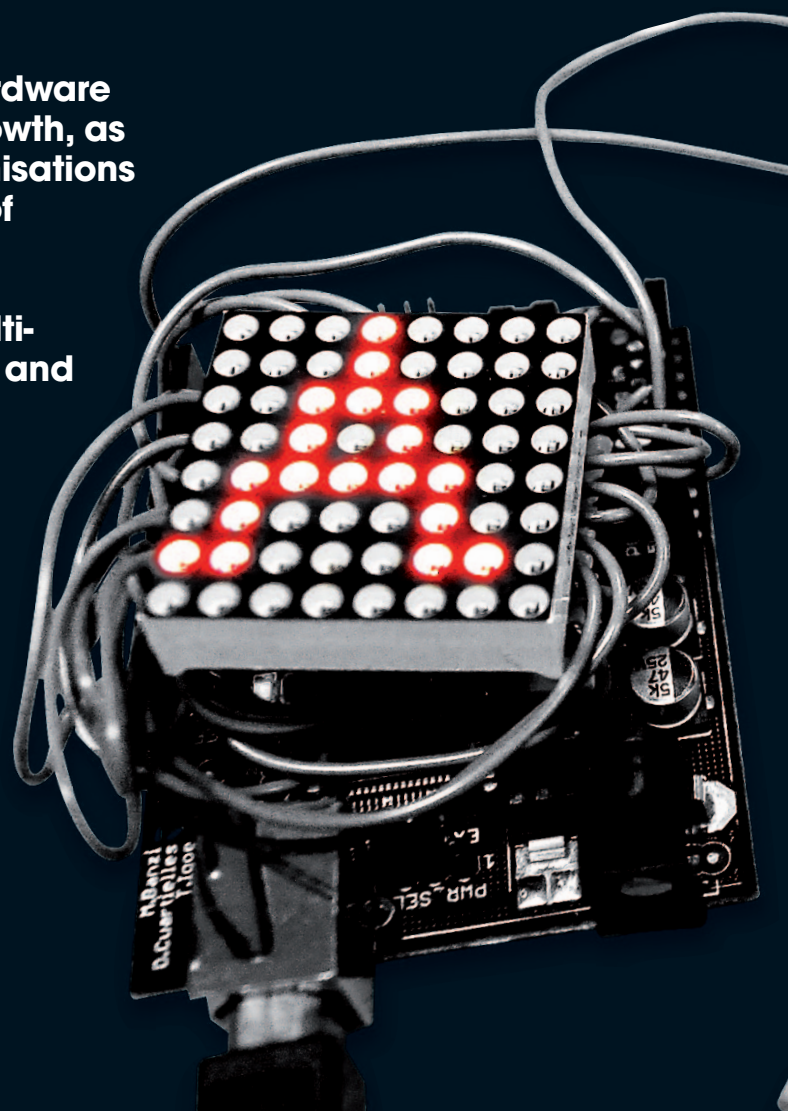


# Introduction to Open Source Hardware

by Andrew Back, Open Source Hardware User Group

Within the last few years the open source hardware movement has been subject to explosive growth, as hobbyists to established multi-national organisations have come to realise the inherent potential of engaging in open collaboration and liberal licensing of hardware design artefacts. What started as a niche phenomenon is now a multi-million dollar industry that continues to grow and that shows no signs of slowing down.

**As** the name suggests open source hardware (OSHW) adopts the principles and methodologies employed in the development of open source software and applies them to hardware development. As with the development of open source software there is no rigid formula, however, a fundamental principle is that design artefacts will be made available at zero cost and via a liberal licence. These may be, for example, schematics, CAD files, PCB layouts or C or HDL source code. Through publishing these via an open source licence the copyright holder grants anyone the right to study, modify and improve the design, and for them in turn to subsequently make it or a derivative work available in a similar manner to third parties.



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It is important to note that not all open source designs must start out that way and there is no reason why proprietary technology cannot be “open sourced”; that is provided that you hold all the rights to the design. However, most OSHW projects are open from the offset and are often the result of collaboration that crosses organisational and geographic boundaries. With public resources such as mailing lists, version control systems, wikis and bug trackers typically being employed in support of their development.

The poster child of the OSHW movement is without a doubt the Arduino microcontroller platform, and the success it has enjoyed is in no small part due to its open nature and the fact that this aspect has served to foster a substantial ecosystem. Which has not only benefited third parties through the creation of new business opportunities, but has also enabled the platform to secure significant market share. Whilst its highly active and ever growing community of users and a culture of sharing has enabled global-scale support.

Arduino is just the tip of the iceberg and you’d be mistaken if you thought that OSHW was only concerned with simple systems. The movement boasts, for example, multiple cutting edge software-defined radio (SDR) projects, high performance embedded computing platforms, low cost desktop 3D printers and an affordable USB protocol analyser project, to name but a few out of hundreds.

As was initially the case with open source software, OSHW has its own share of detractors. It may be difficult to at first see how it could work when the replication costs for hardware are so much greater than those associated with software. However, it offers the potential to democratise the hardware development process, reduce development costs, drive reuse, simplify business relationships in collaborative environments and to create opportunities for new entrants. By its very nature it supports learning and for this and other reasons it is also gaining favour in education.

The numbers speak for themselves and as of May 2010 there were already at minimum thirteen OSHW companies with >\$1m revenue. While this might sound like small change, let us remember the humble beginnings of the multi-billion dollar open source software industry. ○

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