

Airwolf 3D™

3D Printing

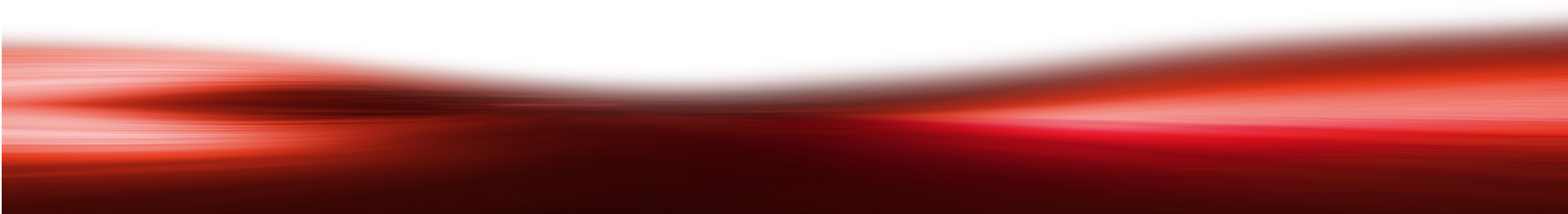
What is This All About?

Mark Mathews
President, Airwolf 3D

Additive Manufacturing AKA '3D Printing'



“A process of joining materials to make objects from 3D model data, usually layer upon layer, as opposed to subtractive manufacturing technologies.”

A decorative horizontal bar at the bottom of the slide, featuring a gradient of red and orange colors with a blurred, motion-like effect.

Why Are We Talking About This?

What is 3D Printing?

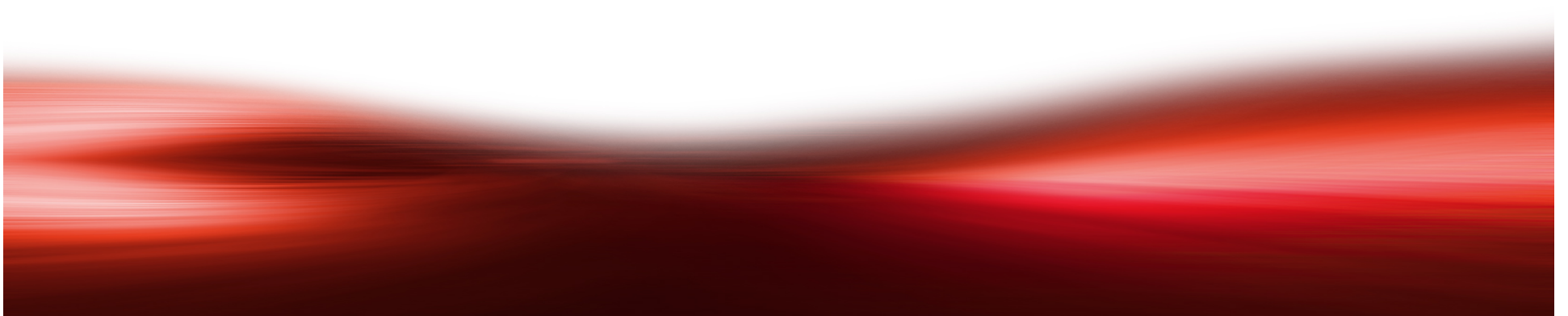
Is This Right for Me?



Why Are We Talking About This?

What is 3D Printing?

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WHY NOW?

The Third Industrial Revolution



First Industrial Revolution

- Britain
- Late 18th Century
- Mechanization of Textile Industry
- Benefits of Centralization
- Cottage Weaver to Single Cotton Mill



Second Industrial Revolution

- United States and Europe
- Late 19th Early 20th Century
- Moving Assembly Line
- Mass Production
- The 'Mill' Gets more Efficient

shapeways



Third Industrial Revolution

- Digitalization of Manufacturing
- Software, Materials, Robots, Web-Based Services, Process (3D Printing)
- Mass 'Customization'
- Local and Entrepreneurial
- 'Mill Moves Back to the Weaver'

Other Factors

Mistrust Of China -
Quality, IP

Expiration of Patents –
FDM, SLS

Maker
Movement

Internet
Software

New
Materials

Improving
Economics

Economic Pressures -
Shorter SC, Quick Dev Cycles



Large and Growing Marketing

3D Printer Market

- Estimates Range from 25% - 50% Annual Growth Rates
- \$13B - \$22B Market by 2019
- Includes Machines, Filaments, and Services

