

IMPACT OF THE MAKER MOVEMENT

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A Future of Potential

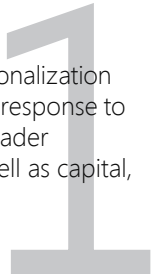
We are on the cusp of an opportunity to more fully tap into our creative potential, driven by significant technological innovation that is democratizing the means of production and enabling connections between resources and markets. Realizing this opportunity will require re-thinking and redesigning all of our major institutions, innovating the way we work, learn and consume. It will require developing ecosystems that can more effectively integrate distributed production by smaller entities with the scale and scope that can be provided by larger entities. We will for the first time be able to truly “race with the machine,” harnessing the power of the machine to unleash and amplify our creative energies. More broadly, we will finally make learning a true lifetime journey, find new sources of meaning, and develop ways to connect more richly in physical space so that we all benefit and prosper from the new opportunities that are now available.

What does this mean? Over the past decade and a half, we’ve witnessed tremendous disruption across the economy at a speed that previously seemed impossible. It all revolved around bits—digital was the edge, the frontier, we connected rapidly and globally through social media, and new business and institutional models evolved to fit the digital world. Now, the edge has become the core—the world is digitized. What we learned with software, web services, and apps about innovation, iteration and collaboration is being applied back to the physical—bits to atoms. Physical “making” is the new frontier. But this time, the atoms are supported by bits, enabled and enhanced by technology that allows individuals everywhere to connect to the same resources and use the same tools.

Collaborative production will define the future of work

The Maker Movement will emerge as the dominant source of livelihood as individuals find ways to build small businesses around their creative activity and large companies increasingly automate their operations. Traditional employment may decline as work is organized primarily around projects rather than job titles, however small businesses, enabled by the technologies of production and access (to funding, design, resources, tools, and markets), will collaborate across a flexible ecosystem and no longer require scale to be viable. Scale operations will continue to have a role, but will largely use automated, robotic production rather than labor.

A greater portion of the labor (and value creation) will reside in the customization/personalization component, including the transition of many “aftermarket” activities into pre-market, in response to changing consumer expectations. The shifting locus of value creation also reflects a broader definition of value creation that includes the exchange of ideas, learning and skills, as well as capital, in the marketplace.



SIGNALS

- Over 70 Kickstarter-funded Makers, who collectively received 23 million dollars in pledges from over 138,000 individuals, present at the 2014 Bay Area Maker Faire
- Shapeways announces over 13,500 online storefronts selling 3D designs in 2013
- ETSY reports \$1.35B in total merchandise sales in 2013 from over a million active shops
- Rethink Robotics launches safe, capable, intelligent, and affordable industrial robot – Baxter – for \$25,000
- Foxconn deploys 20,000 robots as part of its plan to have over a million robots in its factories over the next few years

The Maker ecosystem will disrupt today's large enterprise

Individuals and small businesses will come together, both in urban areas and in virtual communities, driven by a desire to learn faster by working together. Within these ecosystems, participants will combine and recombine as necessary to exchange skills, capital or learning, creating a resilient and agile network structure that supports the decentralization of some activities, including innovation and some types of production, currently done within large enterprises.

R&D effectively moves out of the corporate environment into niche development by individual innovators and eventually works back into the core business. Platforms will allow these ecosystems to access the resources and tools that were historically available only to large enterprises, on a shared or rental basis. This opens up the potential for new types of business offerings, including the supply chains that will evolve around these ecosystems.

Successful large enterprises will find ways to provide scale- and scope-based services to these Maker ecosystems in the form of infrastructure services (e.g., contract manufacturing and logistics) or platforms (e.g., product platforms or data aggregation) that others can build upon. Large enterprises also have the opportunity to become trusted advisors to a growing array of customers, proactively recommending to them the most relevant Maker products based on a detailed understanding of the context of each customer.

