

AVK systems

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Executive Summary

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Introduction, AVK systems SA, is a Swiss technology firm that has emerged as first to market with HD Audio solutions for the sport broadcasting industry through a suite of innovative products and managed services that deliver HD Audio for all forms of sport production (Live, Slow-motion replays, highlights and even archives). Our target market is constituted by over 500 active Sport Broadcasters or “SBs” (e.g., FOX, SKY, CANAL+), and over 2000 Production Firms or “PFs” (e.g., Plazamedia, Euromedia, HBS) who make up the global sport broadcasting industry.

AVK systems has so far raised 1 million CHF in two financing rounds (Seed & Series A) and has signed its first paying customers. The team at AVK systems currently features 15 employees of which 9 are employed full time (6 in Lausanne and 3 in Bangalore). The management team is comprised of experienced professionals backed by an advisory board of distinguished individuals with significant accomplishments in sport broadcasting and technology.

AVK systems has won international recognition. On the 11th April 2013, AVK was conferred the prestigious Red Herring Top 100 Europe award. Earlier on the 6th November 2012, AVK was awarded the Swiss CTI Label from the CTI (Swiss Federal Committee for Technology and innovation). Prior to that, AVK received the FIT prize in 2010 from the FIT “Fondation pour l’innovation et Technologie”. From its inception AVK systems has received the backing of top federations like FIFA and UEFA. On the 11th of December 2012, the journal “Le Temps” carried a half page article on AVK systems highlighting the technology, impact for the Lausanne region, and its growth potential.

Market Dynamics, “SBs” (e.g., RTS, ZDF, EUROSPORT) first purchase broadcast rights for sporting events from federations (e.g., World cup rights from FIFA). This is done through a process of competitive bidding; the broadcast rights are allotted to the SB placing the highest bid. Next, these broadcasters produce sport programming content with the help of “PFs” (e.g., TELERECORD, MEDIAPRO). Today’s production of sports programming includes a complex mosaic of various key elements: Live match, SlowMo/Super Slow Mo replays, Highlights, statistics, graphics, Pre & post match analysis. The production is conducted at the match venue in OB VANS (customized vans fitted with specialized broadcast equipment for live production & SloMo replays) and at the SBs or PFs facility in STUDIOS (purpose built indoor facilities for post-production and analysis). Finally, the produced match content is broadcast to audiences through cable, satellite, IPTV & terrestrial operator networks (E.g., Swisscom, Verizon, DIRECTTV, ASTRO) in exchange for subscription fees (PAY TV) and/or Advertisement revenues (FTA or Free to Air).

Market Situation, Over the past decade, the cost of acquiring rights for key sporting events has increased drastically due to fierce competition between SBs. For example, French Ligue 1 soccer broadcast rights rose from 125 Mil € /yr in 2004 to 668 Mil €/yr in 2011. As of today, the cumulative value of rights for the top 10 sport leagues alone is in excess of one billion \$/yr. This has added to the already high operating costs driven primarily by the 8 to 12 onsite operators needed for production of Slow-Motion replays, statistics and Graphics, all of which have become an integral part of sport broadcasting.

Today, SBs face the daunting task of turning their expensive rights acquisitions into profit by generating additional revenues while keeping operating costs under control. After an initial phase of interest in technologies related to new business models and enhanced interactivity (e.g., PPV, Video on demand etc.) the focus has now shifted to enhancing the core audio-visual experience through HDTV, 3DTV, and more recently, the 2nd Screen. This is because sports fans are willing to pay more in return for the enhanced HD/3DTV experience, generating significant extra revenues for SBs. For ex., BSKYB charges each subscriber an additional 10 - 15£ per month for the HD/3D sports experience. The uptake of HD/3D by its existing subscriber base of roughly 10 million subscribers can generate 1.8 Billion £ of additional revenue per year. Not surprisingly, HD/3D sport is top priority for BSKYB and the entire English Premier League (EPL) is produced in 3D and HD.

Business Opportunity, The enormous extra revenue potential from HD/3D sport is spurring SB’s worldwide to constantly improve and market the HD/3D experience to the subscribers. Today, major strides in HD/3DTV production notwithstanding, SB’s are still unable to deliver HD Audio despite significant efforts. For live HD/3DTV sport broadcasts, most action sounds cannot be heard because mics fail in high noise environments. For example, while watching sport on TV, one can always hear the tennis ball but rarely the soccer ball. TV Globo of Brazil even attempted to place a microphone inside a soccer ball without success. In regard to SlowMotion (SloMo) replays, they are always played out muted (without the original Audio) for all sports because the original audio track cannot be replayed at a slower speed. EVS (World leaders in SloMo) have tried for many years now to deliver audio solutions for SloMo without success. HD Audio for highlights, archives & even DVD releases of High profile events like FIFA world cup remain impossible because movie-like post production techniques cannot be used due to the sheer scale and complexity of identifying and mixing the right action sounds for the over 1500 events in a single game. Subsequently, HD Audio for sport broadcasting has emerged as a significant opportunity.

