



The Creative Potential of Productive Inconvenience as a Design Approach

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Abstract

A prevalent focus in design has for some time been on reducing frictions in everyday lives, a solutions-centric focus on reducing effort and discomfort while fostering convenience. This paper questions this underlying assumption and illustrates with a case study of a research project on human-robot collaboration how abandoning *convenience* for a turn to *inconvenience* can become a novel basis for a productive human experience. Inconvenience as a concept is situated within a growing literature that focuses on cracks, slips, and glitches of everyday life and on how we experience technology, rather than the seamless and user friendly imperative. An exploration into the nature of convenience and a discussion of its flip side gives way to a proposal for a design approach that embraces *productive inconvenience* at its core.

Keywords

Experience Design, Inconvenience, Design Methods, Human-Robot Collaboration

Introduction

For some time now design has been characterized by a predominant emphasis on problem solving and user-friendliness. Based on a practice largely focused on reducing frictions and upsets in various instances of everyday life a big focus of the practice has been on reducing effort and time in tasks and operations with an overall focus on efficiency and optimization. The ghost of modernist thinking is still very much alive in this solutions-centric approach,

and it arguably received renewed emphasis with the ascent of the “smart-everything” as is the case with smart city and smart technology developments. (Kloeckl, 2020, p. 9)

The seamlessness of these aspirations is, however, cracking, not least by the complexity and vehemence with which challenges in the social and environmental domains have come to the foreground. Life and the everyday experience are too messy as to authentically fit into fantasies of borderless user-friendliness, optimized efficiency, seamlessness, and convenience. Frictions, glitches, disruptions, and uncertainty are simply part of our everyday life and in particular ways of our daily experiences with technology. It is high time for design to not only acknowledge this but to engage with this more bumpy view of the world proactively and in creative and productive ways.

Convenience an imperative in much of today's design work. Conscious or not, making things more convenient is a deeply ingrained value that is hard to challenge and that appears to enjoy broad, if not unanimous support. In the context of a recent research project on human-robot collaboration this notion of convenience emerged, instead, as problematic. The debate in our group that followed led to experimentation with its exact opposite - inconvenience - to overcome the issue that we encountered.

In the following sections I briefly relate the argument of this paper to existing literature before I look more closely at convenience in the context of design, as well as unpacking the term and its underlying concepts. I then summarize key aspects from the case study that gave rise to the notion of productive inconvenience. Based on this work and a more thorough understanding of the concept and notions of convenience I finally attempt to indicate ways in which productive inconvenience can be leveraged as a design approach more broadly and beyond the scope of the case study to disclose new value.

Foregrounding cracks, slips, and glitches

There is a limited but growing literature that looks beyond the smoothness of user-friendly and human-centered design in how we live with technology, rather focusing on the cracks, slips, and glitches.

The smart city framework has received disproportional attention in the realm of urban design and operations and is dominated by aspirations of efficiency and optimization through technology deployment. Adopting terms such as urban operating system (Greenfield, 2013) and the consideration of cities as akin to computers (Batty, 1997), smart city initiatives have come to view the complex socio-cultural construct of cities as machines rather than historically grown complex socio-cultural realities. According to a smart city view, it suffices ‘oiling’ the city machine with real time data from networked digital technology systems to achieve the aspired efficiency in operations. In many ways the smart city concept has come to resemble the modernist thinking of the early twentieth century: to make things new was the imperative to free humans from all ailments then; to make them smart has come to be its equivalent today.

