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Toward Donut-Centered Design
A Design Research Toolkit for the 21st Century

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The social and ecological challenges of the 21st century require a design research process that contributes to viable economic solutions. This paper proposes donut centered design as a hybrid of service design and ecological design that works within the donut economic model. It describes how private and public sector ethnographers can weld the best of these two processes by providing a holistic, empirical research foundation that seeks to provide distributed service innovation value to all within the limits of the planet. Donut-centered design addresses lacunae of the current innovation models by advocating multi-site assessments, multi-species ethnography, ecosocial blueprints and holistics metrics as important components of a regenerative design research practice.

GROWTH CANNOT BE THE GOAL

The 21st century global economy consists of competing, irreconcilable imperatives. On the one hand, the economy has been designed such that it must grow. On the other hand, expanding economic activity is extremely closely correlated to higher levels of pollution, emissions, resource depletion, climate change, and extinction in the biosphere. To make things more confusing, growth at the global level does not appear to have a predictable impact on global inequality, or a continued impact on human well-being beyond a certain point. Of course, economic growth is not entirely bad--20th century economic growth and attendant resource utilization contributed to unprecedented contemporary peace, cooperation and material prosperity (Pinker 2018). The problem lies in applying last century's solution to this century's problems, namely a growing population, increased ecological impact, and significant global inequality.

The US economy over the past decade is an example that economic growth and other measures of well-being have been effectively decoupled. Following the economic contraction that followed the 2008 financial crisis, the US economy expanded substantially and unemployment eventually reached an all-time low in 2019 (www.bls.gov). By these traditional measures, the economy would be said to be thriving. However, other measures of economic flourishing did not automatically follow the GDP trend upward. During the same period of time, wealth inequality has become greater. Mental health statistics have dipped since 2008--suicide in particular increased over 25% in the US in the meantime (www.cdc.gov). Likewise 45% of those surveyed say they are satisfied with their jobs, down from 61.1 % in 1987. Thus GDP expansion cannot currently be equated to human flourishing.

Nor can future economic growth solve some of the most substantial problems facing humanity in the 21st century. Of the 21st century social and ecological challenges, economic growth is either tangential or antithetical to meeting the affront. Even global poverty is unlikely to be assuaged by growth alone. While global income inequality generally improved over the 20th century, the world remains very unequal (ourwordlindata.org). For those who wish to normalize inequality through economic growth, expansion must be maintained at relatively high rates for many years (e.g., 6% growth for 60 yrs) on end to achieve a world

above the global poverty line of 14,500 int-$ (ourwordlindata.org). However, if the world managed to achieve present USA-level consumption for all its citizens, the human footprint would eclipse 4 Earths (https://persquaremile.com). Clearly the population of humans living in that world would be able to take little solace in their relative equality. Economic growth only improves human lives up to a certain point, after which it appears to experience diminishing returns (Harrari 2016).

The 21st century's challenges span material-environmental limits and, in a related way, the impact of a state of perpetual growth on humans. Together they intimate that, in a physical sense, single-mindedly pursuing traditional economic growth in the 21st century is an unsupportable course of action. It is theoretically insupportable because 3% economic growth will literally boil the surface of the earth (dothemath.ucsd.edu) with entropic heat loss in less than 400 years with no help needed from carbon dioxide induced global warming. This is simply due to entropy. Economic activity traces a very tight correlation with total energy expended (Smil 2017). Thus with 3% growth, the entropy from energy use, renewable or not, would cause the surface temperature increase. It is practically impossible because unknowable ecological tipping points exist that, once triggered, could drastically reduce Earth's carrying capacity, thus effectively and automatically reversing the growth of the global human economy. On the social side, the rate of growth has led to a profusion of stress (Harrari 2016), exploitation and inequality.

Presently, the inhabitants of the biosphere, the Earth's layer of living organisms and their inter-relationships, find themselves squeezed between calls for growth and the empirical realities of pollution and depletion. Human inhabitants increasingly create an economic system that exacerbates capital, material and environmental inequality. Meanwhile, the benefits of growth and resource extraction are concentrated in developed nations and already relatively wealthy individuals, while the negative effects are experienced predominantly by socioeconomically marginal humans.

Yet growth is an imperative for the current economic instantiation, due in large part to the implicit collective expectation that the future economy will be larger than the present one. This belief, grounded in several hundreds of years of economic growth, has led us to design techno-monetary systems that take growth as a systemic assumption. To demonstrate the necessity of growth, take the United States Mortgage crisis of 2008 when a temporary decrease in the expansion of US credit, caused by mortgage defaults by marginal borrowers nearly led to the implosion of the international banking system due to the amplification effect of collateralized debt instruments. On a more mundane level, any interest-bearing loan carries with it a similar expectation--that 100 dollars of a loan will lead to a future where that dollar yields more than 100 dollars.

The same high-level expectations for growth have propagated through nearly all of our enterprises and institutions. Universities pursue increased enrollment each year in order to thrive. Rarely does a university actively curtail admissions. Corporations pursue increased adoption/revenue/market penetration each quarter, or it risks investor flight. Rarely does a corporation content itself with stable metrics but greater value, or upon being profitable, but not growing. The call for growth has trickled down to every corner of the economy, even ethnographic practice in industry. While changing the monetary system or economic system as a whole is beyond the scope of this paper, or our agency as individual actors, I describe alternative ways of thinking, doing and building that seek to provide innovation value to people within the limits of the planet. It situates these ways of thinking and acting as primal,

and subordinates growth to the level of epiphenomenon--something that start-ups do, or an unintended effect--rather than the nomothetic goal of all economic activity.

