

## The Rise of Distributed Consumption and Production



### July/August 2013:

The industrial revolution reshaped the world and built efficient and productive economies. Mass production and increasing affluence allowed us to consume an increasing range of goods and services. Trade in goods and services brought the world closer together and allowed countries to specialize based on their resources to lift levels of growth even further. Scale was king.

As we look forward, knowledge is increasingly driving future sources of competitive advantage, while technology advances are reshaping the means of production. The ability to combine distributed knowledge with small-scale production equipment, e.g. 3D printing, close to the point of consumption will completely change the dynamics of many industries, as well as reducing or even eliminating the need for transportation. Services will be reshaped both by putting knowledge and tools in the hands of consumers and customers to allow them to perform the services themselves cheaply and easily, and by the internet of things which means that sensors and computers can perform services invisibly and efficiently. Smart machines and robots will reshape how we get to work – if indeed we need to physically move at all – along with all aspects of production of goods and services.

Add to that a completely new world of consumer behavior in which new consumer groups and communities are emerging, demanding with increasing desire, power and tools to create solutions around their own needs. As such, we are moving from a world of firm mass-customization to a world of co-creation with consumers, from a mindset of “made for me” to “made with me.” And possibly even “not owned by me,” but “shared with me.”

For firms the challenge is to keep up with technology advances and understand how to compete in an environment where scale gives way to agility and flexibility, where small-scale production is economically feasible, and where the power to configure and reconfigure the production network rapidly confers the advantages of speed to market and leading-edge innovation.

In this briefing we explore the changing the world of production and consumption patterns – and what happens when you cannot distinguish who is the producer and who is the consumer. Welcome to a more distributed world.

## Distributed production

According to the magazine [Scientific American](#) nothing will impact how things are made, and what they are capable of, more than the materials that manufacturers use to make those things, from cutting-edge foams to coatings, metals and other substances. However, these new materials are the product of information, knowledge and new technology, all of which are rapidly changing the landscape of manufacturing. Technology such as open source software and 3D printers are having a disruptive impact on the way products are being designed and produced. Mass customization is increasingly taking over the world of mass production, involving consumers in the process of creating the exact product they crave.

## In Action!

**Will 3D printing completely change manufacturing?** Only few weeks ago a gun was made using a 3D-printer. Not the best way to think about this technology becoming more mainstream! While the hype about 3D printing is hotting up the realities are somewhat different. According to Carl Bass, president and CEO of [Autodesk](#), a provider of 3D design, engineering, and entertainment software, 3D printing will not replace other manufacturing technologies but rather complement them. Why? Some of the reasons include the fact that it is just a part of the accelerating software-controlled manufacturing trend which also comprises laser cutters, mills, lathes, routers, and industrial robots. This trend is getting increasingly powerful, affordable and approachable. In addition, 3D printing remains an immature technology and everything from cost and time to amount of material increases exponentially with the volume of objects produced. He points out that, *“Instead of a mass-manufacturing marketplace where everything is made the same way, I expect the “production” trajectory for 3D printing to start with low-volume, high-value objects like prosthetic devices or bespoke items like [jewelry](#). Most 3D printing will be personal and custom, similar to the way we use our inkjet printers today.”* (Source: [Wired](#))

**Towards mass customization and personalization:** The step from mass production towards mass customization has been evolving for many years and is not really a new concept, e.g. [NIKEiD](#) was initially launched in 1999 letting customers customize clothing purchased from [Nike](#). However it is only in recent years that the trend has really picked up among bigger companies. Today mass customization almost seems to be the standard of the 21<sup>st</sup> century as most established companies as well as start-ups are following in Nike’s footsteps. Recently the concept has found its way into the pharmaceutical industry where [Eli Lilly](#) is focusing on tailored therapeutics, using advanced diagnostics to identify specific subgroups of patients for whom different drugs have the highest efficacy. The U.S. personalized medicine market is expected to grow at 11% annually rate to US\$450 billion by 2015. (Source: [McKinsey, Manufacturing the future: The next era of global growth and innovation](#))

