

# SHAPEWAYS AND THE 3D PRINTING REVOLUTION

## *Teaching Case*

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## Abstract

*The technology of additive manufacturing – also known as ‘3D printing’ – holds the potential for revolutionising industrial production at all levels. Although the underlying techniques to build up physical items layer by layer from digital 3D design models have been in use since as early as 1986, only big companies could afford the necessary knowledge and equipment. Since 2008, things have changed dramatically, when Shapeways arrived on the scene and provided an affordable additive manufacturing service for consumers. This teaching case, based on the contents and services provided by Shapeways’ 3D printing online community and marketplace, is designed to challenge students to cope with additive manufacturing and its impact. In particular, the teaching case may be used to (i) give a basic introduction into the technology of additive manufacturing and its historical development, (ii) illustrate the business model of Shapeways and (iii) develop a deeper understanding of the corresponding strategic challenges.*

*Keywords: Additive Manufacturing; 3D Printing; Business Model; Disruptive Innovation.*

## 1 Introduction

In 1974, the fictional inventor Daedalus, known from the New Scientist’s Ariadne column, described a new imaginary plastics fabrication process that would be able to revolutionise industry at all levels (Jones, 1974). The outlined technique uses liquid monomers and ultraviolet laser beams in order to polymerise the fluid. Hereby, it is possible to produce any arbitrary type of three-dimensional object just from its digital representation. At this point in time, nobody could ever imagine that this technology would become reality and that the surrounding industry would grow up to a market of \$2.204 billion in 2012 (Wholer and Caffrey, 2013).

The broader public became aware of additive manufacturing (AM), also known as ‘3D printing’, at the latest in February 2013 when US president Barack Obama acknowledged the technology of 3D printing the potential to revolutionize the way almost everything is made in his state of the union address (Office of the Press Secretary, 2013). Because of the expected economic potential as key enabler for the future competitive advantage, a new \$1 billion proposal as part of the ‘We Can’t Wait’ initiative was announced to build a so-called ‘National Network for Manufacturing Innovation’ (Office of the Press Secretary, 2012). The decision to focus on additive manufacturing during the pilot phase emphasizes the expectations raised by this technology and the hope that it may bring manufacturing jobs back to high-wage countries. Jim Kohlenberger, a former chief of staff in the

White House Office of Science and Technology, describes this new technology as follows (Thompson, 2013):

*“Once in a generation a new technology comes along that has the potential to transform just about everything – think printing press, steam engine, telegraph, and now 3D printing.”*

Today, 3D printing is not exclusively reserved anymore to major corporations, who can afford the corresponding technological equipment. Internet-based service providers promise to make the technique of turning virtually every imaginable object into physical reality available to everybody. The following case of Shapeways, a 3D printing marketplace and online community co-founded in 2007 by its current CEO Peter Weijmarshausen, illustrates the underlying business model and the strategic challenges that top managers of the company are dealing with.

## **1.1 Shapeways' Company Background**

In the year 2008, Shapeways started as a spin-off of Philips in the Netherlands, founded by Peter Weijmarshausen, Robert Schouwenburg, and Marleen Vogelaar. The idea to build a 3D printing marketplace and community first came up in 2007 from within the design department and was then further developed within the Lifestyle Incubator of Royal Philips Electronics. Today, Shapeways is an independent company based in the United States and employs more than 90 people. (Weijmarshausen, 2010)

Peter Weijmarshausen is the company's Chief Executive Officer (CEO). Prior to his current job, he showed off his ability in different companies developing and designing satellite broadband services. His co-founder Marleen Vogelaar acted as Chief Financial Officer (CFO). Since 2013 she fills the position of the Chief Strategist (CSO) and for that provides expertise and guidance on a strategic and operational level. Co-founder and Chief Technology Officer (CTO) Robert Schouwenburg had been responsible for the technology and the manufacturing at Shapeways until he left the company in June 2012. Weijmarshausen describes his company's business model as follows:

*“Shapeways is the largest 3D printing marketplace and community online and what we basically do is, we make it possible for anyone to use 3D printers, so you do not need to physically own one.”*

From its beginning in 2007 until today, Shapeways experienced a rapid growth, especially with regard to the number of community members, and the amount of 3D printed items increased significantly during the last years.

Since 2010 and the spin out, the company is headquartered in New York but still also operates from offices in Seattle and Eindhoven in the Netherlands. A new production facility was built in Long Island City, NY. This new factory is be the biggest additive manufacturing facility in the world equipped with industrial-sized machines. It is capable of manufacturing three to five million unique items per year. The fact the New York's former mayor Michael Bloomberg himself cut the ribbon in October 2012 highlights the high expectations associated with this new factory. (Fisher, 2012)

Shapeways already raised \$5 million in series A funding led by Union Square Ventures and Index Ventures in 2010. In June 2012, Lux Capital joined the other existing investors, financing Shapeways with another \$6.2 million. The latest milestone in Shapeways' financing is marked by the series C funding in April 2013. The round ended in a new \$30 million financing and Andreessen Horowitz joining the group of existing investors. (Weijmarshausen, 2013)

## **2 Technology Background**

### **2.1 Traditional vs. Additive Manufacturing**

Traditional manufacturing techniques, such as milling, carving or drilling, are referred to as ‘machining’. As all these methods mostly rely on the removal of material, they are known as ‘subtractive manufacturing’. The other general traditional ways to manufacture use formative techniques, for example casting, moulding and shaping. Because of their long history advanced methods like high speed cutting or injection moulding evolved, which are used for fast and efficient mass production.

