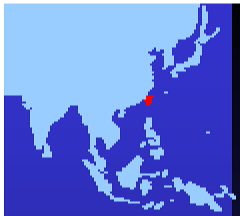


The Global Change in the Telecom Industry -- a Taiwan Case

Keynote in

Extreme Communications

A Radical Rethinking of Business, Technology and Communication Strategies

Dr. Mao Chi-Kuo

April 15, 2003

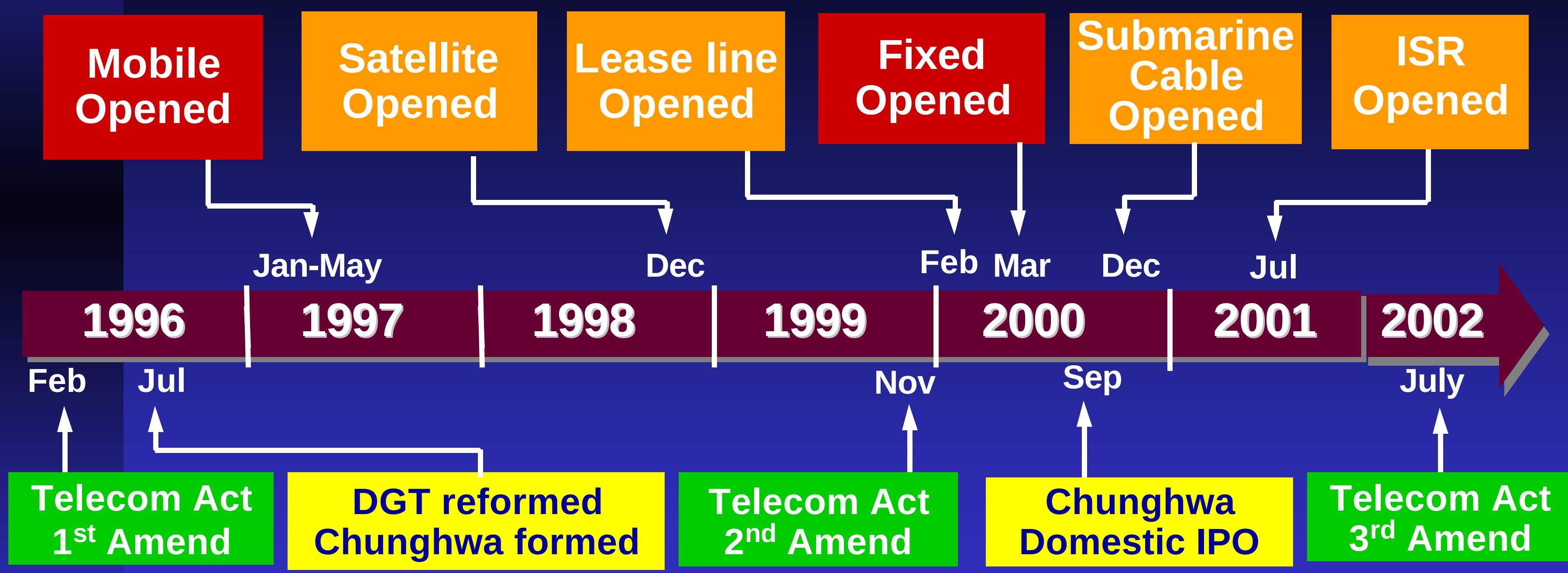
The Media Lab, MIT

Contents

Demographic Background

- **Land Area**
  - **36,000 KM²**
    (≅ 2 X Massachusetts)
- **Population**
  - **22.5 million**
- **Household**
  - **6.8 million**
- **Per Capita Income**
  - **U$ 12,000**

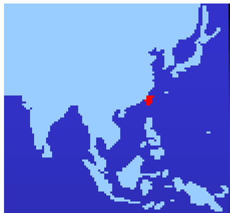
Telecom Deregulation Schedule



Chunghwa Telecom (CHT) Data

- **Date of Establishment: July 1st, 1996 (reformed from DGT)**
- **Number of Employee: 29,000**
- **Total Capital: US$ 2.8bn**
- **Total Asset: US$ 13.0bn**
- **Total Liability: US$ 2.2bn**
- **Shareholders' Equity: US$ 10.8bn**
- **Total Revenue (2001): US$ 5.2bn**
- **EBIT: US$ 1.34bn** (2001 — 7th place: Taiwan + China together)
- **EPS: NT$ 3.86 (2001) ; NT$ 4.4 (2002)**
- **Awards**: Best Corporate Governance in Taiwan 2003(by The Asset)
  Most Committed to Creating Shareholder Value 2003 (by FinanceAsia)

