

# *Changes in Consumer Behavior and Convergence between MMDS and Cable Services*

**Virgílio Amaral**  
*Strategy and Technology Director  
TVA Sistemas de Televisão*

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## *Agenda*

- **Market Movements and Consumer Behavior**
- **Wireless Technology**
- **MMDS Business**
- **What are Experts Saying?**

### *Convergence has immediate impact on the way consumers search for entertainment and information*

- New ways of searching for contents (less passive behavior and more customization)
  - TV as the main source of home entertainment
  - Devices with screens will become more and more appealing to consumers outside home (ex. PDA's, cell phones etc)
- Ever easier access to information -- contents distributed in different platforms
- Consumers are interested in managing their own media – convergence and new technologies allow consumers to manipulate, configure and share their personal content (more personalization and interactivity)
- Requirement for services and contents “on-demand” – multiplication of devices and technology development originate multiple new ways of content distribution
- Successful devices must have technological complexity but always with simple interfaces -- usability

### *New technological and market trends are already noticed...*

- Content and entertainment are leaving the “Living Room” towards “Anywhere” (“any-entertainment”) – “Digital World” makes the users require same quality and features of their “Living Room”
  - Music: MP3 (“IPOD”) ; Video: Video IP (remote access to personal content) ; Games: Next generation of portable games ; Digital Car: Devices with interface for MP3 and DVD ; Cellular / PDA: Online multimedia platforms
- New devices already prepared for wireless broadband technologies
- Technological innovations ever more frequent with lower costs
- New concept of “Participation Entertainment” – reality shows, sports events, game shows, etc, as distinct from interactive TV
- Multimedia and audio-visual contents are more relevant to consumers -- Internet and TV are responsible for 2/3 of the time spent with media
- Video content in the format of “Channels 24h” will lose relevance to consumers
- Voice and data convergence redefine connectivity
  - Difference between long and short distance tends to disappear
  - Price decreases at the same proportion that efficiency increases

*... and media industry already shows significant changes on its dynamics*

- Merging of contents, entertainment and marketing leads to advertising and communications alternatives in all media and personal devices
- Convergence originates a considerable impact in Telecommunications and Pay TV Industries
  - "Core business" are being changed
  - "Telcos" are investing in Video over IP or ADSL and in the expansion of services and content
  - Voice service in Pay TV operators is already a successful reality in some countries
- Voice communication is still mobile company's "killer application", but integration to Internet, TV and Games is increasing
- A "Digital World" ever more connected and with increased mobility requires larger numbers of wireless broadband networks -- WiMax and 3G are the major bets for the future
- New markets are being created and there are possibilities for new players
- Bundling is present in all strategies
- New distribution networks and new relationship with content providers-- everything converges to new business models
- "Connected World" searches for new experiences for users -- "Non-Stop Entertainment" -- success of this industry is based on producing simple interfaces, attractive contents and applications, broadcast and customized content, with profitable business models

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➤ **Market Movements and Consumer Behavior**

➤ **Wireless Technology**

➤ **MMDS Business**

➤ **What are Experts Saying?**

## *Development of technology is affecting the “Wireless World”*

- Wireless is the current “killer technology” and it is bringing new consumers to entertainment world
- Wireless business is based on high-end technologies
- Application of wireless broadcast technology in equipments is increasing (PDA, Lap-Top, Home-network etc)
- Companies are investing in wireless research and development– Wi-Fi, WiMax, 3G, 4G, Digital TV and new multimedia formats
- Companies have lots of expectations in WiMax -- the future of Wireless
- Number of mobile telephones super passes fixed telephones in Brazil and in several other countries
- TV and radio broadcast are migrating to Digital
- In Brazil, 40% of Pay-TV subscribers get their signal through wireless networks (DTH and MMDS) – in USA this percentage is 28%

**Frequency spectrum will become an ever more scarce and precious good**

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## *Wireless networks show several advantages compared to cable networks*