Perhaps we should simply adopt a human-centered perspective, rather than a growth-centered one, in order to attain our clear and obvious implicit goal of a thriving economy?

HUMANS CANNOT BE THE CENTER

Many EPIC members work in the design or technology industries, where human-centered design process are integral to developing the products and services upon which our firms depend. Human-centered design emphasizes empirical humanistic research as the starting point for creating products and services that are designed to serve customer/user desires. While it is prudent to emphasize end users' needs when considering technology development (Cooley 2016), our collective design process might already be overly human-centered. Aside from technology and humanity, all most other considerations are excluded from the design process. This occurs in large part because such externalities do not factor into our current pallet of economic incentives.

Other inhabitants of the biosphere are increasingly marginalized, taxed or exterminated. Today the biomass of humans and their mammalian livestock (≈.16 Gt C) far surpass that of wild mammals (.007 Gt C), while the same is true for poultry (.005 Gt C) versus wild birds (.002 Gt C) (Bar-On et. al. 2018). As humans and domesticates have outcompeted other species, species extinction rates have already exceeded 1,000x likely background extinction rates, which have pre-historically roughly equated to speciation rates (Pimm et. al. 2014). Further exponential increases in extinction are expected, as geometric increases in human economic activity have been associated with ongoing extinction events. Even for extant species, considerable population losses portend an ecological limit to human expansion. To wit, oceanic phytoplankton, the base of the aquatic trophic pyramid, have been declining in reverse proportion to pollution and economic growth (Boyce et. al. 2010). Their loss is problematic because they create ~50% of the organic matter on Earth and emit ~50% of the oxygen. Without a self-sustaining population of phytoplankton, the productivity of continental shelves would be much lower. This decrease is directly caused by various sorts of human-made pollution, both run-off and atmospheric. There isn't enough room for humans and for microbes.

As the previous section alludes, present levels of human economic growth increasingly come at the expense of important support systems of the biosphere. A glaucomic focus on human needs obscures and enhances well-documented externalities of our system of production.

In that human-centered design is primarily focused on meeting human needs with the goal of driving use and adoption of a product or service, it is ideologically complicit with the unsustainable growth paradigm outlined above. Human centered design emerged in a time when the needs of corporations, governments or the technology itself was given primacy over the present needs of the humans making or living with the product or service (Cooley 2016). Human-centered design is an unquestionable step in the right direction over machine-centered design. Although the human-machine conflict is not yet entirely resolved, human-centered design is insufficient to provide for a thriving world populated with technological, non-human and human actors.

While human-centered design is effective for designing more effective products and services, it fails to effectively address the social and ecological impacts of its services and technologies. For instance, let's take a hypothetical example of a technology ethnographer working for an ecommerce company. She interviews participants, most of whom are dissatisfied with shipping times and porch theft. She analyzes the results and facilitates a workshop to ideate solutions to the problems she identified during her studies. The team posits that delivering packages with drones during evening hours is a parsimonious solution. The packages are delivered when users are at home, often at least 12 hrs before they would be delivered otherwise. Moreover, the technology does not require that delivery people work after-hours, away from their families. Even better, the drone technology is inexpensive to operate, so the e-tailer's profit increases. A pilot in densely settled, suburban Silicon Valley is encouraging. Yet in the world beyond the product manager's spreadsheet, high levels of crepuscular drone traffic disrupts the local bat community at key feeding times, leading to lower populations. Lower bat populations lead to higher mosquito populations in the freshwater creeks that drain into the South Bay. Higher mosquito populations tempt local governments to control the problem with pesticides, which filter into the Bay and have further unexpected, negative entailments within its estuarial ecosystem. In the end, the firm launches the drone delivery program. It gains market capitalization, increases revenue and grows its user base.

Yet, because of humans' propensity for shifting baselines, end-users are no happier. In the end, requiring that they wait half a day for a package or get reimbursed for a new one was not a real drag on their ability to thrive. However, the new baseline of expectations remains while the bat population doesn't come back and the insecticides remain in the bay.

In this scenario, the firm and product team responsible for the drone pilot program have designed an effective human-centered intervention that would be a complete success by most standards. Yet their product has not measurably contributed to human thriving. Worse, it has several negative externalities associated with it. This kind of product is an example of innovation without progress. It is precisely the type of product error to avoid in the 21st C economy.

Humans are appropriately the center of our worlds, but we are not the central hub of Earth's functioning as a whole. Paradoxically, the human center cannot hold if humans are the only focus of the design process.

TIME FOR A REDESIGN: HOW MIGHT WE ETHNOGRAPHERS____?

Because economic systems help to establish the conditions under which businesses operate, the growth model has profoundly influenced the way products and services are designed. Technological innovation is nested within the economic matrix in which it occurs. Therefore, most of the technological innovation to which industrial ethnographers contribute is either implicitly or explicitly in the service of growth. Yet, as detailed in the first section, total economic growth may not continue to be to our collective advantage to the extent it was in the past.

