

AM Selling Introduction

1. Untitled Scene

1.1 Title



Notes: Welcome to this e-learning module on Siemens Selling Introduction to Additive Manufacturing.

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1.2 Attachments

Attachments

CLICK the Attachments Tab to download resource materials for this course.

CLICK the "closed caption" option to read the the captions for this course.

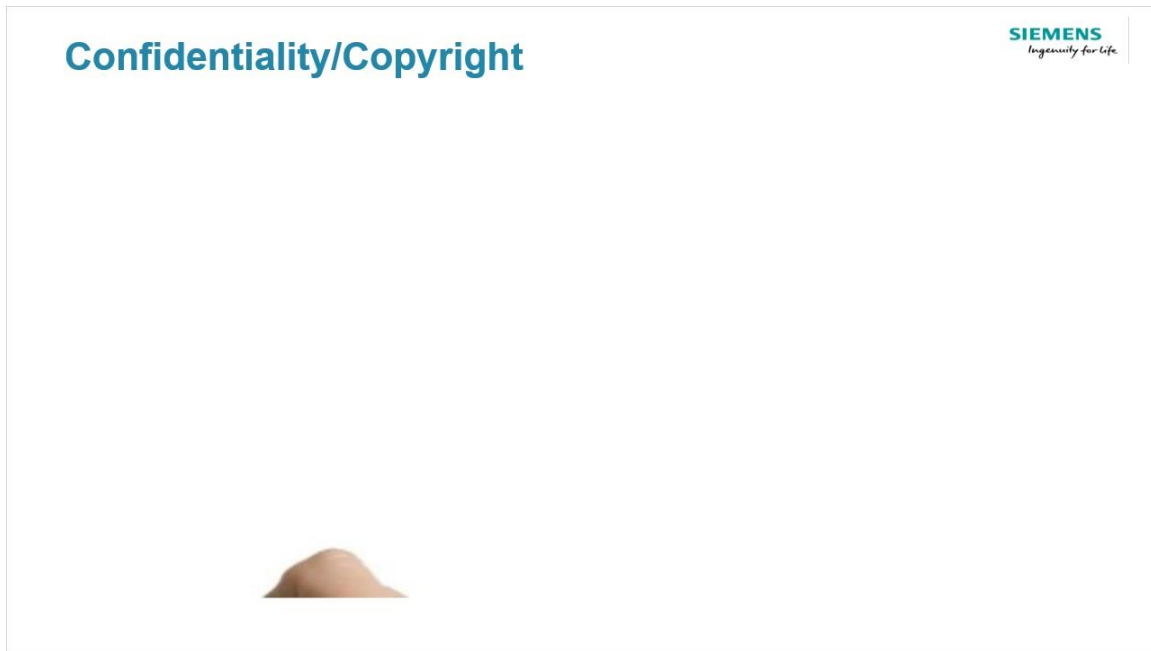


Notes: In order to download the resource materials for this course, click the attachments tab in the top left hand corner of your screen.

If you would like to read along with this course, please click the closed caption option in the bottom left hand corner of your screen.

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1.3 Copyright




Notes: Please note that all video content is proprietary and confidential to Siemens PLM Software.

Unauthorized duplication or distribution of any or all of this course is strictly prohibited.

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1.4 Target Audience

Target Audience



Anyone in Siemens curious about Siemens Additive Manufacturing Approach

Notes: This course is for anyone in Siemens that is curious about Siemens Additive Manufacturing Approach.

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1.5 Learning Objectives

Learning Objectives



By the end of this course you will be able to:

- Summarize why Additive Manufacturing should be sold
- Summarize the focus industries, target accounts and eligibility criteria
- Identify and validate opportunities for Additive Manufacturing
- Describe the TIPS for Additive Manufacturing
- Create a tailored commercial insight for Additive Manufacturing
- Summarize business case studies and success stories

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Summarize why Additive Manufacturing should be sold;

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Describe the TIPS for Additive Manufacturing;

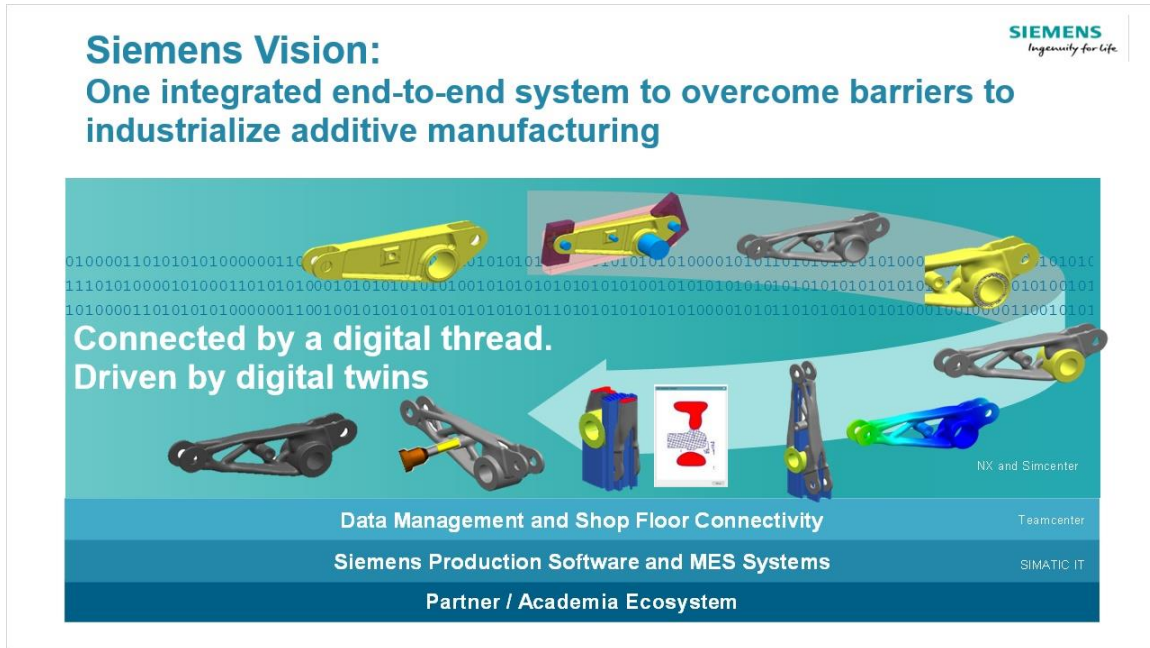
Create a tailored commercial insight for Additive Manufacturing; and

Summarize business case studies and success stories

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1.6 Siemens Vision:

One integrated end-to-end system to overcome barriers to industrialize additive manufacturing



Notes: Let's start with a quick re-cap of our Additive Manufacturing solution:

Siemens is fully committed to deliver this industrial-strength additive solution and provide our customers the complete end-to-end process.

This eliminates data conversion between each of step of the process.

We are offering a powerful set of additive tools fully integrated into NX

Our integrated software solution for product development including product design, engineering and manufacturing.

The additive design, engineering and manufacturing data and process is managed by Teamcenter and the solution is integrated and connected to our Manufacturing Operations System Simatic IT.

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1.7 Key Target Segments for Additive Manufacturing



Notes: These are the core industries relevant for Additive Manufacturing. The numbers show the respective market share for service provider revenues (yellow) as well as for software revenues (orange).

You can see that our traditional Siemens industries are great targets among them Industrial Machinery & HE, Aerospace & Defense as well as Automotive & Transport. Most of the parts that are manufactured by Additive Manufacturing 3D printing service providers go to these industries. Medical is also a quite large Additive Manufacturing market, especially for plastics. We currently have deals as well in the pipeline for the Electronics Industry and we can find customers in the Energy & Utilities Industry in which Siemens PG itself is quite strong.

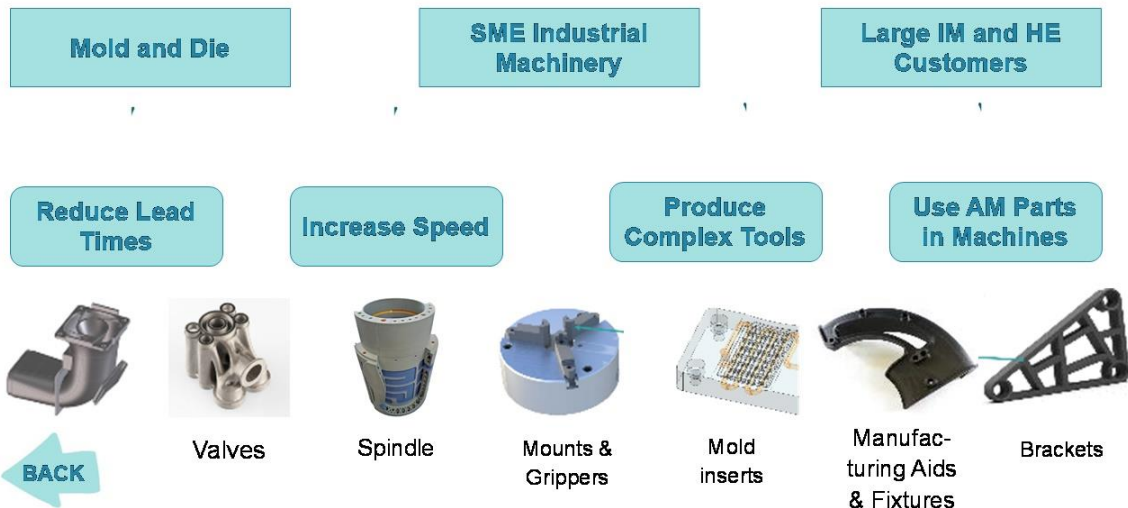
3D printing service bureaus and printing providers are a natural user of Additive Manufacturing at scale and we have a great success story there to show: Toolcraft in Germany. This industry is growing extremely fast, faster than our core industries when it comes to Additive Manufacturing.

Finally Education & Government is another attractive segment carrying out many Additive Manufacturing projects and initiatives we can benefit from.

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Industrial Machinery & HE (end Customers) (Slide Layer)

Industrial Machinery & HE (end Customers)



Notes: As briefly mentioned Industrial Machinery & HE is the largest segment when it comes to service provider revenues.

There are three main customer segments for siemens:

Mold & Die; SME Industrial Machinery companies; and Larger I.M & H.E customers.

