

The Maker Movement

When I talk about the maker movement, I make an effort to stay away from the word “inventor”—most people just don’t identify themselves that way. “Maker,” on the other hand, describes each one of us, no matter how we live our lives or what our goals might be. We all are makers: as cooks preparing food for our families, as gardeners, as knitters. Although this view may not be part of mainstream thought, there once was a time when most Americans commonly thought of themselves as tinkerers. Tinkering used to be a basic skill, and you could get a little bit more out of life than the average person if you had good tinkering skills—if you could fix your own car, for example, or improve your home or make your own clothes. I think we lost some of that over the decades, but I also think it is coming back, for a lot of reasons. While people today may not treasure this ability out of the same sense of necessity as they once did, they are finding their lives enriched by creating something new and learning new skills.

Make magazine, which I founded in 2005, harkens back to the magazines that hit their peak in the mid-20th century, like *Popular Mechanics*, which had the attitude, if it’s fun, why not do it? Such publications often helped people to start a hobby and learn new skills. Moreover, they helped the new hobbyist find a community of likeminded tinkerers to talk with about it.

Maker Faire, which started in the Bay Area in 2006, a year after the magazine, expanded this idea of learning and community and created a space where readers of the magazine could get together to extend the conversation. At the Faire, a maker could put an object they created up on a table and have people ask them about it. Having that kind of conversation with a range of people is the essence of the magazine, of the Faires—and perhaps of the whole movement. The excitement of making things extends to kids as well. Many begin at a young age to explore and develop things they really care about, so we have made the Faires a family-oriented event that features many exhibits by younger makers. We also hold workshops and competitions for people of all ages. Since the first Maker Faire held in San Mateo, California, we have held Faires in Austin, Texas; Detroit, Michigan; and New York City. The most recent New York City event, the World Maker Faire, attracted over 100,000 attendees. In response to requests from fans, we have begun to hold mini-Maker Faires in cities around North America.

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THE MAKER MOVEMENT

The maker movement has come about in part because of people's need to engage passionately with objects in ways that make them more than just consumers. But other influences are in play as well, many of which closely align the maker movement with new technologies and digital tools. Makers at their core are enthusiasts, such as those engaged in the early days of the computer industry in Silicon Valley. We've lost sight of that aspect of the computer industry because the devices they create have become so widespread and people no longer need to be enthusiasts to use them. But those makers in the early days of the computer industry were essentially playing with technology. They didn't know what they wanted computers to do and they didn't have particular goals in mind. They learned by making things and taking them apart and putting them back together again, and by trying many different things.

Today's makers enjoy a level of interconnectedness that has helped to build a movement out of what in the past would have been simply a series of microcommunities defined by a particular hobby or activity. Although the movement is largely driven by the Internet, events like Maker Faire allow people to mix with many different groups. People take a little bit from here and a little bit from there, and the resulting mash up leads to some pretty exciting creations. Maker Faire has brought together makers of things who rarely rub shoulders in our everyday world. Whether it's arts and science or crafts and engineering, they seem to belong together, connected by enthusiasm and a common passion.

EXPANDING TO EDUCATION, BUSINESS, GOVERNMENT

A lot of institutions, such as schools, corporations, or government departments, think they understand what drives innovation and that they can manage it in a controlled environment. At Maker Faire, we see innovation "in the wild." It hasn't been "domesticated" or controlled, you have to look for it, and to turn a corner at any of our Faires is to see something you haven't seen before. I believe that in the same way U.S. companies studied the secrets of the Japanese manufacturers decades ago, the institutions around us should look to the maker movement for tips on how to create an ecosystem of talent, connections, and learning that will lead to a truly innovative economy and society.

I feel strongly about this as it relates to the topic of education. A century ago, psychologist and education reformer John Dewey extolled the virtues of learning by doing, and contemporary science of the brain confirms the importance of tactical engagement and of using our hands in the learning process. Kids today are disengaged and bored in school, and as a result, many see themselves as poor learners. We should be framing things in our schools not just in terms of "how do we test you on that?" but on "what can you do with what you know?" When you're making something, the object you create is a demonstration of what you've learned to do, thus you are providing evidence of your learning. The opportunity to talk

about that object, to communicate about it, to tell a story about it is another way we learn at the same time we teach others.

There are a variety of ways to bring this learning strategy and many other positive aspects of the maker movement to education, some of which we've started to employ already. Our first wave has been to find teachers who are themselves makers. They understand the relevance and importance of making things and are able to act on it, and also to connect with their students as mentors. Getting these makers involved in summer camps and afterschool programs at science museums and community centers is one good way to reach kids, but going where the kids are during the day—at school—is even better. I helped one local school create a program called Project Make. I invited sophomores and juniors into the classroom, and simply asked them, "What do you want to make?" They organized the space and used the teacher as a resource to find the materials and information they needed. In a more recent development, I received a grant from DARPA,

the Defense Advanced Research Projects Agency, to continue this work and to bring making things into the school day. Our aim is to serve student populations that are not well served by the academic tracks traditionally available to them. It is significant that I get little resistance from superintendents or principals.

Companies clearly can benefit enormously by embracing the maker movement. I recently talked to an individual who worked in research and development at a large semiconductor company. He attended a Maker Faire to take pictures and talk to people, then went back to his company and told them that a 14-year-old had exhibited something remarkably similar to the home-automation system they had spent \$10 million to develop. The lesson here is that companies need to look outside of themselves and into the maker community as a source of talent and ideas. Of course, great ideas may be brewing inside a company as well, so companies should engage with their employees in ways that get to the heart of what they are passionate about and what they're working on outside the confines of the company walls.

Employers should look for relationships as well. In the software world, independent developers could use open-source code and go after really small niches in the market that a commercial software company may have found too small. As we have seen over and over again, those small things sometimes grow quite big, and

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companies need to identify and partner with more creators of small things. The kind of opportunity I'm excited about isn't necessarily creating more jobs in the defense industry, but that the kid from Georgia Tech (which, by the way, has an incredible student-run maker space) can now freelance and engineer on his own. He doesn't need a big manufacturing facility or lab anymore because the tools are already out there. For example, a 20-year-old kid who has an idea for a website can use open-source software to build that site and add his own layer of value.

We can outline more strategies for maker-friendly cities and maker-inspired development as they relate to policy and governance. Many cities have economic arms that try to attract new businesses to establish headquarters within their borders but simultaneously have strict, often misinformed zoning restrictions that prohibit potentially valuable maker spaces. Therefore, we need to improve local policymakers' understanding of the actual liability and risk involved in creating these spaces and encourage their growth as potential cradles of innovation and job creation.

These activities also can have an important impact beyond economic development. Jose Gomez Marquez of MIT recently wrote in *Make* about do-it-yourself medical devices. He describes kits used in developing countries, where local organizations that have received second-hand equipment have to fix and modify the devices that inevitably break down. While the tinkering culture that has emerged in medical technology as a result of this phenomenon is fascinating, I think that if we start sending these organizations more modular components that are well made rather than just hand-me-downs, we'd be enabling those on the ground to build new things rather than just to repair the old.

CONCLUSION

When I walk around a Maker Faire, the thing I notice most is how happy people are. In fact, many participants and attendees remark on the sense of optimism in the crowd, which is a really precious thing. It's a pretty simple formula, one based entirely on talking to people who make things, seeing what those people do, and nurturing the diversity of ideas that come together in a community space. The Faires bring a community together around figuring out how to solve a range of problems. Discovery keeps us young because it's always fresh. The more we dive into something we didn't know how to do before, whether by figuring it out on our own or reading an article or talking to a friend, the more interesting life becomes.