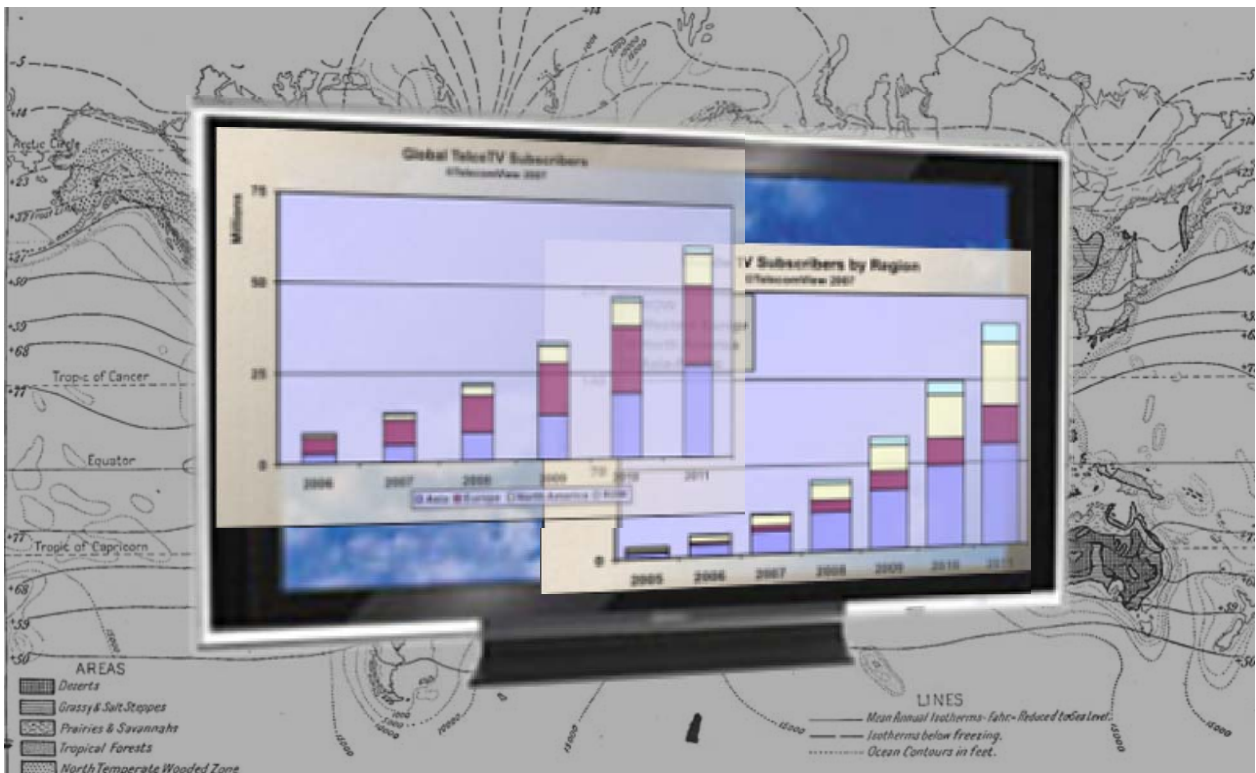TelecomView
information, opinion, analysis

TelcoTV Opportunities

Opportunities in TelcoTV:
Forecast & Market Shares - 2006 to 2012

Forecasts and market share for TelcoTV services and equipment sales with an evaluation of the market opportunity remaining through 2012

The TelcoTV market has taken form. This report identifies the top 50 TelcoTV service providers that will dominate this market along with systems companies providing their deployments. It forecasts the market and defines the market position of these companies from 2006 through 2012 while identifying new opportunities.

TelecomView

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Report Annex

An Excel spreadsheet Annex accompanies the full report. The full report includes 16 forecast and market share charts and 35 tables. The Annex includes the charts in this report along with the data used to generate them as a spreadsheet table. The Annex includes an additional 24 charts that are not included in the body of this report as well. The Annex also includes 34 tables in addition to the 39 tables in the full report. This Annex to the full report includes the following worksheets:

TelcoTV Subscriber Tables

TelcoTV Subscriber Charts

TelcoTV Subscriber Revenue Tables

TelcoTV Subscriber Revenue Charts

TelcoTV System Revenue Tables

TelcoTV System Revenue Charts

TelcoTV Access Tables

TelcoTV Access Charts

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TelcoTV Set-top Box Charts

1   Executive Summary

This report identifies opportunities in the TelcoTV market for the period from 2006 through 2012. It does this in four steps:

- ❑ **Step1:** Create forecast for TelcoTV subscribers and subscriber revenue by service provider and by region.

- ❑ **Step 2:** Create a revenue forecast for each TelcoTV system suppliers. This system forecast will be generated on a service provider by service provider basis. The segments analyzed in this report include access systems use to support Telco TV subscribers, video on demand systems, middleware systems, content security systems, and TelcoTV set-top boxes

- ❑ **Step 3:** Aggregate these revenue forecasts for each TelcoTV systems company within each of the system segments and use this information to rank each company globally and within geographic region in each segment.