Innovation, Our patent pending core technology "Audio Visual Kinetics" or "AVK" is the outcome of 4 years of research with leading research institutes (EPFL, IISC). AVK allows SBs to produce HD Audio for their sports programming for the first time ever in the history of sport broadcasting. AVK features revolutionary audio-visual algorithms that extract and refurbish degraded audio from high noise environments and synchronise with Slow motion to deliver stunning HD Audio across all forms of production; Live, SloMo replays, Highlights and even Archives. AVK also features operational innovations that allow broadcasters to minimize operational costs; works entirely using the existing set-up (no additional mics or cameras required) and allows for remote production (no need for onsite operators). AVK is backed by a strong IP portfolio of 6 patents of which 3 have already been filed with clean ISRs.

Products, our product offering features 8 distinct products (See Table 1) spread across three product lines; DECIBELS™, MATCHDAY™ and NEXTVIEW. The DECIBELS™ suite of products allows broadcasters to deliver HD Audio covering various applications; Live (LMA), Slo-Mo (LSA), Highlights/Reruns/Archives (DMA), Clips for Mobile/internet/pre-post match analysis (DCA), and , Replays on Radio (DRA). Where applicable these products are available in three operational variants; Multi operator variant (C) with full functionality, Single operator variant (SPRINT) with scaled down functionality, and, a fully automated variant (R) requiring no operators and driven entirely by offshore/offsite AVK operators as a managed service. The MATCHDAY™ product line includes products that allow broadcasters to avail remote offshore production (OMS) and deliver L1/L2/L3 stats as a fully automated by-product of HD Audio production (LMS). The NEXTVIEW product line includes products that grant SBs extended control in the way the deliver and monetize HD Audio through embedded decoders (G4/G5) for use in consumer devices like STBs, s etc., as well as 2ND screen productions (PITCHSCREEN) for Mobile phones and Tablets.

Services, our LMD service (Live Match Data) is provided using AVK LMD servers; dedicated processing stations with built-in touch screen and voice recognition interfaces. Up-to 3 AVK LMD operators use as many AVK LMD systems to generate logs that drive the R variants of our products deployed at the production centers or OB Vans. The operators can be deployed onsite or from a remote location as desired by the broadcaster and a range of delivery turnarounds are available ranging from STD (within 24hrs) to Express (within 8 Hrs), Priority (within 1 hour), Flash (within 10 seconds) and Live (within 3 seconds). Turnarounds from STD to Priority are classified as DMD.

Target Market, Roughly 600 active SBs" and over 2000 "PFs" world-wide could use our products and services. SB's and PF's purchase our products to equip their OBVANS (customized vans used at the match venues for live production) and, STUDIOS (purpose built indoor facilities

for post-production and analysis etc.). SBs and PF's also use our managed services in tandem with our R variant products to avail cost effective production. Each SB or PF typically operates multiple OBVANS and studios to cater for parallel productions and therefore requires multiple product units. Considering only the Primary market (Major International/National SBs and PFs), the market size for our SOUNDFIVE™ products in the OBVAN segment is estimated at 4000 units and 1000 units in the Studio Segment. Every potential unit sale is regarded as a "Sale-Point" and these Sale-Points are spread across three geographical Tiers; Tier-1 includes the top 7 Sports markets (USA, UK, Germany, France, Italy, Spain, Australia), Tier-2 includes Western Europe, Canada, Brazil, Japan, China, India and the Middle-east, and , Tier-3 covers the rest of the world.

Business Model & Pricing, We use revenue models already prevalent in the broadcast industry to ensure both one time revenues from product Hardware & Software sales, and, recurring revenues through annual product maintenance support (PMS) contracts levied at three levels from 9.25% to 15%. This is backed by sales of upgrades/Options and managed services. Our products are priced at a premium; ranging from 24'500 CHF to 232'375 CHF per unit depending on the nature of the application. We reduce the total cost of ownership (TCO) for all our products through our low cost LMD managed services priced from 5 to 30 CHF per minute depending on delivery turnaround chosen.

