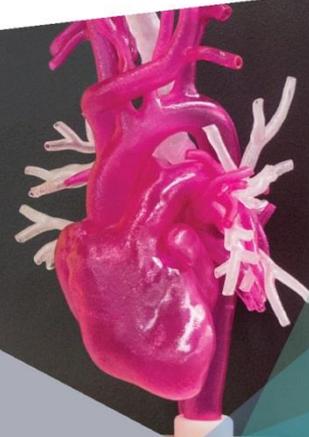
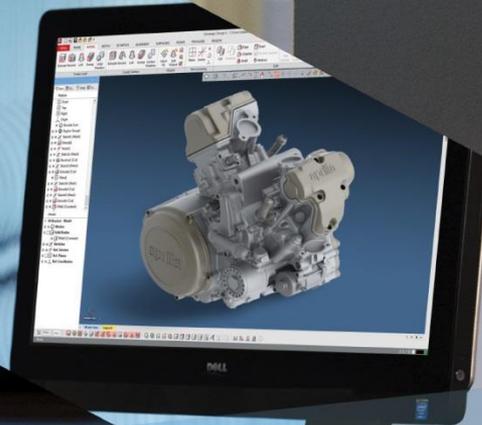


# Healthcare Industry

XVIII. FESZ Congress September 21-23, 2018



A close-up photograph of a person's hand holding a spherical, porous 3D printed object. The object is a fine mesh with several circular holes of varying sizes. A bright light source from the upper left creates a strong highlight on the object and casts a soft shadow on the hand. The background is dark, making the object stand out.

We are at an inflection point.

3D printing is shifting from  
prototyping to production.

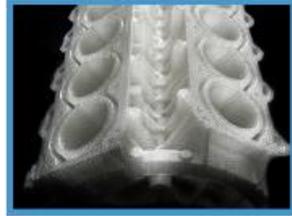
**With our technology,  
our talent, and our domain  
expertise, we are making  
3D production real for  
healthcare professionals  
worldwide.**

# Evolution of Industrial Applications



**WAVE 1**

**Rapid  
Prototyping**



**WAVE 2**

**Indirect  
Manufacturing**



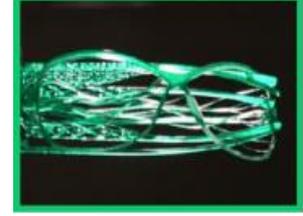
**WAVE 3**

**Custom  
Manufacturing**



**WAVE 4**

**Complex  
Manufacturing**



**WAVE 5**

**3D Production**

ENGINEERING SOFTWARE SOLUTIONS DELIVER KEY ENHANCEMENTS

# What 3D Production Delivers

## DIGITALLY MANUFACTURED PART

- Weight reduction
- Assembly consolidation
- Build impossible & custom geometries
- Improved fluid dynamics
- Use unique materials that were not possible
- Optimize design for functionality
- Multi-material parts
- Multi-color parts
- Durability
- Repeatability

