A Tarot of Things: a supernatural approach to designing for IoT

Haider Ali Akmal*, Paul Coulton[a]

[a] ImaginationLancaster, Lancaster University, United Kingdom
*Corresponding author e-mail: h.a.akmal@lancaster.ac.uk
doi: https://doi.org/10.21606/drs.2020.188

Abstract: This paper looks at an alternative approach to design research for IoT, through a practical engagement with philosophy; based on the concept of *Carpentry,* introduced by design philosopher Ian Bogost. It presents this exploration through the design of a bespoke digital Tarot deck, rooted in Object-Oriented Ontology. This branch of philosophical inquiry withdraws from conventional perceptions of objects and people. Viewing them as equally important 'things', operating with a range of independent and interdependent perspectives; which have been described as "constellations". Through our philosophical carpentry we present a *Tarot of Things*, which acts as boundary object, for understanding how taking constellation perspectives of networked IoT devices can produce new design approaches.

Keywords: Object Oriented Ontology, Human Centred Design, Internet of Things, Carpentry

1. Introduction

In the 90's British sci-fi comedy sitcom *Red Dwarf* (Rob Grant and Doug Naylor), a toaster with a highly advanced AI and speech capabilities appears as a recurring character. In the fictional universe, its purpose is to act as a kitchen companion providing light breakfast banter along with toast. The device also is highly intelligent, causing it a great deal of angst over its predicament of being *just* a toaster. For the purposes of a comedy series set in a sci-fi future, this presents comical scenarios with characters entering philosophical debates with the appliance. In real life though such situations seem less plausible. In todays connected world, the closest approximation to *Talkie Toaster* from *Red Dwarf* is an Internet of Things (IoT) enabled *smart toaster*[1]. Of course, the latter doesn't speak and enter philosophical discussions—but unlike an 'ordinary' toaster, this one aims to produce an *improved toasting experience*.

[1] See: https://www.engadget.com/2017/01/04/griffin-connects-your-toast-to-your-phone/

Generally, when one considers the design of an object, such as a toaster, the approach is to see it from the perspective of its user; in this case humans. Human-Centred Design (HCD), is the prevalent format for designing object's, services, and business models in technological settings. With one of its core axioms being, to drive an object's design towards simplicity such that it becomes 'invisible' in use (Norman, 1999). Where this might prove beneficial, such as with the design of a toaster where it's unnecessary for the user to understand the electrical workings of heating coils inside. It can become problematic when approaching to design much more complex artefacts, such as a smart toaster.

The reason for this, is because smart devices create hidden networks between the user, itself, and other *smart* devices—such as the user's phone. The act of toasting bread in this manner is thus approached from different angles. For example, one may create options to save different settings for different kinds of bread, or, trigger the toaster from their phone and other linked devices. This interaction creates an ecosystem where these smart devices, users, stakeholders, and the services they provide all reside. It doesn't stop there, as the ecosystem could involve other external devices outside of the same design sphere; such as Smart Assistants (Alexa, Google…), or interaction services like IFTTT (If This Then That) that were not initially part of the designed ecosystem.

Thus, treating the interaction of such devices as 'simple' is difficult, and often results in obfuscating its complex workings in the aim of designing *for* humans (Coulton & Lindley, 2019). This is not to say that HCD's simplification mantra doesn't have its merits. All users are different, and one may argue both for and against the generalisation of user bases in design (Hashizume & Kurosu, 2013; Stickdorn & Schneider, 2011). However, the lack of legibility may lead to problematic aspects for some users; the most common, with respect to IoT, being related to security and privacy on how the data is handled (and accessed) within such systems.

The argument we present, is for an alternative view of simplification for the design of IoT. In that regard, this paper approaches IoT's complexity from a philosophical perspective, suggesting the adoption of a world view for IoT devices using Object-Oriented Ontology (OOO). The toaster if perceived in this manner, presents new avenues for designers to approach from; new spaces of inquiry within the design process of IoT. To facilitate this, we introduce the *Tarot of Things*. A philosophically charged artefact around IoT with the intention of *doing* philosophy, to provoke a potential for designers to *see* IoT from the perspective of its inhabitants—its objects. We will introduce both the philosophy behind its creation, and the methodology of using philosophy in this 'practical' manner. Following on from this with insights from user testing of the artefact, and a discussion into the findings. First though, we must discuss our rationale for introducing philosophy more directly into the design process.

1.1 HCD and IoT an ill-fated combination?

Despite its perceived benefits, HCD and its typical characterization within Human-Computer Interaction (HCI), have increasingly raised concerns among scholars (Lindley & Coulton, 2017; Steen, 2011; Stewart & Williams, 2005). Traditionally, the adoption of HCD within HCI presents consumers of technology as "passive recipients" of the value embedded within said technologies (Sørensen, 1994). This is seen as a straightforward mechanism for delivering an experience to the user, that is enriching and designed to be rewarding (Stewart & Williams, 2005). The intention is that by embedding value within a device, HCD moves towards creating the sense of a rewarding experience focusing on the *human user's* needs.

Unfortunately, this is not always the result. Stewart & Williams (2005) argue that there is a "design fallacy" within HCD for computer systems, with designers assuming, that in order to meet user needs the localized knowledge of users must always take precedence. This creates an ever-accumulating loop of knowledge extraction. They assert this approach as "unrealistic" and a hinderance towards "opportunities of intervention", resulting in targeting unique groups of users with the intent of extracted knowledge being applicable to a wider group—conversely aiding in oversimplification. The argument is against seeing design as an inductive process of accumulating data about "current user requirements", rather, acknowledging the "complexity and diversity" of users with differing perspectives and requirements.

