The Trend Of Digital TV

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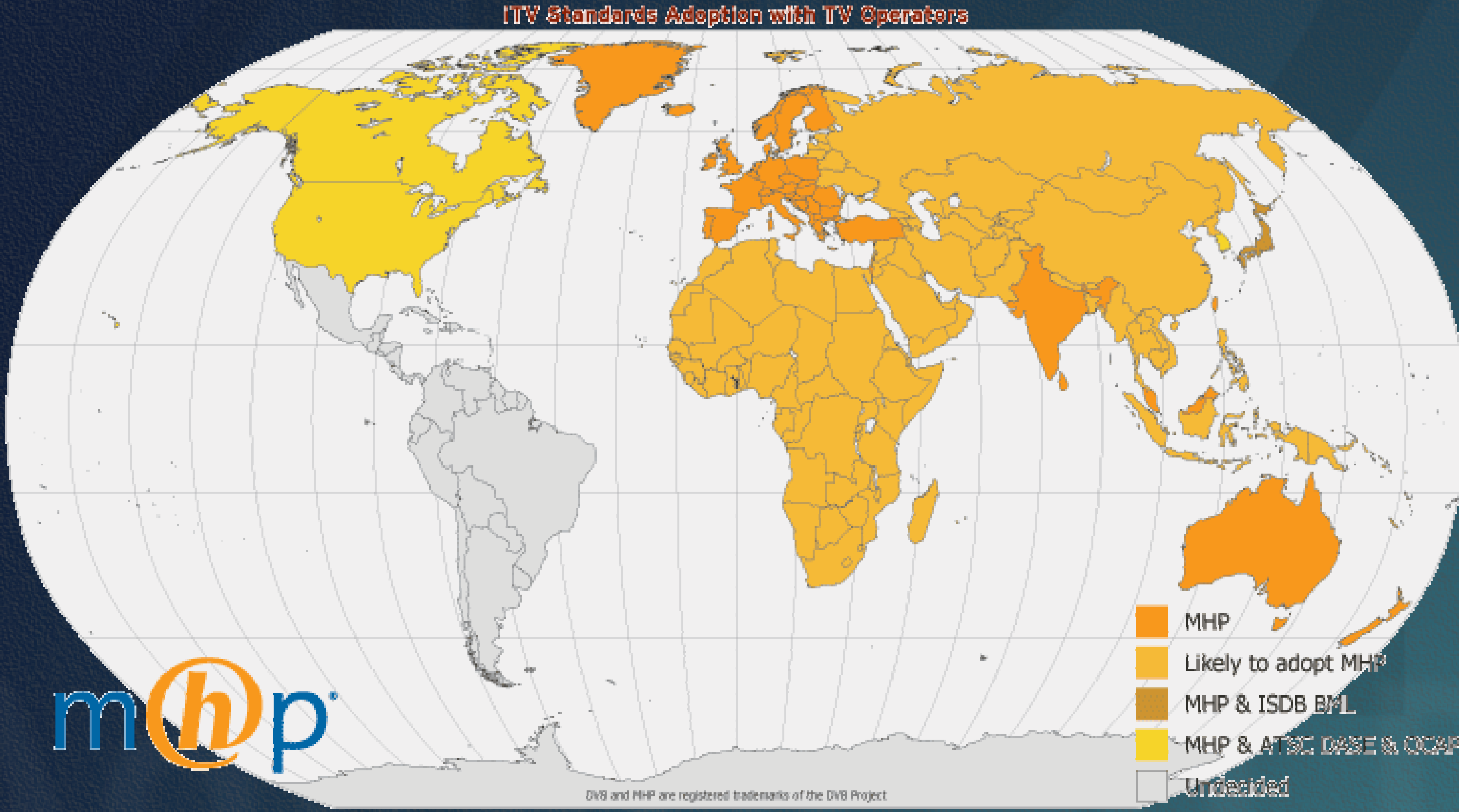
Advanced Digital Broadcast

