Wintel

Recreating the PC Revolution in VR?!!

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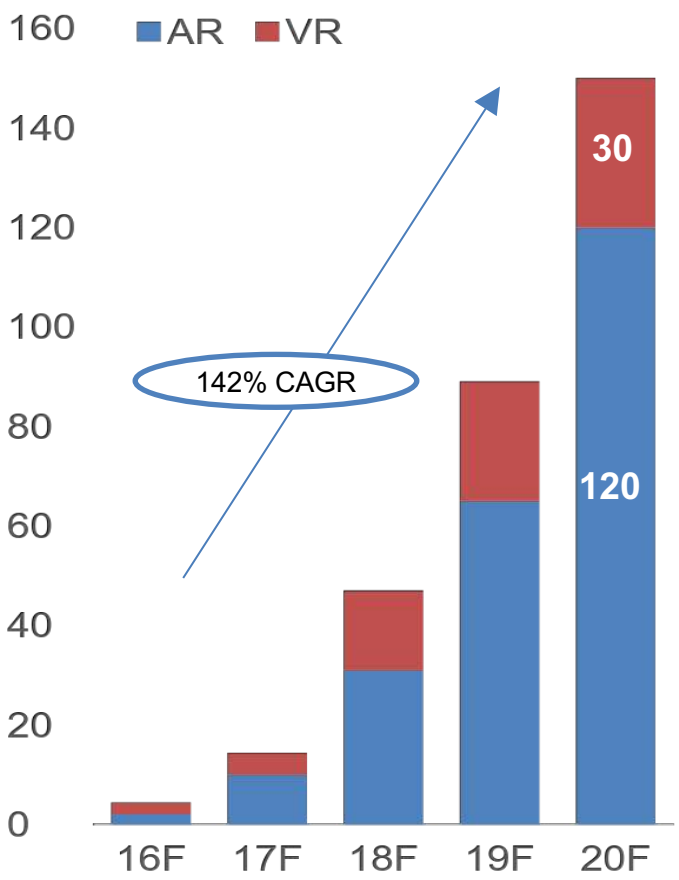
AR/VR market becoming a very lucrative space by 2020

