



Research Report
July 2006

MOBILE TV

THE OPPORTUNITY AND LANDSCAPE FOR START-UPS



Written by: Cartagena Research Team

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INTRODUCTION

The starting point for looking at mobile TV should not be how the mobile industry is changing, and whether mobile TV represents the ever elusive killer application. A better starting point is how TV itself is changing, and where mobility fits into this picture. The best way, of course, is to try and understand what the users actually want and are prepared to pay for - but this is clearly very difficult to do, with information from pilots often misleading and the Japanese and Korean markets little guide to US and European markets.

So how is TV changing? It is moving fundamentally towards a user driven, on demand, personalized and multi-device experience, far removed from the limitations of broadcast schedules. Options for watching, manipulating and storing TV and video are proliferating. Companies such as BitTorrent (P2P sharing of video on the Internet) and Sling Media, SageTV or Orb Networks (watching 'home' TV on different devices in different locations) are illustrative of this trend and of using interactivity.

The greater capacity and functionality of these new systems is also fundamentally changing content. Take Deutsche Telekom's T-Home IP-TV offering which promises new regional, sports and entertainment content. It can also offer 'time shift' programming to allow users to pause live shows or record them for later viewing.

So the challenge for mobile TV is how to fit into this changing world where TV is increasingly diverse, localized and fragmented. And where a raft of other devices will also offer portability and 'TV on the go', such as products from Mustek (PVR-A1) and Archos (AV420).



MOBILE TV OVERVIEW

Another mobile technology, another standards and technology battle looms. Many reports have already been written outlining the different strengths and weaknesses of the various mobile TV options which fall into three groups:

1. unicast (single recipient) over cellular networks - usually 3G but could be 2.5G
2. broadcast (to every user) multicast (specific and defined group) over cellular networks - such as MBMS (UMTS networks) , BCMCS (CDMA networks), TDtv (unpaired 3G spectrum)
3. broadcast and datacast (broadcasting of specific data such as stock quotes) over separate networks - such as MediaFLO, DVB-H, S-DMB, T-DMB, ISDB-T, DAB-IP

Most research reports conclude that different technologies will win out in different geographies - such as MediaFLO in the US or DVB-H in Europe. However, the reality is likely to be far more complex.

- Different technologies will be offered in the same market - such as the US

Offering	Operator	Technology
Hiwire	Aloha, SES Americom	DVB-H
Modeo	Crown Castle	DVB-H
Qualcomm	Verizon	MediaFLO
Sprint Nextel	Sprint Nextel	TDtv?

- Different operators may even offer alternate technologies - such as O2 in the UK (DVB-H and MBMS)
- There will be other channels than the operators - examples already operating include NRK (Norway), Bertelsmann, CNBC (US) and SmartVideo
- There will be increasing numbers of multi-channel solutions (using ActionEngine's mobile interface to 'program' a TiVo is an early example)

It is also far more complex than a simple technology battle - this is about the business models of the operators and whether they can shake off the label that they are simply utility providers. Hence, many will fight tooth and nail to ensure that mobile TV remains wedded to the cellular network, rather than an alternate datacast network.

This is potentially good news for start-ups. The mobile industry (plus the digital media and network equipment industries) desperately wants mobile TV to succeed and will invest heavily in deployment and in resolving the many barriers.

The great unknown for start-ups is timing - when can they see the significant ramp-up in revenues? Although most estimates out the 'significant' growth as at least 2 years away - with handset, license, deployment and other teething issues - many soft launches will take place in the next 12 months. The timescales involved in technology roadmaps and planning will ensure that start-ups can become well-placed now to succeed in mobile TV, even if they do not get the resulting revenue streams immediately.

Unstable industry dynamics always create opportunities for start-ups. Start-ups can still make a lot of money even if the technology doesn't 'succeed' but only if they get the timing right – which means that some mobile TV start-ups are already starting to slip from their peak valuations.

