



Mobile Services in the Networked Economy

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Helsinki University of Technology

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Global trends in the mobile services industry

"The early days of mobile telephony"



"Technical, black and white, and targeted at 55- year- old male customers"

”The Fun Generation”

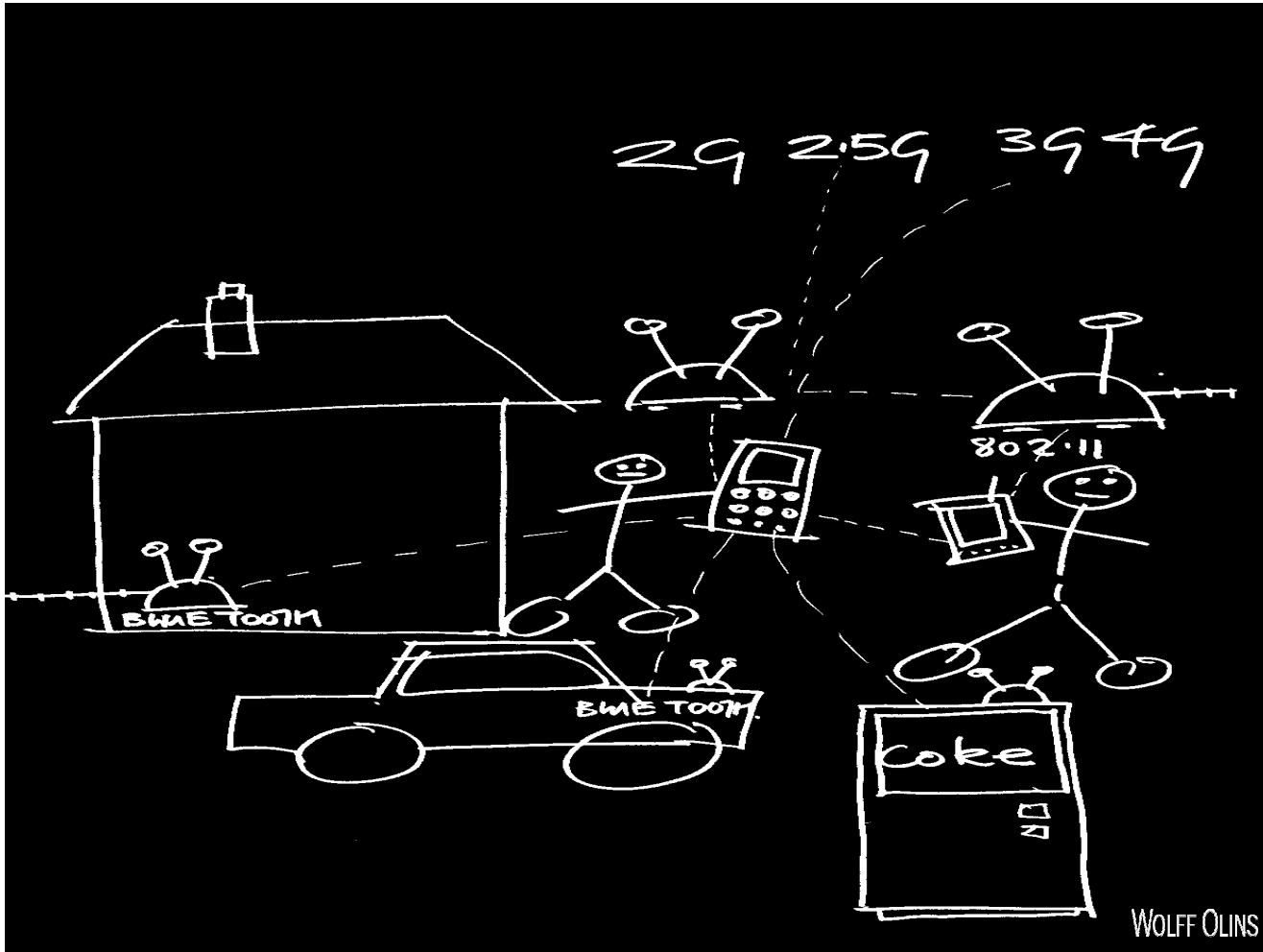


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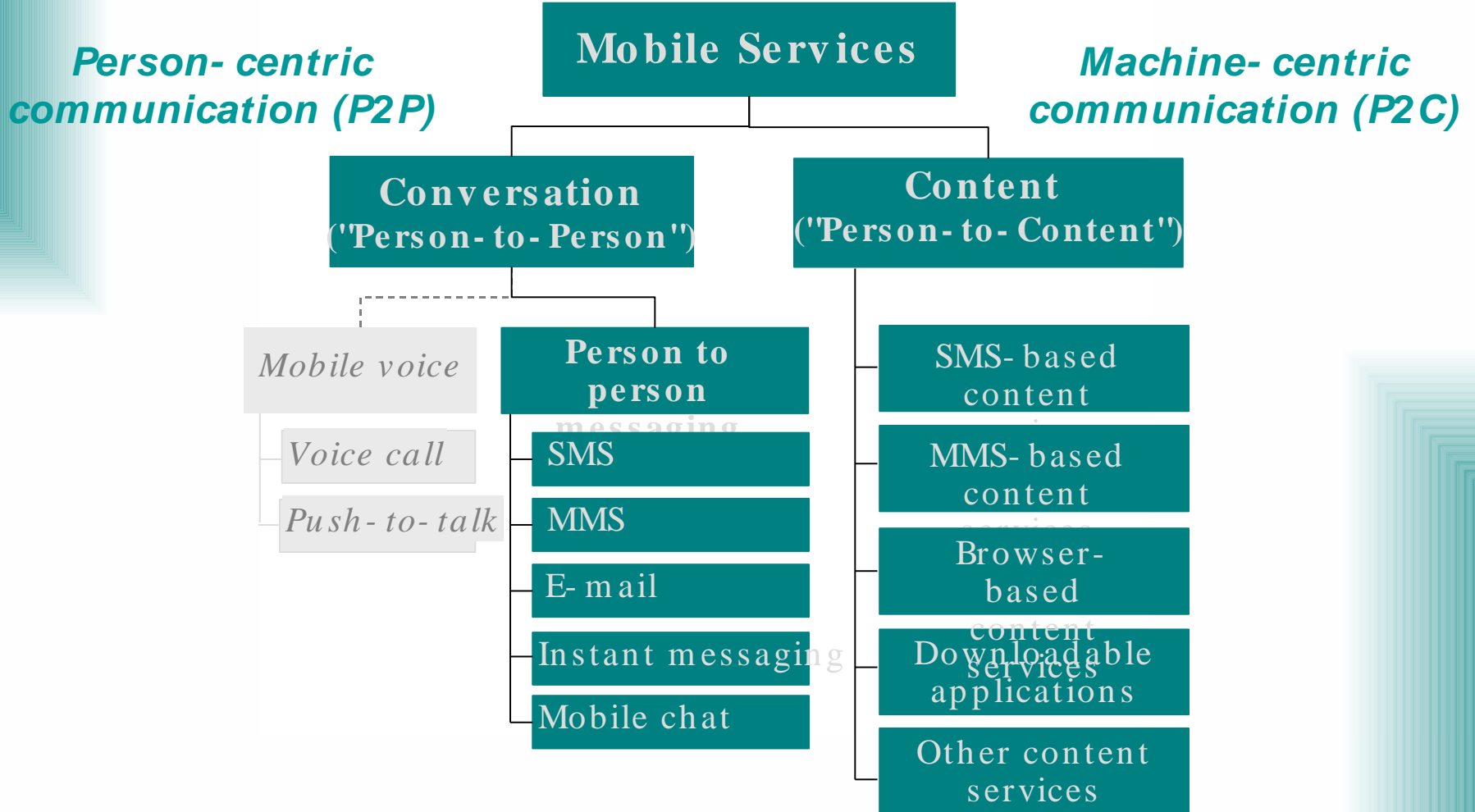
Fun, color, young people