The largest end-customer segment for us is Mold and Dies - they are already taking advantage of Additive Manufacturing for production & repair cases.

The benefits of Additive Manufacturing for these customer segments are:

A reduction in lead times and increase in parts quality - this is achieved by replacing or optimizing mold and casting;

An increase in speed and reduction in price as well as system complexity for small volume;

The production of complex tools, mounts and grippers; and

The use of Additive Manufacturing parts in machines and assembly lines.

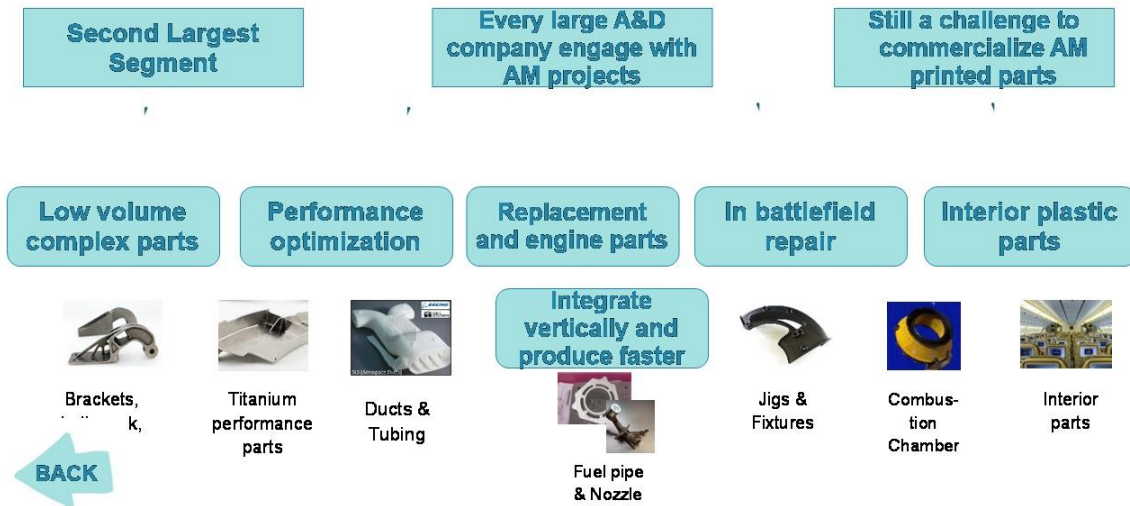
Typical example companies in this segment are:

Machine builders & Line Manufacturers, Plant and machinery construction, (CNC) Job shops and Tooling Manufacturers.

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Aerospace and Defense (Slide Layer)

Aerospace and Defense



Notes: The next core target segment is Aerospace & Defense.

This is the largest segment after industrial machinery for Additive Manufacturing for service provider revenues (18% in 2016). Every large Aerospace & Defense company engage with additive manufacturing projects for different use cases. However, Certification of materials and parts is still a big challenge to commercialize Additive Manufacturing printed parts.

Typical Use cases are:

The production of low volume and complex parts; Performance optimization of parts with new materials, light weighting and reduced material waste.

Aerospace industry already succeeded to additively manufacture some aerospace components with complex geometries, made of exotic materials such as Titanium and Inconel, which are traditionally difficult to shape without compromising their excellent (and desired) properties.

Typical companies in this segment are:

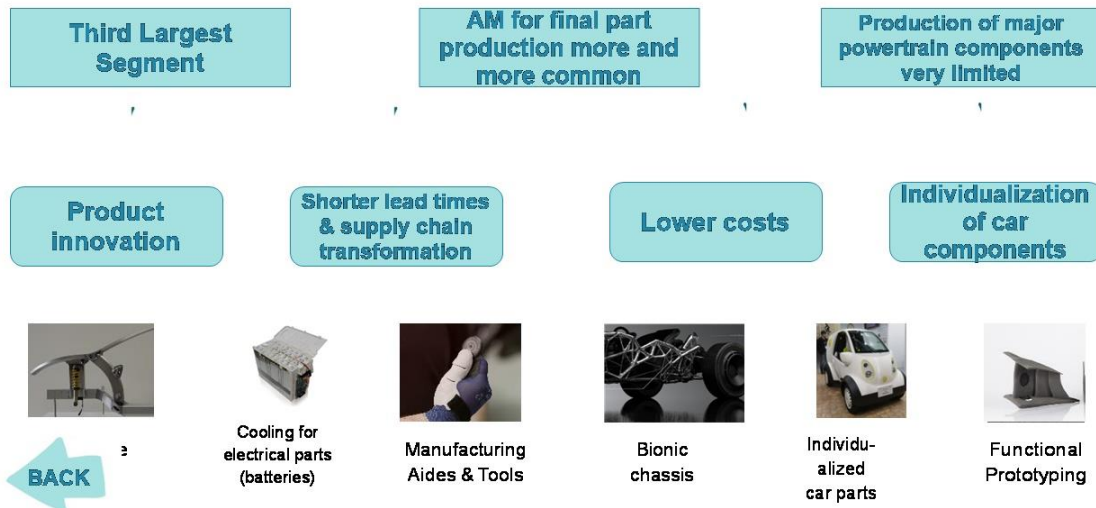
Large Aircraft, engine & component Manufacturers, Space & Defense companies; and

Federal customers e.g. Army, Navy, Air Force, Marines.

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Automotive and Transport (Slide Layer)

Automotive and Transport



Notes: Automotive & Transportation is the third largest segment for Additive Manufacturing for service provider revenues (15% in 2016). Additive Manufacturing for final part production has been slower developed but becomes more and more common. Typical application of Additive Manufacturing for functional prototyping, eliminating tooling and manufacturing aides, fixtures. Production of major powertrain components very limited due to metals integrity and repeatability.

Main use cases we see today:

Product innovation: New designs: optimizing performance of parts, Cleaner, lighter, and safer products (lattice structures, hollow structures for wiring), Multi-material printed parts with individual properties.

Highlight Examples:

bionic shaped, lightweight frames and chassis, cooling for batteries (housing) & other electronic parts for high performance racing cars, increase in cooling performance of over 100% and reduction of volume of the battery housing by half, and weight reduction by 40 %. Shorter lead times & Lower costs (reduce scrap/material).

Individualization of car components (lot size one possible).

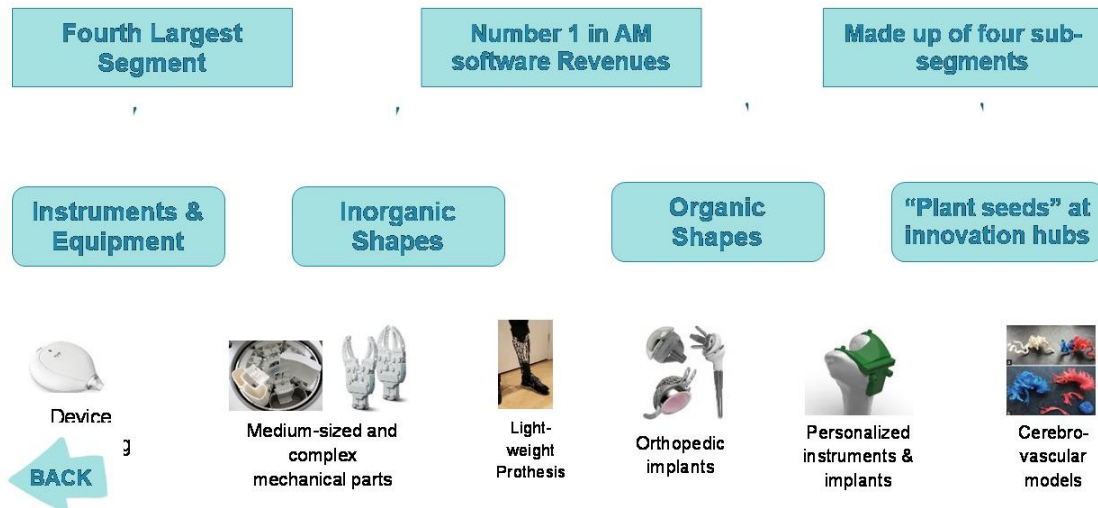
Example companies in this segment are:

Major OEMs; Tier suppliers; Automotive Startups; and Other transportation companies (Siemens Mobility).

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Medical Industry (Slide Layer)

Medical Industry



Notes: Medical is the 4th largest market regarding Additive Manufacturing service provider revenues (2016) and number 1 regarding Additive Manufacturing software revenues (2017).

Siemens Target market segments are: Medical Instrument & Device OEMs (45% market share); Orthopedics & Dental (12% market share); Cardiovascular & Neurological (13% market share); and Medical Research & Educational Institutes.

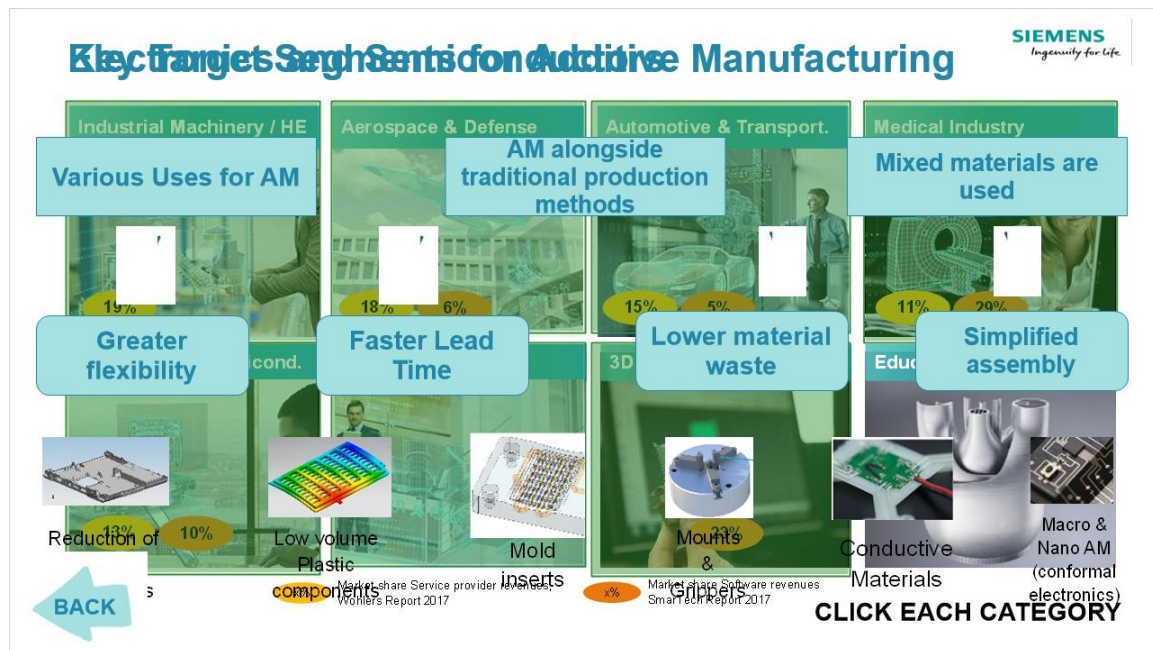
Use cases we see: Instruments & Equipment; Inorganic shapes: highly engineered, high function components; Fast, flexible, cost-effective production for niche products manufactured in small quantities; No expensive tooling or complex assembly processes for specific components with complex geometry; "On-demand" production, accepting of design modifications / variants. (e.g. Automatic cell washing system for serological testing produced with EOS Additive Manufacturing (Additive Manufacturing) technology; and Orthopedics & Dental + Cardio & Neuro, ENT, etc. Organic shapes: prosthetics, implants & surgical instruments.

benefits: Personalization, Light-weighting, complex surface structures.

