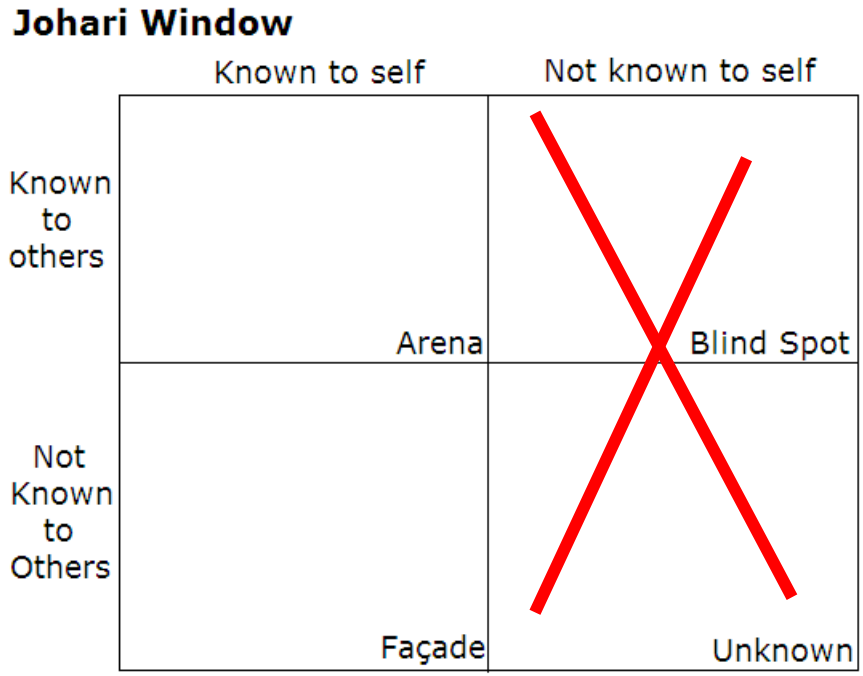
Traditional and merging new Internet logical topology (Sourced from Labovitz, 2010)

CDN = Content Delivery Networks **ASN=Autonomous System Number**

Tier 1s by November 22, 2011:
Level 3 Communication/Global Crossing, Verizon, Centurylink, ATT, Sprint
TeliaSonera International Carrier, Telecom Italia (Seabone), Deutsche Telecom
NTT Commmunications, Tata Communications.

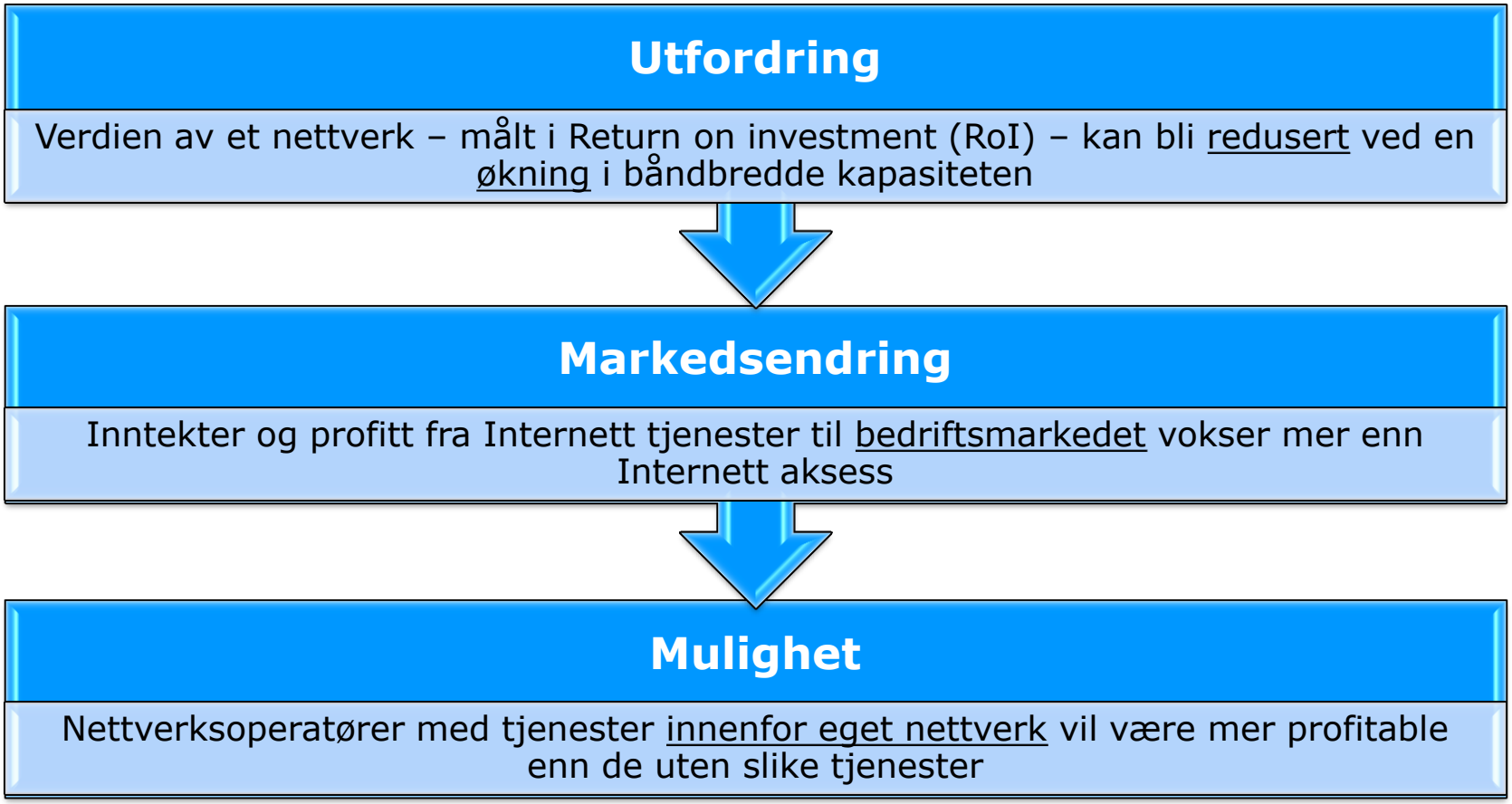
Utfordring for telekom bransjen

- Ukontrollerte kostnadsdrivere
- Ubrukte differensieringsmuligheter
- Skjulte kapabiliteter og konkurransefortrinn



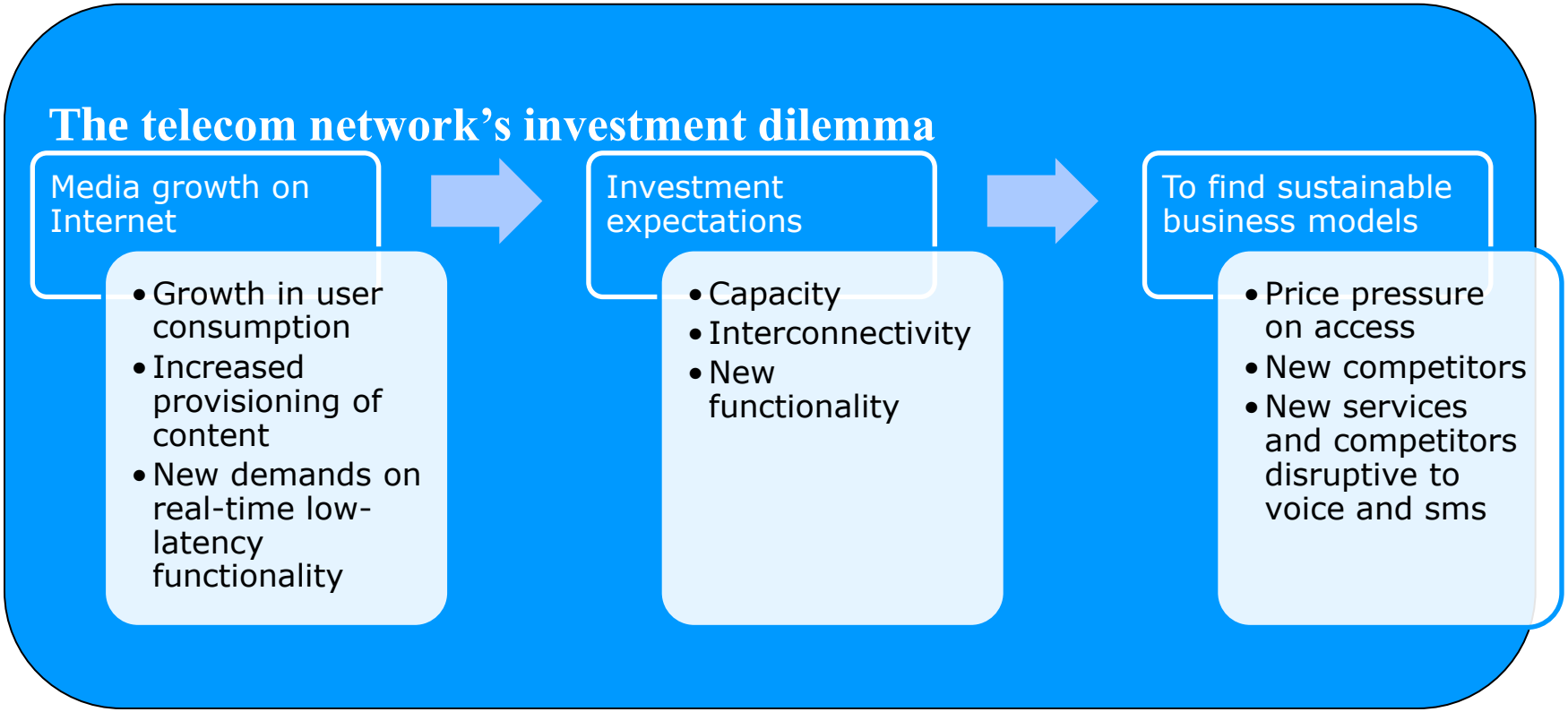
telenor

Hypoteser om Internett økonomien fra en nettoperatørs perspektiv



telenor

Telekom nettverk strever med Internett vekst, investeringskrav nye tjenester og forretningsmodeller



Investeringer skjer i telekommunikasjons sektoren – innovasjon, nye inntekter og vekst kommer i IKT sektorer, Fransman 2010

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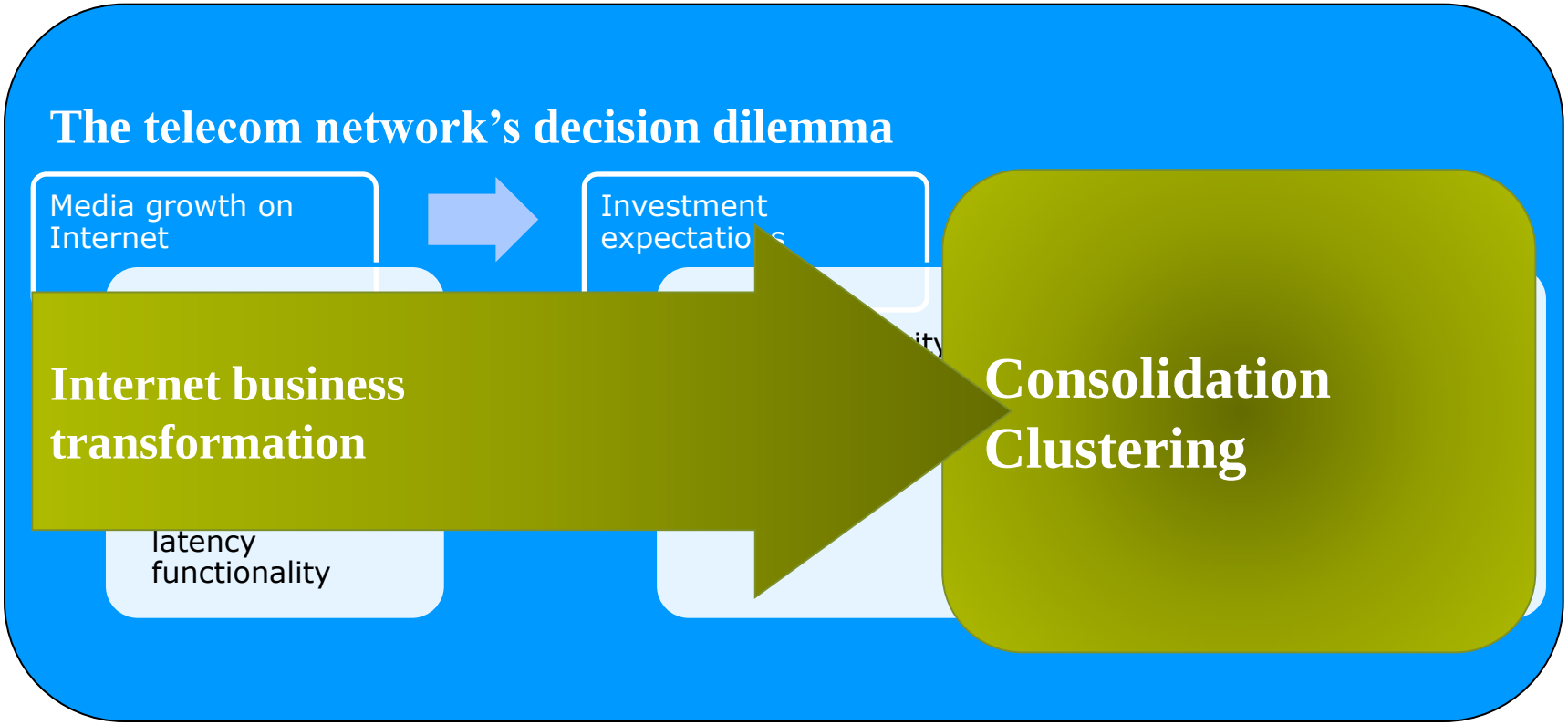
Mens bredbånds nettverk strever går Internett gjennom en transformasjon



Transformasjonen innebærer både ny konkurranse og nye muligheter

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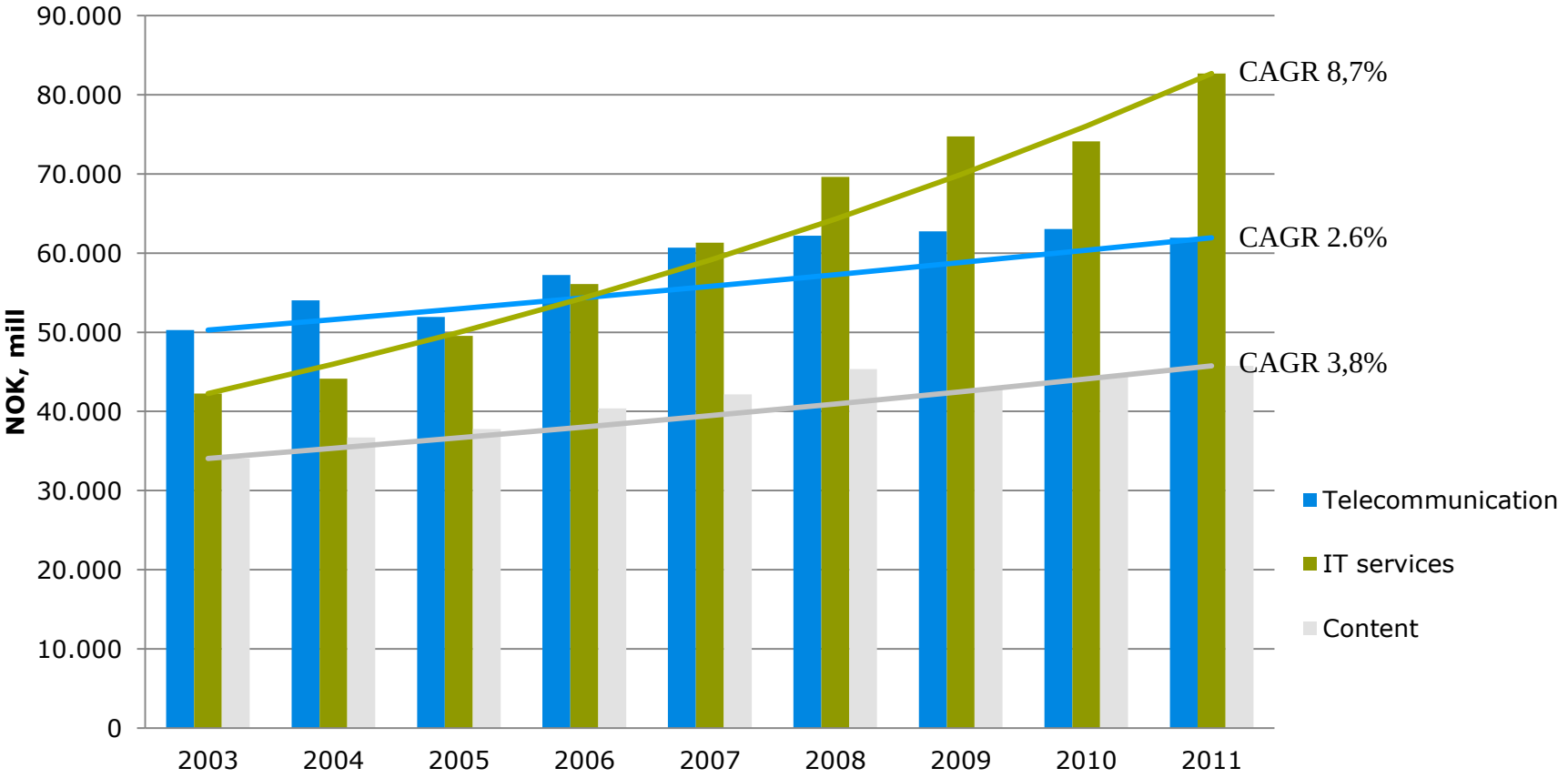
Norsk IKT tjeneste industri
Størrelse og vekst 2003-2011



Source: SSB. Gross revenues for all companies registered within the NACE codes used.
http://statbank.ssb.no/statistikkbanken/Default_FR.asp?PXSid=0&nvl=true&PLanguage=0&tilside=selecttable/hovedtabellHjem.asp&KortnavnWeb=sroi

Telecommunication: NACE code 61 Telekommunikasjon (Kabelbasert, Trådløs og Satelittbasert telekommunikasjon, Telekommunikasjonellers)
IT services: NACE codes: 62 Tjenester tilknyttet informasjonsteknologi 63.1 Databehandling, datalagring og tilknyttede tjenester, drift av web-portaler 63.9 Andre informasjonstjenester 58.2 Utgivelse av programvare
Content: Nace codes: 58 Forlagsvirksomhet 59 Film-, video- og fjernsynsprogramproduksjon, utgivelse av musikk- og lydopptak 60 Radio- og fjernsynskringkasting
Devices not included.
The telecommunication numbers are larger than the e-com statistics reported by Norwegian Post&Tele authorities due to gross registration of all companies and revenues. The e-com statistics are based on reported revenues on specified services from e-com registered enterprises.