Complexity increases

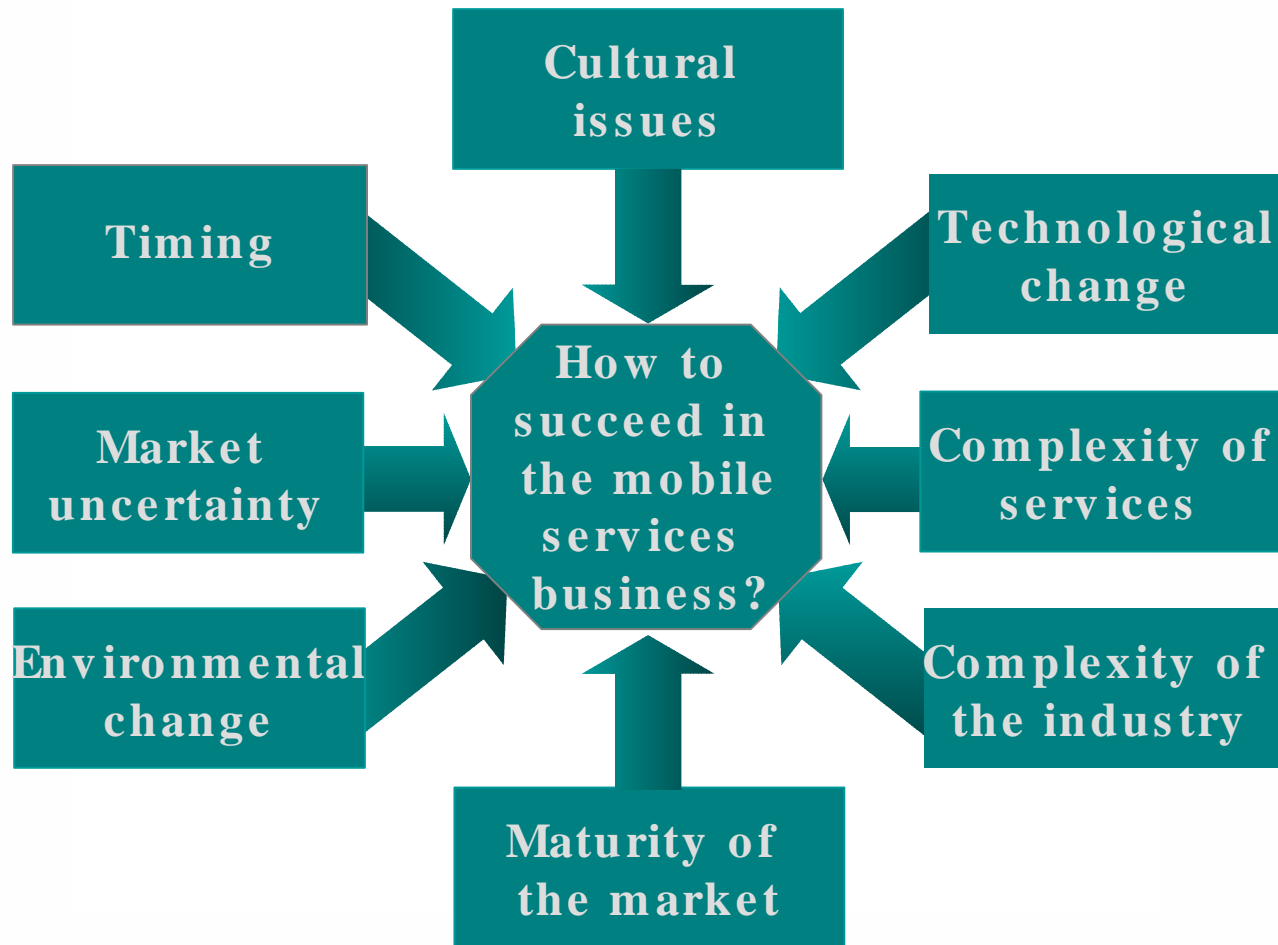


- 2G, 2.5G, 3G, 4G
- 11.5G
- UMTS
- WCDMA
- HSDPA
- HSUPA
- IEEE 802.11
- Wi-Fi / WLAN
- WiMAX
- IEEE 802.16e
- Bluetooth
- RFID
- UWB
- Flash- OFDM
- VoIP
- ...

Typology of mobile data services



The challenging world of mobile services business



Based on Vesa (2005), *Mobile services in the networked economy*, IRM Press

Key trends in the mobile services industry: The Three "C's"



Complexity The increasing complexity of products/ services, of industries, and of mobile services markets.

Collaboration The increasing need for extensive collaboration between companies over traditional industry boundaries.

Coordination The increasing need for "orchestration" and coordination of extensive business networks (a.k.a. business ecosystems)

On theories of complexity, collaboration, and coordination

Coordination of complex goods

- A **complex good**
 - "an **applied system** with components that have multiple interactions and constitute a **nondecomposable whole**" (Mitchell & Singh 1996)
- The **overall performance** depends on **component performance** ("the weakest link").
- As a result of these multiple interactions, "the components require **close configuration** for reliable performance".
- "Complex goods **cannot be separated into components without degrading capabilities.**"
- The billion dollar question
 - It is possible to decompose - or to "**modularize**" - mobile services without degrading the capabilities of the service?

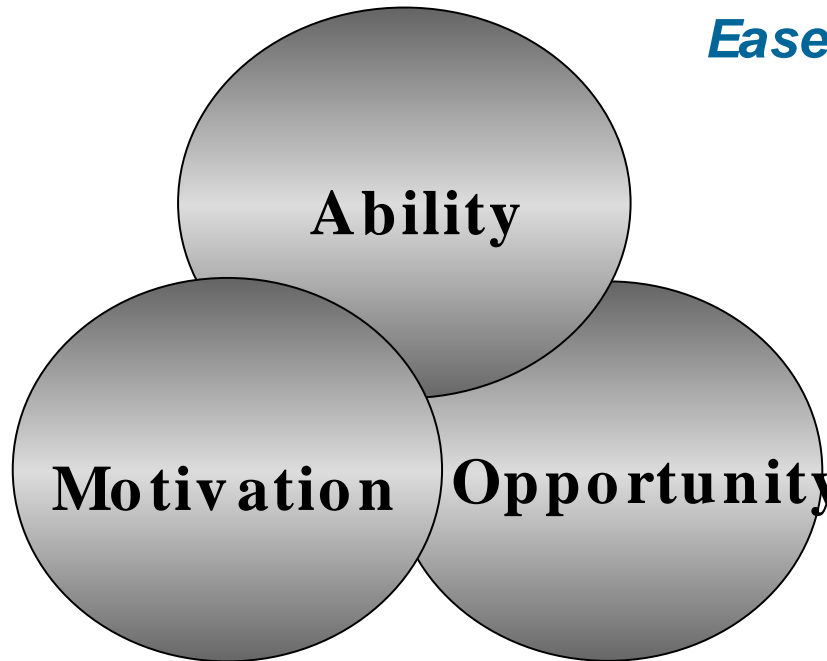
Ability, Motivation and Opportunity (AMO) are vital elements of successful services