This conundrum is a powerful example of the narratives, technologies and rules which people have created exerting undue agency over the creators of those cultural objects. The things we have made are now making us instead of vice versa. In his Right Livelihood acceptance speech in 1981, technology philosopher Mike Cooley stated, "Science and

technology is not given. It was made by people like us. If it's not doing for us what we want, we have a right and a responsibility to change it." (https://www.rightlivelihoodaward.org) Cooley's enjoinder reminds us both of our created system's power over us, and that we are its original architects--we have the ability to change what we've created if those things no longer serve the purposes for which they were intended.

We need a solution that holds a balance between technology, human society and the natural world. This paper explores how we might design products and services that account for the needs of all users (including bats, for instance) within the means of the planet. First, I explore how we can conceptualize alternative goals by theoretically emphasizing the holistic, systems approach to the economy. This section begins by defining donut economics. It points out that such an economy exists in a sort of dynamic equilibrium, much like most ecosystems do. Such an economy in dynamic equilibrium might borrow more processual understanding from the complex nested interrelationships of ecological models, rather than the rational, exponential functions of 20th century economic theory.

Second, I explore service design and permaculture design as repositories of ideas that could be used to form a research framework to aid design for those designing within the 21st century's constraints. Service design provides a useful starting point for thinking about how we might design a system that functions in a sufficiently holistic way to address systemic, complex, interrelated issues. Ethnographers in industry are uniquely positioned to affect the design. Ecological design, specifically permaculture (a sustainable agriculture design paradigm that emphasizes ecosystem mimicry), has developed a system-level approach to designing productive landscapes in the image of productive ecosystems. This design system focuses on empirical observation to identify the relationships between the component pieces of the design.

Third, I explore how we might gather and apply our findings to illustrate appropriate focus points for our teams. While human-centered design has been and will continue to be an effective tool for designing viable technological solutions, I build on its foundation to introduce donut-centered design (Raworth 2007)--a frame and method of design that considers humans within their eco-sociotechnic reality and designs for their relationships to one another and the environment. Improving these relationships is, strictly speaking, growth agnostic.

THE DONUT ECONOMY

We made the growth economy, so we can unmake and replace it. Where as a growing economy has generally, in the 20th century, been synonymous with a thriving economy, the same may not be true in the 21st century. A growing economy can be an unequal, destructive one, while a thriving economy may be growth agnostic. Although many potential alternatives to a growth-oriented economy exist, this paper pursues the idea of donut economics (Raworth 2017), an economic construct that emphasises a balance between social and environmental outcomes, while remaining inclusive of other alternative approaches (*e.g.,* circular economy, solid-state economy, b-corps). "Doughnut Economics" describes the pressing contemporary need for a type of economy that addresses human aspirations within environmental bounds: "Humanity's 21st century challenge is to meet the needs of all within the means of the planet. In other words, to ensure that no one falls short on life's essentials (from food and housing to healthcare and political voice), while ensuring that collectively we

do not overshoot our pressure on Earth's life-supporting systems, on which we fundamentally depend (https://www.kateraworth.com/doughnut/)."

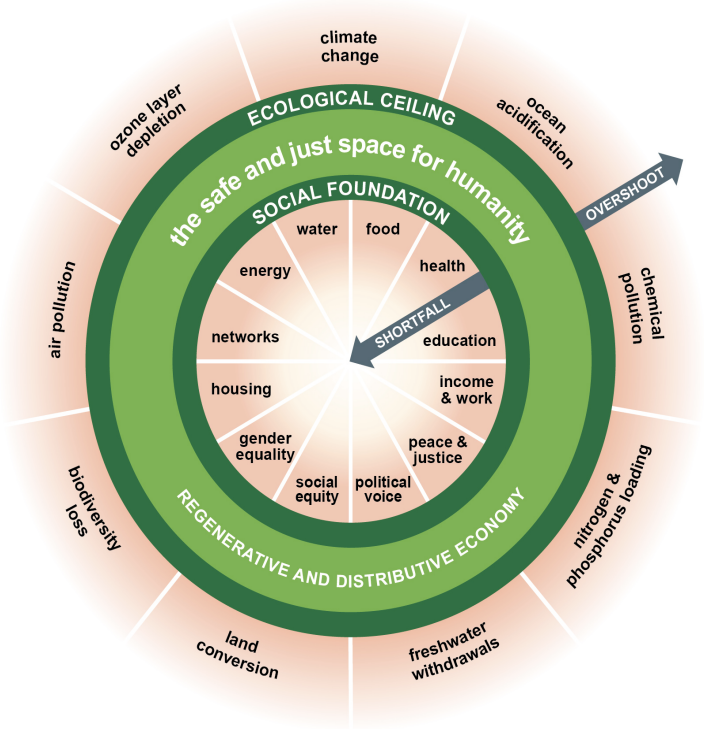

Figure 1. The Donut of Donut economics. https://en.wikipedia.org/wiki/Doughnut_(economic_model)#/media/File:Doughnut-classic.jpg. Creative Commons.

The donut itself, like the hockey-stick exponential growth curve that preceded it, is a useful metaphor for explaining the goal of a system. The inner circle of the donut represents a "social foundation", below which individual want becomes systemic shortfall (see Figure 1). In this space, the "pie" is divided among metrics intended to characterize how well humanity is serving its own needs. Key performance indicators include food and water availability, public health measures, levels of political violence, social inequality of various sorts, public education, and energy availability. The outer circle of the donut represents the ecological ceiling, beyond which humanity over-taxes its biospheric support systems. In order to measure the types and levels of overshoot, Raworth offers the cycles of key chemicals such as nitrogen, carbon, phosphorus, o-zone, freshwater and various pollutants, as indicators of ecological performance.

