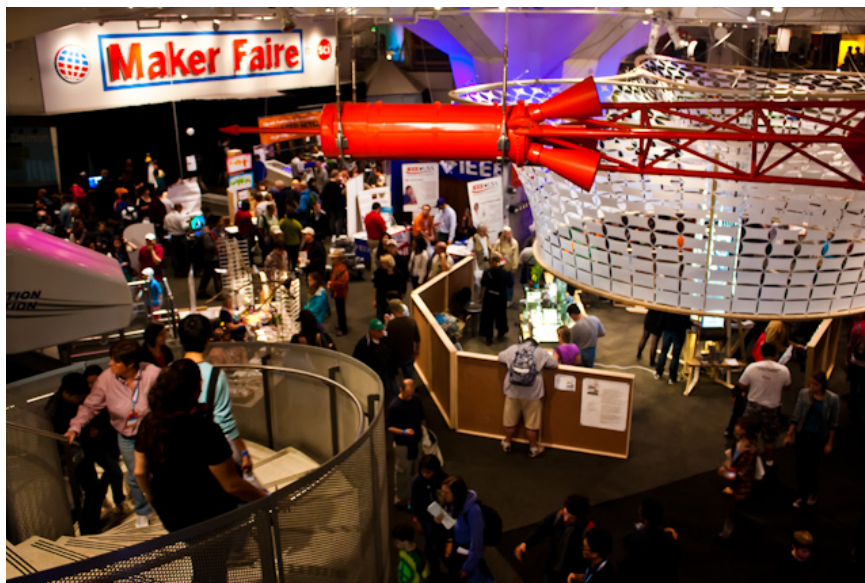




The “Maker Generation”

By ALEX ZENK

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We live in a fascinating time. With the invention of the internet it is now easier than ever to access the world’s information and learn. An answer to almost every burning question and new skill lies no further than the device in our pockets. Computers are in nearly every household, and new technologies are constantly being introduced. Along with this has come the constant falling cost of technological parts and gizmos, which are ever easier to find through the internet. And most importantly, forums, social media, and now physical spaces are allowing those who once tinkered in the quiet of their own homes conjugate and share ideas. This is the spark of the maker generation.

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Most people live their lives as consumers, buying and using devices which suit their needs and never thinking twice about the design or manufacturing behind them. To them, these things just need to work, and it is the job of somebody else who is smarter and more creative to generate them. While it was once true that it required hundreds of thousands of dollars to design and manufacture even common items, new technology is actually starting to change this. Since the early 2000s digital manufacturing equipment, such as computer controlled routers, mills, and even 3D printers, has continued to drop in price. In return, this has greatly reduced the design and prototyping costs of almost everything we own. Prototypes which once cost massive amounts in machining can now be created by the engineers themselves. And even better, these machines are becoming even more affordable—to the point where they are slowly becoming available to the general public. While it may seem that access to this kind of technology would excite relatively few, in reality the interest is staggering.

Various organizations supporting “makers” have popped up in recent years. One of the biggest being Maker Media. In 2005 Maker Media began to publish how-to books and the bimonthly Make: Magazine. A year after, they established the first Maker Faire, a convention which is described as “a showcase of invention, creativity, and resourcefulness, and a celebration of the Maker mindset.” It is in essence a place where makers can show off their projects, talk to others, and get inspiration. The unprecedented success of the event has led to 3 major Maker Faires throughout the country, and dozens of mini Maker Faires on top of that. Maker Media is often considered to be the backbone of the maker movement, but it is a relatively new concept, the hackerspace, where the real work is being done. Hackerspaces are named after MIT’s definition of a hacker, which is not necessarily computer-based. According to this definition, “[A Hacker] is a person who enjoys exploring the details of systems and stretching their capabilities, as opposed to most users, who prefer to learn only the minimum necessary.” Essentially, a hackerspace, which is also sometimes referred to as a makerspace, creatorspace, or techshop, is a physical location where members share tools, resources, and knowledge. It is somewhat like a gym—you pay to be a member, and are then allowed to use the machines you need. Zach Kaplan is the CEO of Inventables.com which designs and sells many of the tools and materials used by makerspaces across the world. He describes hackerspaces as “[having] the potential to give anyone the tools they need to become makers and moving them from passive users to active creators.”