Example companies in this segment are: Instrument & Equipment Manufacturers; Orthopedic & Dental; and Cardio & Neuro.

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Electronics and Semiconductors (Slide Layer)



Notes: Additive Manufacturing is used for rapid prototyping, low-volume production runs, printing complex assemblies and housing for electronics as well as for molding processes.

Large electronic service providers are offering Additive Manufacturing alongside traditional production methods.

Mixed materials are used (both polymers and metals)

Use cases & benefits within this segment are:

Greater flexibility for unit-level customization (mechanical parts, electronic & electromechanical parts);

Speed up lead time for production of plastic parts (eliminate molds or cool faster with Additive Manufacturing mold inserts);

Lower material waste and part weight (e.g. eliminating separate circuit boards, cables, and wiring); and

Simplified assembly single-build sequence for the part's exterior body as well as circuitry.

Example Companies in this segment are:

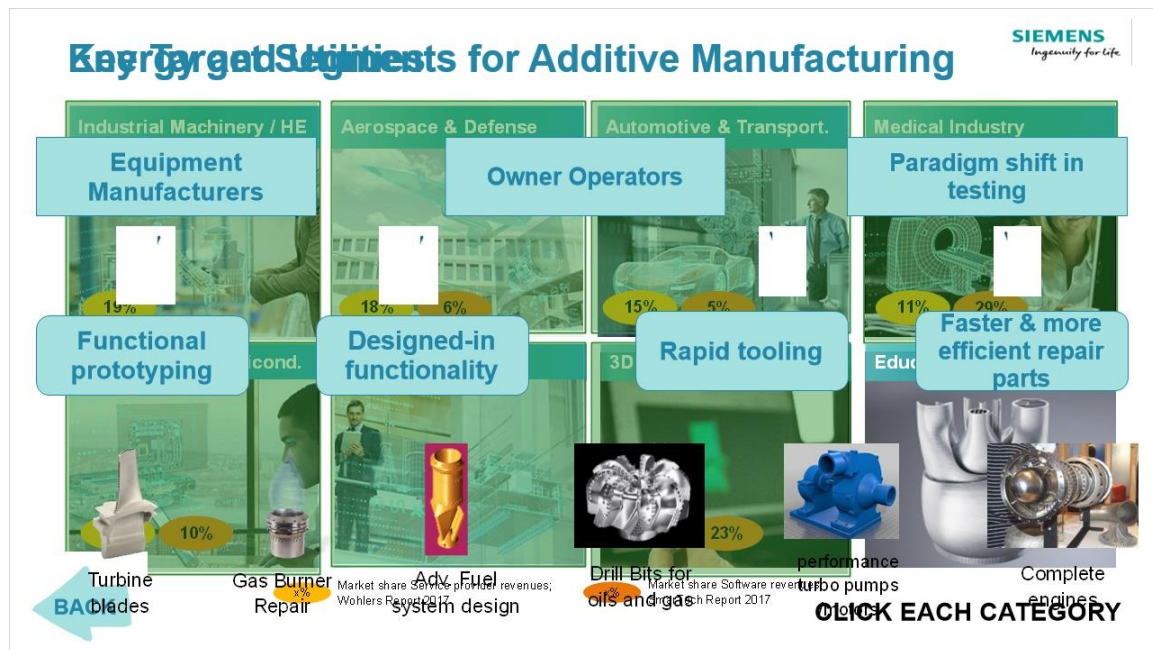
Electronic manufacturing services companies;

Consumer electronics; and

IoT companies

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Energy and Utilities (Slide Layer)



Notes: Equipment Manufacturers are more likely to embrace additive manufacturing for component parts.

Opportunities for Owner Operators to use Additive Manufacturing include replacement parts in the field either on the rig or near-shore.

Paradigm shift in testing and producing components.

Industrial implementation of SLM has successfully started but there are additional development needs which are substantial (e.g. capacities, cost, productivity, quality, line integration)

Goals in this segment are:

A reduction in lead time and cost as well as speeding up innovation and increasing performance of parts.

Functional prototyping (e.g. gas turbine blades)

Designed-in functionality (gas turbine burner tips) & performance optimized parts (adv. cooling channels)

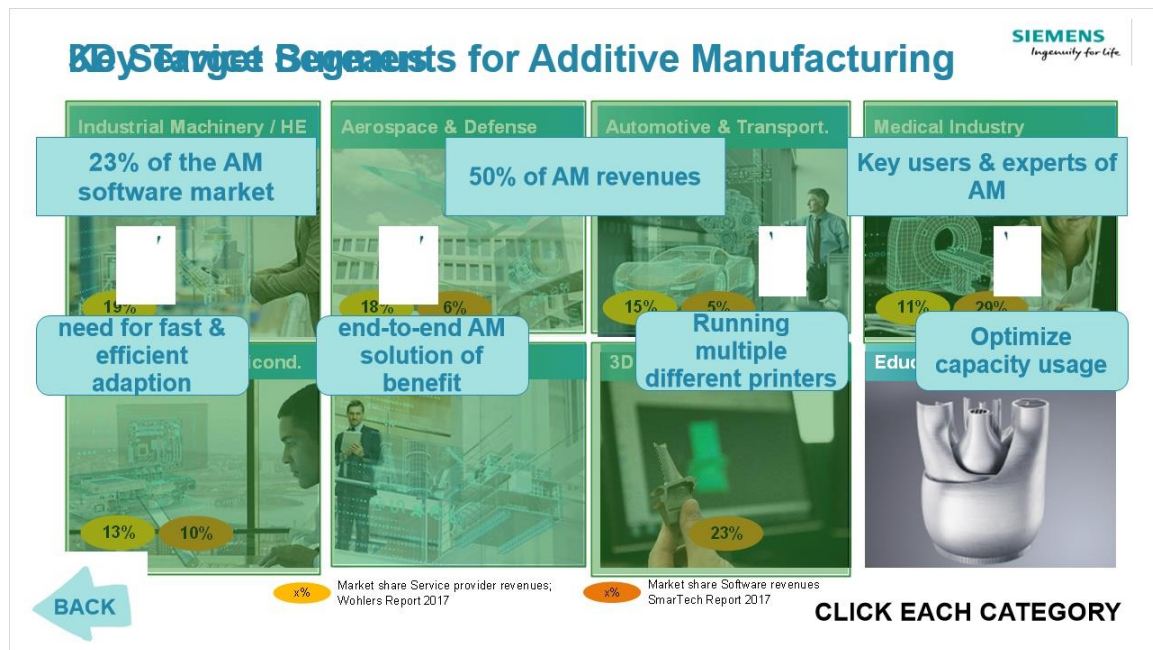
Rapid tooling (e.g. bending tools for fuel pipelines) and rapid manufacturing (e.g. burner heads)

Faster & more efficient repair parts for after market.

Example companies in this segment are: Turbine manufacturers; Oil and gas companies; (Oil field) Service companies; and Government departments

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3D Service Bureaus (Slide Layer)



Notes: 3D Service Bureaus are a top customer target group accounting for 23% of the Additive Manufacturing software market in 2017 and over 50% of Additive Manufacturing revenues in 2016.

They are Key users of & experts in Additive Manufacturing.

Most of the companies provide design & engineering services as well as print on demand for various applications.

Business Challenges in this segment are:

Many design changes coming from their customers, this means that there is a need for fast & efficient adaption

There is also a need for efficient and effective Additive Manufacturing processes, therefore an end-to-end Additive Manufacturing solution is of benefit to them. They are often running multiple different printers, this means that one integrated solution for different technologies is beneficial to them. They need to optimize capacity usage of printers. For this reason M.O.M of interest to them.

Example companies in this segment are:


High-end Additive Manufacturing service providers such as Toolcraft and Materials Solutions (a Siemens Company);

Full service providers including Design & Application Engineering, Materials & Component Production (Oerlikon); and Company internal 3D printing shops & factories.

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1.8 Rapidly Growing MOM Market Segment

Rapidly Growing MOM Market Segment



Global MOM Software License Market for Additive Manufacturing

<p>Low adoption rate of AM in End-User Industries today (2% in 2016)</p> <p>The main driver for the MOM growth in AM will be the increase in adoption of AM by End-User industries</p>	<p>The Value and Volume CAGR are very similar (respectively 29% and 28%)</p> <p>Increases in license prices are not expected to be key drivers for MOM growth in AM in the next 5 years</p>
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Notes: M.O.M is the combination of our manufacturing execution capabilities as well as equality capabilities. There is significant opportunity in this space and we do have a lot of competition.

The main end-user target industries are Aerospace, Consumer Electronics, Automotive and Healthcare.

Currently, there is a low adoption rate of Additive Manufacturing in end-user industries. The growth for M.O.M in Additive Manufacturing will be driven by the increase in adoption of Additive Manufacturing by the end user.

The volume of this market is set to increase rapidly over the next five years.