Ultimately, the steps that Kate Raworth outlines boil down to a single enjoinder: treat the economy like the ecosystem it is, rather than like a single mathematical function, which it cannot be. In order to shift the economy from its present form toward the donut, Raworth outlines a seven-step program that is worth recounting briefly in Table 1.

Table 1. Seven ways to think like a 21st century economist. Adapted from Raworth 2017

	Mindset	Description
1	Change the goals	Growth as a single economic marker is a poor indicator of social or environmental thriving.
2	From the self contained market to the embedded economy	Selectively examining the market, while ignoring externalities, results in a distorted, narrow view of what the economy is, what it does, and how it should be managed.
3	From the self contained market to the embedded economy	A more holistic lens on what the economy is reveals the wide ranging effects that the exchange of goods and services has on society and the environment. Such a framing is both more accurate and more actionable than the present framing.
4	From mechanical equilibrium to dynamic complexity	Replacing economic models of equilibrium with a systems approach helps researchers, business leaders and government officials conceptualize the global cascade of causes and effects that drive the 21st century economy.
5	Distributive by design	Re-designing the economy to create greater equality without the need to actively redistribute gleanings from growth-driven could be more efficient and effective.
6	Regenerative by design	Re-designing the economy to include, rather than extract from, the relationships humans have with the natural world, allows for business models that benefits and thrive on the inherent regenerative power of the biosphere.
7	Toward growth agnosticism	With other metrics and design practices in place, growth becomes a secondary concern, reserved for new ventures aimed at taking market share from incumbent actors.
1	Change the goals	Growth as a single economic marker is a poor indicator of social or environmental thriving.

2	From the self contained market to the embedded economy	Selectively examining the market, while ignoring externalities, results in a distorted, narrow view of what the economy is, what it does, and how it should be managed.

If we examine the typical *modi operandi* of most corporations, we see that the goals of the economy at large are mirrors at the individual corporate level. In Raworth's plan for transformation, the word design appears more often than economy. In this sense, the problem of infinite growth on a finite planet is less an economic problem (mainly because economists seem to lack the tools to conceptualize the problem and conceive solutions), and more of a design problem. The purpose of the system was misidentified and, as a result, the possible components were arranged in a way that optimizes for a tangential outcome.

Since the values of the larger economy trickle down to the individual actors and components of the system, it we have an opportunity--as applied ethnographers--to exert change by researching and advocating for rearranging the people, infrastructure, components, metrics of the system through research and advocacy. In other words, our companies are also optimized for the wrong thing in their efforts to match the bars set by traditional economic reporting. Below I outline the ways in which contemporary corporations fail to meet Raworth's enjoinders.

Change the Goals

Most companies operate with growth as their king metric. Profits can be deferred, as Amazon and Uber have shown (https://www.nytimes.com/2019/04/28/technology/uber-amazon-roadshow-ipo.html). Environmental concerns can be minimized, as numerous firms have demonstrated. Social concerns can be circumvented, as firms from US Steel to Facebook have shown. But at all stages of the corporate lifecycle, growth is non-negotiable. At the start-up phase, growth and adoption are critical. Additional growth is necessary to provide a stable economic foundation for the firm to go public. After the IPO, the firm is beholden to stockholders who demand a return on their investment, which is largely dictated by perceptions of value driven by consistent growth metrics.

From the Self-contained Market to the Embedded Economy

Firms generally measure their impact in narrow terms, such as number of users, profitability or similar growth-oriented metrics. Sometimes, firms will selectively target certain metrics in order to be viewed favorably by consumers or regulators. The end result is a viewpoint of the company or product's impact that is equally narrow, or simply a window-dressing.

From Mechanical Equilibrium to Dynamic Complexity

The manner in which mechanical equilibrium plays on the company level is largely in the quarterly goals set out by venture capitalists or stock-holders. These temporally narrow

check-ins assume a system that is rarely in flux. This assumption is seemingly further supported by the reasoning in the "self-contained market" headline.

Distributive by Design

Designing for distribution involves changing incentives to align them with the goal of distribution and uptake. In many cases, this is revolutionary because it counters the typical framing. For instance, when Henry Ford increased minimum wage, it was widely condemned for reducing margins. However, in practice the move created a workforce that could afford the product it was manufacturing. Similarly, many companies are beholden to margins, users, page-views or other metrics and are unwilling to think creatively about how they might benefit from transgressive thinking.

Regenerative by Design

Similar to designing for distribution, designing for regeneration is something that is not only transgressive, but also beyond the skillset of most people in the position to elicit change. Beyond sustainability, regeneration is a concept so foreign that it is difficult for companies in the capitalist framework to first envision, and eventually embody. Farmland LP (http://www.farmlandlp.com/), an investor in regenerative land conversion, has become an exception that proves the rule by using the regenerative capacity of the land it purchases and conventional farms it converts to organic ones in order to provide a return for investors.

