

axel springer_

(a little bit of) Future in Maintenance

stefan fricke

berlin ~

7 October 2019~

“All the experts said that will not work. Then someone came who did not know that and just did it.”

berlin ~

7 november 2018 ~

3D-Print

Agenda

1. Short Introduction
2. First Steps
3. Team of Experts
4. Training
5. 3D-Printer Portfolio
6. Production
7. Service Provider

3D-Print Visions

Die additive Fertigung mit Serienbauteilen aus dem 3D-Drucker hat das Potenzial, die Weltwirtschaft umzukrempeln.

Der Bericht von Industrie 2030 nennt den 3D-Druck als Schlüsseltechnologie für die industrielle Zukunft Europas.

Hochrechnungen für das Jahr 2025 kommen auf ein Marktpotenzial von etwa 50 Milliarden Dollar. Die Zahlen betreffen sowohl die Industrie als auch den Privatgebrauch.

Das Potenzial steht außer Frage. „3D-Druck könnte zu einer Ent-Globalisierung und einer Re-Regionalisierung führen“, meint Zukunftsforscher Robert Gaßner.

„Der Pionierbereich der Re-Regionalisierung wird die Ersatzteilindustrie sein.“

3D-Print

Use Examples

Siemens setzt mittels Additive Manufacturing (AM) gefertigte Gasturbinenschaufeln nach konventionellem sowie neuem Schaufeldesign unter Vollast in einer Gasturbine erfolgreich ein.

Im medizinischen Bereich ist die Herstellung von Zahnkronen, Hörgeräten und chirurgischen Instrumenten im 3D-Druck bereits Standard.

Bei Mercedes-Benz Lkw folgt nach der Etablierung von gedruckten Ersatzteilen aus Kunststoff nun der nächste Schritt im 3D-Druckverfahren: Das erste gedruckte Ersatzteil aus Metall hat alle Instanzen der Qualitätssicherung bei Mercedes-Benz bestanden.

Chanel produziert Bürsten für Mascara in Massenfertigung im 3D-Druck.

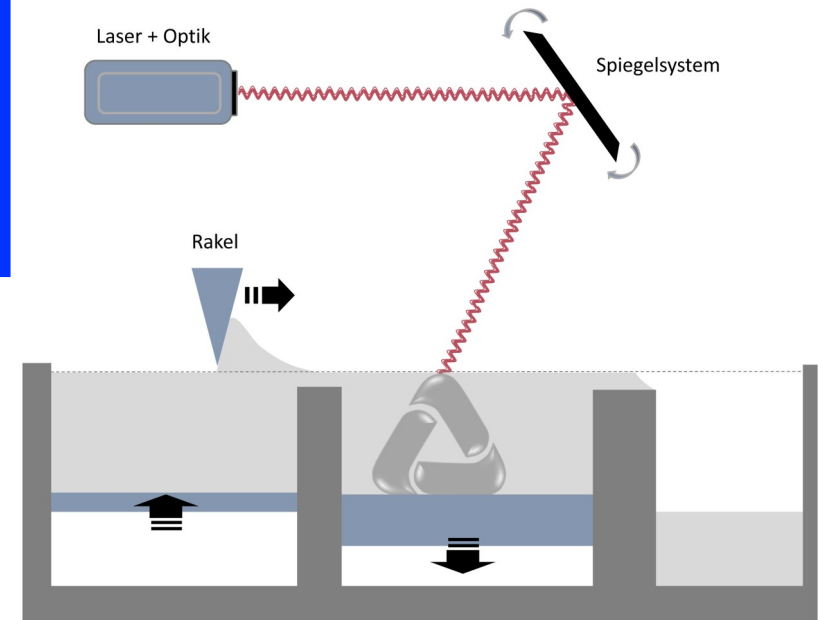
3D-Print

1. Short Introduction

~ In additive manufacturing, components are produced layer by layer from different materials by using digital 3D data