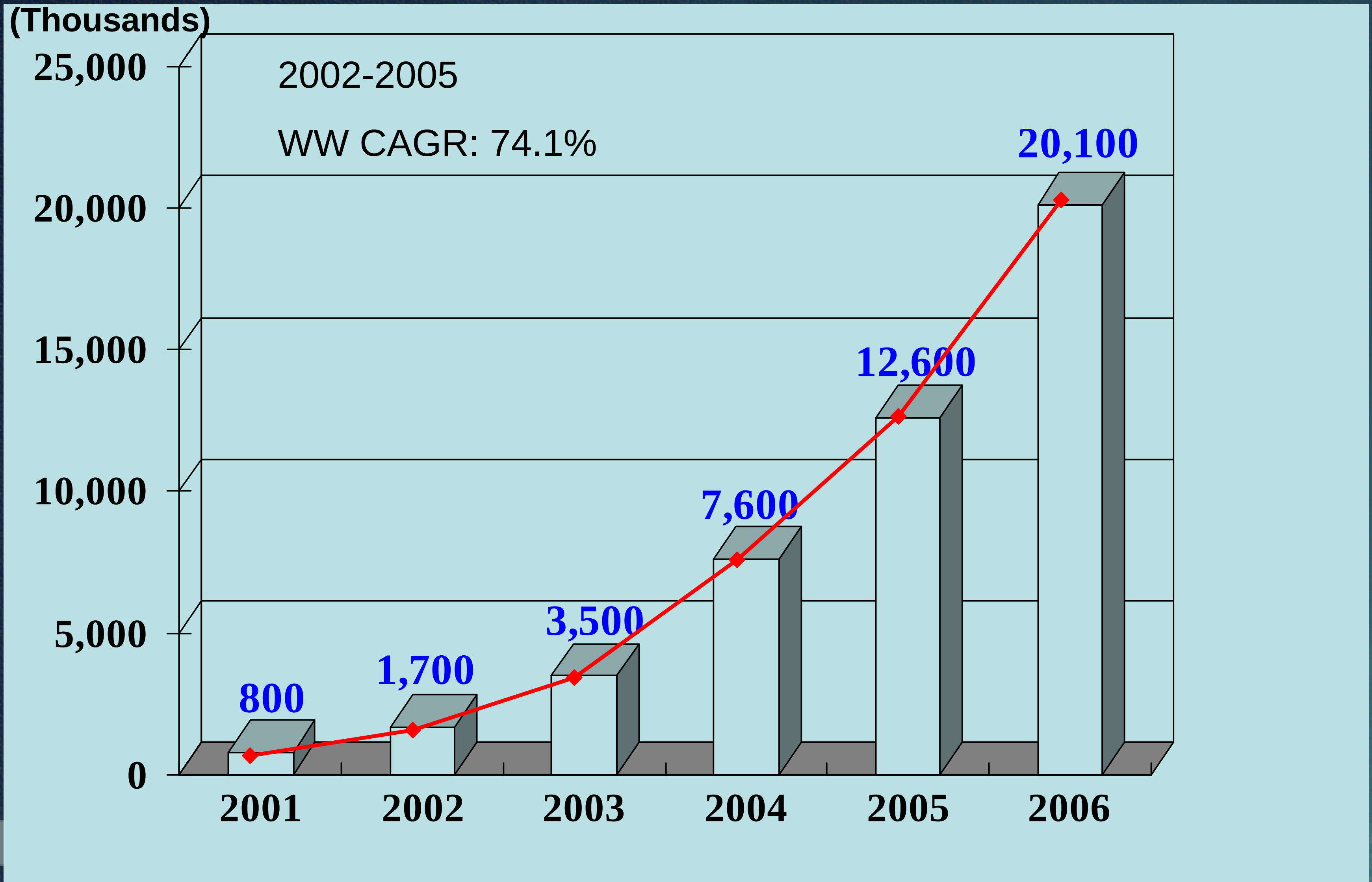
DTV Era Is Coming

- Government’s influences: regulation, subsidy, …, etc
  - USA: to switch off analog by 2007
  - Taiwan: to switch off analog by 2006
  - Berlin: analog switch off during last IFA show (August 2003)
  - Italy: e-Government program, subsidizes EURO$150M for DVB-T/MHP boxes
- High Definition TV creates different viewing experience from Analog TV
  - American HDTV, Japan BS satellite, Europe is starting, …..
- Open Middleware Standards for IDTV – creating economical scale for development of interactive digital contents
  - MHP, OCAP, MHEG5
    - Korea: MHP for Sat.,
    - USA: Korea:OCAP for Cable
    - Finland, Italy, Spain, German: MHP
    - UK: MHEG5
- Big Screen TV demands high video quality:
  - PDP, LCDTV and LCOS – DTV (SD and HD)
- Evolving over Broadband Technology and Advanced Video Compressing
  - Telcos get into video services
- Convergence of STB, consumer electronics (PVR, .., etc) and PC
  - Home Gateway, Media Center