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1.9 Rapidly Growing MOM Market Segment

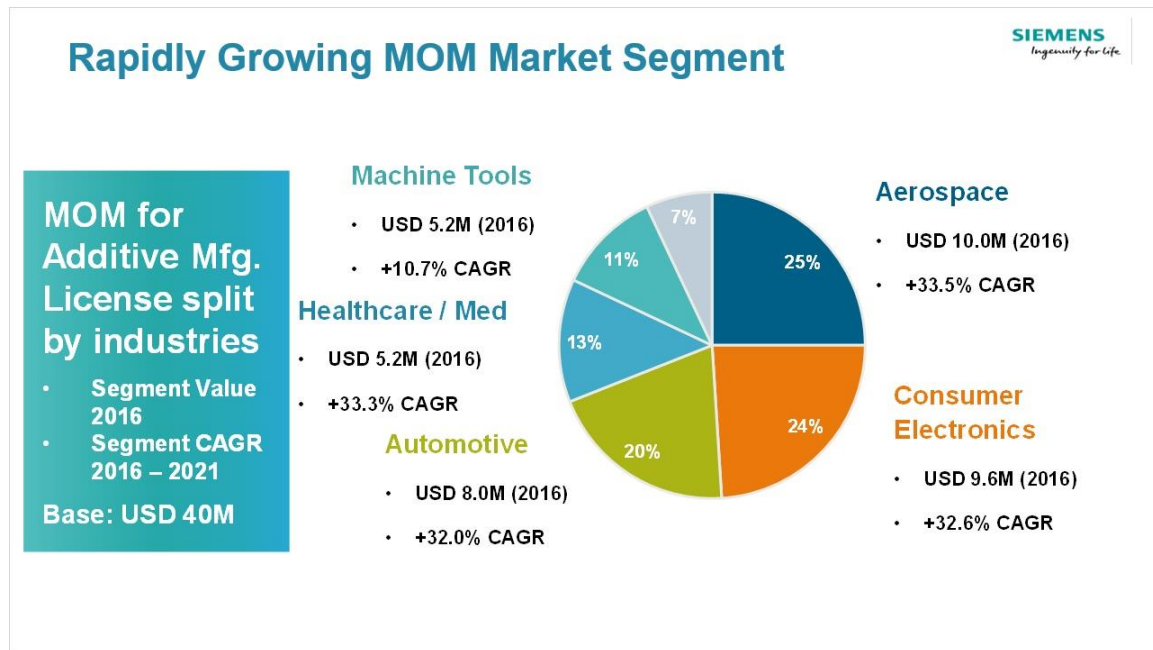


Notes: As you can see the value of this market is currently only \$40 million. This is forecast to be as much as \$146 million by 2021.

Although Additive Manufacturing is new, customers are still thinking ahead and an increase in the use of Additive Manufacturing will trigger an increase in the use of licenses.

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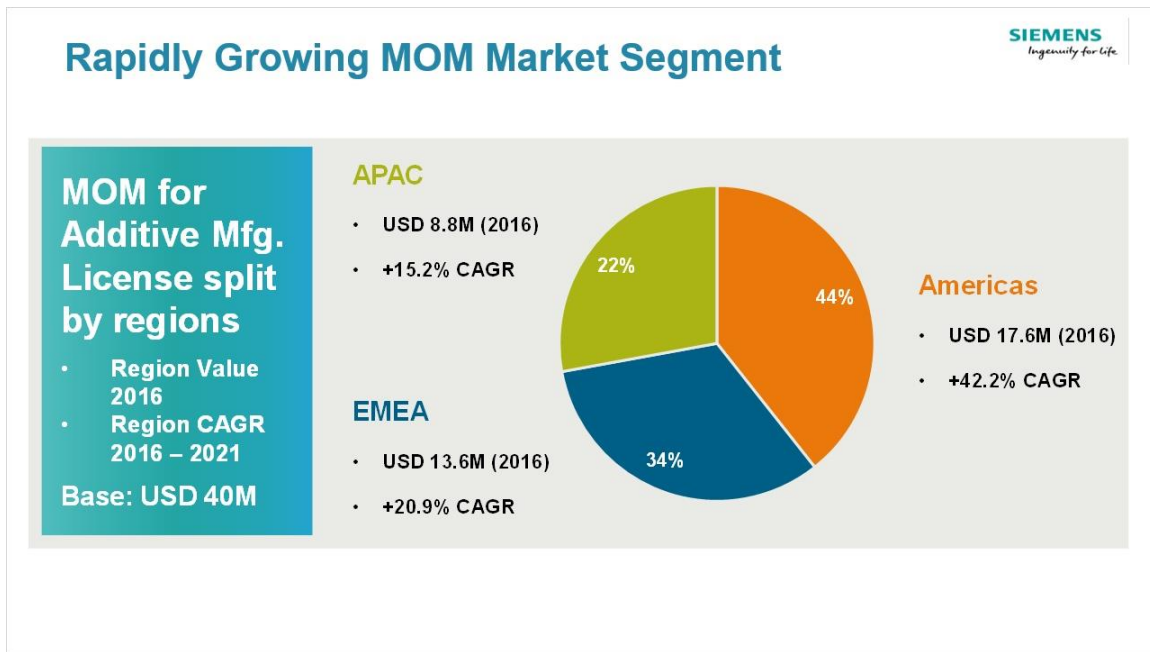
1.10 Rapidly Growing MOM Market Segment



Notes: If we look at M.O.M licenses by industries we can see that the largest industry is Aerospace which covers 25% of the market, closely followed by Consumer electronics which covers 24% of the market.

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1.11 Rapidly Growing MOM Market Segment

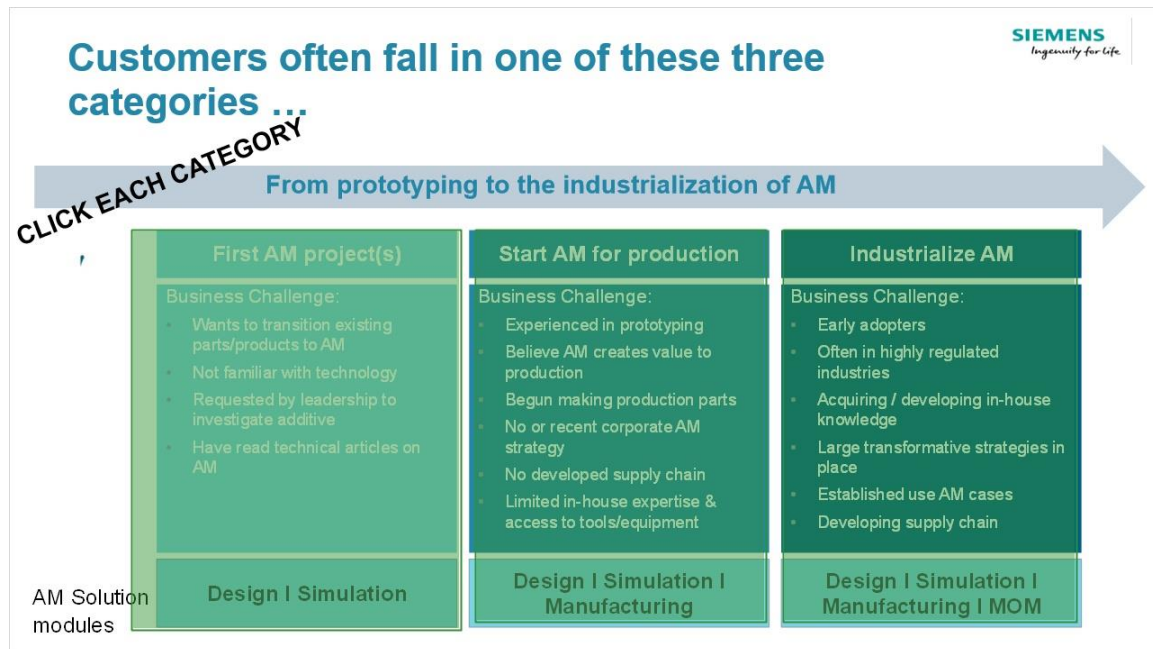


Notes: Looking at the license split by region we can see that the Americas make up for nearly half of the M.O.M licenses.

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1.12 Customers often fall in one of these three

categories ...



Notes: When we look at the customers in many of these industries, they tend to belong to one of these 3 categories - moving from pure AM prototyping to the industrialization of Additive Manufacturing:

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First Additive Manufacturing Projects



Notes: The First category:

Want to try out Additive Manufacturing for existing parts/products;

Not familiar with Additive Manufacturing and no internal know how;

no Additive Manufacturing production yet, just design.

For these customers you can easily use the executive presentation, try to find first suited existing parts that can be optimized and produced with Additive Manufacturing.

Our consulting or engineering service providers can maybe of support and be integrated into the project.

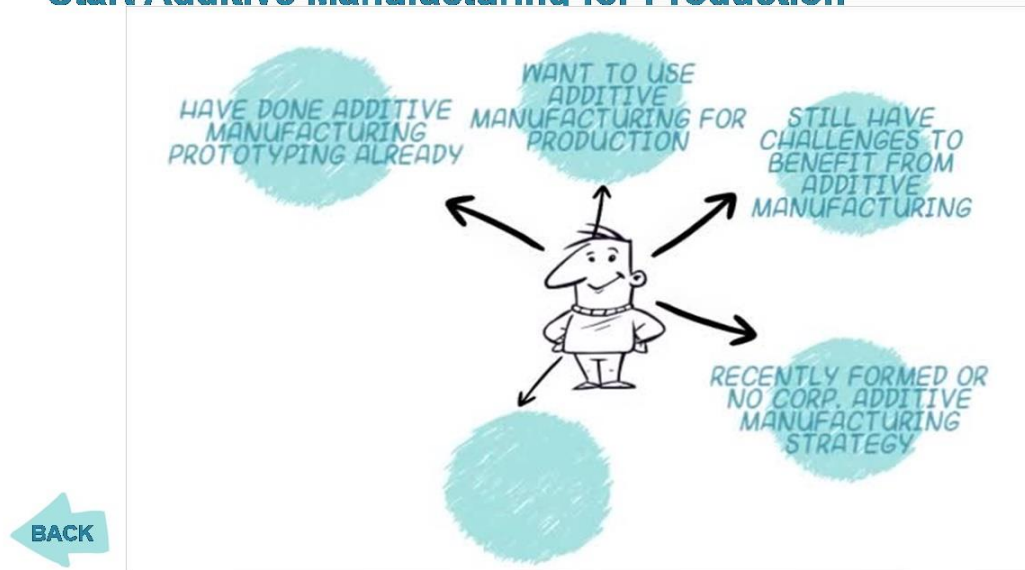
As there is no production yet, you can sell our Design and Simulation modules for Additive Manufacturing.