MARKET ASSESSMENT

Information from trials and early deployments is notoriously difficult to extrapolate. Optimists point to the willingness to pay, and the suggestion that usage both increases and broadens (for example, from using mobile TV at home to commuting time). Pessimists highlight the difference between trials and reality, and the suspicion that the atypical behaviour of early adopters skews the findings.

Trials

Area	Main Sponsors	Price	Popularity
Europe	Gartner focus groups	NA	less important than mobile music
UK	Nokia and O2	67% said up to £8 a month	10 minutes a day
Finland	Nokia, Elisa and TeliaSonera	50% said up to €10 a month	20 minutes a day
Spain	Nokia and Telefonica Moviles	€5 a month	16 minutes a day
France	Nokia and SFR	€7 a month	20 minutes a day
Europe	Nokia user survey	82% said €12.50 a month	78% said good or excellent idea

Early deployments

Area	Operator	Price	Popularity
UK	Vodafone	50% paying £10 a month	100,00 subscribers at end of May 2006
Korea	All	Around \$13 a month	55 minutes a day 440,000 S-DMB 110,000 T-DMB at end March 2006
Japan	All	NA	500,000 handsets capable of TV reception sold by end April 2006



Comparing numbers from the research groups is made more difficult by the various timescales, geographies and definitions that are used. Overall, there is a fairly pessimistic vein running through the forecasts, with the handset challenge (availability, cost, etc.) seen as the major barrier.

Statistics and analyst forecasts

Source	Prediction
eMarketer	Number of people watching TV on their mobile phones in the United States, Europe and Asia will hit the 60 million mark by 2009
Gartner Group	At least 10% of mobile subscribers will adopt mobile TV by 2009
Informa	<p>210 million mobile TV subscribers by 2011:</p> <ul style="list-style-type: none"> • Asia-Pacific: 95.1 million • Europe: 68.7 million • Middle East and Africa: 9.5 million • The Americas: 9.1 million <p>In that year 10% of all mobile handsets sold will have a broadcast receiver</p>
Instat	Mobile TV broadcast subscribers worldwide will reach 102 million by end of 2010
Mobile Youth	<p>65 million people worldwide will be subscribing to streaming or broadcast TV services for their mobile phones by 2010</p> <p>Revenues from mobile TV subscriptions will rise from \$136 million in 2005 to \$7.6 billion in 2010</p>
NSR	107m mobile TV subscribers by 2010
Rethink Research	164m mobile TV handsets by 2011
Strategy Analytics	<p>TV phone sales revenue will soar from \$5 Billion in 2006 to over \$30 Billion by 2010</p> <p>Broadcast TV will be found on just 10% of all devices</p>
The Shosteck Group	Revenues expected to reach \$10 - 28 billion by 2010

KEY ISSUES START-UPS

Across the board, there are key lessons for mobile TV start-ups.

Support multiple standards

Industry fixation on which standard or technology will win out is a side issue although history suggests it will be long, bloody and difficult to predict. It is also likely to be a moving feast as technologies 'converge' and new 'standards' bodies form, particularly as the operators fight ever harder against the move to non-cellular networks. Certainly, they cannot afford to make standards bets and must at least support multiple networks. Ideally, start-ups should be network-agnostic.

Support multiple devices

While the mobile industry likes to think of mobile TV as an extension to the capabilities of handsets, mobile TV start-ups need to be thinking of the much wider range of devices (than traditional mobile handsets) which will support mobile TV. This also creates new opportunities for supporting such devices as games consoles, MP3 players and handheld PVRs.

Support different business models

As with every new market, and especially in mobile, there are a multitude of different pricing and packaging options. These include pay-per-clip, pay per time watched, packaged as traditional mobile service, packaged as traditional pay-TV bundled service and so on. This variation will only increase as new players enter the market, mobile TV is sold as part of a multi-channel offering and packages are adapted for local markets.

Support multi-channel concept

While there is much debate about how 'successful' content will look, it is clear that many users would like to utilize mobile TV in conjunction with other video and TV consumption. An early example is 'mobisodes' (exclusively mobile episodes of popular TV programs).