AR/VR market to grow by 142% yoy to $150B by 2020

AR/VR Market Projections ’16-’20



Source: Digi-Capital

Virtual Reality

Augmented Reality

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More than just gaming

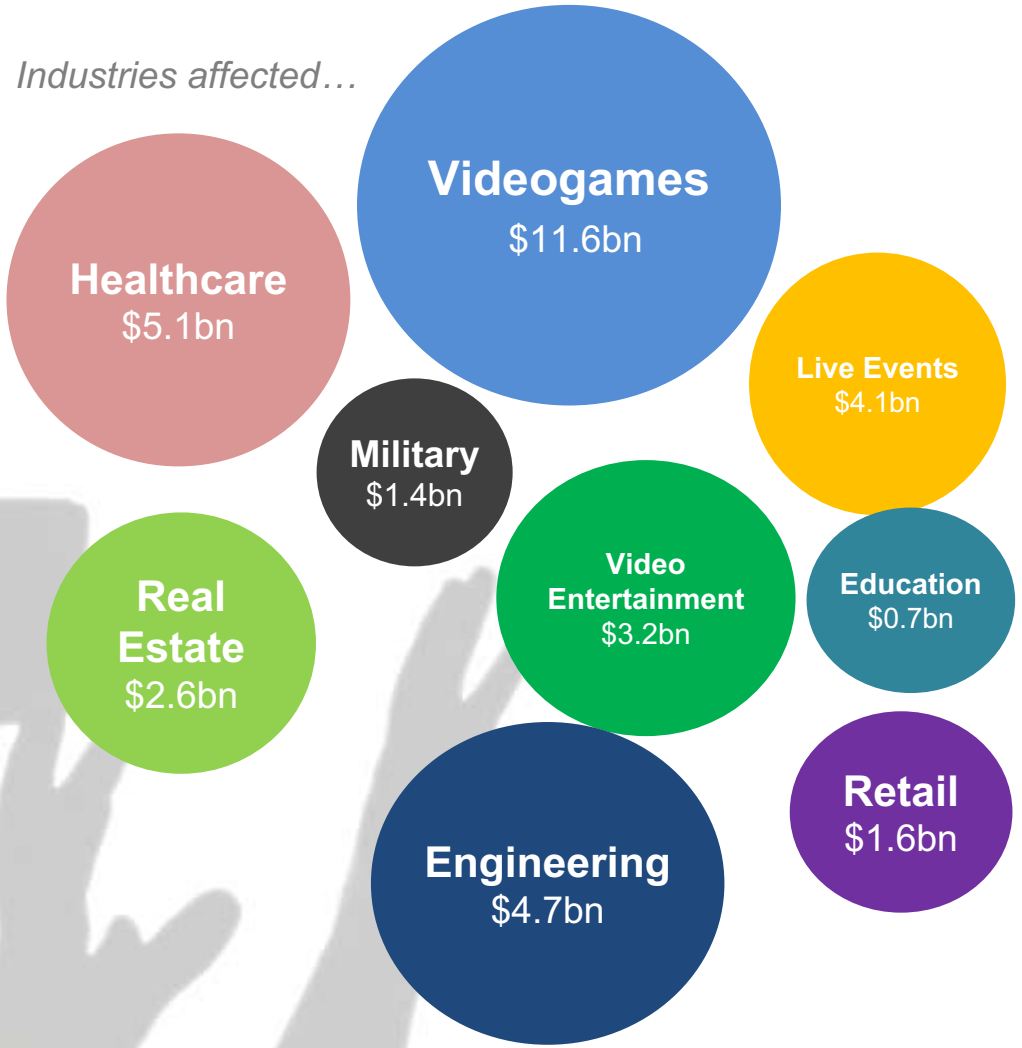
Components of AR/VR Strategy

1 Hardware
- Head-mounted devices
- Processors, Graphics, Memory
- Cameras, Sensors, Lenses, Audio
- Haptics, Input Devices

2 Software
- 3D Tools
- SDK
- User Interface
- Compilers
- Database Management

3 Content
- Apps
- Enterprise Tools
- Educational Content
- Movies
- Videogames

Industries affected…



Source: Goldman Sachs

Competitive Landscape

	Google	Samsung Oculus	Sony	Oculus	HTC Vive Valve	Microsoft
Focus Area	Low-end Mobile VR/AR	Low-end Mobile VR	Mid-range Console/PC VR	High-end Console/PC VR	High-end Console/PC VR	High-end mobile AR and mid-level PC VR
Strategy	Internal + Partnerships	Partnership	Internal	M&A + Partnership	Partnership	Internal + Alliance
Compatible Devices	Android smartphones	Samsung smartphones	PlayStation 4	High-end PCs	High-end PCs	Xbox One Mid-to-high end PCs
Current Products						
Price	Cardboard: $15 Daydream: $79	Gear VR: $50	PSVR: $399	Oculus: $599	Vive: $799	OEMs: $299; Hololens: $3,000

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Complementarities

Capabilities

- Software
- 20Mn+ XBox
- Windows Ecosystem
- ~90% OS market share
- Cloud Services, Photo Storage
- Enterprise Productivity Suite

Capabilities

- Hardware development for PCs, Servers, Tablets
- Leader in Semiconductors
- Supports 90% of Windows
- Huge R&D

Capabilities

- Integrating different components
- Highly optimized Supply Chain
- Mass Production
- Sensors development
- Access to global markets
- Engagements with Enterprises

Weaknesses

- Slow to market
- Hardware Development
- Supply Chain
- Mass production

Weaknesses

- No software expertise
- Out-of-box hardware
- Sensors development

Weaknesses

- Low R&D
- Limited innovation
- Expertise in core competencies

OEMs: Original Equipment Manufacturers (e.g. Lenovo, HP, Dell)

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Co-specialized Assets

Better VR experience	• Smarter voice interaction • More powerful gaming • Strengthened security and identity protection
Future AR development efforts	• Removing cable: WiGig - High Speed Wireless • Inside-out tracking - No sensors all over room • All-in-One head-mounted display - Project Alloy
Ecosystem development	• Greater scale and reduced complexity for Developers - Microsoft Holographics • Standardized hardware and software configuration

Clear price point and an easy to use solution

Why Alliance? Why not Acquisition?

