

Mixed Reality and Experiential Movie Trailers: Combining Emotions and Immersion to Innovate Entertainment Marketing

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ABSTRACT

This paper describes the process and the purpose of innovating Mixed Reality technology to create an Experiential Movie Trailer. We discuss the creative means by which we engage users in a multimodal, multi-sensory group experience that makes them feel a part of a movie's upcoming experience. The key to the success of this endeavor lies in borrowing techniques from playgrounds, game play and theme park design to drive emotional branding in entertainment marketing. The paper also covers a methodology for media innovation to ease the process of adoption of emerging experiential media.

1. INTRODUCTION

The success or failure of a movie is often determined in its first weekend of play. In order to make this opening successful, movie producers and studios must employ emotional branding to hype the movie for a significant period of time prior to its release. The unexpected success of the movie "The Blair Witch Project" is considered to be almost entirely due to the buzz created on the net by its tech savvy, but movie industry naïve creators. They, in effect, made the mythology come alive and sparked people's passions months before the movie was released.

Movie trailers are now the main means by which a new movie is introduced to the public. Traditionally, such teasers were shown prior to other films and comprised of movie montages and stimulating scenes and quotes from the movie. Today, the primary medium for presenting these trailers is via web streaming, which does not fully leverage the interactivity of the Internet. However, they do establish the audience expectations and spark the demand for the movie, and have become an art form in of themselves. While effective in creating hype, trailers are not as sophisticated of a marketing device as what was done by the Blair Witch team. With the high stakes of the movie market, studios need to have the hype around a movie reach the level of a cult following, akin to the Rocky Horror Show, before being released. The key to the Blair Witch approach was interactivity, not just passive watching of a trailer.

It is this ability to become immersed within the experience, not just a passive consumer of the advertising, that Mixed Reality (MR) can provide. Mixed Reality represents the melting of the boundaries between real and virtual content and merges a full spectrum of simulation

domains [9] such as Virtual Reality (VR), Augmented Reality (putting virtual assets into real spaces), Augmented Virtuality (putting real things in virtual spaces) and live simulation (using all real assets and participants).

Using this novel Mixed Reality approach to a traditional model demanded the emerging technology to meet the emotional impact of filmmaking. Successfully achieving this impact provides a unique opportunity to promote the adoption of novel technology and stimulate the innovation process of the emerging experiential medium of MR.

This paper describes a case study for the Experiential Movie Trailer and how we employed a *Media Innovation Road Map* for Mixed Reality to stimulate adoption of emerging technology and overcome typical barriers to market entry into a critical but reluctant entertainment market (Figure 1). By creating an interdisciplinary (scientific, artistic and business) approach, this road map can become a repeatable process to help other emerging technologies reduce the challenges of the typical technology transfer process and stimulate the transformation of novel inventions into mainstream innovations.



Figure 1. Rendering of an Experiential Movie Trailer

From an HCI perspective, we discuss the creative means by which we engage users in a multimodal, multi-sensory group experience that makes them feel part of a movie's upcoming experience. We do so by borrowing techniques from playgrounds, game play and theme park design.

From an economic perspective, we explain how marketing venues motivated the creation of business models. We then discuss the production pipelines that apply

new technology to a traditional institution and the financial benefits that can accrue from this process.

Finally, we briefly present the scientific and technical development of an MR system with its authoring tools, story engine, graphics engine, audio engines, and special effects engine. More details on these engines are found in other papers, e.g., [4].

2. OPPORTUNITY

2.1 The challenge of entertainment marketing

Films remain one of the most powerful media for storytelling [8]. The key to entertainment marketing is in its emotional branding [16]. The ability to sell through compelling story a product the audience can become passionate about. The power of film to romance the story creates deep and fond memories for audiences, bonding them to almost anything associated with that entertainment franchise brand, which in turn sells everything from games to breakfast cereal.