Telecom Market Profiles

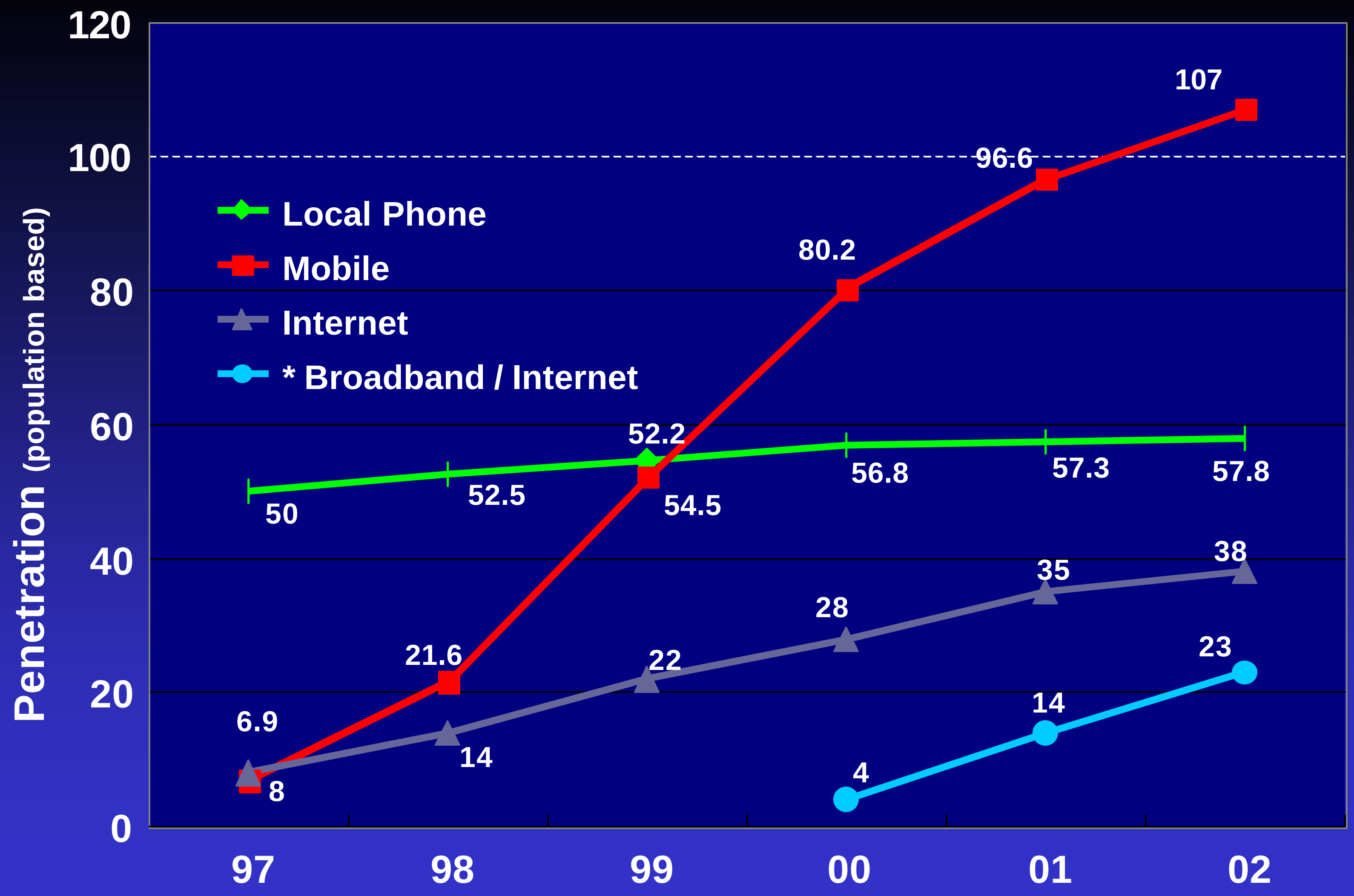


Telecom Market Structure

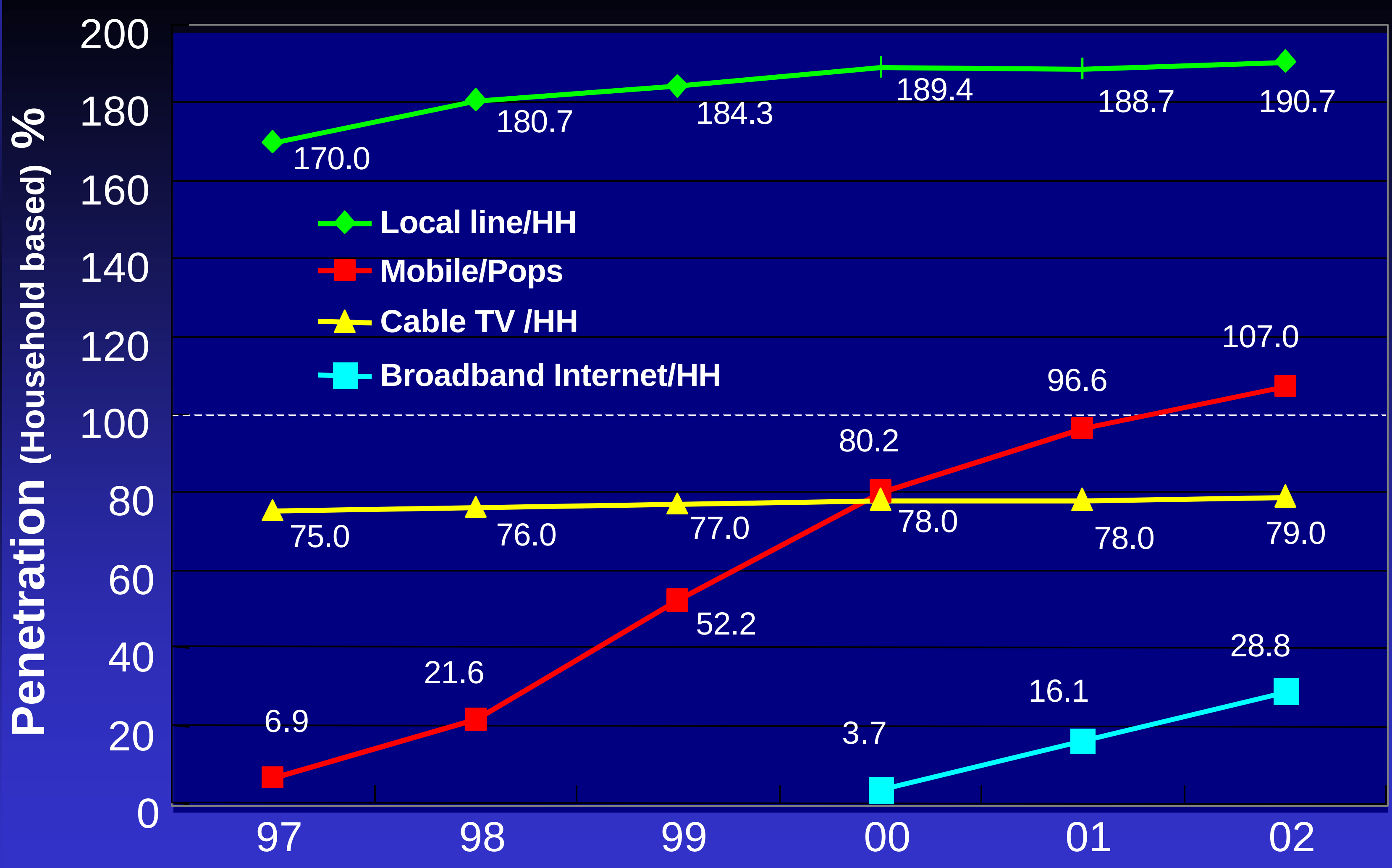
Dec. 2002

Types	Business Categories			Sub Total	Total
Type I	Fixed	Fixed Network		4	68
		Leased Circuit		15	
		Submarine Cable		1	
	Mobile	Cellular Services	6	35	
		Radio Paging	5		
		Mobile Data	6		
		Dispatching Radio	12		
		1900MHz Low Tier Radio	1		
		CT-2	3		
	Satellite	Mobile Satellite Service	0	13	
		Fixed Satellite Services	9		
		Satellite TV Program Relay	7		
Type II	Internet Access			185	350
	Voice Simple Resale			21	
	i-phone			20	
	others			124	