Toward growth Agnosticism

Together the thought of a company being growth agnostic is currently ludicrous. If it exists, it remains unspoken. During the period of time when Amazon was not profitable, the justification for its high valuations and continued line of credit was its growing user base (https://www.forbes.com/sites/lensherman/2019/05/06/uber-should-be-judged-on-its-own-merits-not-amazons/#6ad487fc1fc3). The idea of a growth agnostic company attracting people and resources seems unthinkable within the current economic design schema.

FROM SERVICE DESIGN TO DONUT DESIGN

To conceptualize the economy within the donut's confines changes the goals of the design process. Thus, the design process itself differs from its current instantiation. Rather than focusing exclusively on growing the market share and adoption of a particular offering, the goal of the design process is to contextualize the offering socially and ecologically. Many approaches that would facilitate this shift are already in practice, but simply not utilized on the same projects. On the one hand, service design has expanded the range of design praxis to include all aspects of human service (Stickdorn et. al. 2011). On the other hand, ecological design has emphasized embedding built systems in ecological context (Bane 2012). I propose synthesizing relevant elements from both service design and ecological design to create a

flexible, processual design tool for the 21st century economy-- donut centered design. In order to understand this gravid hybrid, let's first examine its parentage.

Service Design

Service design grew out of the human-centered design movement, which aimed at using technology to serve the needs of people, broadly stated (Cooley 2016). However, it broadens the object of design from technology itself to the entire constellation of parts necessary to produce a product or service. Formally, service design involves arranging, infrastructure, communication and material components of a service in order to improve its quality and the interaction between the service provider and its customers (Hollins and Shinkins 2006). Service design traces its roots to the human-centered design movement, mentioned above, but expands its sphere of influence. Human-centered design grew out of technology design within the field of human-computer interaction; thus it emphasizes the discrete relationship between a technology and its users. By contrast, service design examines all aspects of an offering, both internal and external to the organization providing the offering. Moreover, it examines the social matrix in which it interacts. Because of its wider aperture, some practitioners have begun to apply service design to social development or governmental contexts (Stickdorn et. al. 2018). This application of service design--to the arena of social impact--is of particular interest to the formulation of donut centered design, for it's aim to create a social foundation.

Service design is a holistic design practice, starting with systematic qualitative research (often ethnography) with the goal of arranging people, things and information in ways that serve end users. Following cycles of iteration, testing and refinement, the end result of the methodology is to create a holistic, actionable representation of the service.

However, a deft reader will notice that the foci of service design--people, infrastructure and material components--are very anthropocentric. Service blueprints, the tangible deliverables of the service design process, often divide the service into spheres that are visible to the customer and those that aren't. Yet it does not often take into account the often invisible effects of pre-service supply chains or post-service consumptive waste. In order to more fully account for the systemic effects that occur during raw material sources and after service disbursement, I recommend adding additional layers to the typical ones found in a service blueprint. Typically, service blueprints include customer, front-stage and back-stage actions and processes. The additional layers necessary for a donut-centered design approach would include what happens as a result of the customer journey in the larger ecosocial context. Does the service encourage frivolous consumptive behavior? Or does the service make it easy and enjoyable to consume less (Lockton et. al. 2012)? On the other side, behind the backstage is the supply change, with its local embedded contexts. Does the design of the service take into account the effects of people, infrastructure and resource movements along its entirety? Are people fairly remunerated? What are the ecological effects that are typically deemed externalities, or rolled into the "cost of doing business"? A donut-designed service blueprint captures and examines these facets, whereas one that is simply human-centered does not.

In fact, service design can be used to make services ephemeral or addictive, thus compelling users to be complicit in a service that goes counter to humanity's greater good, at either the social or environmental level. Indeed, unless the service design project is directly

aimed at sustainable outcomes, it would be easy for the method to miss the other component of the donut--staying under the ecological ceiling.

Ecological Design

Ecological design is a method of design that emphasizes the ecological footprint of goods and services. Said another way, ecological design fully contextualizes the materials and processes used to create a product or service within biospheric systems. Ecological design has grown independently out of sustainability studies, agriculture and industrial design. For the purposes of holistically addressing the need for the donut centered design process to maintain numerous systems within their operating capacity, the radical sustainability of permaculture design is preferable to approaches that slightly modify current ones.

Permaculture was originally intended as a sustainable, that is permanent, agricultural system based on mimicking the ways ecosystems operate. In the decades following its original conceptualization by Mollison and Holmgren (Mollison 1988), permaculture designers have codified a loose system of principles for creating functional designs that are effectively and sustainably embedded within their local ecological contexts (Bane 2012).

Table 2. Permaculture Design Principles

	Principle	Description
1	Observe and interact	By taking time to engage with nature we can design solutions that suit our particular situation.
2	Catch and store energy	By developing systems that collect resources at peak abundance, we can use them in times of need.
3	Obtain a yield	Ensure that you are getting truly useful rewards as part of the work that you are doing.
4	Apply self-regulation and accept feedback	We need to discourage inappropriate activity to ensure that systems can continue to function well.
5	Produce no waste	Make the best use of nature's abundance to reduce our consumptive behavior and dependence on non-renewable resources.
6	Use and value renewable resources and services	By valuing and making use of all the resources that are available to us, nothing goes to waste.

