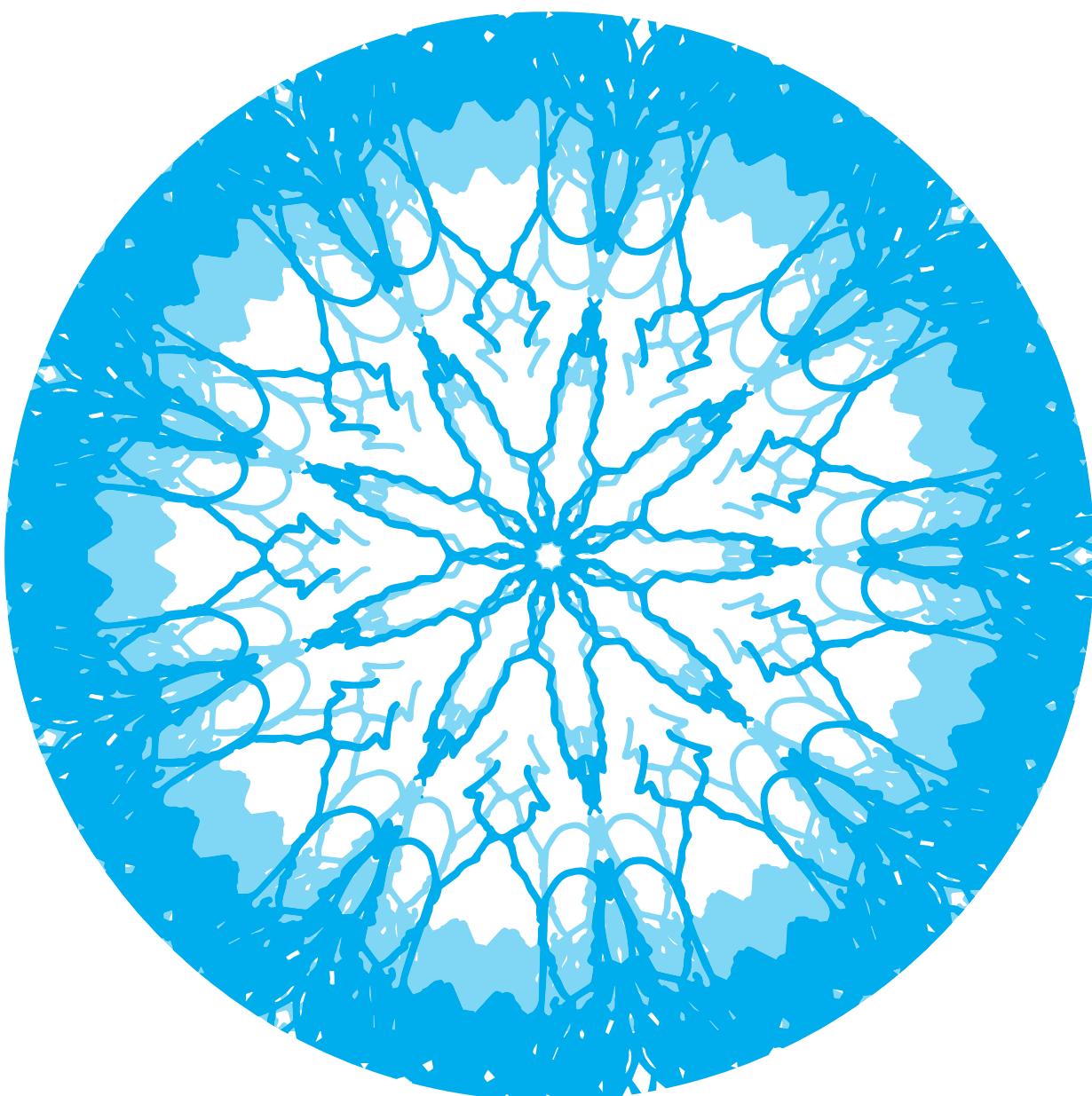


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# FUTURE AS FICTION

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## READINGS ON DIGITAL FUTURES



MEDIA ARTS  
FESTIVAL

## PREFACE

How do new media and digital technology influence the way we perceive our reality and its temporal notions of past, present and future?

This question can be reversed : How can perceptions of time influence our imagination of emerging technology?

This collection arises from curiosity - amplified by the writer's speculation - and set within the contradictory, persistent marvel that is India.

To a keen observer, the seemingly radical progress in Media and Technology is meaningless until it is constrained with the imminent societal, cultural, economic and ethical challenges and opportunities of India.

Positioning human interests and experiences above market-led progress is essential for harmony in the country. These writings reflect on points of conflict, erosion and celebration that typify our plural culture.

The volume of platforms and narratives that India could provide to future global media is immense - but it demands honest introspection. An outpouring of globalised technological expressions might need to be humanised with a few questions -

Can hyperlocal systems exist within the connectedness of everything?

What is the relationship between network creation and craftsmanship?