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Aktører prøver å definere kjernen i debatt, og vinne den

Users

Battle

Fairness

Definition

Sources: http://www.dagensit.no/article2530335.ece, http://www.dagensit.no/article2529667.ece, http://arstechnica.com/tech-policy/2011/01/huge-isps-want-per-gb-payments-from-netflix-youtube/m, http://arstechnica.com/information-technology/2013/07/why-youtube-buffers-the-secret-deals-that-make-and-break-online-video/

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EU er bekymret for IT bransjens vekst – i Europa

- Det ser ut til å gå bra i Norge
- Det som går best av IKT i Europa er telekom bransjen
  - Men IT går også relativt bra
- Telekom investerer forsatt mye (men R&D ned)
- EU satser mye på å gi gass i IT bransjen gjennom Future Internet Private-Public Partnership
- Globalt er de såkalte Internet aktører vekstvinnere

The Internet's contributions to the European economy are **substantial**, **profound** and **pervasive**

Europe is strongest in the more mature segments of the Internet industry, but **lags behind in those segments which enjoy the highest growth rates**

Providers of telecom services continue to dominate the EU Internet industry, but grow **more slowly** and are **less globalised** than their US and Japan-based competitors

Future Internet Public-Private Partnership, 2012

Se også OECD Internet Economy Outlook 2012

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Forskningsprosjekt

Internet Economy, Value Networks and traffic measurement

- Internett i Norge
- IT bransjen og Internett i Norge

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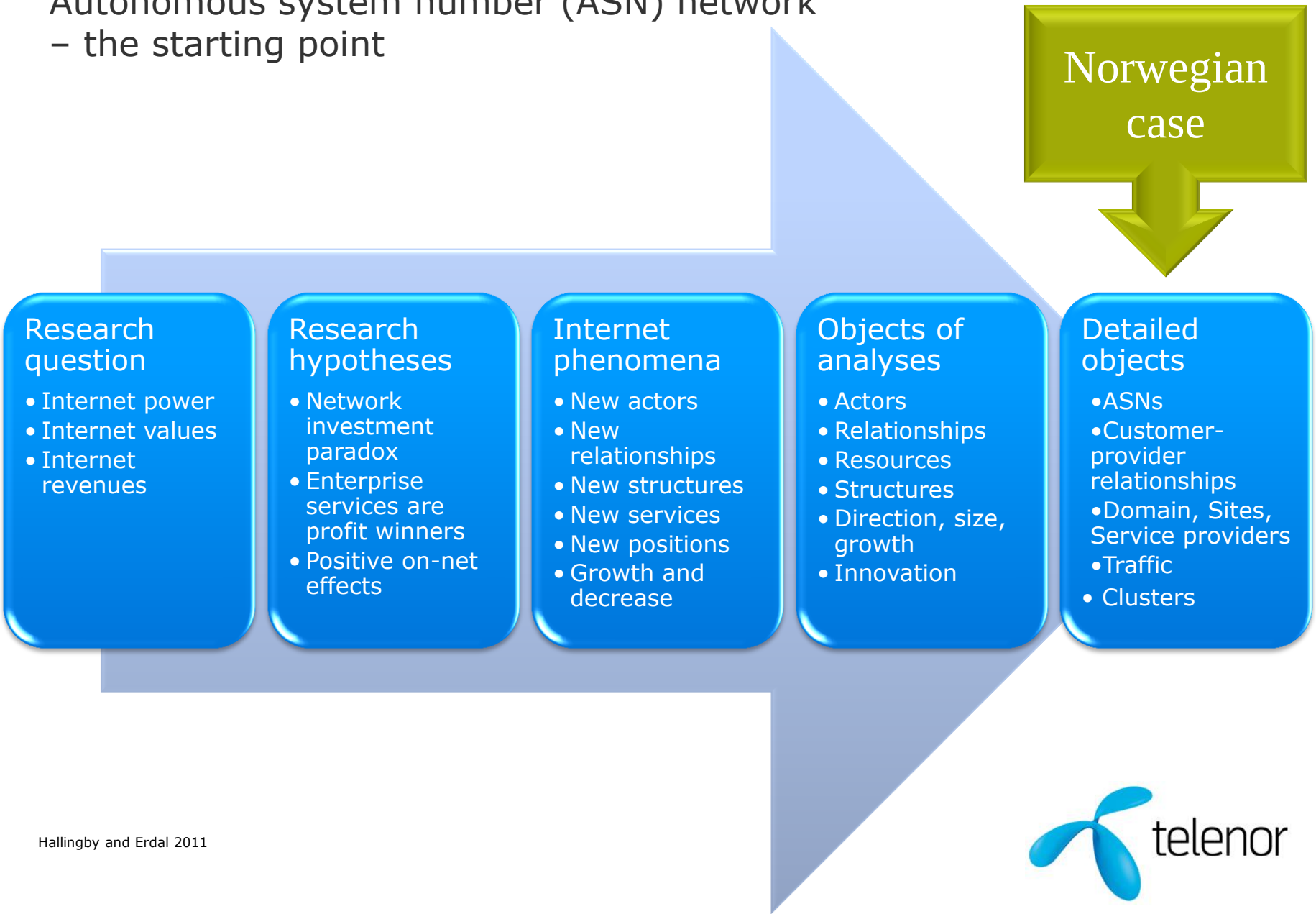
Research design
Autonomous system number (ASN) network – the starting point



Hallingby and Erdal 2011

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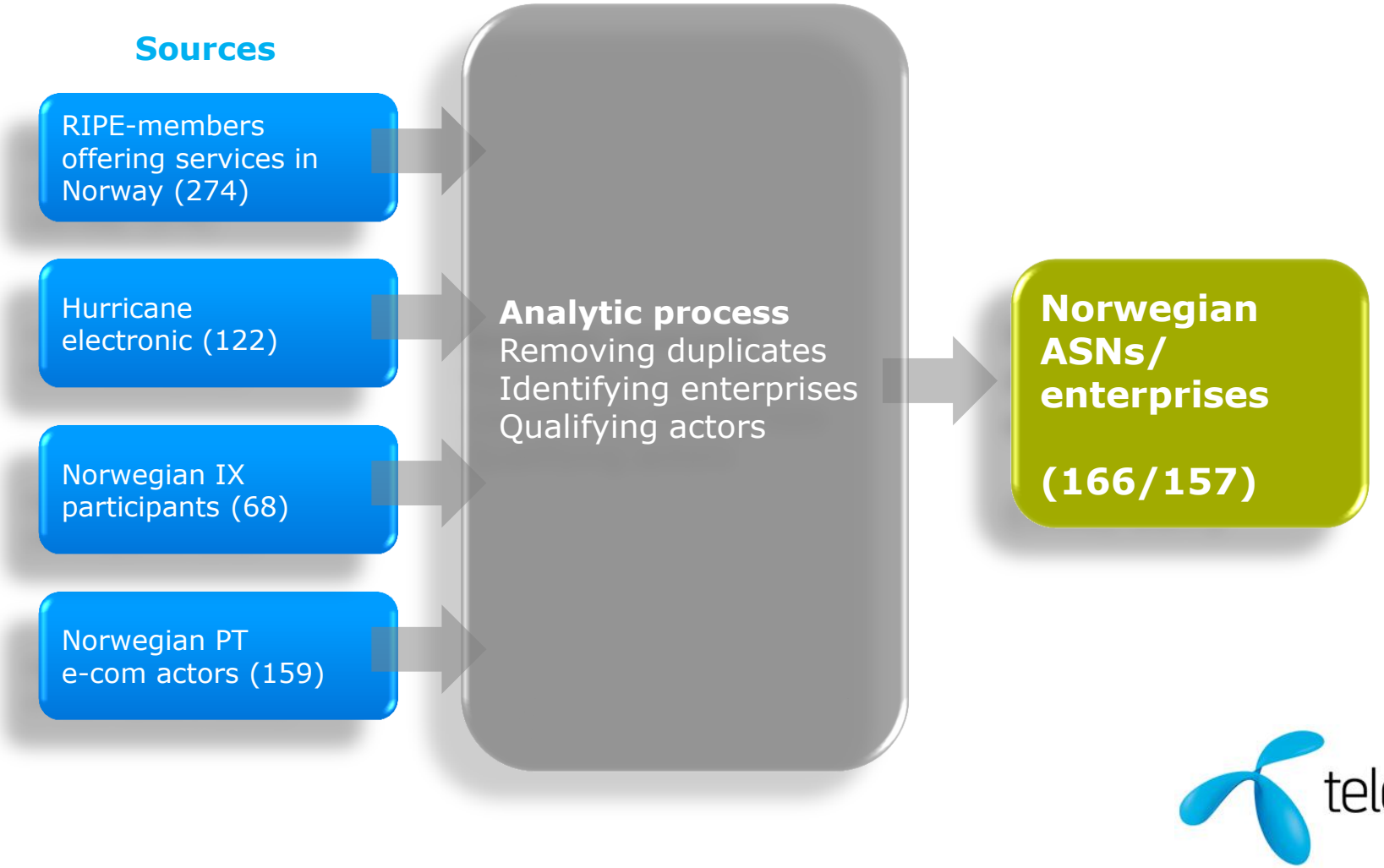
There is a “Norwegian” Internet
Case study – 166 Norwegian ASNs



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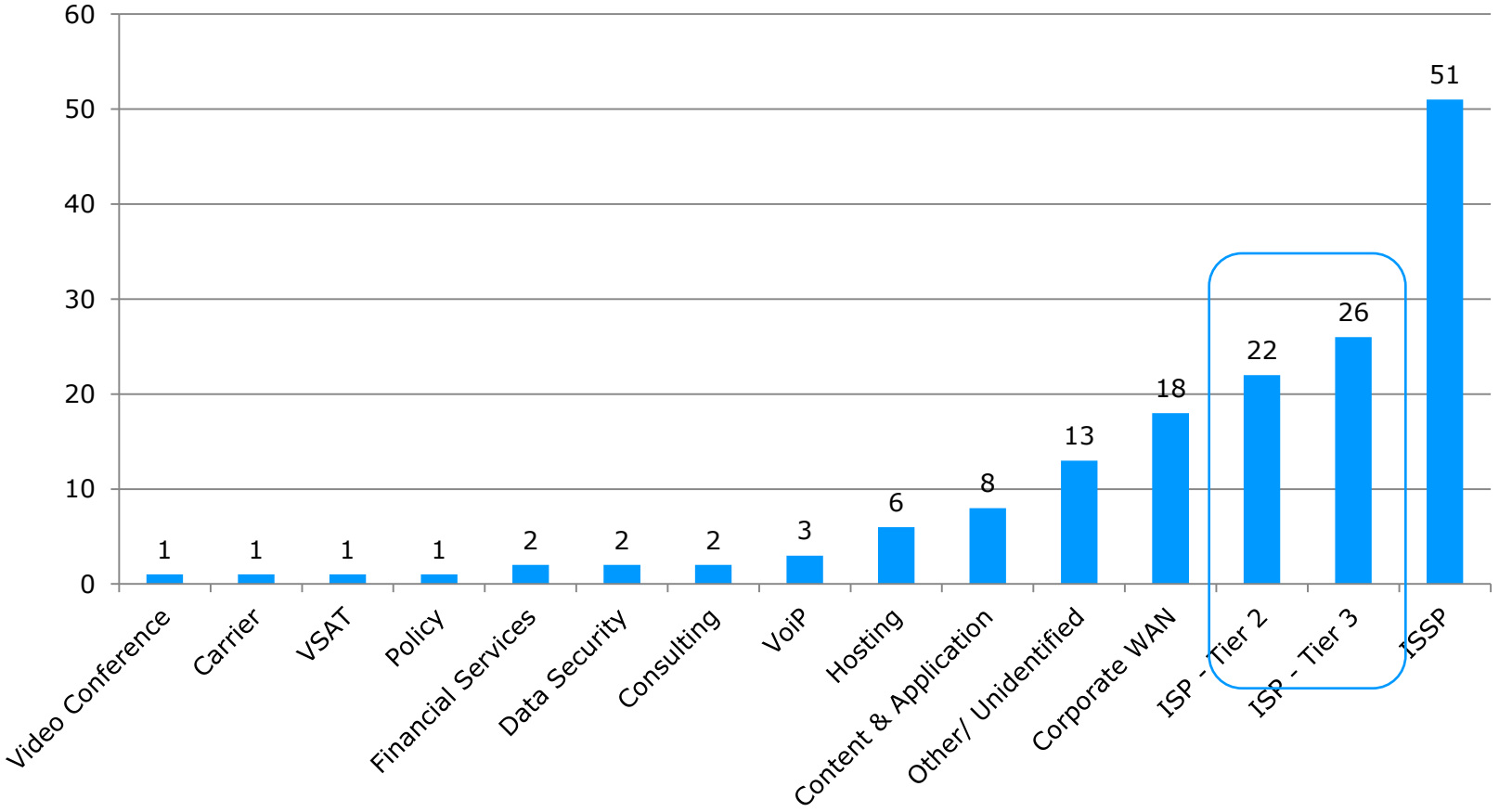
Internet Service (access) providers – only 1/3
Non-traditional Internet actors – 2/3



ISSP – Internet service solution providers (IT-services over the Internet)

ISP – Internet service (access) provider

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Components in the Internet economy

Relationships	•Peers, Ownership and Alliances •Tier 3s
Internet access customers	• 1,6 million subscriptions • Revenues fixed broadband NOK 7B, 2010
Domains	• 779.000 Norwegian domains • 530 000 .no 249 000 .com/net/org/biz
Top Norwegian websites	• Alexa top 200 Norwegian websites; 103 Norwegian
The IT industry on Internet	• IT enterprises: how 129 connects to Internet

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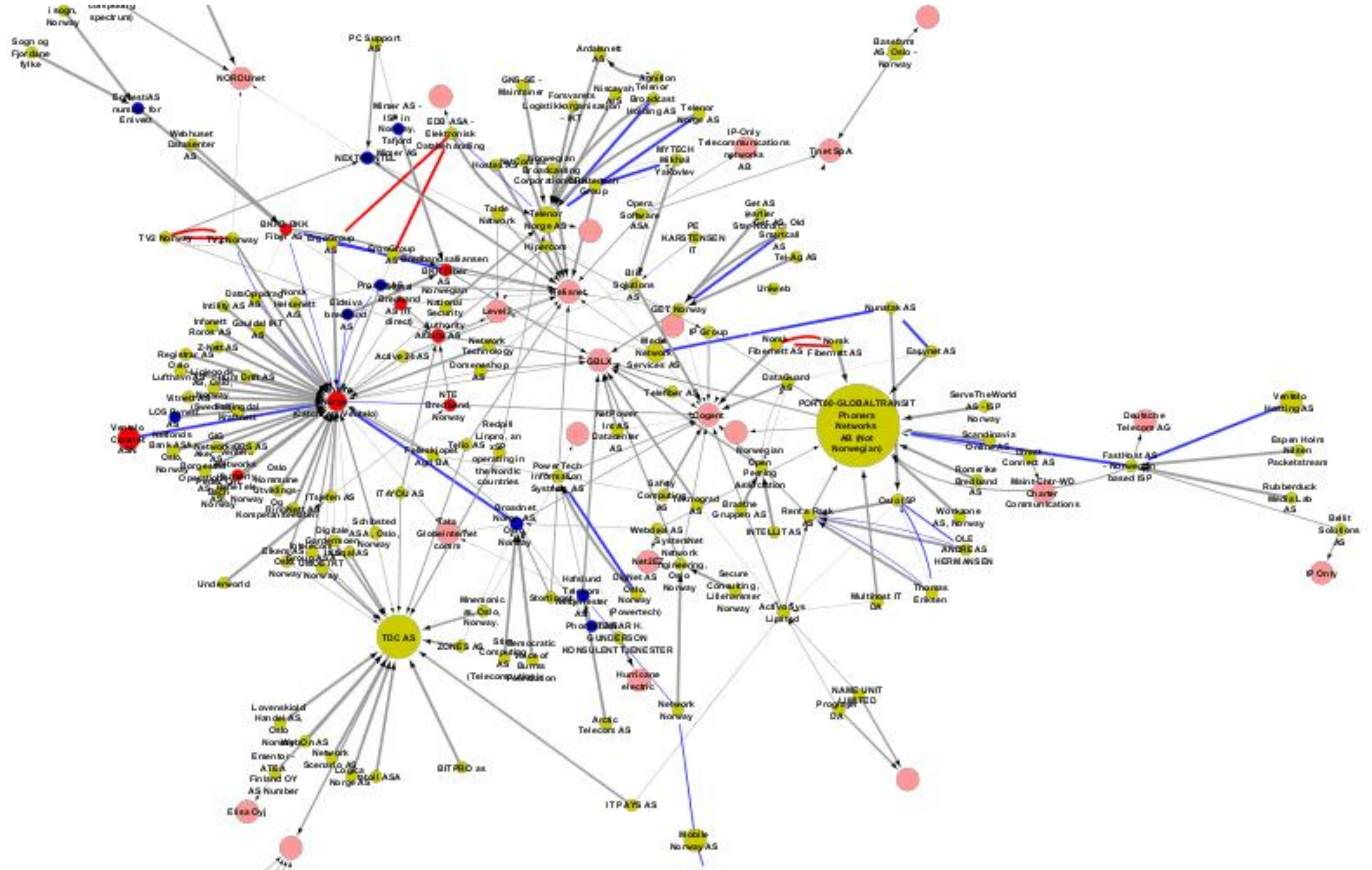
ASNs and relationships