Show credibility and presence

There are many technical challenges to mobile TV and start-ups need to get involved in trials and early deployments to show robustness and potential RoI. Generally speaking, it also makes sense to forge strong partnerships with some larger vendors.

Understand TV and broader digital media world

History has suggested that in the mobile industry, as the latest 'mobile X' opportunity has emerged, it has been more important for the start-up to understand the 'mobile' industry rather than the 'X'. In the case of mobile TV, it is far better for the start-up to understand TV (and particularly its evolution) and its possible application in the mobile industry, than vice versa. It is also beneficial for start-ups to also look outside the operators and traditional handset vendors. Although both will still be influential, not least because of their installed bases, this will vary by country.

THE OPPORTUNITIES IN THE MOBILE TV VALUE CHAIN

The following is an overview of the opportunity in each of the identified six areas. Clearly, there is still potential in all areas for strong start-ups, but the chart provides an indication of where we see the brightest areas.

Market sector	Barriers entry	Threat larger vendors	Time to consolidation	Example acquirers	Attractiveness rating
Chipsets	High	High	Now – 18 months	Freescale, Intel	High
Network equipment	High	Medium	6 – 24 months	Nokia Siemens, Ericsson	High
User interface	Medium	Low	6 – 24 months	Qualcomm, Nokia	Medium
Content adaptation	Medium	Low	12 – 36 months	Adamind, Ericsson	Medium
Content creation and publishing	Low	High	24 – 48 months	InfoSpace, Bertelsmann	Low
Content delivery	Medium	Low	24 – 48 months	Nokia Siemens, Alcatel	Medium
Service providers	High	Low	36 – 60 months	Vodafone, T-Mobile	High



OTHER KEY OPPORTUNITIES

While the previous section presented the broad overview of mobile TV opportunities, there exist a number of niche areas. Some of these are yet to see vendor activity, and so also offer some first-move opportunities. A number of these segments also offer opportunities for start-ups to migrate their business models to mobile TV. One example are the start-ups who have focused on areas such as rendering and user interfaces for mobile data - often with limited success.

Mobile advertising

Price will be a key element in the acceptance and usage of mobile TV. Advertising will be increasingly embraced by operators and content providers as a way of keeping prices to users down. Advertisers like the concept of the personalization, localization, interactivity, always-on nature and sheer penetration of mobile devices, but are wary of making any significant investments for an uncertain reward. They also have to revisit their broader TV models in the face of a fast changing advertisement opportunity.

Mobile rendering

While quality of content and price are two obvious requirements for mobile TV success, the other two areas are less so - coverage and viewing quality. Coverage is both an issue for service providers and an opportunity for convergence (see below). Viewing quality is a must for users, who not only expect TV to be of high quality but have rising expectations as flat screen and HD-TV technology get increasingly popular. Trials of mobile TV show such issues as lighting and contrast require particular expertise. There is a linked issue of user interface, as consumers expect mobile TV to work well every time and straightaway, and do not want to have to reformat their settings.

Convergence

Mobile TV will be a multi-channel experience and hand-off and integration will be vital. Support in the home and for Wi-Fi is an opportunity, as is hand-off to HD-TV and IP-TV.

Filtering and protection

The real early adopter market is adult entertainment. The adult industry can drive mobile TV, as it has done with many aspects of the Internet. Jupiter Research claims sales of adult mobile services worldwide will triple between 2004 and 2009 to reach \$2.1 billion.

Other analyst firms claim that, outside the U.S., between 20-40% of the video content viewed on mobile devices is adult. Filtering and protection will become important areas for the service providers and start-ups.

Battery life

In terms of barriers to mobile TV adoption, battery life rates as a high one. While it is widely considered to be an RF issue, it is actually the screen that soaks up the battery. Opportunities for start-ups include improving screen efficiency as well as better power management.

EPG

Lessons from mobile data adoption show the importance of a good user interface and easy access to services. The concept of the electronic program guide is well-understood in TV circles, and Gemstar has already produced its TV Guide Mobile Entertainment. However, there are a lot of opportunities here, particularly if mobile TV can promise on its much vaunted personalization strengths.