7	Design from patterns to details	By stepping back, we can observe patterns in nature and society. These can form the backbone of our designs, with the details filled in as we go.
8	Integrate rather than segregate	By putting the right things in the right place, relationships develop between those things and how they work together to support each other.
9	Use small and slow solutions	Small and slow systems are easier to maintain than big ones, making better use of local resources and producing more sustainable outcomes.
10	Use and value diversity	Diversity reduces vulnerability to a variety of threats and takes advantage of the unique nature of the environment in which it resides.
11	Use edges and value the marginal	The interface between things is where the most interesting events take place. These are often the most valuable, diverse and productive elements in the system.
12	Creatively use and respond to change	We can have a positive impact on inevitable change by carefully observing, and then intervening at the right time.

Adapted from Bane 2012

A reading of the listed permaculture principles reveals similarities with service design. Importantly, both permaculture and service design seek to arrange the components of system based on extended observation such as to achieve a systemic result that could not be had without such an arrangement. Principles 1, 3, 7, 8, 10, 11, 12 read as though they could just as easily be lifted from a service design manual. First of all, both utilize empirical qualitative research as a foundation for action. This penchant for observation lends itself to ethnographers who aim to increase their agency through applied practice. Service design and permaculture design both create ways for the enterprise to earn it's keep by obtaining a yield. Permaculture's use of the word yield, rather than profit or growth, is useful. Like permaculture, many service design principles apply across industries, allowing service designers to use broad patterns as starting points for the design of novel solutions. Regarding principle 10 and 11, valuing diverse, marginal participants has been an important component of service design firm IDEO's strategy for at least a decade. Similarly, voice assistant technologies originated from researching and meeting the needs of people who do

not access technology in typical ways. Principle 12 is a taken for granted for firms operating in the digital age.

However the opportunity to expand service design practice with methods and principles from ecological design lies in the area of non-overlap. Only niche service designs operating for sustainability-conscious companies would have much familiarity with concepts of catching and storing energy, producing little waste, using renewable resources, and minimizing impact. Some examples exist. Heineken has applied concepts from circular economy thinking to some of its plants, making at least one entirely self-sufficient using a circular (not to be confused with donut) economic approach (https://www.fastcompany.com/40536868/this-brewery-is-designed-as-a-model-for-the-circular-economy). However, projects such as these are typically the province of sustainability experts, not service designers. To design for the donut economy, there needs to be a process that embodies both the embedded creation of products for people, within society, within the already overtaxed means of the planet. Enter donut centered design process.

THE DONUT-CENTERED DESIGN PROCESS

Thus donut centered design is the evolution of service design to include an assessment and arrangement of a broader set of constituent components. It is an even greater departure from the history of design as the creation of objects with a purpose, to the creation of a system with a purpose. Rather than creating an object, it thoughtfully creates a socioeconomic assemblage within the biophysical environment. With this larger framing as the goal of donut centered design, how might product strategy and design teams execute projects toward it? Specifically, how might industrial ethnographers provide strategic guidance in the course of donut centered design?

As mentioned previously, ethnographers possess arguably the most holistic social scientific skillsets present in the UXR/Service Design community. Ethnography emerged from a peculiar need that anthropologists had--to enter a new culture embedded within its environment and make sense of it. Thus, ethnography was initially implicated in tracing kinship, elucidating rituals and ascertaining subsistence patterns. In many regards, the same ethnographic skillset is needed for donut centered design. Many of the relationships, rituals, and modes of extraction are unknown-unknowns in the service creation process.

Despite the familiarity of base method of ethnography, donut centered designing would likely proceed differently than product or service design processes in which most EPIC ethnographers are embedded. Unavoidably, the object of research is more extensive. It is not simply a user/consumer, her immediate network and connection with a product. Rather the object is the holistic system that will be altered by the new product. Thus, research is more extensive, and work products and measures of success differ from other development processes.

Site-Assessment

Site-assessment is the first thing that permaculture designers do. When they are contracted to design and implement a plan, they first conduct a thorough evaluation of the

sites' ecological components. This involves mapping resource flows, testing soil and emissions, analyzing local climate data and conducting an inventory of plant and animal species. While some of these techniques will apply to donut centered design, the idea of the site, and thus the site which is being assessed, must be expanded. A traditional site assessment is necessary but insufficient for the task.

For instance, how does one conduct a site assessment for an app? This would involve the physical locations of the headquarters, the supply chain, the communities of eventual use, and the physical bodies of users. It would also involve the effects of the product on the environment surrounding the relevant actors and they way their agency changes with the new product in hand. A standard site assessment is a good start, but like a single anthropological fieldsite, it fails to account for the empirical linkages among dispersed but connected phenomena, as are so common in the globalized world.

Tracing Associations and Multi-Site Ethnography

Techno-globalisation of the world system called for a different anthropological approach to understanding human cultural phenomena. As anthropologists transitioned from studying cultures in embedded localities, they began exploring multi-sited ethnography as a technique of understanding (Marcus 1995). Derived from actor-network theory, multi-sited ethnography is aimed at understanding the relationship between culture, entities and values by analyzing flows--tracing associations (Latour 2006). Business anthropologists have noted that "in tracing associations, tracking flows, and detecting linkages – also opens up ways of avoiding tendencies to essentialize culture and values. The articles in this volume all testify to this possibility. A focus on the relational, social dimensions of business and exchange – of the making of value in social processes" (Morean and Garsten 2013). Notably, permaculturists trace associations and focus on flows more than on particular plants, animals, or other environmental features. The focus of each is a holistic understanding of the way things are arranged to compile a whole, rather on the inner workings of subsets. While actor-network theory is too large a subject to cover here, it provides the methods and theory for conducting anthropological ethnography of supply chains, technology and dispersed systems that is so necessary for designing in the donut.