What is the position of art - our tool to mediate reality - in a world that's mediated by technology?

# THE INTERNET AS A LOTA

Revisiting the Eames Report for clues to the Digital Revolution

*Jayne Wallace*



North Indian Brass Lota, Image © Victoria and Albert Museum

When I was in India, on campus at NID (National Institute of Design), I revisited 'The India Report' written by American designers Charles and Ray Eames in 1958 for the Government of India, which led to the creation of this institution. The report is a product of the Eames' spending months in India and involved, in part, them spending time with craft communities.

What is striking is that their words are as valid now as they were when written, and resonate acutely both with contemporary craft and digital cultures globally. If we want to think through craft as a lens onto a healthy internet, this seems like a perfect place to start.

"The change India is undergoing is a change in kind not a change of degree. The medium that is producing this change is communication; not some influence of the West on the East. The phenomenon of communication is something that affects a world not a country.

The advanced complexities of communication were perhaps felt first in Europe, then West to America which was a fertile traditionless field. They then moved East and West gathering momentum and striking India with terrific impact – an impact that was made more violent because of India's own complex of isolation, barriers of language, deep-rooted tradition.

The decisions that are made in a tradition-oriented society are apt to be unconscious decisions – in that each situation or action automatically calls for a specified reaction. Behaviour patterns are pre-programmed, pre-set.

It is in this climate that handicrafts flourish – changes take place by degrees – there are moments of violence but the security is in the status quo. The nature of a communication-oriented society is different by kind – not by degree."

(Eames, C. and Eames, R., 1958. *The India Report. National Institute of Design P.3.*)

It is these incremental, considered, "changes by degree" that a person makes in developing something that feels particularly pertinent; when layering a craft way of thinking and doing over our current ways of developing and using the internet. Within a craft

methodology changes are made through tentative adjustments guided by testing outcomes at each stage for 'fit' or rightness, and by seeing each situation as something unique in its texture (even though long established "patterns of behaviour" or actions are applied) and requiring specific treatment.

This tweaking, adjusting, refining, is accompanied by what the Eames' call "moments of violence." Which, I'm seeing in this context as actions such as striking metal with force to form a desired shape, after which more gentle actions such as planishing, filing, or polishing, adjust the form into the ultimate outcome. To give their abstractions solidity the Eames used an example of the Indian "Lota" - a small, usually spherical water vessel used for personal hygiene.

You can similarly view the internet as a Lota pot - something that has been crafted and designed over a generation by the billions of people who use it. By following the Eames' observations further, the explanation for this rationale will become clearer..

A "simple vessel of everyday use, stands out as perhaps the greatest, the most beautiful. (...) But how would one go about designing a Lota? First one would have to shut out all preconceived ideas on the subject and then begin to consider factor after factor (for example):

- The optimum amount of liquid to be fetched, carried, poured and stored in a prescribed set of circumstances.
- The size and strength and gender of the hands (if hands) that would manipulate it.
- The way it is to be transported – head, hip, hand, basket or cart.
- Its sculpture as complement to the rhythmic motion of walking or a static post at the well.
- What is the possible material ?(...)

Of course, no one man could have possibly designed the Lota. The number of combinations of factors to be considered gets to be astronomical – no one man designed the Lota but many men over many generations. Many individuals represented in their own way through something they may have added or may have removed or through some quality of which they were particularly aware."

(Eames, C. and Eames, R., 1958. *The India Report. National Institute of Design P. 4&5.*)

What the Eames' describe is both craft as a process, as well as a methodology. They also detail the way that things evolve and come into being through a decentralised mode of engagement. The Lota, like the internet, is not specific to one individual. Being a shared form, many numbers of individuals have refined, tweaked and developed the Lota over time because they observed through their use of it, changes that would improve it. Craft thinking and doing is always tethered to lived experience and the insights gained, often embodied, through a physical engagement with something. It is an ethos of engagement, whereby living with the things at the centre of an enquiry and gaining insights, enable incremental changes to be applied. Putting a craft lens onto the question of 'what constitutes a healthy internet' brings with it an understanding and value that the voice of the individual is valid, and that all things can be altered to better fit the contextual purpose for which they are used. This is the antithesis of, firstly; an ascribed form of perfection, secondly; the notion of something being 'finished' and thirdly; of passive consumption. The craft ethos, rather, is one in which attunement of a thing by an individual is a welcomed part of life. It acknowledges that in living with and (importantly) through things, we not only adjust them, but mould them around ourselves. If we subscribe to this 'craft lens' for the internet we see that there is no perfect 'thing' - all things can change- and nothing is ever 'finished'. Craft (separate to design) is in a constant state of 'becoming', which is hugely useful as an ethos - because it is in harmony with the fact that people, just by being people, are also essentially decentralised and ever changing

entities. Therefore a 'craft lens' can help us reflect on issues/situations/challenges from a deeply humanistic point of view.