The power of Film to make memories for a lifetime is the spearhead for emotional branding of any entertainment marketing strategy. Even when a story originates in print (Harry Potter, Lord of the Rings, etc.), it is the film that ignites the surge of new markets of games, merchandise, theme parks, etc. The success of a film can create an entire product franchise that can make or break a studio's profitability. Even though U.S. film box office receipts equal only about \$10 billion, they drive a \$100 billion dollar industry in subsequent markets (Theatrical Release, Rental, DVD sales, Games, TV spin-offs, games, theme parks, merchandise, licensing, etc.). The ultimate challenge is that the success of a film is made or broken in its first weekend box office revenues. The pressure to successfully market movies the first weekend is not just for ticket sales, but the opportunity to cash in on the larger prize of \$90 billion worth of subsequent markets.

When stimulating the innovation and the adoption process of Mixed Reality, the power of entertainment allows for the strong emotional attraction to adopt technology that most people didn't even know existed before using it. Unfortunately, entertainment has been reluctant to stray from the "tried and true" to adopt any new technology that may change their way of doing business or worse yet change their artistic conventions [11].

Fortunately, marketing applications have historically been a valuable catalyst in bringing new technology to mainstream audiences and sparking widespread demand. The introduction of television ultimately found its audiences and evolved its format from having its experimental days of live broadcasts underwritten by companies that recognized its ability to enter into millions of living rooms and sell household products such as soap. The sponsorship and use of advertising has defined what television is today. The same process occurred with the Internet: Marketing with on-line brochures was the prime application of the early World Wide Web.

As new forms of experiential media become available such as Mixed Reality (MR), they can find their alpha consumers and entry into mainstream entertainment through

the power to market and entertain by marketing entertainment itself [10]. Yet MR must provide a significant improvement to existing solutions to prove its viability. Being novel is not enough to ensure innovation and market penetration.

2.2 Case study: experiential movie trailer

Why would anyone want or need something that they lived without for so long? Few people understand what Mixed Reality is, much less know how to commercially exploit it within mainstream applications. Is MR a mere solution looking for a problem, like the early days of VR?

The challenge of marketing a film can no longer be limited to the traditional form of a movie trailer (a richly compacted, passive audio-visual montage of the movie shown in theaters prior to current releases). The challenge of marketing entertainment to the next generation is to discover novel approaches as The Blair Witch Project demonstrated when it made box office history as the most profitable film ever. Its success was credited to its interactive and alluring website.

In order to break out of the pack and rise above the bombardment of passive media we employed the latest interactive and immersive technology to make trailers more effective. This provides entertainment marketing with the ability to sell the whole franchise and brand as well as the movie.

Our goal was to capture the imagination, engage it and propel it into a mini-adventure [14]. This is not unlike the man-eating *Jaws* billboard in the 2025 version of Hill Valley from *Back to the Future II* where Michael J. Fox was eaten alive by a humongous Mixed Reality Shark.

Our objective was to find how MR could significantly gain entry into the entertainment industry by being an answer to a key entertainment-marketing question: How can we reach more people in a more impactful way where they are more likely to buy all the products of the franchise as well as the movie? The goal was an experiential movie trailer that *looks like a film, plays like a game and is as immersive as a theme park* and that can play in one of the fastest growing experiential entertainment venue in the world (shopping centers).

3. APPROACH: The challenge of media innovation

To imagine the future is the easy part. The challenge is in adopting new techniques and methodologies of interactivity and immersion that can drastically change the way both the entertainment and marketing industries do business. In a practice where success is achieved by repeating successes, new ideas and methodologies are difficult to sell to these reluctant adopters of new technology. In a dominantly passive media market, how do interactive and immersive innovations achieve success in mainstream applications avoiding the slow and grueling adoption of technology such as the cell phone or the Internet that took decades to reach the mainstream?

We also examined whether, in an age of constant innovation, a repeatable process of innovation can be developed to help insure future success of other novel ideas.