- ❑ **Step 4:** Use this forecast by segment to provide an estimate of the revenue opportunity that remains in each of these five TelcoTV system segments.

Based on this analysis, this report provides the following information:

- ❑ The size of the TelcoTV market in terms of subscribers and subscriber revenue for service providers globally, by region, and by company, which identifies which service providers are likely to be most successful.

- ❑ The amount of spending for each of the five system segments studied in this report by year, globally, by geographic region, by service provider.

- ❑ The amount of revenue that will be received by each company providing systems to the service providers studied in this report by year, globally, by geographic region, and by service provider.

- ❑ Rankings of these vendors by each of these segments and by overall total revenue to see which vendors did the best in 2006 and are expected to do well through 2012.

- ❑ A quantitative analysis of the amount of revenue that may still be available by system segment, and over all, based on TelcoTV opportunities, where the vendors have not been selected and where the vendor relationships may change. This will also include a qualitative analysis that describes the likelihood of service providers selecting new vendors for each product segment.

1.1   TelcoTV Service Forecast – 2006 to 2012

Figure 1-1 shows the forecast for TelcoTV subscribers from 2006 through 2012. It shows the number of TelcoTV subscribers growing from 7.8 million in 2006 to 70 million in 2012, a compound annual growth rate of 44 percent. Europe is forecast to have more TelcoTV subscribers than any other region. Asia is in the number two position and is about one year behind Europe in terms of the number of subscribers. North America is in a distant third about four years behind Europe. The Rest Of the World lags well behind in fourth place.

Figure 1-1: TelcoTV Global Subscriber Forecast
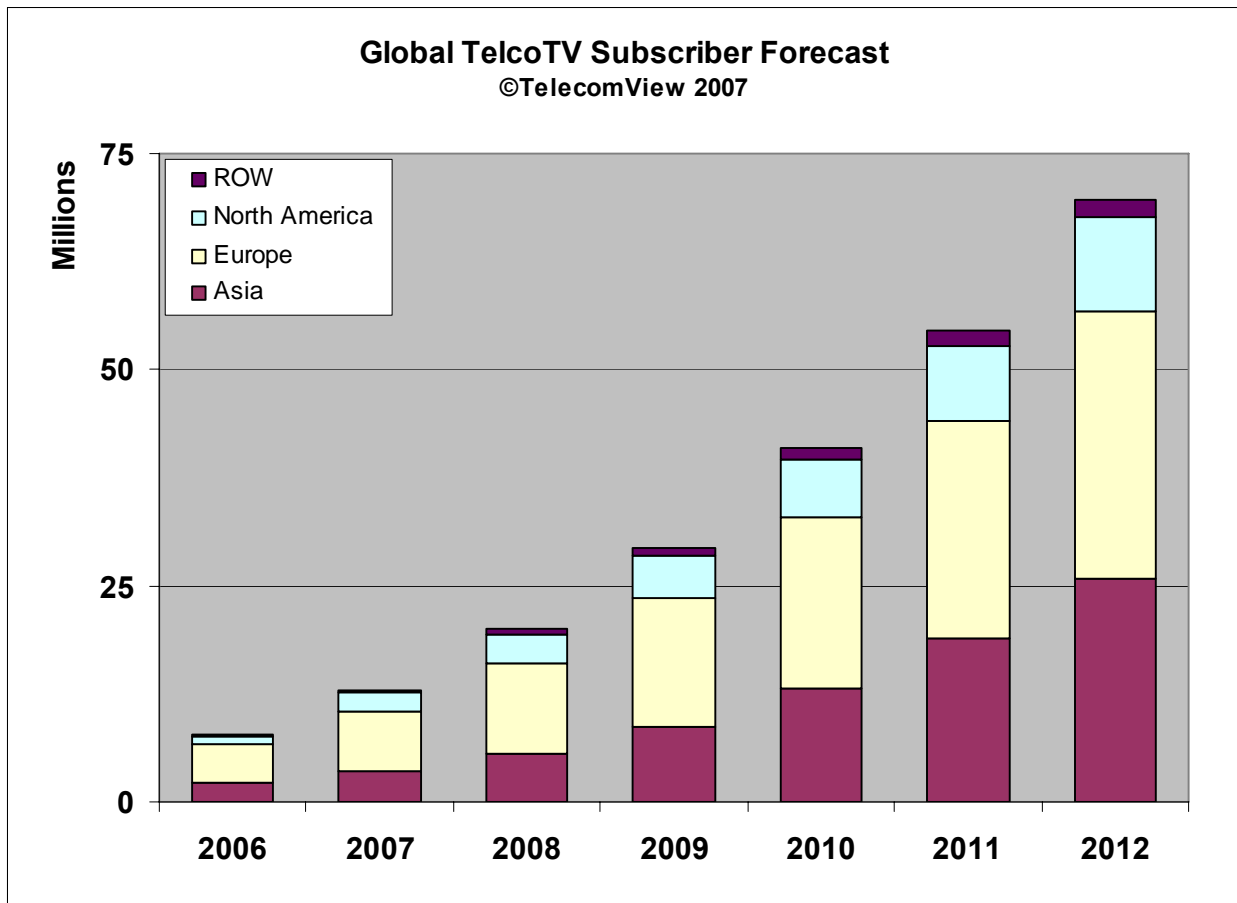
Source: TelecomView – 2007