	Internal Development	Alliances	Acquisition
Growth - Medium/High	(Slow) ✘	(Medium) ✔	(Fast) ✔
Control/Coordination - Full	(Full) ✔	(Limited) ✘	(Full) ✔
Cost - Low	(Medium) ✘	(Low) ✔	(High) ✘
Implementation Risk - Low	(High) ✘	(Low) ✔	(Medium) ✘
Challenge - Build Ecosystem	Build Capabilities	Partner Relationship	Integration
Synergy - Modular		(Modular) ✔	(Reciprocal) ✘
Soft Resources - High		(High) ✔	(Low) ✘
Redundant Resources - Low		(Low) ✔	(High) ✘
Market Uncertainty - High		✔	✘
Competition - Medium		✔	✔

Source: “When to Ally and when to Acquire”, J. Dyer, P. Kale, H. Singh, HBR

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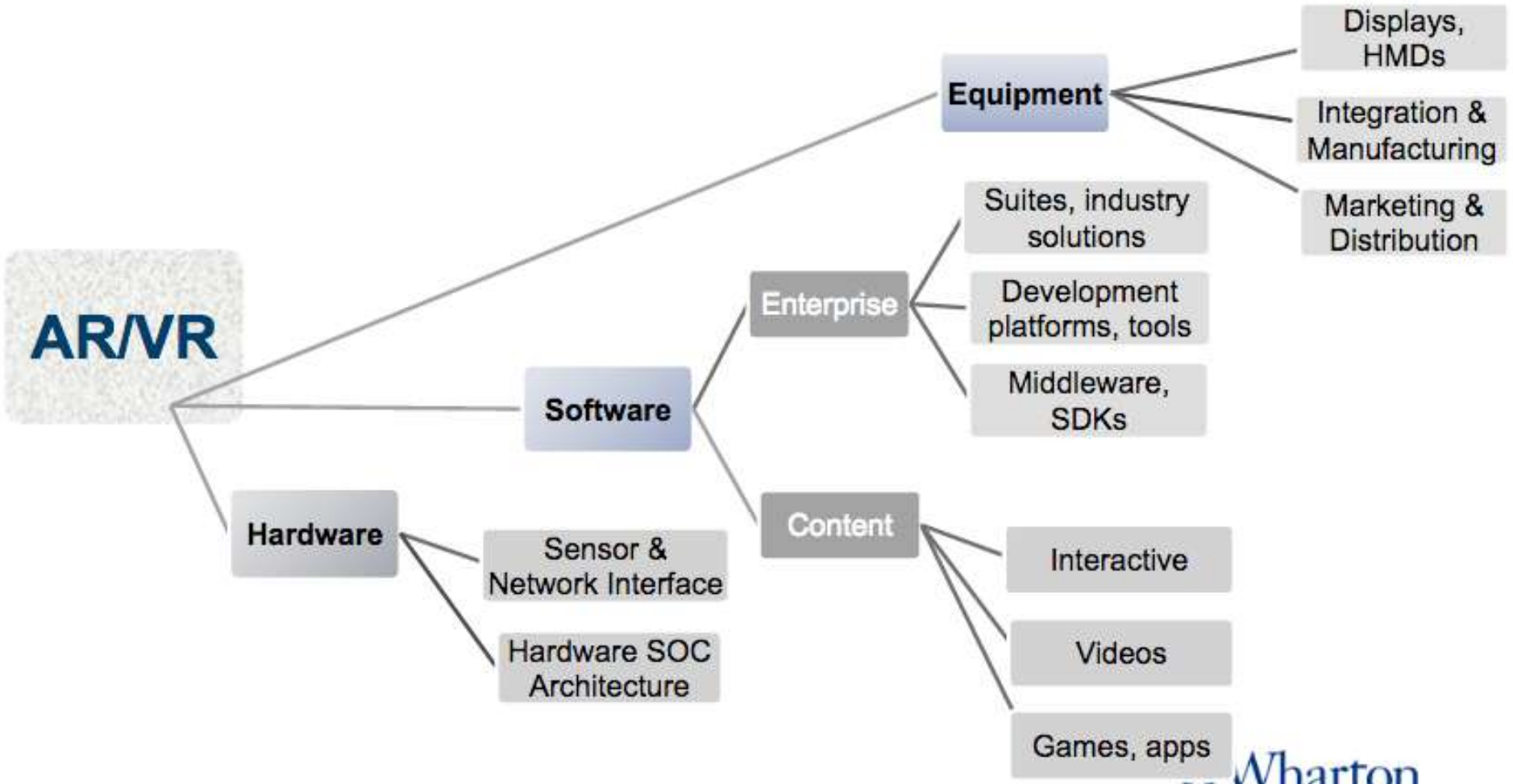
AR/VR Value Chain