In contrast to these long-established conventional processes, about 25 years ago, a new way of manufacturing started its story of success. Because of the fast development of this technique, varying terms evolved. What is called ‘additive manufacturing’, in distinction from its traditional subtractive and formative counterparts, is also known as ‘rapid manufacturing’, ‘direct digital manufacturing’, or just ‘3D printing’. However, the latter term – though it has become the most popular one – may be misleading since only some techniques actually require the printing of material. In fact, what makes this family of production processes so special is its additive nature, which offers a novel way of highly customised manufacturing.

### **2.2 Types of Additive Manufacturing Techniques**

In a first step, a digital representation of the object to be made is required. This digital blueprint is usually called a ‘computer-aided design’ (CAD) file. In a second step, the file, which describes the three dimensional model in the form of vertices and edges, is transformed into another layer-oriented digital representation. This ‘slicing’ procedure corresponds to the manufacturing process, which generates the object layer by layer. The common denominator of all additive manufacturing techniques is the forming of the model out of these cross-sections while simultaneously linking all the layers together. The digital representation is thus translated into a real physical item (see Figure 1).

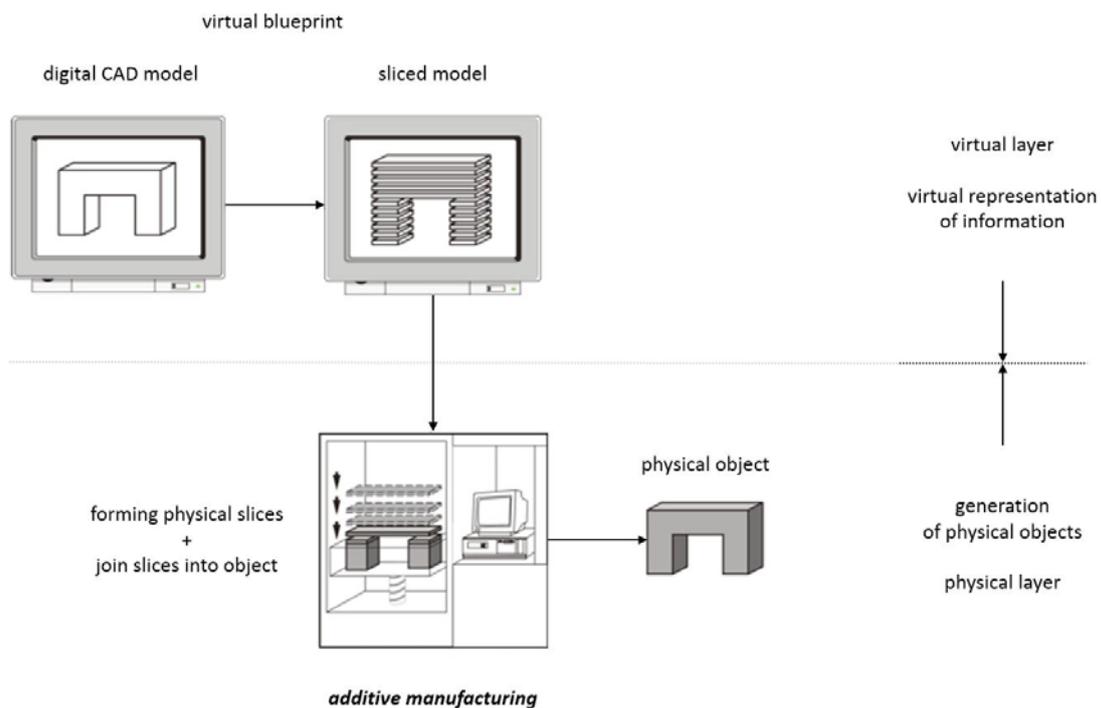


Figure 1. Principle of additive manufacturing. (Gebhardt, 2012)

Though the principle of slicing a digital representation into equally thick layers is a common characteristic of all additive manufacturing techniques, the process of building the different layers of an object differs. Today, five fundamental types of techniques exist (Gebhardt, 2012):