IoT, in this regard, may be described as an "ill-defined construct", because it involves the interconnection of different devices where each device can be observed from a unique tangentially differing perspective (Lindley & Coulton, 2017). The stakeholders involved around any given IoT device range from the device's users to the service providers in overarching companies, such as ISP's, data providers, and data collectors etc. In such situations the design of an object, intended to be used in or around IoT, would effectively have a collective of users with unique needs as opposed to an individual user with a singular need. As previously discussed, this *fallacy* may also be attributed to HCD's mantra of simplification, which Coulton & Lindley (2019) view as, creating contradictions for users when used around "hyper-connected and data-mediated assemblages"; such as IoT. Contradictions often arise in the form of depriving users their privileges and affordances from devices or services that they encounter. They give the example of door locks, one being a conventional lock with key, the other an IoT enabled lock. Where the formers usage is clear and simple, the latter involves sending data between the door and any parties vested in its interest. One gives full autonomy to the user, while the other "obfuscates" the role played by data, thereby removing the user of some of their agency. When seen from their own vantage points, the traditional lock and the digital lock intend for the same interaction, yet, the latter creates what Coulton & Lindley call "independent but inter-dependent" perspectives and relationships (Ibid).

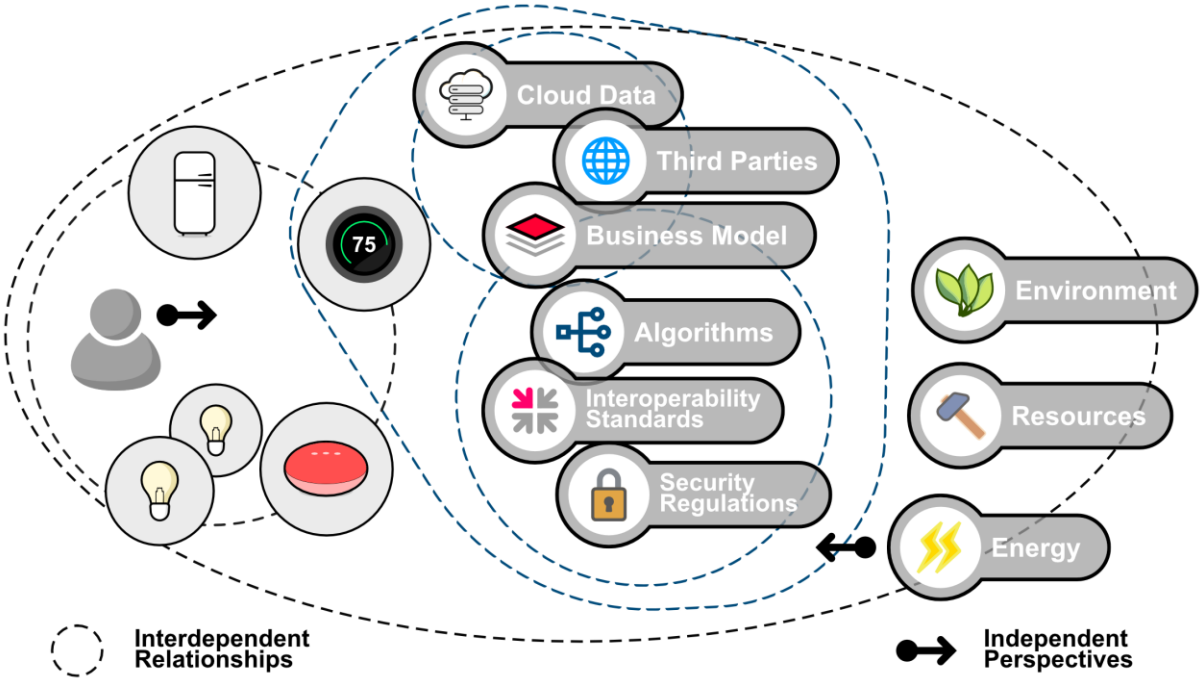

Figure 1 Depiction of how a constellation for IoT could be imagined (Coulton & Lindley 2019)

As a solution, they propose seeing IoT through the metaphor of "constellations" (Figure 1). Each device, service, stakeholder, etc. become elements within various constellations, with the intent of allowing designers to better visualize IoT. This approach takes the focus away from the human user, and instead, presents foci on the myriad *things* that entangle themselves within a networked IoT system. It attempts to use OOO as a medium for exploring the design of IoT objects as non-human entities; independent of their human users.

The artefact described in this paper, intends to act as a boundary object utilizing philosophy to further the discussion of *constellations* with IoT. It does this through the forecasting of a *Tarot* of the many things that may constitute such constellations. In the next section we go into the philosophical roots behind the artefact in more detail, along with an explanation of what we mean by, *doing* philosophy.

2. Thinking and Doing

In *The Quadruple Object*, Graham Harman (2011) describes objects as unit entities with the ability to both display and conceal their traits; in a manner he calls "overmining" and "undermining" respectively. By viewing objects in this manner, his aim is to enhance them to the levels of other non-objects around them. Morton (2011) describes this view as an attempt at reimagining realism in the wake of anti-realists. Generally, when we consider the perception of physical objects around us, they are perceived indirectly, i.e. they exist as real entities but independent of the act of perceiving them (Maund, 2003). The realist would say, this perceiving of physical things is only possible indirectly, for what is direct to the perceiver

is the act of perceiving the physical object through their senses; ergo, an apple exists because it can be seen, tasted, smelt, or touched. These qualities are what would create the apple for the observer. Conversely phenomenologists would say, the senses are aware of the apple—therefore, allowing us to experience it—yet, the apple's existence is not predicated by the presence of, or interaction with, the senses.