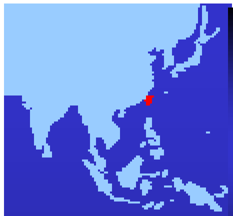
Market Profiles (1)



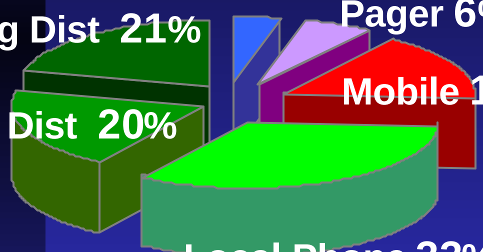
Market Profiles (2)



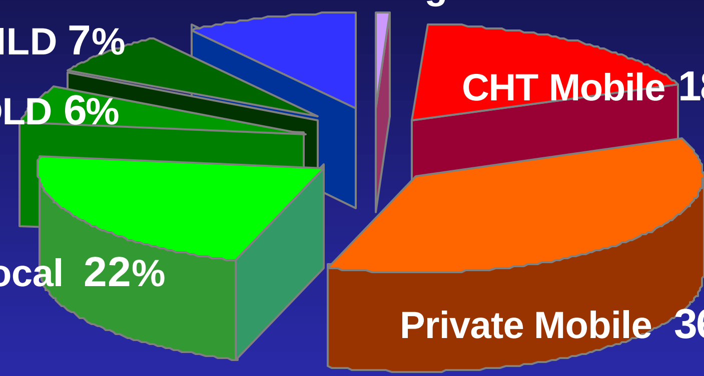
Market Structure Change



Dec 1997 (Before)



Dec 2001 (After)