~ Different materials like metals, synthetics and composites are available

~ The design is no longer limited by the manufacturing process



3D-Print

1. Short Introduction

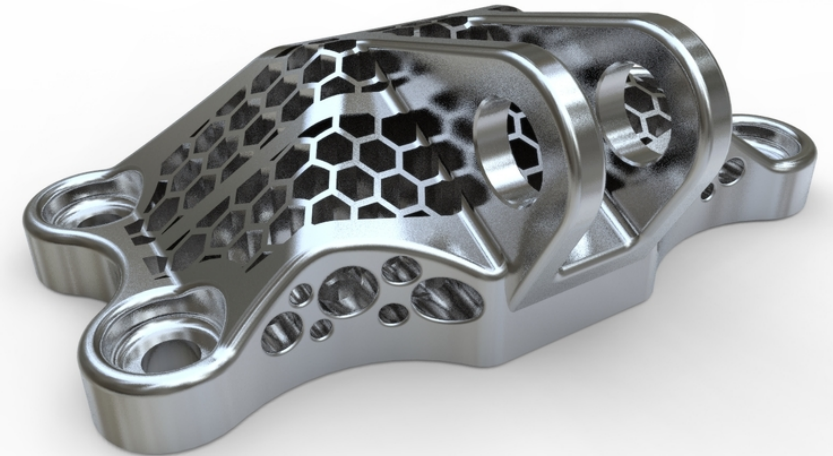
This offers some important advantages

complex structures

customized parts

function optimization

small lots at low prices



3D-Print

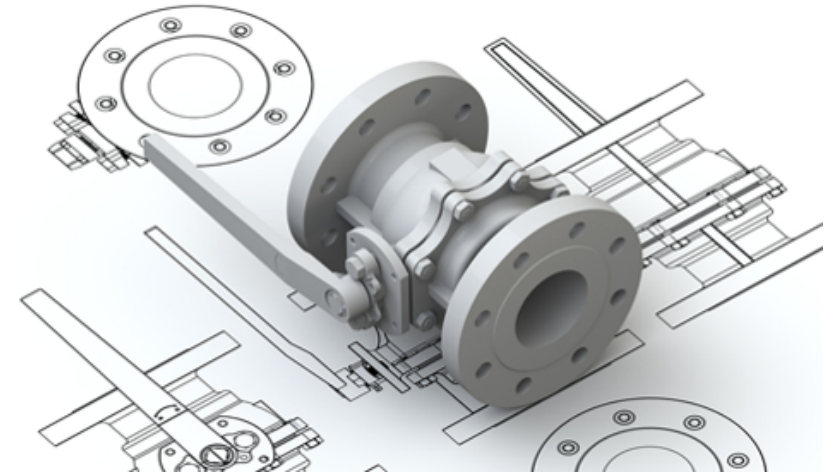
1. Short Introduction

Produce spareparts and components which...