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Start Additive Manufacturing for Production (Slide Layer)

Start Additive Manufacturing for Production

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Notes: The Second category:

have done Additive Manufacturing prototyping already; want now to use Additive Manufacturing for production; still have challenges to benefit from Additive Manufacturing (e.g. quality / process stability); Recently formed or no corp. Additive Manufacturing strategy; however, no developed supply chain and Limited in-house expertise / tools; few Additive Manufacturing machines

You will need a more detailed presentation and have to find you the use cases the customer already has, in which status of integration of Additive Manufacturing the customer is and where are his challenges. The customer has already some software solutions for Aditive Manufacturing, so also know well our competitors and the Siemens differentiators. For a first project select the most promising use case and application to start with.

You can sell CAD, CAE and CAM modules there.

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Industrialize Additive Manufacturing



Notes: The Third category:

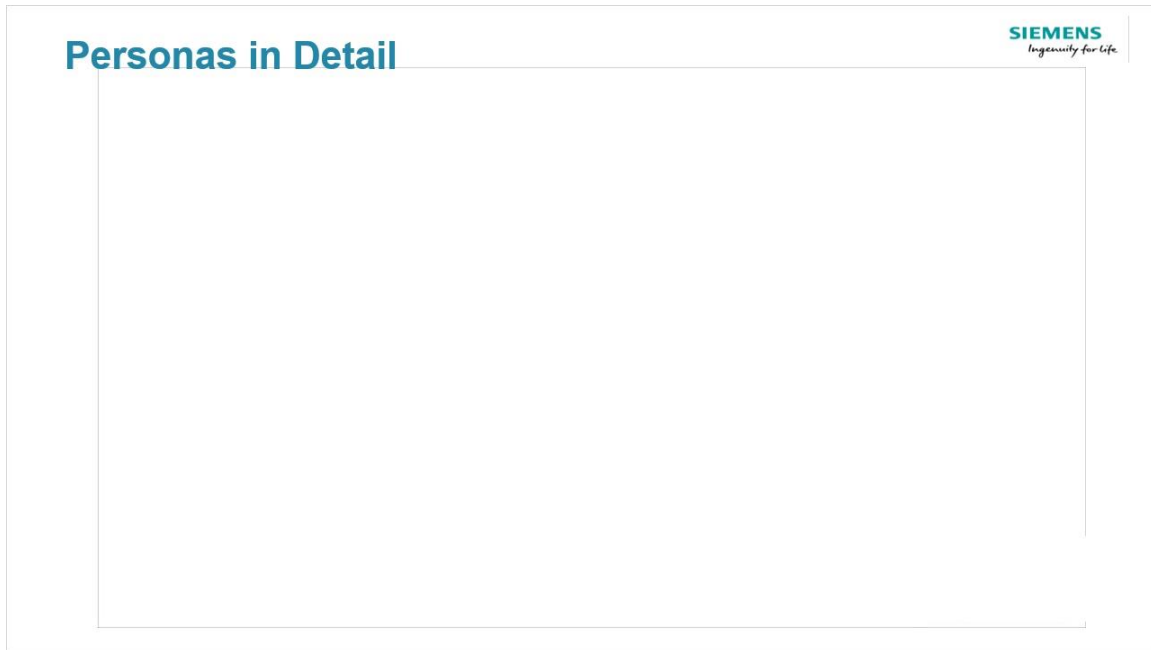
Early adopters/head start, Sometimes highly regulated industries, Acquiring or developing in-house knowledge, Large transformative strategy in place, Established target use cases for Additive Manufacturing, Developed supply chain; different and several Additive Manufacturing machines

These customers have very specific questions and challenges. You need a well experienced team for a workshop, demo or presentation at the customer which has to cover the end-to-end Additive Manufacturing solution. Often these projects include resource intensive evolutions. Please don't hesitate to include us in such opportunities to help you win the deal.

As the customer has more machines also MOM modules are very relevant.

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1.13 Personas in Detail



Notes: There are several different individual personas that will use Additive Manufacturing.

The first of these is the Designer/Analyst.

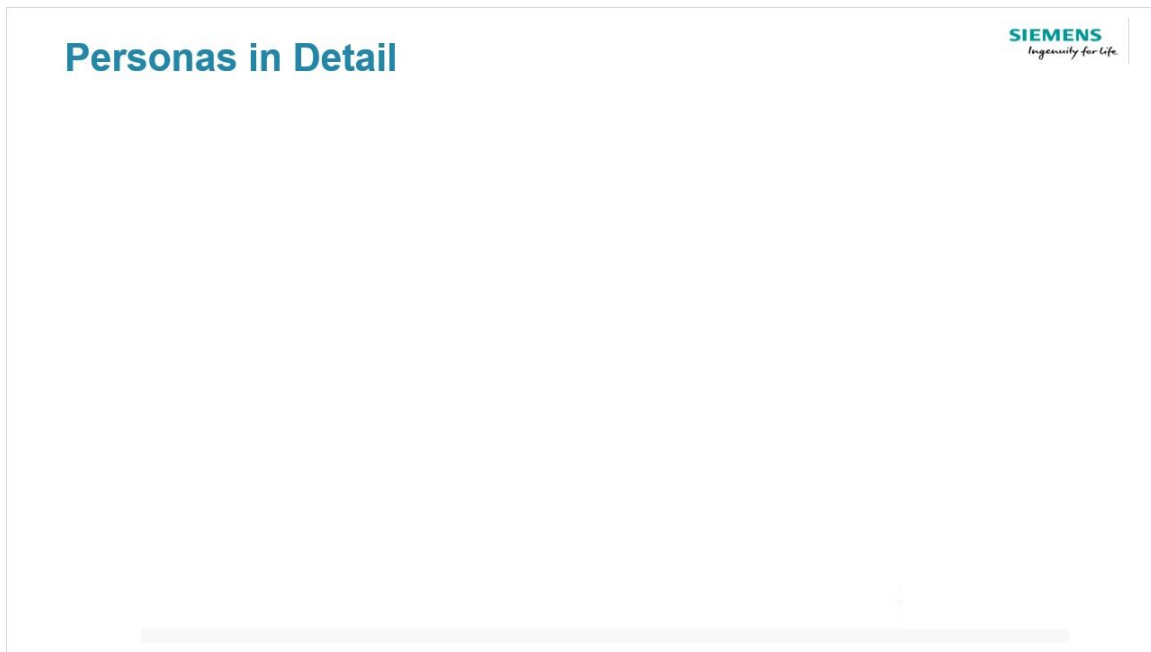
They will need to optimize performance and reduce design errors. In order to do this they will need to encourage the acquisition of the best tools available as well as ensuring that these tools are used in the most effective manner.

The designer analyst will need to know that they can get their design tasks done efficiently and quickly. There may be some convincing to do as they will often prefer certain systems and have a dislike for others. For this reason it is essential that they are convinced that adopting any new system will be beneficial to them.

You will find Designers/Analysts in all companies across all of the target market segments.

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1.14 Personas in Detail



Notes: The second persona is the Operator.

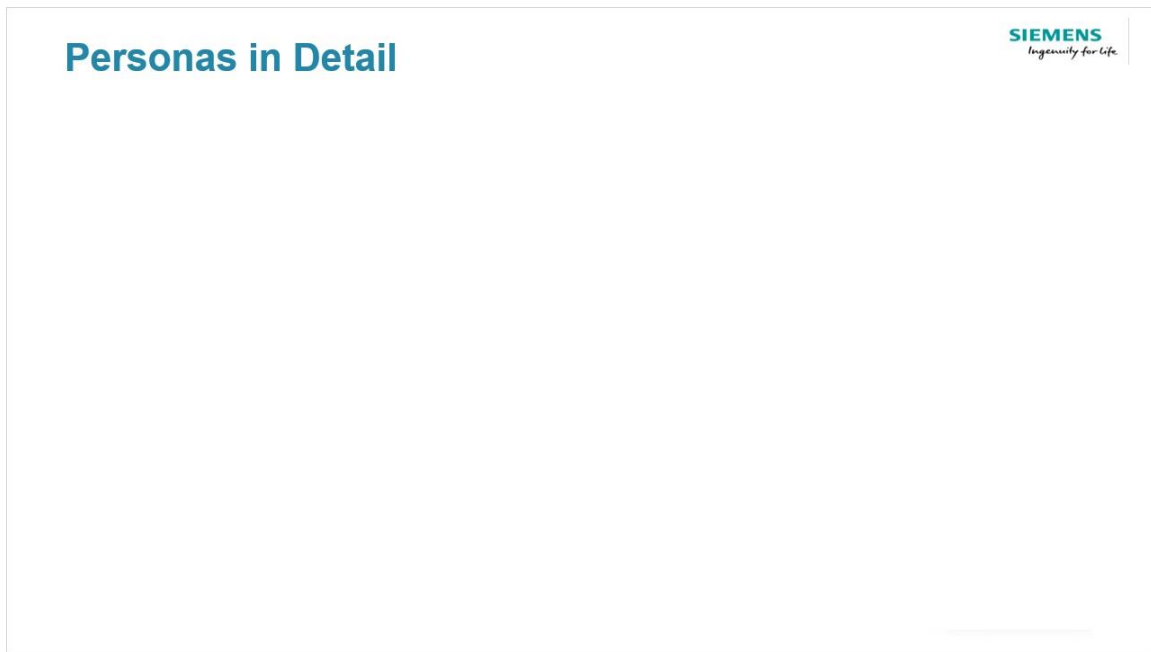
They will need to turn out a quality product with as little downtime as possible. They are often technically orientated and run the 3D printer to produce parts. The Operators believe that the Additive Manufacturing process can be optimized by improving the overall workflow. This can be done by optimizing the individual phases of the manufacturing process.

