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*The* \_\_\_\_\_  
**CRAFT**

*edition*

FROM GOA 2017

A Publication by UnBox in partnership with Mozilla's Open IoT Studio

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*The* \_\_\_\_\_  
**CRAFT**  
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A Publication by UnBox in partnership with Mozilla's Open IoT Studio

Editing - Babitha George, Jon Rogers, Michelle Thorne and Romit Raj

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The simple techniques developed by medieval masons could be used to create huge edifices because masons had strong social networks to share their knowledge. The guilds and lodges of the medieval masons were like huge idea factories. Maybe, to assure the future health of the internet of things, we need a new form of guild. Perhaps that is what the Open IoT studio might become.

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## Further Reading

Michael Feathers, *Working Effectively With Legacy Code* (Upper Saddle River, NJ: Prentice Hall, 2013).

Larry Greememeier, 'Software's Dirty Little Secret', *Scientific American* 17 June 2008: <https://www.scientificamerican.com/article/software-dirty-little-secret/>

Stephan Murer, Bruno Bonati and Frank Furrer, *Managed Evolution: A Strategy for Very Large Information Systems* (Heidelberg: Springer, 2011).

Stephen Murray, *Beauvais Cathedral: Architecture of Transcendence* (Princeton, NJ: Princeton University Press, 1989).

Eric S. Raymond, *The Cathedral and the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary* (Revised edn., Sebastopol, CA: O'Reilly Media, 2001)

Lon Shelby, 'The Geometrical Knowledge of Medieval Master Masons', *Speculum* 47 (1972), 395-421, reprinted in Lynn Courtney, *The Engineering of Medieval Cathedrals* (Aldershot: Ashgate, 1997).

Lon Shelby and Robert Mark, 'Late Gothic Structural Design in the "Instructions" of Lorenz Lechler', *Architectura* 9:2 (1979), 113-31, reprinted in Courtney, *Engineering of Medieval Cathedrals*.

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## The Berlin Tapes (digitally remastered)

A reformatted and summarised transcription of a conversation between Jon Rogers, Jayne Wallace & Justin Marshall 18-19/1/17, Mozilla office, Berlin.

### What is IoT?

IoT is an amplifier ■

**Jon:** Every form of electronics to date has been a replacement, but IoT is additive, not being a more efficient or effective version of something previous, but a change in relationship (e.g. with a light bulb, IoT does not make it brighter or directly more efficient, but allows you to control it in new way).

IoT is not about revolutionising how we use products, but about revolutionizing the collection of data, e.g. collecting health data and surveillance, so it has the potential to be both beneficial and to be scary.

### Why do we want to decentralise IoT (thousands of tens, not tens of thousands)?

IoT as **amplifier** and **materializer** of effects and the risks associated with ownership by a few companies could be/is immense.

You need decentralisation to de-risk the opportunity for large scale surveillance, but not limit the benefits of big data understanding of health and other such useful missions.

### What do we want from our relationship with our data?

Control of data is the key, and subtler than ownership. Control means knowledge and control of data in specific contexts: some fine, some not. Jon's inhaler example: cloud data on inhalers is good for health, but IoT e-cigarettes sending data of inhaler user to NHS/ whoever is bad, so context of data is significant.

### What is a craft?

Making with a craft approach: engagement with materials that is not ends driven, not about aesthetics of efficiency, but an element of the 'art' of meaning making.

Craft thinking: one to the many, personal and localized scaled up (as process not product), rather than universal solutions applied locally, scaled down. Aspects of craft outcomes can be generalizable, but that you are reversing the universal design principle, it is not going from the general to the specific, but from the specific to the general. Generalisation from the bottom up, not the top down.

Research through craft's methodological approach is not problematizing, not solving issues, but settling into a situation, building relationships, being holistic, making things fit, not fixing; it's about dialogue.

Craft is non-brief driven, as opposed to design which usually is. Research through Design has found its home and value in industry. Craft research - where has it gone? Craft has gone into community, like Occupational Therapy.

So, in the context of the realignment of the way things are being made (global mass production and consumption model) Craft talks to a different space, a different post-industrial way of doing things, a

community focused way of doing things...

Craft can go into a massively decentralized global community...(maybe!)