SIGNALS

- Factorli gets \$10M in seed funding to create a 25,000 sq. ft industrial manufacturing space in downtown Las Vegas aimed at start-ups needing production up to 10,000 units
- Manufacture New York announce 2014 opening of 160,000 sq. ft clothing design and production center in Brooklyn, New York with potential to house 70 resident designers and large related community
- GE partners with Local Motors to launch FirstBuild, an open platform to source collaborative ideas online from a community of engineers, scientists, fabricators, designers and enthusiasts to prototype, iterate and refine existing GE products, as well as build and commercialize various new designs
- e-NABLE's \$50, community led, open sourced, 3D printed hand matches up against \$42,000 prosthetic
- Facebook Buys Oculus VR, a crowd-funded virtual reality gaming company, for \$2 Billion

Empowered demand drives supply, and Manufacturing and Retail follow the customer

The Maker Movement will reshape the retailing world by helping to drive the growth of both online retail platforms and a resurgence of fragmented “Mom and Pop” retailing in physical space. As consumption patterns change to reflect values, including the desire to participate rather than be a passive marketing target, the “long-tail” of demand widens and drives supply decisions. Consumers also begin to see themselves differently in a world of kits and customization and personalization.

A class of goods will emerge that is broader than just artisanal or craft where local/personalized production is valued and can be done affordably at smaller scale. The proliferation of products and disaggregation of demand will paradoxically create advantage both for online platforms that can overcome the limitation of scarce shelf space (even in big box retailers) as well as for specialized retailers who can help curate products to address specific niche needs and help foster more intimate connections between local communities of Makers and the people buying their products.

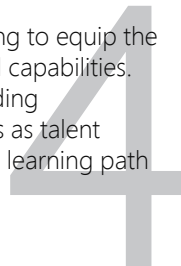
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- Radio Shack teams up with PCH International to create a retail pipeline for hardware startups
- Martha Stewart curates over 1,100 small batch, artisanal items on her eBay site, "American Made"
- Consumer participation increases on niche, Maker-made e-commerce sites like Etsy, Grand St, Grommet, and Shoploket
- Major shoe brands from Nike to Converse and Jimmy Choo allow consumers to create customized shoes
- Over 70 craft beer brewing establishments apply for permits in San Diego in 2014

In Education, practice trumps theory

The Maker Movement, in conjunction with other pressures, will have a disruptive impact on traditional educational institutions as it shifts the focus of learning from theory to practice and sets the stage for more distributed and sustained active learning where the individual seeks out and crafts educational experiences, formal and informal, tailored to her unique needs. Lifetime learning will be the main event rather than a secondary creative or enrichment activity, and collaboration, mentoring and reverse mentoring will be key components.

Many other institutions will play a significant role in promoting and supporting learning to equip the workforce with the tools, access and community to continually develop new skills and capabilities. Successful educational institutions will find ways to support lifetime learning by providing infrastructure that will help these learning ecosystems grow or positioning themselves as talent development agents that will work with individuals throughout their lifetime to craft a learning path that will help them to achieve more of their potential.



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- TechShop Chandler, located in the Arizona State University (ASU) Chandler Innovation Center, provides space for ASU students to connect and collaborate with Chandler-area makers and entrepreneurs
- Massachusetts Institute of Technology (MIT) evaluates students' maker portfolios as part of the application process
- A recent survey of 143 librarians noted that 41% of respondents (from 30 US states and 7 countries) currently provide makerspaces in the library
- 10 prominent universities commit to supporting the growth of and involvement in the Maker Movement in an open letter to president Obama.

With shared production and marketplaces in communities, agency trumps apathy

The Maker Movement will become a key vehicle for pulling edge communities—artisans, disadvantaged groups, youth, industrial arts communities, temporary workers-- into the core by providing them with access to more and more powerful tools of production through shared platforms and helping them to connect with individuals and resources that can amplify their efforts and build viable commercial enterprises.

If local governments find ways to relax restrictions and create space, negatives like unregulated micro business activity can be seen as positive, early-stage entrepreneurial activity. More broadly, the Maker Movement will become a key driver of the local commerce movement, helping people connect in local areas and develop much deeper relationships with each other by witnessing and participating in the process of creation together. Finally, the notion of fragmentation will transform our social ideas about how we create identity, how we learn, and how we form social capital.

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- 100 Maker Faire's were hosted in 2013 across the globe allowing over 530,000 people to experience a Maker Faire
- Hackerspace.org identifies over a thousand active hackerspaces world wide
- Jobs in the manufacturing sector double in San Francisco – currently more than 4,000 manufacturing jobs in 500 companies; up from 2,500 jobs in 250 companies in 2011
- BALLE, a business alliance supporting local business growth, boasts 30,000 innovators, 80 local business networks and over 450,000 jobs