Private operators stared servicing since 1998

å Revenue U$ 5.5 bn

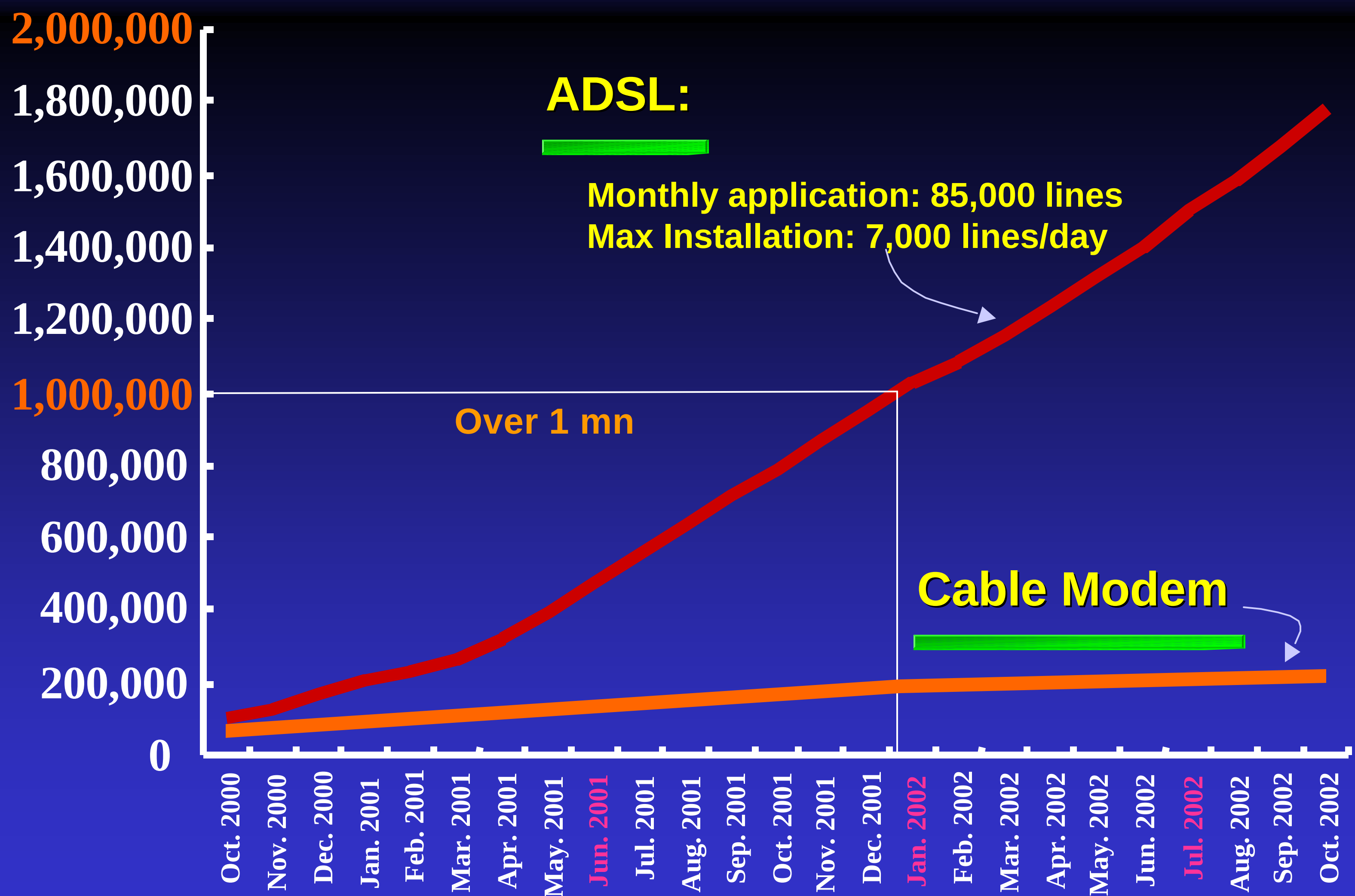
Fixed	74%
Mobile*	22%
Data	4%

å Revenue U$ 9.9 bn

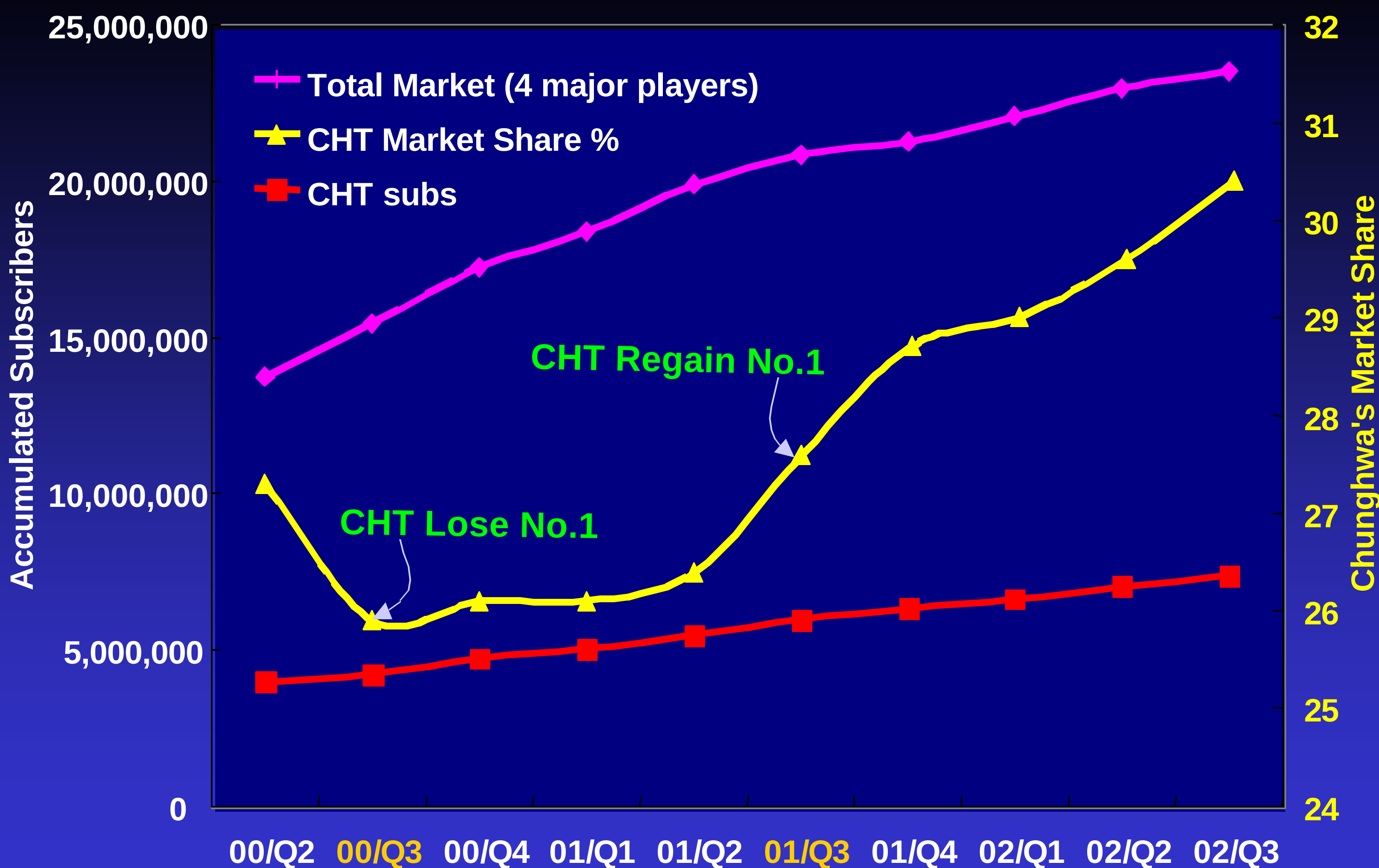
Fixed	35%
Mobile*	55%
Data	10%

Highlights on Mobile & Broadband Businesses

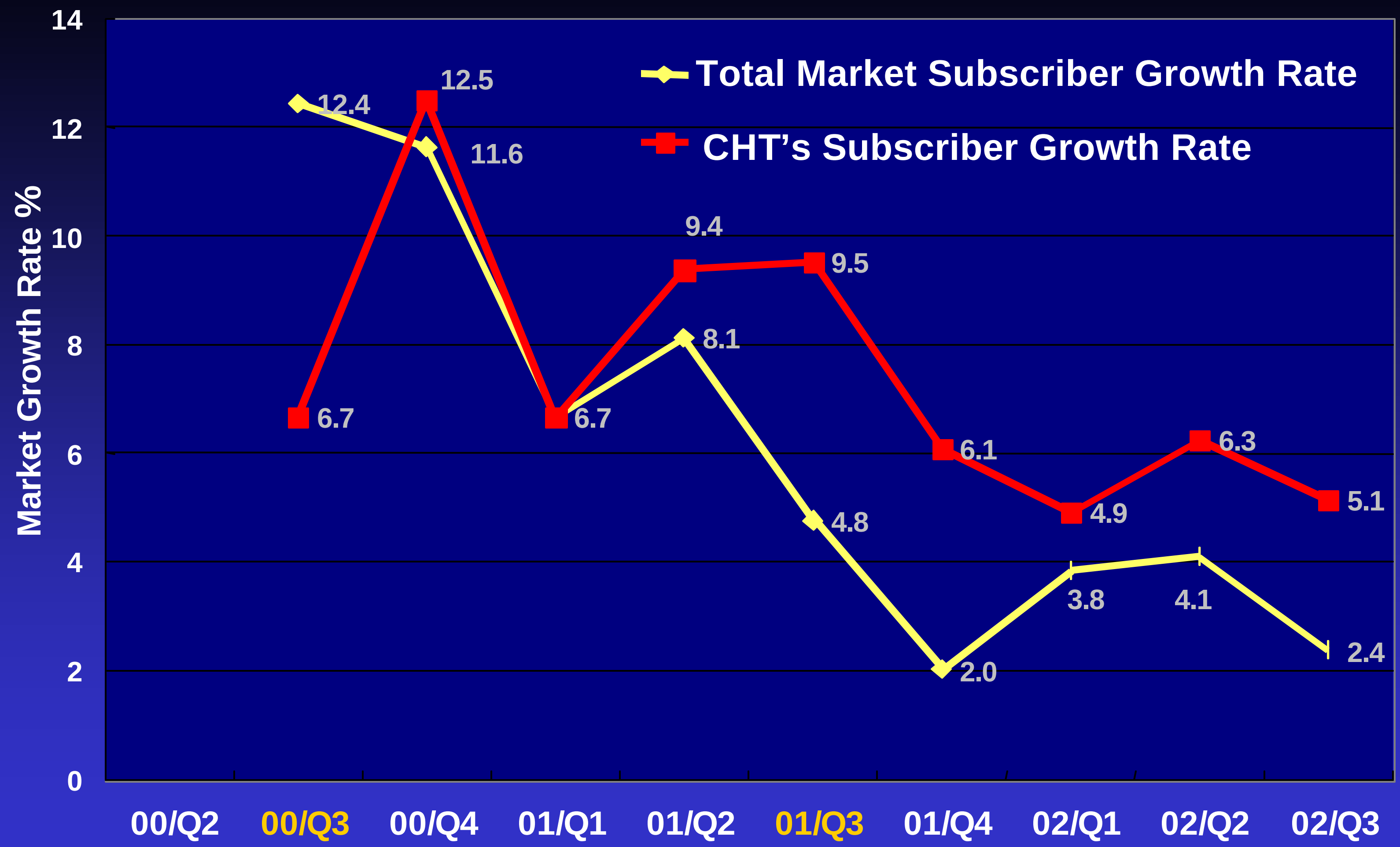