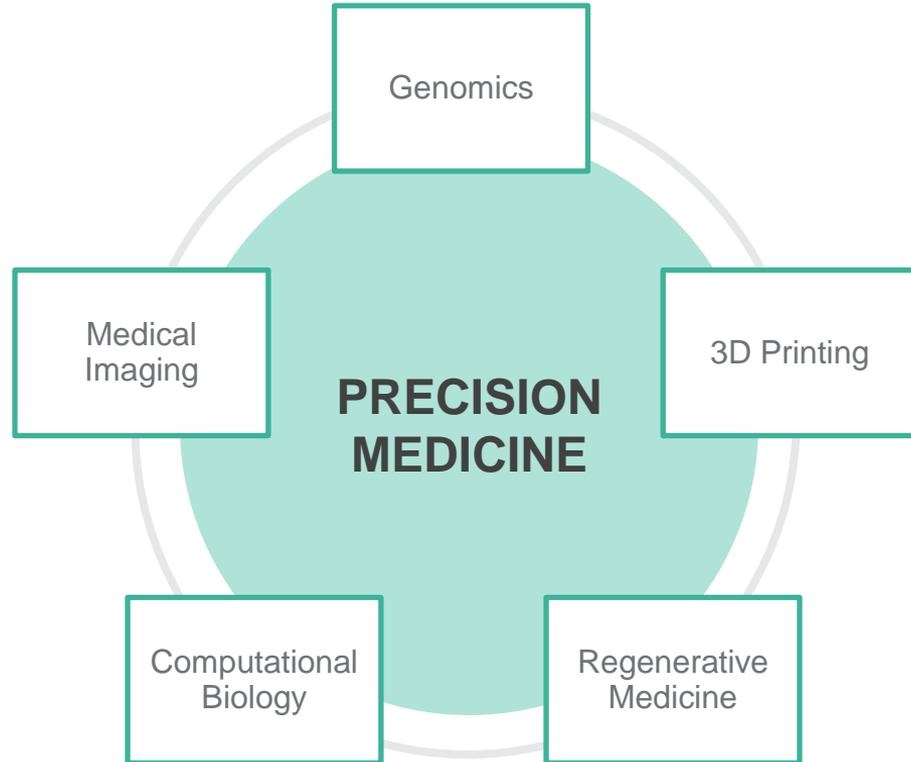
## ECONOMICS

- Reduction of tooling
- Decentralized manufacturing & supply chain consolidation
- Mass customization
- Reduction in inventory
- Low volume production
- Bridge manufacturing
- Agile manufacturing operations
- Time to market
- Rapid prototyping for form & fit verification
- Increased productivity

# The Promise of Precision Medicine

Precision Medicine refers to the tailoring of medical treatment to the individual characteristics of each patient\*

\*National Research Council



# Device Design & Manufacturing

## HEAD-TO-TOE APPLICATIONS



Models  
(Class I)



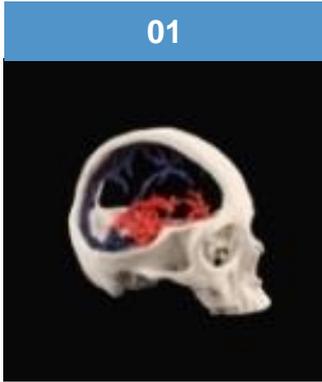
Instruments & Implants  
(Class II)



Highest Risk Devices  
(Class III)



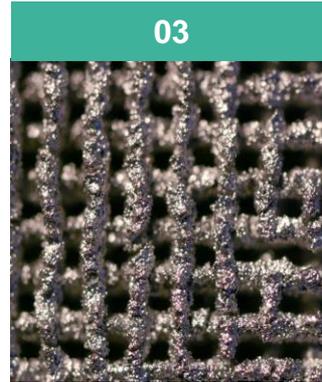
# Long-Term Drivers for 3D Printed Devices