Figure 1-2 shows the annual revenues for TelcoTV services growing from $2.0 billion in 2006 to $22 billion in 2012, which is a compound annual growth rate of 50 percent. The forecast assumes that average subscriber spending will grow over time due the increased popularity of new services such as video on demand. TelcoTV service revenues for Europe and North America are about the same, especially in the later years of the forecast, because per subscriber spending is assumed to be significantly higher in North America compared to the other regions, because…. Revenues are lower in Asia due to lower pricing in the large developing countries such as China and India. Revenues in Asia are about two years behind Europe and North America. Again the Rest Of the World contributes only a small amount to the forecast.

Figure 1-2: TelcoTV Global Service Revenue
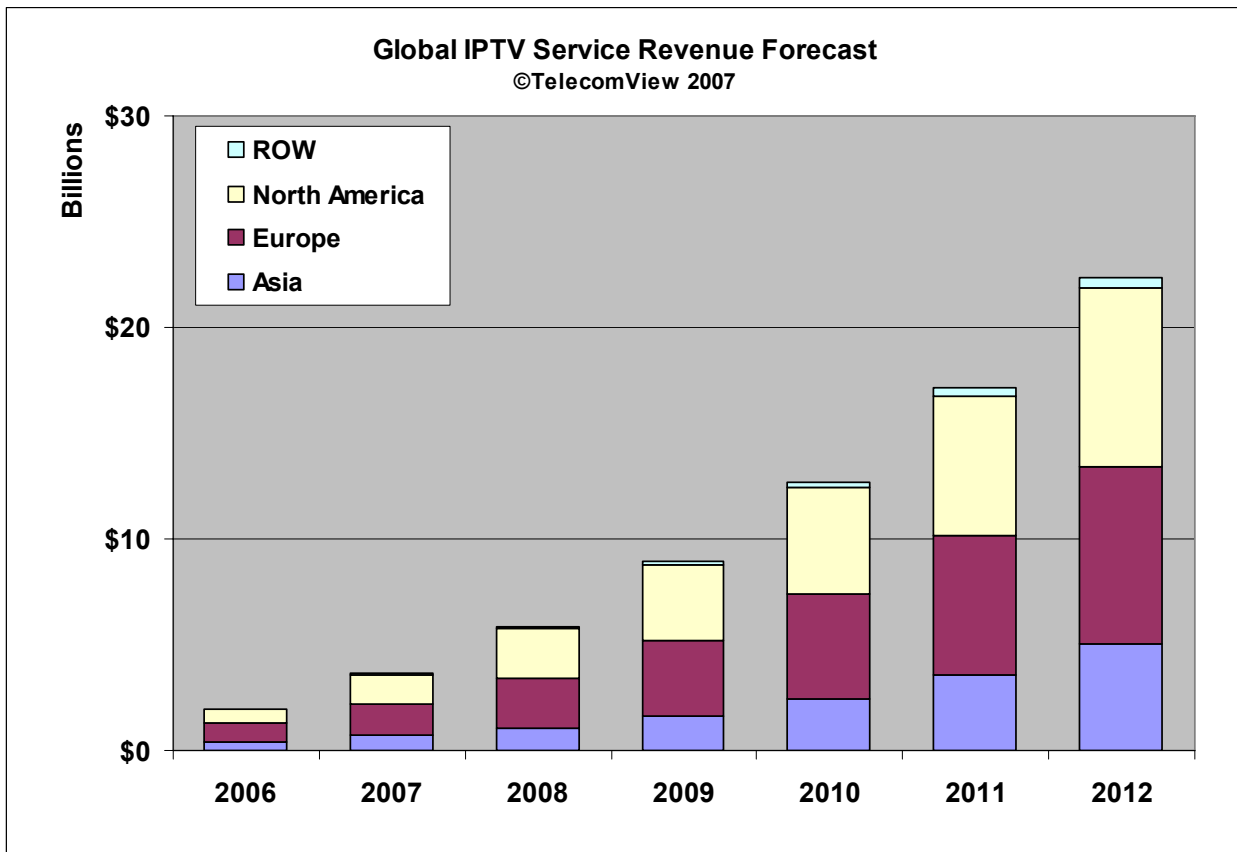
Source: TelecomView – 2007

This forecast indicates that there will be 14 countries with more than one million TelcoTV subscribers by the end of 2012. The top five are shown in Table 1-1. This table also shows the number of TelcoTV subscribers for each of these countries at the end of 2006 along with their ranking in both 2006 and 2012.