To continue the metaphor of the internet as a Lota pot, whilst the "big five" (Apple, Google, Microsoft, Amazon, and Facebook) may claim to be the internet, in reality they are part of a vessel that has been tweaked and hammered into existence by billions of users/owners. They can, of course, sell a dominant version of a Lota pot (internet), but they can't, presently, deny the existence of others.

Through the over-control of content creation and consumption we can see that companies like Facebook don't see the 'Internet-Lota' pot as a crafted thing that has been made by many and evolved by their hands over time. They merely see users as adding content within Facebook's own rigidly framed scaffolds and identity. More significantly the "big five" companies are averse to a crafted object, and want a final solution.

One of the biggest problems we currently face is that social media monopolies like Facebook, now have the financial and political power to stop us from crafting our own web. They can prevent us from tweaking, adapting and creating an internet that fits us and can confine us to a standardised internet space and materiality where only facsimiles of their vision can co-exist. This promotes a form of passive consumption that not only stifles and controls people who use it, but also denies an evolution of digital communication that is analogous to being human in that we are ever-becoming, decentralised 'things'.

# DECENTRALISING THE INTERNET OF THINGS (IOT)

Working with the Open IOT Studio at the Mozilla Foundation to explore alternate narratives for the Internet of Things.

**Babitha George  
& Romit Raj**

The narrative of IoT is currently dominated by discourses set by large for-profit organisations. These discourses tend to revolve around closed systems where the touch points for casual users are usually appliances. Even in such cases as the Google Cloud Platform, which are technically open source, the channels of innovation and usage tend to be very narrow.

For example, at present, the narrative around the Internet of Things is closely linked with the narrative of Big Data. The Google Cloud Platform, which on the surface appears to be a fairly open set of tools, including a developer hardware kit, is in fact, a fairly closed narrative around sensors streaming data through Google Cloud servers. Therefore, while the systems may have diverse and scattered inputs, the data collected is channeled into a narrow utility zone of monitoring and only through the Google Cloud pipeline.

Even this, however, is a fringe component of the IoT ecosystem as it exists today. For most people, interactions with IoT systems will begin (and perhaps end) with mainstream appliances such as refrigerators, washing machines, televisions, ovens, automobiles etc. An average user perhaps will understand IoT in her home as the communication paradigm between these appliances. The idea seems to be that these appliances will be able to communicate with each other and with a larger system architecture.

This seems to be not only a benign but also a fairly decentralised system where each household

forms a contained whole capable of intelligently making the lives of their owners more convenient. However there are large systems and protocols in this ecosystem that are definitely not decentralised and perhaps not so benign either.

For an average user these systems and protocols may be invisible. However, they are apparent to any kind of careful consideration. A fitness device for example, is a closed electronic system collecting user data and communicating with proprietary servers while giving the user a narrow window into the data collected through an interface. Not only are these devices closed systems built with proprietary technologies but they often communicate with centralised server architectures that are proprietary as well.

## Learning from 'Disconnected' Communities

It is in this context, that we must seek to understand and learn from decentralised models of production, distribution and control. The world of technology is often silo-ed, and works under the assumption that innovation emerges primarily in systems that are largely urban and often Western - in aesthetic, in function and in their inception.

The other aspect to this is the nature of the Western world being more 'dependent' in an intrinsic way on technology; the daily lives of people being more intertwined with technology in a way that has maybe led to even surreal comical scenarios of dysfunction. Maybe there is a lot to learn from alternate contexts, in places like India, where some marginalised peoples, that are



seemingly 'disconnected', continue to sustain communities of practice. Such communities are involved in a diverse range of activities like traditional crafts, sustainable harvesting of forest produce and water body restoration. They often feature a decentralised structure, a keen awareness of contextual needs, local participation and a deep connect with the context at large. What can we learn from these communities? What is it that enables them to be resilient to shocks and be able to serve local contexts and needs better?

It appears that resilience is closely connected to the nature of control in such communities; in that it is contingent upon the community experiencing genuine agency, outside of any control imposed by an outside agency. A community organised around restoring water bodies in a village will not be able to preserve traditional restoration practices unless the external implementing agencies build around the community's recommendations.

Centralised technology narratives that are disseminated by large corporations offer little agency to the people consuming and scaling these narratives. The relevance of the Internet of Things is often narrowly defined in terms of collecting, analysing and reacting to big data where it could equally be about a seemingly unrelated challenge like empowering farmers to preserve crop diversity. An ecosystem of connected objects offers a far larger spectrum of possibilities than is currently recognised by the mainstream IoT narrative. A broader scoping is required to make this narrative itself more sustainable, resilient and relevant to large groups of people.

Technology companies often seek efficiency through specialisation and formal hierarchies. This setup compromises flexibility, thus making the core proposition of these companies more certain and predictable. For publicly held

companies the organisational rhythms and product visions are dictated by the market. The communities that we seek to learn from often have a more organic form, evolved, as they have, through natural circumstances and not solely as a response to a market or business need. These communities thrive on shared and flexible notions of power and responsibility.