They will need to maximize their machine efficiency, minimize material usage and consistently create usable, high quality parts efficiently. They may be convinced that a new system will be of benefit to them by seeing our tools in action or alternatively by seeing our success stories with other companies.

You will find Operators in the larger target market sectors such as Aerospace and Automotive as well as in Machinery. Other industries, such as medical and Energy, will often outsource this role.

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1.15 Personas in Detail



Notes: Another persona is the manager.

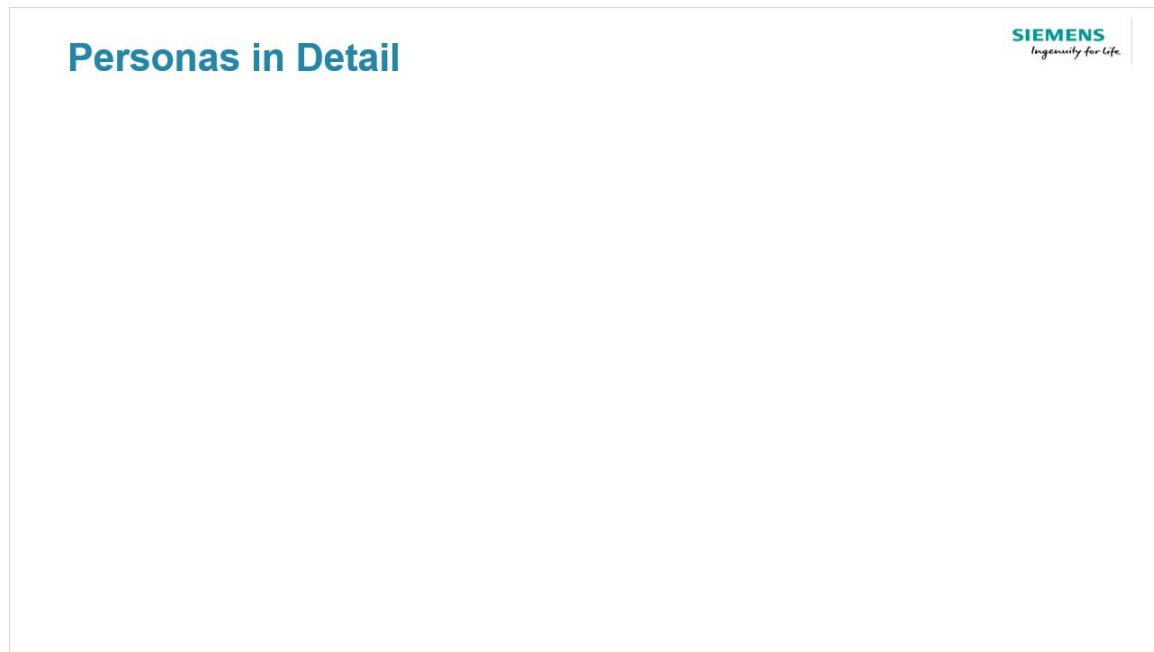
The Manager believes that profitability comes from efficiency and that efficiency comes from having the correct tools - including hardware, software and people. They are often technically oriented but also must pay attention to the commercial side of things. They will rely on subordinates to provide data about which solutions should be considered.

They need to know that their people can get their jobs done both efficiently and to a high quality standard. They will also focus on maximizing product performance as well as reducing waste. The Manager will often follow the lead of their more technical subordinates, for example Designers, Analysts or Operators.

You will find managers across all of the target market sectors.

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1.16 Personas in Detail



Notes: The Influencer can be either the Designer/Analyst or the Operator.

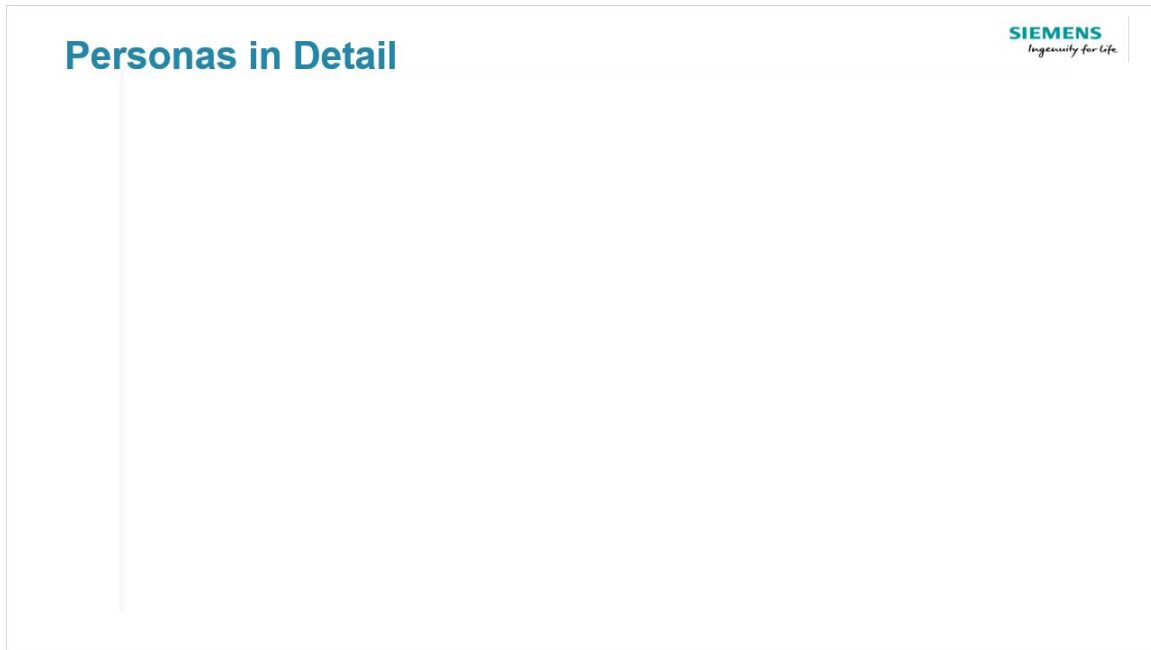
They are looking for technology that can help to maximize efficiency as well as reduce design errors. They will evaluate technology and business options in order to provide accurate information to the Managers who are not as technical in nature.

The Influencer helps to maximize profitability by influencing the Managers to acquire the best tools available. They understand the details of the software landscape and the ability of those tools to interface with their machines. For this reason, they must be convinced that the tools will work for their situation, their processes and their machines.

You will find Influencers across all of the larger target market sectors, for example in Additive Manufacturing work groups or the Centre of Competence.

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1.17 Personas in Detail



Notes: The Strategist is the final Persona.

They prefer to work with large, well established companies because of a belief that this gets them better service and results. If they hear from their subordinates that the technology lags behind, they may be more willing to try their hand with a smaller, more nimble provider.

The Strategist needs to increase revenue and profits. They will do this by winning new deals and expanding current projects. This helps them to maintain their competitive edge. They will look at the big, long-term picture and will be convinced by wider value statements and Siemens' Additive Manufacturing vision.

You will find the strategist as an upper-level executive. They will interact with companies from many industries including partners and suppliers.

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1.18 Qualifying Questions

Qualifying Questions

Understand the customer's current situation



What is the customer's level of AM maturity?

What AM use case is driving the customer?

What application(s) are currently used to design, simulate and print parts?

Notes: In order to understand the customer's current situation, you will need to ask the following questions:

What is the customer's level of Additive Manufacturing Maturity?

This includes: Is there a formal Additive Manufacturing organization or is it hidden within engineering or at a production facility? How many Additive Manufacturing Printers do they have? And what type of printer are they?

How are they using Additive Manufacturing? Prototyping, Product Innovation/Redesign and/or Production?

What is their long-term strategy for Additive Manufacturing? And Does the customer have both conventional and Additive Manufacturing within the same facility?

What Additive Manufacturing use case is driving the customer?

This includes: Product optimization as a competitive advantage? Reduction in manufacturing costs and delivery times?

What application(s) are currently used to design, simulate and print parts?

This includes: Are there problems with these tools? Features/Functions, data conversions, associativity?

How efficient is their Additive Manufacturing process in using their current software tools?


How experienced are they with Additive Manufacturing software?


What are they using for CAM? Are they interested in consolidated their CAM and Additive Manufacturing tools?

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1.19 Demand Generation and the Buyer's Journey Map

Demand Generation and the Buyer's Journey Map







Designer/Analyst




Operator




Manager



Influencer



Strategist



CLICK EACH PERSONA

Notes: Here we can see the break down of the collateral stack or the assets that we have in order to help your customers through the buyers journey depending on the persona.

Click on each of the personas to see the break down for each one.

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Manufacturing Engineers (Slide Layer)

Manufacturing Engineers



Persona	Engage	Educate	Explore	Select	BUY	Initiate
	Asset	Asset	Asset	Asset		Asset
Manufacturing Engineers / Shop Floor Operators	2017 Analyst Event Video (checking with HP)	Blog Posts	End-to-End AM On-demand Webinar (1 of 2)	Additive End-to-End Seminar Kit		GSI BOM content - Sales enablement kit
	2016 Analyst Event Video (end-to-end demo)	MFG for AM Blog Posts	End-to-End AM Global Live Webinar	Automotive Use Case (Blog + Video)		
	Spark Video	End-to-end AM Blog Post	End-to-End AM On-demand Webinar (2 of 2)	Medical Use Case (Blog + Video)		
	General AM Infographic		MFG for AM Global Live Webinar	Aerospace & Defense Use Case (Blog + Video)		
	AM Landing Webpage		MFG for AM On-demand Webinar	Industrial Machinery Use Case (Blog + Video)		
	AM Imagery		End-to-end video	Energy Use Case (Blog + Video)		



Notes: Depending on who you're working with, the assets that you use and the conversations that you have will differ. If you are working more with the engineers in a less formal environment, you can talk to these people to get their decision on products. These tend to be more technically minded and will understand how the software will integrate with their processes.