Mobile search and discovery, specifically for mobile TV, will also become an interesting opportunity for start-ups.

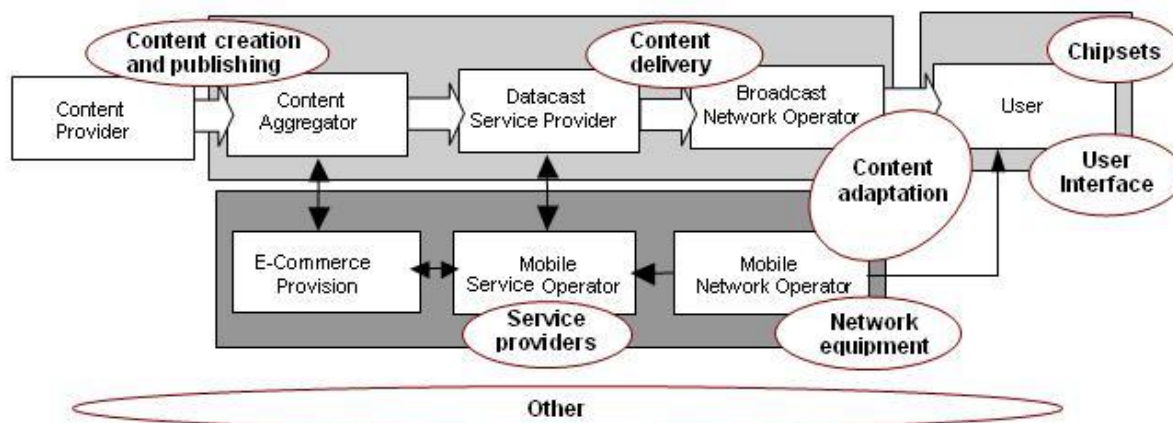
MOBILE TV VALUE CHAIN

So what does the mobile TV value chain look like and where do current start-ups fit in? Any segmentation of start-ups is fraught with difficulty, particularly as it can be so difficult to neatly summarize their technology and their focus can quickly change. The following segmentation is based on Cartagena's best understanding of the companies at this point in time. Each vendor has also been assigned to one of the eight segments, which in some cases is a simplification and, in others, is a view on their main focus among several mobile TV business areas.

Market segments

1. Chipsets
2. Network equipment
3. User interface
4. Content adaptation
5. Content creation and publishing
6. Content delivery
7. Service providers
8. Others

Positioning in the mobile TV value chain



The start-ups have been selected on the basis that they are either totally or increasingly focused on the mobile TV market.