Source - 3DPrint.com, Apr 2, 2014

CAD Placements

- Roughly 20M Seats World Wide
- US – 35% of seats
- EMEA – 35% of seats
- Asia – 25% of seats
- ROW – 5% of seats

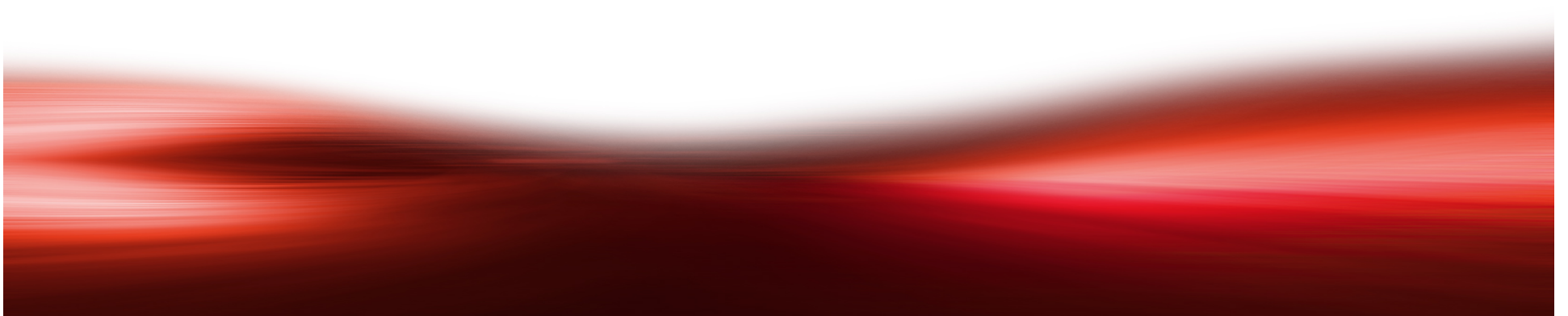
Source - Jon Peddie Research, Aug 2012



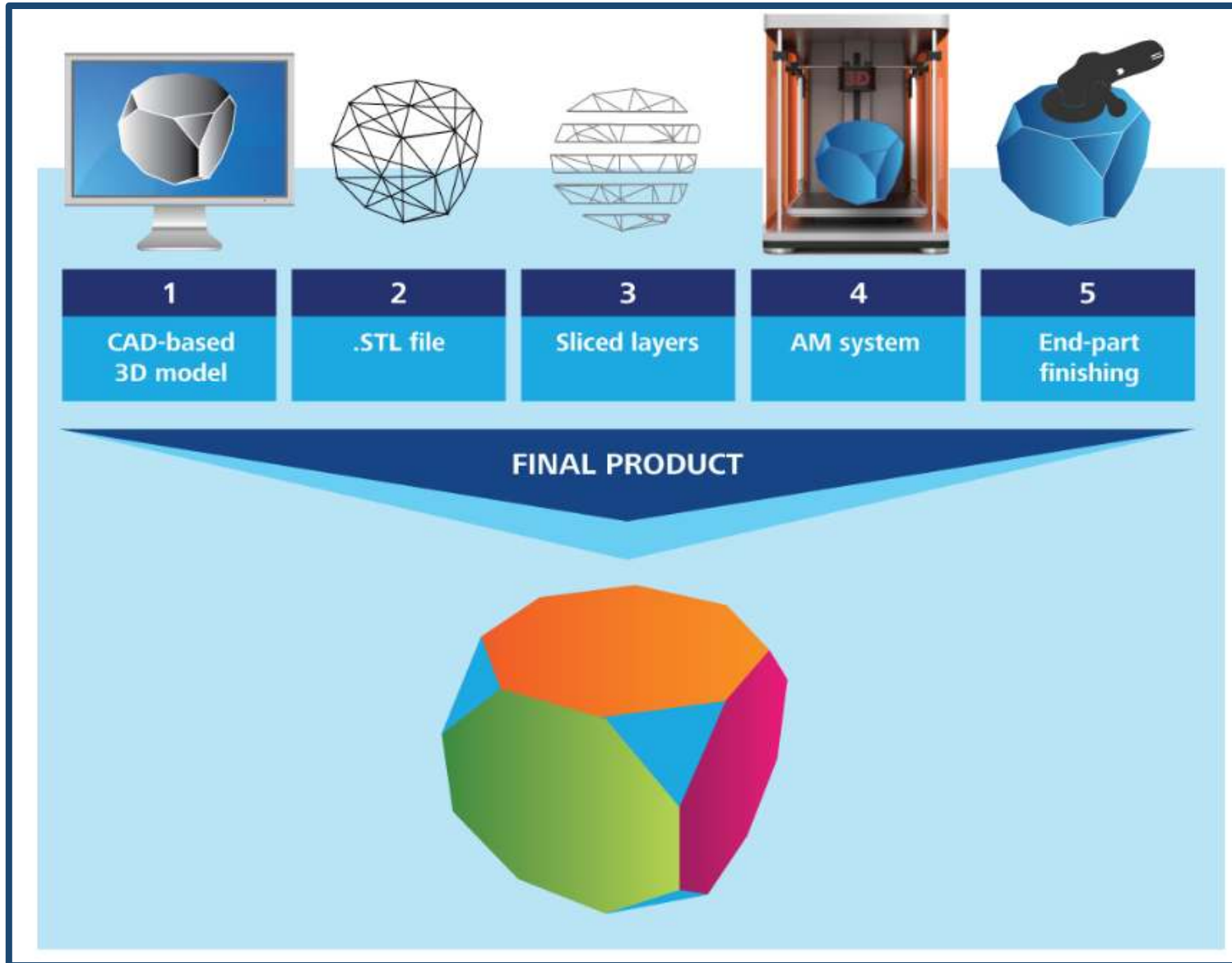
Why Are We Talking About This?