Tier 3 ASN-clusters around transit providers



ASNs and relationships

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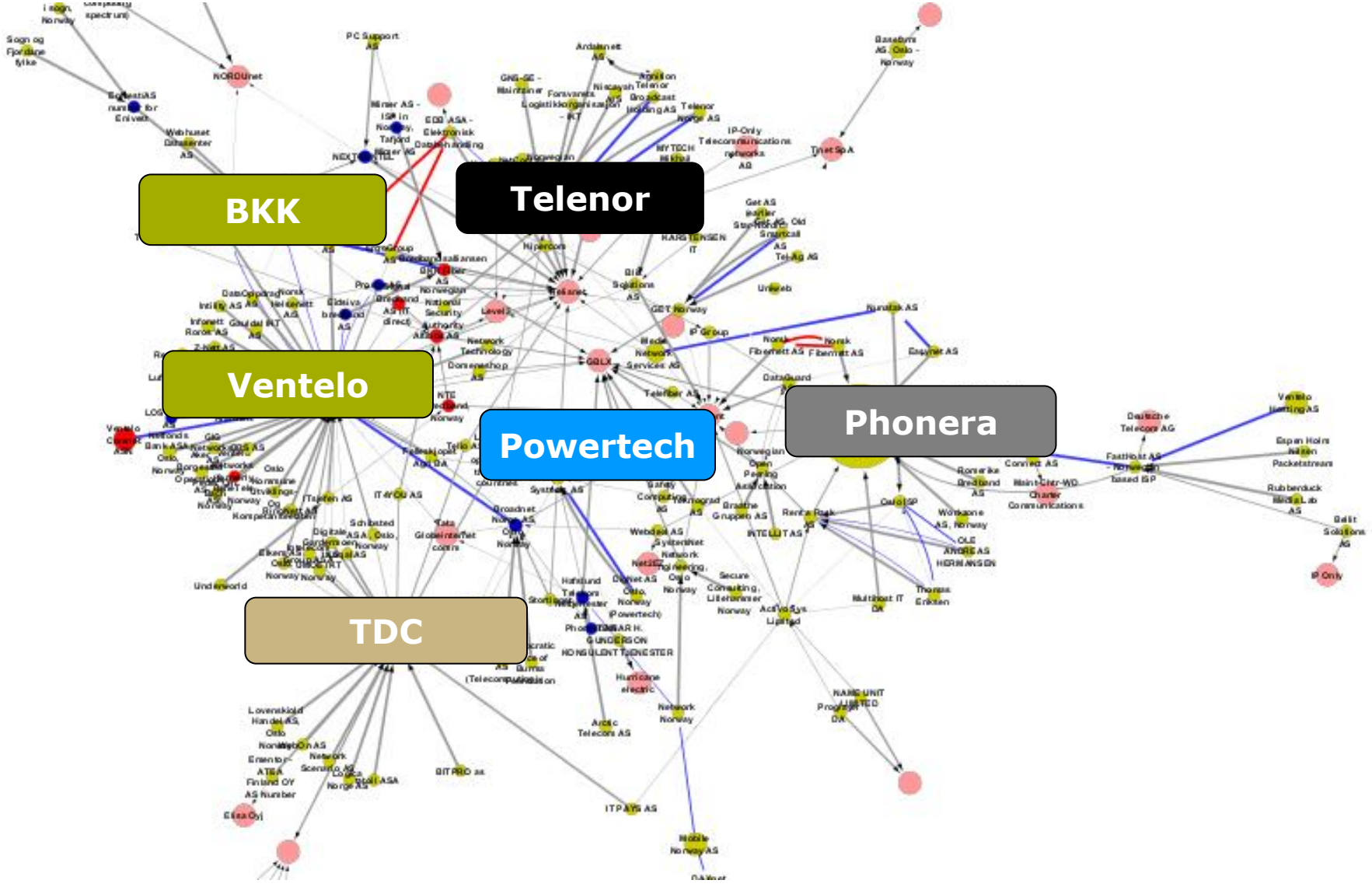
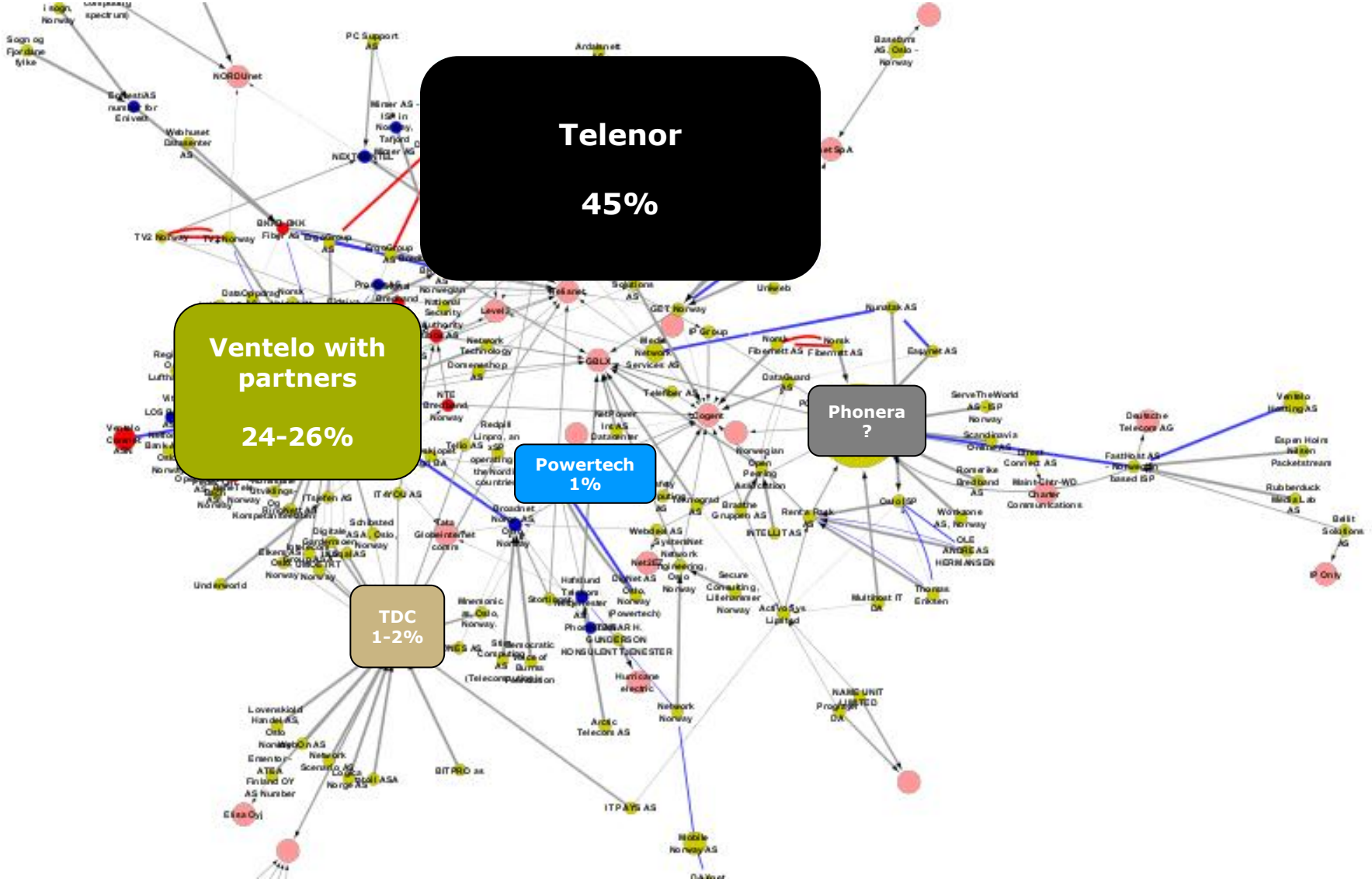