Table 1-1: Top Five Country TelcoTV Deployments

Country	Region	2006	2006 Rank	2012	2012 Rank
France	Europe	2,700,000	1	13,950,000	1
China	Asia	242,210	8	10,012,000	2
U.S.	NA	275,500	5	8,346,296	3
Japan	Asia	605,000	3	4,612,000	4
Spain	Europe	421,000	4	2,873,000	5

Source: TelecomView – 2007

France is the leading country in both 2006 and 2012. This forecast includes all of the subscribers that are capable of receiving TelcoTV services. It includes the subscribers that receive only the broadband TV services that are included with the broadband service and is not limited to subscribers to premium services that require fees beyond the basic broadband service. This has a large effect in France, especially with Free where better than 75 percent of all of its broadband subscribers are able to use its TelcoTV service.

China is in the number two position, up from number eight in 2006. China will clearly become the number one country in terms of TelcoTV subscribers at some point. This forecast takes a conservative approach to China because of the higher levels of uncertainty there. The U. S. moves from number five in 2006 to number three in 2012 largely based on the anticipated success of Verizon's FiOS TV service. There is some up side potential in this forecast based on when AT&T sorts outs its issues and starts matching Verizon's success with TelcoTV.

Japan drops from number three in 2006 to number four in 2012. There are several TelcoTV deployments in Japan by NTT and its competitors. The broad availability of fiber broadband services in Japan should keep it in a leading position.

Spain is forecast to be number five in 2012, down from number four in 2012. Telefonica in Spain has been a leading TelcoTV service provider in Europe. Spain is forecast to remain a strong TelcoTV market based on Telefonica's continued success as well as the introduction of TelcoTV services by competitive providers.

This report includes individual forecasts for the top 50 service providers over the forecast period. They account for the preponderance of the TelcoTV subscribers in each year of the forecast period of 2006 to 2012.

Table 1-2 shows the number of subscribers for each service provider at the end of 2012. It also gives the service provider's 2012 ranking globally and by region. China Telecom is number 2 globally and number 1 in Asia, while Free in France is number 4 globally and number 2 in Europe.

It is interesting to note that Verizon in the U.S. is in the number one position with its Fiber to the Home FiOS TV service. France is the leading country by a large margin in terms of TelcoTV subscribers because TelcoTV has become a standard offering for all basic broadband services in France.

Table 1-2: Top Five Service Providers Globally

Telco	Country	Region	2012 Subscribers	Regional Rank	Global Rank
Verizon	U.S.	NA	6,000,000	1	1
China Telecom	China	Asia	5,999,000	1	2
France Telecom	France	Europe	5,100,000	1	3
Free	France	Europe	4,450,000	2	4
China Netcom	China	Asia	4,000,000	2	5

Source: TelecomView – 2007

1.2   TelcoTV System Spending

Table 1-3 shows the service provider spending that result from the forecast in this report by each of the system types included in this report. It shows that set-top boxes will account 58 percent of the total spending. Adding access and video on demand systems accounts for 88 percent of the total, leaving about 12 percent middleware and content security software.

Table 1-3: Service Provider Spending by System Type

Rank	Type	2006 to 2012 Spending ($B)	Percent Revenue	Comments
1	Set-top Boxes	$7.28	58%	Most expensive element on a per subscriber basis
2	Access	$1.94	16%	Every TelcoTV subscriber is connected to an access port
3	Video On Demand	$1.69	14%	On demand services increase in importance
4	Middleware	$0.92	7%	All TelcoTV subscribers are served by middleware software
5	Content Security	$0.64	5%	Growing in importance for on demand and broadcast content
	Total	$12.48	100%	

Source: TelecomView – 2007

This report addresses five different types of TelcoTV systems:

- **Set-top boxes** take the TelcoTV broadcast and on demand streams and render them onto the TV. Set-top boxes today typically support both MPEG-2 and MPEG-4 encoding for standard definition (SD) and often high definition (HD). Set-top boxes often include a hard disk that supports PVR functions.

- **Access Systems** provide the broadband access service to the subscriber. They may support ADSL, ADSL-2+, or VDSL for copper based services. They may support PON or point-to-point Ethernet for fiber based systems. The access systems forecast included in this report is based on the number of ports required to support the TelcoTV subscribers.

- **Video On Demand Systems** are the hardware and software required to support video on demand streaming services. These systems send requested streams to subscribers. They also provide for the distribution of caching contend when distributed architectures are used.

- **Middleware Software** provides the viewer with the ability to select broadcast channels an on demand content as well as to control the TelcoTV service in other ways.

- **Content Security (Content Protection/Digital Rights Management) Software** protects broadcast and on demand content as it is transmitted across the service provider's network as well as the viewer's home network. It also insures that the business rules that define how and when the content is to be viewed are met.

1.3   TelcoTV Market Share – 2006 to 2012

The individual forecasts by service provider are used to generate revenue forecasts for each of the TelcoTV service companies that have been selected by these top 50 service providers in the five segments studied in this report. These individual forecasts for the revenue that each of these companies gets within each service provider are summed to get a total by region within each segment and by an overall total.

