

# Situation Analysis of the 3D Market

**By: Douglas I. Sheer**

*Stereographic 3D is well along the way to becoming the most captivating entertainment technology of the new century. This is so despite some unresolved technical issues. That advance has been helped by fresh gains made in establishing standards that can ease the way to wider acceptance. This report and resulting book called SMPTE Professional Report Series – 3D in Media A Technology Situation Analysis marks the first of a new effort by the Society to provide industry- wide marketing perspective to both the membership and the greater technology audience as well. The article that follows touches on the consumer appetite for 3D, the Digital Cinema and workflow changes and proliferation of devices that provide support to the deployment.*

## **Introduction**

When it comes to considering the commercial potential for 3D, perspective is helpful. I am talking about being able to see 3D in the proper context in the broader global consumer electronics market. And, such perspective is a difficult commodity to come by today. That is particularly true in keeping with developments and their potential to have 3D succeed in the entertainment marketplace. First, it becomes important to see 3D and its various components ~ cinema, portable devices, games, TV sets and programming ~ as players in a highly varied and crowded consumer entertainment technology environment in which a plethora of new trends are all vying for the attention and dollars of recession plagued and option addled consumers.

Since 3D is not at all a new phenomenon, it's no surprise that the constant innovation of 3D technology occurs as rapidly as it does. Ever since its creation, 3D technology and production underwent major changes, with the quality of such steadily enhancing continuously. Furthermore, consumer demand for 3D capable devices has dramatically increased since the past few years. And although this is not the first time that 3D experienced this significant boom (it also occurred in the 1950's), this is the first time that 3D consumer based products targeted each age group and device universe. This ranges from movies, games, smart phones, channels, and more; therefore increasing consumer awareness and ultimately, consumer demand.

With that said, collectively, all 3D products are creating a sort of viral need amongst target audiences. 3D is exciting more and more consumers due to the increasing quantity of 3D content available and the expanding number of devices that support the viewing of that programming. With its growing popularity, it is no surprise that 3D may be seen as an advanced feature or app on devices in the future. But, despite the current embrace of 3D, skepticism about it or lack of funds to purchase it today, consumer will find a rising tide of 3D-centric devices, even though in many cases, those devices will likely allow for more than just a 3D experience to be viewed enabling non 3D too. 3D is bent on becoming, in the next decade, the strongest 'app' on the consumer scene.

## **History of previous attempts has led to skepticism**

With more than a hundred years of previous attempts to popularize 3D in motion media, and an even longer time in still image history, the new trend has surfaced a slew of negative pundits ready to put down any advances of the movement. Unlike previous and often sensationalistic attempts to popularize 3D, this movement enjoys much broader support from the entertainment industry. From its beginnings as a 19th century movement, this time 3D is seeing a much broader range of delivery systems and applications. It's not just a movie house phenomenon. Audiences are larger, and as likely to be at home, on the run or supporting a premium level approach to revenues in theaters that made "Avatar" the blockbuster it became.

3D has established a firm beachhead in the entertainment industry, worldwide, that goes well beyond all of its' previous long, if checkered, history. If there is a sustaining power, which remains to be seen, it will be in no small part due to the breadth of the interest, the wide range of delivery pathways and the clearly higher quality of the technology and not solely to the intrinsically sensationalistic nature of the previous imagery.

Furthermore, the rise of Digital Cinematography and its higher resolution and more immersive capabilities and fast spreading electronic cinema infrastructure as well as glasses free handhelds and there is a veritable 3D boom under way. Now incorporated into games, and heading for an ultimate deployment in television, the use of 3D is expanding daily.

## **3D Awareness Becoming Multi-dimensional**

The name of the game in any new technology is to build desire for the new ability or feature and this has been aggressively done now, for years, and we can now see that awareness building and the experience with actual 3D imagery also rising. Most people are gaining their initial exposure to 3D via visits to the movie theater. Having seen one or more 3D movies, most viewers seem to develop an appetite for more, a fact that has been driving theatrical releases and pumping up box office revenues for the past few years. And, that has also established the beachhead for other devices and other forms of 3D experiences.

YouTube has been testing deploying 3D videos. The adult entertainment industry is another powerful force that could drive 3D technology for home use. The traditional film business has been ahead of the adult film business because of better financing, which explains the relatively few adult-film productions scheduled compared the robust Hollywood line up. We see national sports organization testing and looking at 3D for a variety of sports applications. American football, European soccer, boxing matches, the Masters Golf and the other events are examples. In sports, broadcasters are learning what works and what doesn't.

3D, even with its somewhat more limited application than HD, still represents marquee entertainment, excitement and fun. It seems to be thriving in those tighter confines where it applies best. It supports higher ticket prices, helps pump up attendance, supports the

deployment of special satellite and cable channels, creates a demand for 3D Blu-ray, has enlivened the games business.