- *Polymerization.* A layer is built out of a liquid photopolymer that is solidified by ultraviolet light. If a whole slice of the object is complete, a new layer of liquid polymer covers this layer and the next slice is being solidified. The biggest advantage of this oldest method of AM processes is its high level of detail. The generic method of polymerization is better known for its brand name 'Stereolithography' (SL).
- *Sintering and Melting.* Melting and sintering techniques are capable of handling not only materials like plastics but also various metals or even ceramics. The raw material, which is present in form of powder, is melted layer by layer. This method can work up almost every material that is available as powder and produce objects with high stability. Alternative terms are 'Selective Laser Sintering' (SLS) and 'Selective Laser Melting' (SLM).
- *Extrusion.* The material, usually plastic, is melted and ejected through an extrusion head. The extruded material, which hardens immediately after its deposition, forms the layer. After the completion of one layer, the next one is placed right on top of the prior one. Due to the temperature of the extruded thermoplastic, the layers directly melt together. The large majority of personal 3D printers, so-called 'fabbers', uses this general principle. Often synonymously used is the term 'Fused Deposition Modelling' (FDM) that is actually a registered trade name for this kind of AM process.
- *Powder-Binder Bonding.* While the term 'Three-Dimensional Printing' (3DP), or just '3D printing', is often used as a synonym for AM, it actually describes a special rapid manufacturing process, which comes close to what is commonly referred to as printing. An inkjet-like printing head dispenses a binder on a bed of powder. Afterwards a new layer of powder is distributed and the process starts again for the next layer of the object.

- *Cutting and Bonding*. In its simplest form, sheets of paper are cut with a knife and glued together, layer by layer again. More advanced machines make use of laser cutters and are capable of using thin sheets of plastic or even metal. Accordingly, the process is referred to as ‘Layer Object Manufacturing’ (LOM).

These five basic AM techniques are summarized in Table 1 hereafter. Besides the technique itself the basic physical principle, possible materials, the name of the process, as well as the pros and cons advantages are demonstrated.

<b>technique</b>	polymerization	sintering and melting	powder-binder-bonding	extrusion	cutting and bonding
<b>principle</b>	uv	laser, electron beam	printing head	extrusion head	laser, knife
<b>material</b>	liquid	solids			
	liquid, paste	powder		filament	film
<b>process</b>	SL	SLS, SLM	3DP	FDM	LOM
<b>pros</b>	specificity, surface quality	materials, resilience	cost, colourfulness	cost	cost
<b>cons</b>	cost, resilience	cost	specificity, resilience	specificity, surface quality	complexity

Table 1. Comparison of the five fundamental types of AM techniques.

### 2.3 History of Additive Manufacturing

The history of additive manufacturing started in the year 1986 when Charles Hull patented a technology for printing physical 3D objects from digital data. He named this process ‘Stereolithography’ and founded the company 3D Systems, which later became one of the leading companies in the 3D printing industry. An overview of the developments in the following years and other important events in the history of additive manufacturing are given in Table 2.

<b>Time</b>	<b>Event</b>
1986	Charles Hull obtained a patent for Stereolithography.
1988	Scott Crump invented fused Deposition Modelling.
1991	The first Layer Laminate Manufacturing machine was sold.
1992	Selective Laser Sintering machines were released.
1993	MIT patented “3 dimensional printing techniques”.
	The revenue for AM products and services worldwide is about \$100 million.
2001	The average selling price for industrial additive manufacturing systems was about \$118,000.
2006	RepRap, a self-replicating 3D printer, started as an open source project.
2007	The unit sales for personal 3D printers were about 65.
2010	Additive manufacturing had been used to bioprint blood vessels.
	The market for additive manufacturing grew up to \$1.3 billion.
2012	About 7,800 industrial systems have been sold in 2012.
	The average selling price for industrial systems was about \$79,500.
	Sales of personal 3D printers reach about 35,500 units, as fully assembled printers for home use are available from \$1,500.
	The market for additive manufacturing, consisting of products and services grew up to \$2.2 billion.

Table 2. Historical overview of the development of additive manufacturing. (Van West, 2011; Wohler and Caffrey, 2013)

Machines called ‘3D printers’ have already existed since as early as 1986. For decades, they have only been used in industrial processes, especially for prototyping purposes in an early stage of the product lifecycle. However, the industry has undergone several changes along the years:

- *Diversity in technology.* Since the first patent for Stereolithography, many different new additive manufacturing technologies have evolved. What started as a technique to print plastic for prototyping purposes is now capable of printing functional parts and final goods. Used materials vary by metals to food, or even synthetic human tissue
- *Home use.* Fully assembled low-cost 3D printers are available for less than \$1500. These machines are mostly used for personal or academic purposes. As the sales numbers grew by 289% in 2011, this market segment is especially interesting for developers and investors. Figure 2 shows this remarkable development in unit sales for the years 2007 until 2012.
- *Industry growth.* Since its start more than 25 years ago, demand for additive manufacturing has always been strong and showed a continuous growth, though it took about 20 years to reach \$1 billion in size. However, particularly in recent years, the market for additive manufacturing has grown at a double-digit rate. Analysts predict further growth and expect the industry to reach \$4 billion in 2015. Some of them even go further and recognise a disruptive technology with the potential to start the next industrial revolution (Wholer and Caffrey, 2013)