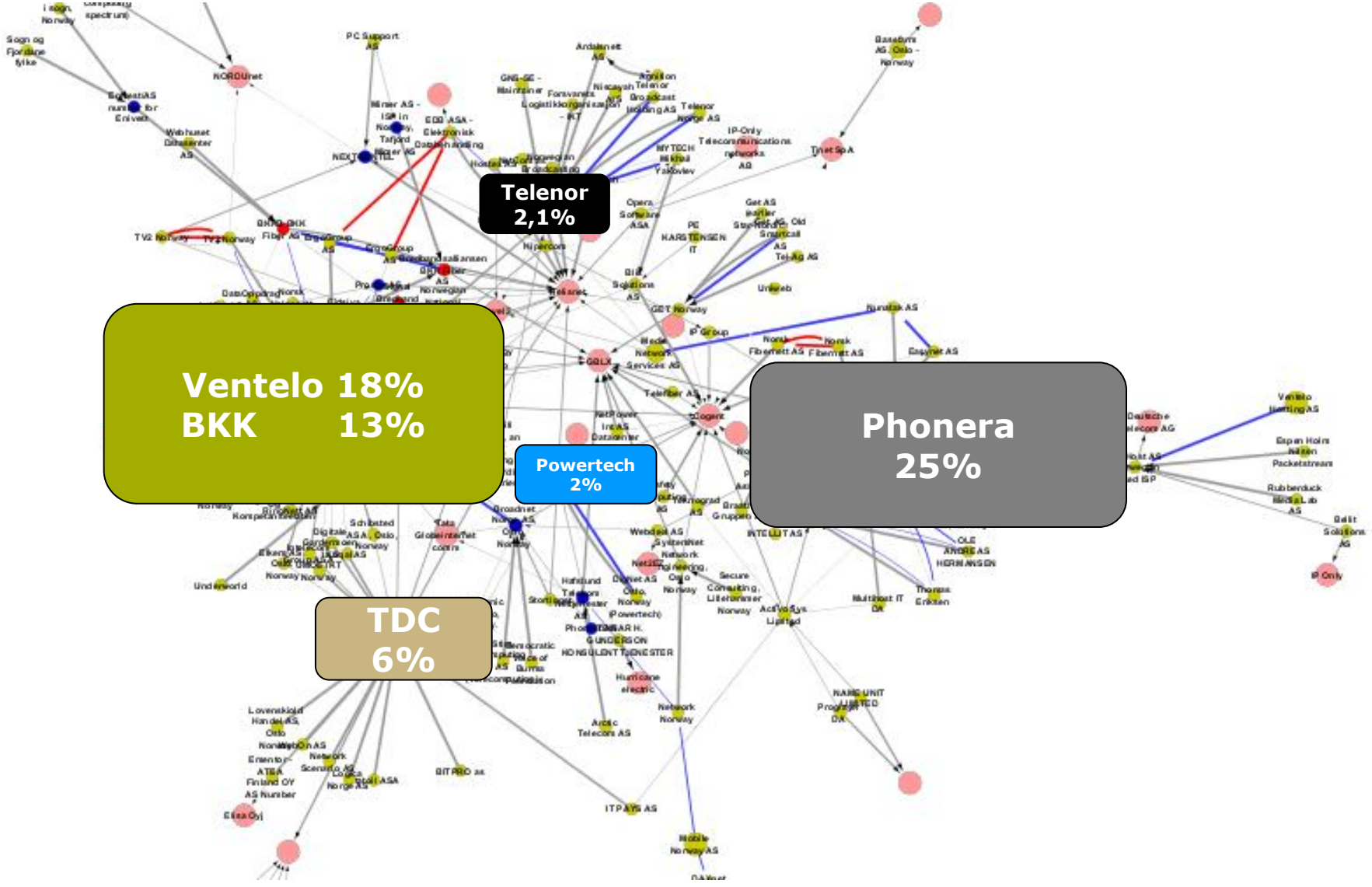
Internet access customers

Well known distribution of revenue market shares



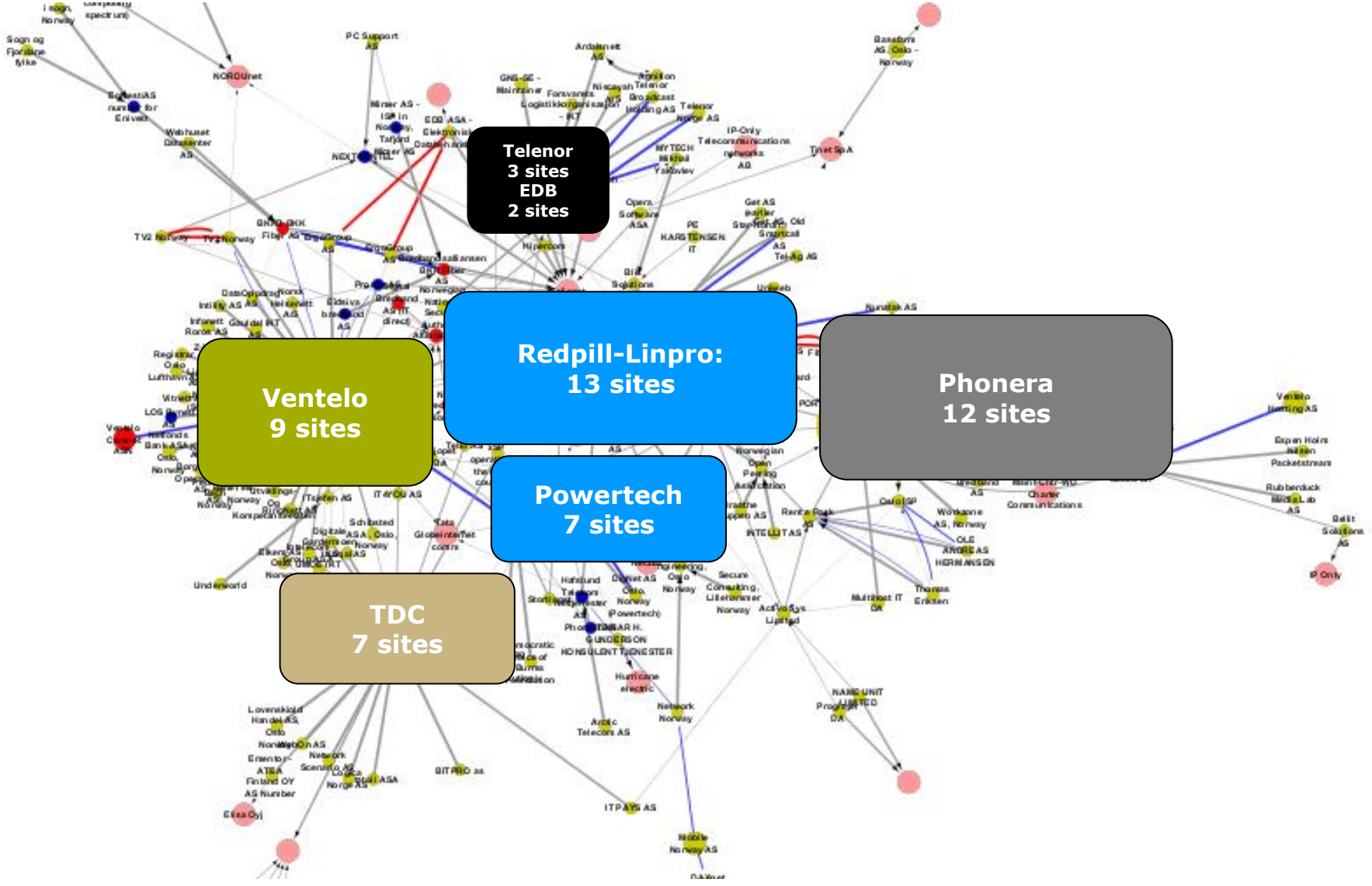
Domains

The clusters hold almost two thirds of the domains identified



Top Norwegian websites

The clusters host a significant share of the 103 websites



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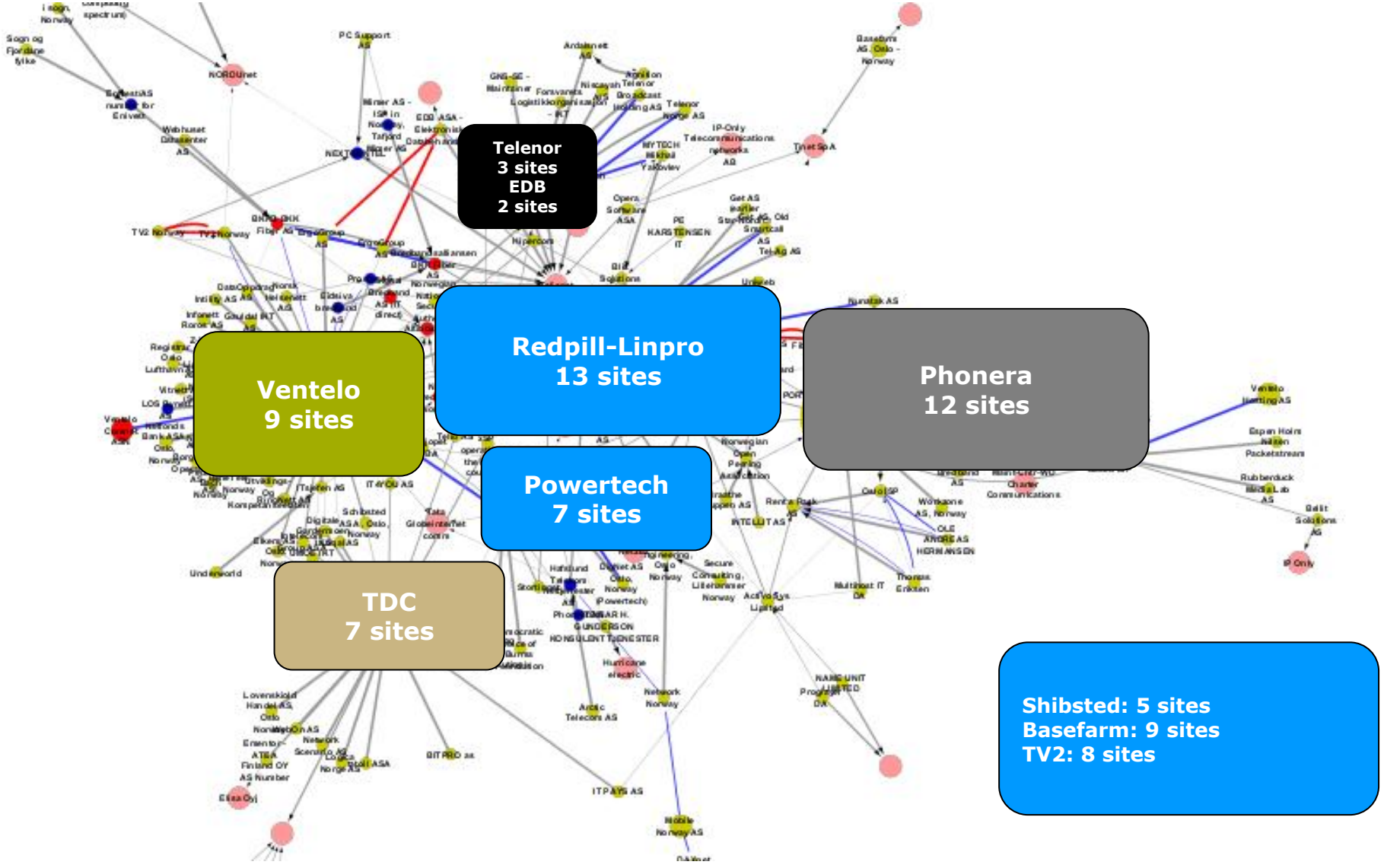
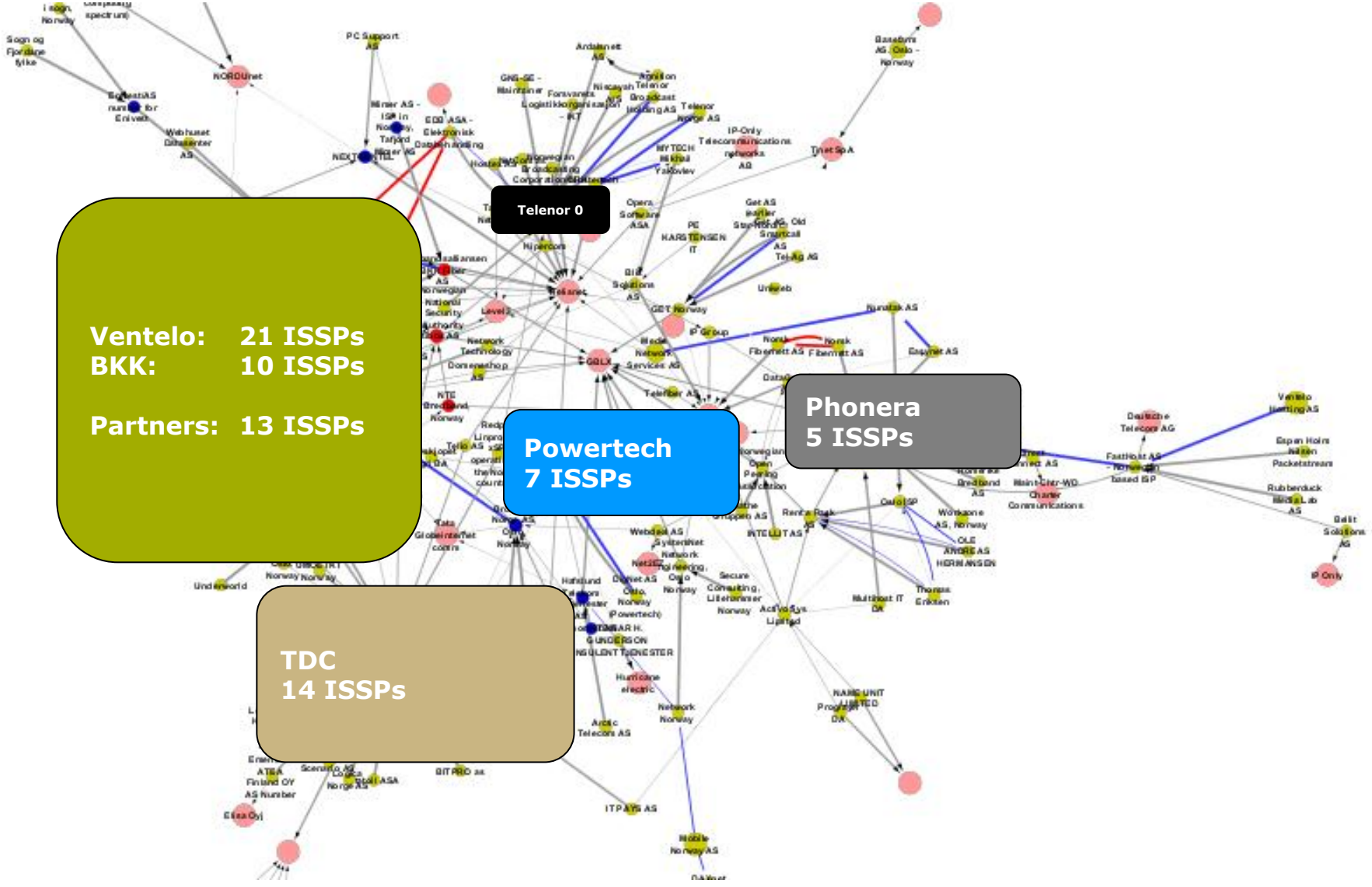
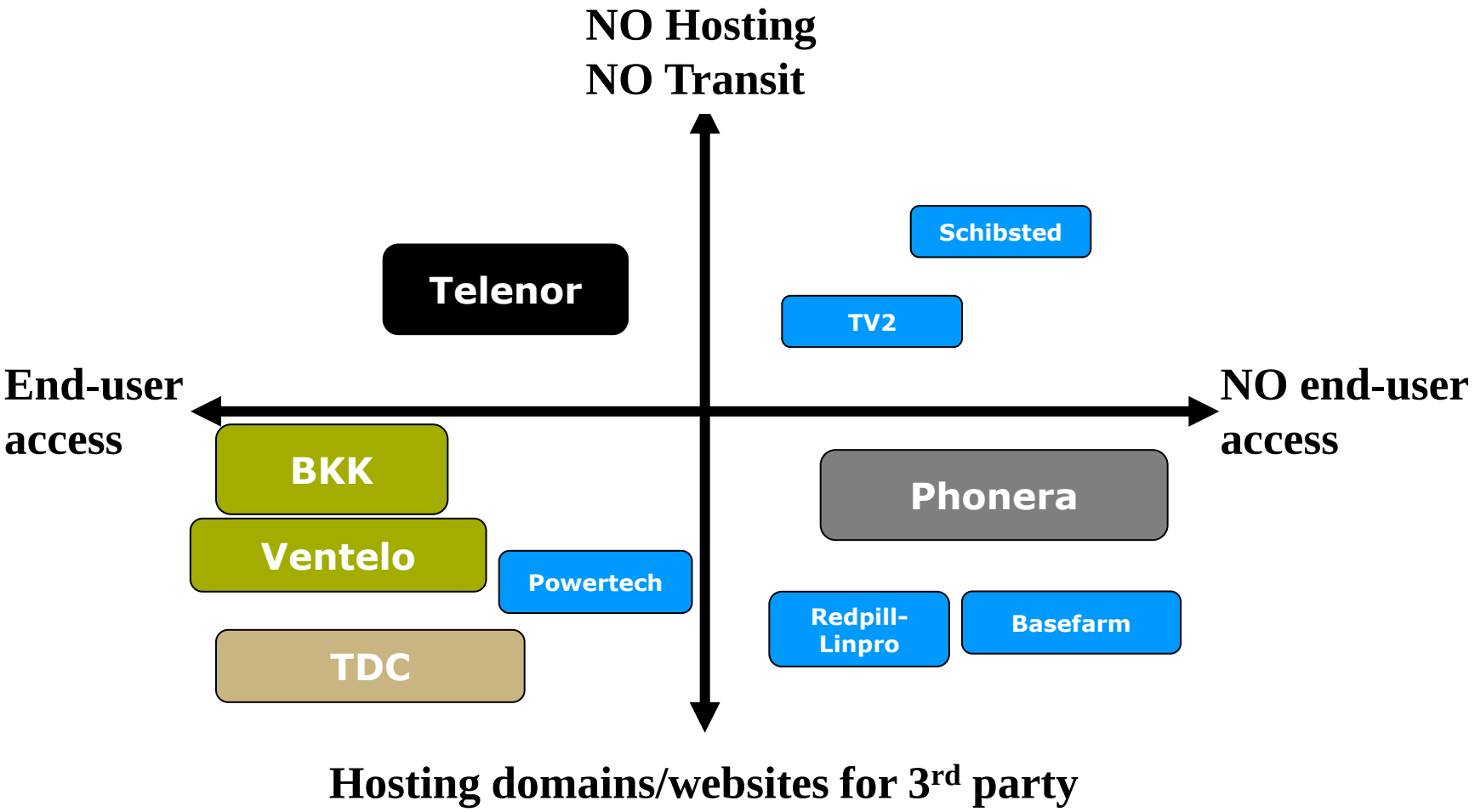


The IT industry on Internet

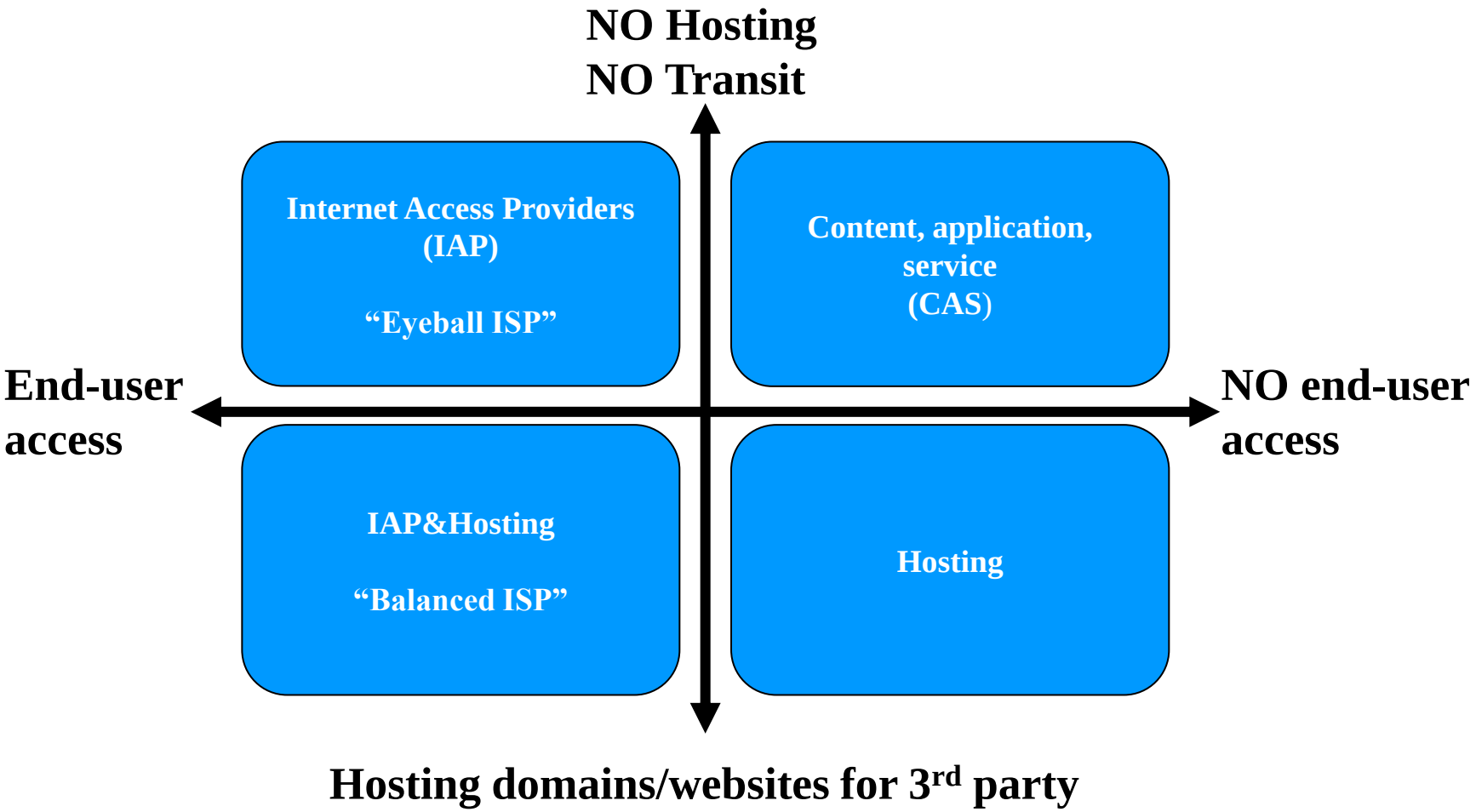
The clusters hold a significant share of 129 ISSPs' websites



Four Internet economy arch-types in Norway



How **values, power** and **innovation** are really created and **distributed** within the **Internet economy**



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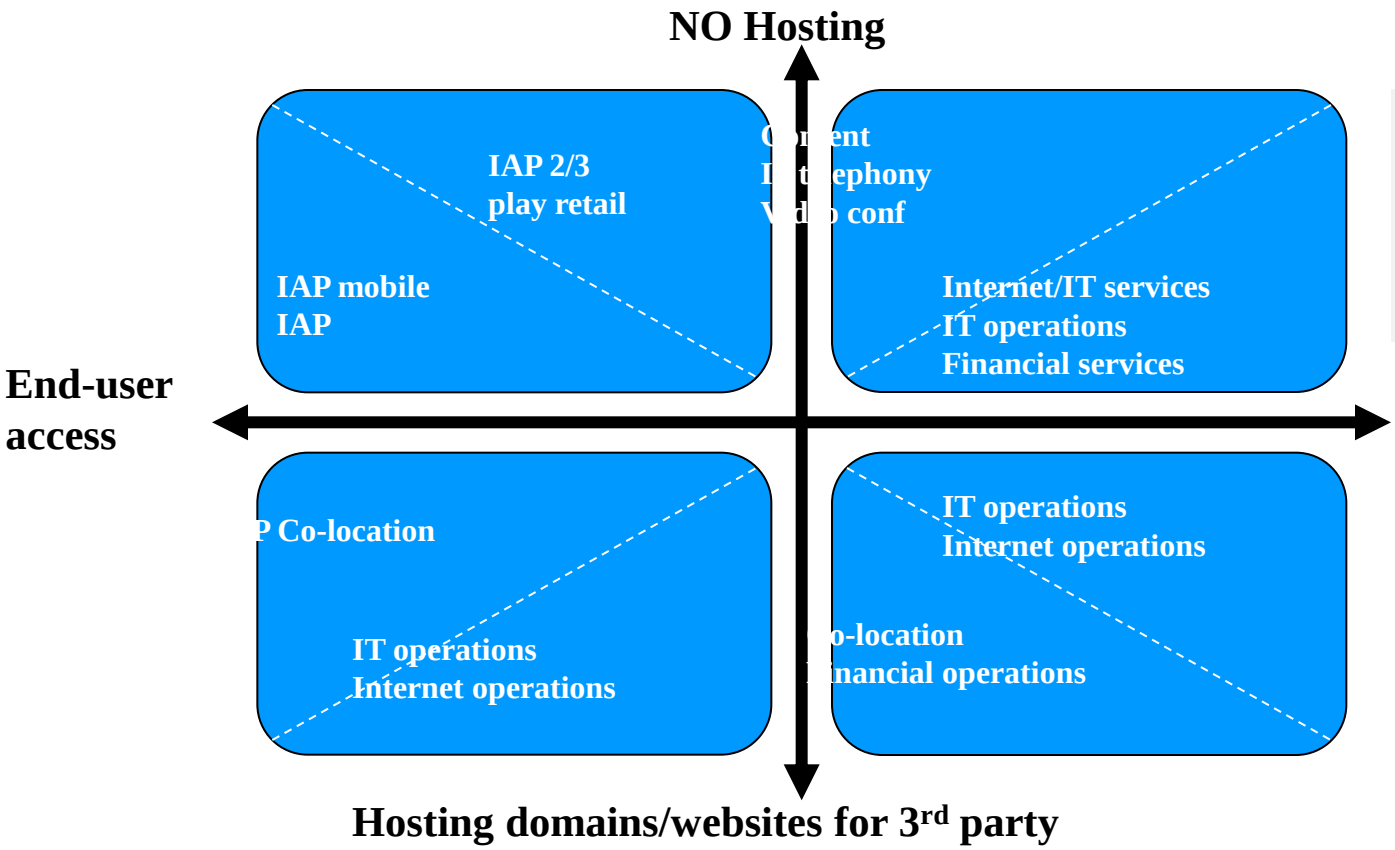
Arch types – more detailed product types