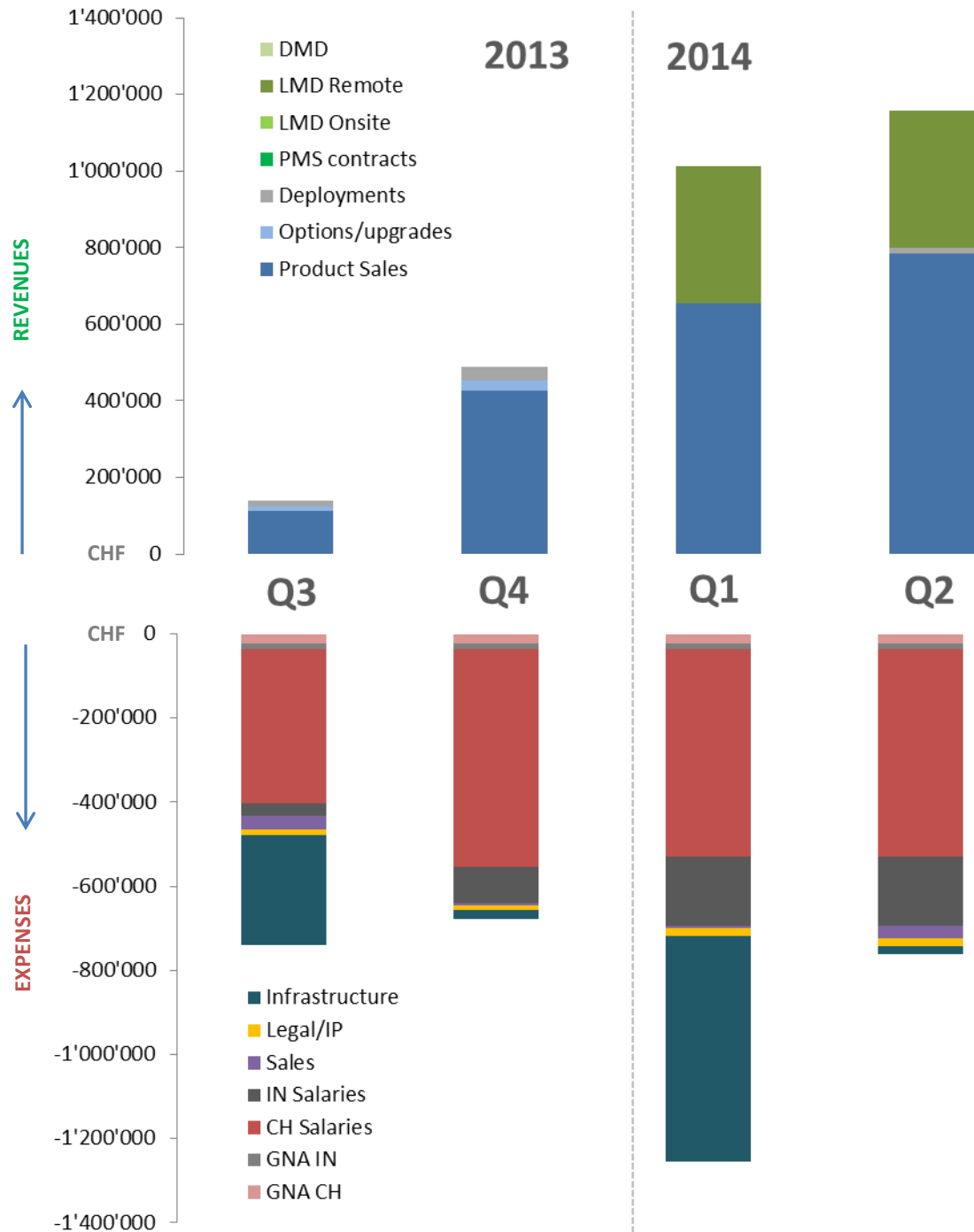
Competition, Where HD Audio is concerned AVK systems are the pioneers, first to market and the only company to date with a viable solution. As of today, there is no immediate competition. Going ahead, our competitive edge lies in the quality/versatility/speed of our HD Audio production and our ability to provide globally scalable low cost managed services, both which will be hard to match. This of course is in addition to our first to market position, strong IP portfolio and operational expertise backed by credible client references.

