Lunch Panel Discussion -Wednesday, Jan 12th 12:20 p.m., N259/261

Wireless Mobile Multimedia

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ABSTRACT

- The combination of topics below has created a perfect storm driving new consumer services to hand-held multimedia devices:
  - —upside business opportunity
  - —new spectrum availability
  - —wide area broadband packet radio services
  - —advanced video compression, and
  - —battery friendly high resolution user interfaces has created a perfect storm driving new consumer services to hand-held multimedia devices.
- These devices range from enhanced cellphones, wireless PDAs, to purpose specific personal multimedia devices.
- The convergence vision is finally coming together but the small form factor and processor intensive demands of transmission, storage, and rendering of rich multimedia content creates unique technical challenges, and opportunities.
- The challenges include cost, performance, battery life, and managing the complexity of the user interface.
- Our panel members will share their vision, benchmark the current activities/state-of-the art, and identify challenges ahead.
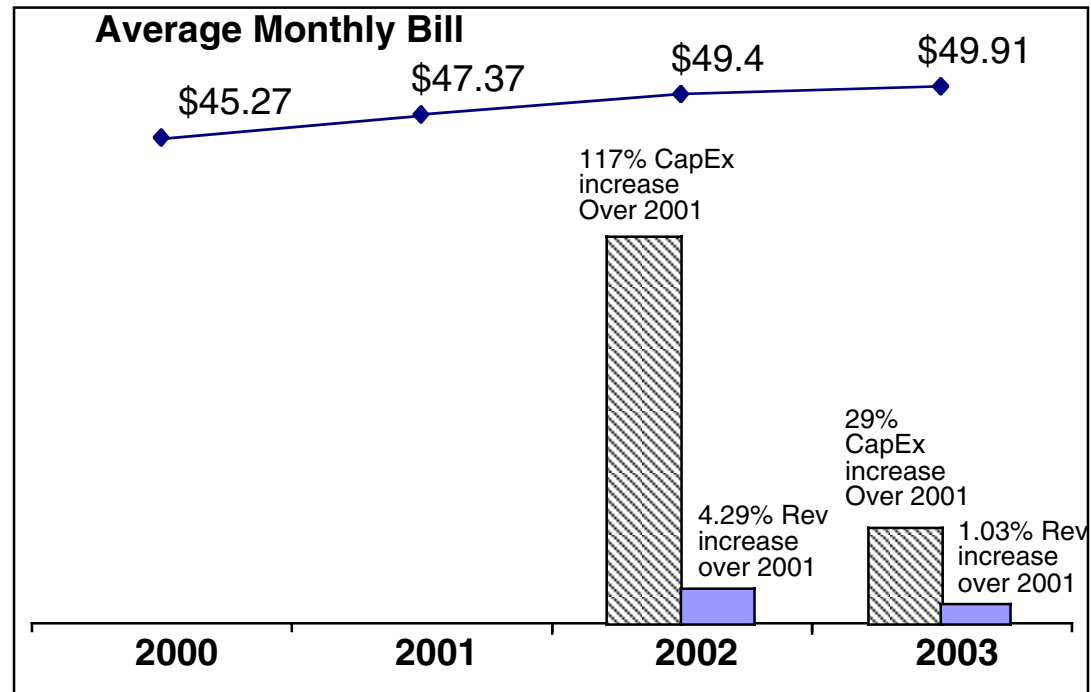
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The drivers include an assumed demand for rich media and video as well as a need for cellcos to develop non-commodity new revenue streams
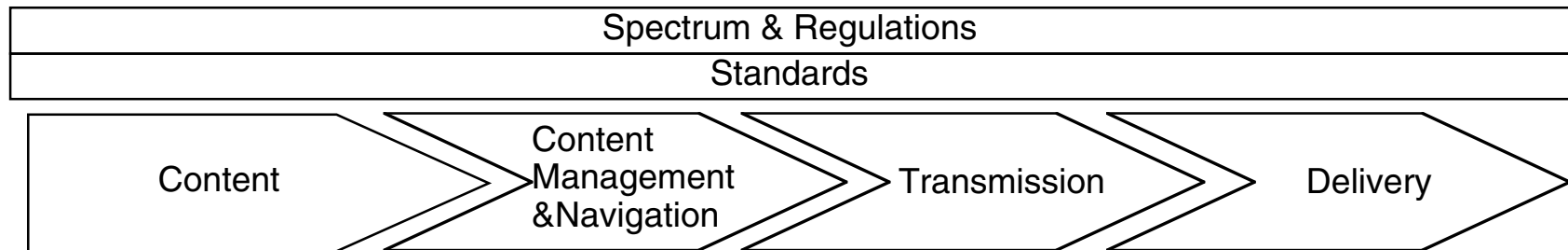
- Hypercompetition and commodity nature of voice services leading to
  - Revenue stagnation
  - High churn rate (~2.5%) drives subscriber acquistion costs (~$400)
- Continuing demand for capex investment out of proportion to revenue growth
- Failure to find a non-voice *killer-app*