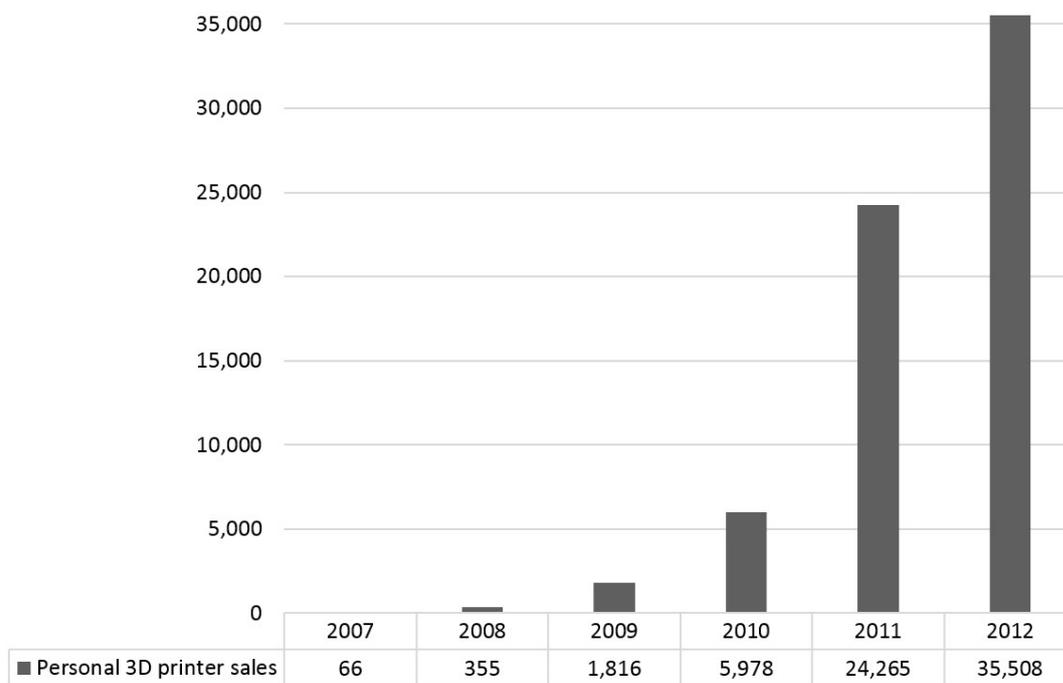


Figure 2. Personal 3D printer sales. (Wholer and Caffrey, 2013)

### 3 Shapeways

#### 3.1 The Ability to Manufacture

Shapeways operates two business models within one company. On the one hand, Shapeways operates a large number of 3D printers and acts as a 3D printing service provider. In so doing, it provides

customers the ability to manufacture physical objects. On the other hand, Shapeways is an online platform for 3D content, that is, objects that were modelled by a large community of designers who sell their content on the Shapeways website.

### 3.1.1 A Customer's Perspective

For decades, the ability to manufacture items, to actually make something, has been a privilege to big companies and required not only time but also substantial investments in manufacturing capacities. In any case, manufacturing requires more or less complex production systems to make things in an efficient way. As Weijmarshausen states, this stands in direct contrast to our basic needs:

*“As humans, we have always strived to create, build something that will solve our problem or meet one of our needs. [...] What is happening, we call the democratization of production because until now, only big companies had access to these machines that could produce stuff. Mass manufacturing is reliant on very complex and expensive factories to make things very efficiently but no normal person can have access and make something for themselves. What we are doing is giving the power of creation back to everybody.”*

Additive manufacturing fulfils this need as it facilitates so-called ‘personal manufacturing.’ In the age of personal manufacturing, every citizen has the potential to be a micro-entrepreneur. Personal 3D printers using FDM start at about \$1500 and are shipped fully assembled and ready to use. In contrast, Shapeways provides the power of industrial additive manufacturing machines to ordinary people. The steps to transform a great idea into a product are summarized in Figure 3 and can be described as follows:

- *Invent:* Everybody with a great idea is a possible inventor for upcoming products.
- *Design:* As described above, 3D printing is capable of transforming digital blueprints into physical objects. Less than a decade ago, CAD software cost thousands of dollars. Today, professional software is available for free and even basic smartphone apps already exist.
- *Configure:* After uploading a design file, the next step is to choose a material according to one's personal wishes. The material not only specifies properties like the production method and quality but also is the prime determinant of the instantly calculated price. Shapeways offers a wide variety of different materials (see Table 3 for an overview of the different materials).
- *Fabricate:* 3D printing gives customers the opportunity to manufacture a first prototype of their idea right after they have completed the design. This also means that the time to market goes from years down to days. The period until the item arrives is about 10 to 21 working days. If customers are going to sell their design or product, they can open their own shop at Shapeways and the platform operates as a marketplace.

