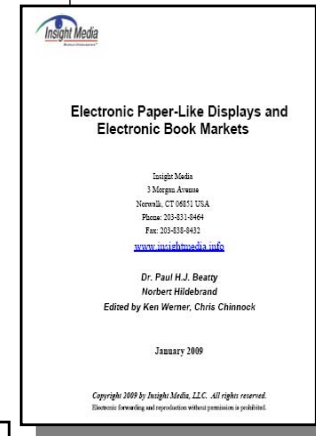


AS-3D Displays in Digital Signage

Dale H. Maunu

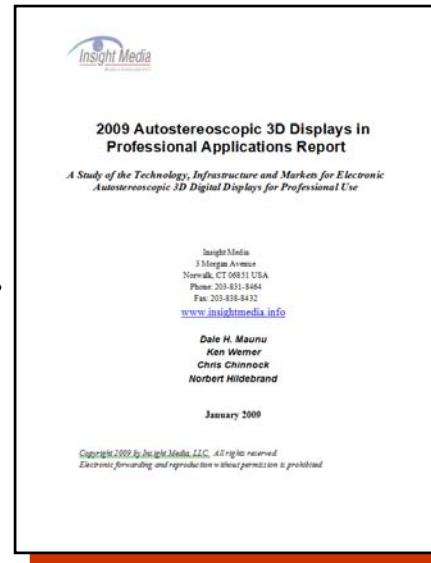
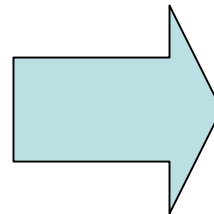
3/5/09

- This webinar is designed to start to answer these questions:
 - Is AS-3D signage becoming important?
 - How mature is it?
 - How can 3D signs be integrated into 2D signage networks?
 - What are the business models of AS-3D?
 - Who is making money?
 - How is 3D content created and how easy is it to accomplish?
 - Who is responsible for buying decision on 2D or 3D signage systems?
 - Is this an area that offers opportunities for my company?



Our Industry Reports

- Deep dive into display technology, markets or opportunities
- Focus on emerging technologies or markets in transition
- Build on our core strength in technology and market analysis
- Linking technology and market analysis to develop
 - Performance models
 - Cost models
 - Value propositions
 - Competitive analysis



Up-Coming Reports

3D Gaming
4/2009

Head Up Displays
3/2009

Low Cost Projection
3/2009

- Pro

- “WOW” Factor
 - Advertisers Are Paying to Have Their Ads Seen
 - AS-3D is Harder to Ignore than 2D Signage
- Emerging Public Awareness
 - Over 30 3D Movies Currently in Production



- Contra

- Stereo Blind and Stereo Anomalous Viewers
 - Estimated 4% to 6% of Population Cannot See Stereoscopic 3D
 - Estimated 25% to 30% of Population Does Not See Stereoscopic 3D in the Same Way as a Person with “Normal” 3D Vision.

- Commercial Display (LCD or PDP)
 - 2D Displays Are Mature
- Two Basic Approaches to Modifying a 2D Display to be AS-3D
 - Lenticular Lens
 - Parallax Barrier
- Available Sizes Are Lagging
- Content is More Expensive

- Can be as Simple as:
 - Swap-out Existing 2D Display
 - Upgrade Player Software
- Difficulties Arise:
 - Incompatibilities between CMS and AS-3D Player Software
 - Media Player (Hardware) and AS-3D Player Software

- Shopping Malls
- Chain Restaurants
- Bowling Centers
- Banks
- Sporting Venues
- Retail
- Transportation
- Gas Stations & Convenience Stores
- Rental & Staging
- Casinos
- Cinema Lobbies
- Theme Parks
- Water Parks
- Arcades
- Museums
- Aquariums
- Planetariums
- Pachinko & Other Gaming
- Trade Show Venues
- Professional Offices
- Corporate Lobbies
- Sales Offices