**Crowdplanning my city:** Involving people in urban and city planning in order to meet the actual need of citizens and population is growing. Today many collaborative platforms are evolving empowering people around the world to engage and participate in shaping their own communities. One is the platform [Neighborland](#) that allows people to share their ideas for improvement and gather support from people in the community. Another example is the urban planning game [Block by Block](#) which is a collaboration between [UN Habitat](#) and the gaming company Mojang (the creators of the building game Minecraft). Using the popular Minecraft servers, [Block by Block](#) gives people and especially the youth an opportunity to show planners and decision makers how they would like to see their cities in the future. There are numerous great platforms out there and the last one to mention here is [My ideal city Bogata](#) which is using crowdsourcing and crowdfunding solutions to solve the problems of Bogata in Columbia –

one resulting project is the 3200 investors (ordinary people) who decided to put together their money to make the first skyscraper in Colombia. (Source: [PSFK](#)).

### **Look Out For...**

**Is this the new world of movie making?** You don't really need BBC, CNN or Hollywood to control what you are seeing because today everybody can do "something with media" as technologies provide hundreds of different ways to produce, consume and share content. New technologies and a shift of peoples' mind-sets towards active participation add to the world of entertainment. Take [Wreckamovie](#) that is using a model from the social networking world and the Creative Commons/Open Source movement. It sets aside traditional studio production methods by using a collaborative film production platform making it possible to collaboratively produce professional quality A/V content of all types: from short films to feature films and for all distribution screens – from Internet and mobile to film theater. (Sources: [Clarkesworld](#) and [Wreckamovie](#))

**The intellectual property threat:** Do we need to prepare for the next copyright war as 3D printing evolves? This new technology could potentially be good news for intellectual property lawyers. It is only two years since the first known notice for a 3D printable object was sent. And things could get increasingly complicated with consumer level 3D printing. In February 2013 [HBO](#) sent a cease-and-desist letter to designer Fernando Sosa as they wanted him to stop producing and selling a 3D printed iPhone dock modeled after the Iron Throne chair from the popular HBO TV series Game of Thrones. Even though Sosa designed the dock himself in Autodesk Maya, HBO owns the rights to the show, its characters, and objects that appear onscreen. Today copyright application to 3D printing is not straight forward, so time will tell, during filed lawsuits, how IP laws will be applied to this new technology. (Source: [Readwrite](#))

**What's next – 4D printing?** Earlier we mentioned that 3D printing is still an immature technology but that hasn't stopped [MIT's](#) Massachusetts Institute of Technology architect and computer scientist Skylar Tibbits from taking it to the next level – self-assembling 4D objects. The self-replication powers of Mother Nature were the inspiration for the concept. The process could in the future be use to install objects in hard-to-reach places such as underground water pipe and build furniture, bikes, cars and even buildings. To see a video of Skylar Tibbits' TEDTalk in Los Angeles 2013: The emergence of "4D printing" click [here](#). (Source: [BBC](#))

### **Distributed consumption**

Today we have the information and technology to interact, transact and socialize with a much greater range of people, communities and organizations around the globe than at any time in human history. The influence of consumers is evolving. The "influenced consumers" of decades past are becoming the shapers and influencers in their own right. Connectivity is giving consumers a voice and the ability to share information, fostering a new type of consumer that demands more involvement in and personalization of experiences and products. These constantly connected consumers never stop craving real-time information, with access to knowledge and rapid, sophisticated search tools fuelling their high expectations. It's all part of the evolving sharing economy, driven not only by sharing knowledge but also by sharing goods and services as environmental concerns increase and financial pressures bite. In this world, trust is critical, as we increasingly let stranger enter and share our personal space.

### **In Action!**

**Sharing is becoming big business:** Since [Airbnb](#) was launched in 2008 more than 4 million people have used it—2.5 million of them in 2012 alone. In November 2012, [Lending Club](#) – one

of the leading peer-to-peer money lending platforms in the US – exceeded US\$ 1 billion in personal loans. Since the company launched in 2007, lending has more than doubled year-on-year. In Europe, the market for car sharing services is estimated to grow from 0.7 million subscribers in 2011 to 15 million by 2020. Rachel Botsman, author of “What’s mine is yours,” says the consumer peer-to-peer rental market alone is worth US\$26 billion and [Forbes](#) anticipates that the market will grow 25% more in the coming year. Big corporations increasingly want in, so much so that there’s now a VC firm, Collaborative Fund, that’s dedicated to investing in sharing-based startups. (Sources: [Trendwatching](#) and [Boston Magazine](#))