However, the smart city concept has also been critiqued. Challenging the efficiency-driven discourse in the application of information technologies in the realm of cities and, in particular, civic action, Gordon and Walter introduce what they call “meaningful inefficiencies as an emerging design paradigm for civic technology, which accommodates the possibility of messiness, disruption, and playing with rules and boundaries.” (Gordon & Walter, 2019, p. 313) In doing so, they do not question the importance of providing efficient solutions to basic services such as housing, policing, healthcare, and similar. Rather, they challenge a condition in which “efficiency goes unchecked, and the rigid systems are designed only for ‘good users’—where the slightest unexpected use of the system by a user operating outside of the accepted norms is not accommodated or acknowledged.” (Gordon & Walter, 2019, p. 329)

The good user, as portrait by Gordon and Walter, is a fantastical construct where citizens become idealized in following the paths and motions that designers of systems lay out for them. This good user is also that fictional ‘friendly user’ in a user-friendly world; someone that plays game; that follows the rules, and that does not step outside of expected norms.

Jennifer Gabrys also critiques pressures toward efficiency, solutionist approaches, and problem solving in the smart city domain. She argues for a new understanding of citizenship that involves notions of becoming and belonging rather than a rule following and living up to expectations set by system developers as in the case of the above good user. Her argument against this obedient good user endorses the disruptive figure of the idiot. (Gabrys, 2016) Gabrys builds on works by Belgian philosopher Isabelle Stenger and Gilles Deleuze and on the ancient Greek origin of the term ‘idiot’. There, idiot was used to describe, in a non-derogatory way, the common man, the private citizen, who, unlike the public citizen, in the form of the professional, the public official, or the expert, does not participate in public life and does not contribute to the common cause. It indicates someone who does not participate in the way that is expected of a public citizen but rather does things and approaches things based on a personal and individual interpretation of reality. Translated in a smart city context, the idiot may not comply with obediently filling out online systems to notify a city of a prescribed categories such as broken lamp posts or graffiti but rather use that system to write about what actually matters to him or her. In that way, the idiot breaks a system that views citizens as merely supporting efficiency metrics established by others and, instead, brings him or herself in in a way that is of individual and personal relevance.

Norwegian scholar on digital culture Jill Walker Rettberg also focuses on deviations from what are deemed adequate, appropriate, or correct responses but focusing on responses from machines, while exploring new value in that. Rettberg puts to the test a methodology proposed by Munk et al. for using failed predictions in machine learning as a method to identify ambiguous and rich cases for qualitative analysis, suggesting that the productive work with algorithmic failure challenges the notion that data science per se provides for higher degrees of objectivity and accuracy. (Rettberg, 2022) “If the ambition is thick description and explication rather than formalist cultural analysis and explanation, then a

failure to predict is more interesting than accuracy.” (Munk et al., 2022)

In her work on human-machine communication, Andrea L. Guzman abandons the focus on use cases and user scenarios for the rich entanglements that a focus on non-use and failure of today’s technologies represents. Looking at those times when people choose to not use certain technologies available to them or when failure occurs in the usage of technologies, Guzman concludes that “non-use and failure are more than interesting variables in the study of technology, including Human-Machine Communication; they are critical perspectives that when overlooked create a deficit in understanding of a device or application, of communication with it, of the people interacting with it and the effects for them, and of larger cultural conceptualizations and far-reaching implications.” (Guzman, 2022)

These works shine a light on what is becoming a rich and fertile flip side of the still prevalent discourse on efficiency, seamlessness, and convenience that prevails in the design domain. They examine situations where things do not work out as planned or designed for but rather than seeing this as leading to a lack, they guide us to recognize new forms of value that are different than anticipated but not less.

Design’s obsession with convenience

Convenience has a long history of playing a dominant role in design and western culture at large, perhaps most notably illustrated by the origin of the convenience store.