Value Proposition Analysis

- Business Model Analysis, Needs Analysis, Venue Profile

Worldwide TAM

- Determine the number of venues worldwide

Market Penetration Curves

- Define market penetration curves for 2D signage

Market Segment Evaluation

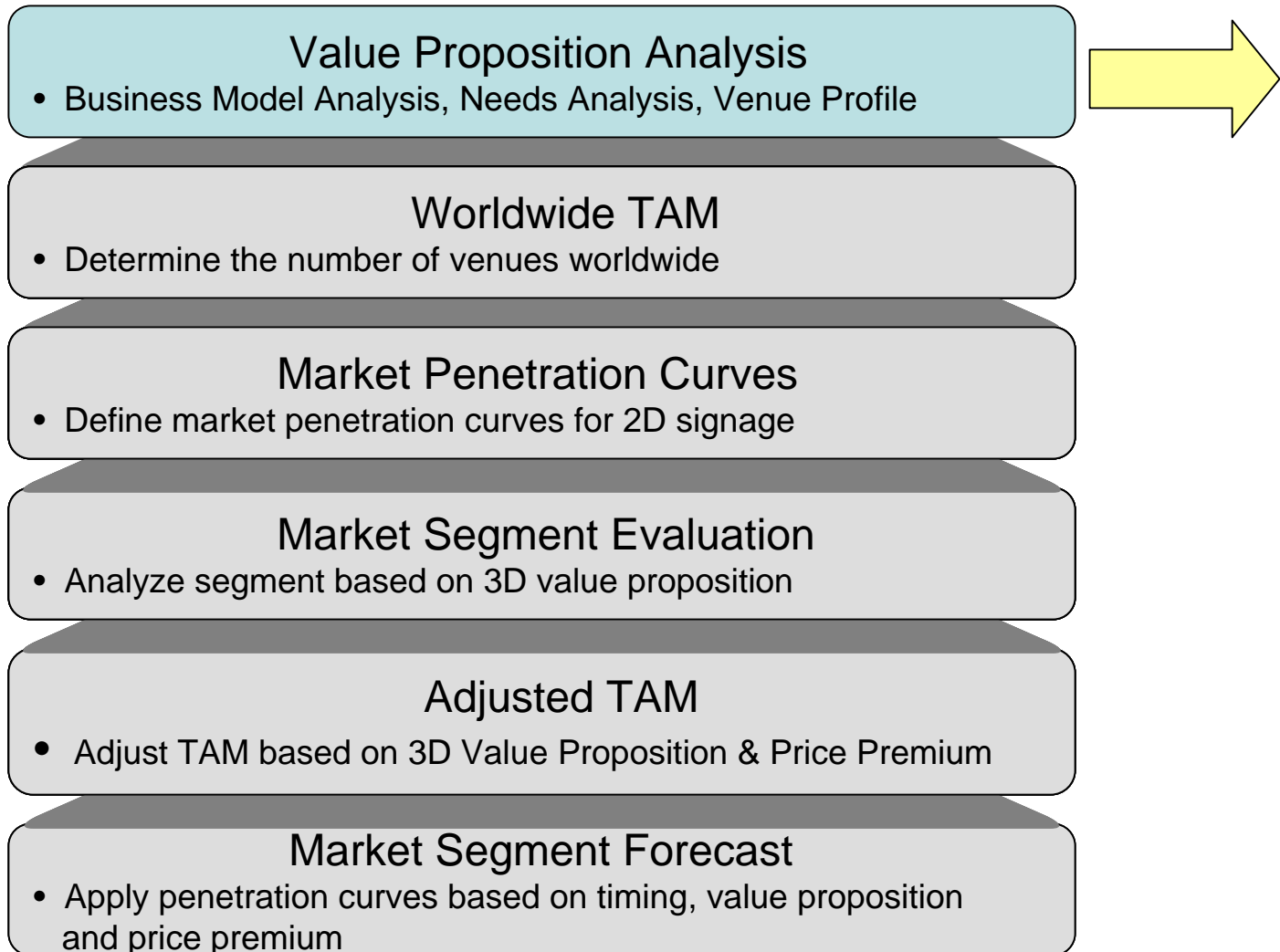
- Analyze segment based on 3D value proposition