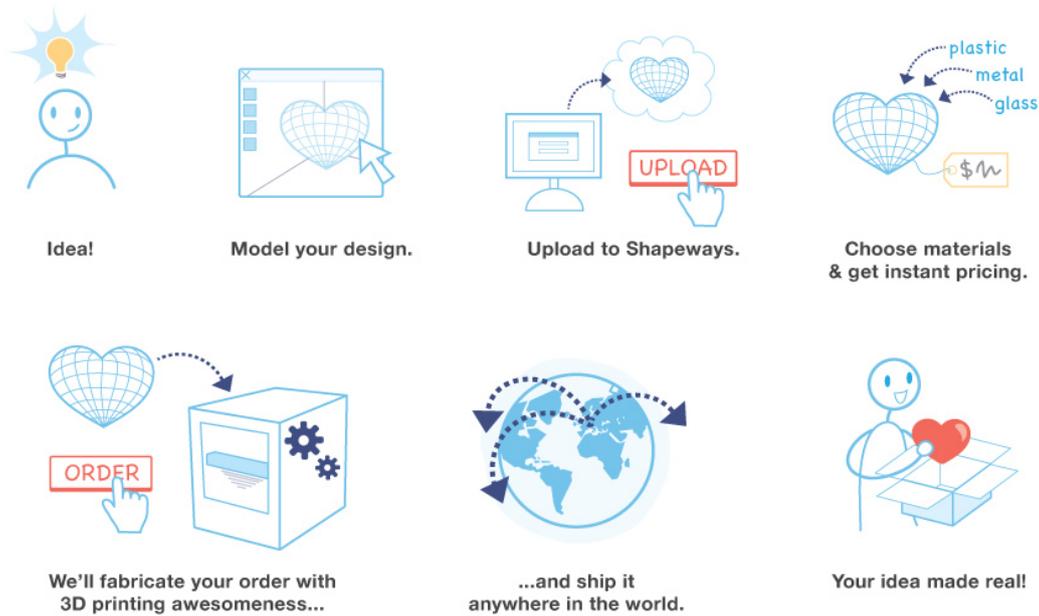


Figure 3. General process of ordering things at Shapeways.

The general process described above is reflected by the structure and user functionality of the Shapeways website (see Figure 5):

1. The catalog of 3D design files is subdivided into different categories: Featured Picks, Art Fashion, For Your Home, Gadgets, Games, Jewelry, Maker/DIY, Miniatures, and All Shops.
2. By browsing through the catalog, a product can be chosen.
3. The product site contains various information, such as the designer's name or keywords, as well as some social functions (e.g., adding the specific design to a favourites list). When ordering a product, it is necessary to choose one out of different possible materials.
4. The list of materials gives a short impression of the condition and color and also shows the different prices next to each material.
5. After choosing the material that fits the customer's needs, the selected item is automatically added to the customer's cart
6. During the final checkout process, address and payment information is required. Furthermore, the estimated shipping time is displayed. At the end of the process, customers instantly receive a receipt according to their purchases. All they have to do from this moment on is to wait until the 3D-printed item arrives.

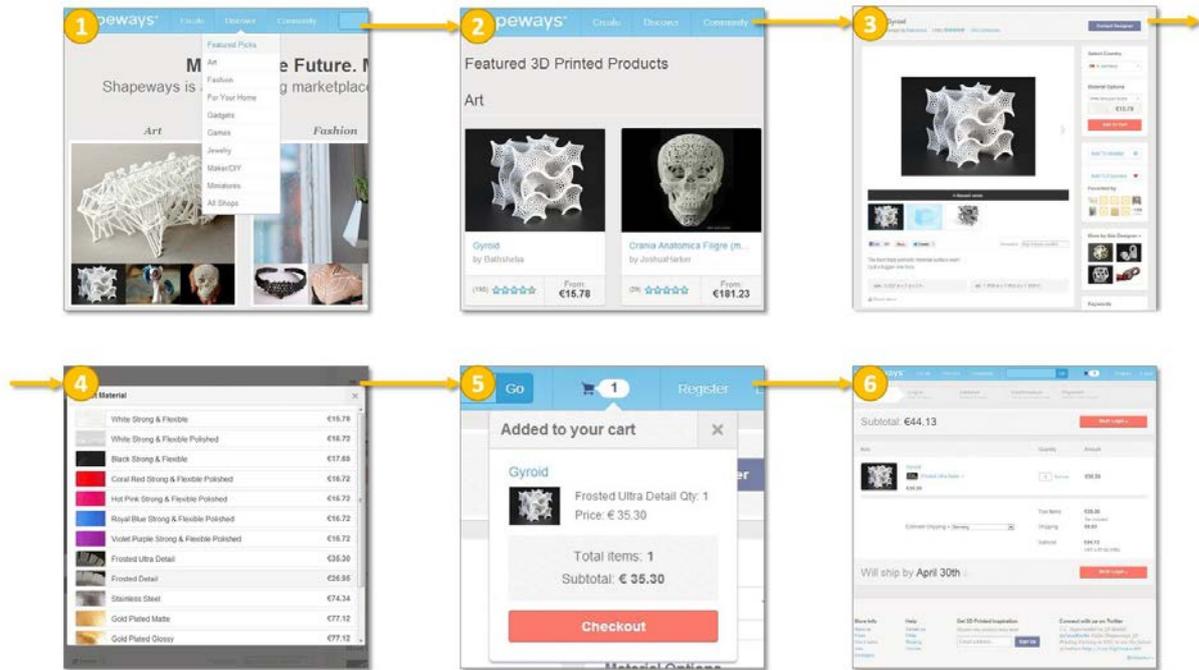


Figure 4. Ordering an item.