Take-off of Broadband Market



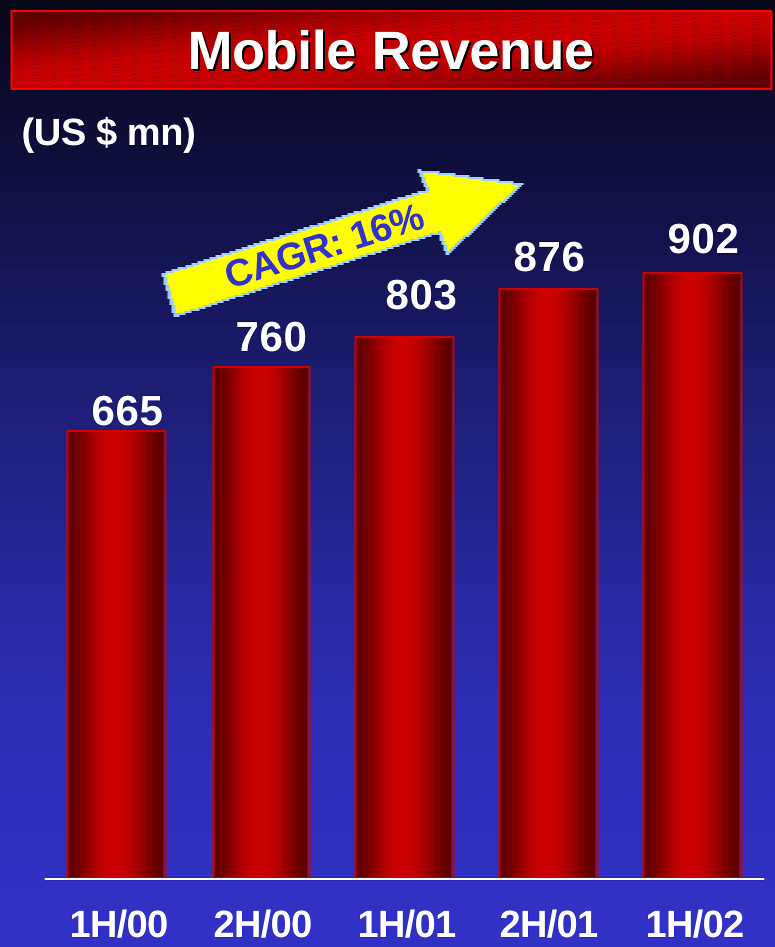
Growth of Mobile Market

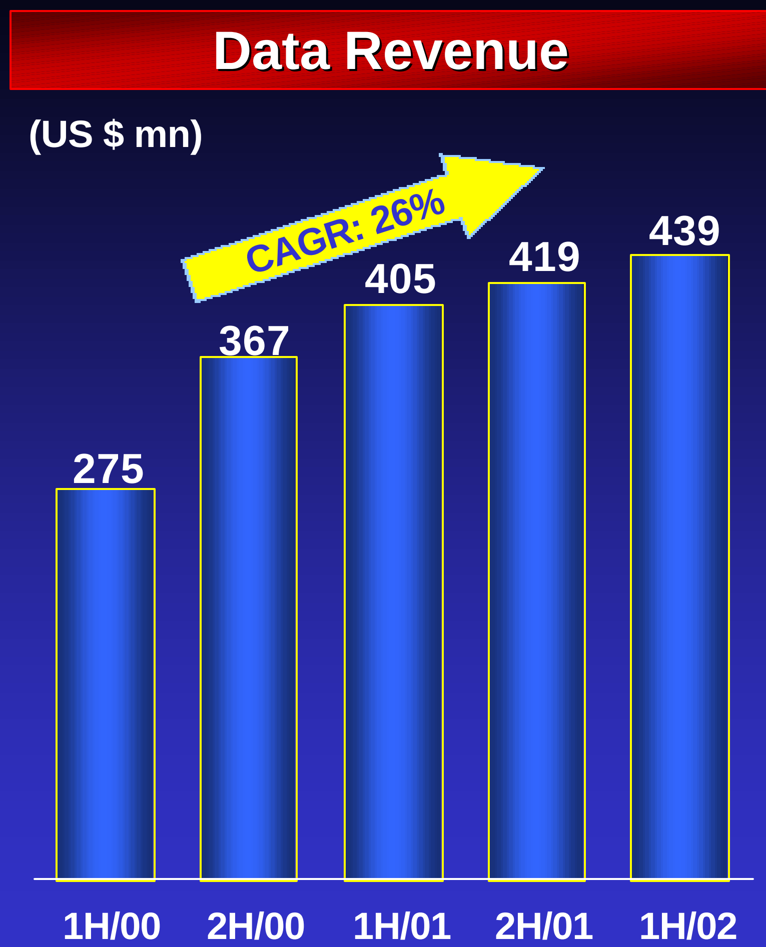


Mobile Market Growth Rate



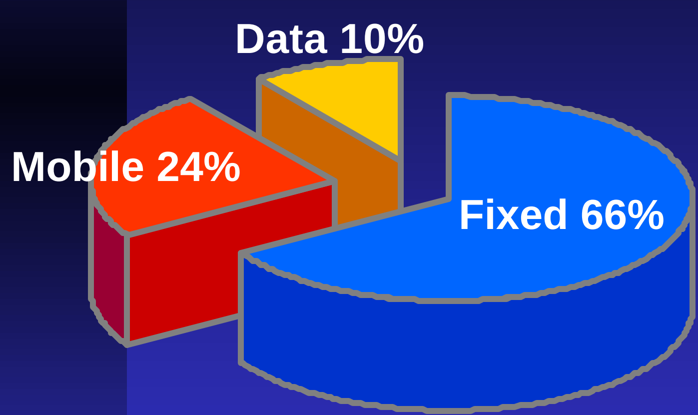
CHT's Mobile & Data Revenues





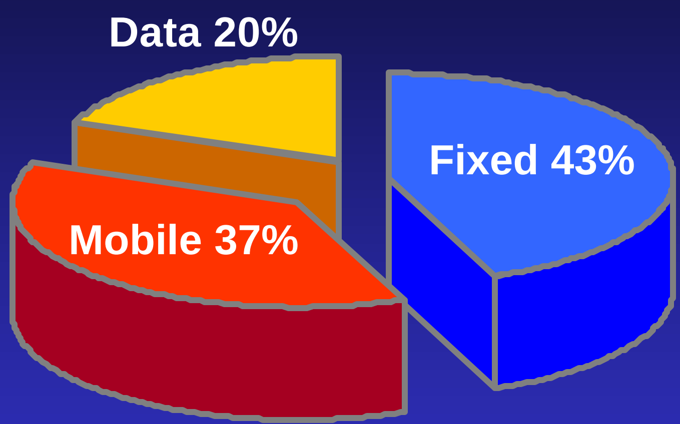