Revenue Potential, LSA (Live Slo-Mo Audio) product is a fine indicator of the significant revenue potential at hand. We base our market size estimations on key figures linked to sales of comparable technology products in the industry. e.g., 6000 SloMo servers sold by EVS in the primary market, 400 sloMo servers sold by BLT in the territory of Italy. We estimate the addressable market size for LSA at 2500 units in the OB van Segment for the primary market alone. With variants priced between 57 to 112K CHF, one-time product sales for LSA can bring in 120 Million CHF. Similar assessment (TABLE 2) based on product price and Sale-points indicate over half a billion CHF in one-time sale revenue potential for the DECIBELS™, MATCHDAY™ and NEXTVIEW product lines combined, and that for the sport of soccer alone. Upgrades for other sports and options should bring in another 250 Million CHF. Recurring revenues of up-to 50 million CHF are expected annually from support contracts and LMD Managed services.

TABLE 1	PRODUCT LIST AND PRICING					TABLE 2	REVENUE POTENTIAL			
PRODUCT	DESCRIPTION	VARIANTS	APPLICATION	LIST PRICE	TIER-1	TIER-2	TIER-3	Product	PMS/Year	
DECIBELS™					SALE POINTS			REVENUES		
AVK DCA Deferred Clip Audio	Near-Live production of Action-Replay ³ clips in HD Audio	DCA-R	For Action Replays during live Broadcast , Half-time, Pre/Post Match analysis, as well as for commentary animated replays on Radio (RX)	28.325 CHF	90	180	300	~ 15 Mil CHF	~ 1.5 Mil CHF	
AVK DMA Deferred Match Audio	Post-produced or Near-live full length games in HD Audio	DMA-R	For Highlights, weekly/daily shows , full match re-runs /delayed broadcast, Video on Demand (VOD), Archives	43.630 CHF	90	180	300	~ 24 Mil CHF	~ 2.5 Mil CHF	
AVK LSA Live SloMo Audio	Live production of Slow-Mo & Super Slow-Mo Replays ⁴ in HD Audio	LSA - Sprint	For Instantaneous Slow Motion Replays during Live broadcast for all action sequences & across unlimited number of camera angles.	57.565 CHF	150	500	750	~ 80 Mil CHF	~ 8 Mil CHF	
		LSA - R		67.500 CHF	120	240	300	~ 44 Mil CHF	~ 4.5 Mil CHF	
AVK LMA Live Match Audio	Live production of full length games in HD Audio	LMA - R	For Live broadcast of full length games	127.000 CHF	120	50	80	~ 31 Mil CHF	~ 3 Mil CHF	
AVK TRA Triggered Replay Audio	Triggered HD Audio Replays	TRA - R	For HD Audio replays on Radio	23.745 CHF	100	150	250	~ 11 Mil CHF	~ 1 Mil CHF	
MATCHDAY™					SALE POINTS			REVENUES		
AVK OMS Offsite Media Streamer	Live frame synced (UNCOMPRESSED – COMPRESSED) streaming of Audio Video and Key Frames	OMS Light - R	For enabling remote production from offshore/offsite operators	17.500 CHF	50	80	100	~ 4 Mil CHF	~ 0.5 Mil CHF	
		OMS - R		33.500 CHF	140	150	200	~ 9 Mil CHF	~ 1 Mil CHF	
AVK MLS Match Live Statistics	Live match statistics covering L1 -Goals scored, Fouls/cards, corner kicks, L2 -passes delivered received per player, L3 -Player Foot heat maps	MLS - R	For L1, L2 & L3 Live Match Statistics exports aimed at integration in TV / internet and other applications.	35.000 CHF	70	85	110	~ 9 Mil CHF	~ 1 Mil CHF	
NEXTVIEW™					SALE POINTS			REVENUES		
AVK PITCHSCREEN	Application client framework for consolidating HD Audio & Statistics	PITCHSCREEN	For second screen, internet and mobile productions.	TBD						
AVK GX DECODERS	HD Audio decoders with user control for embedded devices	G4/G5	For STBs , Tablets, handhelds and Smart TV's	~ 1 CHF	170 Mil					

FIGURE 1

1 YEAR CASH FLOW PROJECTION



REVENUES – KEY ASSUMPTIONS

- HD Audio Product H/W & S/W sales for SloMo, Live & Highlights covering:
 - 5 parallel games in the German BUNDESLIGA, per week
 - 3 parallel games in the French League per week
- HD Audio remote LMD production for SloMo, Live & Highlights covering :
 - 5 parallel games in the German BUNDESLIGA, per week
 - 3 parallel games in the French League, per week
- One custom AMX - BUNDESLIGA