**Jayne:** Design's trajectory is into industry, but craft's trajectory is into the tools for everyday use, so naturally it has gone into the human areas of health care and other areas of complexity and human mess, that's where there is value in it's holistic approach.

### Why Craft and IoT?

Craft as a way of thinking about decentralized/localised production, thinking about end to end production.

Craft approach as a way of getting around IoT being owned by large-scale corporations, systems that work against the production of everything in one place (eg; Shenzhen and electronic consumables)

Craft as a way of creating opportunity for more resilience within a system.

Crafting our relationship with data. It is not binary.

Is there something about the nature of IoT that makes the human-centred messy craft approach more or equally valuable to IoT as the industrial design process has been successful for the rest of the electronics/digital development ?

What are the pros and cons of a craft approach over an established design manufacturing model?

For a craft approach a sense of ownership is central, how does this relate to ownership of data?

Why do we need to be able to go to craftspeople to create IoT objects?

### Instead of making tens of millions (the industrial design approach), making millions of tens (the craft batch approach)

BUT does this imply that the IoT objects are in discrete networks of tens? i.e. they are highly focused networks (in geography or number), Jayne's 'Blossom' piece being a great example.

So, in terms of IoT objects, is there is an opportunity for personalised craft (the opposite of universal design), make do and mend, bricolage, creating something in the mess of a particular context/situation/locale, tying into making communities.

Scalability is important, but scalability is in the approach not the solution.

The question is more one of whether this approach to scaling is one of expansion (i.e. growing something that works on a small scale to make it bigger) or is it based on a replication model (i.e. if something works on a small scale, create more small scale 'units'), or is it some other approach?

#### What is a crafted/crafty approach to IoT?

We want to be able to say:

- This is what we mean by crafting in this context
- These are the characteristics
- This is how they can be applied
- This is a demonstration of the outcomes
- This is how it fits into a global argument (political, economic, ethical)

Characteristics of a Craft methodology are:

- applications are recognised through extended engagement (it is time consuming)

- responsive rather than solving things
- dialogue with the materials of a situation (incl. people, data, physical stuff)
- recognising complexity (messy)
- seeking outcomes that are not reliant on large-scale industrial resources (masses of batch, not mass production)
- using technology as a playground. revelling in the means not driving towards ends (but having ends in view - pragmatic view of the relationship between means and ends)
- enchantment (as an experience) and beauty as an emotional tool (how does this relate data visualisation and beauty). Fixing and practical approach on one end, enchantment at the other, it is all human. Mired in the mess. So things move beyond function to include enchantment (beyond pleasurable interactions/interfaces?) Hard to describe, easy to demonstrate, easy to recognise when missing. ('Self-Reflector' from Connected High Street research and Starlight are good examples).
- care and care transmitted through the objects, the way they are made and used (we hope).
- human-centred.
- learning from the periphery (not the centre of the bell curve, but the edges). It allows you to identify particular uses that allow a reconsideration of use/value for the many

You need to be able to amplify and translate ideas into physical prototypes/physical manifestations.

This is true and prototyping is a designerly approach. Craft does not tend to 'prototype' in the same way as design does. I am not sure what you would say the

equivalent is: tests, material experiments, open ended process (play).

Is this one of the places in which we can (want to) make a distinction between crafted and designerly? And what implications does it have for the specific activities that we undertake with interdisciplinary groups?

Are the crafters in the IoT realm coders, experts in data manipulation not the craft community that wrangle physical materials?

### What can we do and what are the challenges?

#### **MISSION: Developing a craft methodology for creating an collective ecosystem for IoT**

And practically:

What can we do on the ground?

What are the outcomes?

Can you create a decentralized production of IoT based around existing craft communities?

This is top level methodological development (fundamental research) that has the possibility to be tested in wider digital context than just IoT in the future.

How do we move the knowledge and understanding of the very few in the crafts who engage with issues of the digital (e.g. Jayne and Justin) to the many, in order for them to understand the design/craft space they are working in and so respond in a crafty way to the challenges of making IoT objects?

What are the risks of falling back to the 'few experts in a room together' approach?

Jon discussing the 'Self-Reflector' mirror from the 'Connected High Street' project- nothing could have been done without being in the environment that the mirror for example, was created for. You needed the in-depth knowledge of this to provide impetus for the design, you needed the shopkeeper and their professional practice. You need experts of context.