In the future, the process of innovation will become as important as the product of innovation. The process of introducing an innovation, such as an experiential movie trailer, formed a framework for a repeatable approach to create a innovation infrastructure that would more effectively transform ideas into innovation, well into the future. We did this by examining the process of past media innovations and assessing what the critical technical, creative and economic considerations are that interdependently propel innovation? That led to developing a Media Innovation Road Map (Figure 2). This approach informed the design and implementation of each part of the product prototype. It focused on the three interdependent criteria for media innovation that are often superficially or independently addressed.

budget of the Blair Witch Project could not even afford an advertising spot on late night television, it resorted to the emerging interactive media of the World Wide Web to leverage the publicity. The phenomenal success of the movie, making film history as the most profitable film ever, was accredited to the web promotion, which is now an industry embraced interactive medium to provide a dramatic new edge in hyping a film's release. Yet even the Web is a challenge in selling movies to the next generation of mainstream audiences. Current X and Y generations are more likely to zone out on the bombardment of passive advertisements on TV and interactive marketing on the Web. The traditional movie trailer must now explore a transformation to highly interactive and immersive media such as Mixed Reality to increase impact on advertising and

Discipline	Opportunity Recognition	Opportunity Validation	Opportunity Capture
A) Scientific & Technological Feasibility	1) Limitation	2) Capabilities	7) Product Development
B) Human Appeal & Impact	3) Pushing the Limits Experimentation	4) Possibilities	8) Market Development
C) Commercial Potential	5) Studies and Assessments	6) New Business Models	9) Innovation, Reinvention (repeat process)
Venue:	Academia	Laboratory	Marketplace

Figure 2. Media Innovation Road Map

- A. **Commercial Potential** (future not past success and how technology informs new business models)
- B. **Human Impact & Appeal** (Finding unmet needs and how that informs novel conventions and design methodologies)
- C. **Technical Feasibility** (Novel uses and enabling technology adapting new ideas to traditional models or paths for smoother adoption).

4. COMMERCIAL POTENTIAL: The instant classic

Before any applied research can be conducted, there must be a commercial rationale supporting the approach and implementation. A necessary design criterion in entertainment is that "form follows funding." There are many great stories and concepts that never see the light of day within modern entertainment venue because they lack commercial potential.

Dealing with the market pressures of past commercial franchise phenomenon such as Disney, Star Wars and Harry Potter, the market demands are that any new release becomes an *Instant Classic* and a box office blockbuster. Regardless of the fact "Instant Classic" is an oxymoron and despite the fact that occasional word-of-mouth phenomenon like the Blair Witch Project happen, the simple reality is that movies must create an almost cult following before they are released. The first weekend box office receipts can make or break a movie's success, or worse, have its marketing budget pulled (commercial suicide).

It is an industry standard to invest as much money on marketing a film as one does in making it. Traditionally, films have been promoted by using passive filmmaking techniques within the movie theater or on television through the use of presenting the power of the film media. Since the

sales with the use of Experiential Retail Marketing [1].

This project partnered with a leading expert on experiential marketing, the Brand Experience Laboratory (BEL) in New York City, to meet the challenge of creating a new model to satisfy one of their clients, MGM™. With franchises such as James Bond™, StarGate SG-1™, RoboCop™, and Flipper™, they handled some of the most diverse entertainment brands and franchises across all forms of media from movies to television, to games and themed attractions.

Experiential media requires experiential venues to be successful. The fastest growing experiential entertainment market is shopping. Located within every metropolitan location in the modern world, shopping malls house major movie multiplexes and provide an ideal marketing outlet and exposure for an experiential movie trailer.

The rapidly growing entertainment form called shopping has implanted over 46 thousand experience venues (shopping centers) across the US, with over 203 million visitors a year, and \$2 trillion in sales. High-end shopping in enclosed malls has penetrated most metropolitan areas to sell all kinds of other entertainment products including movies (theatrical and digital), games (home and arcade), Music, DVDs (rental and purchase) and to service the full scope of consumer demographics (age, gender, race, income level, etc.). (2003 statistics from International Council of Shopping Centers (ICSC) global trade association of the shopping center industry.)

As the next generation (Y) shopper dominates sales and attendance (7% of population and 21% of mall spending), its members are spending five times more than baby boomers of the same age. At \$94 per week, the Y-generation shopper is a major contributor to transforming

the \$122 billion teen market in 2000 to its projected size of \$158 billion by 2006. They are a generation that enjoys extreme sports and rejects the bombardment of blatant and mindless marketing and branding. However, an experience that immerses the body, engages the mind and touches the heart could be a media sensation that will capture their spending dollars.