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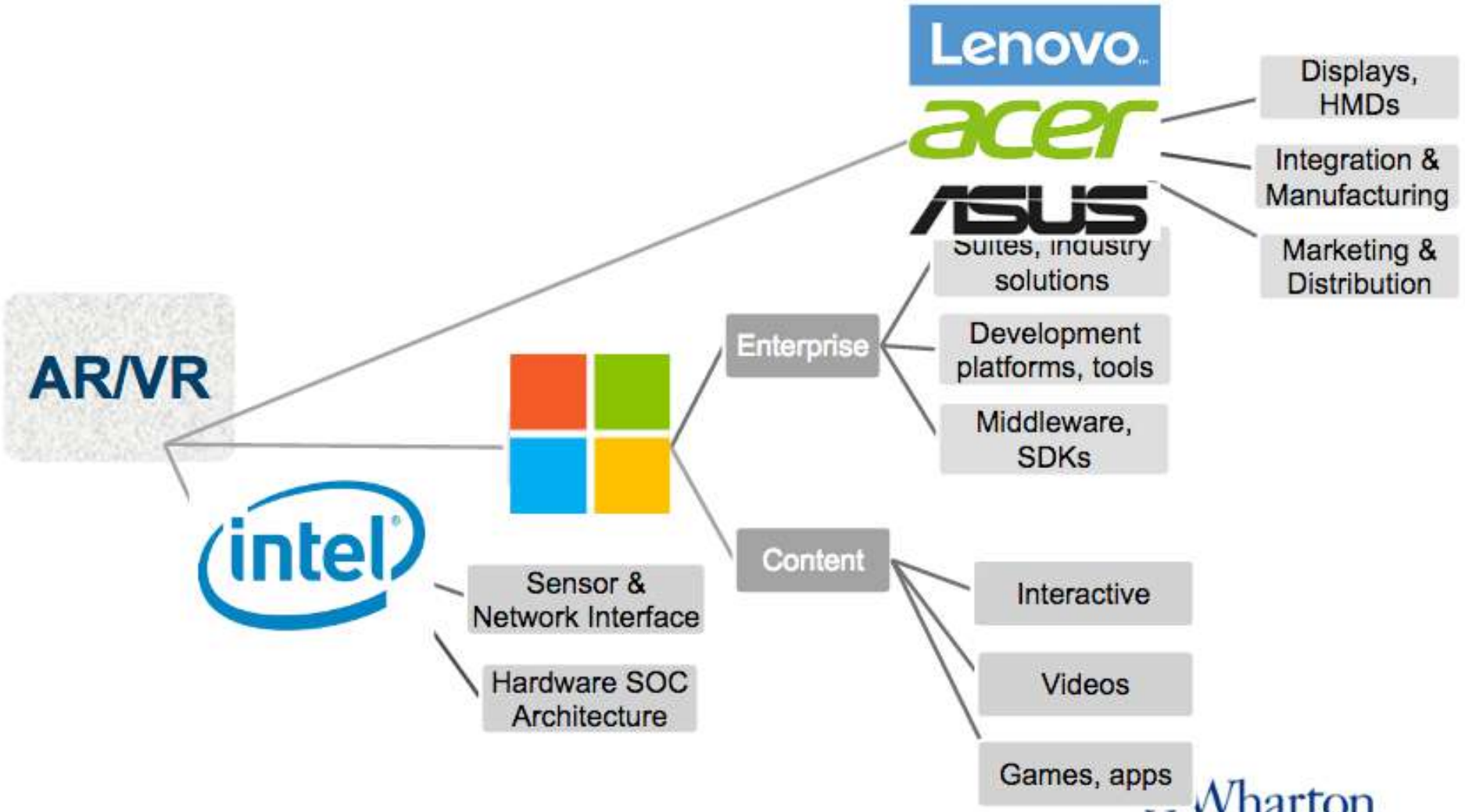
AR/VR Value Chain