...are no longer available on the market

...price is increasing

...are not available in the required form



3D-Print Development Overview

First Steps



3D-Print

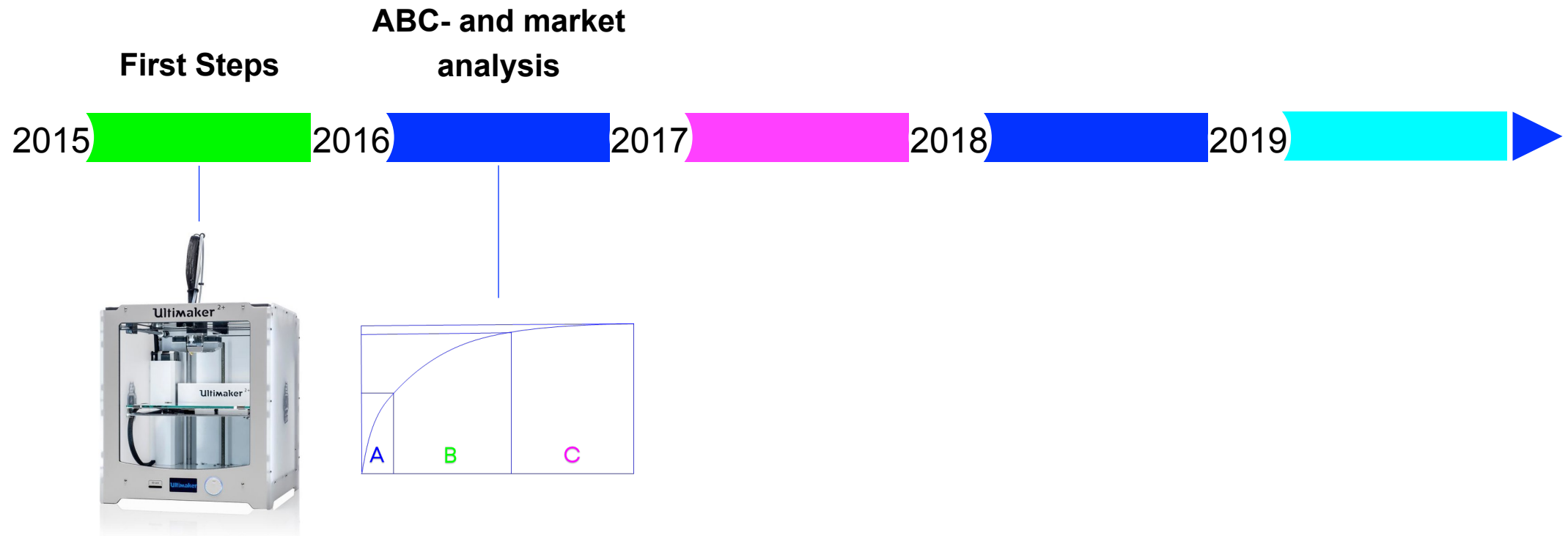
2. First Steps

- ~ First Trials by using a non-professional 3D-Printer in our printing house in Essen Kettwig
- ~ To gain experience, first simpler items such as smartphone holders are made
- ~ With increasing experience, components with higher requirements for stability, such as holders for softproof monitors or security bars for mailroom machinery (approved by Berufsgenossenschaft), were produced and used