To further this debate Quinten Meillassoux introduced *correlationism,* in his ground-breaking work *After Finitude* (Meillassoux, 2010). It described a viewpoint, whereby, things may only exist in relation to humans. For the correlationist, subjectivity and objectivity are intertwined. Their understanding cannot be undertaken without one influencing the other. Zahavi (2016) explains it as a view where "thought cannot get outside itself", with the intention of revealing to us its intricacies. Our imagining of an apple cannot exist before our having experienced the apple, as it is, in relation to ourselves. Therefore, the apple cannot be thought of in isolation.

OOO refutes such correlationism, in an attempt at rethinking realism (Morton, 2011). Through the view of OOO, humans and non-humans are seen on equal footing, ergo, having no precedence over the other and equated as *objects* (Harman, 2018). This is in lieu with Levi Bryant's notion of a "democracy of objects" (Bryant, 2011):

> "Objects need not be natural, simple, or indestructible. Instead, objects will be defined only by their autonomous reality. They must be autonomous in two separate directions: emerging as something over and above their pieces, while also partly withholding themselves from relations with other entities." (Harman, 2018, p. 19)

In OOO's light, *objects* need not conform to any prejudiced view of what an 'object' is, or what might traditionally be thought of as objects; i.e. cupboards, teapots, the ocean, a symposium, and Alaska are also considered objects. Much like Latour's (1994) proposition for a "parliament of things", this view raises objects to the standard of Latour's "quasi-objects". This constructed view of *object-oriented-ness* by Harman, uses these ideologies and taps in Heidegger's infamous tool-analysis as a foundation (Bogost, 2012; Harman, 2011), to explain how objects don't need to relate through any human-use but rather any form of use—including any *format* of inter-relational use.

Seen in this light, the *Talkie Toaster* from *Red Dwarf* becomes on par with other characters in the series; an actor like all other actors in its play of existence. For IoT objects, this means they may be imagined existing upon a plane equivalent to that of their users; and to that of the services they provide; the companies they benefit; the spaces they occupy, and so on. With this in mind, from this point forward in this paper all things that form IoT will be referred to as ***objects***; rather than devices, services, users, etc.

2.1 Anthropocentrism for IoT

At first glance, objects may be seen as "phenomenon present in consciousness" (Harman, 2011). Yet, they exist in our vicinity, occupying physical spaces around us. Where this discussion of OOO leads to is, an imagining of the vicarious lives of equally animate and

inanimate objects in our existence. Though such an imagining of the world, from a non-human perspective, presents its own difficulties (Harman, 2018; Lindley et al., 2019). The premise provides a starting point to discuss a potential alternate view for designing in IoT; a view of the object as opposed to the user. In *The Uncommon Life of Common Objects*, Akiko Busch narrates the unseen backgrounds of common objects around us, explaining how their design was influenced by the mundanity of everyday life. Her poetic approach towards household objects, such as strollers and potato peelers, evoke their mystique. The suggestion is, that the objects around us have lived lives of their own, signifying more than what one may assume through their instrumental value.

This giving of life to an inanimate object may be seen as an anthropocentric approach of viewing life through the eyes of such objects. OOO though, suggests going beyond anthropocentricism in the pursuit of understanding objects. Lindley et al. (2019) discuss the potential for using a "post-anthropocentric" view as a way to view IoT networks as seen by IoT devices. They do this by suggesting the presence of metaphorical "ghosts in the machine", in hopes of having an alternative view of interactions. *Talkie Toaster* is shown to present the world from its own perspective, creating new perceptions of interacting with a toaster for comic relief. Those same interactions, if presented within the confines of a design problem, could offer an opportunity for intervention in the process of design for IoT objects; such as smart toasters, forks, bathtubs, apparel, etc.

2.2 Doing Philosophy

The *constellations* metaphor presents a novel opportunity to see IoT interactions as "flat ontologies" (Coulton & Lindley, 2019); a concept introduced by Harman (2018). Flat in OOO's regard should not be mistaken for a metaphorical flatness, rather, it is acknowledging a perspective of viewing objects in relation to each other as being flat; i.e. as seen from 'above' or 'below'. In the words of Wiscombe, "In the [flat ontology] model, everything exists side by side, like a collection of treasures laid out on a table" (Wiscombe, 2014). Coulton and Lindley's approximation of constellations as flat ontologies, attempts to lay out IoT objects before designers for scrutiny. The deep contentions around flat ontologies aside (Brassier, 2015), scholars have touted certain benefits of viewing the world in this perspective (Bogost, 2012; Simon, 2018; Lindley et al. 2018).

Bogost (2012) predicated his methodology of *"carpentry"* on the flat ontology concept. Bogostian carpentry entails, the making of artefacts that explain the workings of the worlds they occupy (Ibid); which he equates to as "philosophical lab equipment". He argues for the benefits of using this approach, as a keen way for practitioners to enhance their "natural talents". By using the act of philosophical carpentry in one's own practice, one may effectively create different *formats* of philosophers; philosopher-programmers, philosopher-chefs, philosopher-designers, etc. In relation to the counter argument in the previous discussion, around anthropocentrism and the potential difficulties of seeing things through alternate perspectives, arguments exist for the use of *"carpentry"* as a way to work around

the human-to-non-human hurdle (Bogost, 2012; Coulton & Lindley, 2019; Lindley et al., 2019).