CHT's Revenue Mix Shift

Q1 2000



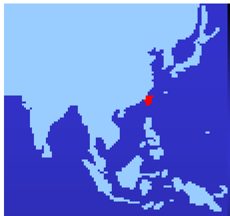
Total Revenue of Q1 2000: US$ 1.28bn

Q4 2002



Total Revenue of Q3 2002: US$ 1.35bn

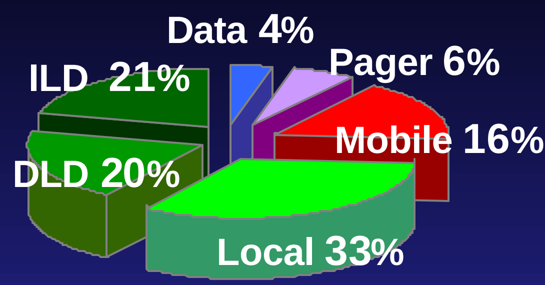
Market Trends



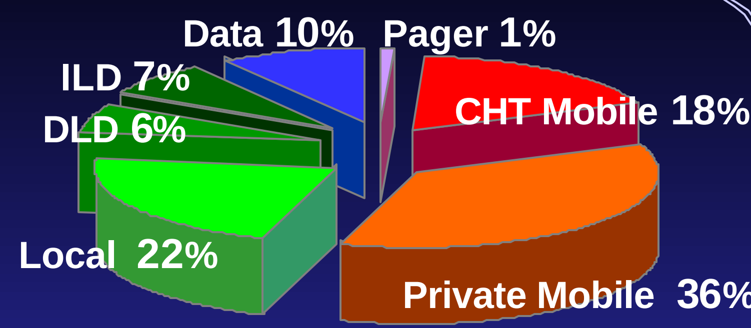
Market Trend
-- From PSTN to Mobile & Data