Communication and IT industries distribute in different arch types

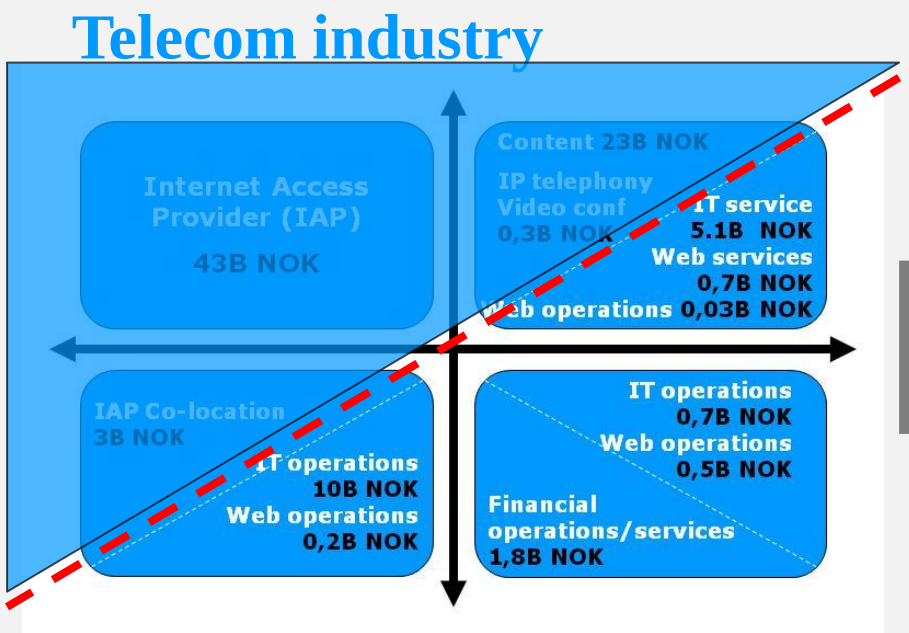


Not included:
Corp wan
Consulting
Private Initiative
Entrepreneur
National authority

Hallingby and Hartviksen 2012

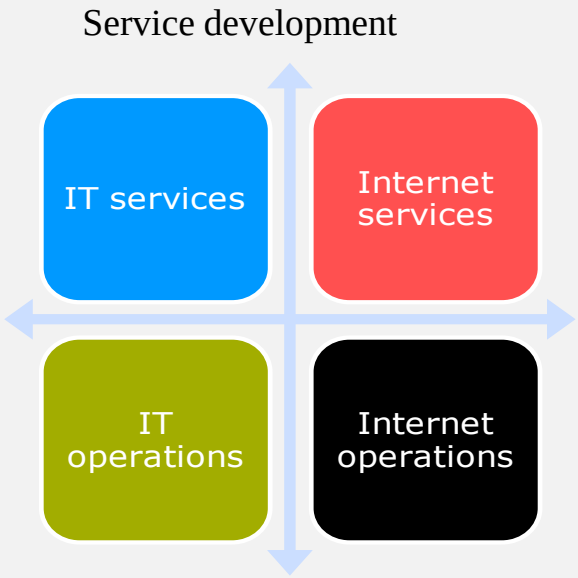
From ICT arch types to IT services segments

ICT Arch types



IAP, IAP co-location, Content ruled out

IT Segments



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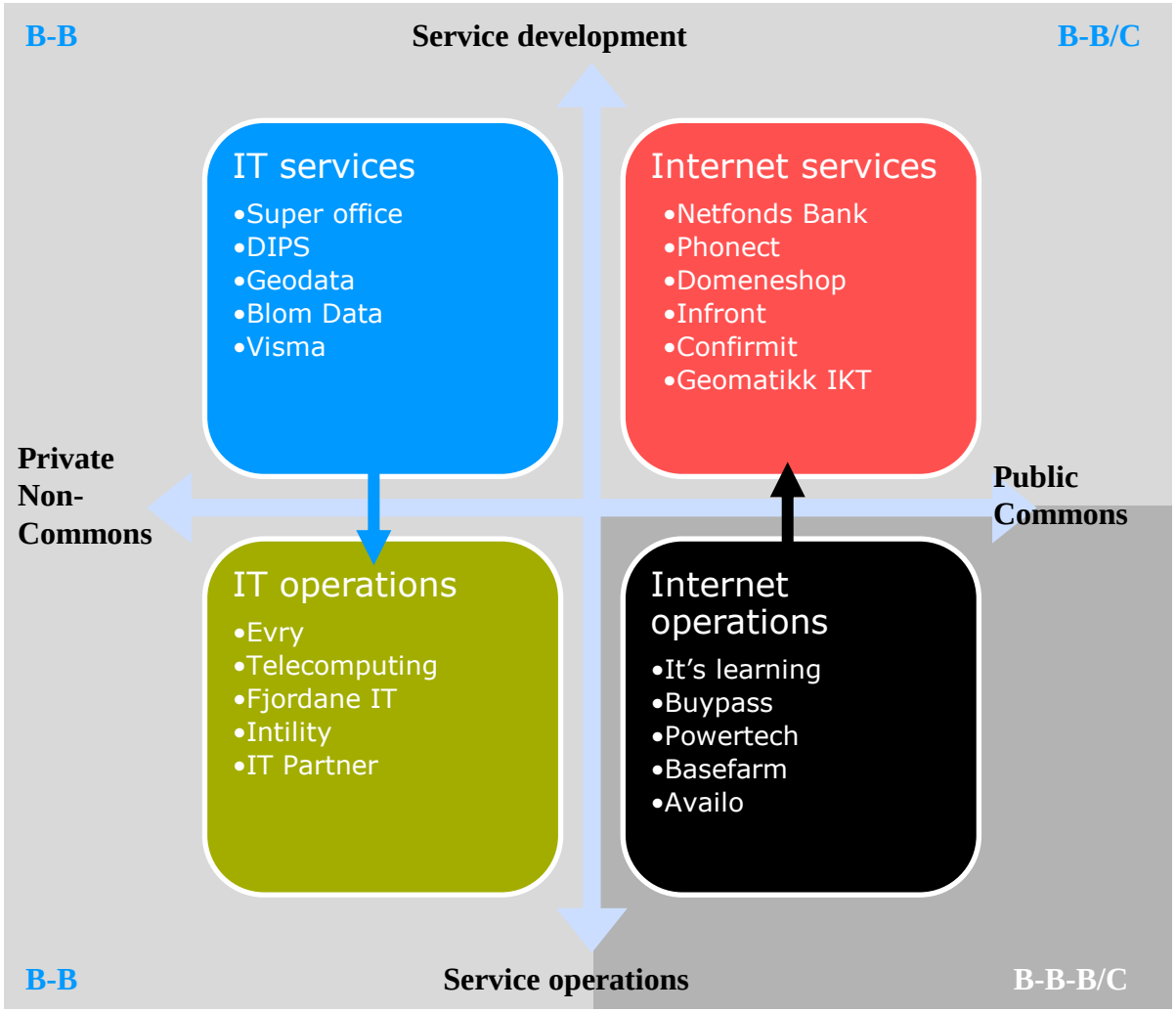
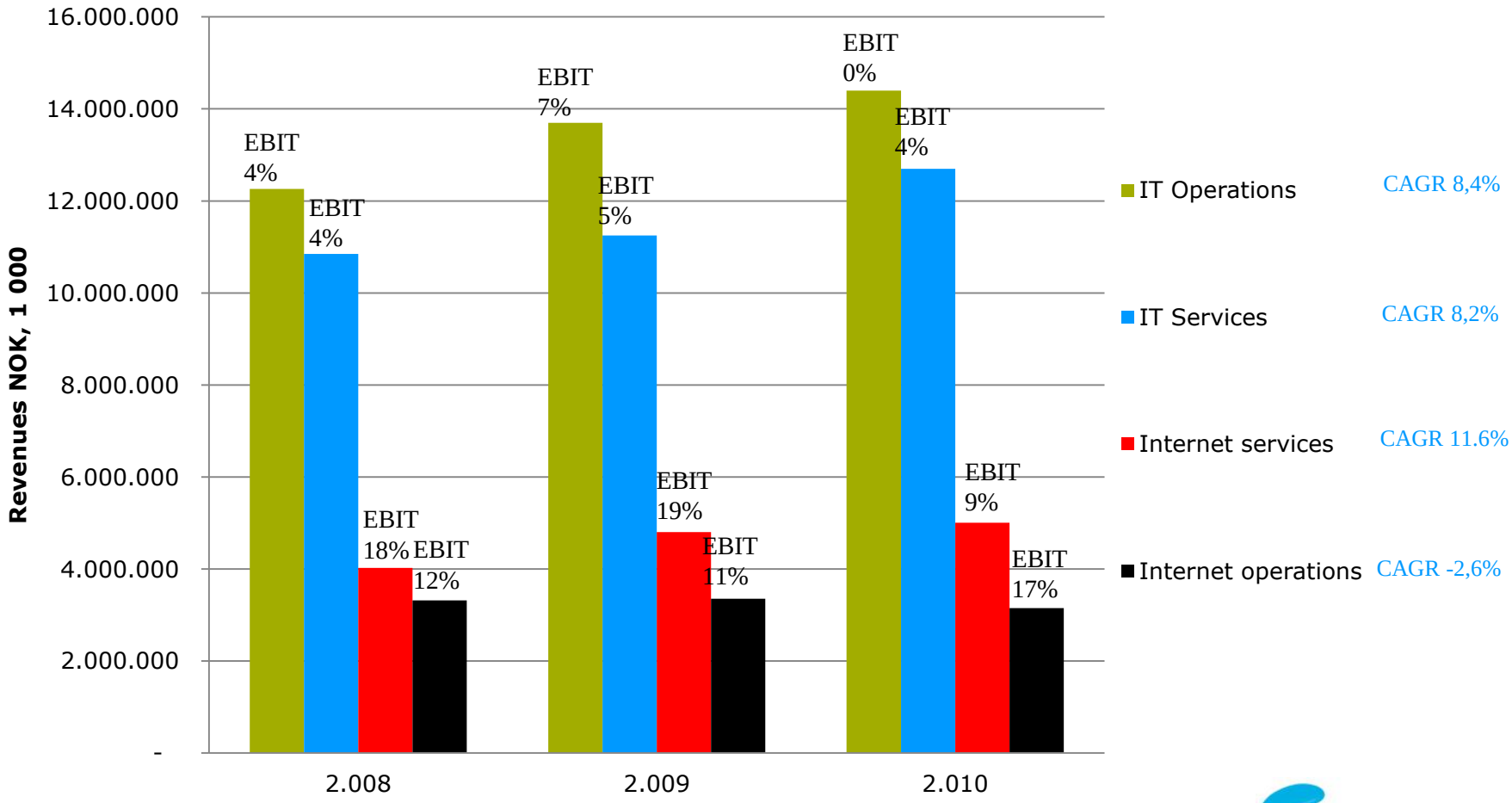
Four segments in the Norwegian IT service industry

IT Operations and Internet Operations hold AS numbers



Revenues 2008-2010, four IT segments



Source: SSB, Proff.no, Telenor RFS analyses of industry. Gross revenues from enterprises identified, found in Proff.no.
IT Operations without Evry Økonomitjenester, approx 3B NOK

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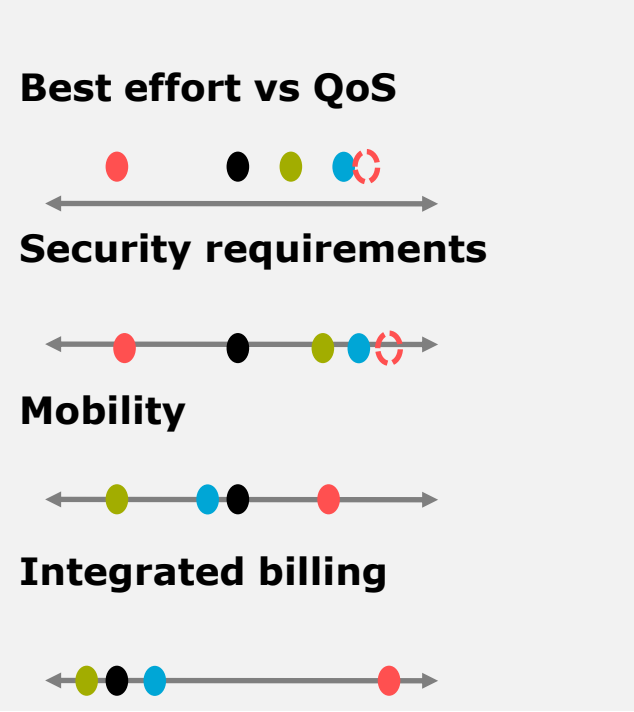
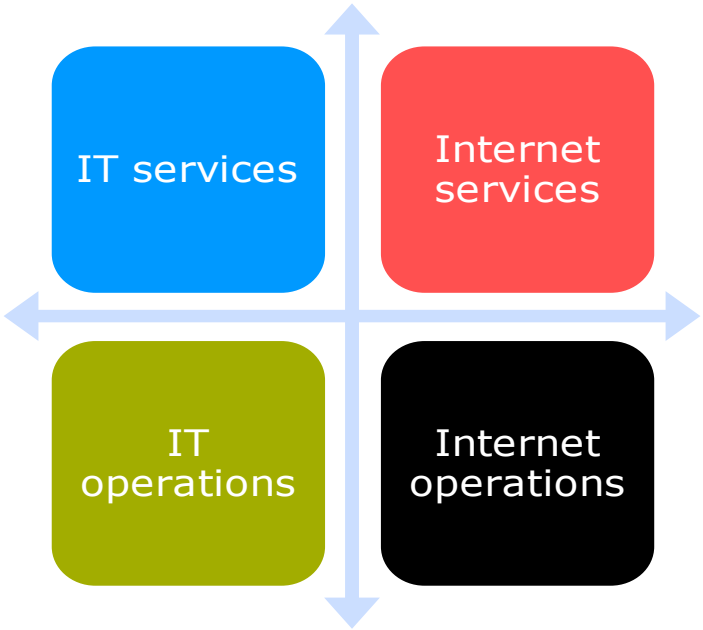
Different segments have different requirements on network This might be an opportunity for the telecom business