5. HUMAN IMPACT AND APPEAL:

Creating demand with retailtainment

The promise and growth of Internet sales are truly impressive. However, to think a click and point experience was going to replace the flesh and blood, bricks and mortar retail experience overlooked a primal human need: immersive, multi-sensory, real-time, 3D, social interaction. It is less about Human Computer Interaction (HCI) than it is about Human to Human Interaction via the Computer (H₂IC). However, retail has seen a dramatic need to amplify its entertainment value or be put out of business by the lackluster Internet or Wal-Mart shopping experience that focuses on sales volume and price-slashing over human appeal.

5.1 The Venue

Entertainment is penetrating every aspect of life. Retail is no different. Today's malls resemble theme parks; theme parks are beginning to look like shopping malls. From Universal City, Downtown Disney, Mall of America to the local Galleria, price is not the only criteria for shopping. Equally important is the time spent. If one can shop, eat, be entertained and socialize in one-stop shopping, then the hike through the mega discount warehouse parking lot seems relatively less and less appealing.



Figure 3. MR Trailer photo at the International SIGGRAPH Conference, San Diego, CA.

5.2 The Reach

There is no reason why the Experiential Movie Trailer (EMT) can't have the potential to play within both venues. EMT needs to reach customers where they are most vulnerable and most likely to compulsively buy the intended product to ensure its adoption. The solution needed a small package with a big punch in order to penetrate a larger

percentage of existing shopping venues. It also needed to envelop the social environment that they came to experience. The limitation of purely virtual reality (VR) was counter-intuitive to the immersive social characteristics of the shopping experience. Where VR separates the user from the real world for computer human interaction, MR allows you to envelop the surrounding environment and engage with others in human-to-human interaction via the computer (Figure 3). It is critical to understand that Retailtainment is not designed as a solo pastime.

5.3 The Target

The most pervasive social group is the family. It is the prime target for most entertainment marketing and the dominant demographic of shopping malls. Due to its diversity in age, gender, class, fashion and spending habits, it is the most challenging to satisfy all at once. Even though most entertainment products and shopping stores are usually focused on one demographic or another, the mall must address the entire family unit and is both experiential and immersive.

This becomes the prime target for the Experiential Movie Trailer. In order to break into the established entertainment venues, new technology needs to achieve what other technologies can't. This was the ideal application for Mixed Reality, a technology that can work with full-body interaction, melt the boundaries between real and virtual, and most of all engage the whole diverse and extended family into extreme entertainment.

5.4 Experiential Entertainment Design

There is no venue more geared towards the family than one that provides experiential entertainment. With thousands of years of evolution at fairs, expos, carnivals, circuses and most recently theme parks, these venues are responsible for some of the fondest memories of a lifetime. It is here that key design methodologies are transferred in scale to a touring unit called the Mixed Reality Kiosk. Stories, Weenies, Swimmers, Divers and Waders make up the unique experience design techniques and multi-level interactivity of theme parks.

5.5 Stories

Stories transcend venues. Like any entertainment experience, a good story with a beginning, middle and end is key in providing satisfaction. However, a story told in a passive enclosed theater is very different than that being experienced in an interactive and experiential venue [3]. When an audience is invited to participate and provided choices of actions within a dimensional world, many of the same goals are achieved with different conventions. Environmental storytelling [2] involves interplay between play, story and games that effortlessly play off each other to motivate the user towards the author's intent [13]

5.6 Weenies, Set-ups and Pay-offs

The design of the Mixed Reality Kiosk provides its own condensed version of beginning, middle and end through the environment. The beginning is to set the mood and to draw

the audience into the story world of imagination. Within an eclectic commercial environment, designers use what Disney Imagineers call Weenies. The ploy refers to dog training where the use of bait is used to attract dogs and make them do what you want them to do. The kiosk becomes a structural landmark whose theming and embedded surround audio, lighting, and special effects draws guests into its web. This acts as both the beginning and establishing shot. The opportunity to participate from the periphery allows participants to dive into the action and serves as the story's middle and climax. The pay-off is the immersed player's view in the center of the action.