Carpentry, introduced by Bogost (2012) in *Alien Phenomenology*, provides a method for creating objects that *do* philosophy. In this case, it would be philosophically experiencing the world view of an IoT object. Bogost describes carpentry as an extension of the term more associated with woodcraft, accompanied by, a phrasing from Graham Harman and Alphonso Lingis' explanation of how things influence one another and the world around them as a "carpentry of things". He explains the relation of carpentry with HCI as such:

> "Just as the painting infects our material understanding of the photograph, so the influence of photography and cinema on television can cloud our understanding of how computers construct visual images…Human-Computer Interaction (HCI) concerns itself with human-computer relations, not computer-computer relations—or house-computer relations, for that matter. Despite its technical tenor, computing is just as correlationist a field as everything else, obsessed with human goals and experiences." (Bogost, 2012, pp.101-107)

Bogostian carpentry takes liberties with the world around us, creating assemblages of interactions that help explain how they (in turn) make the worlds around them. Quoting Latour, "If you are mixed up with trees, how do you know they are not using you to achieve their dark designs?" (Bogost, 2012) He suggests the viewing of objects through a lens of *"ontography"*; or the description of their natures. Very much entering the space of metaphysics, he compares Latour's *Litanies* to Stephen Shore's photograph series titled *Uncommon Places*. Where the former creates lists of quasi-objects creating unique ontologies through their assemblage, the latter, in his view, explodes these objects into *ontographs* or descriptions of their realities creating "tiny, but contiguous universes". As an artefact of carpentry, he presents the *Latour Litanizer*[2] that fetches random pages from Wikipedia to create assemblages in the form of lists of things—or *tiny ontologies*.

The idea of flat (or tiny) ontologies, becomes the basis for our approach to carpentry. Utilizing Coulton and Lindley's constellation metaphor for IoT, we carpenter an artefact that allows us to communicate with the *stars* in our *IoT constellation*. These are the core constructs for our approach through philosophy. Going into further details would be exiting the scope of this paper, and risk convoluting the argument. That said, for those interested, our detailed exploration of philosophy and IoT is published elsewhere (Lindley et al., 2020). The following section explains the artefact in detail, its workings, and is followed by an inquiry through feedback and discussion from user testing.

3. Scanning the *Stars*

The precursor to this *Tarot of Things* was the *Internet of Things Board Game* (Akmal & Coulton, 2019), which used another approach to describe the idea of constellations to users through a procedural rhetoric emerging from gameplay. Whilst this approach had merit, due to the nature of game design, the artefact created was left not fully able to engage players

[2] See: http://bogost.com/writing/blog/latour_litanizer/

with its underlying philosophy. Thus, the drive to create a *Tarot of Things* was to approach the philosophy of constellations head on. The reasoning for the use of Tarot comes from its widespread cultural influence as a practice that invokes a *spirituality*. As we are coming from an anthropocentric view of IoT objects, this artefact attempts to raise the bar for agency within said objects by introducing an air of the *supernatural* akin to Lindley et al. "ghosts in the machine" (Lindley et al., 2019).

The supernatural view of IoT is our way of expressing an alternative perspective of the devices interacting in networked assemblages. This approach does not suggest any human-like agency in non-human objects, rather, it is intended as a provocation of HCD presenting a dialogue different to that of more general approaches towards the design of these objects. That said, as we are about to discuss these objects with agency, it would help in clarifying our approach of Tarot. Its use here is similar to Semetsky's (2006) endorsement of Tarot within psychoanalysis, as capable of enabling an awareness of "unconscious material into consciousness". Here the *unconscious-consciousness* is hinting towards the inanimate IoT object, but, is meant to act as a bridge for practitioners. We intend the users of this appropriation of Tarot, to see through and dive within their own unconscious materials for insight, through what Semetsky calls "projective hypothesis". The *divinator* of a Tarot session is no different to a psychoanalyst in this regard; keying the possibility for a philosopher-designer-psychologist through the view of carpentry.

3.1 A Tarot of Things

The deck consists of a custom Tarot deck with unique illustrations and card names, appropriated for IoT (see Figure 2). The deck is not a physical deck, but rather a computer program created in a variant of Python and thus is entirely digital[3]. This is a deliberate design choice to *relate* more to IoT objects which, though have physical bodies in some cases, primarily operate within digital systems.

[3] The program and a compilation of the different bespoke cards used to define the Tarot system is available online, and can be experienced here: https://www.fictionware.org/tarot-of-things/