#### **Seeking alternative narratives for IoT**

The problems of the real world are complex and largely evolve unpredictably. Lack of food diversity, for example, is a global problem that involves responding to climate change, soil preservation, nature of production systems and markets among others. These problems are perhaps more aptly addressed by the values and qualities of decentralised communities rather than those of the current technology ecosystem. These values that may appear chaotic and messy are also flexible and organic, and are therefore well suited to grapple with these complex evolving challenges.

Accountability, mutual responsibility, care and trust are prerequisites for any successful community of practice. These could potentially be seen as guiding principles that serve as a framework for resilient and sustainable systems. Maybe technology could be well-served to learn from these messy human systems that have evolved in an innately people-centered way. They allow for diversity to thrive, are more sensitive to the irrevocable scarcity of resources and recognise the limitations of scale.

# TINKERING WITH TRADITION

*Hugo Pilate & Eve Wolfs*



If you haven't been to the Integrated Crafts Colony (ICC) yet, you must. It's a fascinating Disneyworld of Crafts, the ultimate Indian heritage hub of production. Our team here at TechnoCrafto has gone to the heart of the ICC to give you an insider's view on what the largest craft colony in the world is up to!

For those of you who've been living behind a photovoltaic firewall in the past decade, here's a brief download. The ICC was formed in 2027, as the Indian government kicked off its 'Think Green Initiative', a massive government-subsidized effort, working across industries to make India the first Zero Emission country by 2070.

As we now know, it has been an astounding success.

Starting with the introduction of renewable energy alternatives into public transit services, the drastic increase of tariffs on non-electric vehicle imports (rendering it nearly impossible for most American cars to enter the Indian market), the government has also targeted industrial production facilities by incentivizing electrification and automation, thus stabilizing energy consumption.

However, it hasn't all been smooth sailing. Unfortunately, this transformation also required strict sanctions on more traditional, low-tech industries like agrarian communities, fishermen and craftsmen. Food started being synthesized or imported to offset the carbon footprint from growing it. Non-government regulated fishing, which involved fleets of highly polluting ships was outlawed.

Moreover artisans, especially potters, have been made the scapegoats of the movement after a slew of viral videos emerged online showing the thick dark fumes kilns produce. (Editor's note: there are rumours the videos were released by government-funded green warriors.) As the ecological mission made its way to the top of the national agenda, violent riots erupted against potters and those who did not seem to support the program — even while they may not have had any alternatives to support their livelihoods.

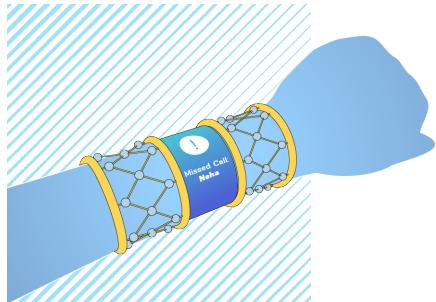
Thankfully, there's been a surge in demand for traditional goods both internationally and domestically. According to a recent census by the Craft Ministry of India, the average Indian living above the poverty line

spends up to 11% of their income on traditional crafts, the ICC was created with the intention of having the persecuted communities live together and support each other to meet the strict sanctions affecting their livelihoods, until better tools and processes were discovered.

A government-funded initiative, the ICC is a protected militarized crafts colony in Andhra Pradesh for those affected by high tariffs and violence. The government also funded the relocation of all farmers, fishermen and artisans to the colony, a tedious task that was greatly expedited through the use of Aadhar technology.

Now, the ICC is a mesmerizing ecosystem of hand-driven innovation, jugaad, automation, experimentation, and production. We've put together for you a little scavenger hunt for the next time you visit the ICC. A collection of 5 Luxury items and 5 Hacks you must look out for — in person or virtually — enjoy!

# ICC : Luxury



## Smart Meenakari Jewels

Beautifully crafted by the best Meenakari artisans of the ICC, this connected bracelet projects the digital data you always should have at hand. No more excuses for missing an appointment, a last minute party invitation or forgetting to buy milk while coming back from work.