What is 3D Printing?

What do I Need to Think About?



How Does it Work?

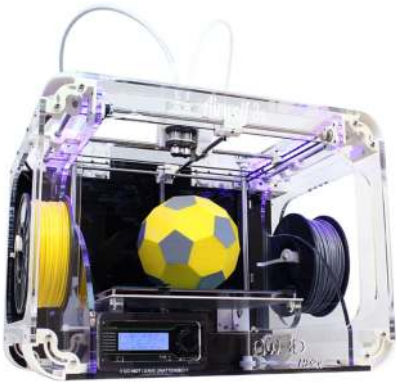


How Do You Print?

- Over a Dozen Different Technology
- Prices range from \$500 to \$500K+

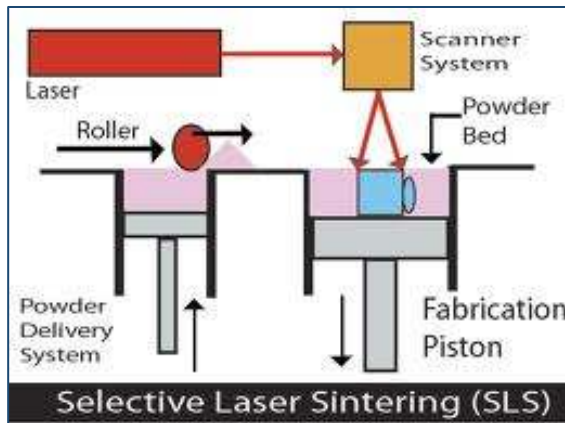
FDM

Fused Deposition Modeling



SLS

Selective Laser Sintering



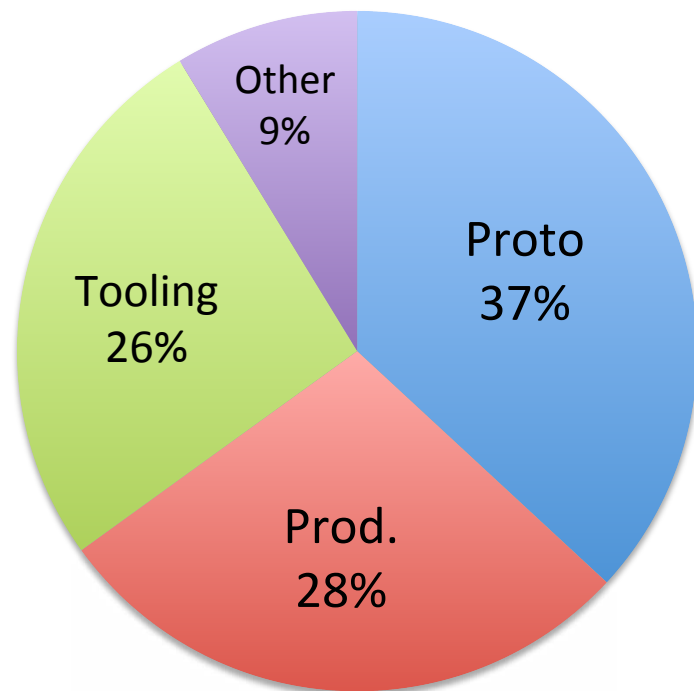
SLA

Stereolithography



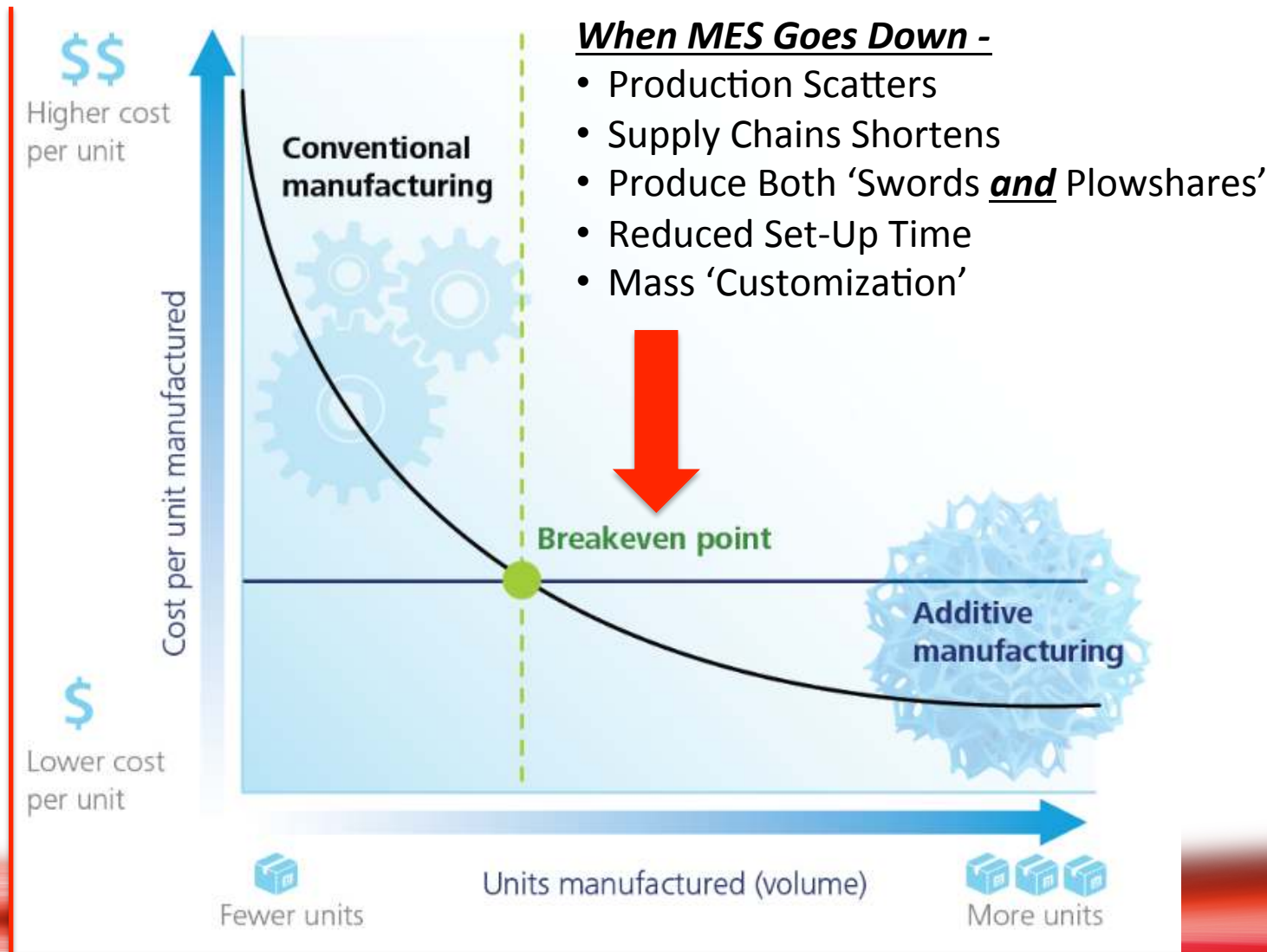
Application and Benefits

How's It Used

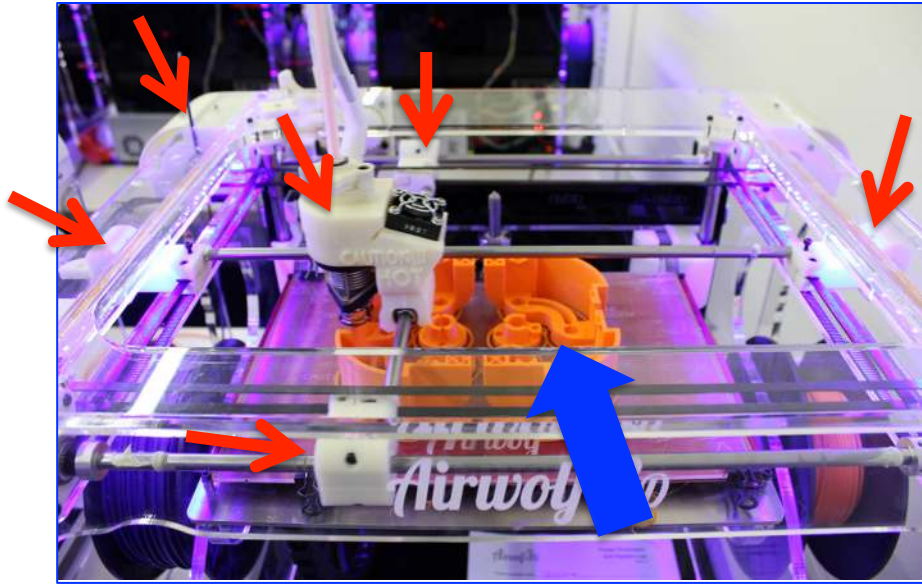


- Prototyping and Design -