Anatomical  
Models



Personalization

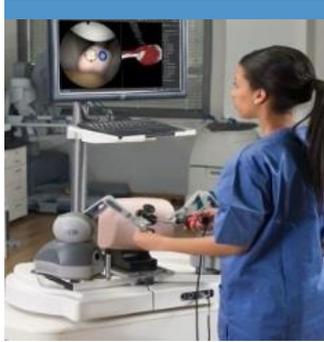


Functional  
Integration

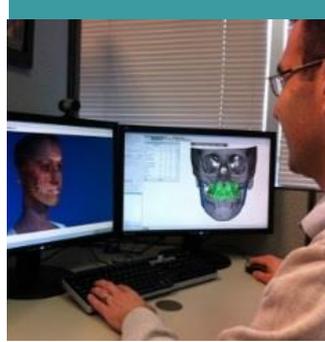


Manufacturing  
Economics

# Precision Healthcare Focus



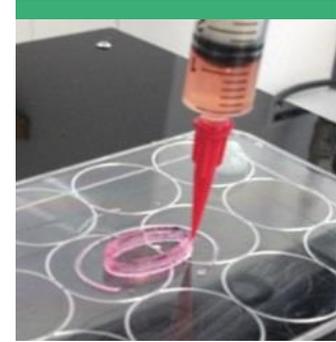
Surgical  
Simulation



Surgical  
Planning



Device Design &  
Manufacturing



Bioprinting



SECTION 2

# USE CASES

# Virtual Surgical Planning

## Customer Problem

- Need to improve pre-surgery planning to create better patient outcomes

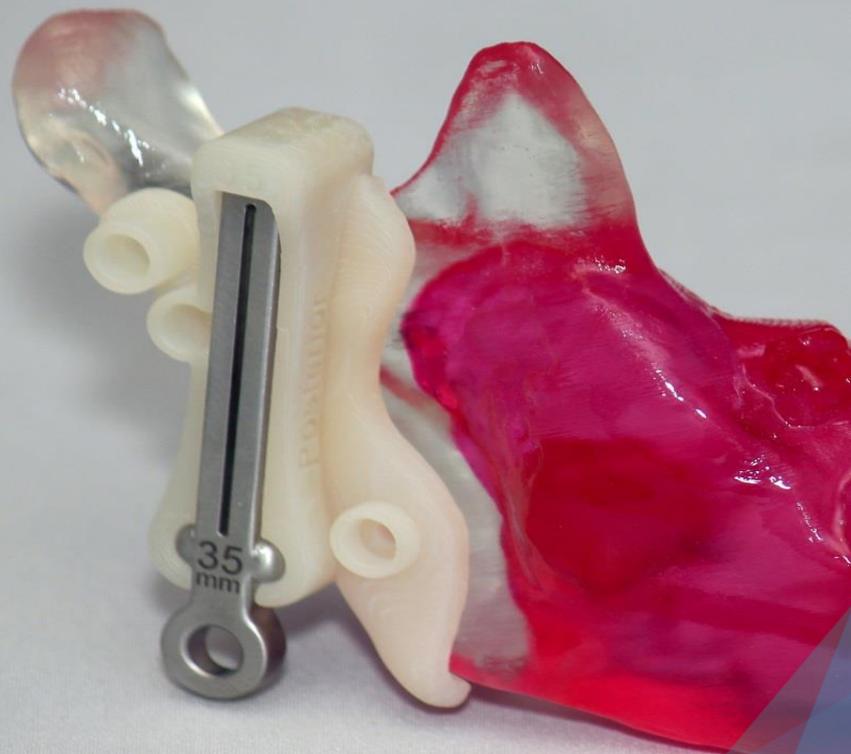
## Solution

- Technology: SLA
- Material: Accura® 7810m
- Process: default

## Results

- Surgical time savings
- Improved surgical outcomes and accuracy
- Enhanced surgeon confidence

Patient-specific mandible guide



# Virtual Surgical Planning

## Customer Problem

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## Solution

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- Process: default

## Results

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- Improved surgical outcomes and accuracy
- Enhanced surgeon confidence

