

highly industrialised factories without extensive re-tooling for each product run. Also, since those first inkjet-printed transistors of Sirringhaus in 2001, a new field of plastic and printed electronics was rapidly growing (*Point 4*). Electronics manufacture was on the path to becoming industrialised and I would just print the electronics I needed rather than combine a mix of commodity and non-commodity components on my own circuit board created on some assembly line that changed with every product run.

For me, the interesting aspect of this was the combination of both physical and electronic forms. In 2005, I had become aware of several University led efforts to create hybrid objects including junction boxes where both the physical form and electrical components were printed (*Point 5*). This too would become industrialised to a world in which I printed my entire device rather than used factories which assembled. Now, along with potential for creating novel materials and components, this also had the opportunity to fundamentally change the concept of design.

The function of a device is a combination of its physical form, its electronics and any software that interacts with this. As hybrid printers industrialise then this function is described by purely digital means — the CAD (an instruction set) which is then printed and the code (an instruction set) which is run. When we wish to change the function of a device then we need to change one of those two instruction sets along with considering the interaction between the two. Normally, we try to make changes in software because it's the less costly but as hardware become more malleable then that equation changes. It also