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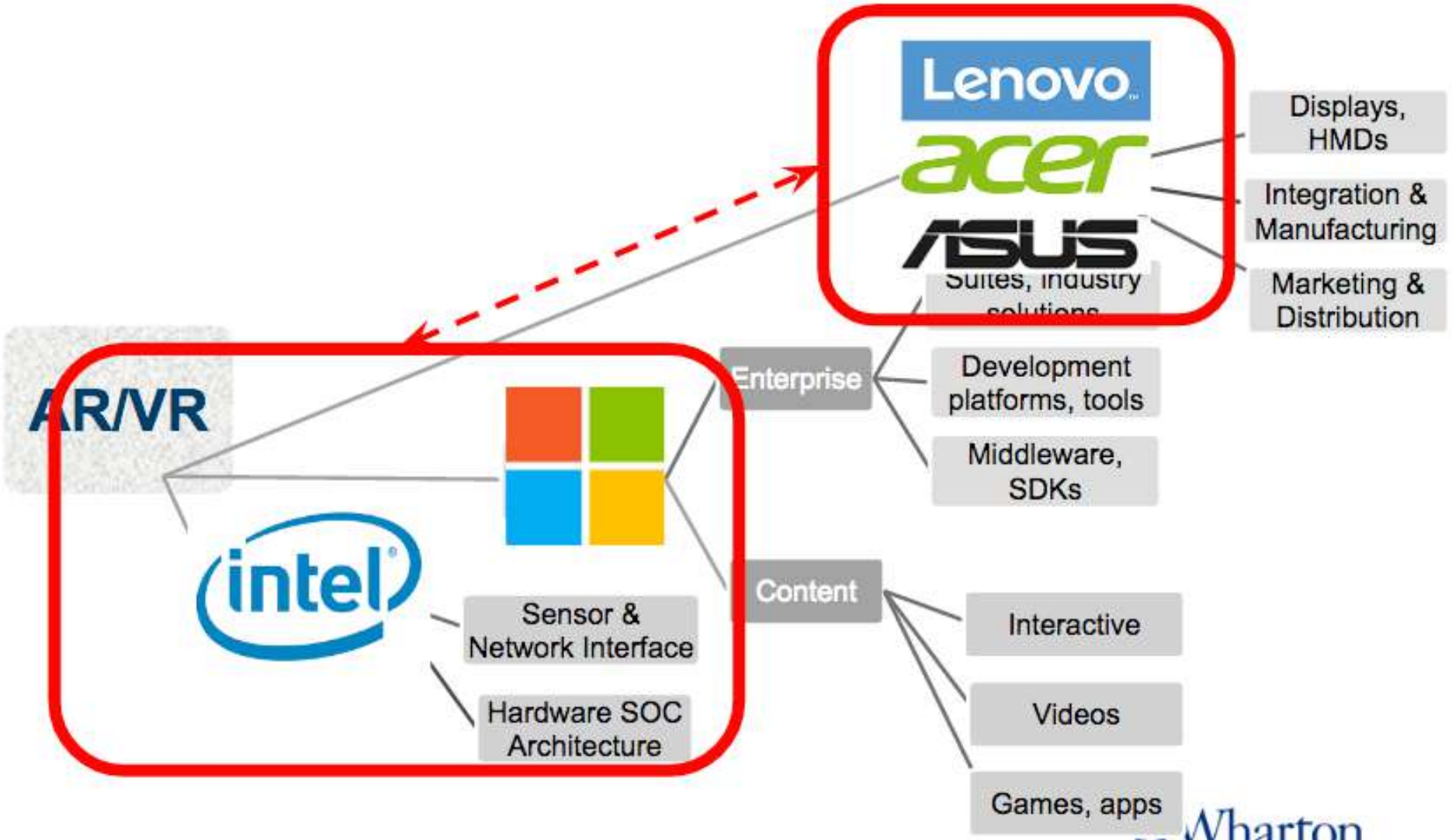
AR/VR Value Chain