EXPENSES – KEY ASSUMPTIONS

- Expansion of AVK team (ramping up) to include by Q2 2014:
 - FULL TIME – SWITZERLAND: CEO, VP Sales, VP System Engineering, VP product Mgmt, 3 x Technical Product Mgrs, 1x RND Project Mgr, 1 x Program Mgr, 1 x production Mgr, 3 x System engineers, 2 x Support Engineers
 - FULL TIME – INDIA : VP operations, VP production, VP Product Engineering, Head of Documentation, Head of QA, Head of Audio Engineering, Head of Video Engineering, Head Of console, 3 x RND Project Mgrs, 3 x Snr Product engineers, 6 x product engineers, 2 Snr Test engineers, 4 xTest engineers, 2x Technical writers, 20 x LMD operators
 - PART TIME – SWITZERLAND: 15 x LMD operators (20%)
- Expansion Of AVK infrastructure to include :
 - SWITZERLAND : Furnished offices with 2 x MCR
 - INDIA : Furnished offices with 10 x Production Rooms
 - AVK SERVERS & 3RD Party Equipment
 - Fiber connectivity : MUNICH-LAUSANNE-BANGALORE
- 3 X PATENT GRANTS

Management Team

Vijay SATHYA, 41 **Chairman & CEO**



Holds a PhD in uncertainty analysis/numerical modelling from the Swiss Federal Research Institute (EPFL) and has over 10 years of cumulative experience in the broadcast industry, having held positions ranging from Quality assurance, to Program Mgmt., and Product Mgmt., within the Kudelski group.

David GUHL, 42 **VP, Engineering**



Holds a Master's degree in computer science from the Swiss Federal Research Institute (EPFL) and has more than 15 years of industry experience in the development of real-time mission critical systems across firms such as the Kudelski Group, VisioWave, and GE security.

Stephane JOBERT, 41 **VP, Sales**



Holds a graduate degree in Business, Electronics and computer science engineering from Paul Sabatier University of Toulouse- France and has more than 17 years of experience in International Business Development and Strategic Marketing for the Sports, Broadcast & Digital Media industries across Asia-Pac and EMEA regions through senior positions in sales at Harris Corporation, Lysis, Kudelski Group as well as operational roles at UEFA.

Thierry HEEB, 41 **VP, Research**



Holds a Master's degree in mathematics from the University of Lausanne (UNIL) and specialises in audio algorithms (DSP) and real time computing. Thierry is a seasoned entrepreneur with more than 16 years of professional experience having successfully co-founded several technology start-ups in the audio domain (CH Precision SARL, Anagram Technologies SA) before joining AVK systems.

Advisory Board

Prof. Claude PETITPIERRE, **Technology Advisor**

Head of the Tele-informatics Laboratory (LTI) of the computer science department at the Swiss Federal Research Institute (EPFL) in Lausanne, Prof. Petitpierre brings with him a wealth of experience in cutting edge real-time computing technologies used in the development of mission critical products. Prof. Petitpierre is a renowned expert in parallel computing and a pioneer of the active objects approach in computer programming.

Prof. K R RAMAKRISHNAN, **Scientific Advisor**

Head of the Vision & sound Laboratory of the electrical department at the Indian Institute of Science (IISc) in Bangalore, Prof. Ramakrishnan brings with him a wealth of experience in the design of innovative audio video algorithms and techniques. Prof. Ramakrishnan is a renowned expert in the audio visual field and actively leads a team of researchers in the quest for new breakthroughs.

Gregory PASCHE, **Business Advisor**

Holds a Bsc (Hons) in Physics with Management from Royal Holloway, University of London, and has over 20 years of international marketing and commercial experience in the media industry as director of marketing worldwide for Reuters and other senior executive/managerial positions within service, sales & marketing, business development at a regional and global level within Reuters

Francoise ZWEIFEL, **Business Advisor**

As former secretary general of IOC, Francoise brings with her over 30 years of experience in the sports industry and access to key people and decision makers across the length and breadth of international sport federations, clubs and broadcasters. Francoise continues to play an active role in various high profile sports organising committees such as the RIO 2016 Olympics, and the 2014 soccer World cup

Pascal DUTHEIL, **CTI Coach**

Designated by the Swiss Federal committee for technology and innovation (CTI), Pascal brings with him over 10 years of experience in mentoring technology companies in their early stages across the breadth of its activities ranging from the choosing the right IP strategy, to fund raising, and, formulating innovative business models