### **Cable Networks**

- High-capacity of data transportation (optic-fiber network)
- Technology development is one step ahead
- Requires higher investments to upgrade
- Lower operational costs for areas with larger density
- Brazil has a large territorial extension -- impossible to operate through cable networks in the whole country

### **Wireless Networks**

- New wireless technologies (WiMax / 3G) will allow the expansion of services
- Video, voice, images and data convergence in a wireless network with new technologies (WiMax)
- Bigger scale and more participation of suppliers will result in a fast cost reduction
- Lower operational costs for areas with small density
- Devices with easy manipulation – Plug & Play model (self-installation ; portable and mobile services)

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## *MMDS technology combines important characteristics in communication - convergence, portability and mobility*

### Convergence

- Total convergence of telecommunications' services in a unique radio transmission (wireless) – data, voice and image
- Consumers demand for portable entertainment and personalized content can be fully offered through MMDS

### Mobility and Portability

- Unique module for transmission and reception embedded in the devices
- Allows utilization wherever "roaming" service is available

### *Market movements and technology development cause positive impact in MMDS business*

- Digital MMDS already provides all services available in Digital Cable Platform
- Non-proprietary solutions and larger penetration of Digital Broadcast TV will result on fast cost reduction
- Software and interactivity platforms and broadcast systems are the same for Digital Cable and Digital MMDS technologies
- Tuners for MMDS Digital set-top-boxes are the same for Terrestrial Digital Broadcast TV
- Technology of cells is a reality for Wireless Broadband (Wi-Fi Networks)
- Intel participation with WiMax technology -- larger coverage, security and lower costs
- Mobile companies are testing 3G and 4G standards with success
- Considerable investments in Japan and Europe to increase the number of users per cell

### *DOCSIS technology can be a good solution for MMDS, in spite of some disadvantages*

- DOCSIS standard, originally developed for cable networks, also shows good performance in MMDS networks with line of sight
- TVA offers services from 256 to 1 Mbps since 2002
- Distribution system is based on one macro-cell – each 6 MHz slot support around 2K subscribers
- Download modulation is 64 QAM and for upload is 16 QAM

#### **DOCSIS Advantages**

- Technology with large acceptance, several suppliers and fast implementation
- Modem cost is USD 35
- Topology of macro cell or mini cell
- Synergy with cable operation (TVA/SP)
- Lower operational cost -- use of DOCSIS testing equipment for installation and technical support
- Installation personnel already trained

#### **DOCSIS Disadvantages**

- Needs line of sight
- It is not a product originally developed for wireless
- Needs specialized installation
- Modems from different suppliers show different performances – more difficult to choose
- Wireless network management is a challenge (band and interference)

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## What are experts saying?

- *"O grande impacto do desenvolvimento tecnológico dos próximos anos será resultado da convergência de todas as formas de comunicação, computação e conteúdo. Para acelerar ainda mais o processo, novos chips e novos softwares continuarão oferecendo, por muitos anos, avanços e melhores recursos para os computadores e outros equipamentos de eletrônica de uso pessoal"* (**Craig Barrett, presidente da Intel**)
- *"O processo de convergência traz mudanças múltiplas, do mundo analógico para o digital, do físico para o virtual, do fixo para o móvel, do coletivo para o pessoal."* (**Carly Fiorina, presidente da HP**)
- *"A convergência nunca esteve tão presente, oferecendo velocidade, mobilidade e interatividade. Todos estes recursos são controlados por um novo usuário, que consome múltiplas mídias com diversas funções."* (**Ivan Seidenberg, CEO da Verizon Communications**)
- *"Um aparelho multifuncional não é lançado para substituir cada um aparelhos dedicados, exclusivos de cada função. A câmera digital embutida em seu celular não pretende competir com a mais avançada câmera digital dos amantes da fotografia de arte ou profissional. O mesmo ocorre com o computador de mão acoplado ao seu celular."* (**Pieter Knook, vice-presidente da Microsoft Corp**)
- *"Estamos apenas no começo de grandes revoluções no mundo do entretenimento digital"* (**Bill Gates, presidente da Microsoft Corp**)