Adjusted TAM

- Adjust TAM based on 3D Value Proposition & Price Premium

Market Segment Forecast

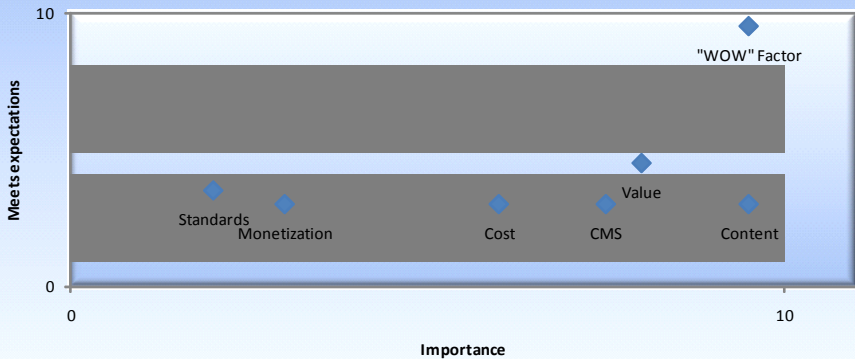
- Apply penetration curves based on timing, value proposition and price premium



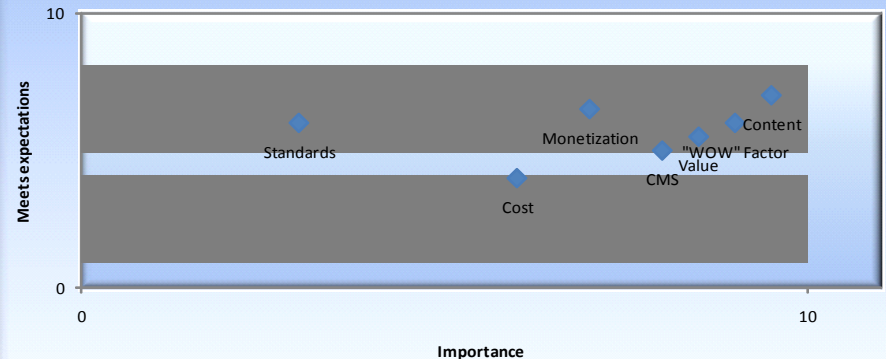
- Business Model Analysis
 - Owned by Network Operator
 - Shares Revenue with Venue
 - Owned by Venue
 - Subcontracts Network Operation
 - Capital Improvement
 - Venue owner (ie; Shopping Mall) Increases Rent due to Facility Improvement
- Monetization
 - Number of Screens
 - Length of advertising loop
 - Length of each advertisement
 - Rate for each ad