Can we get interdisciplinary groups together to take a crafted approach to an area of interest/concern- what methods do we use? how are they distinct? are they novel?

Is the equivalent challenge in craft that of design thinking within the broader field of design? The debates and challenges to how it is being applied to areas outside the established boundaries of design over the last 15 years or so.





### How do we be authentic in our crafted approach?

We involve craft practitioners to close the gap between the realities of where craft exists as a sector (in different contexts and countries) and our academic speculation of how there are 'crafty' ways of thinking and doing that are potentially useful to IoT.

But we need bridging roles. Shared experience and respect are useful bridging mechanisms when engaging with all communities of practice.

For example in a previous collaborative project that involved Jayne Wallace and Sean Kingsley (an experienced ceramicist) working with potters in India, it was Sean (as a doer and a demonstrator of skill and experience) that provided this bridge and broke down barriers.

### How many people are actually doing research that puts objects in the world/homes to test?

Bill Gaver thinks little goes on. There are problems of deployment, it takes so little for things to fail.

Justin: But crafting is not necessarily good at creating technically robust prototypes, industry is. So is craft only an ethos, not a practice? We need to remember that craft, unlike some other practices, is a place where ethos and activity should be undivided.

### How do we achieve proper Dialogical Collaborative Making, what approaches work?

What this approach is seeking to achieve:

- responsive not interventionist
- nurturing not disruptive
- slow and flexible not fast and agile
- meaningful not novel

This is not as simple as traditional design approaches, where it can feel as if you are going in to get something out. While craft approaches undoubtedly seek to achieve results we believe that engagement through craft can be humbler than some technologically orientated design approaches, in both its modus operandi and its anticipated outcomes. As discussed in other pieces in this publication much of design's history is connected to a mission to create efficient systems for creating things and systems and to formal rationalisation. The ethos of the designer can therefore be one that seeks to take on big and 'wicked' problems and seek rapid transferable solutions, and be recognised for it. While this is both admirable and valuable in many cases, it is not always the most appropriate approach, especially in contexts in which the complexities of social relations, economic, environmental and technology resources are not understood. It is in this context that humbler, smaller scale responses to a situation may have a role to play.

### Process/Method

Much of our conversation was focused on the characteristics that we felt might coalesce to define a craft approach to IoT. Naturally these tended towards slightly abstracted meta-level statements and reflections. However, if craft is about anything it is about activity, about practice. Therefore towards the end of our discussion we began to think about how to make these characteristics manifest in actual activities, in a sequential method that takes a multidisciplinary approach while retaining the ethos, if not all the anticipated traditional aspects, of craft. Below is our first attempt at this and is something that we feel could be used as a basic framework for a craft and IoT workshop.

### Dialogical making between practices (i.e. all those that can bring something useful to the area of IoT in a particular context)

involves:

**Mess of potentialities** = Open interdisciplinary conversation, discursive in order to identify characteristics and thingness (Heidegger and the idea that a thing is a way of thinking about an object in terms of all the relations/associations it gathers to itself-it's interrelations)... it is **relational**.

Identify characteristics and established patterns of human behavior and then spend time exploring in as many directions as possible what they mean. You can do this in lots of ways. Jayne - it's a conversation - it's before making things physically. Sharing stories in the wider group.

**Narratives of Potential** = early sketching/playing (speculative, but not critical, design fiction approaches)

Creating stories that are played out through little sketches, little models. It is about narratives of potential interactions. A lot of the time that is drawing on your own life, your own lived experiences. To whatever extent you've been able to emphasise and understand certain contexts.

**Jayne:** If I was doing this in a care home I would look to find what an 85 year would find enchanting. Not prototyping the final idea - not just about technology, but about sketching possibilities.

Then split up into our own expertise.

**Grounded prototyping** = viable, grounded, down to earth, craft, bricolage, to-handedness - grounded in terms of context in which you are working (hospital, market, etc) and grounded in terms of technology (it's doable), socially and technically viable.

**Patient Making** = collaborative trusting craft making in an appropriate space, enabling technologists and craft to come together in a way that is not functional and service orientated, but discursive and responsive.

Authentic evaluation & legacy = extended, human centred. Reward people you work with, recognising the significance of legacy (incl. friendships), privilege ethical stance.