This technique provides the ability to rank each of these companies by region within each segment. This ranking is done for every year from 2006 through 2012 and summarized in this report and its accompanying Annex. Within each segment there are companies that are leaders in the regions but not necessarily on a global basis.

The next five systems companies that hold the position of five through ten are Netgem, Thomson, Cisco, ZTE, and C-Cor. It is interesting to note that four out of five of these companies offer TelcoTV set-top boxes. This means that seven out of the top ten companies provide set-top boxes. This is a result of the fact that set-top boxes account for 58 percent of TelcoTV spending over the forecast period.

1.4   TelcoTV Opportunities – 2006 to 2012

The vendor relationships with these top 50 companies have already been established in most cases. These relationships are defined initially during the trial and early marketing phases for each TelcoTV deployment. Even so, there are continuing opportunities with these TelcoTV service providers that vary by segments.

Table 1-5 shows the service provider spending that result from the forecast in this report by each of the system types included in this report. It shows that set-top boxes will account 58 percent of the total spending. Adding access and video on demand systems accounts for 88 percent of the total, leaving about 12 percent middleware and content security software.

Table 1-5: Service Provider Spending by System Type

Rank	Type	Remaining Opportunity 2006 to 2012		Comments
		Total Opportunity ($B)	Percent of Total Spending	
1	Set-top Boxes	$3.10	42%	Opportunities for second and third suppliers
2	Access	$0.62	32%	Technology upgrades to VDSL or FTTH
3	Video On Demand	$0.80	47%	With new services such as NPVR or personalized advertising
4	Middleware	$0.47	50%	Selections stable over time
5	Content Security	$0.31	48%	Selections stable over time
	Total	$4.62	38%	

Source: TelecomView – 2007

Table 1-5 lists the total spending forecast for each of the five segments along with the estimate for the size of the remaining opportunity in the 2008 to 2012 period going forward. This remaining opportunity consists of services that have not yet selected vendors, early stage services where the initial selections may be changed, or for the smaller TelcoTV services that were not individually forecast in this report.

The opportunities for each of these five segments are described as follows:

❑ **Set-top boxes** are expected to generate $7.3 billion in TelcoTV service provider spending between 2006 and 2012. It is forecast that 42 percent of this amount represents the remaining opportunity for set-top boxes in the 2008 through 2012 period.

The large TelcoTV service providers are likely to add additional set-top box vendors as the number of subscribers grows. The investment in set-top boxes will be large and the larger services will be able to easily afford the additional overhead required to support an additional vendor. This will be more difficult for the smaller service providers.

Today there are typically two or three set-top boxes per home in North America but only one per home in Europe, Asia, and the Rest Of the World. The number of set-top boxes in Europe and the developing countries of Asia are likely to increase over time.

❑ **Access Systems** are expected to generate $1.9 billion in TelcoTV service provider spending between 2006 and 2012. It is forecast that 32 percent of this amount represents the remaining opportunity for access systems in the 2008 through 2012 period.

TelcoTV service providers will often acquire new access systems when they start offering new services that have higher bandwidth requirements such as HDTV programming. Moving from ADSL to VDSL and especially to fiber access technologies involves the introduction of new vendors. It is less likely that a broadband service provider will bring in a new broadband systems vendor when adding a TelcoTV service to an existing ADSL/ADSL-2+ based broadband service.

Every TelcoTV user will need an ADSL, ADSL-2+, or VDSL port. A fiber-connected user will need to either a point-to-point Ethernet port or an appropriate share of a PON Optical Line Terminal (OLT) interface.

❑ **Video On Demand Systems** are expected to generate $1.7 billion in TelcoTV service provider spending between 2006 and 2012. It is forecast that 47 percent of this amount represents the remaining opportunity for video on demand systems in the 2008 through 2012 period.

TelcoTV service providers may introduce new video on demand system vendors as they add new services. For example, FastWeb in Italy uses Bitband to support traditional on demand services and Kasenna to support NPVR services.

Video on demand systems are forecast based on the maximum number of simultaneous streams required to support the service. This is typically 10 to 20 percent of the total number of subscribers in North America today, because the uptake of on demand services is still low. In Europe and Asia, a ratio of 5 percent of total subscribers or less is required today.

This forecast assumes that on demand services will increase in popularity over the forecast period and that the introduction on network PVR services that permit viewing previously broadcast TV programs along with personalized advertising will push the required video on demand capacity required to over 50 percent of the total number of subscribers by the end of the forecast period in 2012.

❑ **Middleware Software** is expected to generate $920 million in TelcoTV service provider spending between 2006 and 2012. It is forecast that 50 percent of this amount represents the remaining opportunity for middleware software in the 2008 through 2012 period.

Middleware software is likely to be stable over time as long as it provides the capabilities that the service provider is looking for. The middleware software defines the look and feel of the TelcoTV service; consequently, it is not likely that the service provider will introduce a second vendor unless it has decided to move to a new system.

Every TelcoTV subscriber is serviced by middleware software, since the viewer uses this software to select channels and to control the service.