• Needs Analysis

AS-3D 2008 - Shopping Malls



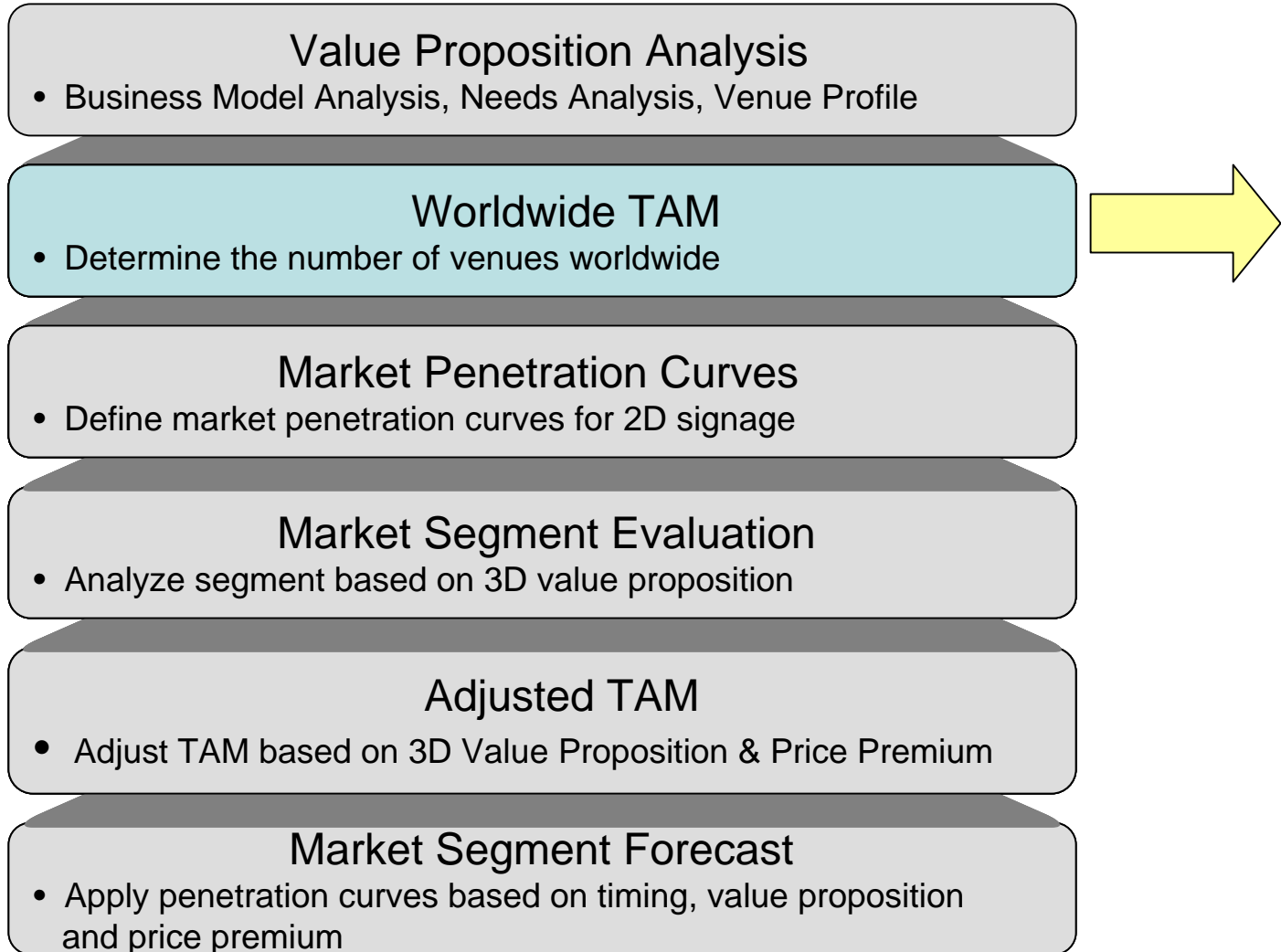
AS-3D 2012 - Shopping Malls



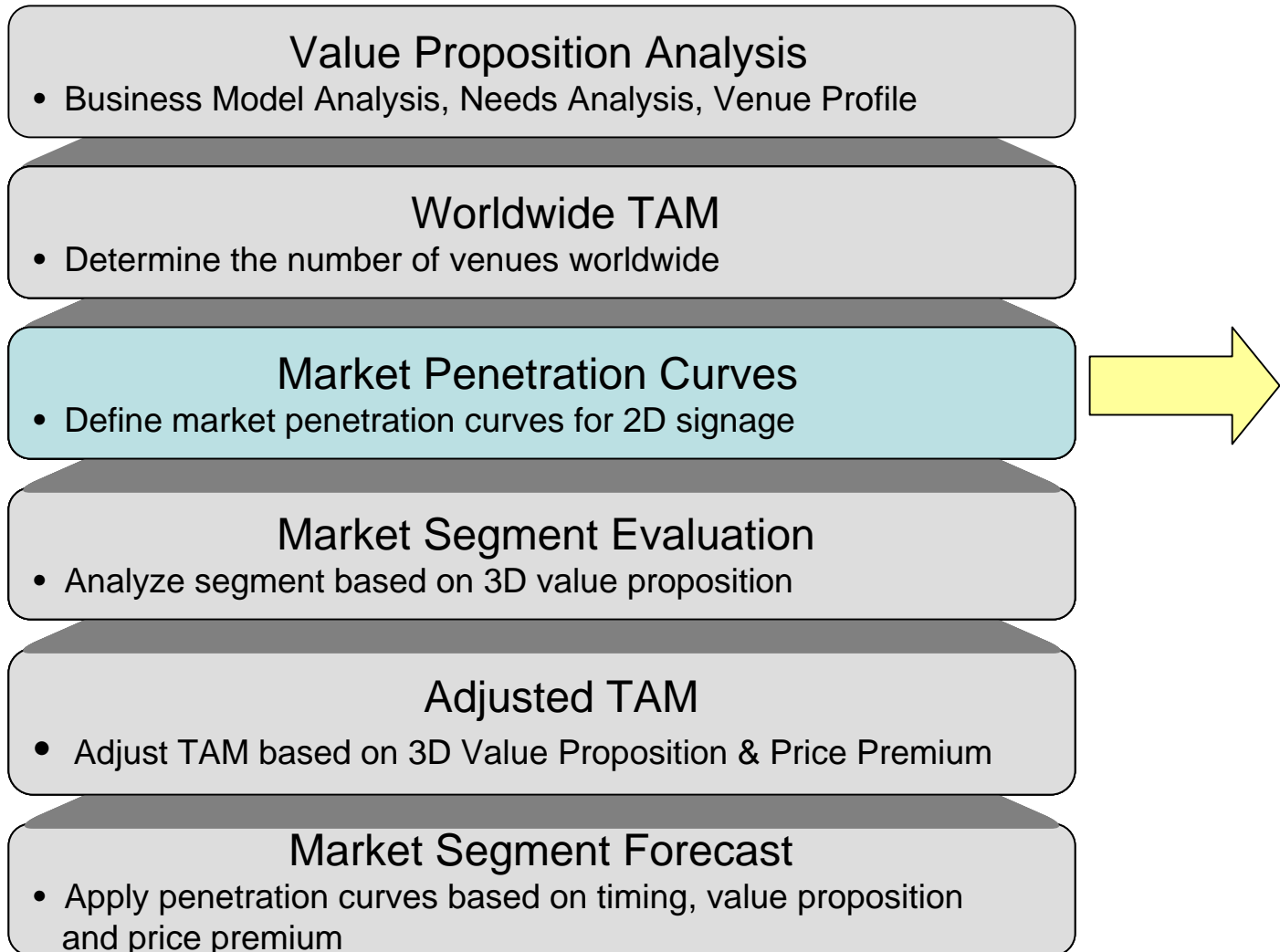
Issue	Importance	Normalized Score
Cost	6	1.8
Value	8	3.6
Standards	2	0.7
Content	9.5	2.9
CMS	7.5	2.3
"WOW" Factor	9.5	9.0
Monetization	3	0.9
Total	45.5	21.1
Overall Score:		46.4%