5.7 Proximity Factor

The story line also transitions the typical passive audience into the experience. This addresses the critical perspective of cross media hybrids using the proximity factor (Figure 4) coined by former Disney Imagineer, Jesse Schell. Extending beyond traditional film or theater, the intensity of the experience increases as the proximity factor is increased.

Watching a story on film is once removed from the present, because it was captured and created in another time and another place. It is about THEM, not me. Theater is live and thus more immediate and intense. If an actor seems to die on stage we may be more tempted to call 911 than if it occurred in a film. However, the ultimate intensity happens when we are immersed within the story experience and we become the center of the action in real-time as in a theme park or video game.

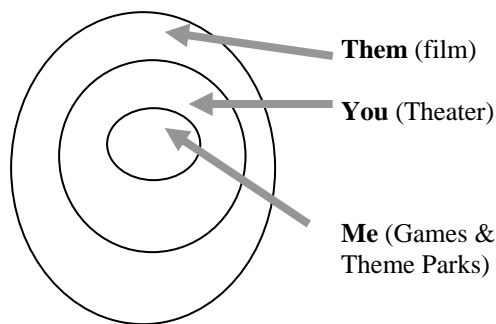


Figure 4. Proximity Factor

The mini-story of the Experiential Movie Trailer builds to a climax by moving through these levels of proximity. It starts with the beginning as the kiosk draws you in (Figure 5). It engages you with the premise and ensuing conflict that can be seen from the periphery. The ultimate thrill comes with the ability to step into the experience and confront the action with the whole body with all modalities, all dimensions and all realities whether real, virtual or imagined [12].



Figure 5. TimePortal experiential movie trailer still of action scene.

5.8 Levels of Interactivity: Swimmers, Divers and Waders

Unlike other entertainment, theme parks and shopping malls need to entertain the whole family at once, from the “No Fear,” “extreme sport,” teenager to a shy and subdued parental unit. Interactivity needs to address each level of participation, and provide sufficient pay-off that comes from a group activity and the human-to-human exchange responsible for the endearing memories

In satisfying a diverse audience such as the family with multiple personality types, one needs to offer a variety of interactive levels that is most comfortable for each user [15] but has the opportunity to work up the proximity with each play or visit so they continue to come back. In addition, the level must be interactive to support the inter-group dynamics to satisfy the social experience. One member on the periphery is interacting and influencing action at the center with a friend or family member.

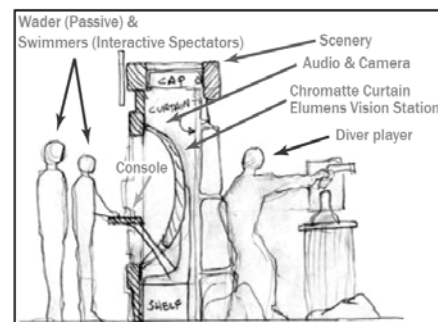
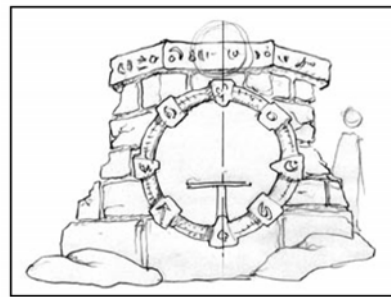


Figure 6. Elevation and section of the Kiosk

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In Disney-speak, these different level players are called Divers, Swimmers and Waders (Figures 4, 5 and 6) and, like the whole family in a swimming pool, each type needs to be entertained as much as the other simultaneously [12].

The most adventurous is the Diver who has little hesitation about gearing up with Head Mounted Devices (HMD) and sensory vests and being the center of attention. This is most like the decision-maker of the group who motivates others to participate. This subgroup makes up the top twenty percent of audiences.