❑ **Content Security (Content Protection/Digital Rights Management) Software** is expected to generate $640 million in TelcoTV service provider spending between 2006 and 2012. It is forecast that 48 percent of this amount represents the remaining opportunity for middleware software in the 2008 through 2012 period.

Content Security is also likely to be stable time as long as it provides the capabilities that the service provider is looking for. The viewer will not be aware of this software, but it is important to the content owners. The TelcoTV service provider is developing its relationships with the Hollywood studios and the other content providers based on its content security software. It will have to reestablish these relationships if it changes this software.

Content security is provided for all on demand content, so every on demand session includes content security for most TelcoTV services. Content security is also provided for many premium broadcast channels, especially special events and sports broadcasts.

In general, there are three potential sources of TelcoTV systems opportunities. There are opportunities with service providers that have not selected their vendors yet. This is the clearest opportunity. There are also opportunities with service providers with service providers that are still at a very early stage of deploying their services. There are opportunities for replacing existing vendors in these early deployments. There are also opportunities with the smaller TelcoTV services are not included in the top 50 list included in this report. TelecomView has identified 450 smaller telcos globally with some level of TelcoTV activity. These smaller companies are a good market, but one that is growing slower than the over all market forecast in this report.

2 Methodology and Assumptions

2.1 Coverage of Report

This report focuses on the top 50 TelcoTV service providers based on the forecast. These 50companies all had at least 200 thousand TelcoTV subscribers by the end of 2012. There were another 37 service providers whose individual forecasts for this report that were below this line. These top 50 companies accounted for 80 percent of the subscribers in the forecast for 2006 and 88 percent of the subscribers in the forecast for 2012.

The forecasts are grouped by four regions – Europe, Asia, North America, and the Rest Of the World (ROW). The Rest Of the World contains the Middle East, Africa, Latin America and the Caribbean, along with the Russian Federation. This report uses the following methodology to perform this opportunity analysis:

❑ Forecast the number of subscribers for these top TelcoTV services for each year between 2006 and 2012 and forecast the total number of subscribers for the smaller TelcoTV services in each of the four regions.

❑ Forecast system spending for each of the top service providers for each of the five product segments.

❑ Use this system spending forecast to rank each systems company globally and within each the European, Asian, and North American region within each of the five segments. Rankings are not provided for the Rest Of the World region because this market is not sufficiently mature; however, revenues in the Rest Of the World are included in the global rankings.

❑ Use the service provider TelcoTV system spending forecast to define the size of the opportunity for TelcoTV systems by quantifying the amount of spending over the forecast period where the vendors have not been selected, the spending where the TelcoTV service is still at an early stage and there is still opportunity to replace vendors, and the spending by the smaller TelcoTV service providers that are not included in this top 50 list.

2.2   Opportunity Analysis

This report identifies three kinds of opportunities for system companies with TelcoTV products. The first opportunity is with service providers that have not yet introduced their TelcoTV services and have not committed to a set of vendors as yet. Clearly, there are significant opportunities with these companies.

The second group of companies is those that are in the early stages of their commercial rollout. Companies at this stage have selected an initial set of vendors but may decide to move to vendors before the number of subscribers gets very large. While penetrating an account at this stage is likely to be more difficult than with service providers that have not yet introduced a commercial TelcoTV service, it is clearly possible.

Thus, the third group of companies are those that are smaller than the top 50 examined in detail in this report that account for 12 to 20 percent of the forecast. TelecomView has identified over 450 other service providers globally outside of the top 50. This market of smaller carriers is a strong market, but it is likely to grow more slowly than the market defined by the top 50. There are many companies that are thriving serving this smaller market. However, their results will not be reflected in this report. In any case, these smaller markets to change the ratings in this report significantly.

2.3   System Segments

This report examines five types of TelcoTV products. Each product category will present different opportunities for new vendors as follows:

❑ **Access Systems:** TelcoTV service providers will often acquire new access systems when they start offering new services that have higher bandwidth requirements such as HDTV programming. Moving from ADSL to VDSL and especially to fiber access technologies involves the introduction of new vendors.

❑ **Video On Demand Systems:** TelcoTV service providers may introduce new video on demand system vendors as they add new services. For example, FastWeb in Italy uses Bitband to support traditional on demand services and Kasenna to support NPVR services.

❑ **Middleware Software** is likely to be stable over time as long as it provides the capabilities that the service provider is looking for. The middleware software defines the look and feel of the TelcoTV service; consequently, it is not likely that the service provider will introduce a second vendor unless it has decided to move to a new system.

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- ❑ **Content Security (Content Protection/Digital Rights Management) Software** is also likely to be stable time as long as it provides the capabilities that the service provider is looking for. The viewer will not be aware of this software, but it is important to the content owners. The TelcoTV service provider is developing its relationships with the Hollywood studios and the other content providers based on its content security software. It will have to reestablish these relationships if it changes this software.

- ❑ **Set-top boxes:** The large TelcoTV service providers are likely to add additional set-top box vendors as the number of subscribers grows. The investment in set-top boxes will be large and the larger services will be able to easily afford the additional overhead required to support an additional vendor. This will be more difficult for the smaller vendors.