 - Accelerate time to market (up to a 90% reduction)
 - Lower development costs (from \$2500 to \$50 per proto)
 - Better Meet Customer Needs
- Production and SCM –
 - Reduces multiple assembly steps
 - Simplifies Components
 - Product Complex Geometry
 - Parts Customization
 - Less material scrap
 - Eliminates tooling
 - Move production closer to demand
 - Shorter supply chain

Minimum Efficient Scale (MES)



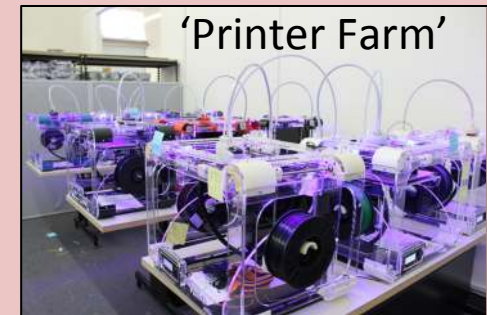
A Case Study – Airwolf 3D



Laser Cutter Waste



- No Tooling – No Capital Investment in a ‘Manufacturing’ Company
- Design Changes Prototyped and in Production Same Day
 - No set-up or transition time – Send a file
 - In production that night
- ‘Print’ in multiple colors – ‘mass’ customization
- Eliminate of waste (laser cutter vs 3D printer)
- Minimal inventory – Short Supply Chain
- No dealing with outside vendors
- Most important – ***we control the entire process in-house ensuring a quality product***




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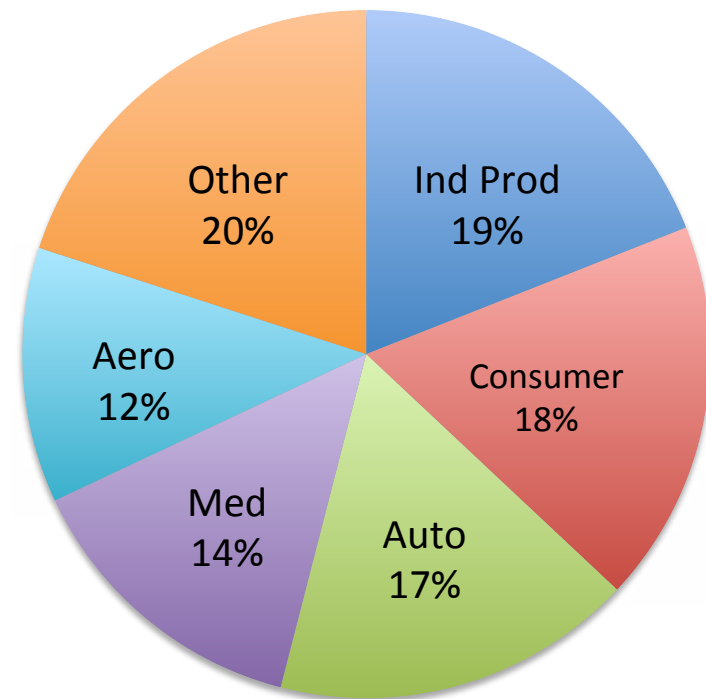
The Business Model