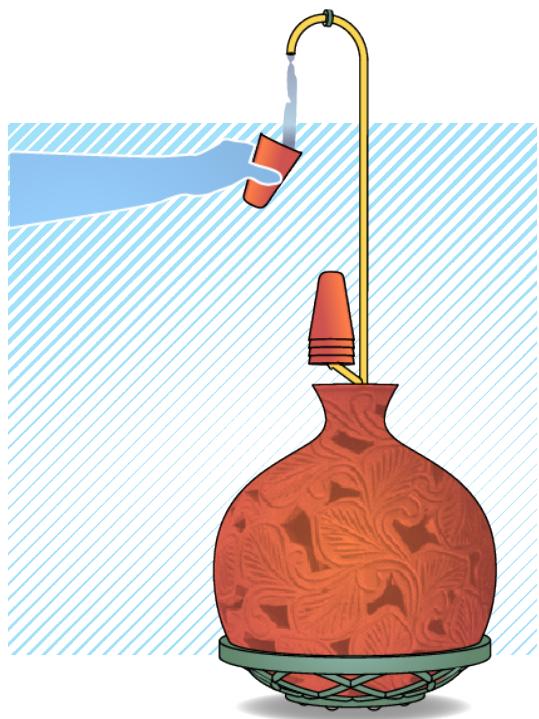
### Mythical Pattachitra Travels

Vikram Bunodh, a talented and innovative Kondapalli artisan recently developed a Pattachitra Epic immersion rocking horse. Let your child escape on an immersive journey through interactive Pattachitra epics.



## Autonomous Ayurvedic Matka

Let this matka on wheels pamper you. Throughout the day it will come to you anywhere in your home to bring you the most refreshing Ayurvedic water concoctions known to man to this day.



### Bidri Home Entertainment System

The perfect addition to any high-end lifestyle, this set of projector and wireless speakers is crafted using traditional Bidri engraving techniques. Whether playing a movie or making your living room look ravishing, this entertainment system is a must-have.

## Channapatna Festivals Transporter

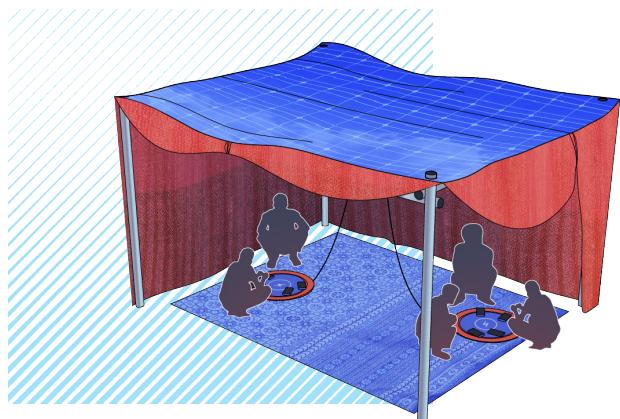
This precious kit is for all of you away from home! Virtually attend your favorite festivals remotely from the comfort of your home. Comes with exciting accessories: a Holi ring, two dandiya sticks and a beautiful Channapatna Augmented Reality headset.



# ICC : Hacks

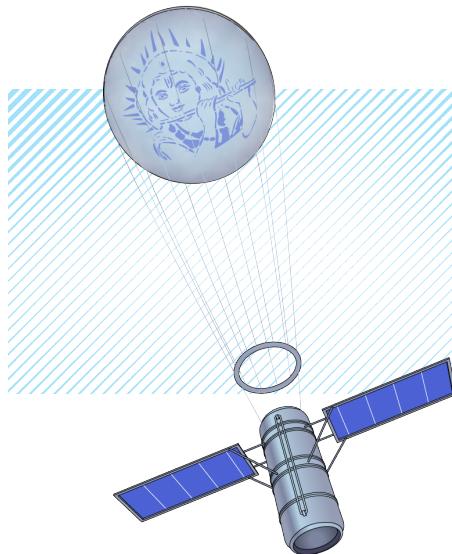
## Detractor Masks

Reflective masks used during protests to avoid identification. Originally made from repurposed paper-mache masks from Andhra Pradesh, they are now stamped out of recycled plastics.



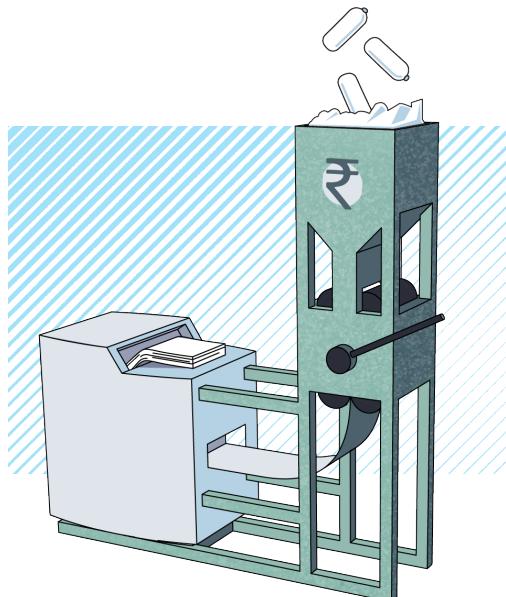
## Solar Charging Tent

With limited access to combustibles which are often saved for their crafts, more and more ICC residents have turned to solar energy for all their smaller devices. To that end, charging tents have been erected using solar capturing fabrics, feeding energy into wireless power mats.