Issue	Importance	Normalized Score
Cost	6	2.4
Value	8.5	4.7
Standards	3	1.8
Content	9.5	6.7
CMS	8	4.0
"WOW" Factor	9	5.4
Monetization	7	4.6
Total	51.0	29.5
Overall Score:		57.8%

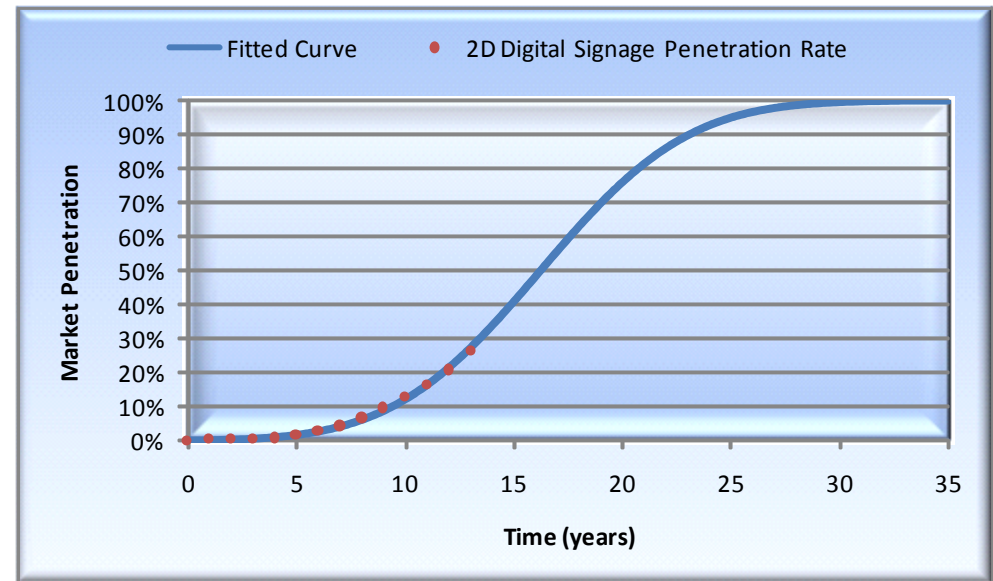
Shopping Malls Venue Summary					
Content Creation		Content Management		Design & Installation	
Style	Video, Animation, Graphics	Player	Media Player or PC	Decision Makers	Network Operator
Format	Beta SP, DVD, QuickTime, Flash	Network	Wireless (Wi-Fi or Cellular)	Installer	Network Operator or VAR
Length	15 to 60 seconds/ad	Management	Remote	Business Model	
Budget	Advertiser	Venue Description		Monetization	Lease of space for signage, revenue sharing
Mix	Advertising >90%	Physical Layout	Inside or Outside	ROI	Direct
On-time	10 to 15 hours/day	Purpose of Signage	Advertising		
Refresh	Weekly	Display Size	Large, 65" is common		
Repeat	6 to 9 minutes	Location of Displays	High Traffic / Common area		
		Ambient Conditions	Very Bright, Specular		