### 3.1.2 A Designer's Perspective

Designers of objects can either design and print items just for personal use or open up a shop within the Shapeways marketplace. By doing the latter, it is possible to bring one's own, unique products on the market and to make money by selling these products to other users. Shapeways acts as the intermediary between the two parties and coordinates the whole process of production, payment, shipment, and after sales customer service. For the provision of its platform, Shapeways charges a fee, whenever a customer orders an object from the respective designer's shop.

The integration of custom shops and designs is an important part of Shapeways' business model. Accordingly, Peter Weijmarshausen highlights this feature for designers:

*"An amazing part of Shapeways is that we offer the ability for designers, for product designers, to open their own shop. Again, totally free and in these shops they can sell their product designs and they make a markup that they decide themselves on each and every item they sell, which is really great."*

From a designer's perspective, the process of selling things encompasses three steps:

1. First of all, it is necessary to open a shop. The opening itself requires a registration and the declaration of a PayPal account. This account is necessary to receive the generated profit automatically once a month. Moreover, it is possible to modify the appearance of the shop according to your needs. A customised shop is shown in Figure 5.
2. Right after a shop is set up, 3D CAD files, the digital representations of these items, can be uploaded.
3. During the upload process, the designer can define a retail price. This price contains Shapeways' instantly calculated standard price for the manufacturing of each individual item and a markup, which is defined by the designer himself. If a designer sells an item, Shapeways keeps the standard price as well as an additional 3.5% transaction fee on the designer's markup. The designer in contrast gets his markup minus the transaction fee. As shown in Figure 5, the designer

may set a specific markup for each item depending on the material used for production. This gives every designer full control over the retail price and her/his personal profit per sold unit.

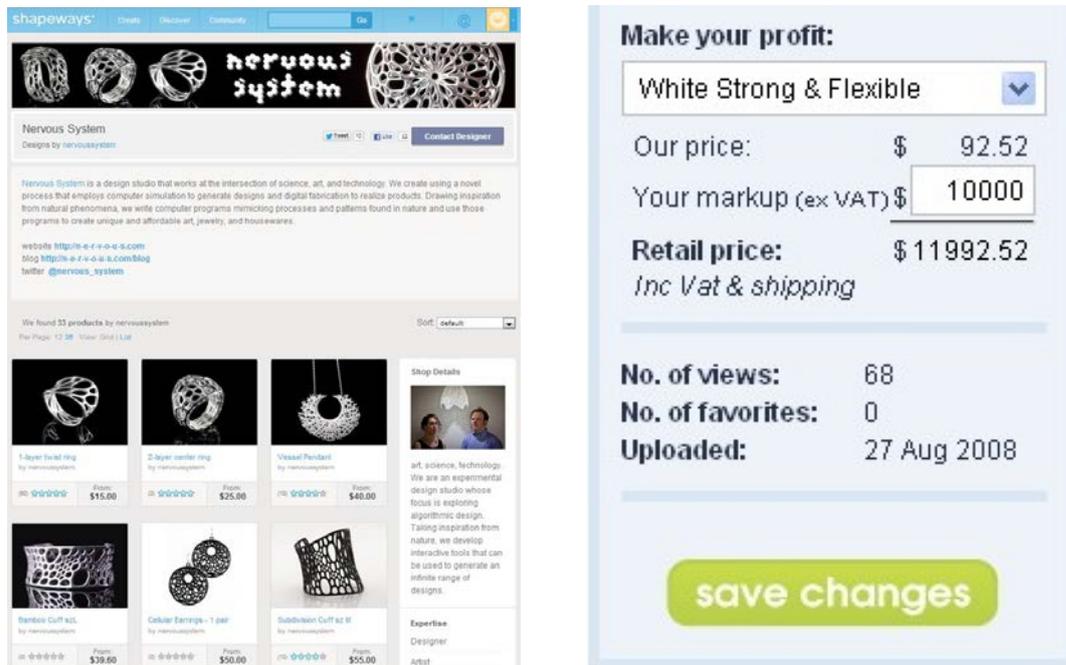


Figure 5. Open a shop on Shapeways to sell your own products: Shop website and ‘Make your profit’ page.

Recent numbers show designers’ growing interest in offering 3D design files for manufacturing. Over 2,500 new shops opened in 2011 alone. One year later the total number of shops reached 8,000, which earned \$500,000 in income during that year. At the end of 2013, the number of individual shops reached a new maximum of 13,500 shops, which means a 75% growth from 2012. (Scott, 2012; Army, 2012, 2013).

### 3.2 Competition

Figure 6 shows a significant growth in all major operating numbers. The number of 3D-printed items passed the mark of 1 million for the first time in 2012 since Shapeways was founded in 2007 and doubled again in the following year. The number of uploaded three-dimensional models as well as the community members also redoubled continuously in each consecutive year since 2011. Another remarkable increase can be seen in the shop owner income. The owners profit accumulated from \$270,000 in 2011 up to \$500,000 in the year 2012. This means a growth of about 85% in just one year.