### **Product Penetration Paltry**

Actual 3D capable device ownership, is still, relatively small. However, those numbers will have to increase tremendously to provide the motion picture studios and programming companies an ample audience of potential viewers outside of movie theatres. Set sales, now seemingly primed to take off dramatically have nonetheless so far been pretty unimpressive. According to Audiovisual Panorama, at the end of 2010, only 3.2 million 3D sets had been purchased worldwide, and most of that was in the U. S.

Most 3D use has been beneficial to those proponents of stereographic, but in the wings, supported primarily by efforts of flat panels display makers to create the possibility of a glasses free TV approach, auto-stereoscopic 3D is a distinct potential next stage. We think that by the 2011 holiday season the two approaches may be actively clashing.

The video game industry is investing in more 3D technology, which could bring 3D content from either Blu-ray playing capabilities or through Internet content. With that said, there is no question but that 3D is having a huge impact on games makers and their customers.

### **3D Movies Build an Audience**

The transition of motion picture production and post-production from a mainly film-based medium to a now electronic dominated Digital Cinematography one is in no small part responsible for getting 3D off the ground. And, Avatar in particular is to receive a lot of credit for that, especially for the ramping up of the speed of international acceptance we are now witnessing. Somewhat simultaneously, the theaters have been converting to all-Digital ones and that too has helped convert distributors and theater owners into players in the game and audiences into willing test subjects for the latest 3D offerings, albeit at a small premium box office seat price for 3D over 2D versions and a bit more for IMAX 3D, hence the most logical business model that has so far emerged.

The clear leader as an entertainment pathway to consumer eyeballs has been 3D motion pictures. It's what triggered this latest round of interest. But what started as a trickle of a few dozen adventurous feature attempts has devolved into a veritable tidal wave of productions, globally. There is substantial 3D feature production happening in not only the USA, but in Brazil, Japan, China, India, Europe, Russia, the Middle East and virtually everywhere people make movies. Theatres capture more revenue by charging premium admission prices for 3D features, and even more in IMAX.

### **Future-Proofing Sets with 3D as a Feature**

While some consumers will shop specifically for a 3D device, others will consider 3D one of a number of features that they would look for. It would be an easier prospect to gauge the chances for the success of 3D were it not for the fact that there are so many concurrent trends at the same time that must be watched and then their impact on the prospects for 3D weighed.

Just as in the past few years, TV set buyers have been motivated to look for 1080p, 4 or more HDMI connectors, and 120hz. This is a case of "future proofing" meaning that consumers are already anticipating the desirability of having 3D as a feature in the new devices that one purchases, even though it may not be the main reason why they purchase the device. Unlike boxy TVs, which lasted many years, flat panels are not faring as well and that may also factor positively into the favor of 3D as sets get replaced more rapidly than they would have been in pre-panel days.

All of these features presented as necessary for future –proofing of their purchase. So, to see success in this feature saturated setting, 3D protagonists must promote and defend 3D against the other features, as few consumers will buy new sets solely due to their having 3D as a prime feature, but rather as one of many features desired in the next set. 3D is rapidly becoming *the* most sought after future-proofing feature requested in sets, supplanting 1080p. Consumers tend to want all the advance features they can squeeze into their next sets. The exposure to 3D creates the consumer demand to increase, therefore resulting in a growth in sales. When this occurs, 3D features may be present in many devices.

## **The Glasses**

3D glasses provide the best possible stereo 3D experience available today. But, they are expensive and a large family or group of friends can require a large number of glasses whose cost can approach that of the TV set. Some set sellers realize this and give the glasses away.

Will consumers be willing to wear the special glasses required to view 3D TV? This certainly seems to hold true for movies shown in 3D in theaters, but there the glasses are a free to use and return for each screening, their cost embedded in the admission price. Glasses within the theaters and within the home are designed to look like sunglasses, tinted dark for a sophisticated effect. Disposal does, however, represent a threat to landfills.

Many 3D admirers would prefer to not have to wear 3D glasses that so far have been a requirement of all 3D viewing whether in theaters or at home. Glasses free 3D TV is generally all lumped together as auto-stereoscopic, even though there are a few subtle differences from system to system. All auto stereo systems regardless of size or configuration, offer glasses free use and is accomplished by placing a transparent or opaque filtering screen in front of the normal LCD panel (such as a TV set or hand-held device). The filter refracts or deflects the light coming from the LCD behind it and thereby creates a left eye, right eye split to produce the illusion of 3D.

## **Possible Health Impacts and Their Refutation by the Industry**

Manufacturers and producers have known for years that some viewers complain of eye strain, headaches, and other discomforts from viewing 3D, in theaters or at home. And, portable devices lend a new potential for viewing discomfort as they are viewed under an even less controlled environment.