Venue	2008	2009	2010	2011	2012	2013	2014
Shopping Malls	1,826	1,826	1,844	1,863	1,881	1,900	1,919
Chain Restaurants							
Bowling Centers							
Banks							
Sporting Venues							
Retail							
Transportation							
Gas Stations & Convenience Stores							
Professional Offices							
Corporate Lobbies							
Casinos							
Convention Centers							
Theme Parks							
Water Parks							
Cinema Lobbies							
Arcades							
Museums							
Aquariums							
Planetariums							
Pachinko & Other Gaming							
Sales Offices							
Rental and Staging							
Venue Grand Total							



Venue	2D Signs per Venue
Shopping Malls	25
Chain Restaurants	
Bowling Centers	
Banks	
Sporting Venues	
Retail	
Transportation	
Gas Stations & Convenience Stores	
Professional Offices	
Corporate Lobbies	
Casinos	
Convention Centers	
Theme Parks	
Water Parks	
Cinema Lobbies	
Arcades	
Museums	
Aquariums	
Planetariums	
Pachinko & Other Gaming	
Sales Offices	
Rental & Staging	



Value Proposition Analysis

- Business Model Analysis, Needs Analysis, Venue Profile

Worldwide TAM

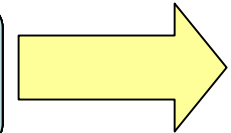
- Determine the number of venues worldwide

Market Penetration Curves

- Define market penetration curves for 2D signage

Market Segment Evaluation

- Analyze segment based on 3D value proposition



Adjusted TAM

- Adjust TAM based on 3D Value Proposition & Price Premium

Market Segment Forecast

- Apply penetration curves based on timing, value proposition and price premium

Venue	2008	2009	2010	2011	2012	2013	2014
Shopping Malls	25	25	25	30	35	40	45
Chain Restaurants							
Bowling Centers							
Banks							
Sporting Venues							
Retail							
Transportation							
Gas Stations & Convenience Stores							
Professional Offices							
Corporate Lobbies							
Casinos							
Convention Centers							
Theme Parks							
Water Parks							
Cinema Lobbies							
Arcades							
Museums							
Aquariums							
Planetariums							
Pachinko & Other Gaming							
Sales Offices							
Rental and Staging							

Determine the number of 3D signs per venue

Value Proposition Analysis

- Business Model Analysis, Needs Analysis, Venue Profile

Worldwide TAM

- Determine the number of venues worldwide

Market Penetration Curves

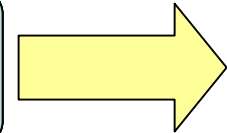
- Define market penetration curves for 2D signage

Market Segment Evaluation

- Analyze segment based on 3D value proposition

Adjusted TAM

- Adjust TAM based on 3D Value Proposition & Price Premium



Market Segment Forecast

- Apply penetration curves based on timing, value proposition and price premium

Venue	2008	2009	2010	2011	2012	2013	2014
Shopping Malls	45,650	45,650	46,107	55,881	65,847	76,006	86,361
Chain Restaurants							
Bowling Centers							
Banks							
Sporting Venues							
Retail							
Transportation							
Gas Stations & Convenience Stores							
Professional Offices							
Corporate Lobbies							
Casinos							
Convention Centers							
Theme Parks							
Water Parks							
Cinema Lobbies							
Arcades							
Museums							
Aquariums							
Planetariums							
Pachinko & Other Gaming							
Sales Offices							
Rental and Staging							
Total							

AS-3D Digital Signage TAM (26" and Larger)

Determined by multiplying the number of venues by the average number of AS-3D signs per venue.