Each of these segments is forecast separately by vendor for each of the top 50 service providers identified. The following steps are taken in this analysis

- ❑ Identify the vendors for each service providers for each of the five product segments and forecast their revenues. This includes a category where the vendor has not been selected.

- ❑ Rank the vendors by their revenue in each segment for each year for 2006 through 2012 and for the total forecast period.

- ❑ Identify the revenue for each segment where the vendor has not been identified or the TelcoTV service is not well established.

- ❑ Develop similar revenue numbers and rankings for the total for each vendor across all five product segments.

This report makes the assumption that the current set of vendor relationships remains static over the entire forecast period. Some allowance has been made by assuming that a portion of the set-top box sales for very large deployments to new vendors.

It is likely that most of these vendor relationships will not change as long as the vendor continues to perform well. As discussed above, the middleware and content security software relationships are likely to remain static. Access system relationships may change with the introduction of new technologies and the video on demand system relationships may change with the introduction of new services. The set-top box vendor relationships are likely to be the most dynamic because it is expected to be most vulnerable to price competition.

This report can be used to identify the size of the TelcoTV opportunity in each region in each product segment. It can also be used to understand the size of each of the top TelcoTV deployments and the amount of revenues that they will generate over the forecast period. It can also be used to identify potential spending levels for each service provider and the revenues received by each systems vendor in each region and product segment.

2.4   Forecast Assumptions

The forecast in this report is based on a number of general assumptions. The assumptions made for each of the system segments included in the report are included in the corresponding sections.

❑ The TelcoTV services will be delivered over an appropriate ADSL, VDSL, or fiber based broadband access service. The penetration of broadband services defines the available market for TelcoTV services.

❑ The top 50 service providers that were included in this report were selected because the forecast shows that they should each have at least 200 thousand TelcoTV subscribers by the end of 2012.

❑ The vendor (or vendors) for each of the five product segments for each service provider are identified. If the vendor is not known, then the vendor is classified as "not selected" if the TelcoTV service has not been introduce as yet, as "small telco" for the forecast for the smaller telcos that are not included in the top 50, and as "unidentified" if the vendor is not known. About 8 percent of the total system spending is in the "unidentified" category.

❑ These vendor relationships are assumed to be static over the forecast period. This means that the forecast and rankings give a picture of what will happen if none of these relationship changes. Clearly, it will not be that static, but this analysis gives a good base line for analyzing the effect of future events.

❑ System revenues over the forecast period will average out to a value close to the spending required to support the installed subscribers. While there are year to year differences where a service provider may buy ahead or may utilize its inventory rather than buying new systems, these effects will be small when averaged over time and over all 50 service providers.

❑ The spending by the smaller telcos that are not included in our top 50 list will not materially affect the rankings in this list, particularly the top five rankings. The total spending by these small telcos over the entire forecast period for all segments is 11 percent of the total. This spending is highly fragmented, so that no vendor serving this market is likely to get a very large slice of this revenue.

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4 Service Providers Included in Report

Table 4-1 lists the service providers individually forecast for this report.

Table 4-1: Service Providers Included in the Report

Area	Country	Service Provider
Asia	Australia	Telstra
	China	China Netcom
		China Telecom
	Hong Kong	Hong Kong Broadband/City Telecom
		PCCW
	India	BSNL
		MTNL
		Reliance Communications
	Japan	KDDI
		NTT
		OCN
		On Line TV
		OnDemandTV
		Softbank Yahoo
	Korea	Dacom
		Hanaro
		KT
	Singapore	SingTel
	Taiwan	Chunghwa Telecom
	Thailand	TRUE

Area	Country	Service Provider
Europe	Austria	Telekom Austria
	Belgium	Belgacom
	Denmark	Dansk Bredband
		TDC
	France	Free
		Neuf Telecom
		Orange France Telecom
		Telecom Italia France
	Germany	Deutsche Telekom
		Hansenet
	Iceland	Iceland Telecom
	Ireland	Eircom
	Italy	Fastweb
		Telecom Italia
	Netherlands	KPN
		Versatel
	Norway	Lyse Energi
		Telenor
	Portugal	Portugal Telecom
	Spain	Telefonica
	Sweden	TeliaSonera
	Switzerland	SwissCom
	UK	BT
		Tiscali UK
NA	Canada	Bell Canada
		Telus Canada
	U.S.	AT&T
		QWEST
		Verizon
ROW	Brazil	Brasil Telecom
		Telefonica Brazil
	Russia	Norilsk
		Sistema/Stream-TV