- Recurring Revenue Model -
 - Machines + Consumables + Service
 - B2B, Value Sale -
 - Must understand business value case
 - Must understand the vertical (use, materials, print, . . .)
 - Technical Sale –
 - Understanding of the machine, material and the process
 - Lot of support around the ‘print’ process
 - High Organic Growth Rate -
 - Everyone is looking at this market
 - An immature market
- 

Whose Buying?

- Corporations
- Educational Systems
- Government Agencies
- Professional
- Consumers
- Makers

Verticals



Who's Out There Selling Today?

3D Printer
Dealers

Established
Distributors

Educational
VARs

FabLabs

Industrial Machine
Reseller

The Start-Up

CAD Resellers

Direct

Service Bureaus

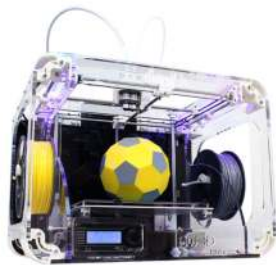
In Flux with No Clear Leader

Who Can I Resell?

Full Line Providers




Desktop Providers



250+ Options – But less than 20 are
'On-Going' Concerns, ***CAVEAT EMPTOR***

What You Need to Ask Yourself

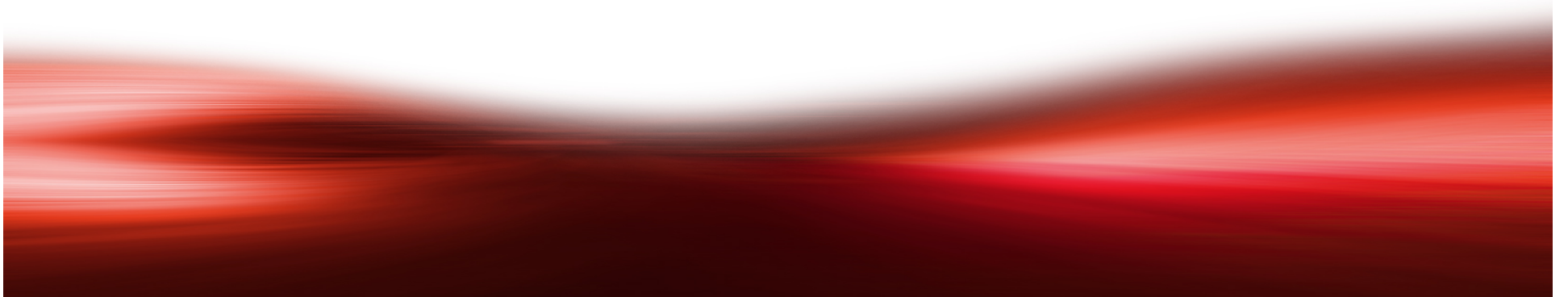
- Do I Have the Right Customer Base?
 - Do I Have Similar Products?
 - CAD, Software, Educational Products
 - Am I Willing to Commit and Develop the Resources?
 - Time, Money, Manpower
 - Resources are in the market if you want them
 - Plan on 1 – 2 Years to Be Fully Competent
 - How Do I Want to Get In?
 - Sales, FabLab, Service Bureau
 - What Brand Do I Want to Sell?
- 

Dear Optimist,
Pessimist, and
Realist,

While you guys
were busy arguing
about the glass of
water, I drank it!

Sincerely,
The Opportunist

Two Important Notes



Where to Find Background Information

Deloitte University Press –

<http://dupress.com/articles/3d-opportunity-additive-manufacturing-course/>

3dprintingindustry.com –

<http://3dprintingindustry.com/wp-content/uploads/2014/07/3D-Printing-Guide.pdf>



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