- **Mobile & Data lead telecom market's growth**

Total Market

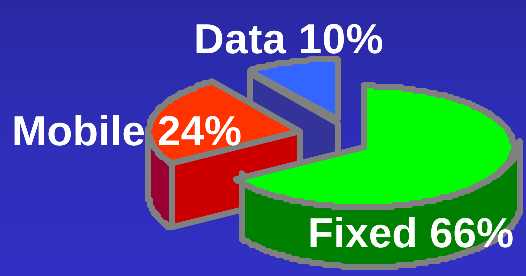


Dec 1997

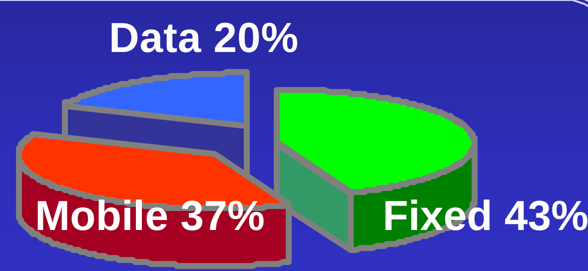


Dec 2001

Chunghwa Telecom



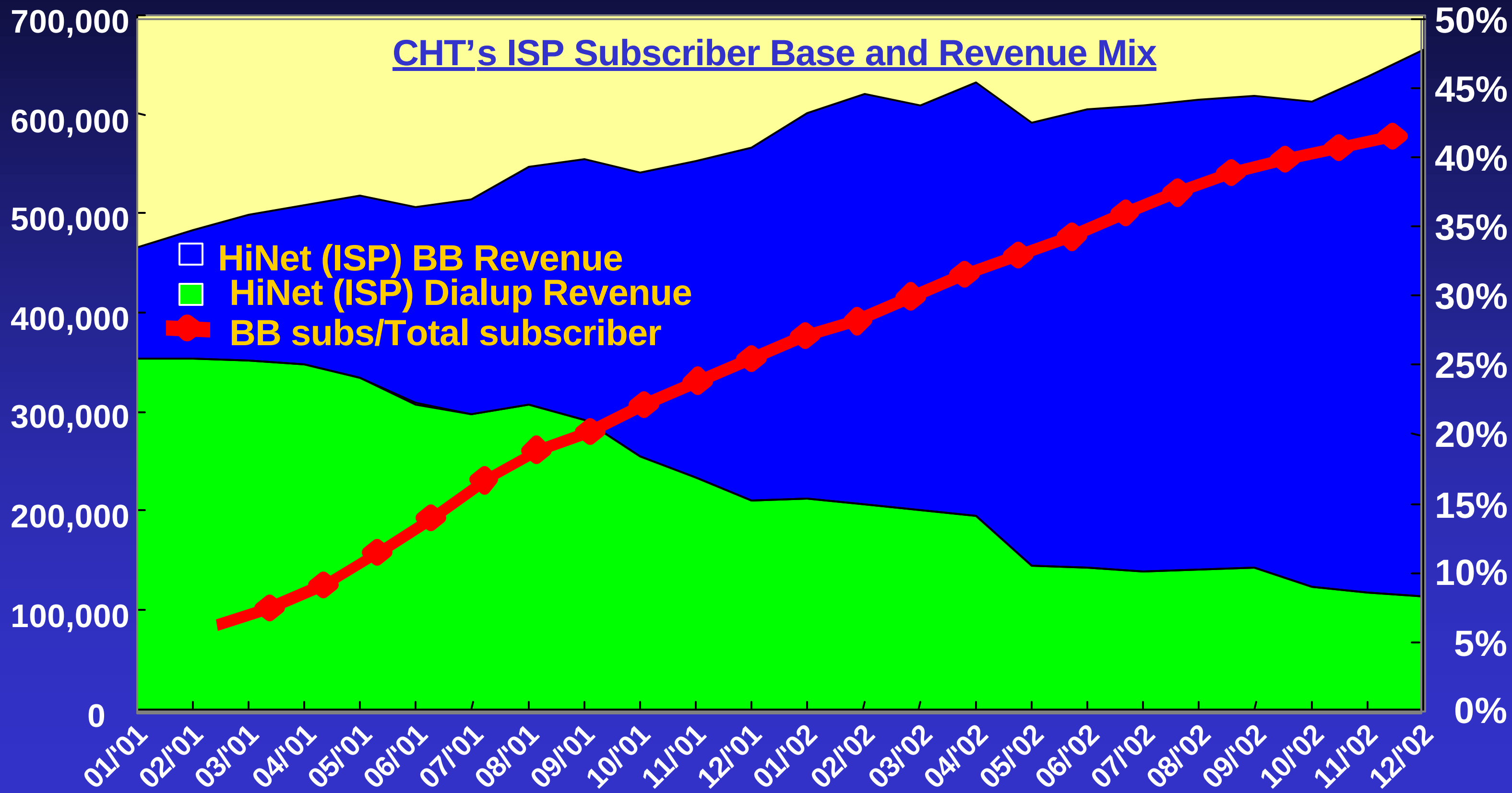
Q1 2000



Q4 2002

Market Trend
-- From Narrow- to Broad-band

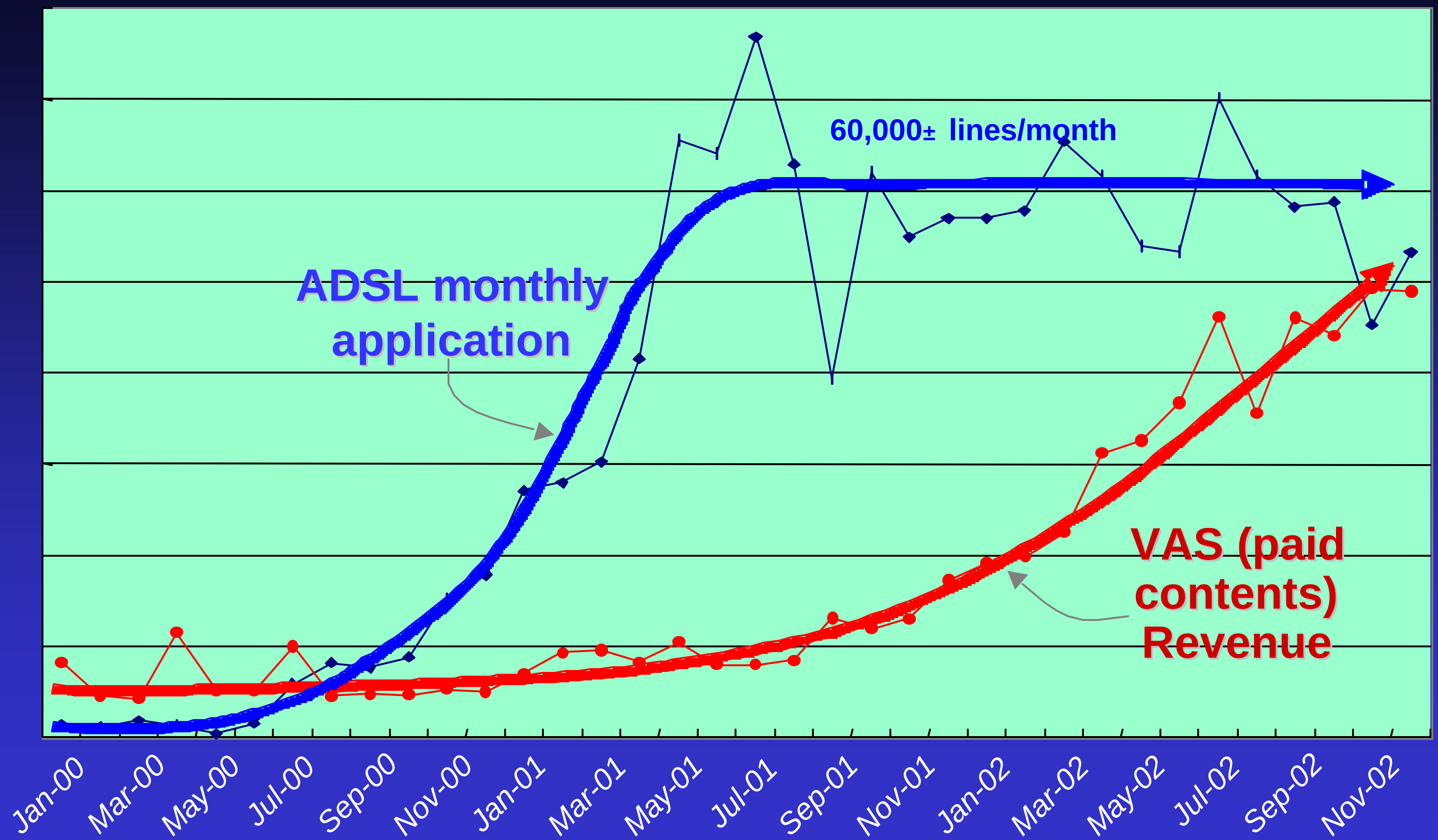
- Narrowband shifts significantly to broadband
- Telco's revenue also benefited from this shift