3D-Print

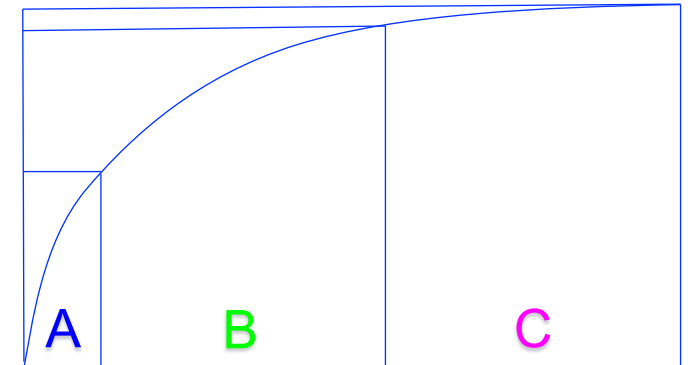
Development overview



3D-Print

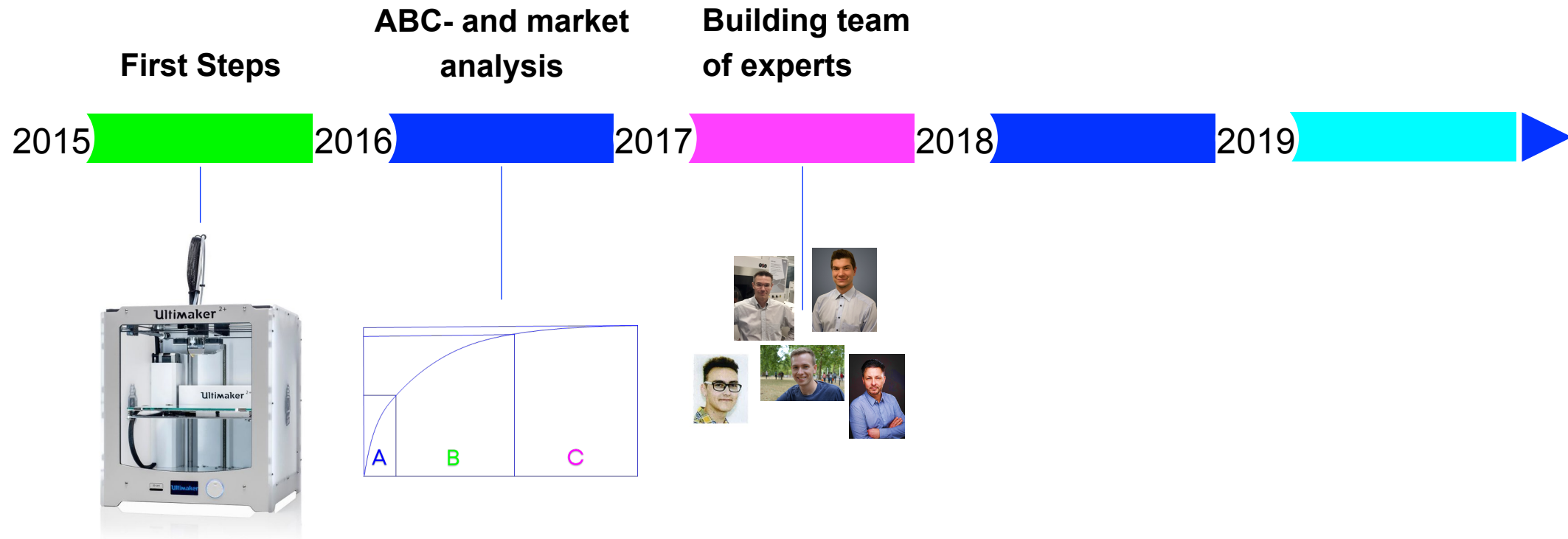
2. First steps

- ~ With the first self-made components we have achieved savings of approximately **12.000€**
- ~ This fact has led us to analyze for which parts we have spent a lot of money in the past and with which we will continue to do today and in the future
- ~ With this knowledge we went in search of the right 3D-Print technology for us