**The age of trust:** Is trust becoming the cornerstone of the new economy? The rise of the sharing economy is based on trust between provider and consumer. Every day we push aside expert opinions and rather trust our online peer-to-peer network reviews and opinions. Also as online shopping is getting increasingly popular consumers are handing over personal information to vendors, which for many have led to concerns about data privacy. However, a recent study from [Accenture](#) reveals that among 2,000 U.S. and UK consumers 49% of those surveyed said they are receptive to having trusted brands track their data in return for a personalized shopping experience that will provide relevant recommendations, targeted offers, and information on future product availability. This is despite 86% of the respondents saying they were concerned that their data was being tracked. It looks like our craving for personalization is overriding our fear for data privacy. (Source: [Digital Trends](#))

**The inequality divide:** The size of the “global middle class” is poised to increase from 1.8 billion in 2009 to 3.2 billion by 2020 and 4.9 billion by 2030 with the bulk of this growth coming from Asia: by 2030 Asia will represent 66% of the global middle-class population and 59% of middle-class consumption, compared to 28% and 23% respectively in 2009. While this is a good sign, there is a growing concern about global inequality among the world’s consumers. The U.S., in particular since the financial crisis, is often mentioned in connection with inequality. However, a recent survey from [Pew Research Center](#) found that a majority of people in the 31 of the 39 nations surveyed said that the wealth gap in their country has become worse over the past five years. Reports of increasing income inequality are particularly high in the advanced economies, where a median of 80% says things have got worse, compared with medians of 70% in the developing economies and 59% in the emerging markets.

### Look Out For...

**Will the consumer be the new designer?** For the majority of consumers 3D printing is unknown territory. Sales of 3D printer have been limited to offerings from specialist and online shops. Now, though, you can pick up a 3D printer from [Staples](#), the first major US retailer to offer 3D printers on its shelves. It is called the [Cube](#) and cost US\$ 1299.99. This could be the beginning of a new way to make things as it gives people opportunity to create what they want, whenever they want it, and in an easy way. It takes self-creation and customization to new levels while fundamentally transferring the role of the designer to the consumer. However customizing a product can only be done to a certain extent as high customization requires a high level of investment in time, skill and ability. (Sources: [gizmag](#) and [PSFK](#)). Have you thought about the potential impact of 3D printing for your company?

**Pop-up retail:** Whether the emerging trend of [pop-up stores](#) is used to test a new product, get rid of overstocked items, as a seasonal sales channel, or to establish brand awareness it is definitely on the rise. Research from [IBISWorld](#) found 2,380 pop-up shops in the U.S. in 2012, (68.1% of which were Halloween-themed), up from 2,043 three years earlier. Among others [Target](#), [Nike](#), and [Gap](#) make use of the concept. It is not only gaining popularity in the U.S. and

definitely not only in retail. One example is the [London's Crazy Horse Paris's](#) avant-garde cabaret performed at a custom-made temporary theater in South Bank in the fall of 2012. Another is the [Cube by Electrolux](#), a restaurant that has toured the world touching down in Brussels, Milan and London. And restaurants with end dates force diners to plan ahead! Also Design Hotels' [Papaya Playa Project](#) has appeared on a beach near Tulum, Mexico, with 85 cabanas and casitas and a restaurant. (Sources: [Wharton](#), [Travel+Leisure](#), [Cradlepoint](#)). Is your company ready to participate in the pop-up retail trend?

**The rise of the connected, real-time consumer:** As the use of smartphones and tablets is exploding so is the number of consumers getting accustomed to the flow of real-time information. An increasing number of businesses are now offering solutions for time poor, real-time information craving consumers. One is the [aisle411](#) app that offers detailed in-store shopping maps for big stores in the U.S. such as Lowe's, Home Depot, Albertson's and Safeway, locating items in inch-specific detail and providing routes for getting in and out as quickly as possible. While online channels in the U.S., one of the worlds biggest e-commerce markets, still only account for about 9% of direct purchases research by [Deloitte Consulting](#) reveals that 41% of US retail sales are "digitally influenced" and suggests that up to 60% of transactions will be influenced by phone or internet, or a combination, within the next six years. (Source: [Vodafone Global Enterprise](#)). What kind of real-time solution can your company offer your customers?

