

# **MAGICbox research aims & philosophy**

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*The mission of the laboratory is to develop tools and systems to make production technology accessible to a wider range of people.*

The ethos behind this work is based around a perspective which re-evaluates the traditional boundaries of organisation. There have evolved divisions of function and role in society based around demands, available technology and social organisation. Some of these arbitrary divisions can be seen in the differentiation between consumer and producer, brand and product, artist and audience. Various stable economic and social systems have formed in a time when transportation and communication were more limited.

The organisation based around centralised production location using specialised knowledge formed hermetic companies. With improved transport technology, production has become separate from companies. Companies have become repositories of inherent specialised knowledge organised around supplying goods and services. Distributed collaborative networks and economic models have come into existence as the distribution of information and goods has become more efficient. Commons based peer production (Benkler 2002) arises from a distributed knowledge and production social networks.

Commons based peer production can be seen as the non-commercial efforts of groups with a common production goal. This is distinct from crowdsourcing, mass customisation and open innovation and is most visible in the development of open source computer software. In this particular instance, the aim is to research tools and methods suited to open source product design and manufacturing collaboration.

The tools of product design and engineering have remained inaccessible as design itself has been specialised. The economic dominance of mass production relied on highly specialised machinery which would perform specific tasks with great efficiency. As the production line was not cheap to reconfigure, product design configuration and revision was minimised. The role of the designer or engineer became increasingly specialised to reduce the amount of prototype revision. In the drive towards automation, machines became computer-controlled and eventually the entire machining process became modelled on computer. Further advances in computing meant that products could be modelled, tested and revised on computer. The software tools adapted to these tasks are aimed at engineers within large organisations and so are expensive, specialised and not easy to learn. As there is no perceived market for the individual user/designer there are correspondingly few software tools aimed at this market.

Production machinery which was more flexible in its abilities enabled a wider range of products to be produced for less capital outlay. Coupled with the production flexibility has come an increasingly modular array of components. This means that the majority of a production process can be subcontracted to suppliers. These two innovations open the means of production to a wider section of society because the capital investment in the process required to produce one item can be greatly reduced.

Products with a demand too small to create an economy of scale are correspondingly expensive. This is the case with highly specialised or custom products. When the means of production are generally accessible this is not the case. If for instance you desired a cheese and marmalade sandwich, though you might not be able to buy it, you could source the constituents and

produce one with a minimum of expenditure. If however you required a left-handed tin-opener, you would find it proportionally more expensive.

If an individual or a group has a specific product requirement that is not economical to produce commercially or is prohibitively expensive, then an alternative production route is proposed. If software design tools are freely available and there is an active peer community, the product is designed or specified using software tools and produced in a commercial computer controlled manufacturing centre or on a local computer controlled machine. This model of production dispenses with much of the organisational costs inherent in commercial production and may allow the creation of niche "peer markets".

If designs become available as computer files instructing computer controlled manufacturing machines, then these designs can be traded, exchanged or shared like mp3 music data files or documents. The instrument required to manifest this data as an object can be perceived as a computer output device like audio speakers or a printer. Computer-controlled machine tools are becoming smaller and cheaper and there are a healthy number of enthusiasts building their own; this would indicate an emerging demographical dynamic. It is felt that a key element to make production technology more accessible is a robust 3D modelling environment and dedicated driver software to run specific machines.

Peer production is not seen as a replacement for highly specialised manufacturing production, a television will always be more economical to make on a production assembly line, but it can be seen as a production model enabling highly specialised products.

This study is not examining the social implications of accessible technologies used as a tool for beneficial or destructive purposes.

Benkler 2002: [Coase's Penguin](#).<sup>[2]</sup> 112 Yale L.J. 369 (2002)