**Ability to communicate
or to use the service**

WAP services ✓
SMS ok!
MMS ✓

Ease-of-Use



WAP services ✓
SMS ok!
MMS ✓

*Usefulness
Value*

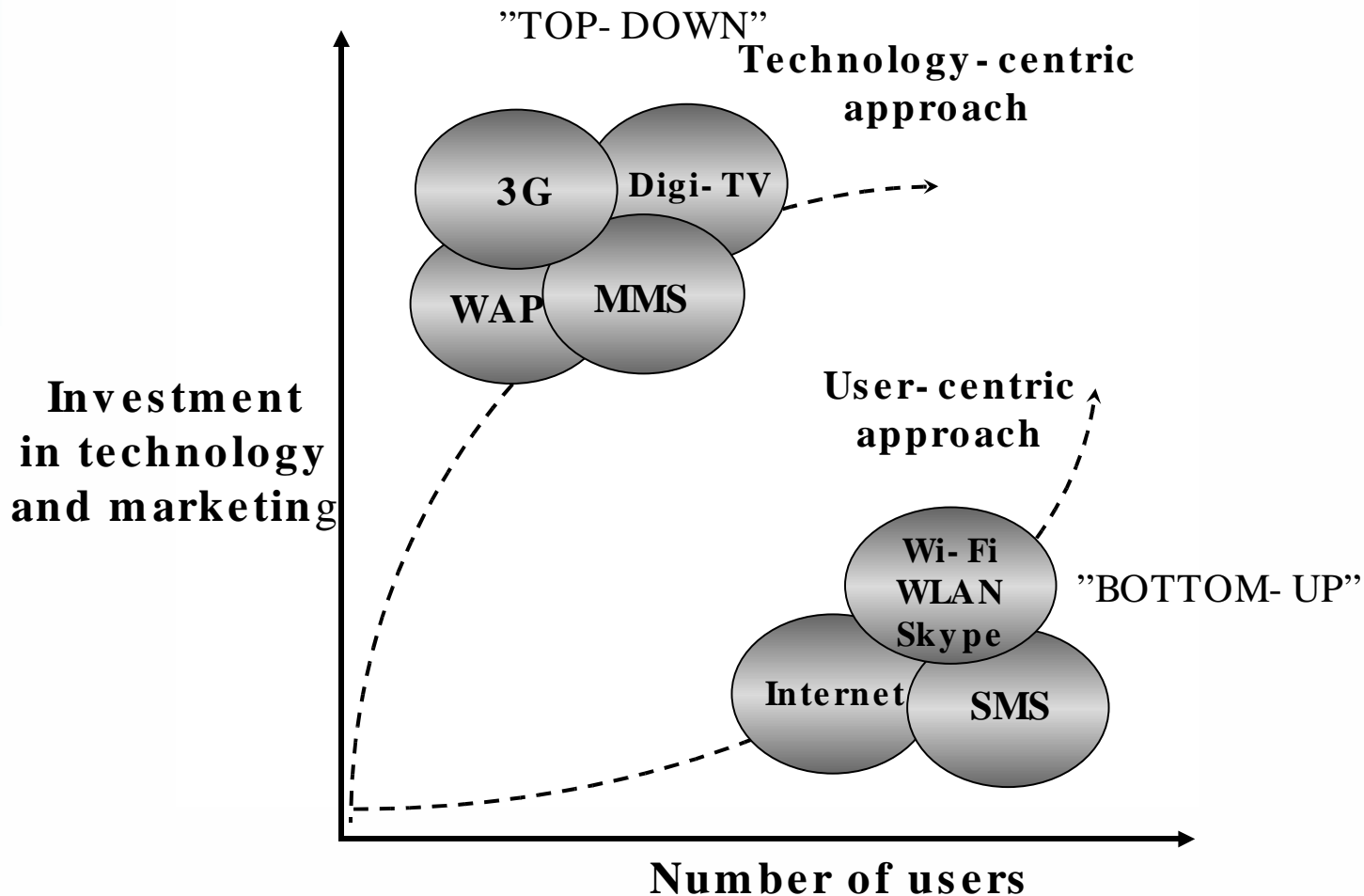
WAP services
SMS ok!
MMS

Availability

**Reason to go through all the
trouble to be able to communicate
or to use a content service**

**Access to the communications
system (i.e. suitable device,
connection to the service)**

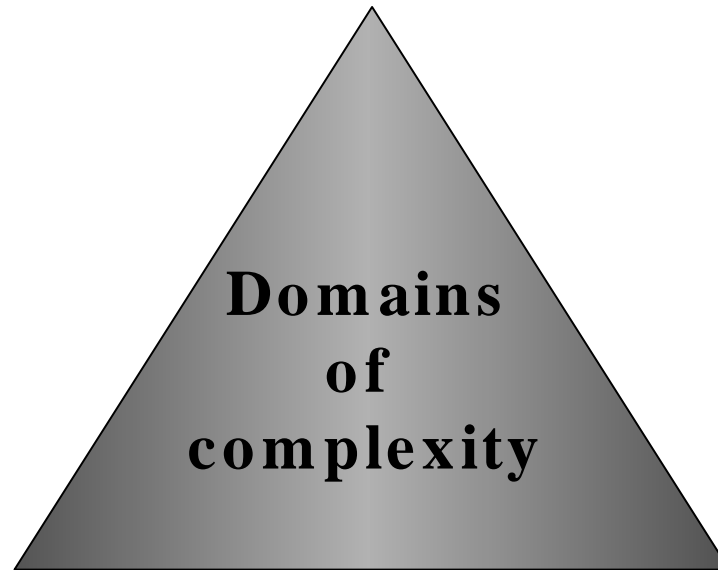
Diffusion of communications technology: technology- centric vs. user- centric approach



Three distinct domains of complexity in the mobile services industry



The complexity of mobile networks (technical)



The complexity of end-user market (commercial)

The complexity of the mobile industry (collaboration)

Two major difficulties in the commercialization of complex goods



- Firstly, companies must "develop and maintain the **ability to produce and coordinate** the many dissimilar components" (Mitchell & Singh, 1996)
 - In the mobile services industry this refers to the fact that all three elements - networks, terminals and services - must be commercialized in parallel.
- Secondly, managing complex processes requires **complex and often expensive organizational structures**.
 - Maintaining this kind of high degree of variety in organizational structures requires costly interactive mechanisms.

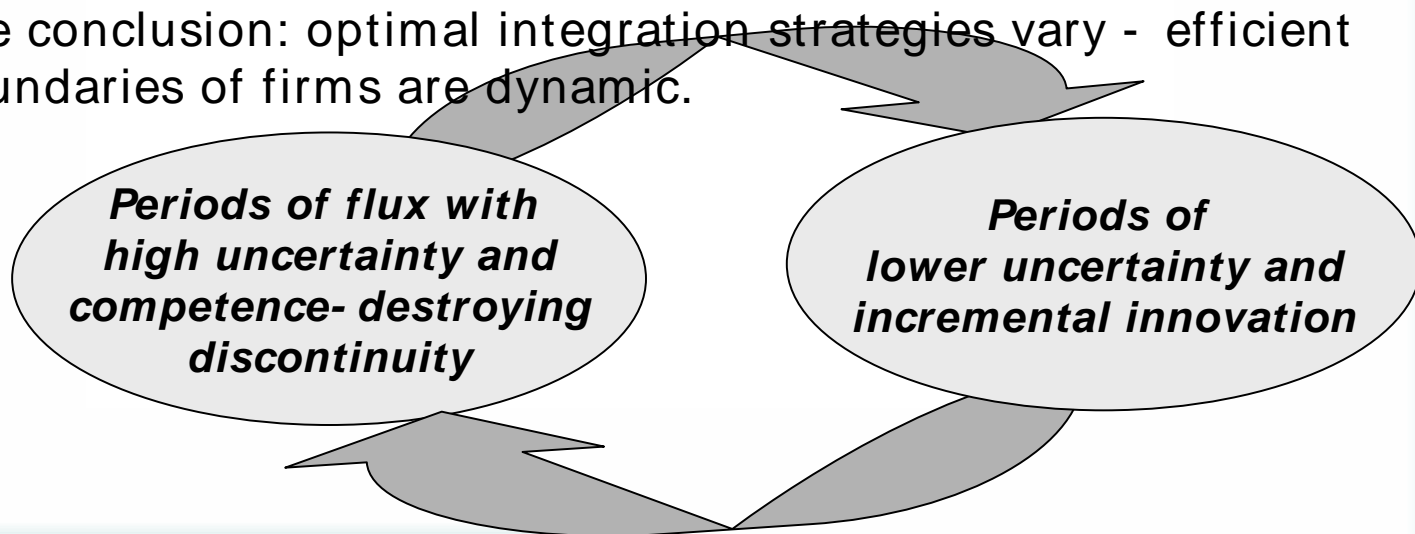
Market uncertainty, environmental shocks and the dynamic boundaries of firms



- **The role of market uncertainty**
 - Pioneering firms may be forced to undertake many states of activity in order to create credibility for a **radical new industry** (Harrigan, 1984)
 - e.g. NTT DoCoMo's active role in developing the Japanese mobile services market (Kodama 2002, 2003)
- **Environmental shocks**
 - An industry may experience a **major shakeout**, after which the industry looks very different.
 - Mitchell and Singh (1996) call these situations "environmental shocks" which can be described as "**sudden and substantial changes in technology or market segmentation**"
 - the ability to respond to external shocks depends partly on the **collaborative approaches** firms have chosen (development-oriented vs. marketing-oriented approaches).