### When you can't tell the difference – The maker movement

Manufacturing of goods is one of the biggest industries in the world and with the size of the "global middle class" increasing to 4.9 billion by 2030 demand for goods is unlikely to slow down. Historically manufacturing has been driven by companies with the means to operate at large scale. However, in the 21<sup>st</sup> century the internet and technology advancements are shifting the advantage in production away from scale – and therefore away from the owners of large scale facilities – towards flexibility and agility. DIY (do-it-yourself) has always existed but is today rapidly transforming from the traditional "how to mend a sock or change a tire" towards the ability to make or design something for yourself or others. As more and more people are getting involved, it is not only starts-up but also larger companies who are taking advantages of this growing "maker" culture.

### Examples of a thriving maker movement

- **3D Hubs:** [3D Hubs](#) is a manufacturing network started in Europe, which distributes products to communities around the world. It is like Facebook, just for products. The idea of the company is to network 3D printers together through a web interface and get users to register their printer availability on a map so users can find the nearest one. Then people can select a hub near to where they want to send an object, and ask a local Hubber to 3D print and deliver it. Does it have the potential to transform the global manufacturing economy? Well, at least that's what the Dutch founders Bram de Zwart and Brian Garret are aiming for. (Source: [3D Focus](#))
- **The entrepreneurial mindset:** Being an entrepreneur is not a just about starting a company. It has become a mindset. The survey '[Millennials and the Future of Work Survey](#),' commissioned by [Millennial Branding](#) and [oDesk](#) has found that being "an entrepreneur" is defined today as someone who has a certain mindset, according to 90% of the professionals surveyed versus only 10% who chose "someone who starts a company." When asked to define an entrepreneur, aspects of this mindset mentioned included being a "self-starter," "risk-taker," "visionary," and someone who "spots opportunity." Why does it matter? As for product and experiences, it is increasingly about freedom to choose and customize your work life.

- **Maker Faire:** In 2005 Dale Dougherty of [O'Reilly Media](#) launched the [Make Magazine](#), a quarterly journal about DIY projects. The year after he launched a nationwide series of [Maker Faires](#) that became the first showcases for the emerging “Maker Movement” and a growing DIY culture. Since it originated this subculture has held events on a regular basis around the world and in 2012 a crowd of 120,000 people visited an event in San Mateo, California. (Source: [Wired](#) and [On 3D Printing](#)).

#### Examples of how the maker movement is entering the “big business” space

- **Quirky:** With the slogan “We make invention accessible,” a member community of 180,000 people, and an online collaborative crowdsourcing platform, [Quirky](#) helps people and aspiring inventors bring products to life. Products that are chosen get designed, manufactured and marketed by Quirky. The inventor and any other contributors then get up to 30% of any resulting revenues. Since its launch in 2009, Quirky has collaboratively developed over 200 new products. National retail partnerships include [Apple](#), [Bed, Bath & Beyond](#), [Target](#), [Barnes & Noble](#), [OfficeMax](#) and many others. (Source: [GE Garages](#))
- **GE Garages:** [GE Garages](#) is a high-tech, hands-on lab space where makers can come to learn modern ways of prototyping and manufacturing new products using devices like laser cutters, 3D printers, CNC mills and injection molders. It aims to spark interest and engagement for modern making, from prototyping inventions to teaching modern manufacturing-based technologies through hands-on experiences. Developed in partnership with [Skillshare](#), [Quirky](#) and [Make Magazine](#).
- **RadioShack:** [Radioshack](#) has also found its way to the exciting new maker movement. In cooperation with [Make Magazine/Maker Faire](#) RadioShack has [launched](#) the cobranded product line Arduino, a popular open-source electronics platform that lets makers easily create interactive objects. It includes LEDs, robotics kits for kids, microcontrollers with Wi-Fi, a line of mini-PCs, and tools. All of these items will be sold exclusively through RadioShack stores and by [Make](#) online.

**In September: Look out for trends in action on moving from unemployability to future skills!**