The large majority of family members are swimmers. They want to engage and interact with each other without as much commitment or attention from the public. They are allowed to goof up discreetly. These people interact through a Mixed Reality Portal backed by a dome screen and view the MR experience over the shoulder of the Diver. They have the ability to influence the unfolding of the story by introducing elements that can either help or hinder their partner, thus enhancing the interplay between group members.

Passive onlookers are called Waders. They are either afraid to play or gain more enjoyment watching others having fun. This voyeur group becomes the one with the most economic importance, because they are the largest percentage of participants and they have a better opportunity to catch the message and purchase concessions. In addition, they are usually the underwriters because their cherished offspring become more of the entertainment than the technology. It is a critical requirement that the core experience be shared like a spectator sport and that the game fills the arena to be successful. This is extremely difficult with passive media or VR.

5.9 Impact

The movie trailer has a unique purpose in the success of any entertainment. Most entertainment is about satisfying expectations. With a movie never before seen, the movie trailer has the function of building up expectations and whetting the appetite. This is so the audience must buy a ticket to quench their hunger. Its story structure is unique from the film and does NOT just present a synopsis. It does everything BUT fulfill expectations. It is critical that it is short and sweet, using the tagline as its script. Its purpose is to set up, romance the story and make you hunger for more. Buying a ticket to the movie is the only way to satisfy that desire.

5.8 Objective

In stimulating media innovation and the adoption of emerging and novel technology, entertainment has

historically been a key indicator of success. For it to transformation from technological invention to compelling media innovation, it needs to appeal and impact human nature in satisfying and entertaining ways. Each new media innovation has been dependent upon this objective. The audience's demand for content becomes more important than the increased technological capability. Historically, content has driven adoption of new technology, which is why content is king and technology is secondary.

5.10 Play-testing: Proof of the Pudding

As much as insight, expertise and training can provide, they pale in comparison to the ability of users to tell you directly what they need. The critical practice of play-testing provides immediate clues and indirect suggestions to enhance the experience [6]. Play-testing is an under-used term and under-developed practice. It needs further study and evolution to avoid the massive miscalculations of what constitutes satisfying entertainment before a product is released to the public. Made up of ad hoc and anecdotal observations of focus groups, the entertainment industry tends to keep results and techniques proprietary, which hinders the evolution of industry theory and practice.

A critical discovery from our play-testing of the Flipper experience (where one talks to the dolphin with acoustical transmitters) was the inappropriateness of a gun interface, which was extremely effective in interacting with 3D space. The obvious problem was that it was emotionally disturbing to point a gun at a lovable dolphin. When applying a typical game pad that was designed for console games, the interface was extremely counterintuitive to both the old and the very young. These are two demographics you do not want to overlook when reintroducing a children's classic. The frustration of the user arises from the fact that the typical video game is via a 2D monoscopic monitor and its interface leads to confusion even with a 3D tracker.

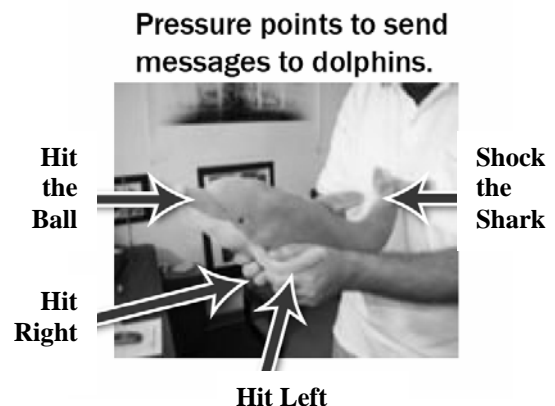


Figure 7. Dolphin Interface

In a highly competitive marketing venue, the learning curve of interfaces must have a rapid, almost instantaneous rise. Our solution was to place the commands on a stuffed toy of the object so that users could keep their eyes on the subject, feel the body parts of the dolphin and tell it to turn, hit the ball or shock the shark by pinching its fins, nose and tail (Figure 7). As experience becomes unique, so should

interfaces. Where they can easily disappear while interfacing with non-immersive media, the interface in an experiential venue is the largest obstacle between the audience and the content. One missed calculation can undermine the rest of the experience.