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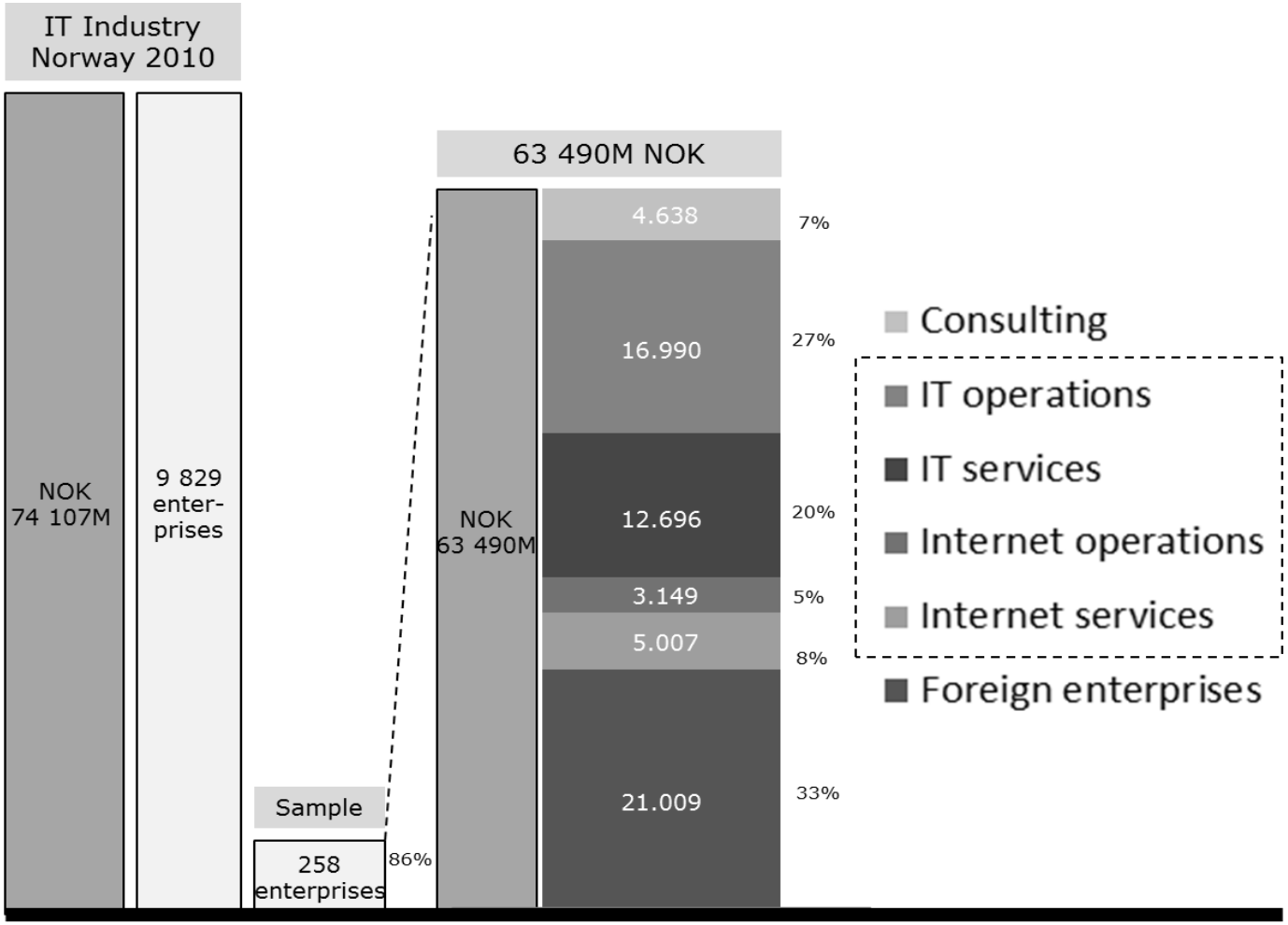
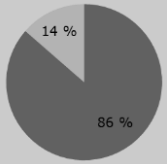
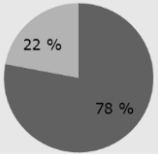
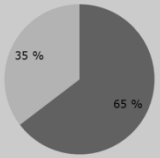
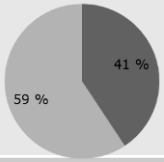
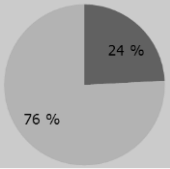
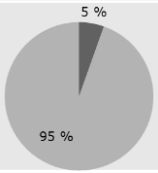
IT service industry Norway, 2010



Source: SSB, Proff.no, Telenor RFS analyses of industry. Gross revenues from enterprises identified, found in Proff.no.
*With Evry Økonomitjenester

Variation between categories and how AS enterprises capture revenue market share points towards AS significance

Category	Enterprises with ASN (Revenues)	Enterprises with ASN %	Category share of total (rev)
IT operations		70%	27%
Internet operations		81%	20%
Foreign enterprises		49%	5%
IT services		8%	8%
Internet services		28%	7%
Consulting		25%	33%

Internet services with ASN Internet services without ASN

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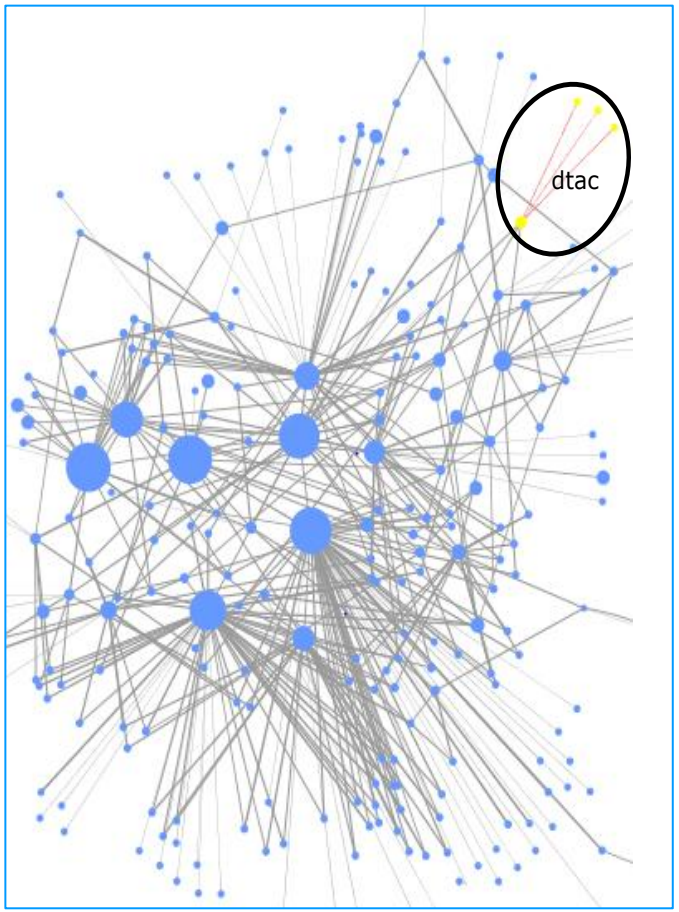
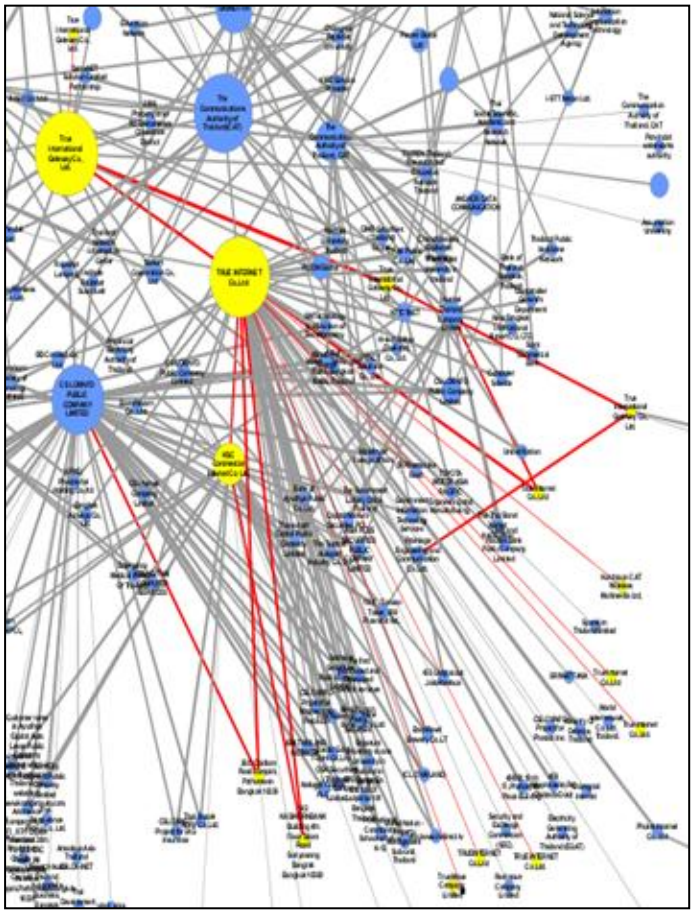
Thailand Internet and mobile operators
Left illustration: Dtac's (Telenor) four ASs in upper right corner.
Right illustration: True's 15 connected ASs





Results in Thailand confirm: local Internet, hub structure, four categories, significance of IT sector.

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Hallingby and Hartviksen 2013, A quick look into the Internet footprint in Thailand, Telenor R 01/2013

Nettoperatørers utfordringer og strategier med hensyn til tjenester, trafikk og forretning - oppsummert

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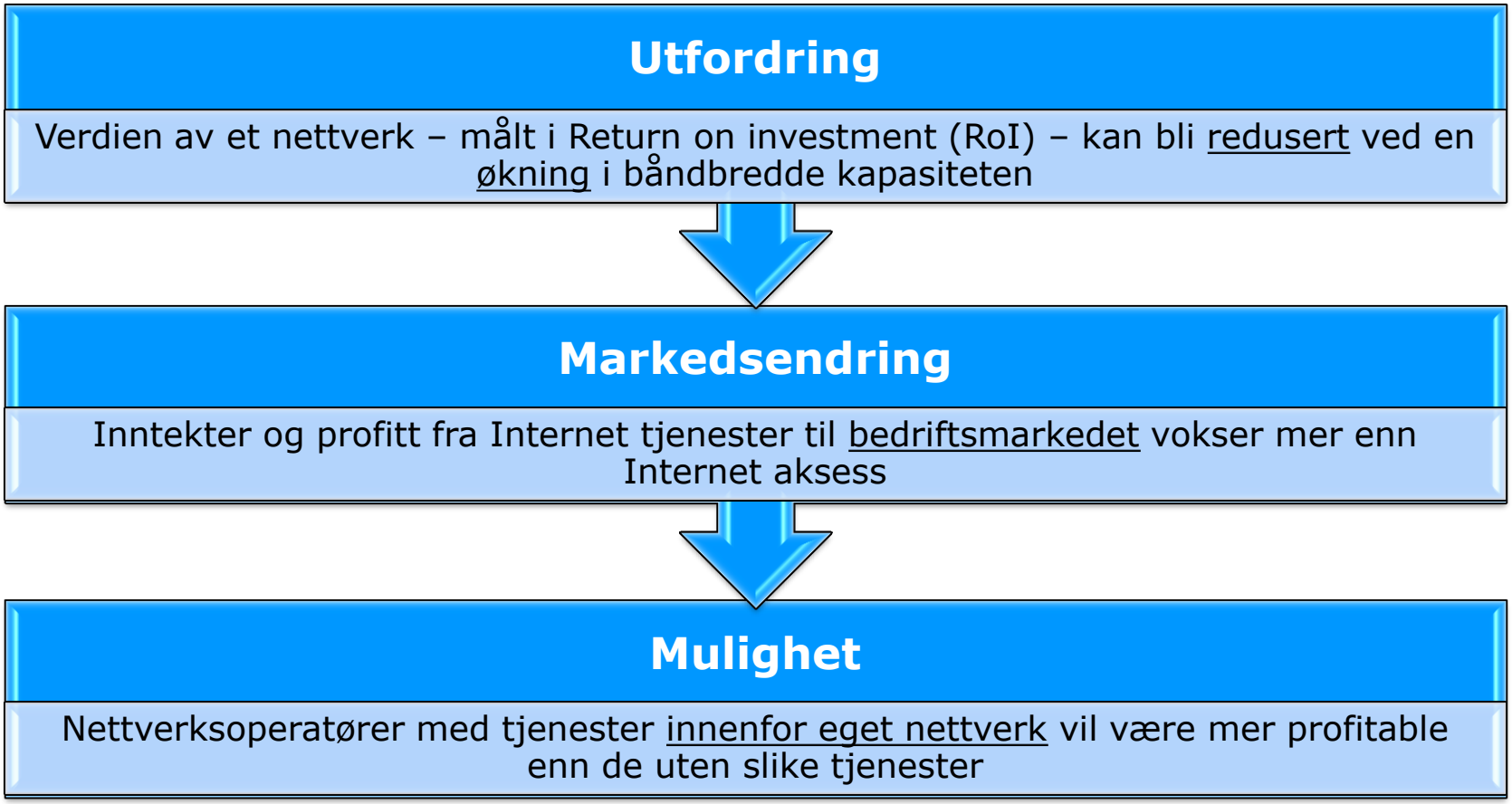
Hypoteser om Internett økonomien fra en nettoperatørs perspektiv



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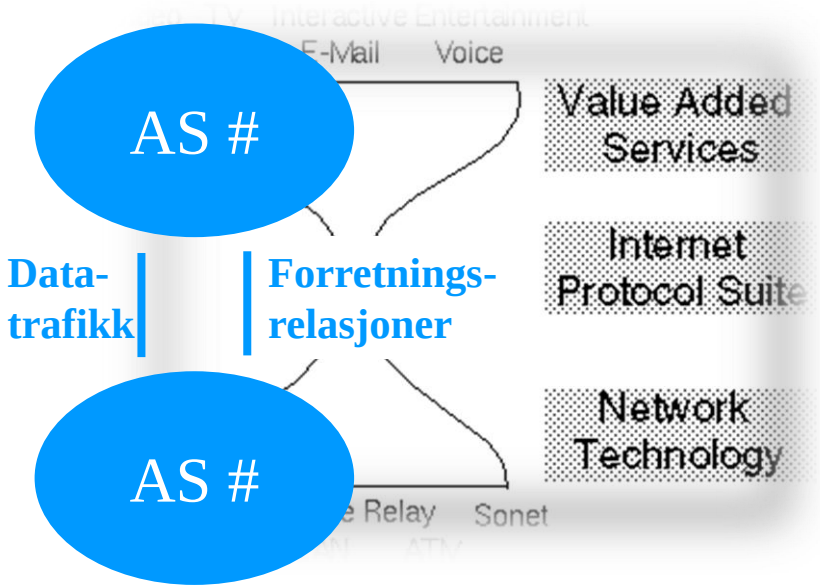
Hypotese 1 - Utfordring

Verdien av et nettverk – målt i Return on investment (RoI) – kan bli redusert ved en økning i båndbredde kapasiteten

Disruptive business model for telecom

1. Internet introduces a split between networks and services
2. Services and end-users in different networks
3. Services are operating their own ASs
4. Most Internet traffic are off-net according to access networks and relying on interconnection
5. Inter-connectivity is a cost, not a revenue stream for most ASN operators
6. Investment in more capacity does not necessarily increase revenues
7. To access networks – 3rd party service providers are utilizing free capacities to provide telephony, messaging, VPN and TV and hence undermining core revenues of traditional network operators



Source for picture: http://www.isoc.org/inet98/proceedings/3e/3e_2.htm

Eksempler
Verdien av nettverk har blitt redusert mens selskaper fortsetter å investere i båndbredde

- IP transit business
  - prices fell by 99,8% from 1998 to 2009
- Nearly 3/4 of telecom companies are the coming 2 years at risk of distress
  - due to debt from infrastructure and M&A investments (Source: Alixpartner.com)
- Mobile business
  - US Sprint Nextel stock value felt 20% when launching LTE plans October 7, 2011

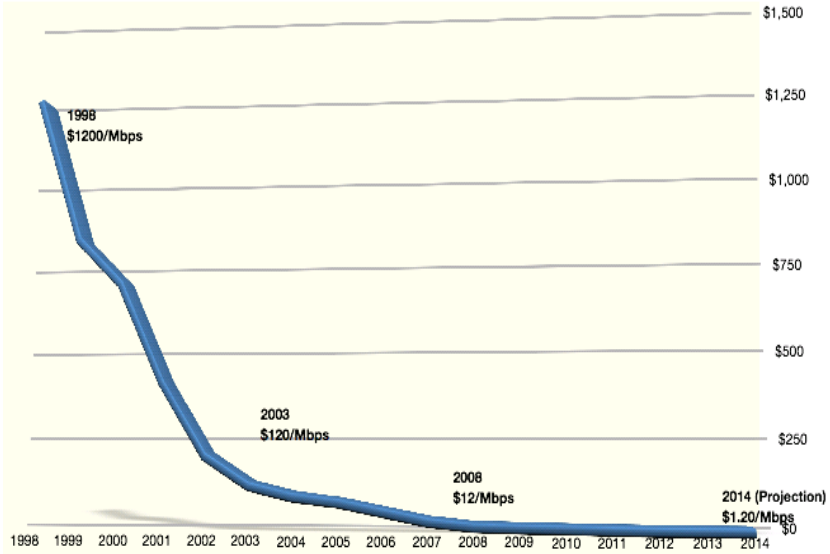


Figure: IP transit prices US market 1998-2014. Source: Drpeering.net

Sprint
Together with NEXTEL

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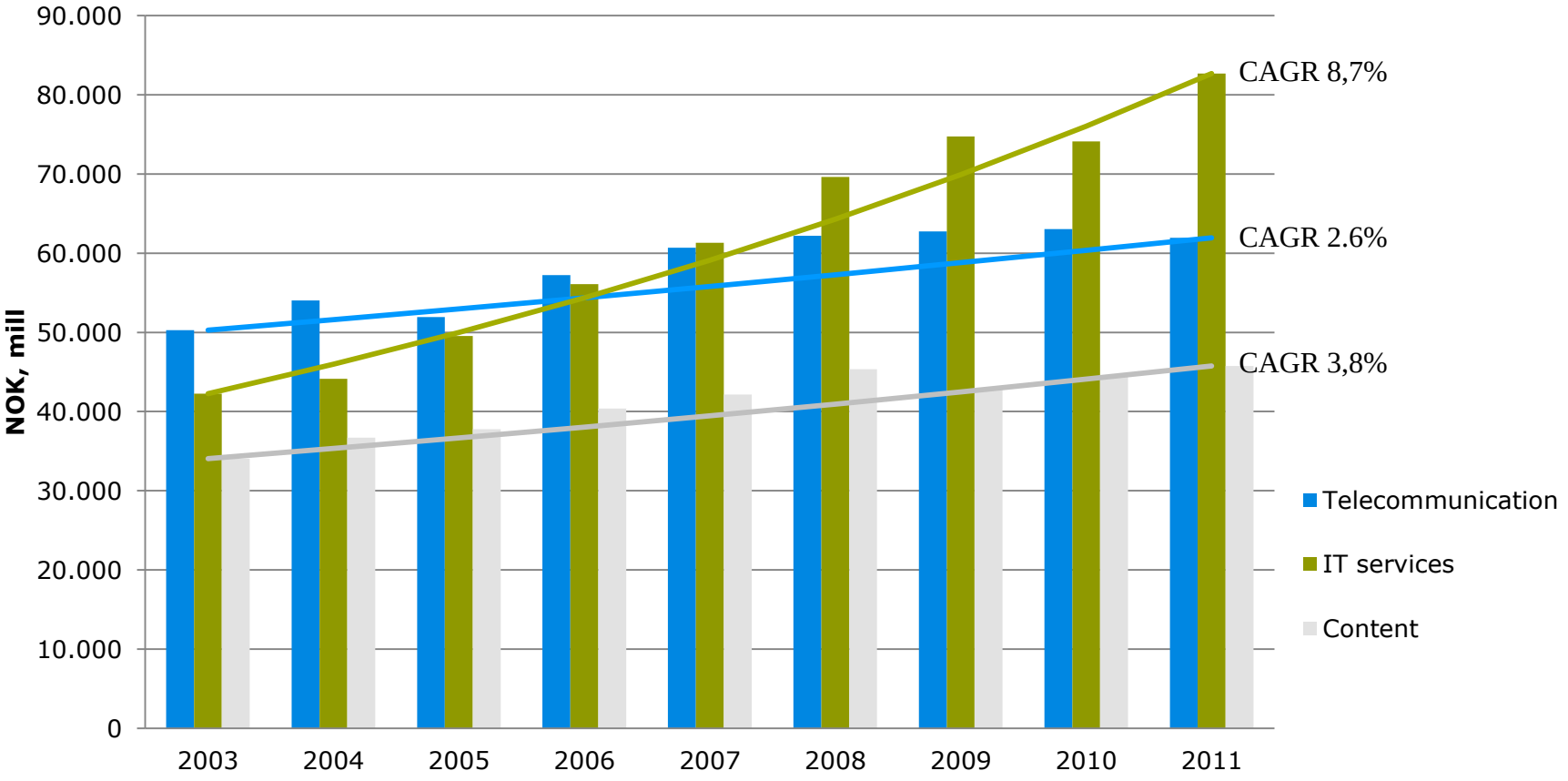
Hypotese 2 – Markedsendring