Value Proposition Analysis

- Business Model Analysis, Needs Analysis, Venue Profile

Worldwide TAM

- Determine the number of venues worldwide

Market Penetration Curves

- Define market penetration curves for 2D signage

Market Segment Evaluation

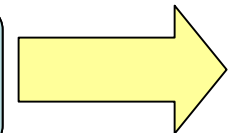
- Analyze segment based on 3D value proposition

Adjusted TAM

- Adjust TAM based on 3D Value Proposition & Price Premium

Market Segment Forecast

- Apply penetration curves based on timing, value proposition and price premium



Venue	2008	2009	2010	2011	2012	2013	2014
Shopping Malls	75%	75%	80%	85%	90%	95%	100%
Chain Restaurants							
Bowling Centers							
Banks							
Sporting Venues							
Retail							
Transportation							
Gas Stations & Convenience Stores							
Professional Offices							
Corporate Lobbies							
Casinos							
Convention Centers							
Theme Parks							
Water Parks							
Cinema Lobbies							
Arcades							
Museums							
Aquariums							
Planetariums							
Pachinko & Other Gaming							
Sales Offices							
Rental and Staging							

% of TAM that will consider buying AS-3D

Market Segment Forecast

Venue	2008	2009	2010	2011	2012	2013	2014
Shopping Malls	101	199	378	731	1,416	2,462	3,909
Chain Restaurants							
Bowling Centers							
Banks							
Sporting Venues							
Retail							
Transportation							
Gas Stations & Convenience Stores							
Professional Offices							
Corporate Lobbies							
Casinos							
Convention Centers							
Theme Parks							
Water Parks							
Cinema Lobbies							
Arcades							
Museums							
Aquariums							
Planetariums							
Pachinko & Other Gaming							
Sales Offices							
Rental and Staging							
Other							
Total							

$$\begin{aligned}
 &\text{Adjusted TAM} \\
 &\quad \times \\
 &\quad \text{\% of TAM that will buy AS-3D} \\
 &\quad \times \\
 &\text{Penetration Rate of AS-3D Signage} \\
 &\quad = \\
 &\text{Market Segment Forecast}
 \end{aligned}$$

Note: Penetration rate is adjusted for each venue based on market needs analysis and other proprietary factors.

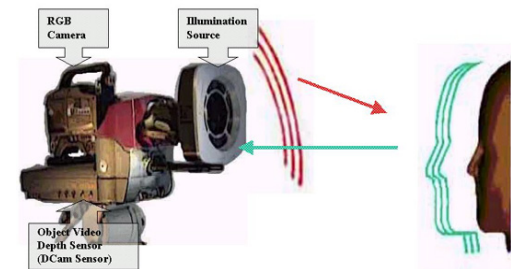
- Today
 - Content Creators
 - Installers
- Future
 - Network Operators
 - Display Makers
 - Software Developers
 - CMS
 - Content Creation / Editing Tools

- Lack of Existing 3D Content
- Inconsistent Results w/ 2D Conversion
- Excellent Tools Available for 3D Animation
- 3D Cameras are not Common
- Lack of Standard Tools for 3D Editing
- Few Artists Trained in AS-3D Techniques

- 3D Image Capture
 - Dual Camera Systems
 - Image + Depth
- 2D to 3D Conversion
 - DDD TriDef Vision+
- Computer Generated
 - 3DS Max
 - Maya
 - Others



21st Century 3D 3DVX3



ZCam

- Digital Signage Networks Are Bought By:
 - Network Operators
 - Tie Together Common Regional Venues
 - Convenience Stores
 - Sporting Venues
 - Cinema Lobbies
 - Venue Owners
 - Example: Wal-Mart

- Use of AS-3D in Digital Signage Is Just Beginning
- AS-3D Is Appropriate in Many Venues
- AS-3D Display Cost Is a Detriment
- 2009 Is Breakthrough Year for Consumer 3D
 - 3D Infrastructure is Growing
- “WOW” Factor Is Key Differentiator

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Prism Technologies

- **Display Markets, Forecasting and Cost Modeling Expert**
 - Over 23 years in a variety of roles in the display industry, including Executive Management, Sales and Marketing, Business Planning, Engineering and Manufacturing
 - Held position as Vice President at DisplaySearch, responsible for Small / Medium Displays
 - Developed and published the industry's first report on the North American Industrial Display Market
 - Responsible for Marketing, Procurement, MIS and Contracts while a Director at Optrex America
 - Authored numerous articles on display related topics and has spoken at various industry conferences
- Attended University of Minnesota, Institute of Technology (Electrical Engineering) and was a Dean's Scholar in the College of Science at San Jose State University (Physics)