In 1927, Southland Ice Company started selling eggs, milk, and bread from one of its icehouse storefronts in Dallas. Joe Thompson, one of the company’s founding directors understood that having plenty of ice available for cooling allowed him to offer products such as bread, eggs, and milk all in one convenient location without clients having to travel long distances. The ice ensured cooling for food preservation and the store soon began to stay open until late in the evenings as well as on weekends when other grocery stores closed. Gasoline and other food and beverages were soon added to the assortment in a new store with the now legendary 7 am to 11 pm openings hours - today, 7-Eleven has stores at 78,029 locations. (Sparks, 1995) The convenience store was born and with it an underlying concept that would influence design for decades to come and that Thomson summed up as “Give the customers what they want, when and where they want it.” (7-Eleven Corporation, 2023)

Today, convenience is a largely unquestioned dogma when designing our environment, products, and services. Groceries can get delivered to our doorsteps at any time of the day by tapping on a phone while sitting on a couch. Movies and TV shows are streamed ondemand into our living rooms. Digital platforms help find a partner with a mere swipe on the touchscreen of our phone.

While the beginning of convenience culture can be traced back to the first half of the 20th century, the phenomenon really took off in the US in the era following World War II. In the western world the post-war era gave rise to a time of unprecedented prosperity, economic

growth, growing wellbeing, and a consumer culture. Automation was on the rise and brought machines to the home and to the workplace that began to alleviate people of ever more tedious things that required manual handling before. In many ways the horrendous achievement of efficiency in the war industry was in need of a new market after the war and found it in the domain of home convenience. All kinds of tasks could now get accomplished in less time and with less effort. The push of a button became synonymous with the convenience of ease and instant gratification.

Dishes and meals came to be provided in minutes at fast-food restaurants or as drivethrough. Frozen ready-made dishes at the supermarket became a quintessential convenience at the supermarket. (Penfold, 2012) The internet paved the way for mail and phone order by catalog to be taken to the next level - today reaching same day delivery and free returns.

Early home appliances have today developed into full-fledged robotic devices capable of autonomously carrying out entire activities rather than supporting tasks. While the vacuum cleaner helped in the task of collecting dust, the robotic vacuum now keeps the house dust free, eliminating the need for an entire activity.

In reducing the effort when getting to places self-driving cars can be seen in a conveniencecentric lineage that includes automatic transmission, taxis, and ride hailing services that drive you wherever you like by the push of a button. Paradoxically, the push of a button has become synonymous with convenience in the digital era where buttons do not exist in any other way than as a visual representation on flat glass.

Making things more convenient is a powerful and omnipresent design paradigm but not always. Local farm stores are growing in popularity because there is an underlying value and trust rather than convenience. Apple picking is not convenient but an engaging and valued experience as a process, and there are numerous similar examples. It is, however, fair to say that finding ways to make things more convenient, reducing time and effort in accomplishing tasks and activities continues to exert an enormous attraction on the imaginary of people both on side of designers as well as consumers and users.

Unpacking convenience

The Latin *convenire* means a coming together, agreeing, a meeting of parts, or, in our context, a meeting of expectations. Things that are convenient do literally or figuratively come towards you. They meet you at where you are at, they correspond to your expectations, they work for you in terms of who and what you are at a given moment. Something that is convenient reduces time and effort in carrying out a task or achieving an objective. Doing my grocery shopping at the gas station is convenient as it reduces my time and travel distances to get both things done.

Convenience is not the same as efficiency. Efficiency is an objective metric of output vs input

in a process. Convenience, instead, relates to an individual and his or her plans, ways of doing, expectations. People tend to want things to be easier for themselves - convenient, even if it means being less efficient.

Convenience is relative both to a person and to context. Walking to an ATM a few blocks away was convenient when the alternative was going to a bank branch, limited by its opening hours, and waiting in line at the counter. That same convenience becomes inconvenient when mobile banking on a cellphone becomes a possibility - at that point online banking is more convenient. It saves me from making any steps outside of my house, reducing both effort and time.

We can distinguish between convenience that is actual or perceived. Booking, buying, and checking-in for my flight on a cellphone may feel convenient even though it may take me more time to do so than having someone do it for me at an office or the airport. It feels convenient as it saves me from the expected waiting time and lines that may or may not be involved. Perception changes based on expectation and past experience, and these vary at an individual level. (Weissman, 2012) Control and agency also play into this dynamic. Having control over a process such as booking a flight online by myself at any time can make the process be perceived as convenient. This may be so regardless of whether it does indeed save time or effort, simply for the fact that timing and action are under my control.