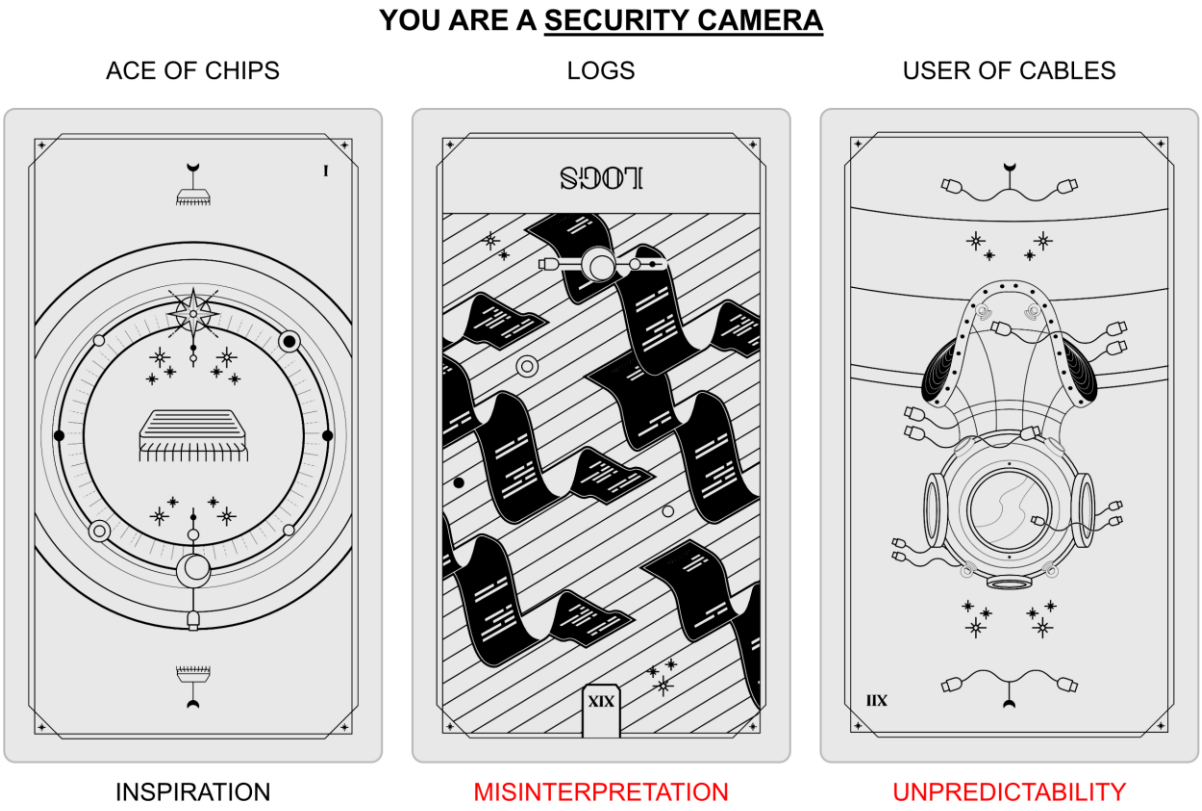

Figure 2 Adaptation of Tarot of Things presenting a configuration of digital Tarot cards

Tarot is a tool under the guise of a card game. It takes 2 to 'play', whereby, the divinator reveals the meaning of chosen cards for the subject in the manner of telling a story. The standard Tarot deck consists of 78 cards out of which 22 form the *Major Arcana* cards, followed by 4 suits of 14 cards each within suits of *Cups*, *Pentacles*, *Wands*, and *Swords*. As the theme for Tarot is taken from folklore and mythical fantasy, the imagery associated with tarot is of a similar nature. This is most visibly seen in the names and imagery of the major arcana cards: *High Priestess*, *Magician*, *Hanged Man*, etc.

For our purposes, the suits and the major arcana cards were altered to relate better to IoT (Akmal & Coulton, 2020). As such the suits became *Sensors*, *Chips*, *Cables*, and *Clouds*. The major arcana were given equivalent card names according to their most common descriptions. For example, *The Fool* became *The User* as it normally relates to the person having their fortune read. As in our case we do not differentiate between users and devices, the object itself becomes the user in this card.

To begin the process of Tarot, the one being foretold their future shuffles the cards and presents them on the table. In this case, the shuffling is done digitally on command and the table is on screen. After which, cards are drawn and placed in various configurations according to the depth of foretelling that is required in sequence. For our program, we opted for the simplest configuration of 3 cards in a single line.

Each card acts as a visual aid in the experience of foretelling, followed by the divinator's description of events. This description can be reduced to a series of keywords that each card represents; which may differ according to the orientation of the card. For instance, the *Magician* card suggests *structure*, *ambition*, *authority*, and *rationality* when upright. Alternatively, it may suggest *chaos*, *anger*, *domination*, and *tyranny* inverted.

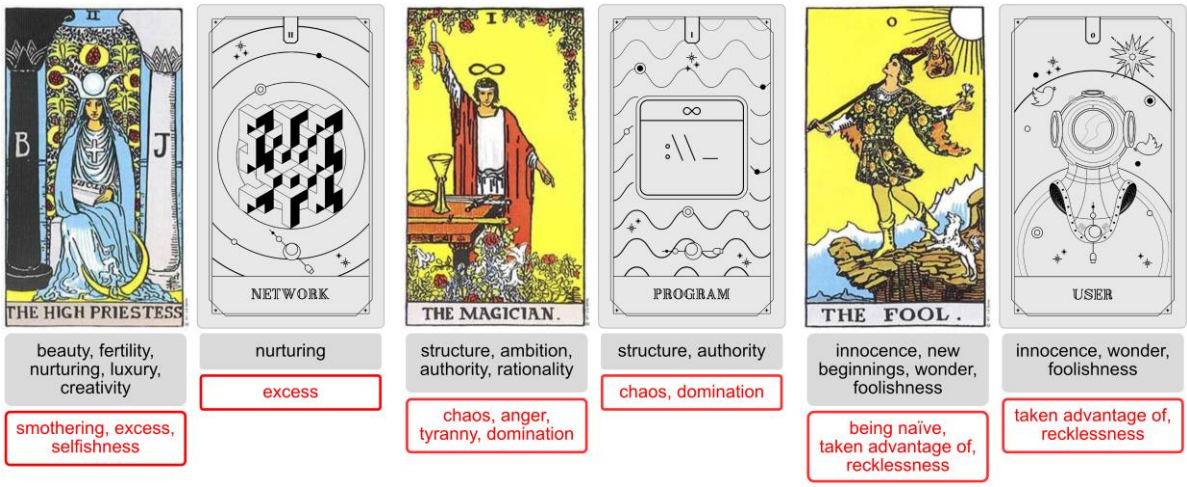

Figure 3 IoT Tarot cards compared to traditional Rider-Waite Tarot cards with their keywords and curated keywords upright and inverted