Average Monthly Bill

$45.27 $47.37 $49.4 $49.91

117% CapEx increase Over 2001

29% CapEx increase Over 2001

4.29% Rev increase over 2001

1.03% Rev increase over 2001

2000   2001   2002   2003

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Wireless Mobile Multimedia- The Value Chain

The issues we are likely to take up today map into this value chain

Spectrum & Regulations
Standards

Content	Content Management &Navigation	Transmission	Delivery

- Types
  - —Still image
  - —Music
  - —Video
  - —MM Msgs
- Sources
  - —Cellco
  - —3rd Party Svc Providers
  - —Cell Sub
  - —PrivateServers

- Functions
  - —Host
  - —Transcode
  - —Metadata
  - —UI
  - —Bill
  - —Settle
  - —Rights Manage
- Degrees of Freedom
  - —Server based
  - —Delivery platform based

- Architecture
  - —Unicast
  - —Broadcast
- Spectrum
  - —Cellular/PCS
  - —New Spectrum
- Standards, e.g:
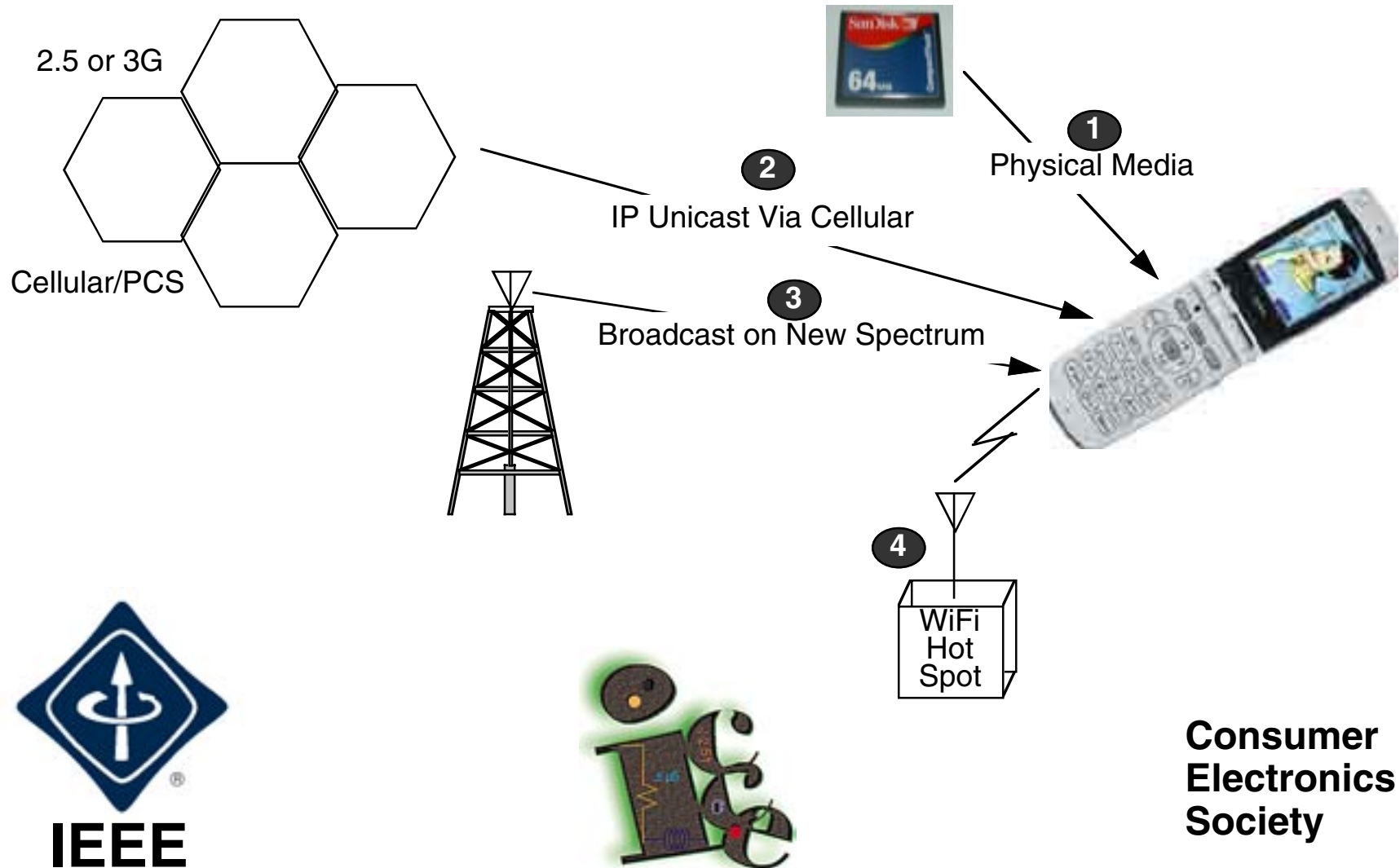 - —2.5/3G Packet IP
  - —DVB-H
  - —MediaFLO
  - —ISDB
  - —DMB

- Features
  - —VOD
  - —Store
  - —Move content
  - —Interact
- Technology
  - —CODECs
  - —DSP/ICs
  - —Battery
  - — Display
  - —User Interface
  - —Cost