Unlike such deliberate acts, convenience can be event-driven and prompted by circumstances that were not planned but become an objective that can be met while doing something else at the same place at the same time. This is the origin idea of the convenience store. It is also the underlying idea of a bank partnering with a coffee shop chain to meet its clients where they are at. (Sandbiller & Myerson, 2018) Convenience or inconvenience is about where a product proposes itself to meet the people.

Contemporary society emphasizes ease and instant gratification and gears towards reducing time and effort which provides the backdrop for a convenience culture. And there is undoubtedly tremendous value when a design intervention meets people at where they are at. The following case study illustrates a situation where convenience, rather than a value and feature, turned out to be a limitation in a human-robot collaboration prototype that we developed as part of a research project on industrial workplace experience.

Case study of an inconvenient robot

The Gymnast-CoBot project is part of an ongoing research initiative on the future of work, co-led by the author. Our research specifically focuses on exploring opportunities for human-robot collaboration in industrial workplace environments in the seafood processing industry in the Northeast of the USA. (Kloeckl & Padir, 2021)

The Gymnast-CoBot project is based on observational studies in seafood processing workplace environments in Massachusetts and is guided by two key considerations: there is

a long legacy of humans working with machines in factories with detrimental impacts on human health as humans are required to adjust and adapt to fixed and monotonous machine operations. Today, instead, the use of responsive technologies opens the possibility to develop devices that monitor context as well as human condition and behavior in real time to dynamically adjust and adapt the machine's operation and behavior to each individual worker. In this way, the opportunity is to create industrial machines that allow individual workers to carry out work in ways that is comfortable and sustainable for their health while robots adjust and adapt to each worker's individual behavior in a supportive way.

The comprehensive project of the Gymnast-CoBot project takes inspiration from health-oriented fitness movement routines and gym machines. (KloECKl & PAdir, 2021) For the purpose of this paper, the relevant aspect of the robotic helper prototype developed for the project is that it takes over the part of lifting heavy boxes from the ground while handing them to a human worker in a supportive way. It does that by monitoring the worker's position and movements, body height, and heart rate, establishing optimal movement tempo and hand-over locations with the goal to reduce straining postures and movements.

Robot-to-human hand-over processes are well studied tasks in robotics and based on the notion that there is an optimal or ideal object transfer point in relation to a human. Most prior work in this regard considers singular hand-over events aiming to enable the least deviation in the human receiver's center of mass within his or her base of support. (Kim et al., 2019; Kim et al., 2017).

That approach is an improvement over machines that do not take the specific human worker into account as it enables the human worker to assume a more comfortable posture during hand-over. As we noted in our experiments, however, this approach has a limitation when observed over multiple handovers. While the optimal object transfer point for different people is quite different, for one same person it remains fairly constant over time. While responsive machines adjust to individual biomechanics, the objective of identifying optimal transfer points results in a highly personalized but yet again repetitive process. This poses once again an issue of reduced posture variance as well as work monotony, which is associated with a loss of attention, increasing the risk for accidents in workplace environment. (Wilkins & Acton, 1982) The apparent convenience of positioning an object at an optimal position for robot-human hand-over reveals itself in this way as a significant limitation.