3D-Print

Development overview



3D-Print

3. Team of experts

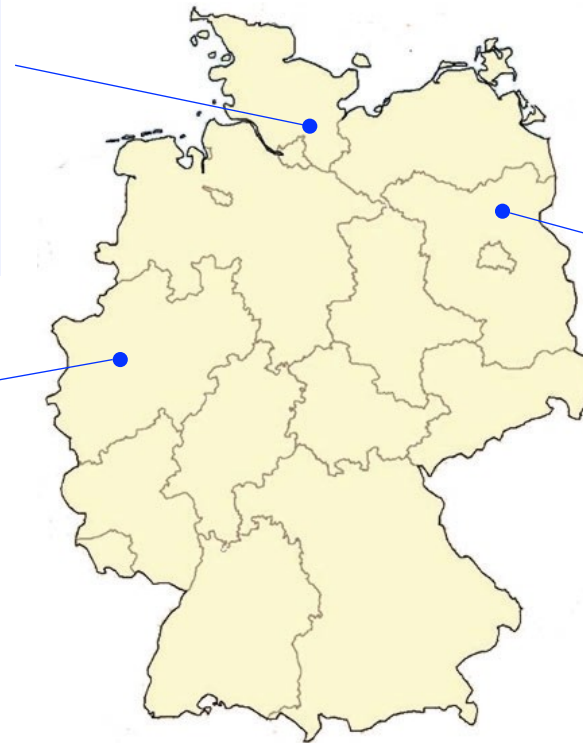
Ahrensburg

apprentice
mechatronics
technician



Kettwig

electrical &
mechanical
technicians



Spandau

mechanical
engineering
technician



3D-Print

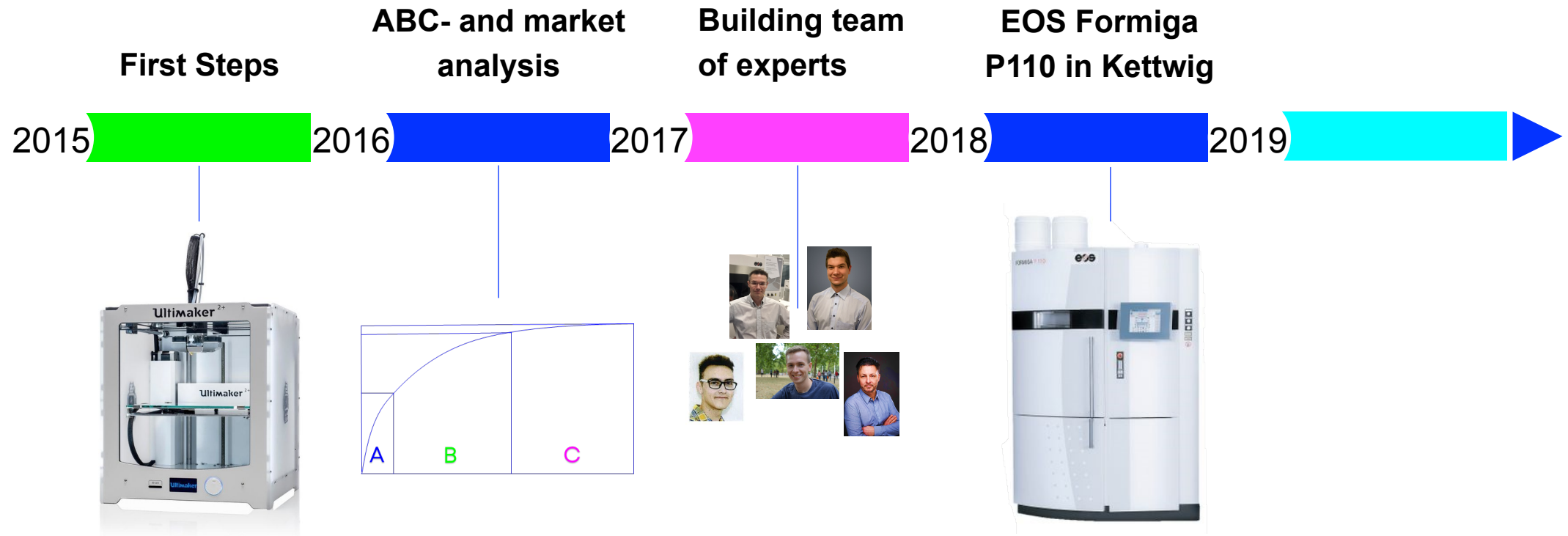
4. Training

- ~ The apprentices as mechatronics technicians have the opportunity to receive an additional basic training in 3D printing
- ~ Therefore, workshops are offered in which the handling of the technology as well as the preparation of CAD designs are trained
- ~ This further education option also supports our attractiveness as an employer



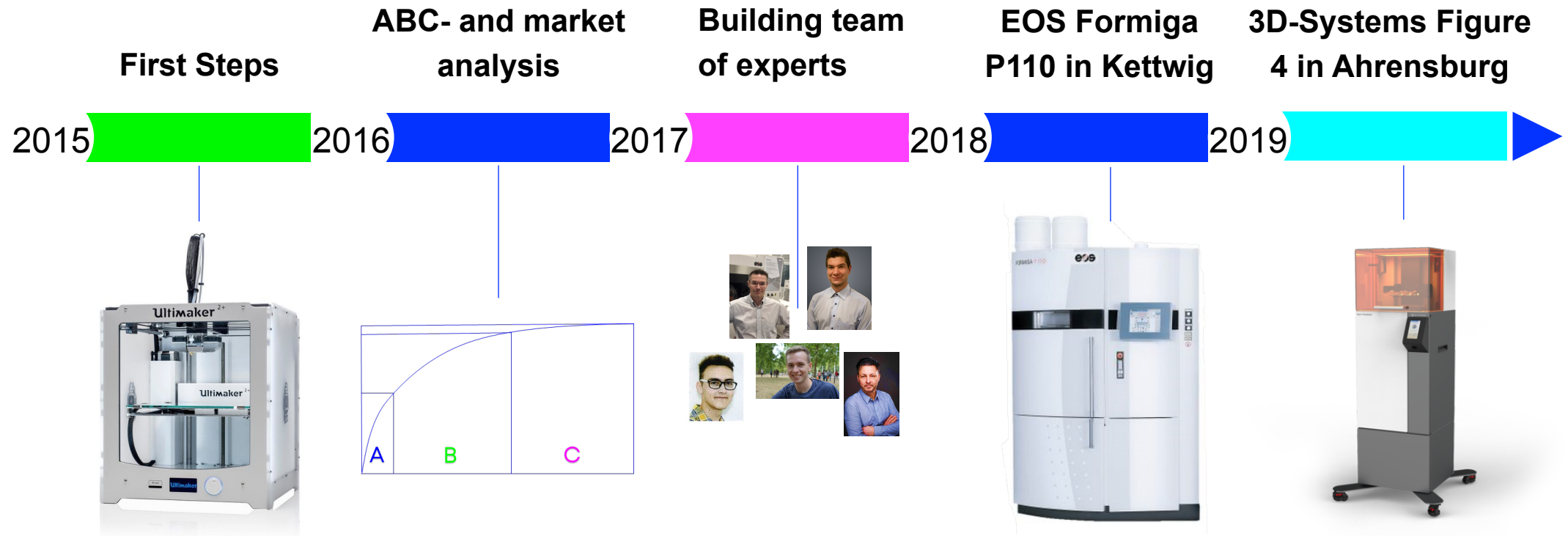
3D-Print

Development overview



3D-Print

Development overview



3D-Print

5. 3D-Printer Portfolio

- ~ The EOS P110 was acquired for a professional industrial production
- ~ It has a construction volume of 200 x 250 x 330 mm (16,5 litres)
- ~ The precision laser allows a minimum layer thickness of 0.06 mm
- ~ The system can create larger as well as smaller, filigree components with the highest surface quality
- ~ There is a range of materials available for it. We work primarily with polyamide