Implementation Strategy: Window Strategy

Phase I

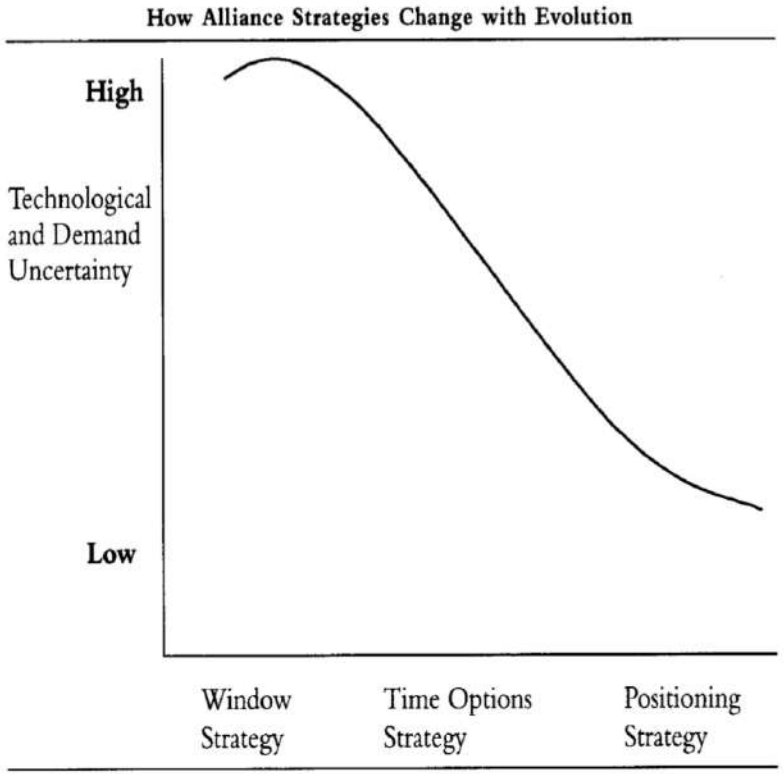
Prototype Development

- MS & Intel teams colocate in Portland/Seattle
- Periodic meetings with OEMs

Phase II

Collaboration with OEMs

- Rotation of Product Managers (PM + Engineers) from MS & Intel to China for coordination with OEMs