Efficient boundaries of firms are dynamic

- "The technology on which a firm's capabilities and products rest usually evolves from a ***period of flux with high uncertainty*** to one of ***incremental innovation and relatively low uncertainty***" (Afuah, 2001)
- Various industries oscillate between cycles of ***high uncertainty and competence-destroying discontinuity***, and periods of ***lower uncertainty and incremental innovation***.
- The conclusion: optimal integration strategies vary - efficient boundaries of firms are dynamic.

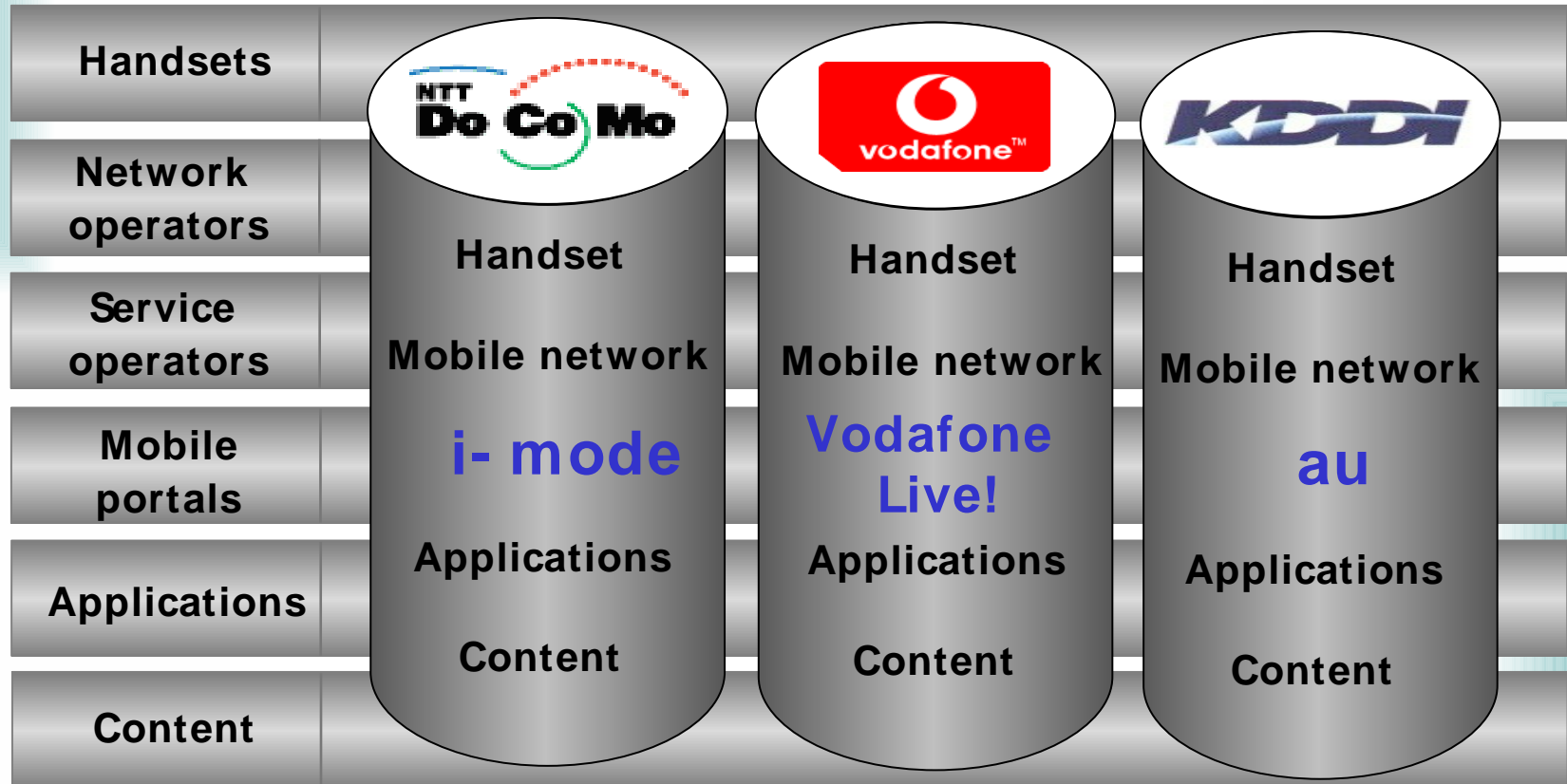


Evolution of firms and industry boundaries - some conclusions

- ***The focus*** is shifting from firm level to ***network or industry level analysis***.
- ***Boundaries are less clear***: It will be increasingly difficult to the where a firm, a business network, an industry, or an ecosystem begins or ends.
- ***Boundaries are dynamic*** - they change constantly and these changes are driven by factors such as maturity of the market, market uncertainty, environmental change, technological change, regulation, and so forth.
- ***Timing is essential***: The world is not linear, and tomorrow is not necessarily like today - an optimal structure may change over time as the markets, technology, or consumer behavior change.

Mobile services in three markets: Japan, Finland and the UK

The *vertical* and integrated structure of the Japanese mobile market



"Operator- driven business model"

NTT DoCoMo as a Content- Centeric Value Chain Coordinator

- NTT DoCoMo describes the **role of i- mode** in the Japanese mobile Internet ecosystem as "**content- centric value chain co- ordinator**" (Hirano, 2002).
- The **mobile service value chain** is a **layered model** where various layers require different kinds of skills and resources:
 - in the **handset layer** the important attributes or success factors are size, weight, battery, and price;
 - in the **network layer**, good coverage and packet- based technogy;
 - in the **server layer**, servers must be based on solid technology;
 - in the **marketing layer**, it is important to keep marketing messages easy to understand and to keep it consumer oriented - not technology oriented
 - well- balanced and high- quality **content** is the most important

Mix- and- match, PC- like *horizontal* structure of the Finnish mobile market



<p>Marketing legislation (no SIM- lock, no bundling ¹⁾)</p> <p>Regulation</p>	Handsets	Nokia	Samsung	Siemens	Sony Ericsson	
	Network operators	TeliaSonera		Elisa	Finnet	
	Service operators	TeliaSonera	Saunalahti	Cubio	Spinbox	DNA
		Tele Finland	Elisa	Fujitsu	Finland Oy	
	Mobile portals	ZED	Sonera Plaza	elisa.net	MTV3	Buumi.net
	Applications	MTV3 Handy	Elisa Palveluvalikko	Java games	E- mail	Location- based services
		Sonera Surf Port				
Content	Maps	Movie trailers	Weather	News		
	Screensavers	Ringtones	Music	Logos		

"(Handset) Vendor- driven business model"

¹⁾ Bundling of 3G subscription and handset will be allowed for a period of two years starting Jan 1, 2006 © Jarkko Vesa (2005)

Leading European mobile operators started to challenge Nokia in 2002

It's Mobile Operators vs. Handset Makers

Vodafone Joins Its Rivals, Snubbing Likes of Nokia

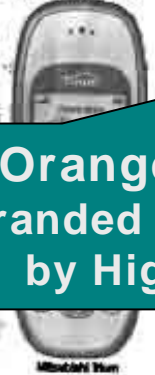
Hands Down

European companies dominate the GSM-handset market. Global GSM shipments, in millions of units and market share by vendor.

Vodafone ordered 500,000 handsets from Sharp

Orange will sell an Orange-branded handset manufactured by High Tech Computer of

Company	2Q '02	%Share	Shipments	%Share
Nokia	20.2	20.2	26.5	42.9
Motorola	10.0	15.5	9.5	15.1
Ericsson	10.0	4.4	5.6	9.1
Other	2.2	4.0	3.0	4.9
NEC	0.2	2.3	1.3	2.1
Japan	4.7	1.9	0.9	1.5
Philips	5.2	2.0	0.6	1.0
Other	0.8	0.2	0.8	1.3
Panasonic	2.7	1.1	0.4	0.6
Other	18.5	8.3	0.8	1.3
Total	252.1	100.0	62.8	100.0



Vodafone spokesman said his company also will price the Sharp handset cheaper than its rivals in other European markets. Earlier this week, Orange said it will sell an Orange-branded handset made by High Tech Computer Corp. of Taiwan, together with a detachable camera, for £180 in early November in the U.K. The phone is going to give Nokia

Vodafone Group, one of the world's largest operators, intends this week to begin selling Vodafone-branded, camera-equipped handsets made by Sharp Corp. of Japan and Matsushita Industrial Communication Co., to accompany its launch of picture messaging and other new services.