6. TECHNICAL FEASIBILITY:

Reaching new heights in experiential media

To meet the requirements of entertainment, the technology needs to disappear and become transparent to the user. The presentation must tap and richly layer the sensory display to suspend disbelief. The interaction needs to become so intuitive that it will enhance and not disrupt the story flow and social interaction. This requires the technology to be a direct connection to the heart and imagination. Incorporation of more technology should always seem like less.

Advances on all fronts were required with multimodal capture and display, tracking and registration, rendering and illumination, real-time algorithms, hybrid techniques of occlusion and compositing. The key to reaching the objective was to apply artistic technique to scientific solutions in order to help transform technological capabilities into creative possibilities.

We have developed the MR system with its authoring tools, its story engine, its graphics engines, its audio engines, its special effects engines, and its production pipeline. From a traditional computer science perspective, we developed real-time algorithms, lightweight protocols and extensible system designs that deliver interactive experiences, which include real-time illumination and shadowing of real and virtual objects (both real and virtual lights affect our view of the real and virtual objects in a scene, and each of them can cast shadows on each other). Where possible, we took advantage of story and its relation to perception to develop effective rendering strategies. We also created a comprehensive audio production/delivery engine that adapts its delivery to speaker positions. This latter capability allows us to easily provide three dimensional, multi-tiered audio experiences in new environments without having to ask the audio producer to create new assets. We only need to specify the speaker positions to the software, and it adjusts its delivery to provide 3d positioning within these constraints

7. PRODUCT PROTOTYPE

7.1 Mixed Reality Kiosk

The development of the Product Prototype was to explore not only how one unique problem could be solved, but how we could see the patterns of success that aid and obstacles that plague the innovation process. We examined the past and modeled a road map of the future on this case study to help nurture the more rapid and effective transformation of ideas into innovations.

The entertainment and marketing industry thrive on repeating success and relying on artistic new ideas more than on changing the technological infrastructure with new scientific wizardry. The challenge in introducing new technology is in making it fit within the requirements of

existing models. This is so users feel safe about accepting new opportunities without facing the fears of the unknown.

In addition, the traditional model has proven to be successful, so to change the existing model of the passive movie trailer to being interactive and immersive was not the solution either (even without considering the challenging feat of equipping thousands of theaters with MR). A low risk, high reward model was needed to introduce new concepts, but it needed to fit an existing format. The end effect needed an appeal no less compelling than that of the gift of a Trojan Horse.

We developed a MR KIOSK Prototype to fit a traveling shopping mall marketing kiosk model that could be deployed into mall atriums and large movie lobbies. The cost, size and complexity needed to fit current marketing kiosks that BEL and MGM employed to travel from mall to mall following marketing tours. The footprint needed to be small, with a big impact. The cost needed to be no more than a quarter of a million dollars and needed to rapidly and easily deploy on a constant and weekly basis. The solution needed to use Commercial-Off-The-Shelf (COTS) components to meet demand and provide replacement parts.

7.2 Cross-Industry Transfer

The true sign of innovation is when one discovers the surprisingly obvious and that the solution starts to be applied for unintended purposes. Within the Media Convergence Laboratory, each experiment is applied to entertainment, education and training applications. This is because each industry asks different questions and poses different challenges and criteria that in the end provide a more robust and transferable model.

Currently this research is being field tested at the Orlando Science Center bringing to life prehistoric fossils [5] and applied as a human performance tool at the US Army's Science and Technology Center for the Research Development and Engineering Command in Orlando Florida [7]. See www.mcl.ucf.edu/videos.htm for video presentations.

Future markets will include industrial design, corporate communications, location-based entertainment and creative art installations. The same approach is being applied these fields to discover equally compelling, commercially and technically feasible innovative models. This process is encapsulated within our Media Innovation Road Map method.