Source: Dyer and Singh 2000

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Phase 1 (1-2 years)	Phase 2 (2-4 years)	Phase 3 (4-6 years)	Phase 4 (6 years +)
Prototype Development	**Low-end VR Headset**	**VR Ecosystem**	**Transition to AR Ecosystem**
• MS & Intel teams co-locate in Portland/Seattle • Periodic meetings to drive co-development goals • Defining Hardware / Software specs – Developing Windows Holographics and specialized X86 processors • Knowledge-sharing technical prowess • Partnership with with single OEM to build prototype • Alliance Board for governance	• Partnering with leading OEMs for mass production • Rotation of Product Managers, Engineers from MS & Intel to China for coordination with OEMs • Standardize specifications for Hardware/software development • Dedicated Alliance Team to coordinate project activities regularly • Alliance Board + OEM consortium for governance	• Utilizing stronger partnership with OEMs to drive derivative VR products • Emphasis on synergy across devices and OEMs to build common platform/ecosystem • Focus on organic growth of ecosystem through content development for Enterprises, Games • Access to global markets • Extending OEM consortium to include Developers forum globally	• MS & Intel teams co-innovating through R&D investments in AR • Focus on building technology for stand-alone AR headsets, WiGig • Developing AR prototype and leveraging OEMs to create low-end AR devices • Standardizing transitioning of VR applications to AR ecosystem • common-marketing protocol - Access to wider market across industries collaboration • Leveraging Alliance Board + OEM consortium and developers forum to build AR ecosystem

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Implementation Strategy Cont.

Implementation Challenges

- **Cultural alignment**: Existing relationships between alliance members
- **Potential for distrust**: Colocation & Equal investments
- **Incentive structure**: Everyone gets share of growing pie size.

Effective Governance

- **5 member Board:** 2 Microsoft, 2 Intel and 1 OEM consortium representative
  - Power with keystone players
  - OEMs: tie-breaking role and involved in decision making
- **Equal investment and equal contribution**
  - Microsoft:Intel = 50:50 cost split for Phase 1
  - OEMs pay licensing fees per unit to the key players

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Success Metrics & Future Growth

Value Creation:

- Time to Market
- Revenue capture across industries
- Geographical Expansion

Growth in OEM strength and relationships

Spider Network of complementary products

Alliance : set standards for Cyber Security, Legal regulations on health-safety & IP protection

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Key Takeaways

- **VR Industry** : Value creation by ecosystem
- **Two Keystone Players :**
  - –Equal power and equal investment
  - –Multistakeholder Alliance within Alliance
- **Spider relationship networks** only grow the pie, not kill it!

Thank you!

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Present Market Dynamics!

Project EVO

- Microsoft + Intel alliance to build VR prototype

GVRA - Global Virtual Reality Association (Dec'16)

- Develop, share knowledge

Intel + HTC alliance (8th Feb'17)

- Collaborate to build WiGig - High Speed Wireless

GVRA

oculus from facebook

VIVE

Google VR

SAMSUNG

STARVR

BackUp 1: As Virtual Meets Real, Many Legal and Regulatory Complications Are Emerging

Health and safety: These are top concerns for AR/VR as they can distract users' awareness of physical surroundings, exposing risk of injury and putting to test product liability and workplace safety laws. Many such cases were reported after the launch of Pokémon Go.

Intellectual property: This is another area that AR/VR will impact, and conflicts might emerge between owners of copyrighted work, property, and content creators. Importantly, digital avatars' resemblance with public figures can amount to infringement and attract penalties.

Ethics and privacy: AR/VR applications store location data, facial recognition, or other passive, biometrics information that could raise privacy concerns or ethical dilemma for ad targeting. Many countries also have stringent laws for child privacy protection that need to be adhered.

Religious and social beliefs: Although free expression is a right across many democracies, overlaying virtual characters and things over places, such as religious institutions or memorials, can hurt societal and religious beliefs and even attract lawsuits, as witnessed in the case of Pokémon Go.

Cybersecurity. This is a common concern for all internet-connected devices, and as AR/VR unleashes new devices and sensors, including location-aware applications, hacking becomes a major risk. In addition, malicious or offensive content in AR/VR could have more profound psychological and emotional impact.

Financial compliance. As AR/VR ecommerce, in-app purchases, and new payment applications emerge, suppliers need to be compliant with PCI standards and financial data collection norms for underage users. Virtual games currency and its use is also under the regulatory radar in many countries.

Source: IDC analysis

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