Chris Gent, Vodafone's chief executive, said his company has ordered all the camera phones that Sharp and Matsushita, widely known as Panasonic, are making for the European market. A Vodafone spokesman said the company has so far ordered 500,000 handsets from Sharp for sale across Europe, but declined to say how many Panasonic phones have been ordered.

Vodafone helped design the software in the Sharp phone, following in the footsteps of Orange SA, France Telecom SA's mobile unit; KPN NV, and other European operators that have asked Asian suppliers to build handsets to their specifications. The influx of customized phones from

Asia marks a watershed in the European mobile-phone industry, where different operators have typically sold exactly the same models to their customers and competed purely on price. Nokia and Motorola, in particular, have benefited from this business model, which has allowed them to achieve significant economies of scale and build up well-known brand names by making millions of identical handsets. Now, operators' push to bolster their own brands is giving many Asian handset makers an opportunity to break into the vast market for handsets that comply with the GSM, or global system for mobile communications, standard. GSM, the dominant cellular standard globally, was devel-

oped in Europe, and European handset makers, together with Motorola of the

Hutchison Whampoa ("3") ordered two million specially

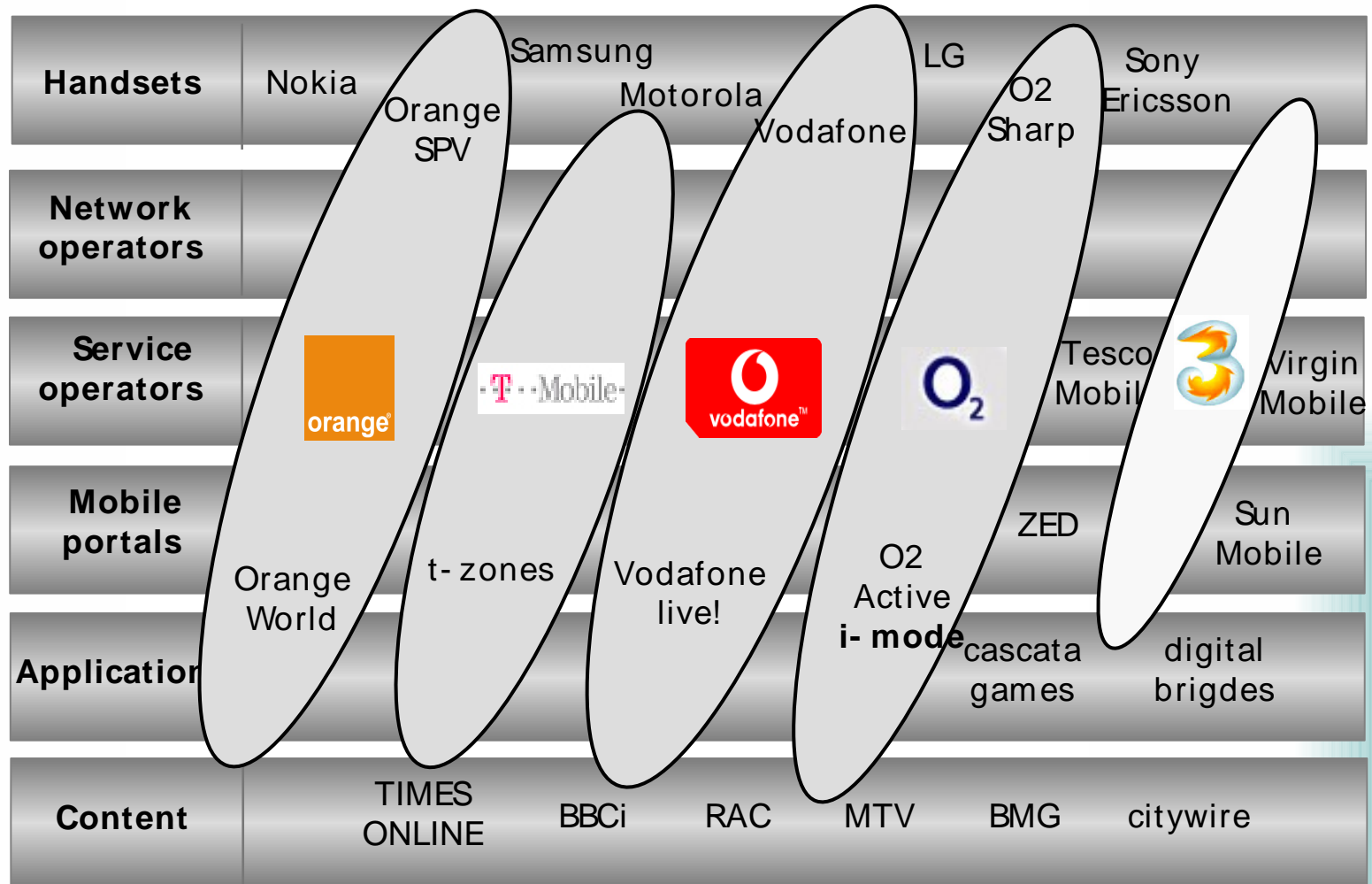
label, which says it has contracted with the end of March next year, for £200 (£316) in the U.K. with a network contract. The Nokia phone costs £200. Moreover, the Sharp phone is the only handset available on a prepaid contract. The

ures, which will be rolled out in France, Denmark, Switzerland, Belgium, the Netherlands and other European countries where Orange offers services.

Meanwhile, Hutchison Whampoa Ltd., the Hong Kong conglomerate, said this week it had ordered two million specially designed handsets from High Tech Computer Corp. of Japan. The handset will be sold at seven other European markets under three different brand names. Hutchison is a joint venture with U.S. Data Corp., which is likely to use the handset to offer services. Hutchison handset makers to provide products neatly tailored to their services. "It is all about differentiation," he says. "The operators are all trying to do it."

—Almar Latour and H. Asher Bolande contributed to this article.

The "tilted" or "hybrid" model of the UK mobile services industry



"Hybrid- model"

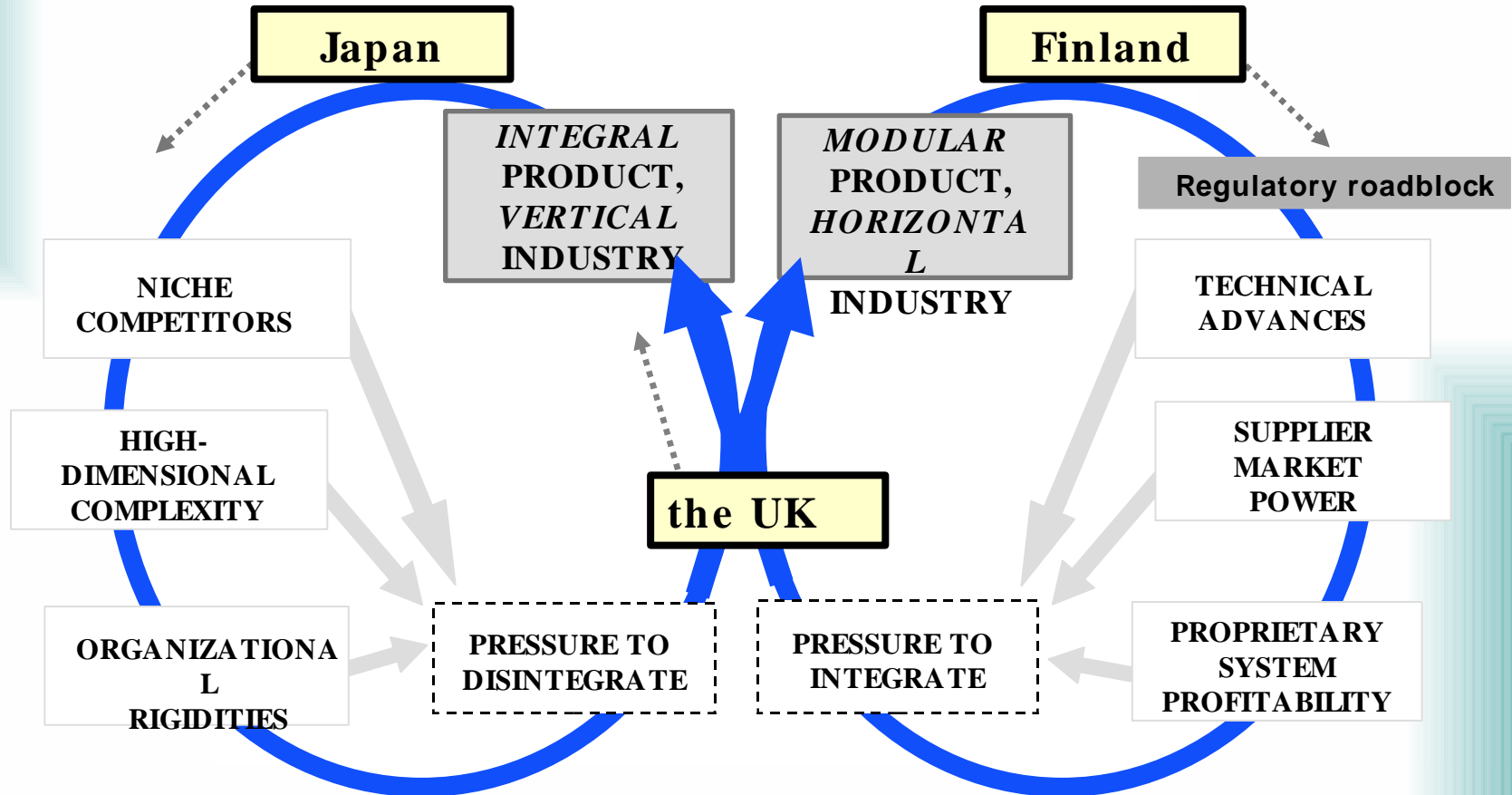
Examples of mobile services of the five leading operators in the UK market