As with the titles and imagery, the keywords had to be curated for our purposes to relate more to IoT objects. That said, there was still enough variance left in them to allow ambiguity of meaning (see Figure 3). So, the *Magician* in our deck becomes *Program*; utilizing *structure*, *authority* (upright) and *chaos*, *domination* (inverted) from the original definitions. This does not necessarily mean there is no way of understanding a tyrannical or ambitious IoT object, but rather, we purposefully reduced the keywords to allow for an easier assessment of the Tarot.

3.2 Forecasting IoT Futures

This keyword reduction on our placed Tarot cards, in effect, creates a tiny ontology of its own that is intended to relate to the IoT object. Currently the program presents a random object to be foretold its Tarot. But as it is programmed, and exists in a digital space, it can be linked to any IoT object to retrieve a forecast of whatever action the object attempts to undergo. For instance, if synced to a bulb that can be switched on with a smart phone, the program can present a series of keywords to define the interaction with the bulb; such as a reading for being switched on, switched off, sending data, receiving data, creating a log, etc. Subsequently, the ontography of the keywords presents a platform for practitioners to raise questions; that otherwise would seem implausible.

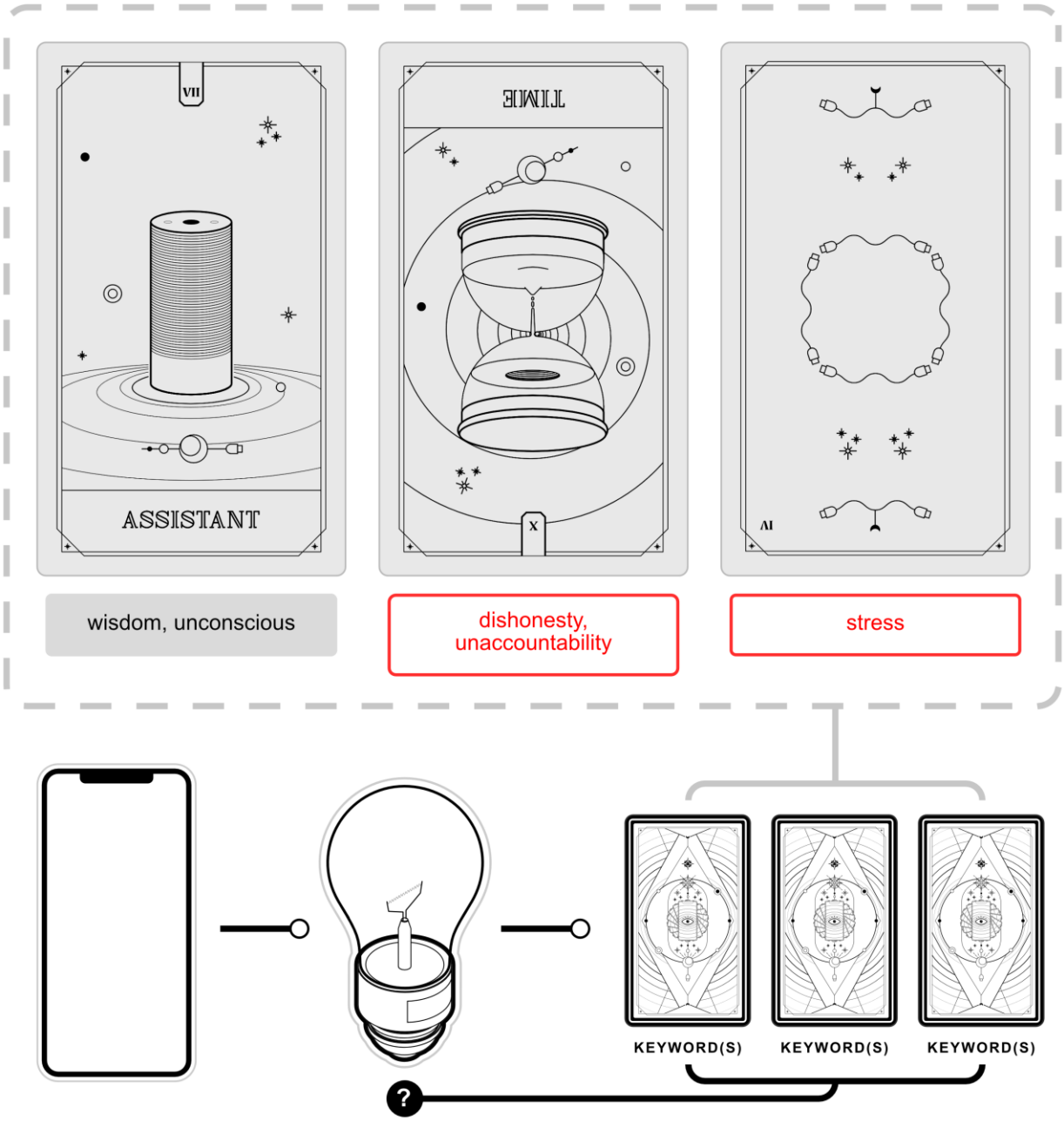

Figure 4 A smart bulb being forecasted its Tarot through the program

Consider an example of a lightbulb remotely switched on by a smart phone (Figure 4). The Tarot program is present on a separate device connected over the cloud. On switching on the bulb, it pings the server triggering the generation of a forecast saved to a log. The configuration of cards is random, the same as with traditional Tarot. In our case, let's assume the cards along with their keywords logged are:

- **Assistant (upright):** Wisdom, Unconscious
- **Time (inverted):** Dishonesty, Unaccountability
- **Four of Cables (inverted):** Stress

When presented with these keywords, in relation to an IoT enabled bulb, it raises questions such as: What is wisdom for a bulb? How can a bulb be unconscious? Can a bulb be dishonest or unaccountable? What about stress, what stresses a bulb?

Where some of these questions might seem more straightforward to answer—for example dishonesty: does it send its operating data to a third party without informing the owner? — others present unique challenges. Of course, all of this is subject to the understanding of the designer. How much they can create an interpretation that connects the object and keyword. But it does provide a useful starting point for the discussions, which otherwise would likely not be considered under pretences of HCD. Some of these questions might very well lead to novel design solutions.

4. Feedback and Discussion

Though Tarot can hardly be seen as a scientific starting point for the discussion around design of IoT, we nevertheless, attempted to see how much of an effect this approach could have in inducing alternate viewpoints. The program was evaluated through semi-structured interviews with participants where they were asked a series of questions around their knowledge of IoT and their experience of the cards. Participants were given random IoT objects and asked to roleplay as them when questioned. The questions were around their impression of the cards, and whether the keywords related to them as IoT objects. Each participant underwent a series of card/keyword/object configurations, to see how much of the concept could be passed across.

The immediate issue faced by participants was the lack of a starting point for role playing. Questions like, *"How can I think like a backpack?"*, were common. But after the initial few hurdles of configurations and aligning their thoughts to those of non-human objects, they all began embodying the objects more freely. That said, their embodiment was heavily influenced by their own *humanness*; as in, the objects no longer took on the guise of bulbs and forks but instead became *bulb-person*, and *fork-person*. This was partly due to the keywords, which though were heavily curated, still had enough variance to invoke odd interactions from the objects. In one instance, a thermometer was presented to a participant along with the keyword *Discipline*. They managed to make a story out of how thermometers would make your mind more rigid according to the reading; ergo, you need to rest because you are sick, '*says the thermometer'*.

Still, a prevailing argument presented by participants was, *"Why does this matter?"*. When asked about how they see the nature of IoT objects as being capable of more than their designed intentions; for instance, how a telephone is only a feature in a smart phone capable of doing a lot more (even though it is recognized as a *phone*). Some participants argued, that though that is the case, they would see the object as being more *useful* than its otherwise non enhanced variant. This aside, what also emerged was how doing the exercise made them aware of how these objects might be doing things they had not envisaged. One participant suggested how the keywords and cards made her wonder if she should be more

careful with her devices. If an object can be identified as *Manipulative* in the program, then what else could it be?

5. Conclusion

This paper presented an artefact that attempted to do philosophy through Bogostian carpentry in a manner of provoking questions around the design of IoT objects. The argument we present is a reaction to the excessive use of HCD and HCI in the design process for IoT. Building upon the works of Coulton & Lindley (2019), we suggest a plurality of alternative design approaches to foster heightened understandings of IoT actants. We take inspiration from OOO and Ian Bogost's carpentry, to create a bespoke deck of digital Tarot intended for the divination of IoT objects.

The compulsion of design to be *for humans*, coming from the oft quoted Bauhaus phrase *"form follows function"*, keeps the foci of design forever revolving around the human user. The convoluted nature of IoT interactions (Lindley & Coulton, 2017), particularly in the wake of post-GDPR events surrounding IoT, have been the centre of debate around design for these systems. With scholars presenting caveats around HCD and the insistence on human-centeredness, the main reason for entering this research was to approach IoT from a non-human perspective; seeing how much of it could make sense.

OOO withdraws from conventional perception of objects, creating a bubble where strange possibilities may be presented as normality. Allowing non-humans to coexist among, and on par, with humans. This study approaches the viewing of IoT through a philosophical lens of OOO. Eloquently expressed by Morton (2011), human beings are merely "one way of being in a mesh of strange strangeness"; our objects among them.

The reduction of OOO brings with it a few caveats for design. Firstly, the heavy curation of keywords makes one wonder how unbiased have we been towards our IoT objects, and, whether we unknowingly still asserted meaning and value upon them through selective ontography? Secondly, the divide between non-human and human is still one that is difficult to overcome without further philosophical inquiry. We are not philosophers writing this paper, but, have attempted to make sense of these philosophical debates around ontology. Perhaps in hindsight, we should have brought in actors more capable of taking on the role of an inanimate object, or, philosophers more capable of presenting arguments for non-humans. But even then, this reasoning is flawed. How exactly can one remove the human from the *human-object*, to become a *non-human object*?

As stated before, this work is intended as a provocation of current orthodoxies in the application of HCD. The program, cards, the assessment of keywords, all of it are not intended to be for any single user. Rather, to act as a modality of viewing IoT design practice. It could have been enough to simply have a set of keywords randomly assigned to an IoT object. But the setting of Tarot, adds a secondary layer of interpretation; a *medium* for self-assessment.