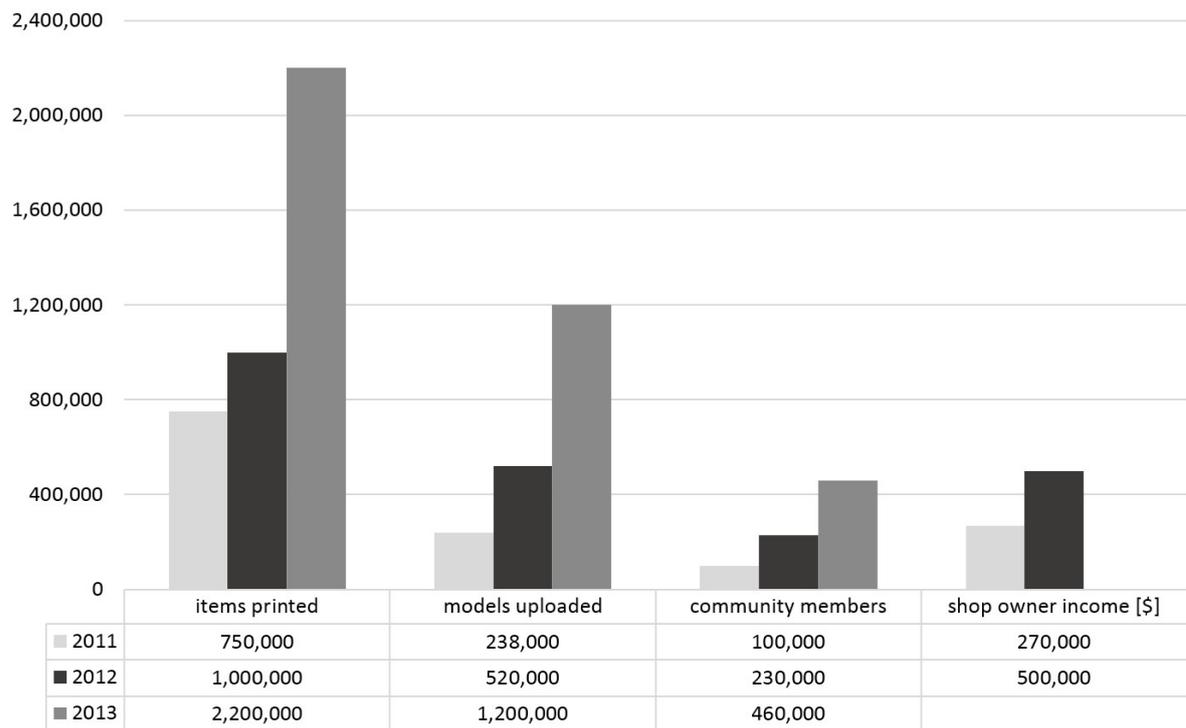


Figure 6. Shapeways business data 2011-2013 (Scott, 2012; Carmy, 2012, 2013).

Despite its remarkable development and this bright outlook, Shapeways has to cope with a variety of competitive threats and business rivals. As the history and latest numbers on the development of Shapeways and AM in general suggest, the whole industry is still continually growing. This growth has attracted several other 3D printing service providers besides Shapeways. Table 3 lists Shapeways and three of its biggest competitors: Kraftwürx in the U.S. as well as i.materialise and Sculpteo from Belgium and France, respectively. Independent of their geographical location, all services operate through a website and offer worldwide shipping of ordered goods. Apart from these general similarities all four 3D printing service providers differ in detail, for example in the available material portfolio or the range of supported file formats for the three dimensional designs.

Service Provider	Shapeways.com	i.materialise.com	Kraftwurx.com	Sculpteo.com
headquartered in	New York, USA	Leuven, Belgium	Houston, USA	Vanves, France
<b>Material</b>				
plastics	alumide, artificial resin, polyamide	abs, alumide, artificial resin, polyamide	abs, artificial resin, polyamide, polycarbonate	abs, alumide, artificial resin, polyamide
metal	brass, bronze, silver, steel	bronze, gold, silver, steel, titan	aluminium, brass, bronze, cast iron, gold, steel, palladium, platinum,	aluminium, brass, gold, platinum, silver, steel, titan
coloured	powder-binder	powder-binder	powder-binder	powder-binder
others	ceramics, flexible	ceramics, flexible, upon request	ceramics, paper, wax	ceramics, wax
<b>Model</b>				
file format	dae, obj, stl, wrl, x3d	3dm, 3ds, dae, fbx, igs, matpart, model,	dae, obj, off, ply, qobj, stl, wrl,	3ds, ac3d, ase, cob, dae, dxf4, iges,

		mxp, obj, skp, stl, wrl	x3d	kmz, lwo, md3, obj, off, ply, q3o, scad, skp, step, stl, vrmf
max. dimension [cm]	76,2 x 39,3 x 39,3	210 x 70 x 80	-	67,7 x 36,8 x 56,5

Table 3. Comparison of Shapeways and other major 3D printing service providers.