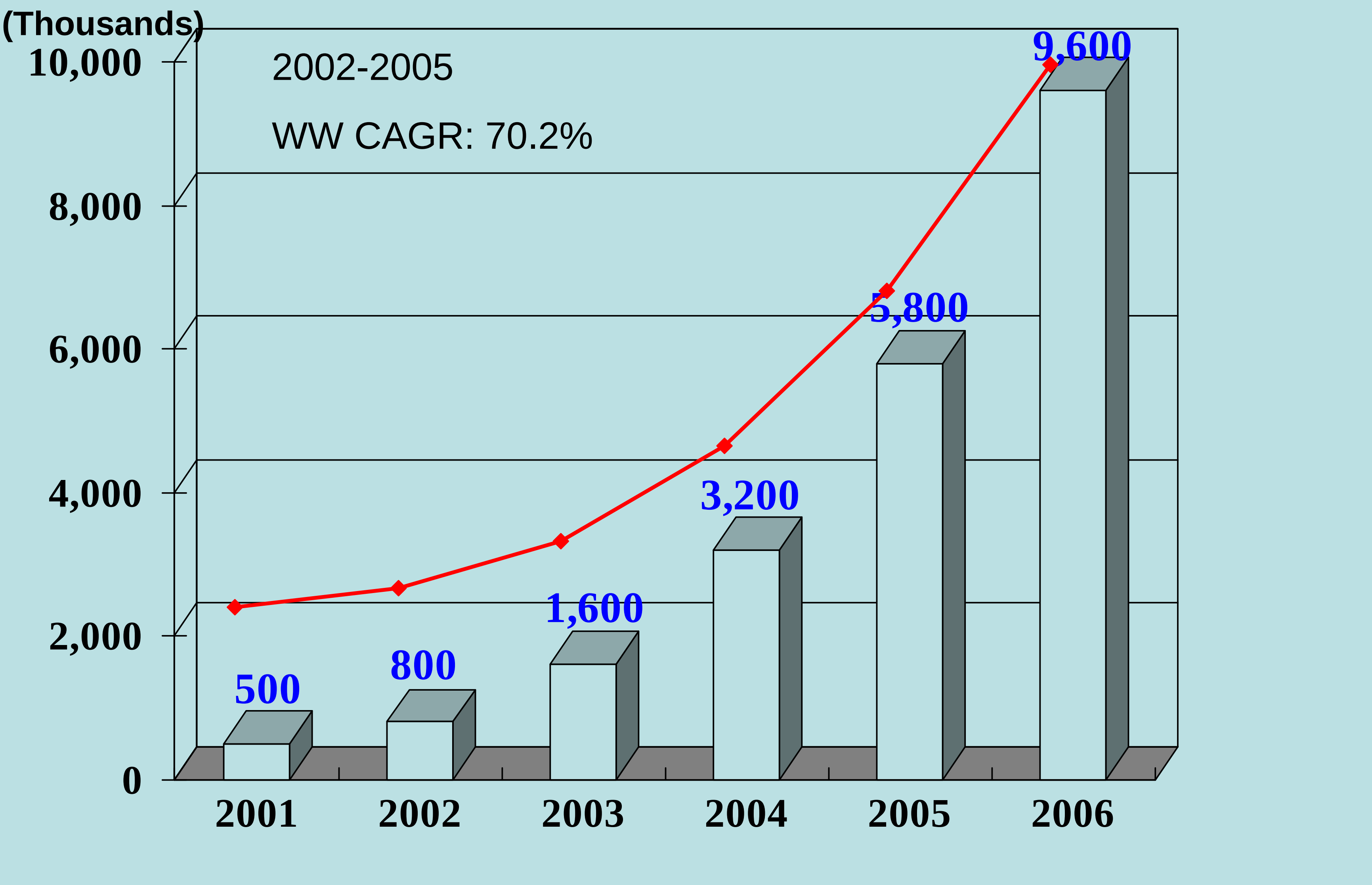
MHP adoption



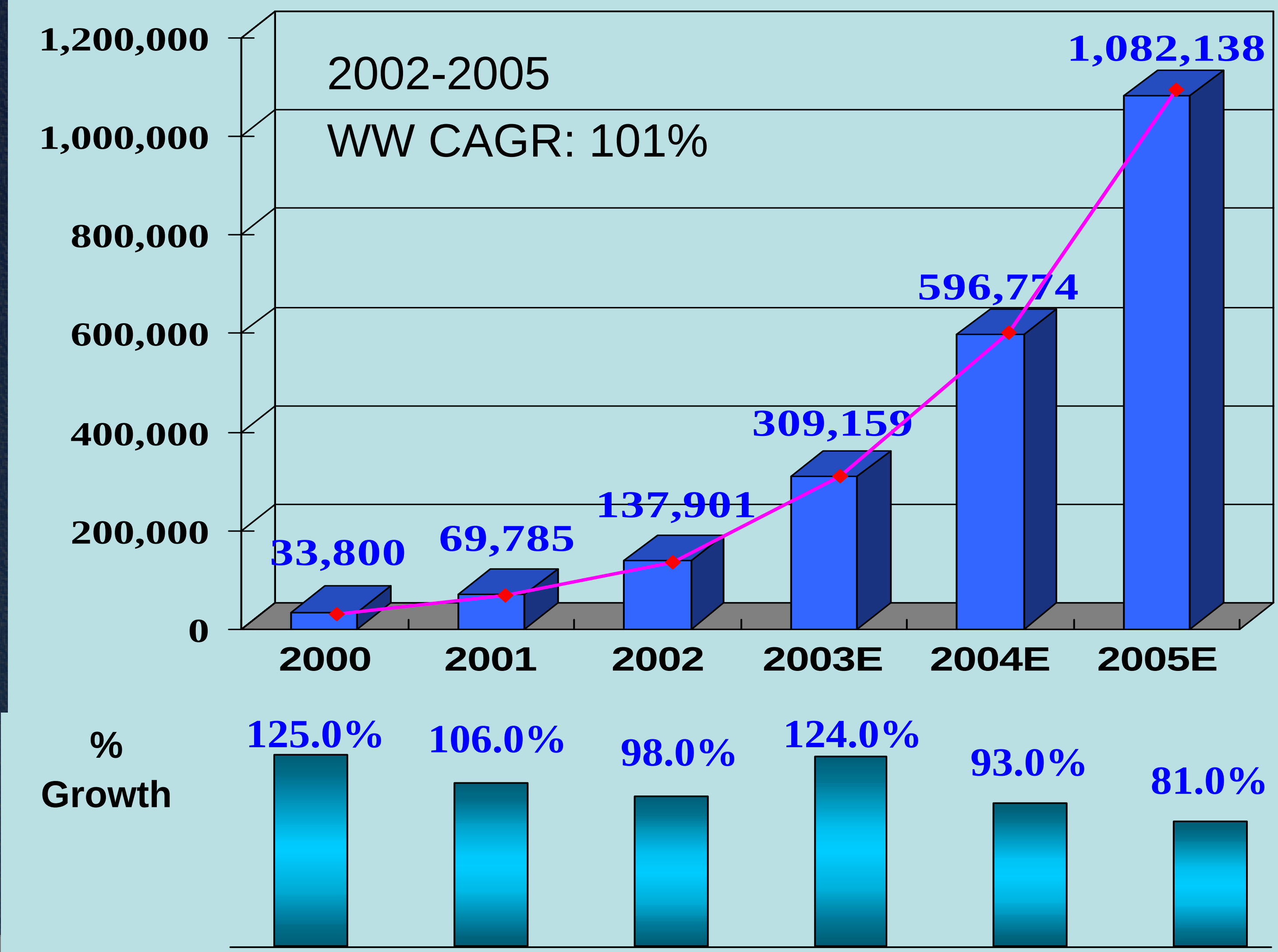
Global LCD TV Market Growth



Global PDP Market Growth



US Annual PDP Market Growth



TFCinfo –Worldwide Leader in Display Market Research

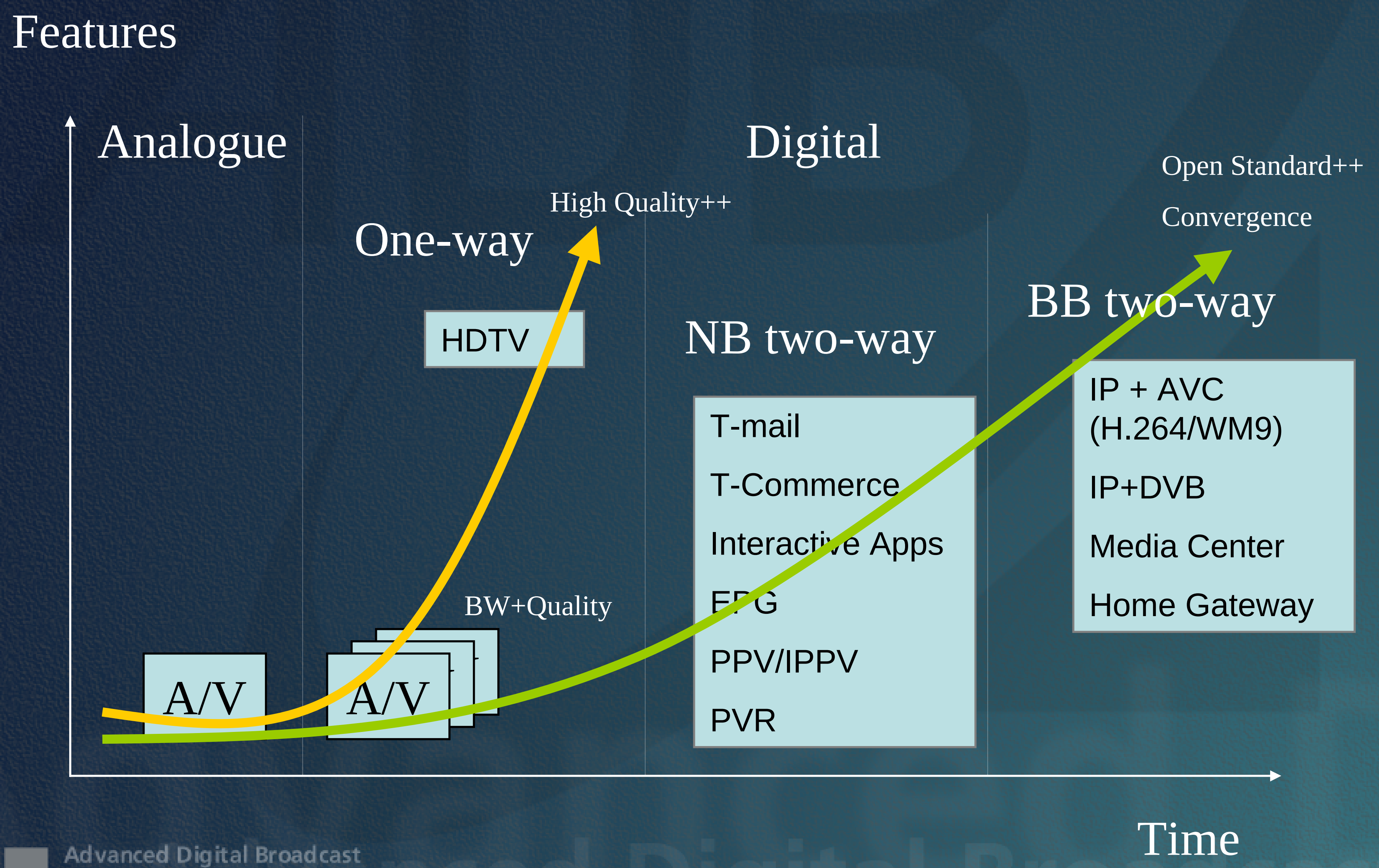
FCC HDTV Mandate

- **50% of TV's 36" and larger** must include tuners by July 1, 2004, and 100% of them by July 1, 2005.
- **50% of TV's 25" to 35"** must have tuners by July 1, 2005, 100% of them by July 1, 2006.
- **100% of TV's 13" – 24"** must include tuners by July 1, 2007.
- **100% of TV interface devices** such as VCR's and DVD players / recorders must include DTV tuners by July 1, 2007.

Global STB Volume Prediction

Thousands STBs	1999	2000	2001	2002	2003	2004	2005
Satellite	12,236	14,187	16,201	18,235	21,232	23,268	27,289
Cable + MMDS	6,196	9,575	13,246	15,331	20,030	22,339	28,657
Terrestrial	593	931	1,099	4,174	8,276	11,163	19,454
Total	19,025	24,692	30,946	37,740	49,539	56,771	75,400