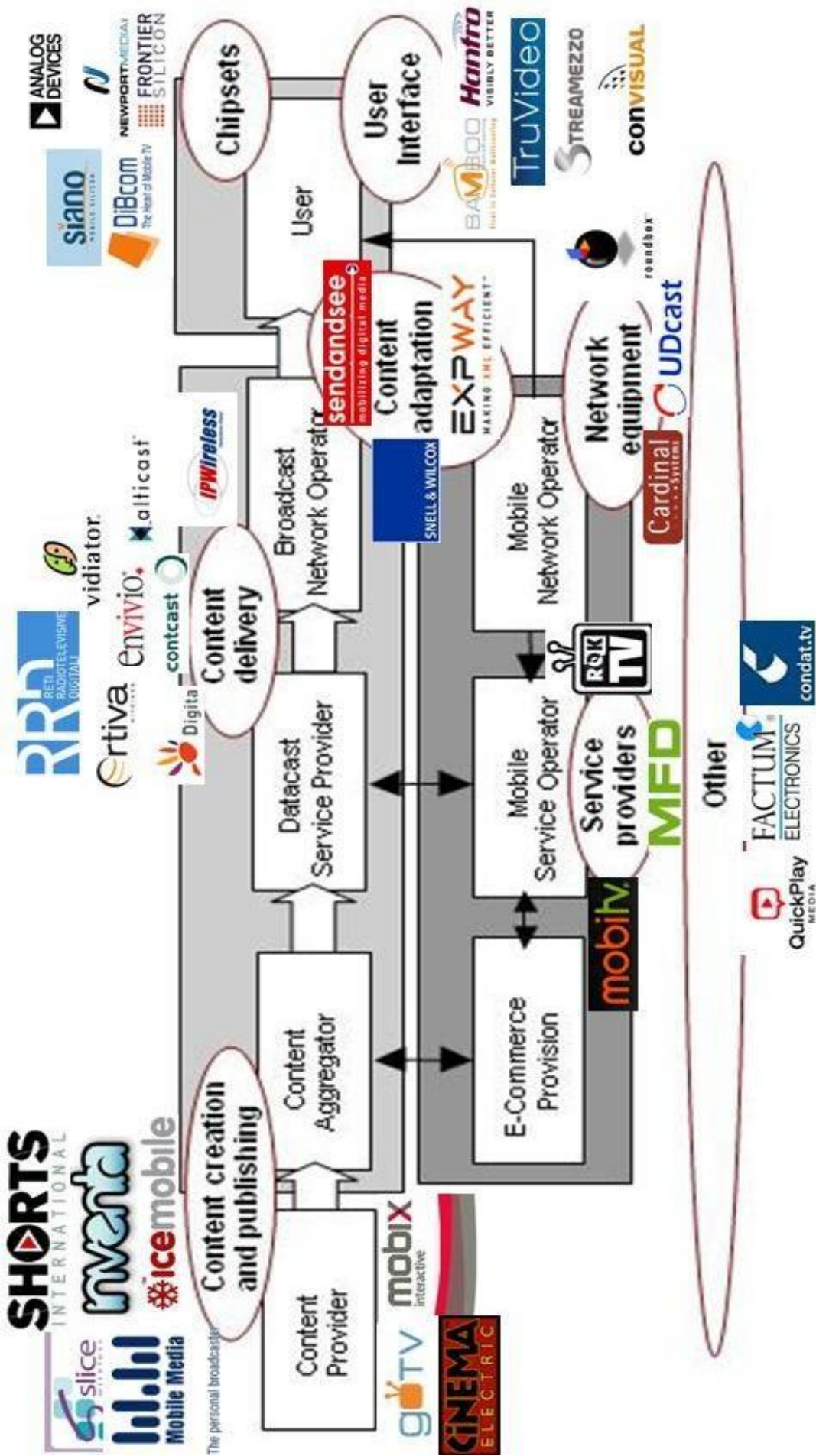


Start-up Players in mobile TV

Market segment	Company name	Business description	Website
1. Chipsets	DiBCom	DVB-H; DVB-T (fabless semiconductors)	http://www.dibcom.info
1. Chipsets	Frontier Silicon	Chips for DAB and T-DMB	http://www.frontier-silicon.com
1. Chipsets	Newport Media	Fabless semiconductors for various standards such as DVB-H, DMB and MediaFLO	http://www.newportmediainc.com
1. Chipsets	Analog Devices	Analog, mixed-signal and digital signal processing integrated circuits	http://www.analog.com
1. Chipsets	Siano	Silicon receivers supporting various standards such as DVB-H, DVB-T and T-DMB	http://www.siano-ms.com
2. Network equipment	Roundbox	End-to-end software system for multi-standard mobile broadcast	http://www.roundbox.com
2. Network equipment	UDCast	DVB-H compliant IP encapsulator, network management and analyzer	http://www.udcast.com
2. Network equipment	Cardinal Systems	Digital broadcasting software for DVB-based content	http://www.cardinalsystems.com
2. Network equipment	Expway	Content Management solutions for multiple network devices	http://www.expway.tv
3. User interface	Hantro	MPEG 4 video codecs	http://www.hantro.com
3. User interface	Streamezzo	Rich Media solutions such as mobile TV and mobile music for handsets	http://www.streamezzo.com
3. User interface	Bamboo MediaCasting	Rich Media platform for a wide range of mobile content	http://www.bamboomc.com
3. User interface	Truvideo	Mobile content distribution software for various platforms and networks	http://www.truvideo.com
3. User interface	Convisual	End-to-end solution with client and server components	http://www.convisual.com
4. Content adaptation	Anyscreen	Development of multimedia and mobile content	http://www.anyscreen.com
4. Content adaptation	Sendandsee	Distribution of visual content	http://www.sendandsee.com
4. Content adaptation	Snell & Wilcox	Digital signal processing and conversion	http://www.snellwilcox.com
5. Content creation and publishing	goTV networks	On-demand television programming customized to the mobile experience	http://www.gotvnetworks.com
5. Content creation and publishing	Inventa Productions	Production of digital content for 3G mobile phones	http://www.inventa.co.uk
5. Content creation and publishing	IceMobile	Publishing of mobile entertainment content	http://www.icemobile.com
5. Content creation and publishing	Mobix Interactive	Distribution and creation of video content for mobile devices	http://www.mobixinteractive.com
5. Content creation and publishing	Shorts International	Programming and distribution of short films for a wide range	http://www.shortsinternational.com