Source: TelecomView - 2007

5 Systems Companies in this Report

Table 5-1: Systems Companies in this Report

Company	Access Systems	Content Security	Middleware	Set-top Boxes	Video On Demand
ADB				X	
Alcatel-Lucent	X	X	X		X
Alticast			X		
Amino				X	
Bitband					X
Buffalo				X	
Cascade			X		
Castis					X
C-Cor					X
Cisco	X			X	
Dasan				X	
ECI	X				
Ericsson	X		X		
Fujitsu	X				
Harmonic					X
Huawei	X				
Hwacomm				X	
Infraware			X		
Irdeto		X			
Kasenna					X
Latens		X			
Microsoft		X	X		X
Minerva			X		
Motorola	X			X	
Nagravision		X			

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Company	Access Systems	Content Security	Middleware	Set-top Boxes	Video On Demand
NDS		X			
NEC	X				
Netgem			X	X	
Nokia Siemens	X		X		
Oki		X	X		X
Orca			X		
Panasonic				X	
Phillips				X	
Sagem				X	
Samsung	X				
SeaChange					X
Securemedia		X			
Softier				X	
Sunniwell				X	
Tellbhs2	X				
Telsey				X	
Thomson			X	X	X
Tilgin				X	
UIEvolution			X		
UTStarcom	X	X	X	X	X
Verimatrix		X			
Viaccess		X			

Source: TelecomView – 2007

6 Appendix II: Glossary

The following terms and organizations have been referred to in the text.

Acronym	Definition
AAA	Authentication, Authorization and Accounting
ABC	American Broadcasting Company
API	Application Program Interface
ARPU	Average Revenue per User (Usually monthly)
ATCA	Advanced Telecom Computing Architecture
ATIS	Alliance for Telecommunications Industry Solutions
ATV	Asia Television Limited
Billion	1,000,000,000 (1,000 Million)
BRAS	Broadband Remote Access Server
BT	British Telecom
CAPEX	Capital Expenditure
CNBC	Consumer News and Business Channel
CNN	Cable News Network
CNO	Cable Network Operator (See also MSO)
CPE	Customer Premise Equipment
CPGA	Cost per gross add
CSCF	Call Session Control Function
DS3	NA transmission standard for wideband communications
DSL	Digital Subscriber Line
EBU	European Broadcasting Union
ESPN	Entertainment and Sports Programming Network
ETSI	European Telecommunications Standards Institute
EU	European Union
FA	Football Association
FCC	Federal Communications Commission
FNO	Fixed Network Operator
GHz	Giga Hertz
HBO	Home Box Office
HD	High Definition
Hz	Hertz
IDP	Intrusion Detection and Protection
IETF	Internet Engineering Task Force
IMS	IP Multimedia Subsystem
INO	Integrated Network Operator
IP	Internet Protocol
IP v 6	IP version 6
IP/MPLS	IP/ Multi Protocol Label Switching
IPDC	Internet Protocol Data Casting

Acronym	Definition
IPTV	Internet Protocol TeleVision
ISP	Internet Service Provider
ITN	Independent Television News
ITU	International Telecommunications Union
kbps	Kilo bits per second
KDDI	Japanese Mobile Operator
kHz	Kilo Hertz
km	Kilometer
kW	Kilowatt
L2CP	Layer 2 Control Protocol
LG	Lucky Goldstar
LLU	Local Loop Unbundling
MAC	Media Access Control
Mbps	Mega bits per second
MHz	Mega Hertz
Million	1,000,000
MPEG	Moving Picture Experts Group
MPLS	MultiProtocol Label Switching
MSNBC	Microsoft NBC network
MSO	Multimedia Services Operator (See also CNO)
MTV	Music Television
NGN	Next Generation Networks
NPV	Net Present Value
NPVR	Network Personal Video Recorder
NRA	National Regulatory Authority
NTT	Nippon Telegraph and Telephone Corporation
OPEX	Operating Expenditure
OSA	Open System Architecture
OSS/BSS	Operational Support System/Billing Support System
PATS	Publicly Available Telephone Service
PBX	Private Branch Exchange
PCCW	Pacific Century CyberWorks Limited
PDA	Personal Digital Assistant
PRD	Product Requirements Definition
PSTN	Public Switched Telephone Network
PTT	See PoC
PVR	Personal Video Recorder
QoE	Quality of Experience
QoS	Quality of Service
QVGA	Quarter Video Graphics Array
RAI	Radiotelevisione Italiani
RTE	Radio Telefís Éireann
SCCAN	Seamless Converged Communication Across Networks
SDH	Synchronous Digital Hierarchy
SHE	Super HeadEnd

Acronym	Definition
SIP	Session Initiation Protocol
SK Telecom	Korean mobile operator
SMS	Short Message Service
SONET	Synchronous Optical NETworking
SS7	Signaling System 7
TE	Traffic Engineering
TIM	Telecom Italia Mobile
TISPAN	See ETSI
TV	Television
UK	United Kingdom
US	United States
VCR	Video Cassette Recorder
VHO	Video Hub Office
VLAN	Virtual Local Area Network
VoD	Video on Demand
VoIP	Voice over Internet Protocol
VPLS	Virtual Private LAN System
VPN	Virtual Private Network
VSO	Video Serving Office
WACC	Weighted Average Cost of Capital
WAN	Wide Area Network
ZDF	Zweites Deutsches Fernsehen