

The High-Speed Network Conference 1999

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The Economic Impact of High Speed Networks

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Summary

At present we see an unprecedented economic boom in a number of countries, accompanied by a surge in demand for digital network capacity, a.k.a. "bandwidth". Are these two trends related, and if so how do they interact?

The prognosis is that of an ongoing exponential growth in bandwidth demand that is called "The Terabit Tsunami", accompanied by a demand elasticity of backbone price/performance of about 1.5 !

This paper tries to focus on the economic effects of the investment in high speed datalink infrastructure in countries and on the reasons that may drive the huge demand for network capacity.

In other words: what are people and computers actually doing in organisations with Internet and intranets, and why is that 'networking' important in the Network Economy. Will it result in networked E-Org's?

Jaap van Till

The economy is booming in the USA, EU: NL and other countries

“The New Economy”

“ The Network Economy”

“ The Internet Age “

• disputes about:

network effects, disruptive technologies, virtuous circles,
increasing returns, cti vs. complexity,
networked teams, self organisation

UNEXPECTED !

DISBELIEF

TIRED vs WIRED

Maginot Line vs Imagination and rapid learning

Growth

USA Commerce Dept: last 3 years:
Business productivity growth not 1.9 % but 2.3 % /Year

Bandwidth demand: W [dig. transmission capacity Gb/s * Km] = about 100 days

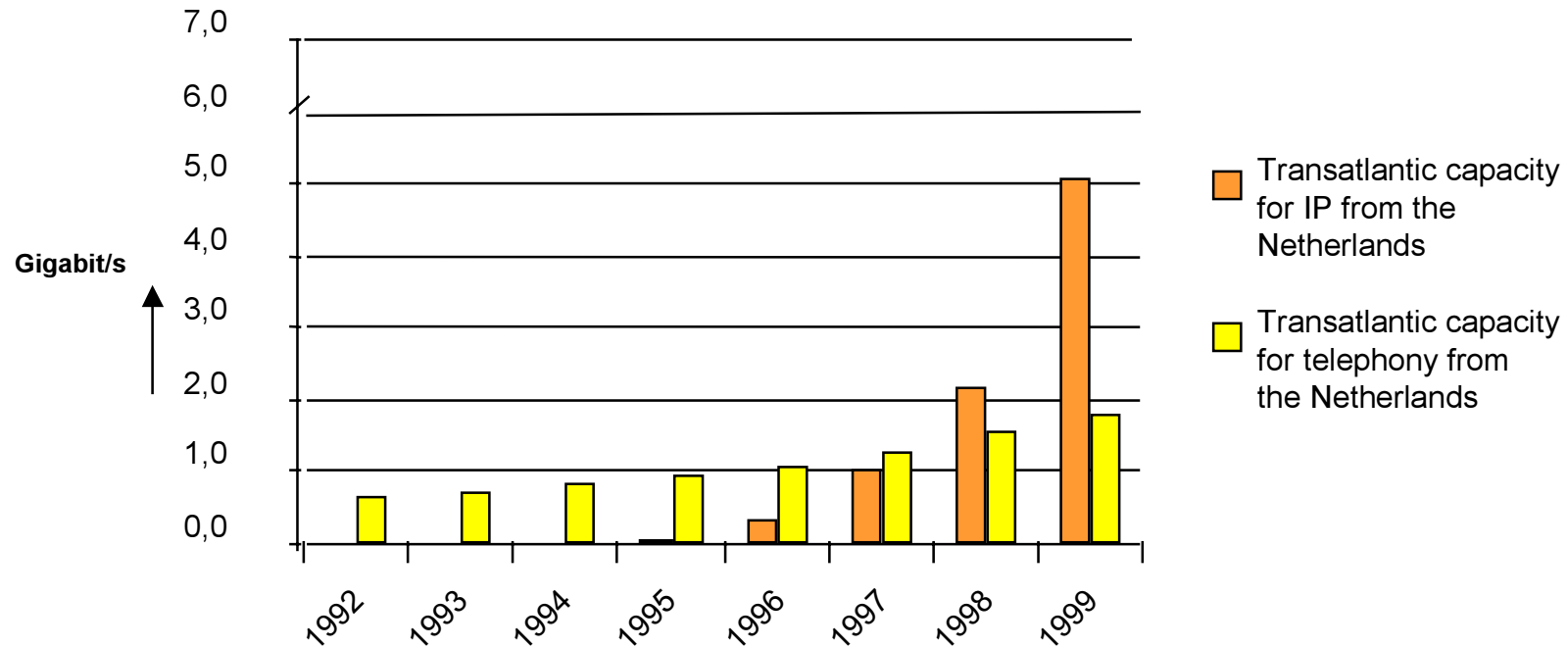
- datavolume ? , utilisation rate
- IP peak load, self similar bursty, bottlenecks
- backbones vs access networks / end to end CIR !!