The collage displays five mobile service websites:

- www.three.co.uk:** Features a navigation menu with 'Services' highlighted, a 'Mobile Web Sites' section, and a 'Timetable' search box.
- www.o2.com:** Promotes 'WHO WANTS TO BE A MILLIONAIRE' on a mobile phone, with a grid of game categories like 'Lemmings', 'Samurai', and 'LMA Manager 2005'.
- www.orange.co.uk:** Lists 'Orange services' such as calling, messaging, and multimedia, with a 'personalising your printing' section.
- www.vodafone-i.co.uk:** Promotes 'Vodafone live! with 3G' and features sections for 'Music and tones', 'Sport', and 'Entertainment'.
- www.t-zones.co.uk:** Features 'Highlights', 'The Hot List', and 'T Mobile Streets' sections, promoting mobile content and services.

www.vodafone-i.co.uk

One way of analyzing the dynamics: The Double Helix model (Fine, 1998)



The forces of change identified by Fine in the Double Helix model



- Forces pushing the vertical and integrated industry structure towards a horizontal and modular configuration:
 - (1) **Niche competitors.** "The relentless entry of niche competitors hoping to win business in discrete industry segments."
 - (2) **High dimensional complexity.** "The challenge of keeping ahead of the competition across many dimensions of technology and markets."
 - (3) **Organizational rigidities.** "The bureaucratic and organizational rigidities that often haunt large, established companies."

The forces of change identified by Fine in the Double Helix model



- Forces pushing the horizontal and modular structure towards a vertical and integrated configuration:
 - (1) **Technical advances.** Technical advances in a subsystem can make that "the scarce commodity in the chain, giving market power to its owner."
 - (2) **Supplier market power.** "Market power in one subsystem encourages bundling with other subsystems to increase control and add more value."
 - (3) **Proprietary system profitability.** Market power "encourages integration with other subsystems to develop proprietary integral solutions."
- The conclusion: Industry structures "should not be expected to be stable", rather they seem to "cycle between integral/vertical and horizontal/modular forms" (Fine 2000, p. 217)

The Finnish mobile market is currently in turmoil



- According to MIT professor Charles Fine (1998), "**horizontal structures tend to create fierce, commodity-like competition within individual niches**", and eventually, "**a shakeout typically occurs**" (p. 47)
 - The competition is currently focusing very much on price as all three 2G/ 2.5G networks offer high quality services and have extra capacity.
 - Mobile call tariffs are among the lowest in the world - and still decreasing.
 - In a **saturated market** with **no bundling** and free mobile **number portability**, operators are trying to steal customers from each other (churn rates for the three leading mobile operators were 33 - 50% in Q1 2005).
 - The **size of the Finnish mobile services market** is expected to **decrease by 20%** in 2005 due to "hyper-competition" and price erosion.

Even the Prime Minister has expressed his concern



"Operators are tripping the information society"
Matti Vanhanen
The Prime Minister of Finland

The buzzword this fall is "free"

Helsingin Sanomat 26.8.2005

HS 21.9.2005

Saunalahti Xtra

SAUNALAHTI

Videopuhelut AINOANA SUOMESSA Saunalahtelta

Näe juttu-kaverisi!

Nyt 3G-videopuhelut ilmaiseksi

Ystävien kaverien on tässä! Saat tarjonnasta nyt 3G-videopuhelut maksutta vuoden sopimus asti.*

Videopuhelut soittaminen on nyt helppoa kuin tehdessä äänipuhelut. Puhelua voit käyttää millä tahansa Saunalahtien GSM-litellä, kunhan sekä soittaja että vastaanottaja on käyttäessään videopuheluita tukeva 3G-puhelin. Seläläinen on valittavana Motorola E1000, josta saat nyt huiman edullisesti Saunalahtelta.

Motorola E1000
3G-multimediatuhoihin
• 3G-videopuhelut
• MPEG4-kamera
• MP3-soitin
• Cam2Cam näytin
• Bluetooth

Vain 11,95 €/kk
(30-päivänsopimus 22 €)

Tilaa heti netistä saunalahti.fi tai soita (09) 4243 0900

Helsingin Sanomat 22.4.2005

PERJANTAINA 26. ELOKUUTA 2005

HELSINGIN SANOMAT

52 sivua

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SYYSKUU ON ILMAINEN.

Ja muutkin kuukaudet kestävät avertailun.

Tele Finland
Ilmainen syyskuu

minuuttia hintaan 0 euroa – normaalisti perusmaksu on 17,90 €/kk. Tuhopaketti-asiakkailta. Ole hyvä!