publishing		of media	
5. Content creation and publishing	The Mobile Media Company	Distribution of a wide range of mobile content	http://www.mobilemedia.com
5. Content creation and publishing	CinemaElectric	Production of multimedia and mobile content	http://www.cinemalelectric.com
5. Content creation and publishing	Slice Wireless	Publishing of mobile TV and multi-media content	http://www.slicewireless.com
6. Content delivery	Envivio	MPEG-4 solutions for revenue generating and efficiency increasing applications	http://www.envivio.com
6. Content delivery	IPWireless	Mobile content distribution for 3G networks	http://www.ipwireless.com
6. Content delivery	Digita	Distribution of radio and television services	www.digita.fi/english
6. Content delivery	Ortiva Wireless	Rich media content delivery	http://www.ortivawireless.com
6. Content delivery	Contcast	Distribution of mobile content using DVB-T	http://www.contcast.com
6. Content delivery	Penthera Technologies	Mobile broadcast software for rich media services	http://www.penthera.com
6. Content delivery	Vidiator Technology	Creation, production, packaging and delivery of mobile content	http://www.vidiator.com
6. Content delivery	Alticast	Interactive broadcasting services based on open standards	http://www.alticast.com
6. Content delivery	Reti Radiotelevisive Digitali	Digital network services for DVB-T/H networks	http://www.rrd.tv/en
7. Service providers	Mobiles Fernsehen Deutschland GmbH	Broadcasting solutions based on the DMB standard	http://www.tv-mfd.com
7. Service providers	MobiTV	Mobile TV and digital radio services for cellular, Wi-Fi and broadband enabled devices	http://www.mobitv.com
7. Service providers	ROK Entertainment	Mobile media player for 2.5G networks	http://www.rok.tv
8. Others	QuickPlay Media	Platform for the distribution and management of interactive content to mobile devices	http://www.quickplaymedia.com
8. Others	Condat.tv	Consulting and system development services	http://www.condat.tv
8. Others	Factum Electronics	System components and solutions for signal encoding, decoding and processing in the field of DMB	http://www.factum.se

Company positioning



APPENDIX: LIST OF ACRONYMS

BCMCS	– Broadcast and Multicast Services
DAB-IP	– Digital Audio Broadcasting-Internet Protocol
DMB	– Digital Multimedia Broadcasting
DVB-H	– Digital Video Broadcasting-Handhelds
DVB-T	– Digital Video Broadcasting-Terrestrial
EPG	– Electronic Program Guide
HD-TV	– High-Definition Television
IP-TV	– Internet Protocol Television
ISDB-T	– Terrestrial Integrated Services Digital Broadcasting
MBMS	– Multimedia Broadcast and Multicast Service
PVR	– Personal Video Recorder
S-DMB	– Satellite Digital Multimedia Broadcast
T-DMB	– Terrestrial Digital Multimedia Broadcasting
MediaFLO	– The mobile media system from Qualcomm
TDtv	– The Multimedia Broadcast and Multicast Service from IPWireless