- Capacity problems in POTS networks !! NL Gov't / OPTA Internet + GSM
Scarcity interconnect, Ph. switching, transmission : 12-month delay L.Line
Underestimated, non linear.

What is happening ????

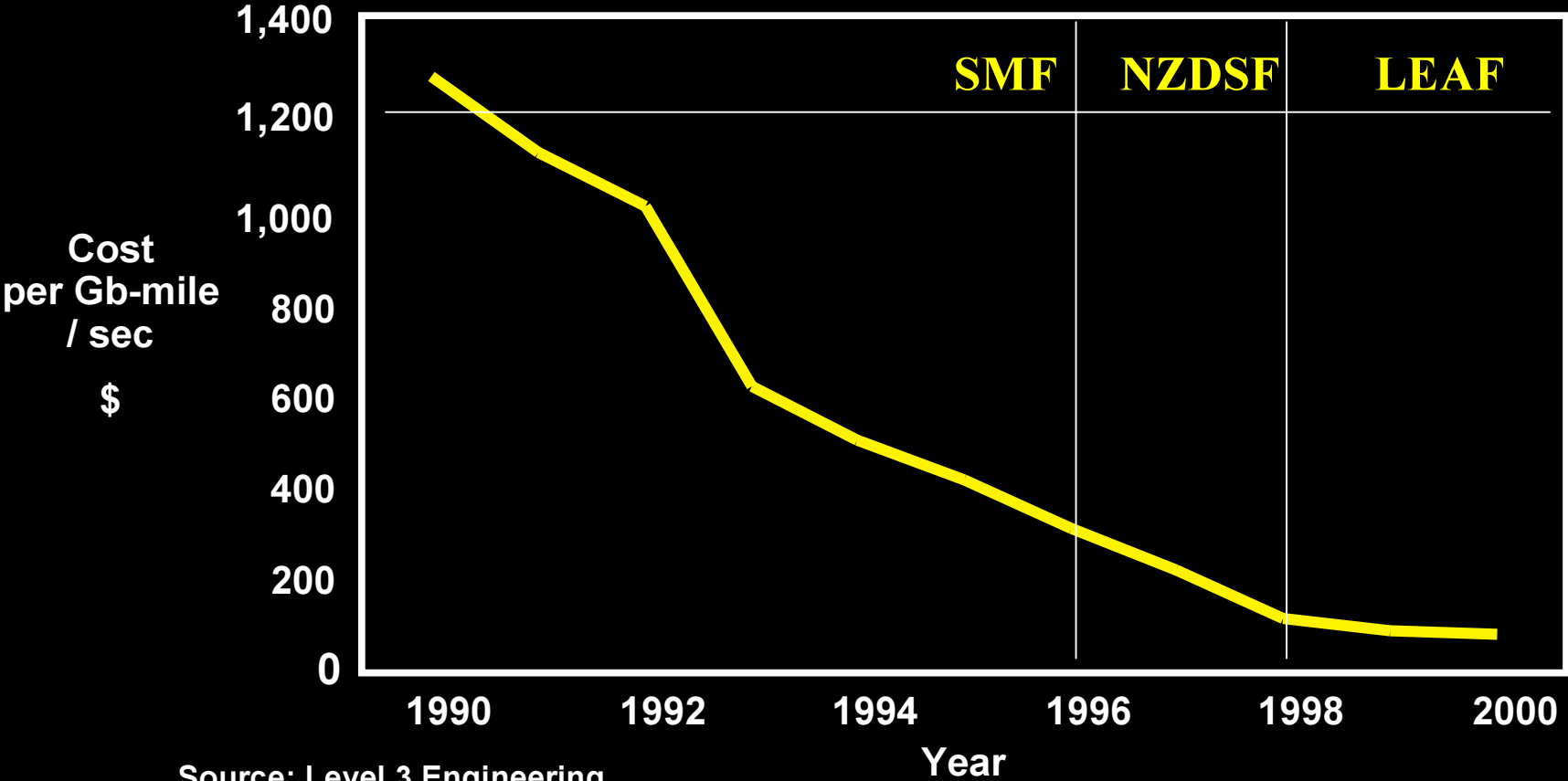
WHAT ARE THE DRIVERS ??