Patient-specific mandible guide



# Anatomical Parts

## Customer Problem

- Need to improve pre-surgery planning to create better patient outcomes

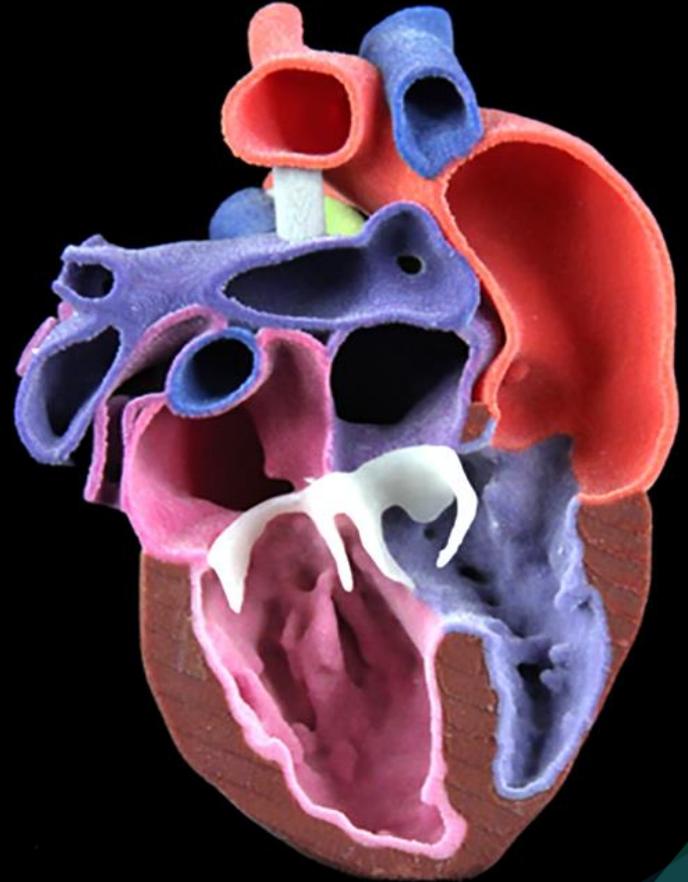
## Solution

- Technology: ProJet 660
- Material: VisiJet® PXL
- Process: CJP

## Results

- Pre-surgical planning
- Improved surgical outcomes & accuracy

Patient-specific Anatomical Heart Model



# Medical Implants

## Customer Problem

- Need to improve pre-surgery planning to create better patient outcomes

## Solution

- Technology: DMP
- Material: Ti6A14V
- Process: Default

## Results

- Accelerated product introduction to market
- Device development and manufacturing in a validated production environment

Titanium hip cup



# Patient-Specific Surgical Simulation

## Customer Problem

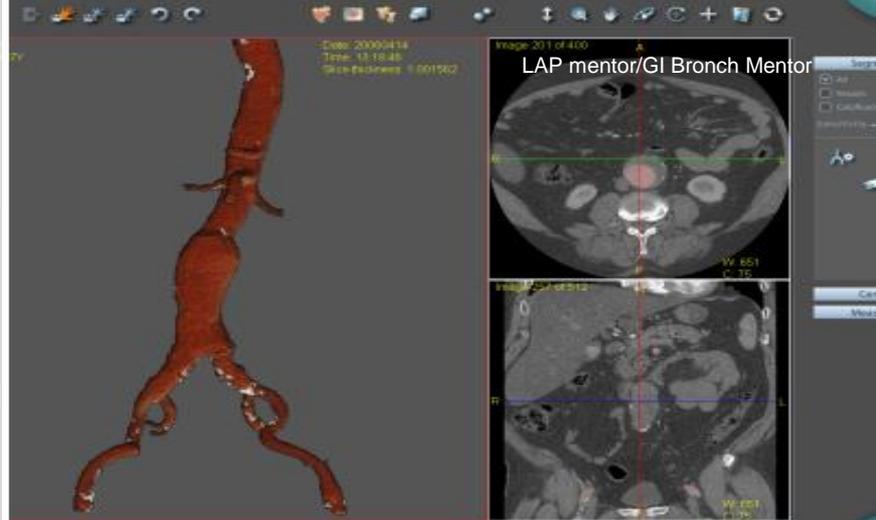
- Need to rehearse procedures on patient-specific simulators prior to surgery

## Solution

- Technology: ANGIO Mentor and PROcedure Rehearsal Studio

## Results

- Better patient outcomes
- Better reputations for hospitals
- Increased revenues for hospitals
- Enhanced surgeon confidence



SECTION 2

# WHY 3D?



# 3D Systems Delivers The Solutions Customers Need



## WIDE MATERIALS CHOICES



FULL COLOR | PLASTIC | NYLON | METAL

# Engineering Software Portfolio



## SCANNERS

## SCANNING & INSPECTION SOFTWARE

## DESIGN SOFTWARE



## ADDITIVE & PRODUCTION SOFTWARE

## HAPTIC DEVICES

# 3D Printer Portfolio



**PROTOTYPING AND PRODUCTION-GRADE ADDITIVE MANUFACTURING**

MULTIJET | COLORJET | STEREOLITHOGRAPHY | SELECTIVE LASER SINTERING | DIRECT METAL PRINTING

# Why 3D? – Unmatched Expertise & Capabilities

- Over 25 years of experience
  - Over 500,000 medical devices printed
  - Over 10,000 surgeons trained
  - ISO certified facilities and processes
  - FDA-approved precision medical services and products
- 
- Over 75,000 surgical cases planned
  - Over 2,800 simulators installed
  - 90 surgical procedures in simulation
  - 45 patents granted/applied



# HELPING YOU ACHIEVE NEW HEIGHTS

## FIND OUT MORE

Call: +36 30 847 4749

Email: [kniesz.oliver@3dz.hu](mailto:kniesz.oliver@3dz.hu)

Website: [www.3dz.hu](http://www.3dz.hu)

# Thank You

HEALTHCARE INDUSTRY