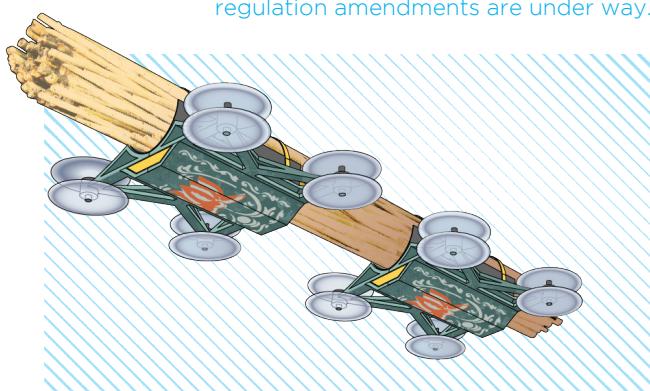
## Tin Sea Satellites

Access to the outside world in the ICC is highly restricted, resulting in activist residents releasing home-made satellites at night to run their ad-hoc network called the TSN (Tin Sea Net). These temporary devices are usually made from repurposed kitchen items carried by tarp balloons.



## Plastic Paper Recycler

An ingenious response to the ban on plastic and paper use, this contraption creates a continuous, micron thin, paper scroll that is then directly fed into a Xerox-type printer used to counterfeit all sorts of legal documents, including old state money.



## Material-Smuggling Drones

Governmental regulations around deforestation have caused a grave challenge for ICC artisans, who now have to smuggle wood and other materials like clay for their own state-funded crafts. The absurdity of the situation has not gone unnoticed, regulation amendments are under way.

# A CASE FOR CONTEXTUALISED FABRICATION

*Hugo Pilate*

## New Partners in Craft

The craft and industrial spheres of production have always had a tenuous relationship. A tension in part been due to new scales of production, material innovation, global price wars and inconsistent demand. These are a few of the many territories artisans and manufacturers have butted heads over. In this decades old tug of war, designers have often played the role of intermediary, on both ends of the spectrum. Sometimes to work with corporations to adapt a craft to industrial constraints, or other times with craftsmen to revitalize a craft. Several projects come to mind from the Eames' India Report and the MP Ranjan's work on bamboo crafts, to brands like Curo Carte, Fabindia or the many mainstream apparel brands that have promoted, collaborated with or appropriated traditional designs and techniques to varying degrees.

This dance, whether or not facilitated by a designer, has always left artisans as the ones trailing, dragging their heritage as baggage while they chase abstract and arbitrary trends. As a designer, researcher, I have been looking for new, more constructive and rewarding forms of collaborations between all parties. Without being overly optimistic, it seems the latest Industrial Revolution (it goes by the name Third Industrial Revolution...) may have some answers or at the very least interesting new practices to bridge the gap between artisans and citizens, financially and culturally.

As we make our way into 2017, the dust is settling on what was somewhat prematurely and self-aggrandizing-ly called the Third Industrial Revolution, the advent of the 'maker' in 2012. A movement coined by Chris Anderson in his book *Makers* brings together several trends emerging at the time, increasingly affordable 3D printers and other digital fabrication tools, makerspaces and fablabs, where said makers could mingle and do their thing between bricolage and invention.

The maker culture (and thus the Third Industrial Revolution), despite having had very limited time in the global limelight, is still alive, well and a very promising counterweight to more traditional modes of manufacturing.

It offers localized and scalable production solutions to community members and, above all, access to designs from around the world — a majority of the work created has a presence online, be it in tutorial form or with reproducible files. This has fostered a diverse global community of curious people trained in problem-solving through fabrication and entrepreneurs learning to use new online tools to live from their crafts.

### Making Craft

India was involved very early on with the maker movement, one of the world's earliest venues for makers, FabLabs (fabrication laboratory), saw the light of day in Vigyan Ashram, Pune, thirteen years ago. Since then, many have sprouted across the country. Maker's Asylum is one such space, named as a tribute to Artisan's Asylum — a space dedicated to makers of all stripes, hosting doctors and artists alike right outside of Boston. Maker's Asylum hosts its own lively community in Mumbai, and is planning on re-opening its doors in Delhi very soon. I visited their Delhi space to speak with its co-founder Vaibhav Chhabra, about projects being hosted there and the potential benefits of cross-pollination between the maker culture and traditional crafts.

While Vaibhav emphasized the importance of community and meeting through making, he shared some very interesting projects going on in Mumbai — electric motorcycles, phone-based retinal scanners, open source satellites being designed in partnership with a fablab in Greece, and 3D-printed prosthetic limbs — all fitting the modus operandi of any fun fablab or makerspace.

When it came to discussing projects around craft or Indian heritage, a couple of interesting points came up. For one, a lot of the craft experiments being conducted involved Japanese crafts: Shibori dyeing, Suminagashi marbling and Origami animatronics. Furthermore, a lot of the visual language used in projects had geek culture references ranging from a full size C3PO (the origami animatronic) to a Super Mario mural and lowpoly patterns on the walls.