On one hand, the purpose of these activities has been to reassure the viewing public and the healthcare industry that 3D viewing is safe and does no harm, the other to refute claims by lawyers and groups that might damage the new industry through, such as through class action lawsuits.

It has long been known that no two audience members actually see the movies or other programs exactly identically. Different age groups, people who wear eyeglasses, people with visual disabilities, and those with brain impairments may have very different responses to 3D, which by its very nature plays with the viewers' brain to create the illusion of three-dimensionality.

### **3D Content is Lagging**

One urgent issue that remains in 3D is a lack of sufficient content and that is the most difficult to overcome in the sale of 3DTV sets. For TV set sales to take off, consumers will need to feel that there is a) enough good quality programming, b) lots of live sports and music performances and – ideally – episodic entertainment series, before they start to really buy a lot of sets.

Today's average consumer wants a lot more content available to them. This may not be a long lasting problem as more and more Hollywood studios are flocking to 3D production, even re-making classics in 3D. And, specialists are exploring re-issuing older content made in 2D processes in 3D. In just a few years we say quite a surge to 3D titles, from movies to re-packaged 'live' events like sports and rock and roll shows. Once content catches up to the equipment, we would see 3D interest climb and sets be bought in much greater numbers.

### **3D Production and Post-Production**

There can be no 3D motion pictures, TV programs, sports or any other live events for consumers, however, without a dependable workflow that allows the capture and processing of content. And, manufacturers and professional customers have been busy over the past several years perfecting new equipment and re-purposing conventional electronic gear to suit the new purposes of stereo production for motion pictures and beyond.

Emerging in that time frame has been an end-to-end workflow starting with cameras and camcorders, generally mounted on rigs/beam-splitters, then going to processors, then to encoders/decoders and or trans-coders, then switchers, then to servers or storage devices, and ultimately to editing and graphics stations then back to more servers or storage devices, then out to either theaters or other distribution links and over the communications pathways in some form. Most of this gear with the notable exception of rigs and processors has been re-purposed conventional and that has been a boon to the traditional brands

What this means for manufacturers is a big boost to their general sales and to customers, a reliable flow of applicable devices to a widening and increasingly dependable and reliable workflow.

### **The Rise of 3D-Trained 'Stereo-graphers' and Stereo Conscious Engineers**

That range of skills, required to create 3D programs has been a pretty daunting, with camerapersons being part lighting expert, part technician, part aesthete and part accountant. But, when they approach it they find that shooting for 3D is not the same as for HD or for film. It requires an eye for getting the two cameras and what they capture, and those signals (as this is a mainly electronic process) to remain in sync and at the right angles and depths of field to work consistently throughout the workflow. It is a more engineering-oriented endeavor.

That said, experimentation is gradually starting to give way to an emerging set of best practices and as software products like those of Dashwood and 3Ality Digital have appeared. These software tools were first seen this year but are beginning to become embraced by the working professionals in 3D production, and as a result what has been an often painful process of getting the angles and depth calculations right shot by shot, has begun to be seen as a smoother set of tools and therefore bodes well for a less expensive and more learn-able set of skills.

The entire workflow and the equipment along it require special skills and those too must be addressed, and are beginning to be also assisted by the new courses in such areas as 3D editing, 3D graphics design and so on. Clearly, to be a 3D capable editor, graphics person or technical director has substantial benefit in addition to being a 3D shooter.

### **3D Standards**

Nothing can torpedo the prospects of a new technology movement, like 3D, than the lack of industry standards. That is why so much effort is currently underway to create standards that will codify practices in the areas identified by SMPTE and other standards setting bodies. The process is steady, and on completion a standard can clarify and speed the use and acceptance of 3D. Standards are reached by a committee process, the process is very open to participation by virtually any legitimate party. Like all things in broadcasting, and related fields, standards are a necessity for the global acceptance of any given technology. Standards help manufacturers create interconnectivity between varying systems. SMPTE has led the way towards such standardization.

### **Conclusion**

3D has already proven itself to be more mature than we would have expected to see by now, based on the past history of the technology and medium. And, I was similarly stunned when it took off at the box office in the wake of Avatar and impressed by how it has now spread to inhabit so many other parts of the entertainment marketplace. Even the hardest bitten skeptics have to admit that 3D has survived longer than they expected and has now truly penetrated the consciousness of audiences, worldwide. Awareness is building rapidly. We expect to see almost every device being capable of playback or screening of 3D imagery by five years from now. Yes, it is less likely that 3D will wholly supplant H-D as the dominant new media technology. Rather, it seems destined to ride the wave that H-D began and ripple across the sea of devices until almost all viewers will know 3D and have it available to them as an option in their devices and entertainment services.

## The Author

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