The demand for bandwidth by applications like electronic mail and World Wide Web grows exponentially, because of falling costs and standardization on the Internet Protocol.



- The **transatlantic bandwidth from the Netherlands** available for IP has already overtaken the capacity for voice telephony

Historically, Transport Costs Have Rapidly Decreased

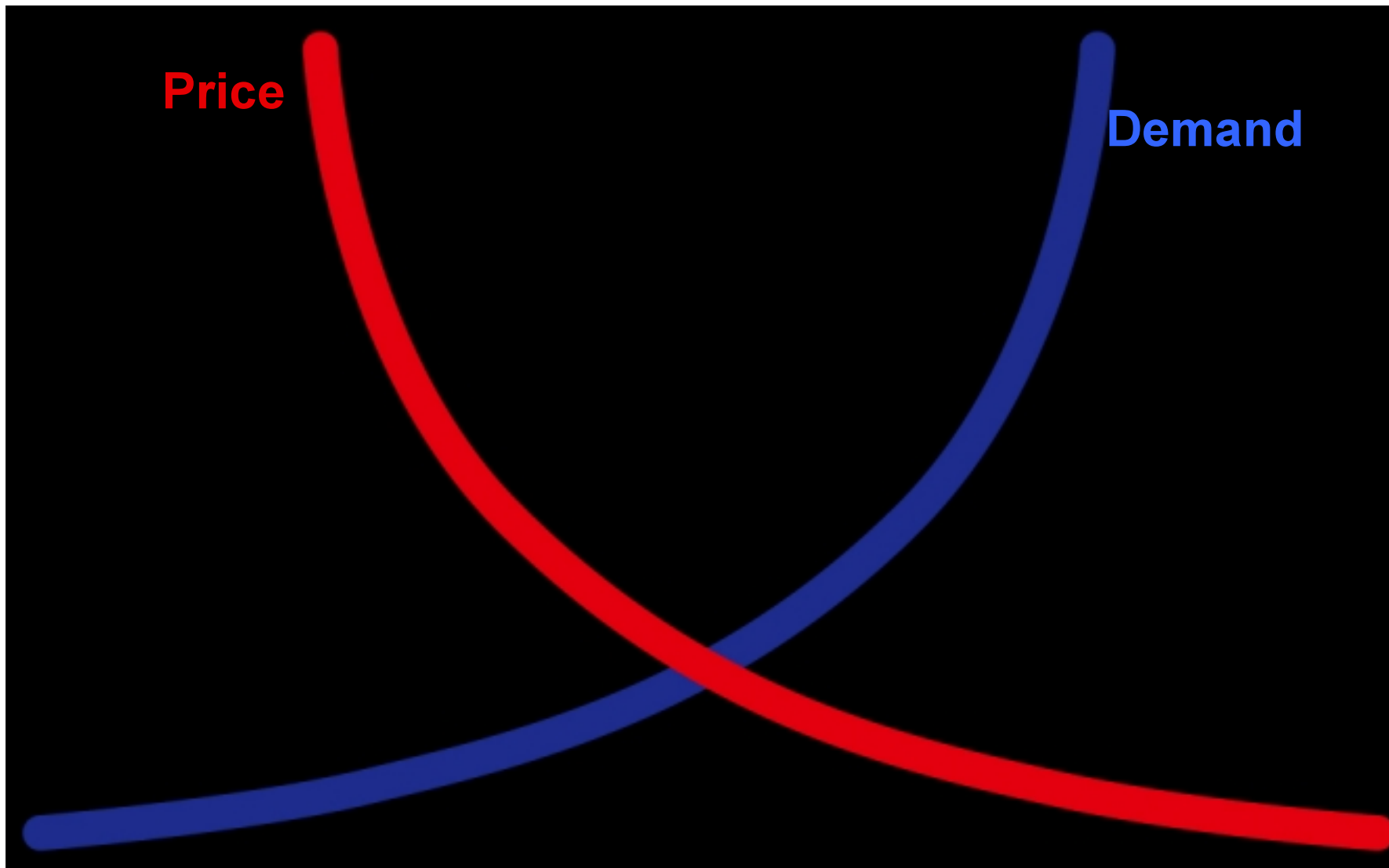


Source: Level 3 Engineering

Market Based Standards (IP) and Rapid Price-Performance Improvement Will Disrupt The Communications Industry

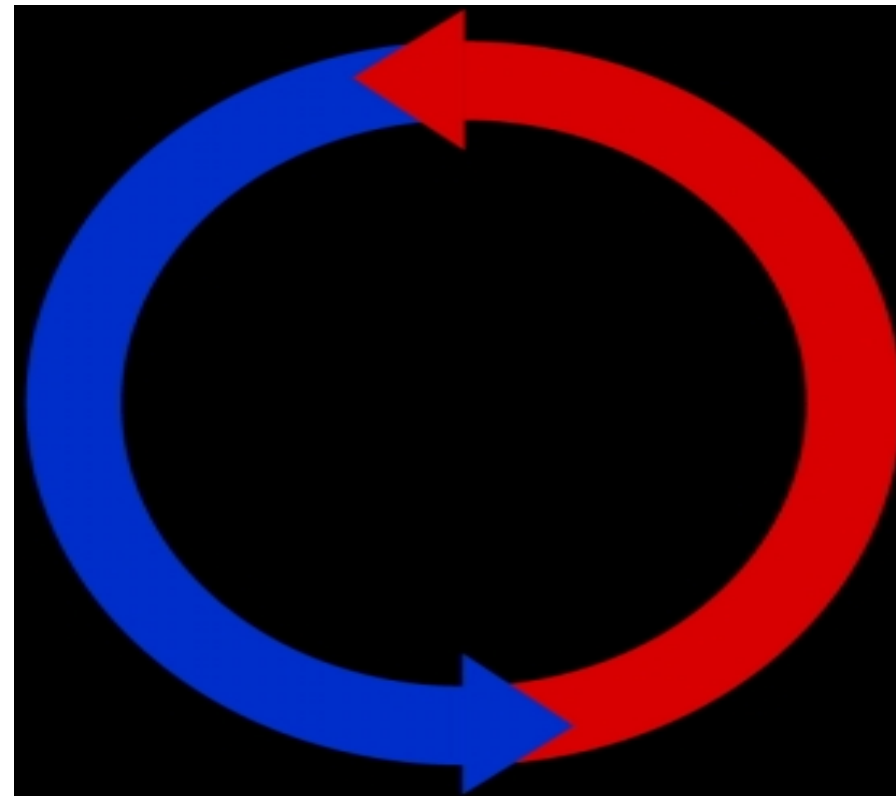
- Similar to mainframe replacement by client server/archive computing (and back to server farms ?)
- Centralized circuit switched networks replaced by distributed soft-switched networks + ASP's
- Vertical integration replaced by horizontal integration (value chains incl, services, bandwidth hotels?)

Network Economics: Demand Elasticity.
for Bandwidth: est. = 1.5




The Virtuous Cycle of Network Economics

**Increasing
Unit
Demand**



**Decreasing
Unit Price**

Sources of Communication Service Demand- *Conventional*

- 
- **Electronic commerce “E-commerce”**
 - **Software distribution**
 - **Music distribution MP3**
 - **Video on demand**
 - **Video conferencing**
 - **Telepresence**

Sources of Communication Service Demand - *structural drivers*

Human (and computer-computer !) social and economic activities

- (tele) Communication
 - “Networking”
 - E-mail attachments
 - Chatting, SeeUseMe, SMS !! --->> Mobile IP
- Co-operation
 - Games, group simulations, Co-engineering, model sharing, workflow

SOHO + medium size offices (5 - 20 people)
MICRO-TRANSACTIONS between people and ... between (embedded) computers

World Wide IP Computer BUS linking hundreds of millions of devices

What do people (knowledge workers) actually DO in the Network Economy?