The most direct Indian reference came from a project made possible

by the Asylum's fellowship program. A resident maker, Coby Unger in partnership with Namita Mohandas, worked around the framework of the auto rickshaw to create a mobile makerspace that's been used at events and embedded into STEAM learning programs. Other projects involved pottery, block-printing, each of which seemed to be more about discovering the technique rather than mastering the craft or rediscovering the heritage.

Therein lies the challenge and the opportunity — makers are above all global hobbyists, drawing inspiration from an international pool of knowledge and heritage, discovering before mastering, realising before perfecting — it must work, whatever it takes (cue in cheesy jugaad reference). Doesn't this, therefore, make fablabs and makerspaces the perfect places for the incubation of new crafts and craft objects?

What the maker movement is lacking at the moment is an incorporation of its hubs' respective local cultures and heritage, be it in Mumbai, Pune, or Kochi, or any other country in the world. As well as, for these new concepts to be projected back onto the global platforms they were built on—Wiki pages, Etsy, and Instructables. Unlike larger organizations or design studios, makers have the freedom to experiment and prototype new concepts on the go at a very low scale.

Several efforts are currently underway, this intersection of traditional and emerging makers was also one of the core focus areas of UnBox Festival 2014. The Digital Craft series of workshops at the festival explored the use of conductive ink and traditional block printing skills to create touch-sensitive surfaces with audio responses. The workshop also explored the use of laser cut and 3D printed blocks to revive older motifs that were too

complex to be carved commercially in today's time. The workshop was anchored by Justin Marshall, a professor of digital craft at University of Falmouth, who collaborated with Rajasthani block printers, textile students, and Arduino enthusiasts. Because the players come from such distinctly different contexts, festivals such as UnBox form the meeting spaces of unlikely partners. But for these experiments to sustain and find meaningful applications, it may need a more permanent and supportive environment.

There is a makerspace being set up in Rajasthan to focus specifically on revisiting local traditional textile weaving crafts. Another interesting program already straddling the line between local and global, is Museomix, a yearly festival where fablabs and makerspaces from various cities around the world simultaneously host a hackathon in a local museum. The goal is to reinvent, over the course of a weekend, the museum's exhibits and how they are experienced. Although not strictly craft, the festival shows the local communities' interest in finding new ways to interact with their own heritage. As more spaces open around India and the world focusing on specific local crafts, they will attract all sorts of makers from incredibly diverse backgrounds. New strategies will emerge for collaborations — the creation of custom tools, new applications for patterns and visual narrative devices, as well as new hybrids between craft and tech, and in between crafts themselves. My hope is that in the next decade, these new fabrication-centric encounters result in new aesthetics, crafts and narratives that link our respective pasts and presents rather than reproducing visual canons dictated by faceless global manufacturers.



# CAN THE DIGITAL ECONOMY DELIVER ON ITS PROMISE?

*Urvashi Aneja*

The proposition that the digital economy is going to deliver development, prosperity and growth has become almost conventional wisdom among policy makers, economists, and innovators alike. Undoubtedly, a digital economy can lead to more trade, better capital use, and greater efficiency, innovation, and competition. Too often however, narratives on the role of the digital economy are characterised by technological determinism – a sense that technology is the natural and necessary solution to a number of complex social problems, a quasi-natural force, impervious to human choice and action, that will autonomously deliver social change. At a conference last year, for example, minister for communications and information technology, Ravi Shankar Prasad, stated that 'India is developing on its own' – the how and why of this was attributed to increased internet penetration.

Currently only 40% of the globe has digital access. A McKinsey report suggests that about 75% of the offline population is concentrated in 20 countries, and is disproportionately rural, low income, elderly, illiterate, and female. A study by the World Economic Forum highlights that in India, only 15 of every 100 households have access to the

internet and there are only 5.5 mobile broadband connections for every 100 people. Unless we can provide universal access to all, the digital economy will benefit only a few, exacerbating inequities between the digital haves and have-nots.

But the digital divide is not only about access. It is also about the degree and quality of participation among those who are already online. According to a Boston Consulting Group study, the percentage of women internet users in India is approximated at only 29%; the remainder 71% is men. A paper analysing Twitter feeds in India concluding that women were significantly underrepresented in political conversations. Almost 85% of the user generated content indexed by Google comes from the US, Canada and Europe. This mirrors the trends in academic journals; knowledge production in the digital world is thus led by a select few, belonging to specific geographies. The digital world is in fact mirroring the inequities of the physical world.

Addressing the digital divide also requires that we pay attention to the analog components of the digital economy – particularly, education and skilling. Education statistics in India remain worrying – the 2016 Annual Status of

Education report argued for example that children in Class III who can read at least a Class I text has dropped consistently from about 50% to about 40% and children in Class III who can do at least subtraction has dropped from 40% to 25%. Too often we hear anecdotal stories about how farmers and carpenters are using whatsapp and that this is a sign of their digital fluency and preparedness for the digital economy. On the contrary, in an information age it is more important than ever to have the critical and analytical skills that allow one to make sense of the vast amount of information available, make informed choices, and safeguard one's security and privacy.