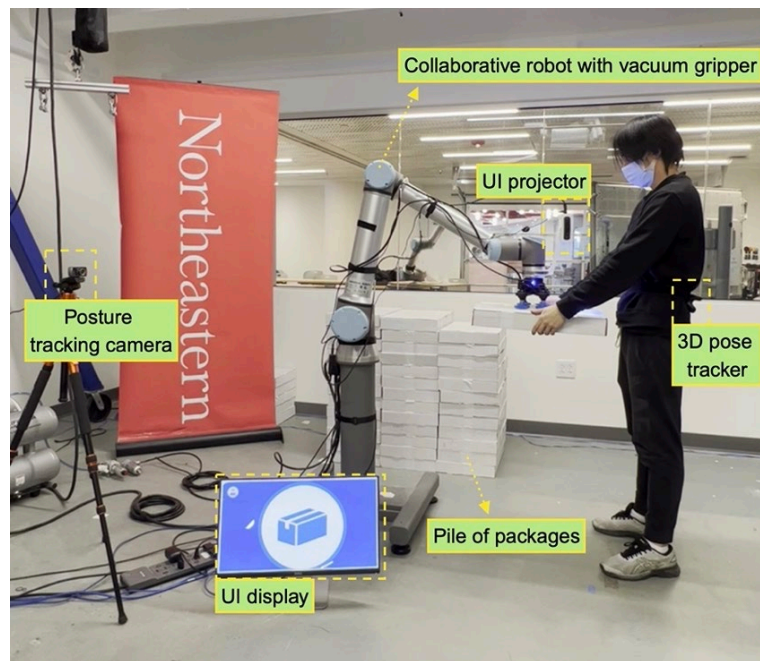


Figure 1: Overview of robot-to-human handover setup and the robotic architecture components. For each experimental trial, the robot would pick up a package from the pile and move it to its computed handover position, allowing the participant to complete the hand-over.

During movement that is unconstrained by machines humans displace their center of mass quite freely. Humans constantly move out of their comfort zone, so as to say, to then recover more comfortable positions and several studies emphasize the importance of human posture variability in work processes. (Mathiassen et al., 2003; Srinivasan & Mathiassen, 2012) During an early prototyping exercise we had a human enact the robot and hand objects to another human while observing critical moments in the operation that could inform the design of our robot's behavior. During this process it was evident that the human actor that enacted the robot handed the objects never in quite the same way - there was variance in the hand-over in a way that kept the human actor engaged and alert.

Based on these observations we developed a new robot behavior that we called 'stimulating'. In this modality the robot still identifies an optimal transfer point but varies it slightly to promote deviation in the human receiver's center of mass in respect to the base of support and to previous movements.

For a series of user testing, we implemented both the "assistive" and the "stimulating" mode of handover. In the assistive behavior, the robotic system monitors human biomechanics to hand objects over at an optimal transfer point and in a way that stabilizes the center of mass for the receiver, being overall more convenient. The stimulating mode, on the other hand, introduces variability into the handover behavior, nudging the receiver to go beyond repetitive body postures, seeking to maintain their attention, engagement, as well as healthy posture flow.

As workplace environments integrate responsive technologies, these devices are capable of

more than behaving in convenient ways, in the sense of 'coming towards the human'. Instead, a robotic machine behaving in an inconvenient manner, with some constraints, may result in their human counterpart being more attentive and hence more cognizant of their posture. Productive inconvenience is, therefore, a way to look at variability in a more comprehensive understanding of ergonomics, considering a human worker's productivity and well-being more holistically.

The findings of our tests show that stimulating receiver motion, as opposed to optimizing for stability, yielded safer ergonomic scores of posture; more dynamic receiver movement generated heightened levels of alertness, and over multiple handovers, human receivers entered into closer proximity with the robot, hinting at improvements in 'trust' or 'comfort'. (Zolotas et al., 2022) Paradoxically it was the work with inconvenient behavior from the side of a machine that resulted in positive results regarding overall human wellbeing.

An in-convenient truth about convenience

The case study described above deals with a very specific case and context - a workplace environment with established processes and a series of specified tasks. Thriving for convenience revealed itself there to be a limitation and, instead, introducing an element of inconvenience in the system's operation disclosed new value. I look at this case as a model and argue that it can have broader implications for how we design things also in other situations.

As described earlier, a convenient situation is one where things come to an individual. Things come together in a way that for an individual saves time and effort - at least in the way the situation is perceived. In that things come to a person, convenience reduces the need to reach out to obtain them.