Transactions/interactions =

The searching, coordinating and monitoring that people and firms do when they exchange goods, services or idea's, internal or external

They take many everyday forms to “enable” the FLOW and exchanges:

management meetings, conferences, phone conversations, sales calls, problem solving, reporting, gossip, “organizing” details!, outsourcing, “super resolution”

McKinsey estimated that the percentage of work time used for interactions is

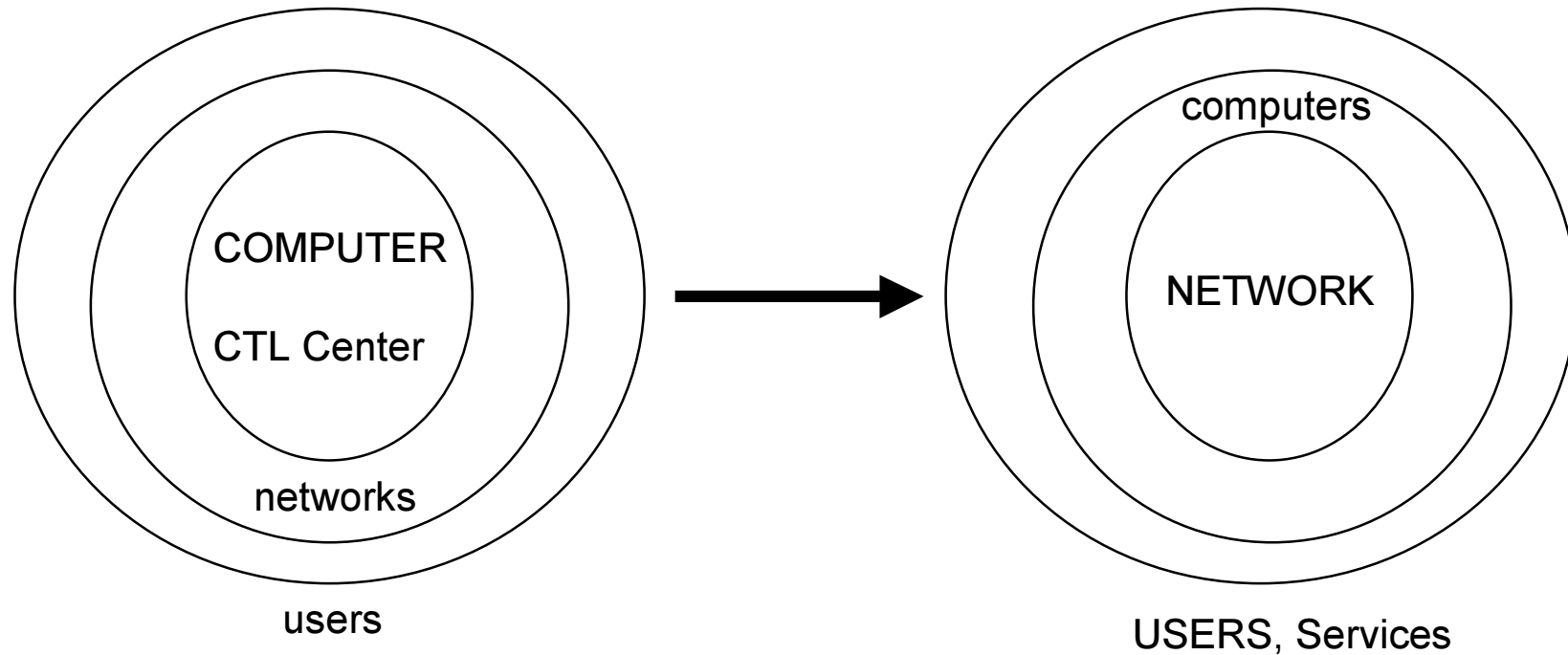
54 % in the USA

48 % in Europe

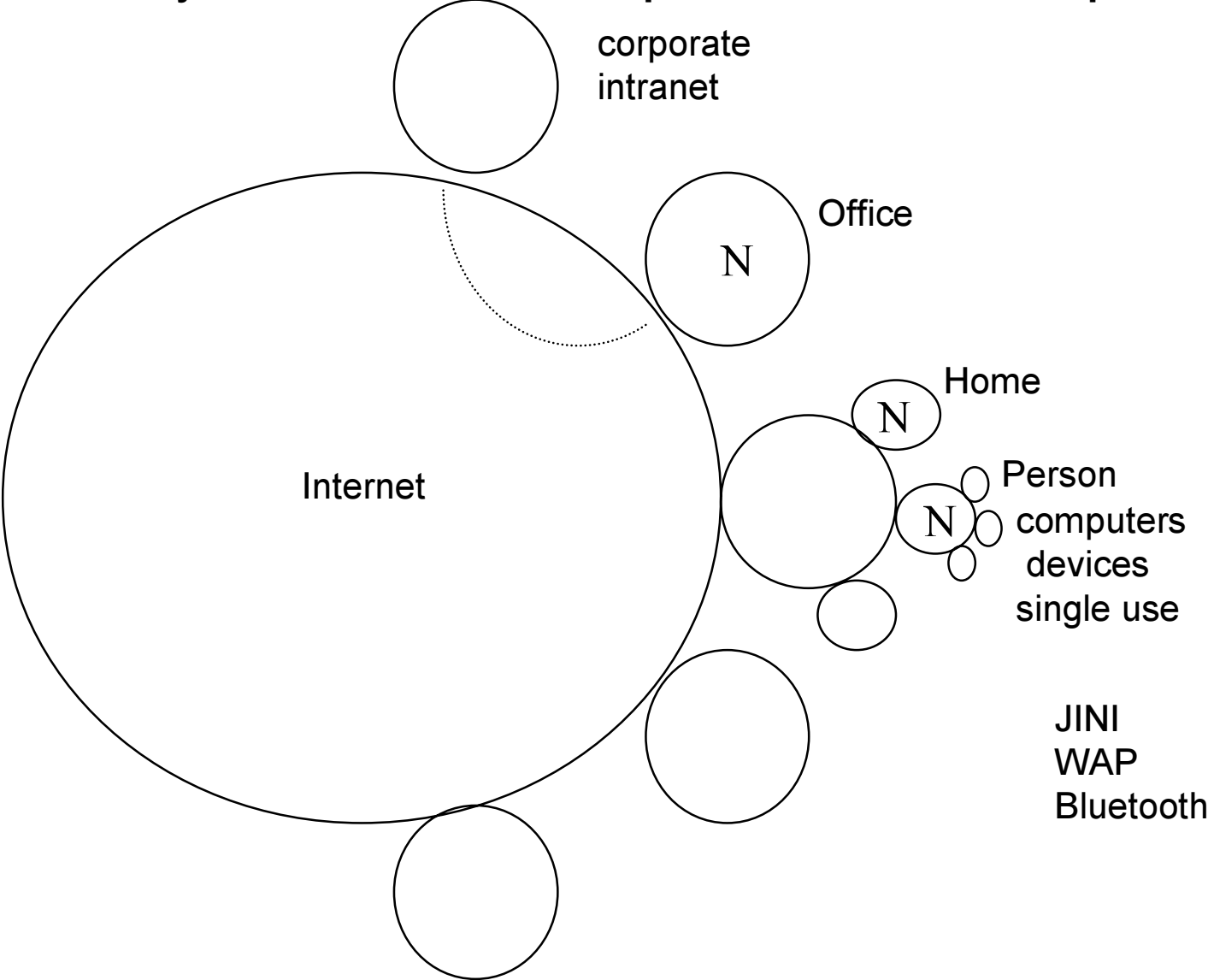
36 % in India

This is not slack, this is WORK !!! --> hurry, quality of transactions
Internet Time and Place distortion

The central Internet paradigm shift



What will it maybe look like : Fractal repetition of the Internet paradigm



This “I-mancipation” network liberation movement of
knowledge workers will inevitably break open obstructions
and bypass bureaucratic barriers, like it did
the Berlin Wall 10 years ago #

The Network Economy’s main problem is lack of Imagination

PREPARE FOR TRANSITIONS AND THE UNEXPECTED

I wish you all GOOD CONNECTIONS !!!