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There are four non mutually exclusive alternatives as well as hybrid combinations

2.5 or 3G

Cellular/PCS

1 Physical Media

2 IP Unicast Via Cellular

3 Broadcast on New Spectrum

4

WiFi Hot Spot

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Wireless Mobile Multimedia- The User Experience

With today's video compression technology, even a 15 fps video only requires a 200 kb/s data stream to look acceptable on a handheld

- 68 second clip
- MP4 Compression
- File size=1.7 megabytes
- Streaming
    - —200 k bits/sec
    - —15 frames/sec
- Resolution 320 x 240 pixels

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There are several broadcast systems in trials or early stage of rollout

	ISDB Japan	DMB Korea	DVB-H CCI in USA	MediaFLO Qualcom/USA
Source Coding	MPEG4 + AAC	MPEG4+ BSAC	MPEG4/VC9 + AAC/WM9	MPEG4 Video+?
Channel Coding	Convol + RS FEC	Convol + RS FEC	Convol + RS FEC	?
Transport Stream	MPEG2	MPEG2	IP	?
Modulation	QPSK/ 16QAM COFDM	DQPSK COFDM	QPSK/ 16QAM COFDM	16QAM COFDM
RF Channel	433 KHz	1.5 MHz	5/6/7/8 MHz	6 MHz

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Thank You