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Designers/Analysts (Slide Layer)

Designers/Analysts



Persona	Engage	Educate	Explore	Select	BUY	Initiate
	Asset	Asset	Asset	Asset		Asset
Designers / Analysts	2017 Analyst Event Video (checking with HP)	TechClarity Paper	End-to-end video	Additive End-to-End Seminar Kit		GSI BOM content - Sales enablement kit
	2016 Analyst Event Video (end-to-end demo)	Blog Posts	TopOpt + Convergent Videos	Automotive Use Case (Blog + Video)		
	Spark Video	End-to-end AM Blog Post	Checkers & Lattice videos	Medical Use Case (Blog + Video)		
	General AM Infographic	Lifecycle Insights e-book		Aerospace & Defense Use Case (Blog + Video)		
				Industrial Machinery Use Case (Blog + Video)		
	AM Landing Webpage	CAE Whitepaper		Energy Use Case (Blog + Video)		
	Exhibition Kit - Industrialize Additive Manufacturing	General NX AM Fact Sheet				
	AM Imagery	Design for AM Blog Posts				

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Notes: As you can see there are various different assets that we can provide to our customers:

These include:

Blog posts;

Case studies;

Videos;

E-books / Whitepapers;

Fact sheet; and

Banner Ads

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Strategist (Slide Layer)

Strategist



Persona	Engage	Educate	Explore	Select	BUY	Initiate
	Asset	Asset	Asset	Asset		Asset
Strategist	2017 Analyst Event Video (checking with HP)	CIMData E-book	Design to Print for HP MJF On-demand Webinar	Additive End-to-End Seminar Kit		GSI BOM content - Sales enablement kit
	2016 Analyst Event Video (end-to-end demo)	End-to-end AM Blog Post	Toolcraft Video			
	Spark Video	Identify3D AM Security Whitepaper	Toolcraft Success Story PDF			
	General AM Infographic					
	AM Landing Webpage					
	Exhibition Kit - Industrialize Additive Manufacturing					
	AM Imagery					



Notes: Conversations with Strategists will be very formal and will often involve the strategy being formalizing Additive Manufacturing. Remember, a large amount of their technical knowledge will have come from the Influencers.

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Influencer (Slide Layer)

Influencer

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Persona	Engage	Educate	Explore	Select	BUY	Initiate
	Asset	Asset	Asset	Asset		Asset
Influencer (Ops leader, Workgroup, COC leaders)	2017 Analyst Event Video (checking with HP)	CIMData E-book	End-to-End AM On-demand Webinar (1 of 2)	Additive End-to-End Seminar Kit		GSI BOM content - Sales enablement kit
	2016 Analyst Event Video (end-to-end demo)	MFG for AM Blog Posts	End-to-End AM Global Live Webinar	Automotive Use Case (Blog + Video)		
	Spark Video	End-to-end AM Blog Post	End-to-End AM On-demand Webinar (2 of 2)	Medical Use Case (Blog + Video)		
	General AM Infographic	Design for AM Blog Post	Design for AM Global Live Webinar	Aerospace & Defense Use Case (Blog + Video)		
	AM Landing Webpage	Identify3D AM Security Whitepaper	Design for AM On-demand Webinar	Industrial Machinery Use Case (Blog + Video)		
	Exhibition Kit - Industrialize Additive Manufacturing	CAE Whitepaper	MFG for AM Global Live Webinar	Energy Use Case (Blog + Video)		
	AM Imagery	General NX AM Fact Sheet	MFG for AM On-demand Webinar			
			Design to Print for HP MJF On-demand Webinar			
			Toolcraft Video			
			Toolcraft Success Story PDF			

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Notes: Influencers tend to be technically minded, so again these conversations will be less formal and more around how the software can work with the machines that they are already using.

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Manager (Slide Layer)

Manager



Persona	Engage	Educate	Explore	Select	BUY	Initiate
	Asset	Asset	Asset	Asset		Asset
Manager (Program manager, Mfg. head, Product dev. head)	2017 Analyst Event Video (checking with HP)	TechClarity Paper	End-to-End AM On-demand Webinar (1 of 2)	Additive End-to-End Seminar Kit		GSI BOM content - Sales enablement kit
	2016 Analyst Event Video (end-to-end demo)	Blog Posts	End-to-End AM Global Live Webinar	Automotive Use Case (Blog + Video)		
	Spark Video	CIMData E-book	End-to-End AM On-demand Webinar (2 of 2)	Medical Use Case (Blog + Video)		
	General AM Infographic	MFG for AM Blog Posts	Design for AM Global Live Webinar	Aerospace & Defense Use Case (Blog + Video)		
	AM Landing Webpage	End-to-end AM Blog Post	Design for AM On-demand Webinar	Industrial Machinery Use Case (Blog + Video)		
	Exhibition Kit - Industrialize Additive Manufacturing	Design for AM Blog Post	MFG for AM Global Live Webinar	Energy Use Case (Blog + Video)		
	AM Imagery	Identify3D AM Security Whitepaper	MFG for AM On-demand Webinar			
			Design to Print for HP MJF On-demand Webinar			
			Toolcraft Video			
			Toolcraft Success Story PDF			



Notes: If you are in a more formalized environment with Managers, the conversation will more likely be around establishing the strategy for Additive Manufacturing. For that reason there are a lot of content examples on salescenter that you can look to for more in depth information on this kind of conversation.

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1.20 Additive Manufacturing Trends, Implications,

Possibilities and Solutions

**Additive Manufacturing Trends, Implications, Possibilities and Solutions**

-  **Industrialization of AM**
-  **Increasing performance requirements**
-  **Cost pressure**
-  **Volatile demand & short delivery periods**
-  **Faster Innovation cycles & higher GTM speed**

Notes: There are five key trends in Additive Manufacturing:

Industrialization of Additive Manufacturing;

Increasing performance requirements;

Cost & Time pressure;

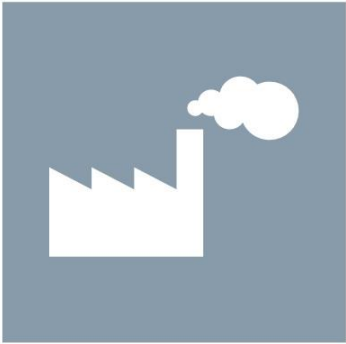
Volatile demand & short delivery periods; and

Faster Innovation cycles & higher Go To Market speed

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1.21 Industrialization of AM

Industrialization of AM



- High flexibility & automation
- High validation of processes & traceability

Possibilities

- Professionalize and integrate AM into existing production

Solutions

- Integrated end-to-end AM engineering & mfg solution

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Notes: The industrialization of Additive Manufacturing:

Customers want to use Additive Manufacturing for real production and this requires high flexibility and automation in production, as well as validation of processes and traceability.


It also means often having to use Additive Manufacturing alongside traditional production technologies and integrate Additive Manufacturing fully into existing production environments.

This is only possible if they use an end-to-end engineering and manufacturing solution for Additive Manufacturing as well as connecting it to existing software systems.


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1.22 Increasing performance requirements

Increasing performance requirements



- Implications**
 - Need for optimization of components and subsystems
- Possibilities**
 - Generative design
 - Light-weight structures
 - Tailored AM materials
- Solutions**
 - Support designing with engineering performance as the baseline




Notes: The performance requirements for parts and products are rapidly increasing and Additive Manufacturing opens new possibilities. With light-weight structures, complex, bionic shapes and new materials.


Designers can optimize their parts for performance with Additive Manufacturing.

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1.23 Cost Pressure

Cost Pressure





Implications

- Special/costly processes and tools needed

Possibilities

- Consolidation & simplification of mfg. processes

Solutions

- Digital Twin to analyze & optimize new mfg. processes
- Simplify components & assemblies through AM

Notes: Cost & Time pressure:


Additive Manufacturing outperforms conventional production technologies in lead time and cost for e.g. complex tools, parts and assemblies in lower volumes.

However, to fully realize these advantages customers need to have a digital twin of their Additive Manufacturing parts, engineering and manufacturing processes in order to be able to optimize and analyze them. E.g. increase machine throughput by optimizing the packing of parts in the build chamber.

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1.24 Volatile demand & short delivery periods

Volatile demand & short delivery periods



Implications


- Over-production of components and costly inventory

Possibilities

- Inventory reduction through print-on-demand, print everywhere

Solutions

- Use of global printer network and services based on AM technologies



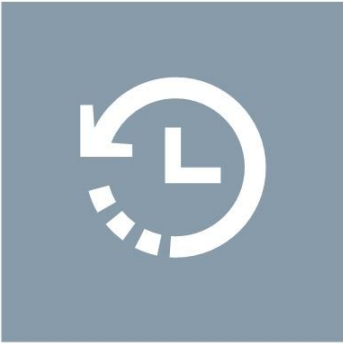
Notes: Volatile demand & short delivery periods:

Here there is the possibility to reduce stock by using print on demand or print everywhere. This will put an end to the over-production of costly components which will in turn cause a reduction in costs.

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1.25 Faster Innovation cycles & higher GTM speed

Faster Innovation cycles & higher GTM speed



Implications


- Need to shorten GTM cycles in order to stay competitive;
- Option to integrate vertically & reduce supplier dependences

Possibilities

- No time-consuming tooling, mold manufacturing and/or assembly
- Vertical integration/internalization of components production

Solutions

- Replace traditional manufacturing technologies with AM to accelerate time from Design to Delivery



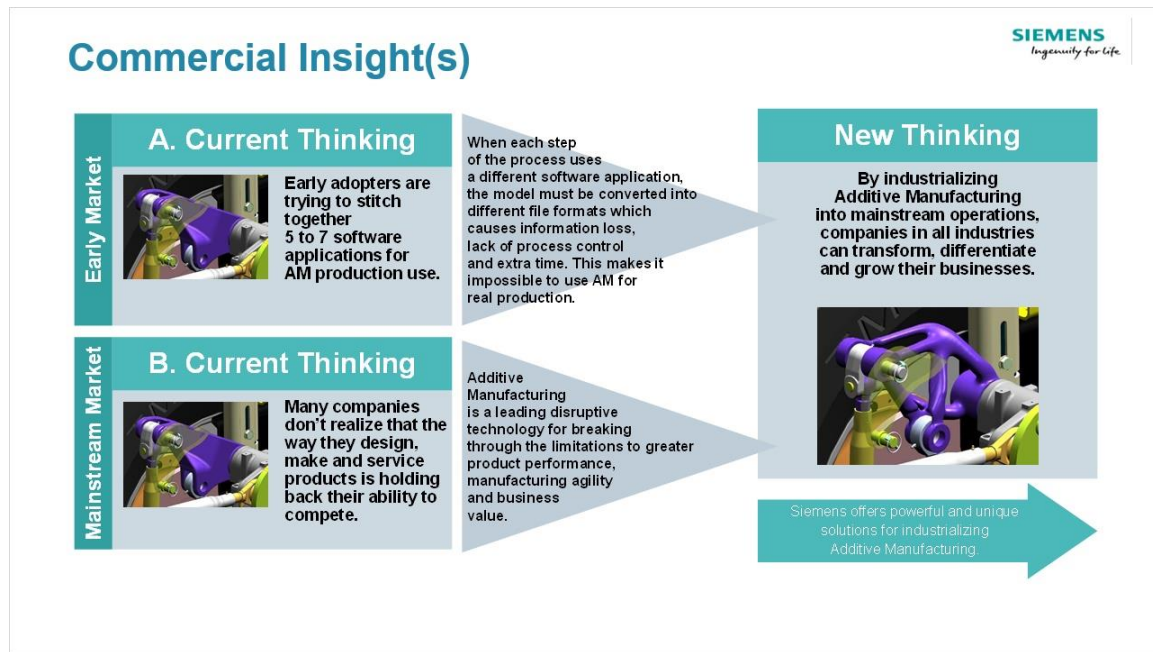
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Notes: Faster Innovation Cycles and Higher Go to Market Speed.