Multispecies Ethnography

In parallel to multi-sited ethnography's focus on dispersed, yet powerful cultural phenomena, multi-species ethnography has started to account for the relationships of humans to actors and forces that have previously been marginalized by anthropology. "A new genre of writing and mode of research has arrived on the anthropological stage: multispecies ethnography. Creatures previously appearing on the margins of anthropology—as part of the landscape, as food for humans, as symbols—have been pressed into the foreground in recent ethnographies." (Kirskey and Helmreich 2010) This development matters for the donut centered designer embedded within industry because the same cultural assumptions about the separate-ness of plants, animals and natural features from human culture is being called into question. Understanding the empirical, qualitative relationship between humans and non-human actors is critical to understanding ourselves. Animals, plants, fungi, and microbes once confined in anthropological accounts to the non-human

zone, are now being included. Turning the lens of ethnography on animals, plants, fungi or the nonliving components of the biosphere is surely a departure--to the extent that ethno- denotes an exclusively human focus. Yet, humanity is so intimately intermingled with its inter-species relationships that this departure seems appropriate for those designing the anthropocene. Multi-species ethnography as step of the donut-centered design process is to locate the features of human activity in the natural realm, not just the cultural one.

Bringing it Together with the Ecosocial Service Blueprint

Following site assessment, tracing associations and multi-species ethnography, the findings and insights of the donut centered research process must be made available to teams of stakeholders. For permaculture designers, the primary work product is the site map (Bane 2012), while for service designers, the service blueprint is a common deliverable (Stickdorn et. al 2011). I propose incorporating elements of both into a master plan called an ecosocial service blueprint.

Service blueprints generally include the people, processes, services and products of a business arranged in a way that makes their inter-relatedness apparent. A common way of visualizing this arrangement is to depict a user journey, with physical evidence and interactions flanking it. The interactions are grouped by those that actually touch users, ones that are visible, and ones that are invisible, but still within the confines of the company's walls. An ecosocial blueprint expands the aperture. On the upper side, the sourcing and ultimate fate of the physical evidence is tracked, along with its immediate relationships. The user's journey contains what might happen personally, socially or communality if many of these journeys are completed. On the bottom side, the ecological and social impact of the company's internal operations appear as a foundation, thus cataloging effects that were previously invisible externalities. This an ecosocial blueprint takes cues from the traced flows and carefully placed elements of permaculture site maps and service blueprints into a master plan which hypothesizes the flows (essentially causes and effects) in a whole systems matter.

While ethnographic research and market assessments provide excellent starting material for an ecosocial blueprint, it is unlikely that ethnographers would possess the various expertises necessary to ideate and craft a plan. In both permaculture design and service design, teams of multi-disciplinary co-creators tend to make the most innovative, most durable designs. This holds even more true here, for without people who know about customer service, product design, sustainability, technology and research a realistic master plan may not be achievable. Many individual methods for ideating and designing services exist and would be useful for creating and implementing an ecosocial design. Many methods would remain nearly unchanged, and therefore are beyond the scope of this introductory article.

Holistic Metrics

After developing a plan, how will you measure success? This returns to the fundamental charge of the donut--growth is essential and good, but perpetual growth is not. As much or more than research and design, target metrics can drive strategy and decision-making. Most ethnographic practitioners are aware that tethering goals to metrics can be a powerful behavioral motivator. In many large organizations, annual goals trickle down through

departments to teams to individuals, where quarterly performance goals operate as microcosms of annual corporate goals. Salaries, bonuses, promotions and retention are often calibrated to these goals. Thus, they heavily influence individuals to achieve relative to chosen metrics as the expense of other metrics. A similar phenomenon operates on the national and international level--when GDP (or stock market indices, another growth-centric indicator) is fetishized and pursued at the expense of other metrics. Thus establishing desirable metrics is an integral part of donut design.

While perpetual growth is not an effective metric, proposing other metrics can be fraught with debate. Any metric can be subject to reification and maximization, at the expense of a more holistic assessment. However, metrics are necessary to track progress and make decisions. The donut describes some physical and social measures that can be useful, but often may not apply to a product or service.

Indeed selecting which metrics are relevant will depend heavily on the particular design, as well as the maturity of the firm producing the product or service in question. The emerging field of social impact metrics seeks to define standard or custom metrics to track progress and change that organizations effect. Establishing relevant metrics that map to the mission of your organization, as well as the resource and interaction flows in the ecosocial blueprint, is largely a custom, iterative process, rather than a one-size-fits-all approach. Yet despite the contingency of social impact metrics, defining metrics changes the goal of the system, and is thus unavoidable for designing for the donut--itself an alternative set of goals set in place of totalizing perpetual growth.

WHERE TO START?