Inntekter og profitt fra Internett tjenester til bedriftsmarkedet vokser mer enn Internett aksess



Source: SSB. Gross revenues for all companies registered within the NACE codes used.
http://statbank.ssb.no/statistikkbanken/Default_FR.asp?PXSid=0&nvl=true&PLanguage=0&tilside=selecttable/hovedtabellHjem.asp&KortnavnWeb=sroi

Telecommunication: NACE code 61 Telekommunikasjon (Kabelbasert, Trådløs og Satelittbasert telekommunikasjon, Telekommunikasjonellers)
IT services: NACE codes: 62 Tjenester tilknyttet informasjonsteknologi 63.1 Databehandling, datalagring og tilknyttede tjenester, drift av web-portaler 63.9 Andre informasjonstjenester 58.2 Utgivelse av programvare
Content: Nace codes: 58 Forlagsvirksomhet 59 Film-, video- og fjernsynsprogramproduksjon, utgivelse av musikk- og lydopptak 60 Radio- og fjernsynskringkasting
Devices not included.
The telecommunication numbers are larger than the e-com statistics reported by Norwegian Post&Tele authorities due to gross registration of all companies and revenues. The e-com statistics are based on reported revenues on specified services from e-com registered enterprises.

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Hypotese 3 - Mulighet

Nettverksoperatører med tjenester innenfor eget nettverk vil være mer profitable enn de uten slike tjenester

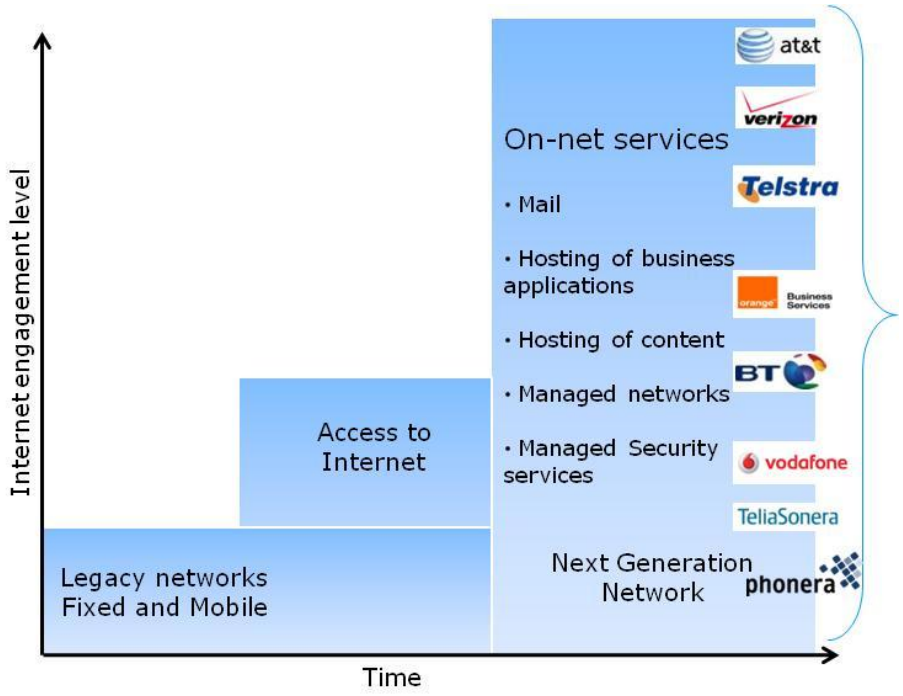
Market demand for managed networks and services

- Best effort Internet access is not sufficient for all objectives
- Quality of connectivity has become business critical

Business model innovations from network operators – within the existing best effort across-AS Internet regime

- In-sourcing of Online Internet services to own ASN network
- On-net provision of Internet solutions
- Provision of wholesale access and services
- To become a hosting provider

How can Internet develop beyond this?



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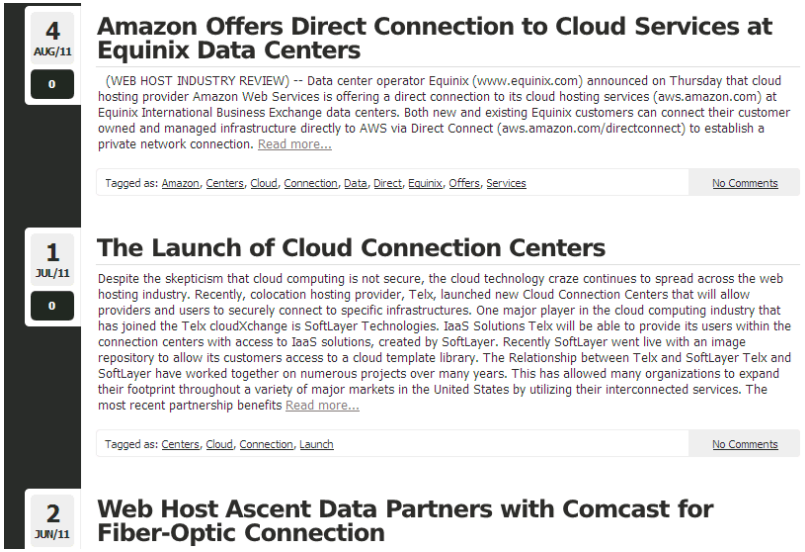
Eksempler
Nye konkurrenter tilbyr allerede alternativer til best effort Internet

Cloud connectivity

- www.specialvps.com/tag/connection



4 AUG/11 0

Amazon Offers Direct Connection to Cloud Services at Equinix Data Centers

(WEB HOST INDUSTRY REVIEW) -- Data center operator Equinix (www.equinix.com) announced on Thursday that cloud hosting provider Amazon Web Services is offering a direct connection to its cloud hosting services (aws.amazon.com) at Equinix International Business Exchange data centers. Both new and existing Equinix customers can connect their customer owned and managed infrastructure directly to AWS via Direct Connect (aws.amazon.com/directconnect) to establish a private network connection. Read more...

Tagged as: Amazon, Centers, Cloud, Connection, Data, Direct, Equinix, Offers, Services — No Comments

1 JUL/11 0

The Launch of Cloud Connection Centers

Despite the skepticism that cloud computing is not secure, the cloud technology craze continues to spread across the web hosting industry. Recently, colocation hosting provider, Telx, launched new Cloud Connection Centers that will allow providers and users to securely connect to specific infrastructures. One major player in the cloud computing industry that has joined the Telx cloudXchange is SoftLayer Technologies. IaaS Solutions Telx will be able to provide its users within the connection centers with access to IaaS solutions, created by SoftLayer. Recently SoftLayer went live with an image repository to allow its customers access to a cloud template library. The Relationship between Telx and SoftLayer Telx and SoftLayer have worked together on numerous projects over many years. This has allowed many organizations to expand their footprint throughout a variety of major markets in the United States by utilizing their interconnected services. The most recent partnership benefits Read more...

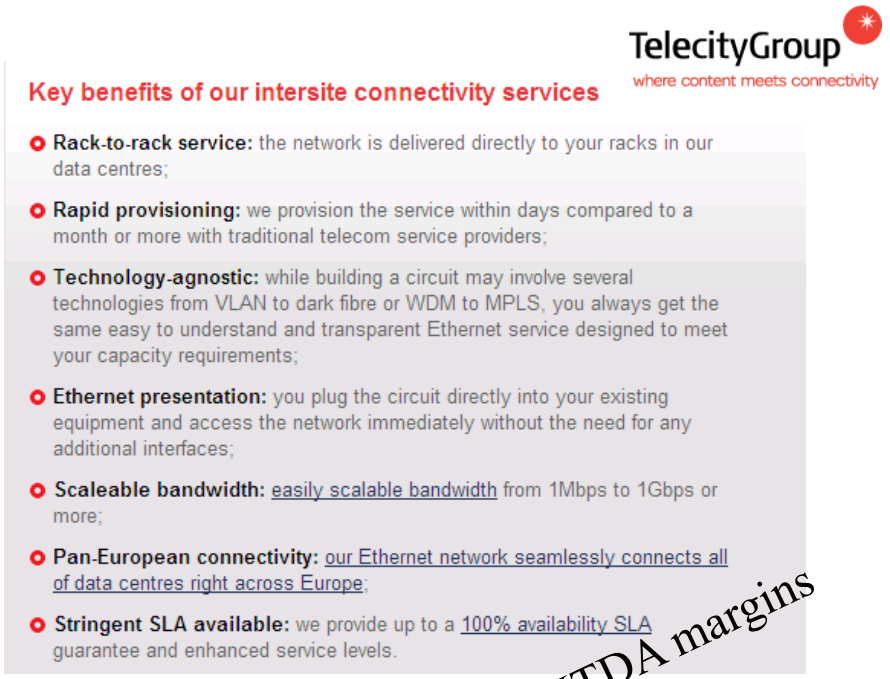
Tagged as: Centers, Cloud, Connection, Launch — No Comments

2 JUN/11

Web Host Ascent Data Partners with Comcast for Fiber-Optic Connection

Intersite connectivity

- www.telecitygroup.com/inter-site-connectivity.htm



TelecityGroup
where content meets connectivity

Key benefits of our intersite connectivity services

- **Rack-to-rack service:** the network is delivered directly to your racks in our data centres;
- **Rapid provisioning:** we provision the service within days compared to a month or more with traditional telecom service providers;
- **Technology-agnostic:** while building a circuit may involve several technologies from VLAN to dark fibre or WDM to MPLS, you always get the same easy to understand and transparent Ethernet service designed to meet your capacity requirements;
- **Ethernet presentation:** you plug the circuit directly into your existing equipment and access the network immediately without the need for any additional interfaces;
- **Scaleable bandwidth:** easily scalable bandwidth from 1Mbps to 1Gbps or more;
- **Pan-European connectivity:** our Ethernet network seamlessly connects all of data centres right across Europe;
- **Stringent SLA available:** we provide up to a 100% availability SLA guarantee and enhanced service levels.

44,1% EBITDA margins

http://www.telecitygroup.com/presentations/H1-11-Presentation-Final.pdf

Forskningsresultater

- Fått bekreftet det generelle bildet av at telecom investeringer i Internett nettverk øker, mens inntekter stagnerer eller til og med synker
- Mobil Internett aksess brer om seg i markedet, men mobile nettverk er fremdeles i ytterkanten av Internettets økosystem
- Cloud tjeneste leverandører/aktører posisjonerer seg som nettverksoperatører
- Best effort Internett tilfredsstiller ikke lenger alle behov
  Vi ser flere typer av Internett

Vi tror at konseptet *Business ecosystems* kan lære oss noe om teknologiske disrupsjoner?

- Kort oppsummering av Business ecosystem som strategisk innfallsvinkel
- Kobling til hvordan Internett utvikler seg

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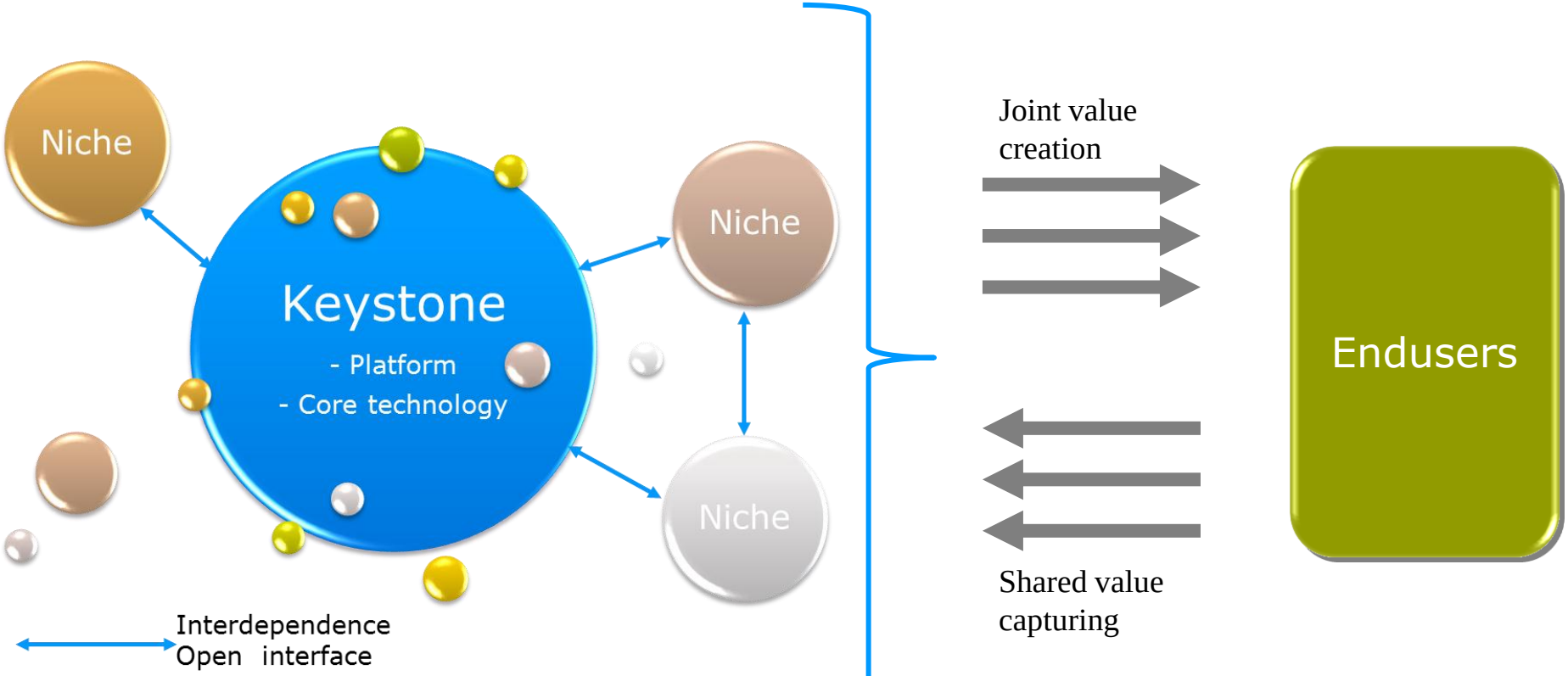
Business ecosystem key concepts: A theory of industry structures, mechanisms and strategies



Strategies for keystone to build a large hub:
1: Define platform or core technology
2: Make it easy to connect
3: Share value with other actors in ecosystem

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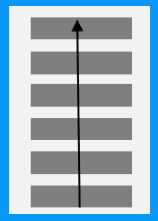
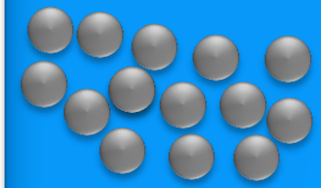
The type of industry and industrial forces that lead to the relevance of business ecosystem

Vertical architecture and industry

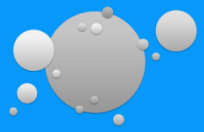


Modular architecture and industry



Many actors

Ecosystem industry structure



Interdependency
Network – Hub&nodes
Joint value creation
Distributed innovation

Hub/Keystone strategies

Shared value capture
Open interfaces
Key platforms

Observations and basic assumptions:
- Interdependence and networked industry

Network science tells us that:
- networked industry structures will be characterized by hubs and nodes
- to become a hub requires to be preferred by others
- a hub is resistant to random attacks (disruptions)