**NOTE:** craftspeople and others involved in the process will have differing contributions (in terms of type and volume) at differing stages, so more emphasis on established craft practices at the patient making stage than the others, but it is NOT a handover scenario. The job of a technologist is not to deliver a finished job, but to enable the craftsperson to allow them to complete the job. (e.g glaze knowledge of colour could inform LED research)

**NOTE:** enforced collaboration is a useful mechanism

Can this process be systemised into set of instructions?

NO: it's a workshop, a guided meditation (like learning an instrument).

## Why Craft?

Justin Marshall

As decentralisation is the core theme of this caravan, then looking for practices and communities which naturally, and often unconsciously, embrace this notion seems like a good place to start.

It could be argued that Design is as a modern activity born out of the industrial revolution. The separation of design from production and the divorce of design processes away from direct material engagement have given it strong affinities to centralized mass manufacturing models that aspire to global reach. So if this is what you are looking for then design's natural inclination and history makes it the practice of choice.

In contrast, though independent craft practitioners are consistently seeking ways to create economic viability, they tend not to be driven by economic models that seek to achieve scale through centralisation. Craft relishes a flexible ongoing interaction with the materials and situations to hand; it rarely seeks to create ubiquitous and dominant products. It is orientated towards creating more bespoke, personal/community objects in which value is created through the tailoring of outcomes/artifacts to specific needs and desires, rather than aspiring to design universally appealing high volume products. A craft approach holds the potential to encourage the consideration of localized IoT networks that grow from the bottom up and are not imposed from the top down. It privileges nuance and material sensitivity (in its broadest terms) over technical specification and feature overload. This might mean that a craft approach might facilitate more effectively than other approaches, the creation of simple, feasible, limited data, low power, localized responses to needs and desires within a particular context.

In a recent scoping session in Berlin, working with Jayne Wallace and Jon Rogers, we worked to map some of the characteristics of craft to an approach to IoT development:

## A CRAFT mini- MANIFESTO FOR IoT

(is there dogmatism in design)

This is what we think is distinct about something that we call a 'crafty' way of working....

Our intention is to take people from a set of principles to a set of actions.

- a. Activities are about nurturing human values, communities and welfare. It is an antidote to 'disruption'.
- b. Applications are recognised through extended engagement. It is time consuming with a focus on considering flexibility over agility and being fit (for purpose) instead of being rapid/quick.
- c. Responsive to a situation rather than problem solving orientated. It is responsive not interventionist.
- d. Involves dialogue with the materials of a situation (incl. people, data, physical stuff). It is about finding a shared working approach between people, objects and their data.
- e. Recognises the complexity of situations (messiness), but aspires to beautiful (tidy?) responses.
- f. Uses enchantment as an experience and beauty as an emotional tool.
- g. Care and care transmitted through the objects, the way they are made and then used. -> the proposition that things can transmit the care that has been given to their creation.
- h. Seeks outcomes that are not reliant on large-scale industrial resources. Crafting masses of batches NOT designing for mass production.
- i. Using technology as a playground- revelling in the means not driving towards fixed and distant ends.
- j. Craft is ongoing and continuous and it understands that you live with and through things. Craft objects therefore are often not considered complete and finalised at the point of delivery/sales/transaction, but it 'acknowledges that in living with and (importantly) through things we not only adjust them, but mould them around ourselves'.
- k. Craft takes a 'bottom-up' approach by default. (whereas design may strive to do so, in an inclusive design approach) .
- l. Meaning is sought over novelty
- m. Finding the resources that are at hand takes precedence over notions of 'perfection'
- n. Mending is important.

Fixing and practical approach is at one end, enchantment at the other, it is all human. Mired in the mess. Things move beyond function and novelty towards enchantment. Meaningful NOT novel.

We recognise that this is an oversimplification and that craft and contemporary design (its ever-expanding remit, spheres of influence and methods) share many of their characteristics and should not be set against each other in binary opposition. However, the relative importance of these characteristics, and the configurations in which they are actioned, is distinct. Craft draws particular ways of knowing and acting together and holds them dear.

The human-centred (humane), localised (vernacular) and often idiosyncratic ways in which craft approaches and engages with the world makes it both a challenging and interesting way to think and act within the theme of decentralisation and IoT.