Like the scale of the problem, implementing a solution can seem like a daunting, even futile, task. This is especially true if you are a sole actor within a large corporate apparatus that is not aligned with the ideas or ideals of donut centered design. For those working in a service design capacity already, begin by conducting the research outlined above and assembling an interdisciplinary team of designers. Proceed from research, to ideation, to co-design, to metrics selection, iterating recursively as needed. An excellent starting point is the application of the permaculture design concept of zones to your professional life. In permaculture, zones are used to represent the level of intensive management of a feature or area. Zone 0 is the living area. Zone 1 contains that which is used daily, like an herb garden. Zone 2 contains features that are visited every few days, like a patio. Zone 3 contains features that are visited weekly, and Zone 4 monthly. Zone 5 is totally wild area. As an ethnographer, you can determine which areas of practice you touch daily, weekly and monthly. Your influence on the design of those areas is highest in Zone 0 and least in Zone 4. You can change what you are habitually tasked with creating, so beginning in the highest zone of agency is a way to effect change immediately. We all have some agency in our lives, and in the workplace, to practice donut-centered design.

CONCLUSION

The theme of EPIC 2019 is agency. The conference theme asks, "What does it mean to have agency in an increasingly automated world?" I would argue that the world has been

automated for longer than digital technologies have been automating it. Our economic systems and their components are automated--designed--for growth via extraction. The fundamental question of agency is then, "do we have agency to determine the goals of an economic system?"

Economic systems include the ways that societies derive subsistence, protect themselves from threats, create infrastructure, solve problems and pass on culture. In the anthropological literature, some societies grow rapidly (like the Mongol Empire), while others do not (!Kung Bushmen). All must have grown for a period of time. Most have collapsed and no longer exist. Growth is certainly not a given. In fact, it has only ever been a phase through which societies pass before reaching equilibrium or going into decline. Is it within our collective agency to reflexively determine when the growth stage of a product, business, sector, corporation, region, country or species is over and equilibrium stage should be considered the ideal in place of growth? To answer in the negative is disempowering, while to answer in the affirmative smacks of centralized planning. To abstain is to wait for environmental limits, intra society competition or crippling complexity to curtail growth "organically."

However, the stakes could not be higher. Regarding the ceiling of the donut, many of the natural resources, living and nonliving, used to stoke growth are non-renewable. As for the donut's social floor, the negative outcomes and externalities of perpetual growth are disproportionately felt by marginal or disempowered members of global society. Not only this, but the structures of power and production exert overwhelming inertia to change.

In a narrow individual sense, most of us have little agency to pursue professions that are growth agnostic. The structure (typically the yin to agency's yang) of businesses within the economic system is so rigidly prescribed that alternatives exist only on the margins, though this is changing in part. An illustrative case of agency and change comes from the story of digital marketplace Etsy. When Etsy began, its founders incorporated as a B-corp, a corporate structure that places social and environmental value as the heart of a business's decision making process, and is designed to protect the values of the firm from the wishes of shareholders in the event that the company goes public. Etsy was one of the first companies to conduct a public IPO as a B-corp in 2015 (https://qz.com/work/1146365/etsy-made-mistakes-from-which-other-b-corps-can-learn/). Its IPO was mixed, and eventually, due to the pressure to generate shareholder value, Etsy allowed its B-corp certification to lapse in 2017 (https://shift.newco.co/2017/11/27/why-we-need-more-etsys/). Etsy's story illustrates that a company can be conceived, designed and grown while retaining a commitment to people and planet. Yet it cannot be grown indefinitely without subordinating those concerns to profit. In essence, the design of publicly owned corporations, whose valuation is assessed by the millisecond, and whose growth goals are rolled over quarter to quarter, is antithetical to the agency a company (or the people within it) .

Etsy's story also illustrates the potential agentive power of various groups to enable future outcomes to diverge from past outcomes. To apply the service design lens to Etsy, they existed in a web of associations with consumers/users, communities of practice, shareholders, governments, the physical environment and other corporations. Like the resource flows that permaculturists track, the flows of power in and out of Etsy reveal a design that caused them to compromise their values. Coerced by stakeholders, alienated from their consumer/community base, and replicated by competitors like Amazon, Etsy was forced to compromise.

But as always, individual agencies conspire to collectively remake outcomes. Other B-corps (e.g., Patagonia, Allbirds) have not gone public, but continue to be vibrant and profitable. Users and communities want to patronize firms with good ethics. Some governments are passing legislation to incentivise socially and environmentally responsible businesses. Talent wants to work for them. Thus, a service design process that focuses on people and planet is a critical feature of a currently forming future. Importantly, donut-centered designers (ethnographers) are crucial for such a production process.

In conclusion, the social and ecological challenges of the 21st century require a design process that matches viable economic solutions. I've proposed donut centered design as a hybrid of service design and ecological design, with an emphasis on how private and public sector ethnographers can serve to weld the best of two processes by providing a holistic, empirical research foundation. From the research foundation, it becomes possible to change the KPIs that organizations use to guide their actions and establish their successes. Rather than employing human-centered growth as a measuring stick for success, the donut economy with its goldilocks optimum above the floor of social impoverishment and below the ceiling of ecological overshoot provides a novel beacon for action. When they founded Google, Larry Page and Sergey Brin installed the phrase "Focus on the user and the rest will follow" to imbue the nascent company with the customer focus necessary to win search market share and achieve success. To adapt the words of Google founders for a new century of technological innovation, perhaps instead of focusing narrowly on the user needs to guide out endeavors we should focus on the nexus of society and environment. "Focus on the donut, and the rest will follow."

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