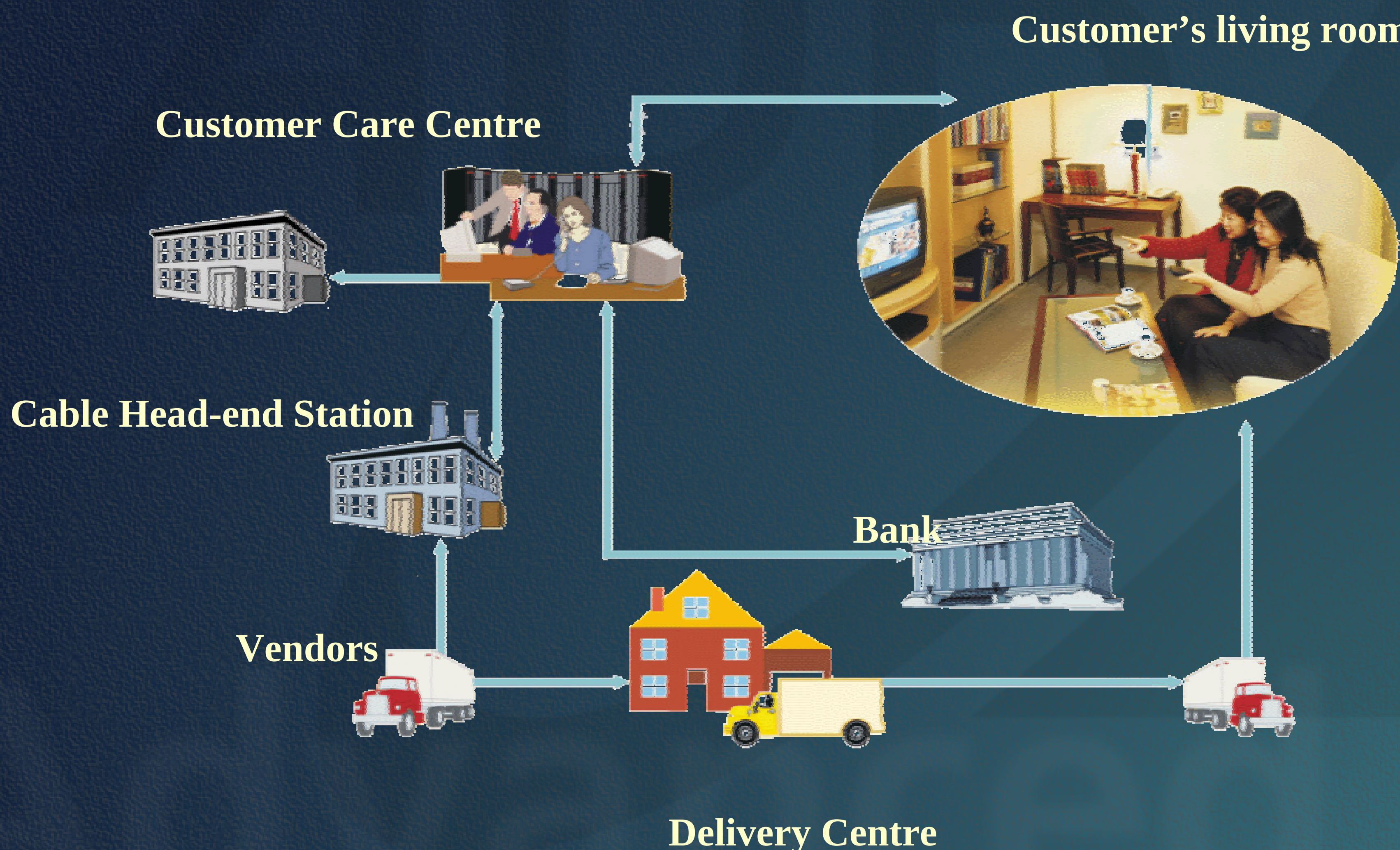
STB Trend



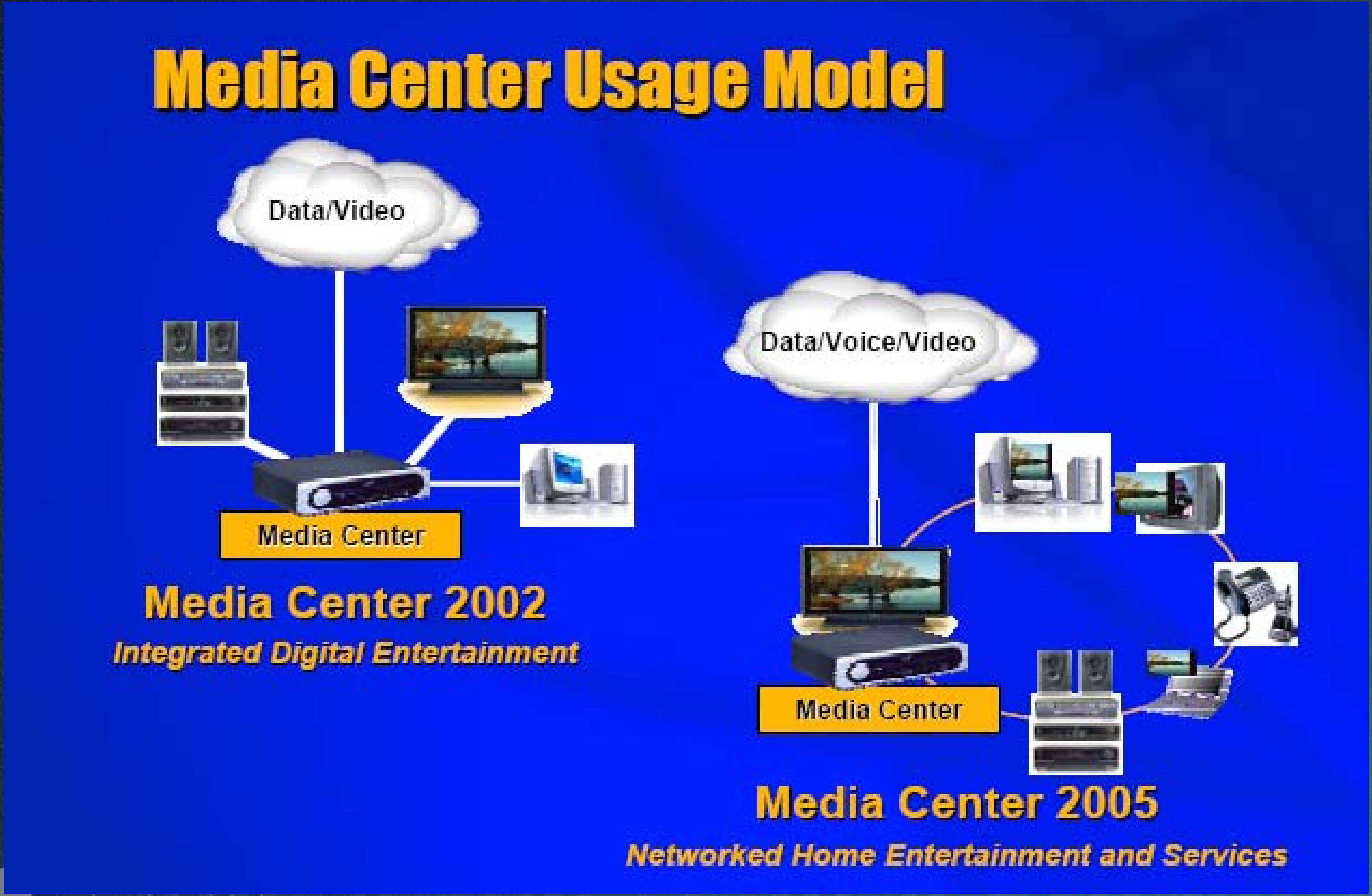
Features
Analogue
Digital
Open Standard++
Convergence
High Quality++
One-way
HDTV
NB two-way
BB two-way
T-mail
T-Commerce
Interactive Apps
EPG
PPV/IPPV
PVR
IP + AVC (H.264/WM9)
IP+DVB
Media Center
Home Gateway
BW+Quality
A/V
A/V
Time

ADB T-Commerce System

Customer: On-Line TV Mall, Taiwan



Media Center



Market Segmentation I

- Low end STB
  - Video and basic interactive
  - Massive volume and low price, but technology capability is still required
  - Ratio of IP cost keeps increasing – MPEG-LA, CA, Middleware, MV,…,etc.

- High end STB
  - Market and technology driven
  - Convergence of STB, Consumer Electronics and PC
  - Multimedia processor (STB) vs. PC???
  - Keys: Technologies and time to market

Market Segmentation II

- B2B (Operator) vs. Retail
- Customization vs. Standardization
- No Win-Intel standard
- Partnership with key players: chipset, CA, middleware…
- Retail market is coming but still small percentage of the whole market.
- PC vs. Home appliance
  – Retail is a domain which may be very different from PC.

Conclusions

- Market is growing and becomes massive because of open standards, government’s influences, new viewing & service experience, However, not yet mature

So…

- STB is Software Business
- Loyalties: MPEG, CA, Middleware
- New media:
  - Operators are facing uncertain environment
  - Operators are seeking for partners.
  - ➢ Software is the key to fast response to their changing requirements.
  - ➢ Not only STB but also applications, system know-how and integrations.
- Software is the key for Differentiation

Thank You!