3D-Print

5. 3D-Printer Portfolio

- ~ The Figure 4 Standalone (3D Systems) in Ahrensburg was purchased as a complement to the P110 in Kettwig
- ~ It has a construction volume of 124.8 x 70.2 x 196 mm (1,7 litres)
- ~ A layer thickness up to 0.02 mm can be achieved
- ~ As a result, a high quality small batch production can be ensured
- ~ Again, a variety of materials are available. We mainly work with Resin



3D-Print

6. Production

- ~ The powder block with the finished individual parts will be removed



3D-Print

6. Production

- ~ The individual parts will be roughly dissolved from the powder...



3D-Print

6. Production

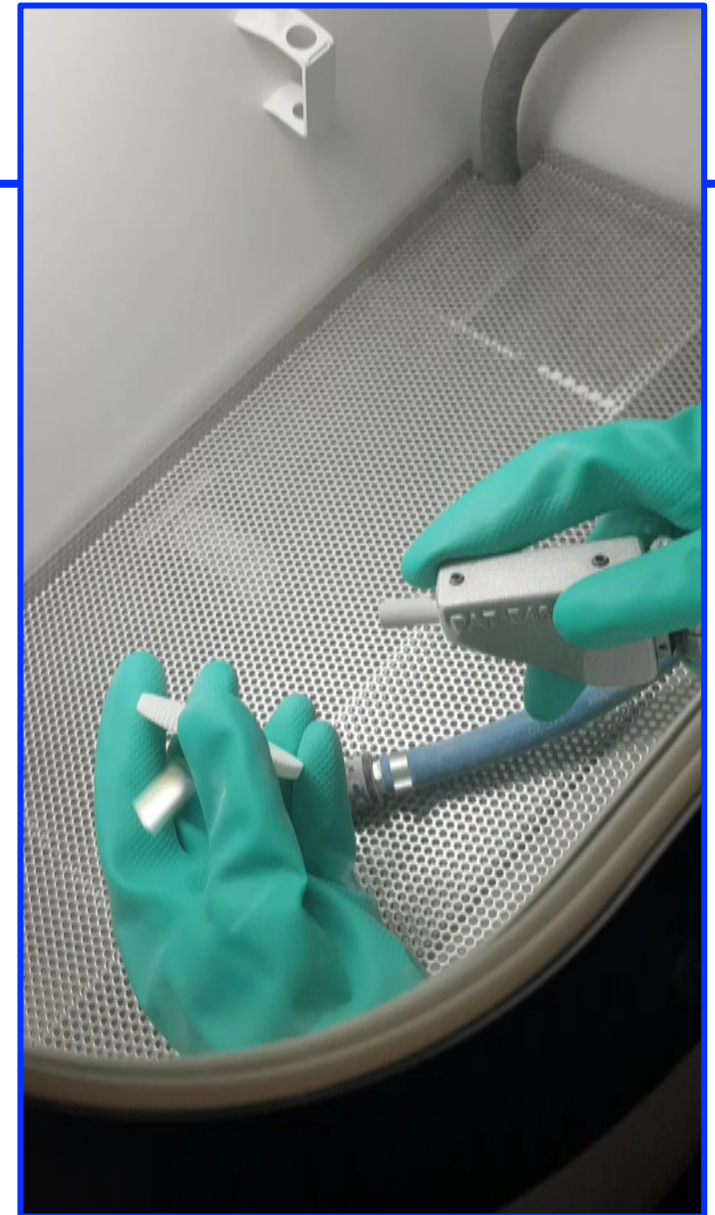
~ ..and cleaned with brushes from the coarse powder layer



3D-Print

6. Production

- ~ The high pressure cleaning will removing the remaining powder residues



3D-Print

6. Production

- ~ To date, we have saved a mid five-digit amount for spare parts
- ~ Currently we produce 30 different spare parts ourselves instead of ordering them from suppliers
- ~ The investment in the 3D printer will be amortized after about 3 years