HS 26.9.2005

SONERA ETU -ASIAKAS

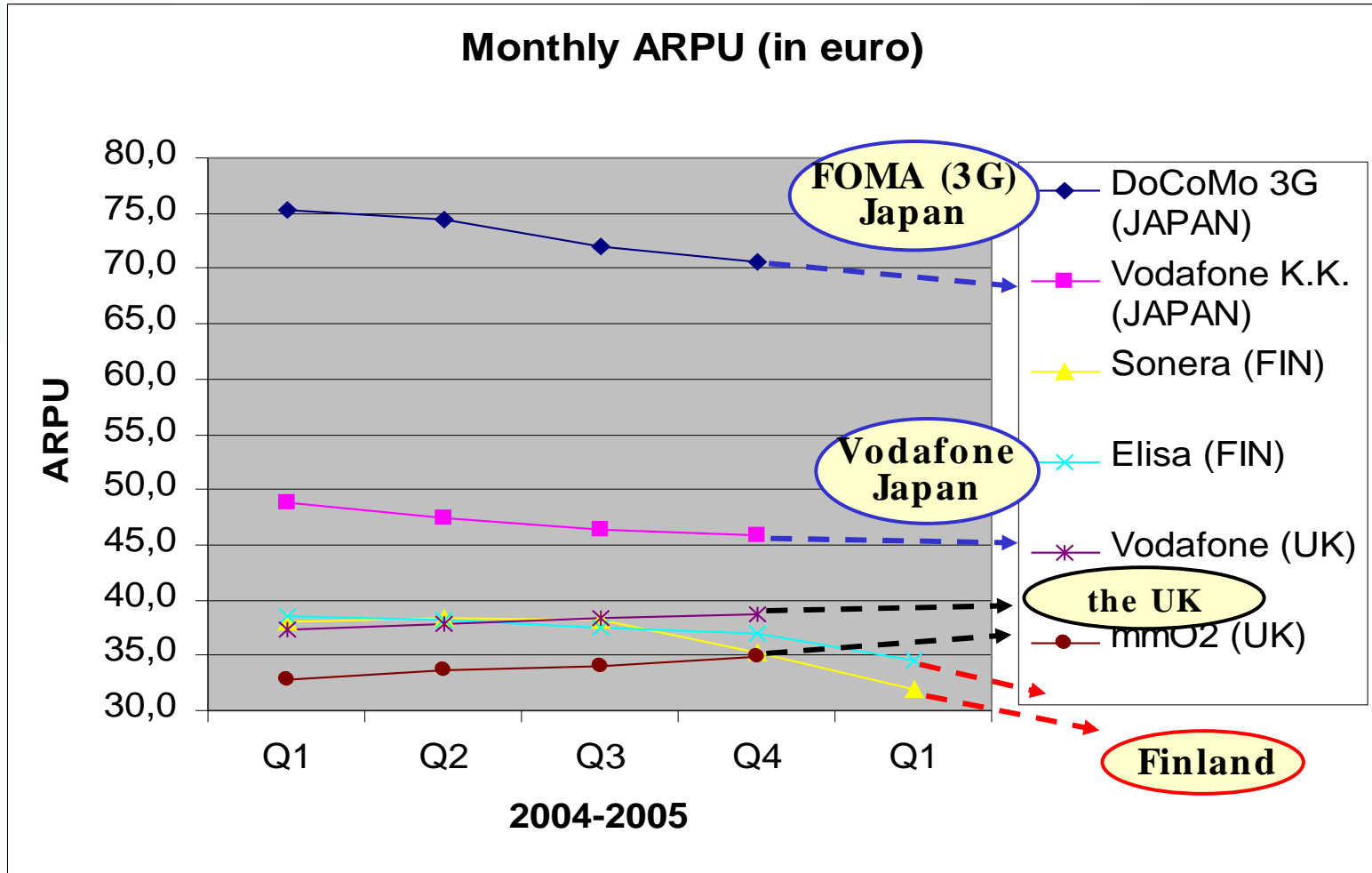
VARMISTA

1 €

SUNNUNTAIPUHELUT VUODEKSI ETEENPÄIN.

HS 26.9.2005

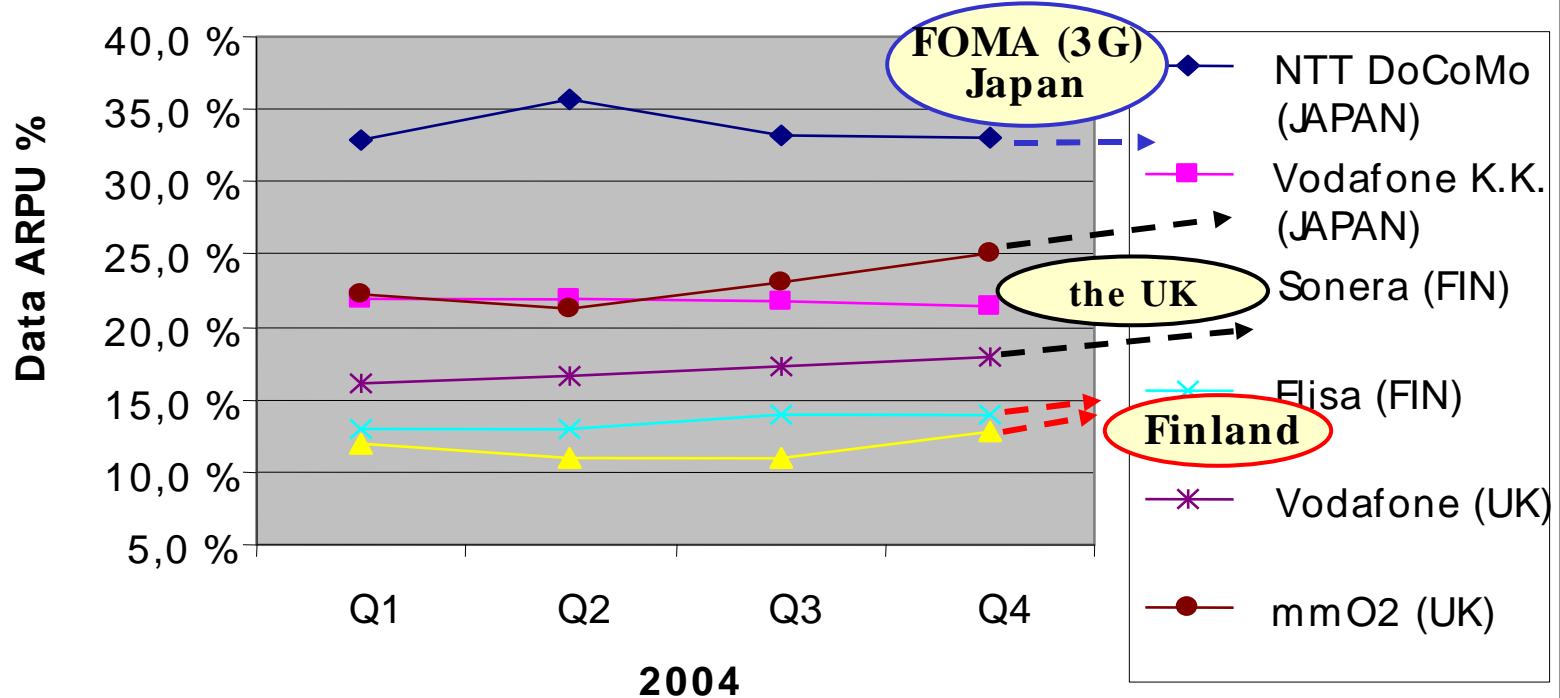
The current trend is alarming: monthly ARPU is going down fast



Increasing data- ARPU (mainly SMS) does not compensate the revenue loss



Non- voice services as a percentage of service revenues



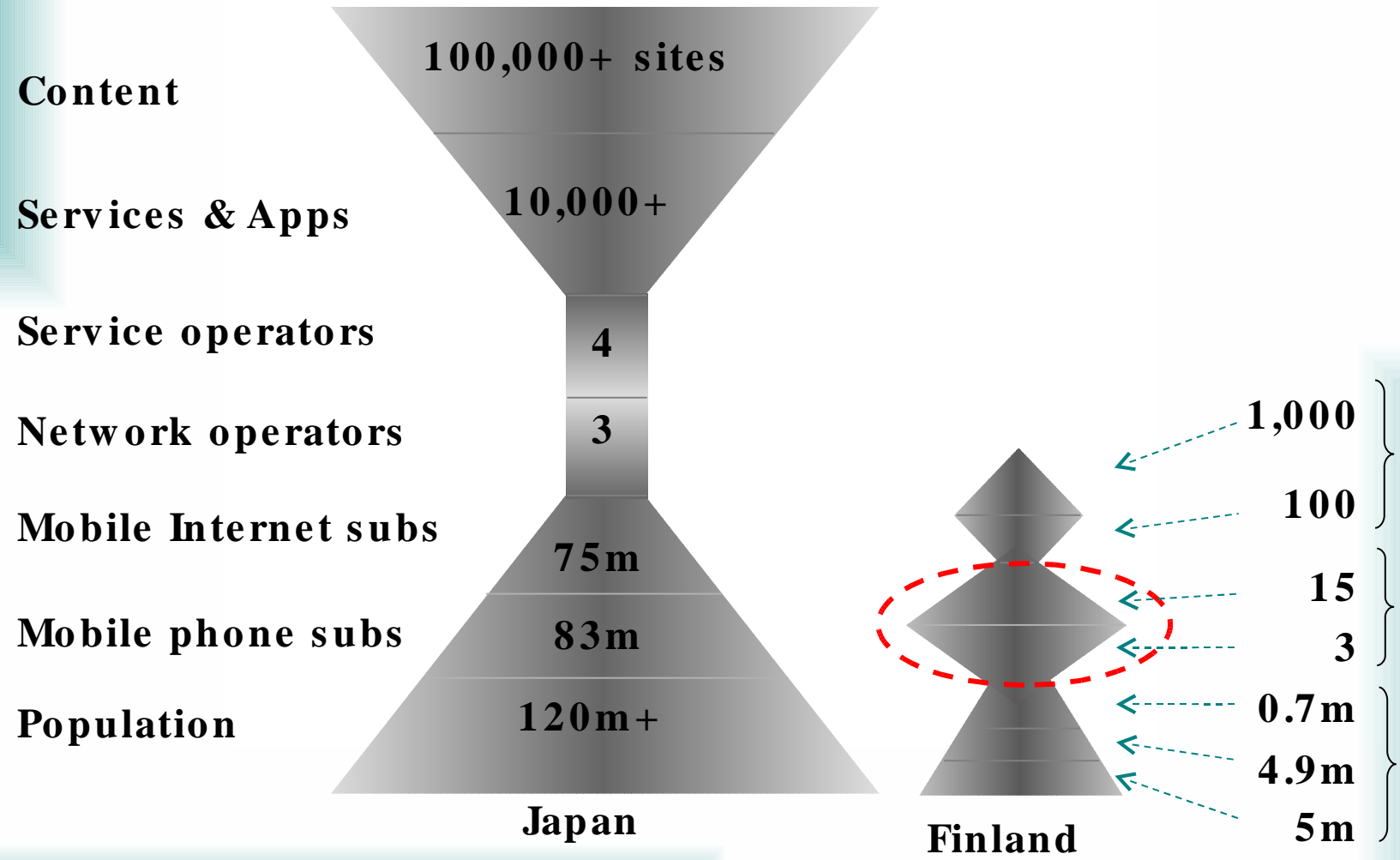
Applying the Strength of Network construct to mobile services market