8. POST-MORTEM: WHAT WAS LEARNED

8.1 Background: Century of Media Innovation

Examining the historic trends of media innovation created the Media Innovation Road Map. As hindsight is 20/20, we learn from our past to chart a path for the future. We observed in almost every media innovation from the Gutenberg Press to the modern day Internet, key steps occurred in the maturation of emerging technology. If these patterns were embedded within a process of research, technology transfer could occur more rapidly, less expensively and with a higher rate of success, stimulating the economy and providing return on the research

investment. The project for the Experiential Movie Trailer became the case study to observe the process and refine interrelationship of diverse disciplines and stages of development.

8.2 Method: Media Innovation Road Mapping

As in most every media revolution in the past, the process is sparked by scientific and technological advancement overcoming limitations (capturing motion, recording sound, broadcasting images, etc.). However, invention is never enough, otherwise Thomas Edison would have been a successful Movie Mogul (not that he didn't try). To form a market for something that nobody has ever needed before, you must create the need that will drive demand and the formation of subsequent markets. The great creative masters of emerging media (Chaplin, Sid Ceasar, MTV, Haxan Group) created novel needs by reaching new heights in human impact or appeal. Unfortunately the common practice of employing new technology is to apply new concepts in old ways. The catalyst for every media revolution has been in finding new business models (distribution, operation, production pipeline, cost models, etc.) that fit the new capabilities and more effectively get the product to customers, creating markets and profit margins that put traditional media to shame.

This paper follows the *media innovation road mapping method* created by the Media Convergence Laboratory to nurture and stimulate innovation and adoption of new ideas in media. Using the case study of the Experiential Movie Trailer, it covered the A) scientific and technical innovation, B) creative content innovation and then the C) business innovation in order to more rapidly bring fresh perspectives to interactive concepts stimulate innovation and overcome obstacles of adoption. It was applied to Mixed Reality research in entertainment in a project supported by the MR System Laboratory, Canon Inc., seeking novel approaches to stimulating market demand for Mixed Reality.

8.3 Stages: Idea, Invention, Innovation

The media innovation was mapped through the key stages of innovation that affected each of the disciplines. Each stage involved a different level of exchange. It starts with creating the I) IDEA to overcome a limitation, and recognizing the opportunities that would be possible with new concepts. The II) INVENTION process applies the nuts and bolts as well as the bits and bytes to the idea to validate its assumptions. The III) INNOVATION Process is what brings new technical, creative and business models into the market place. As the Dot.Bomb era taught us, one is naïve to try to go from idea to innovation without validation of invention. It also showed how technical, creative and business reinvention is needed for successful innovation.

8.4 Disciplines: Scientific, Artistic, Commercial

Each discipline has a unique role within the media innovation process that helps inform the other disciplines to achieve a unique and novel approach.

The innovation process is sparked first by novel Science & Technology that transforms limitations into capabilities.

Examples include Edison overcoming the limitation of still cameras to capture motion for the motion pictures; Marconi overcoming the limitation of transmitting sounds via wire by inventing broadcast radio; and many inventors who overcame the limitation of radio to broadcast moving images for television. These inventions demonstrate that even though inventions made innovation possible, technology does not become a successful and compelling media until the technology can have human impact. This requires the technology to become intuitive and "transparent" to both the artist and the user.

To battle the challenges of constant technological change, it is the Human Impact of media both cognitively and imaginatively that provides a consistent common denominator to ensure adoption. The physical and mental capacities of humans have not significantly changed for millennia. It is the role of artists and engineers to address the media appeal to use these new technical capabilities and, through experimentation, to push the technology to achieve new creative models.

With new technology requiring new design methodology and artistic convention, new technical capabilities are transformed into new creative possibilities. The validation of new human appeal and satisfaction produces new creative models that are taken on by business and production sector and studied and assessed with market realities in order to leverage new capabilities, and then reconciled by industry limitations and customer's requirements to form experimental commercial models. These models become the prototypes that are brought into the marketplace for product development while at the same time market development prepares the customer by building expectations for new possibilities. It is not until the industry and customers embrace the reinvention that it becomes an innovation and the process starts all over again. That is where this case study begins with the "eyes on the prize" and asks what the potential and challenges are in introducing highly immersive and interactive solutions to a dominantly passive market.

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