To consider a common everyday situation, the convenience of using online banking services from the couch reduces one's getting out and walking to the bank branch or to the nearest ATM. In fact, convenience culture has come to be associated with what has become for many people an increasingly sedentary lifestyle. Having things come to you without the physical effort of going to them reduces incidental opportunities of physical exercise during a day that have concrete impacts on health and wellbeing. We may choose to deliberately go to a gym to exercise but convenience can and does reduce incidental opportunities for physical exercise. (Tremblay et al., 2007) This is related to the Gymnast-CoBot case study as it stimulates incidental movement and posture variance during a routine work session.

Convenience comes also with a reduction of time in food preparation. The ready-to-eat segment continues to grow rapidly in the supermarket aisles. What ready-to-eat dishes offer in time saving they tend to compromise in nutritional value. Preserved foods tend to be less rich in vitamins and other essential nutrients. Diabetes and heart disease are some of the health issues connected to nutrient poor diets and both are on the rise. (Augustin et al., 2016; Micha et al., 2017)

At a less tangible dimension, information such as news has become more conveniently available as news agencies broadcast and stream news stories 24/7 directly to people's phones. Social media has come to offer a sense of constant and instant connectedness without actual direct human interaction. Both phenomena have come to be associated with increasing levels of stress, anxiety, and depression. (Samaha & Hawi, 2016; Adams et al., 2020)

The availability of numerous convenience-based services and amenities have resulted in a reality that allows for someone to go for days without leaving home. And while this has certainly been a benefit during the recent COVID pandemic, such a lack of human interaction poses risks of social isolation and loneliness, as well as related mental health issues. Isolation is associated with weakening of immune system and heart disease. (Valtorta et al., 2016) Needing to spend time and effort to get one's daily things done in less convenient ways - literally running errands - also means accidentally stumbling upon a series of human interactions. Paradoxically, in a convenience-based life, it is achieving those moments of accidental human interaction that require extra time and effort.

Beyond the impact on the self, a convenience-based lifestyle also has environmental impacts. Walking or biking to a store consumes less energy than setting in motion an ondemand home delivery system. Motivated by these insights a robust and certainly growing movement has emerged that counters these trends at the level of individual choice: Bringyour-own-cup has been embraced by some coffee shops - rejecting the convenience of single-use paper or plastic cups. Refraining from motorized individual means of transport may be inconvenient but is seen as a contribution to reducing carbon emissions. Getting to places by foot, bike or public transport may pose some inconvenience compared to a personal car but offers opportunities for physical exercise, engagement with one's neighborhood and town, and accidental encounters. (Edwards et al., 2009)

The strategic approach to designing single-use or throw-away products offers the convenience of eliminating time and effort for maintenance and repair for an individual user. The flip side of this convenience are masses of objects that end in landfill arguably at a premature state. The European Union's "Right to Repair" regulation addresses this issue, requiring manufacturers to make their products repairable and in this way extend the actual life cycle. (European Parliament, 2022) Care, maintenance, and repair are not issues limited to electronic products, but also extend to objects such as clothing, shoes, tools, and similar.

The alarm clock as an object has made a revival to counter the addictive nature of smartphones and removing them from bedrooms. (Montag et al., 2015) The convenience of having an alarm function on one's phone is exchanged for the inconvenience of keeping the phone at a distance while having an actual alarm clock object next to bed - it offers the newfound value of keeping the phone out of the bedroom. In line with that, a still small but robust movement is emerging of people deliberately deleting specific apps from their phones that exert too addictive a pull and keeping the relentless notification buzzes and

beeps in check, allowing for more focused offline time as a reward.(Hari, 2022)
The above are examples for how inconvenience can offer a different kind of value. The examples are based on individual choices of rejecting more convenient offerings. What I will be describing in the following section is not so much a suggestion to abolish convenience as a whole. Rather, I suggest looking at the inverse side of convenience, at inconvenience, as a design approach to construct new value for a given situation that can coexist next to its more convenient counterpart.