<u>Construct</u>	<u>Japan</u>	<u>the UK</u>	<u>Finland</u>
(1) <u>Stand- alone product performance</u>	(18)	(10)	(7)
- network	4	2	2
- handset	5	3	2
- services	5	3	2
- content	4	2	1
(2) <u>User network</u>	(21)	(17)	(16)
- current size	5	3	1
- expected future size	5	4	2
- compatibility among members	4	3	4
- accessibility of network	3	3	5
- quality of users	4	4	4
(3) <u>Complements network</u>	(5)	(3)	(2)
- make the focal product more productive or complete			
(4) <u>Producer network</u>	(5)	(3)	(2)
- functionally equivalent to the focal product			
- compatible with the focal product			
Total score	49	33	27

Future challenges of mobile services: Case Finland

The Challenge of the future: how to reach critical mass in small markets



Small head, fat midriff and weak legs

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Regulator seeks only low consumer prices
FICORA blamed for the lameness of Finnish mobile industry

Timo Pöyhönen
 14 Sep 2004 at 17:00

The mobile industry of Finland is in poor condition. It has a small head, fat midriff and weak legs. This is how research fellow Jarkko Vesa from Helsinki Business University described the state of Finnish mobile operators.



Professor Jarkko Vesa of Helsinki Business University

The mobile industry of Finland is in poor condition. It has a small head, fat midriff and weak legs. This is how professor Jarkko Vesa from Helsinki Business University described the state of Finnish mobile operators while speaking on Thursday in Tampere.

Vesa explains that weak legs refer to the small Finnish population and mobile user base. "One can build a network for tens of millions of users for the same effort built for four million or a few hundred thousands,"

Fat midriff refers the number of mobile operators. For three network operators and fifteen mobile operators Japanese 70 million mobile customer base is served by two operators and four service operators.

Small head is a reference to weak content services. If mobile services are stuck in GSM voice calls and SMS operators aren't determined to risk there to move without advancing new content services, Vesa says.

Mobile Services in the Networked Economy
 Latest book by researcher Jarkko Vesa
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"The mobile industry of Finland is in poor condition. It has a small head, fat midriff and weak legs."
 (MobileMonday, 14 Sep 2004)

What do the numbers reveal?

	<u>Japan</u>	<u>Finland</u>	
Content providers	+ 100.000	1.000	Limited number of content providers
Services and applications	+ 10.000	100	Limited number of mobile apps
Service operators	4	15	} Large number of (service) operators
Network operators	3	3	
Mobile Internet users	72 m	0.7 m	Limited data usage (non-SMS)
Mobile phone subs	83 m	4.9 m	High penetration
Population	120 m	5 m	Small market

How is the Finnish mobile services market going to tackle the 3C's?



Complexity The increasing complexity of products/ services, of industries, and of mobile services markets.

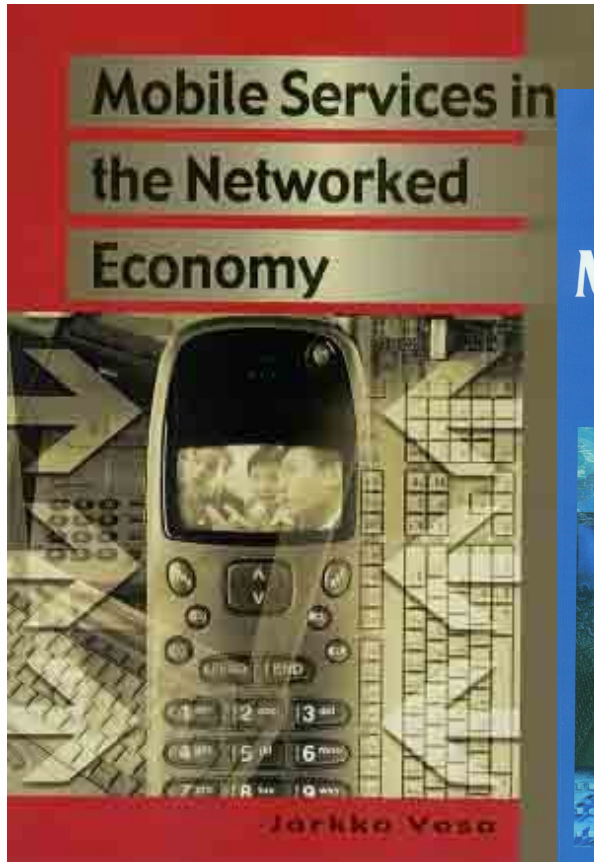
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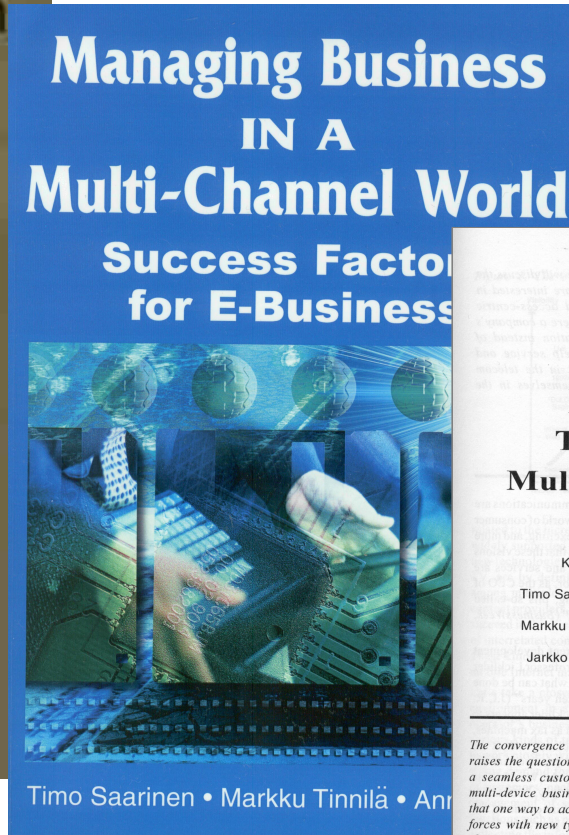
Conclusions

- The success of mobile data services in the future calls for a **clear operator control and guidance** in order to offer a rich user experience in mobile multimedia content and services (a "complex good").
- The best way for companies to survive in the current transformation of the mobile industry is to look for **new ways to cooperate** with suppliers, partners, customers, and even with competitors.
- **Business networks** are argued to increase flexibility and to provide access to skills and competencies of partners. However, these networks need **orchestrators**, or "value-chain coordinators" in order to succeed.
- A **fundamental question** for the European mobile services industry is whether it is possible to the market mechanism when dealing with complex goods or services - it may work for product-driven industries such as the PC industry, but complex³⁹

More about the transformation of the mobile industry and seamless services



www.irm-press.com
(April, 2005)



Idea Group
Publishing
(July, 2005)