Business ecosystem perspectives aim to:
- include empirically observed industry characteristics
- explain possible strategies in order to become a hub (or a keystone) in an industrial network

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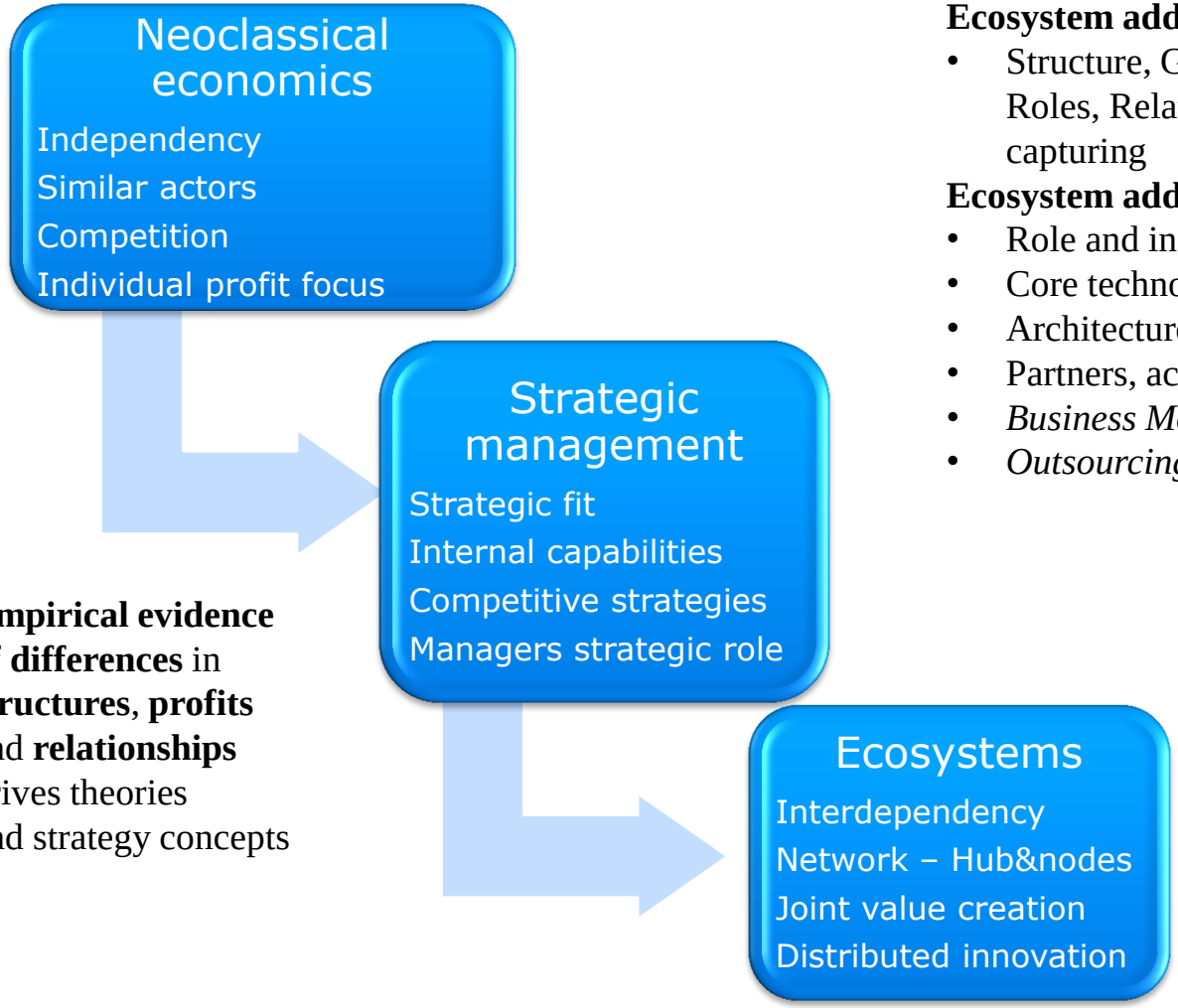
Business ecosystem perspectives will both supplement and challenge traditional strategies



Empirical evidence of **differences** in **structures**, **profits** and **relationships** drives theories and strategy concepts

Ecosystem additional insight:

- Structure, Growth and changes, Roles, Relationships, Value creation and capturing

Ecosystem additional strategies:

- Role and industry understanding
- Core technology platform
- Architecture and open interfaces
- Partners, actors and investment
- *Business Model – value sharing*
- *Outsourcing/disintegration - modularization*

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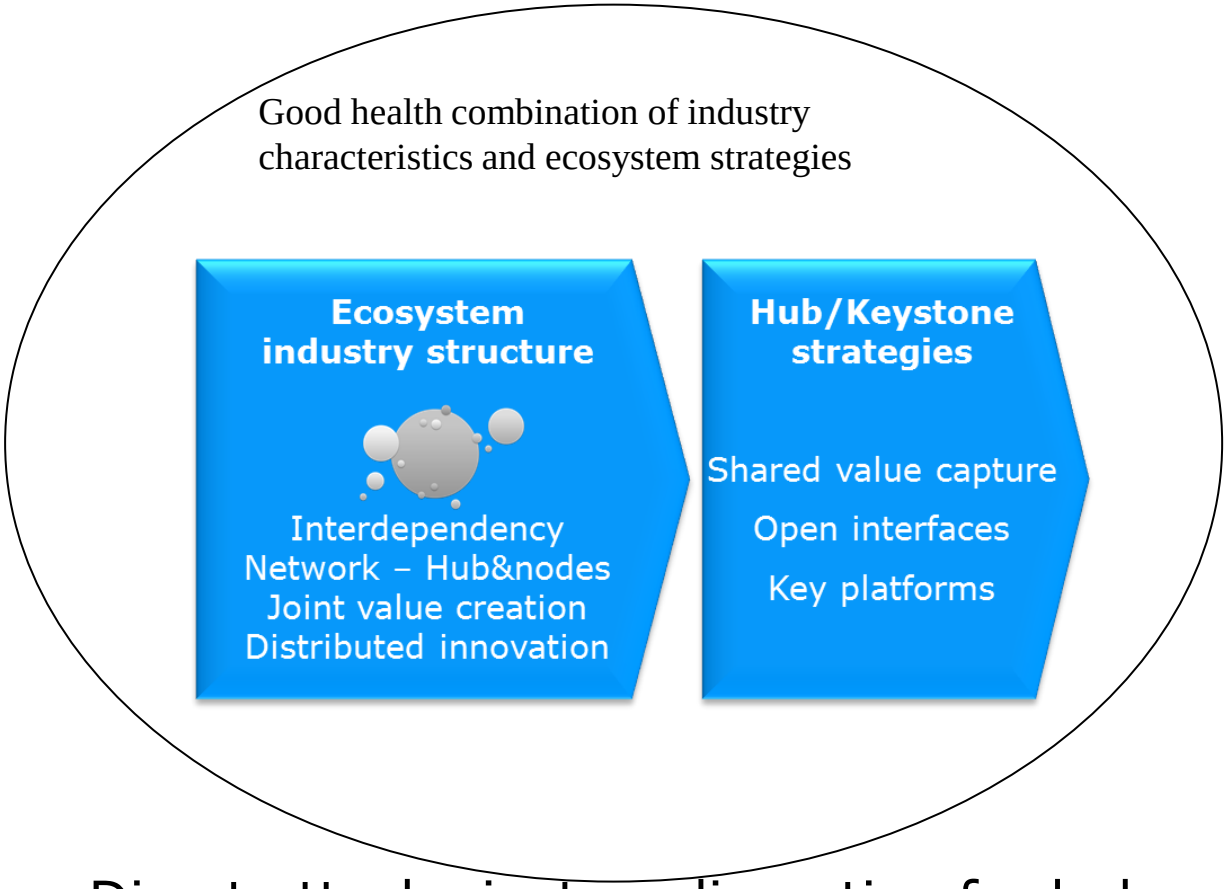
Hubs – or keystones – are less vulnerable to disruptions when ecosystem health is good



Keystone perspective:
Indicators of unhealthy ecosystem, more vulnerable:

- Technology not central in ecosystem
- Few uses your technology
- Difficult to connect to technology
- Not sharing value captured

Consider niche strategy

Direct attacks just as disruptive for hubs – and even more for industry (like viruses)

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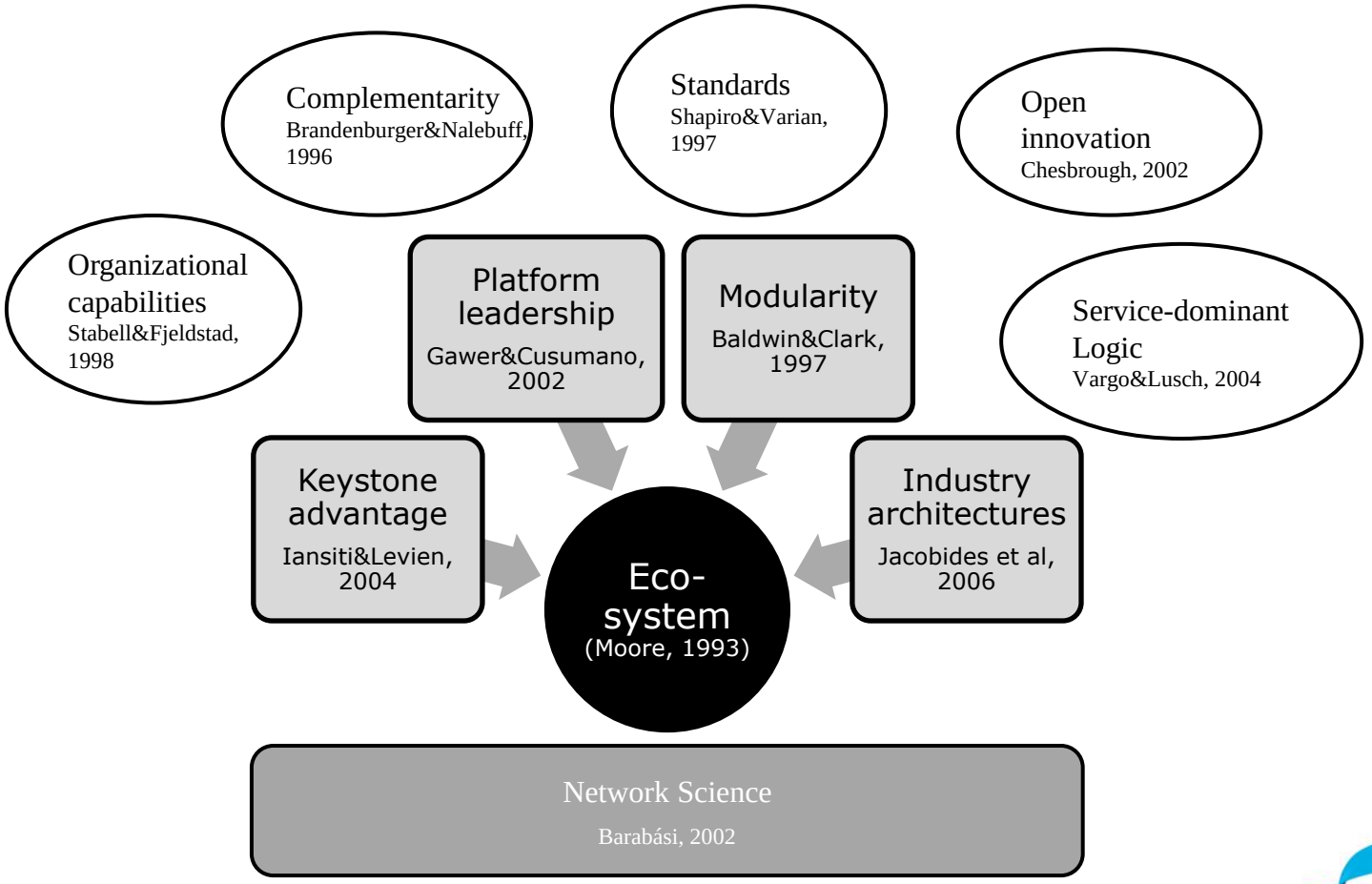
Business ecosystem concept is accompanied and reinforced by many other theories



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Empirically scale-free networks seem to be more common than random networks

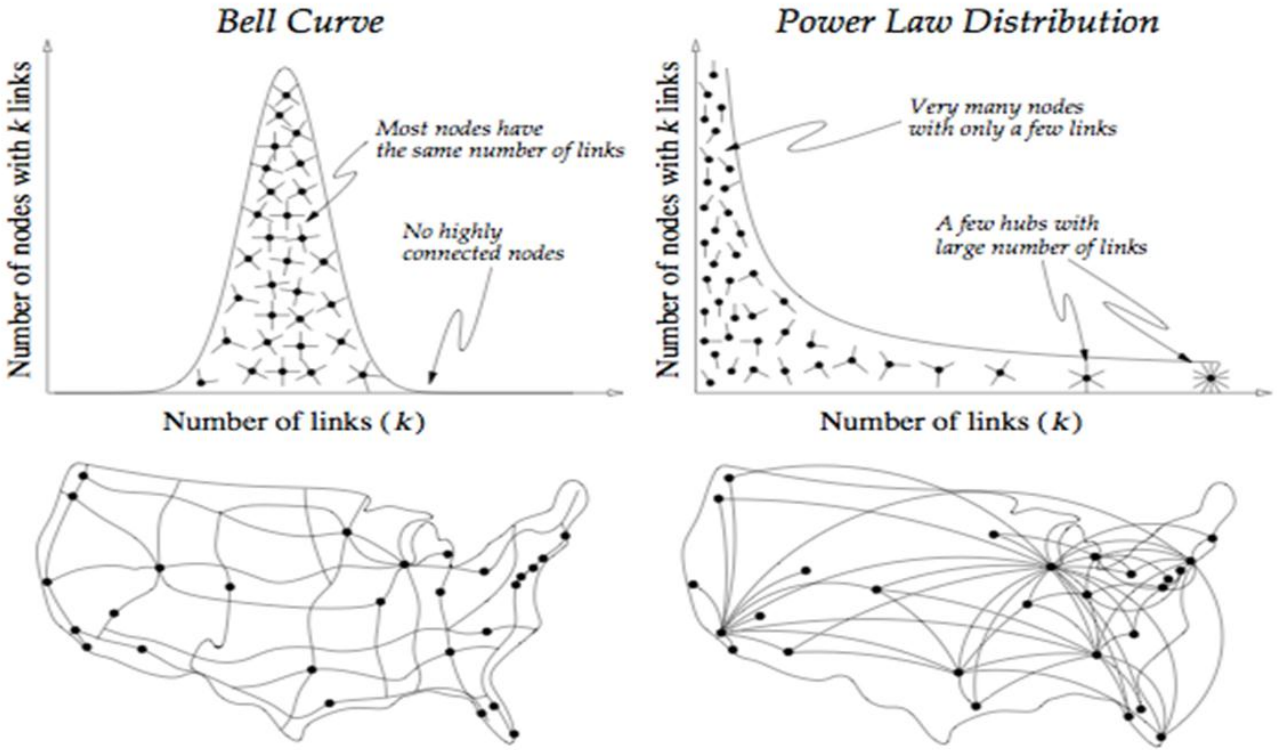
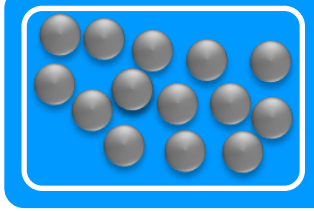


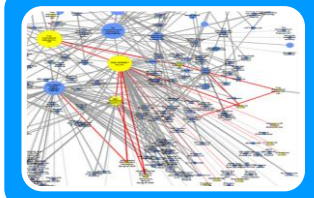
FIGURE (6.1)

Business ecosystem and Internet



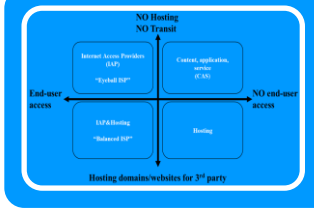
Technology **modularization**

Interdependent actors

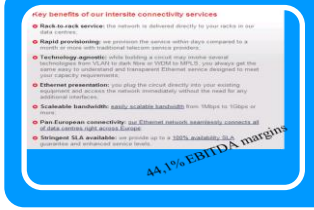


Hub structure

Scale-free network



New actors in position for hub position, disrupting businesses



Telecommunication and mobile **inertia** for repositioning in emerging ecosystem structures

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Tema for Masteroppgaver

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Tema for Master oppgaver

- Case studier av spesifikke Internet aktører med AS nummer
  - Telekom aktører: nasjonale og globale
  - Analyser av ulike typer IT aktører – nasjonale, nordiske og globale
- Case studier av IKT aktører uten AS nummer
  - Telekom aktører: nasjonale og globale
  - Analyser av ulike typer IT aktører – nasjonale, nordiske og globale

  Hva:
  - Verdiskapning, inntektsmodell, Internett og nettverk som innsatsfaktor, kostnadsdrivere, differensiering, innovasjon
  - Status og endringer

- Internett og bedrifter – I hvilken grad har Internett i dag blitt en forretningskritisk innsatsfaktor?

- Økonomiske analyser for å identifisere verdien av det å ha tjenester «on-net» for en (mobile) nettverksleverandør

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