Market Trend

-- Access (Bandwidth) 1st, Content 2nd

- Two learning curves w/ about 1-year time lag

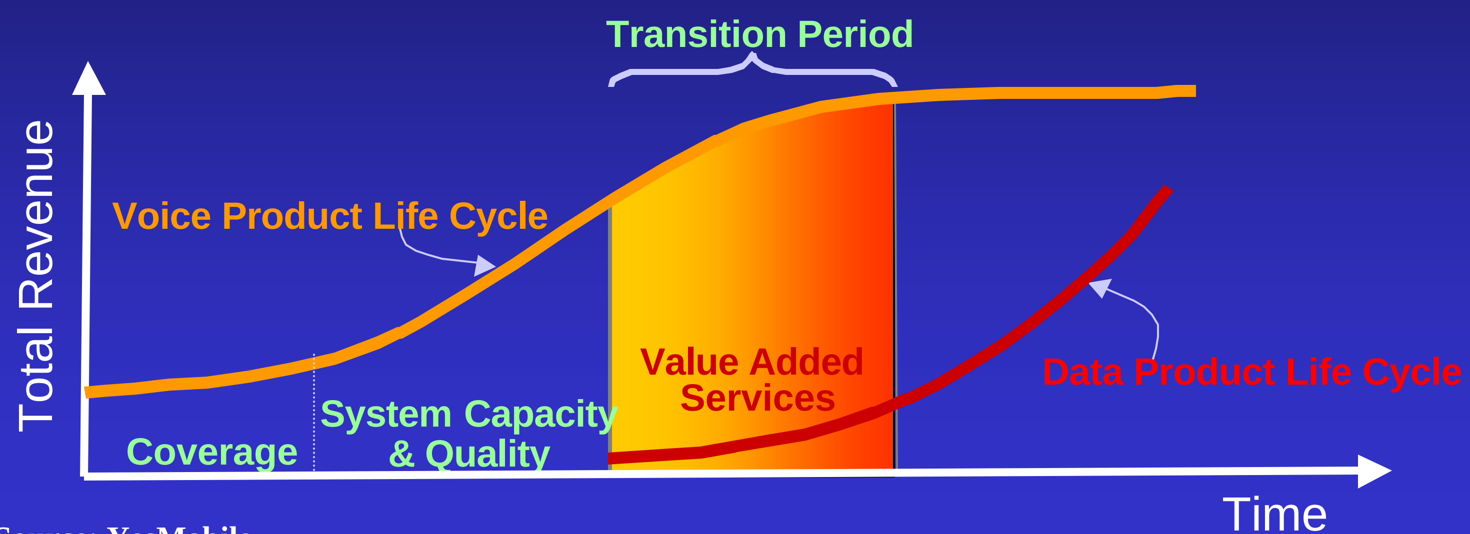


Challenges Ahead

Challenge

From Mobile Voice to Mobile VAS

- **Mobile competition and growth**
  - Coverage → System Capacity & Quality →VAS
  - Mobile voice product matured, ARPU drops; VAS has to be the new “star” to maintain mobile business’ growth
- **Mobile VAS revenue share is still relatively shallow**
  - Is 3G the answer?
  - Mobile-Internet or Mobile-internet ?



Source: YesMobile

Challenge

The Convergence of Telecom & Media (1)

- **Broadband telecom network is capable to deliver video (multimedia) content to compete w/ cable TV**
  - **It's *on-demand*, *interactive*, *pay-per-view***
  - **Bandwidth >10Mps via FTTB+VDSL under ADSL rate**
    - Consumers can access more quality contents
    - Providers are willing to provide quality contents
- **Regulatory Issue**
  - **Fair competition b/w operators; CATV's trouble in Taiwan**
- **Technical Issue**
  - **Internet w/o boundary, quality contents require boundary**
  - **Internet vs. "intranet", managed IP or VPN solution ?**
    - Quality, Protection of IPR
- **Marketing Issue**
  - **From Study's PC to Living room's TV set**
    - Is TV set still the "right" display? Is set-top-box necessary?

Challenge

The Convergence of Telecom & Media (2)

- **What content to be carried? ? How to charge it?**
  - **Game? Sports? Learning? Movies? News?…**
- **Content Delivery Network**
  - **Network Architecture**
    - Core Network, Access Network, capacity issue
  - **Network Technology**
    - Legacy systems, new generation tech, migration strategy
- **New Business Model (new learning curve to build-up)**
  - **Telco's positioning: new media platform**
  - **Other roles: ISP, ICP, Content aggregator?**
  - **External Partnerships: Application Program Provider, Content Distributor, Content Producer**
- **Distribution issue**
  - **How to make the existing distribution channels accountable and feel "tangible" to the sale of pay-content**
    - vs. sale of ADSL lines/handsets

Challenge

The Convergence of Fixed & Mobile Services

- **WLAN**
  - **Until today WLAN has a promising device market, but not the service market**
  - **In Taiwan, 80% of the access points (AP) are used in residential market**
    - Hot-spot business is limited
    - Business market is slow due to economy and security
- **WLAN and 3G**
  - **Comparison**
    - WLAN is for someone, at some place, in sometime
    - 3G is for anyone, at any place, in anytime
  - **From an operator’s point view**
    - WLAN is preferred to be used by a stationary user accessing to the Internet; 3G is for moving user to access Internet
    - Integrated carriers who provide both fixed and mobile services prefer to this view, but not the sole mobile operator

Challenge

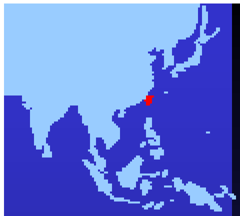
When will Business Market come back?

- **Both broadband and mobile services in Taiwan, consumer market outperforms business market for the past 3 years**
- **Will dot-com come back?**
  - **Many interesting cases observed**
  - **Dot-com re-defined**
    - Any business which takes Internet’s advantage to re-shape its competitiveness – equivalent to e-business?
    - The leverage could be even higher when Internet power (information flow) combined w/ logistic support (physical flow) and on-line transaction (monetary flow)
      - This can convert a corner store into a regional business
  - **If dot-coms come back, they will be in a very much different look – not limited to Yahoo! or e-Bay types**

Challenge

Re-thinking Telco's Organization

- From 1990s, encouraged by Wall Street investment analyst, the split of mobile/data unit from Telco to run independent business became a fashion
  - Integrated carrier suffered
- Chunghwa's experience suggests that
  - the incumbent can leverage on the mobile / data businesses to recreate itself employee value (vs. NTT)
  - the mobile / data unit can also leverage on incumbent's well established channels to distribute service
  - via this strategy, mobile operation won't feel vulnerable under the convergence of fixed and mobile technology
- Will Telco return to integral model?



Thank You