We also need to consider the distribution of gains in the digital economy. The 2016 World Development Report argues for example, that the share of national incomes that have gone to labour, especially routine labour has fallen sharply in many developing countries. And this is true historically as well – a 2015 Harvard Business Review article argued that over the last 200 years technological change has often been associated with stagnant wages and rising inequality, at least for a time. Corporations in the new digital economy are also able to generate immense wealth with fewer and fewer people. Facebook had 5000 employees in 2012, compared with 145,000 Kodak had at its peak in the 1990s; Facebook's market value however is much more than Kodaks' ever was. Google, the platform economy giant, has annual revenues over \$50 billion, but only 50,000 employees.

The question of distributive gains can also be asked of the emerging platform economy – think Uber, Amazon Mechanical Turks or Air BnB. Undoubtedly, new digital platforms facilitate more flexible working arrangements, permitting for example many more women to enter the workforce. But the platform economy can also contribute to a degradation of labour, i.e. when workers move from occupations in which they are highly productive and well compensated to those in which they are less productive and poorly compensated. Sceptics thus point out that platform economies are built on the idea of driving down wages, while at the same time reducing the chances of collective bargaining through labour unions. To participate in a platform economy, workers need to invest both their capital and labour; their continued work however is dependent on a series of external factors beyond individual control. Even more supportive accounts thus note that risks in a platform economy are transferred from the business to the individual worker. For example, Uber drivers often borrow money to buy their own vehicles; if however, the market gets over-saturated with Uber drivers or there is a change in domestic law, an Uber driver is burdened with debt.

With increased automation and advances in artificial intelligence, there is also a very real risk of job dislocation. The World Bank recently estimates that 69% of all jobs in India are susceptible to automation. Automation also means that the cheap labour advantage no longer lies with developing countries – a process of premature de-industrialization is underway in which manufacturing shrinks in poor countries that never had much industrialisation in the first place. The clearest example of this is the re-locating of the textile industry back to industrialised countries. The number of direct jobs created through ICT technologies is also modest – the ICT sector accounts for only 1% of workforce on average in developing countries. One additional technology job does however create around five new jobs in other sectors, but this is not going to be enough, particularly in a country like India where, by some estimates, the requirement is to create 12 million jobs every year.

Some of these jobs are arguably going to emerge from the platform economy, with more and more people working freelance and part-time. But the question that needs to be addressed is whether individuals engaged in so-called 'gig labour' are to be considered employees or contractors. Platforms prefer to treat them as contractors, but this means that workers lose the social protection and benefits – such as insurance or protection against workplace discrimination – that come with formal employment. The freelance economy is in a sense not new to India at all – in 2011-12, over 92% of Indian workers were informal. If automation and artificial intelligence is going to mean job dislocation and if future job creation is going to come from the platform economy, the implication for India is that informal employment is going to be a persistent feature of the Indian economy. The question then is, both for India and globally, how we can guarantee social protection in an informal economy. This would mean we need to find ways in which social protection schemes can be separated or de-linked from formal employment.

The idea of a basic income is gaining popularity in response to concerns about job dislocation and social protection. A basic income would mean that all citizens or residents of a country regularly receive a specified sum of money from either government or another public institution, financed through forms of taxation or profits of publicly owned enterprises. The difficulties in financing and implementation aside, what is intriguing about the basic income discussion is that there seems to be a convergence between on one hand, progressives, socialists, and, feminists and on the other hand, Silicon Valley entrepreneurs. For the former, a basic income could increase bargaining power for workers, change the distribution of domestic tasks between men and women, as well as provide a stimulus to political participation and voluntary work. For the latter Silicon Valley entrepreneurs however, a basic income is a way to create demand for their innovations in a job-less economy.

Can the digital economy deliver on its promise? Perhaps. But for this we need to avoid technological determinism and put people back at the centre as the drivers and recipients of economic change. Sound policy frameworks need to be evolved to shape the trajectories and governance of emerging digital technologies. The digital divide must be addressed, through both universal and affordable access, and by equipping people with the necessary education and skills to safely navigate the digital space. Equally important, and often not adequately considered, is the distribution of gains in the digital economy – as it stands the wealth created by the digital economy is creating neither more employment, nor higher wages, nor better social protection. In fact there is a risk that it can result in job dislocation and increase the risk to workers, without robust and adequate social protection schemes in place. The digital economy will deliver on its promise only if we take these issues into serious consideration. The early days of the digital economy is the time to get the architecture right, particularly in India where the roadmaps towards inclusive development are still under construction.

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The Indian Centre for Immersive Media (ICIM) - an initiative by the Indian School of Design & Innovation (ISDI) - is a response to the critical need to reclaim and expand Indian identity in the global Media landscape. Created in partnership with UnBox Cultural Futures - an experiential platform for creative practice - ICIM seeks to catalyze this immense opportunity with an authentic programme of research, experimentation and entrepreneurship.



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