Besides the increased level of industry rivalry, another threat arises in the form of business models that may become a substitute to the services offered by Shapeways. As Figure 2 indicates, the number of personal 3D printers sold increases every year. So a huge number of printer owners exists that do not need to charge a service provider in order to be part of the upcoming 3D printing revolution. Furthermore, in the middle of 2013 a new service called ‘3D Hubs’ started to build its business model on the foundation of these decentralized manufacturing capacities. Bram de Zwart, CEO and co-founder of 3D Hubs, describes his idea as follows (Hicks, 2013):

*“With 3D printing, the factories of the future could become community-run micro-operations. Products could be made on-demand and closer to their point of purchase.”*

For this purpose, 3D Hubs provides crowd-sourced 3D printing. Individuals who own a printer may list their machine on 3D Hubs’ website, which aggregates them in the form of larger communities. The biggest community in Amsterdam already allocates 57 printers of private tinkerers, so-called ‘hubs’. The business model of 3D Hubs, in turn, is to connect the community makers with customers that are interested in additively manufactured goods. In contrast to the worldwide shipping option of other 3D printing service providers, one can just pick up the printed product at the local hub, meet the maker and even take a look at the 3D printer.

Another potential threat to the Shapeways business model arises from the availability of free 3D model content. The Shapeways catalogue of 160,000 digital design files that are actively on sale increasingly competes with free offerings in the Internet. MakerBot a manufacturer of personal 3D printers launched an online repository for free digital designs called ‘Thingiverse’ in 2008. Until now, the community of Thingiverse users has uploaded over 200,000 3D models, which have been downloaded more than 21.1 million times. The design files are mostly available under a Creative Commons license, so that anyone can use and alter any of the designs free of charge.

## 4 Outlook

Notwithstanding the seemingly bright future of the 3D printing industry, the Shapeways management team faces various technological and strategic challenges. For example, one crucial factor for Shapeways’ further success is seen in its price policy. Industrial sized machines, which offer a high level of detail and quality, are available to end users by aggregating orders for 3D printed products. This scheduling of workload is one key factor for the prices of the printing service. According to Peter Weijmarshausen, the company has always been interested in driving down costs and believes that a further reduction of costs can be expected:

*“What we have done at Shapeways is we bundle the demand from our community and put as many as possible products into one run and because of that we have been able to run down the costs in a dramatic way. [...] The general price points of 3d printing is still quite high and one of the things that we are really committed within Shapeways is to drive down the costs, so things become cheaper and cheaper. [...] We already have lowered the price point by a factor of four since we began and I still think that we can bring down the price point a lot more.”*

While almost every imaginable form can be 3D printed, even shapes that are just impossible to manufacture with the traditional subtractive methods, the technology has to cope with two main limitations:

*“The biggest challenge at the moment is size. [...] The second big limitation is that we cannot print in multi materials at this moment.”*

Currently the largest machines are capable of printing objects that are about the size of a small fridge. Therefore, in some cases, it is not yet possible to print true to scale objects in one production run. The second limitation refers to the number of available materials. At this point in time, there are a lot of supported materials but AM is still far from competing with traditional processes when it comes to material. As the technology evolves, it might even become feasible in the near future to print several materials at the same time, or even making it possible to print electronic devices like smartphones using polymer-based conductive ink.

Other statements show that the integration of designers and custom shops is part of the company's self-understanding. Because of that, it is crucial to attract designers by refining and developing new tools, addressing the special needs of designers and shop owners:

*“We already have tools on our website that make a designer out of everybody. And when everybody becomes a designer to the degree that you want yourself, than you can really get what you want.”*

Since March 2013, a new application programming interface (API) for software developers is available. The API enables the uploading of 3D models and the calculation of printing prices from both web-based, as well as desktop applications. Furthermore, it is possible to submit orders directly from an app to the printing service provider.

The upcoming 3D printing revolution seems unstoppable and will affect all levels of industry. Peter Weijmarshausen emphasizes the nature of AM as an example of a disruptive innovation that may change entire supply chains:

*“One of the killer apps of 3d printing is already there. And that is that 3d printing is completely disrupting supply chain and manufacturing. Because of our ability to take digital designs directly into final products, the need to make it in a country that has the lowest possible labour is no longer there.”*

Duann Scott, who is responsible for Shapeways' education programs and communication, gives an example what is already reality in New York's new 'factory of the future':

*“We can manufacture in the US with a profit. We are not printing ten thousands; we are only printing what's selling. We do not have to inventory, we do not have a warehouse full of things nobody wants, we do not have to advertise something nobody wants, and we do not have to market to produce demand. Our supply exactly meets demand.”*

According to Peter Weijmarshausen, the mission of the entire Shapeways team has always been “to make it possible for anyone to use 3D printers”. The Shapeways business model made this vision come true but also poses a long-term risk at the same time. To discuss the current situation, Peter gathers his board and discusses the question: In which direction should Shapeways evolve in order to be consistent with technology, competitors and market?

He summarizes his view with the words:

*“If we focus only on the risk, nothing ever happens.”*

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