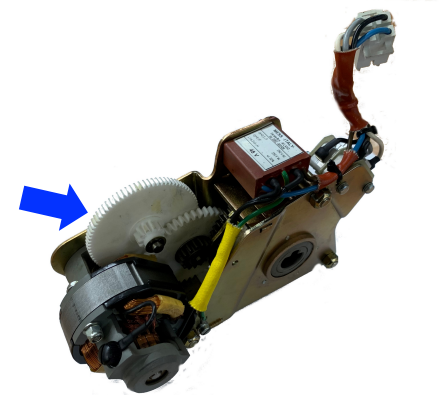


3D-Print

6. Production

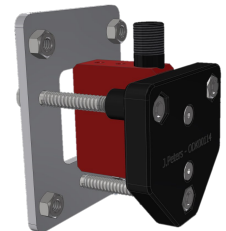
Example: Gears for „Aufzugswerk für Niederspannungsschalter“

| | | | | |
|-----------------------------|-------------------------|---------------|-----------------------------|-----------|
| Market price € xxx,00/pc | Required quantity xx | = € 17.300,00 | Our cost price € 1,98/pc | = € 39,00 |
|-----------------------------|-------------------------|---------------|-----------------------------|-----------|



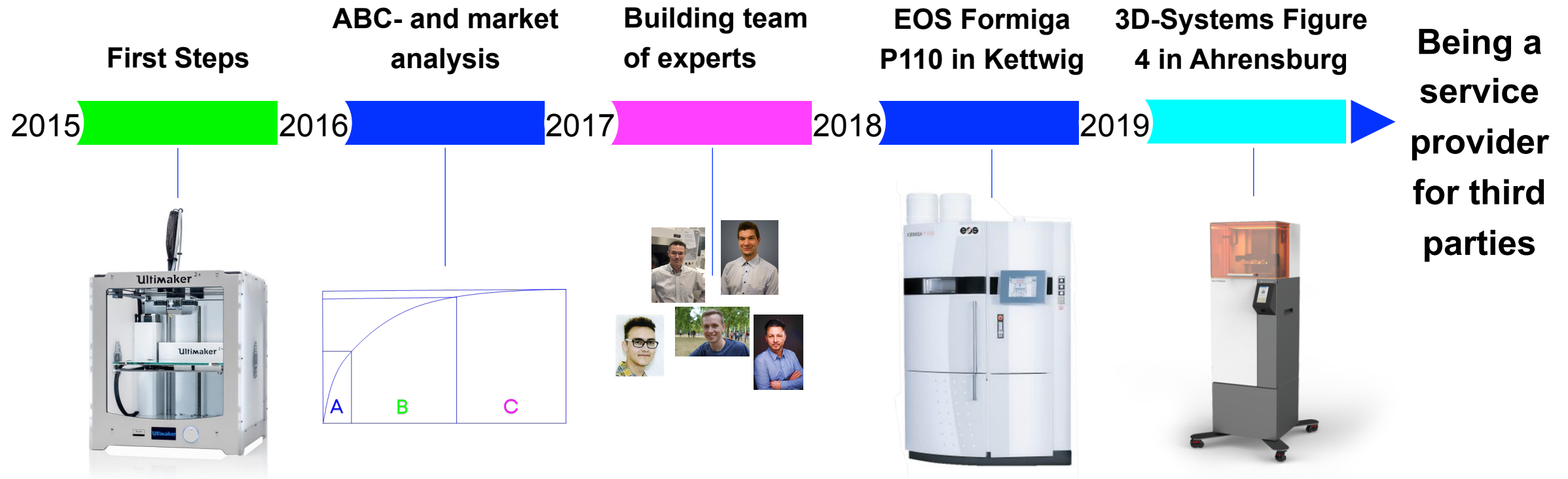
Example: Mounts for photocells

| | | | | |
|-----------------------------|-------------------------|--------------|-----------------------------|-----------|
| Market price € xxx,00/pc | Required quantity xx | = € 7.700,00 | Our cost price € 3,46/pc | = € 76,12 |
|-----------------------------|-------------------------|--------------|-----------------------------|-----------|



3D-Print

Development overview



3D-Print

7. Service provider

- ~ We are now in contact with selected customers to understand their requirements for a potential 3D printing service provider.
- ~ Particularly interesting for us are industries in which the supply of parts is not guaranteed
- ~ To ensure legal protection, we are currently reviewing the requirements of product liability, patent- and licensing law
- ~ The feedback from the market is quite positive