Here there is the possibility of vertical integration of components production and no time consuming tooling.

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1.26 Commercial Insight(s)



Notes: There are two main mind sets when it comes to Additive Manufacturing:

1. The Early adopters; and
2. The Mainstream Market

The early adopters are trying to stitch together between 5 and 7 different software applications in order to experiment with Additive Manufacturing for production use. The problem with this is that for each process step they have to convert their model into different file formats. This leads to information loss, lack of control, additional time and lack of traceability. All of these issues are what is stopping the early adopters from being able to use Additive Manufacturing in their mainstream production. We need to change their thinking around Additive Manufacturing, leading them to think about industrializing Additive Manufacturing in order for them to transform and grow their business. This is where we need to introduce our end-to end product.

Within the mainstream market there are lots of companies that do not realize that the way in which they are designing, making and servicing their products is what is holding them back.

Additive Manufacturing is one of the technologies that will help them to break through the limitations of their existing product performance, manufacturing agility and their ultimate value to their customers.

Again, we need to shift their thinking into industrializing Additive Manufacturing in order to bring into the mainstream of production. This will allow them to compete more effectively.

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1.27 Best Case Studies and Success Stories

**Best Case Studies and Success Stories**

Aerospace & Defense

Business challenges	Keys to success
<ul style="list-style-type: none">• Recently formalized a new Additive organization• Want to be an early adopter for additive• Current process too cumbersome with present software tools• Looking for a solution partner with an industrialized approach	<ul style="list-style-type: none">• Liked our approach to additive by including OEM focus for controls as well as MOM, gaining their confidence• Ability to grow with their future needs

Solution: NX for Additive



Notes: United Technologies wanted to be an early adopter of Additive Manufacturing as their current processes are too cumbersome. They were specifically looking for a solution partner with an industrialized approach.


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1.28 Best Case Studies and Success Stories

Best Case Studies and Success Stories

Automotive and Transportation

Business challenges	Keys to success
<ul style="list-style-type: none">• Need to be more responsive to customer one-off orders while increasing profitability• Ability to expand into other industries, such as A&D• Enhance their current capabilities in part manufacturing	<ul style="list-style-type: none">• Liked our approach to additive by including OEM focus for controls as well as MOM, gaining their confidence• Ability to grow with their future needs
<p>Solution: NX for Additive (Trial licenses) Future: NX CAM, Shop Floor Connect, ME</p>	





Notes: The initial conversation with Roush was not just focused on Additive Manufacturing, but also included machinery parts and how to get the programmers to the shop floor.

Roush believed that Siemens had the right solution for Additive Manufacturing, but due to Siemens other capabilities for machinery, part planning and MES the scope of the sale was expanded.

Do not just limit your conversations with customers to Additive Manufacturing as this sits hand in hand with machinery etc.

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1.29 Best Case Studies and Success Stories

Best Case Studies and Success Stories

3D Printing Bureau

Business challenges	Keys to success
<ul style="list-style-type: none">• Early adopters to additive manufacturing• Many tests required with multiple software solutions• Potential loss of traceability during multistep process• Chance for errors and loss of time with required data translations <p>Solution: NX for Additive Manufacturing</p>	<ul style="list-style-type: none">• Siemens' NX additive manufacturing solution enables toolcraft to perform all the functions in their process chain• Consolidate the process for customers that request traceability <p>Results</p> <ul style="list-style-type: none">• Reduced work time and error rates• Improved traceability• Communicated changes faster and easier

toolcraft



Notes: Toolcraft offers many manufacturing services, including metal laser melting, robotics, injection molding, as well as engineering, measuring and testing.

They have grown to approximately 300 employees with more than 70 CNC machines as well as ten powder bed additive manufacturing machines, advancing to powder nozzle technology.

There supported industries are aerospace, medical, semiconductor, automotive and defense.

Toolcraft offers the entire process chain (seven-to-nine step print process to their customers) starting from design and ending with nondestructive testing on the part for Additive Manufacturing.

Their business challenge: They are early adopters to additive manufacturing and have many tests required with multiple software solutions, Potential loss of traceability during multistep process, Chance for errors and loss of time with required data translations. We sold NX for AM to them.

Key to success: Siemens' NX additive manufacturing solution enables toolcraft to perform all the functions in their process chain. It is easier to communicate with other departments if there are any changes on the computer-aided design models. Consolidate the process for customers that request traceability. With Siemens' NX, we can supply all of these systems and all of these machines – Trumpf, EOS and Concept Laser.

Results:

Reduced work time and error rates, Improved traceability, Communicated changes faster and easier

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1.30 Best Case Studies and Success Stories

Best Case Studies and Success Stories

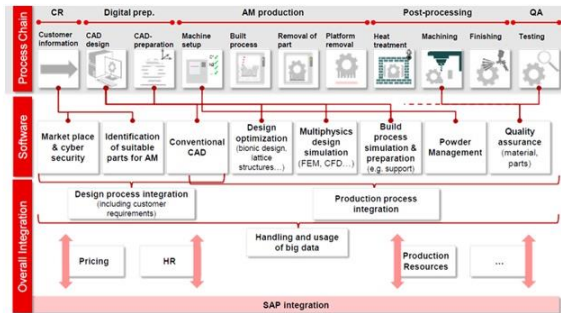
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Full Service Provider for AM

Business challenges

- Reach series Additive Manufacturing (AM) production level
- Promote global cooperation across R&D, engineering & production
- Zero media discontinuity through the AM chain
- Highest security standards within the whole AM chain
- Agile data exchange capability with client

Solution: mcenter, Simcenter and NX
Integrated "end-to-end" Additive Manufacturing Solution (design, simulation & printing) connected to MOM / quality shop floor systems



oerlikon



Notes: Despite initial conversations highlighting that there were other vertical solution providers that are specialist in certain areas, Oerlikon decided Siemens was the provider for them given the full end-to-end that we can provide.

Best Case Studies and Success Stories (Slide Layer)

Best Case Studies and Success Stories

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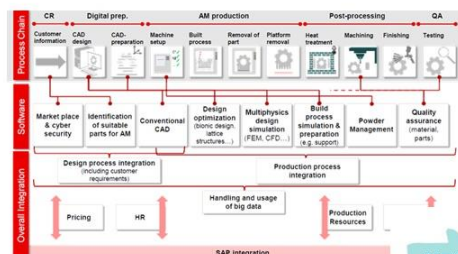
Full Service Provider for AM

Keys to success

- Products are ready to support complete End-to-End AM process
- Design & production processes with higher efficiency and quality based on a closed loop AM approach
- NX capabilities in design, simulation, printing and post processing
- Proven compatibility between PLM and various CAD systems
- Proven Teamcenter integration with SAP
- Coverage of digital process parameters
- Share the same vision about industrialization of AM value chain

Results

- \$625k deal recognized in Q4/17
- Implementation has started already and is running smoothly
- Potential extension of our portfolio to MES and SimCenter



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1.31 Summary

Summary



Truly differentiated solution. No competitor has this integrated end-to-end solution for AM, instead they offer multiple different software pieces

Win at existing NX customers, as well as go after **new prospects**

Relatively fast sales cycle is possible as Additive Manufacturing initiatives are commonly separate & distinct organizations and solutions

Notes: To summarize what we have learned when selling Additive Manufacturing:

Truly differentiated solution. No competitor has this integrated end-to-end solution for Additive Manufacturing, instead they offer multiple different software pieces;

Additive Manufacturing is one of the hottest topics today for our customers: Additive Manufacturing is a door-opener. You can win at existing NX customers, as well as go after new prospects;

Relatively fast sales cycle is possible as Additive Manufacturing initiatives are commonly separate & distinct organizations and solutions

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1.32 Learn More

Learn More

[Additive Manufacturing GSI](#)

[Chatter Group](#)

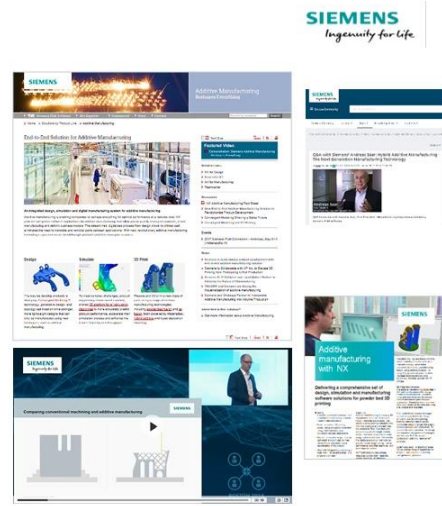
[Sign-up for the AM Email List](#)

[Public Siemens Webpage on Additive Manufacturing](#)

[NX Manufacturing Forum](#)

[Additive Manufacturing Curriculum](#)

[Learning and Development Additive Manufacturing Page](#)



Notes: To learn more about our solution for additive manufacturing you can visit our web or the Chatter Group as well as sign up for the Additive Manufacturing Email List.

You can also join the discussion on our public manufacturing community, where you can learn from experts and stay informed about the latest news.

You can also learn more by accessing the Additive Manufacturing Curriculum.

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1.33 Title



Notes:

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