Many believe that this new interest in “making” really isn’t new at all. Dale Dougherty, the head of Maker Media, points out that makers have been around forever. In fact creation is at the very core of human nature. For ages, woodworkers, metalworkers, hackers, and other creative professionals and hobbyist have gone about their interests individually—they were seen as separate cultures. However, recent interest in new tools and technologies has started to bring these creative individuals together. Dougherty sees the maker movement as something similar to the personal computer revolution that took place in the 70s and 80s. In a recent TED talk Dougherty compares these two movements directly. Explaining that Steve Wozniak frequented the Homebrew Computer Club—a space where hackers would meet to create their own PCs. This was at a time when most computers were only found in large corporations and businesses, but obviously Wozniak played a huge role in the personal

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computing industry, and is a huge part of why we are living in the computerized world we do. This is a pretty great example of the potential that getting the right tools to the right people can have. The maker movement has the power to not only help people find their passion, but also allows them to use their passion to make a living, and perhaps even better society. Even for those who don't have the next million dollar idea, a makerspace can be great place to just do what you love.

So how does a “maker” get started? This is a question that Dougherty is often asked, and one that he addresses in almost all of the talks that he does. There is always room for more makers, and he explains that they don't need to know how to do or make anything in particular, they just need to be interested in making something. Dougherty describes makers as evolving through three stages. They are Zero to Maker, Maker to Maker, and Maker to Market. The first is Zero to Maker, these are the people who know what they want to make and are in the process of learning exactly how to make it. This is at the core of any project, however people in this group have relatively less experience in their area, and are learning as they go. The second type of maker is Maker to Maker, these are the people that have already learned the ins and outs of an area or two, and have decided to collaborate with others either virtually or physically. These people work on projects with others, learn and teach one another, and are constantly building upon the skills they have already acquired. Finally there is Maker to Market. Makers in this group have decided to turn their passion into a career, they have come up with a great idea and are working at bringing it to market. Even though Dougherty acknowledges that these three “evolutions” are at the heart of the maker movement, he does note that they don't necessarily need to be done in the order stated. Sometimes the best way to learn something is to just jump in with both feet and go to your local makerspace.

The next few years should see the maker movement really start to take off. Hackerspaces are continuing to show up throughout the country, and digital fabrication is continuously coming down in both cost and complexity. With the added buzz of Maker Faires and online forums, makers are really beginning to collaborate in ways we haven't seen before. Complex open source projects are being created by collaborations of makers in ways previously only seen in large companies. The maker movement has already sparked hundreds of startups—as is clearly evidenced by crowdsourcing sites like Kickstarter, and this number will only continue to grow as could-be entrepreneurs see these success stories. Furthermore, the maker movement has already sparked the interest of many major tech companies like NASA, Autodesk, and Intel. When asked what Intel was doing at Maker Faire, CEO Brian Krzanich stated “This is where innovation is occurring and Intel has a great interest in helping spur innovation.” This seems to reflect the mindsets of many other tech companies as well. Intel, Google, Autodesk, Dremel, Texas Instruments, and Facebook are only a handful of the companies currently sponsoring Maker Faire. Several of these companies are even providing cheap or even free products geared specifically towards makers, like Autodesk's TinkerCAD, or Intel's Galileo microcontroller board.

The maker movement is finally showing the world the cool side of engineering and science. It is getting adults and kids alike excited about the immense world of possibilities technology opens up, and most importantly showing them that it is within their grasp. The maker movement proves that normal people can build awesome stuff, and that projects only get more

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awesome with collaboration. Furthermore, it teaches people how and why to learn, and provides kids with the “why” behind the science. With the continued push to increase the number of students entering fields attaining to Science, Technology, Engineering, and Math, it is no wonder the maker movement is creating such a stir. If the maker movement continues on the path of the PC revolution 30 years ago, and every bit of evidence suggests it will, there should be no doubt major innovation is on the horizon.

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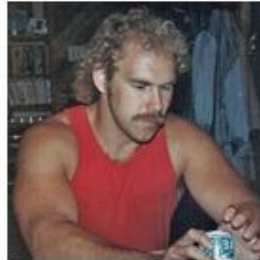
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