In the end, whether we design with human users in mind or non-human, the end-product is still (at least for now) operated by human users. Which could suggest the reasoning of participants on whether this exercise matters. None the less, this approach did open the minds of our participants. That might be enough to encourage greater development of a post-HCD view of IoT design; and maybe design in general. Shifting its focus from solely considering the needs of the human to more adequately consider the non-human i.e. the climate, environment, flora, and fauna etc.

6. References

Akmal, H., & Coulton, P. (2020). The Divination of Things by Things. In *CHI'20 Extended Abstracts on Human Factors in Computing Systems*. (In press)

Akmal, H., & Coulton, P. (2019). Research Through Board Game Design. *Proceedings of RtD 2019: Method & Critique*. Presented at the RtD 2019: Method & Critique, Delft, Netherlands.

Bogost, I. (2012). *Alien phenomenology, or, What it's like to be a thing*. Minneapolis: University of Minnesota Press.

Brassier, R. (2015) Deleveling: Against flat ontologies. In C. van Dijk, E. van der Graaf, M. den Haan, R. de Jong, C. Roodenburg, D. Til, & D. Waal (Ed.), *Under Influence - Philosophical Festival Drift*. Omnia, 64–80.

Bryant, L. R. (2011). The Democracy of Objects. *New Metaphysics*. https://doi.org/10.3998/ohp.9750134.0001.001

Coulton, P., & Lindley, J. G. (2019). More-Than Human Centred Design: Considering Other Things. *The Design Journal*, *22*(4), 463–481. https://doi.org/10.1080/14606925.2019.1614320

Harman, G. (2011). *The quadruple object*. Winchester, U.K. Washington, USA: Zero Books.

Harman, G. (2018). Object-Oriented Ontology: A New Theory of Everything (1st ed.). Pelican Books.

Hashizume, A. & Kurosu, M. (2013). Understanding User Experience and Artifact Development through Qualitative Investigation: Ethnographic Approach for Human-Centered Design. In M. Kurosu (Ed), *Human-Computer Interaction. Human-Centred Design Approaches, Methods, Tools, and Environments. Lecture Notes in Computer Science*. Berlin, Heidelberg, Springer, 68–76.

Latour, B. (1994). *We have never been modern* (3. print.). Cambridge, Mass: Harvard Univ. Press.

Lindley, J., Akmal, H.A. & Coulton, P. (2020). Design Research and Object-Oriented Ontology. *Open Philosophy, 3*(1), 11–41.

Lindley, J., Coulton, P., & Alter, H. (2019). Networking with Ghosts in the Machine. Speaking to the Internet of Things. *The Design Journal*, *22*(sup1), 1187–1199. https://doi.org/10.1080/14606925.2019.1594984

Lindley, J.G., Coulton, P. & Akmal, H. (2018). Turning Philosophy with a Speculative Lathe: Object Oriented Ontology, Carpentry, and Design Fiction. *Proceedings of DRS2018 Limerick*. Limerick, 229–243.

Lindley, J. G., & Coulton, P. (2017). On the Internet Everybody Knows You're a Whatchamacallit (or a Thing). In *CHI 2017 Workshop*.

Maund, B. (2003). *Perception (Central problems of philosophy)*. McGill-Queen's University Press.

Meillassoux, Q. (2010). After finitude: An essay on the necessity of contingency. Bloomsbury Publishing.

Morton, T. (2011). Here Comes Everything: The Promise of Object-Oriented Ontology. *Qui Parle*, *19*(2), 163–190. https://doi.org/10.5250/quiparle.19.2.0163

Norman, D. A. (1999). The invisible computer: Why good products can fail, the personal computer is so complex, and information appliances are the solution. MIT press.

Semetsky, I. (2006). Tarot as a projective technique. *Spirituality and Health International*, *7*(4), 187–197.

Simon, M.M. (2018). *Tool-things: The Making of an Apprentice*. PhD Thesis. OCAD University.

Steen, M. (2011). Tensions in human-centred design. *CoDesign*, *7*(1), 45–60.

Stewart, J., & Williams, R. (2005). The wrong trousers? Beyond the design fallacy: Social learning and the user. In H. Rohracher (Ed.), *User involvement in innovation processes. Strategies and limitations from a socio-technical perspective,* (pp. 39–71). Munchen/Wien: Profil Verlag.

Stickdorn, M. & Schneider, J. (2011). *This is Service Design Thinking: Basics, Tools, Cases*. Hoboken, New Jersey, WILEY.Sørensen, K. H. (1994). Adieu Adorno: The moral emancipation of consumers. In A.-J. Berg & M. Aune (Ed.), *Domestic technology and everyday life-mutual shaping processes, COST Social sciences* (Vol. 1, pp. 157–169). Luxemburg: European Commission DGXIII Science Research and Development.

Wiscombe, T. (2014). Discreteness, or towards a flat ontology of architecture. *Project*, 3, pp.34–43.

Zahavi, D. (2016). The end of what? Phenomenology vs. Speculative realism. *International Journal of Philosophical Studies*, *24*(3), 289–309. https://doi.org/10.1080/09672559.2016.1175101

About the Authors:

Haider Ali Akmal is a PhD Design candidate and practicing visual artist at Lancaster University. His research focuses on the intricacies of human experience around digital and physical interactions using Speculative Design, Philosophy, and Ludic Design as exploratory mediums.

Paul Coulton is the Chair of Speculative and Game Design in the open and exploratory design-led research studio Imagination Lancaster. He uses a research through design approach to creative fictional representations of future worlds in which emerging technologies have become mundane.