Inconvenience as a design approach

The above examples illustrate individual choices that give up on convenience in exchange for a different kind of value. I propose to take this a step further and fold a focus on inconvenience into the design process itself - to deliberately work with inconvenience at the design stage as a way to create new forms of value.

The Gymnast-CoBot case described above provided an opportunity to experiment with this approach: during the early phase of the project, we carried out performative prototyping sessions of the robot-human hand-over dynamic by having a person enact the robot. Besides learning some key aspects that helped in designing the interaction and feedback process we also noted that the continuous variance in human-to-human hand-over did require constant attention and adjustments. While this could be easily branded as inconvenient and optimized by a robot's more consistent behavior, it is that slight variance that proved to be of value. By programming a robotic device to perform hand-over operations deliberately in a less convenient way the overall outcome for the human worker became more productive. The experience results in increased posture variance, an improvement in overall ergonomic metrics as well as increased attention and engagement, both aspects associated with a reduction in work accidents and overall increase in wellbeing.



Figure 2: Performative prototyping of human-robot collaboration with a human enacting the robot to gain insight into critical conditions during hand-over and feedback.

While there is a good human-centered reason for this, there is also an increasingly pressing

argument for such a more holistic perspective in economic terms. Today, many industrial workplace environments are struggling to attract workers that accept the harsh and challenging work conditions. To attract and retain workers, workplace conditions need to improve overall and the approach of Gymnast-CoBot opens a path in that direction.

Beyond this specific case, and in working with inconvenience as a positive vector in the design process at a broader level a pressing question becomes how to design for productive inconvenience? How can something that is apparently inconvenient - requiring more effort and time - be created in a way that becomes attractive in its own way? How can we make the value of inconvenience visible, intelligible, and ultimately experienceable?

Based on the above examination of the nature of convenience we know that a lack of convenience means going out of one's way, reaching out, moving physically or mentally out of one's comfort zone, bringing oneself in, engaging more than not with a situation. Ultimately, making things inconvenient means creating the opening and even necessity for mobility, for participation, for engagement, and ultimately for personal growth.

Informed by a close reading of the case study and the sections above I suggest four stages when designing for productive inconvenience:

1. Identify nature of convenience and what time and effort are reduced

Identification of elements that make a convenient solution convenient. Description of what kinds of effort and time are reduced in the process.

2. Identify what is lost

Description of elements, processes and experiences that are lost in enabling that specific convenience.

3. Creative work with what was reduced and lost

Work with what was reduced, cut, or eliminated by the convenient solution. This lack, or negative space becomes the creative potential to construct something stimulating and engaging, while avoiding that inconvenience results in nuisance.

4. Maintain inconvenience over time

Ensure a level of unpredictability to keep up the inconvenience. Inconvenience is always somewhat unpredictable. Maintaining this unpredictability is important to avoid that planning and expectation come into play and restore convenience to the situation.

These four stages are a first attempt to formalize working with inconvenience as a part of a design process. Embracing inconvenience is, of course, not an end in itself. Rather, it relates to the problematic consequences of a convenience-based lifestyle discussed earlier. The work with inconvenience within the design process generates openings and possibilities to productively address issues related to aspects such as sedentary lifestyles, social interaction and loneliness, nutrition, as well as issues related to environmental impacts of human activities.

Designing for productive inconvenience does not automatically realize any of these outcomes by itself. Making a product repairable is not the same as that product actually being repaired and having its life cycle extended. Neither is it the same as someone actually finding joy in expanding one's own horizon by learning how to repair an object. Designing for productive inconvenience requires the active engagement from the user, which in fact it encourages and invites. It is through this active engagement with inconvenience that productive inconvenience creates openings in everyday life situations for these outcomes to occur.

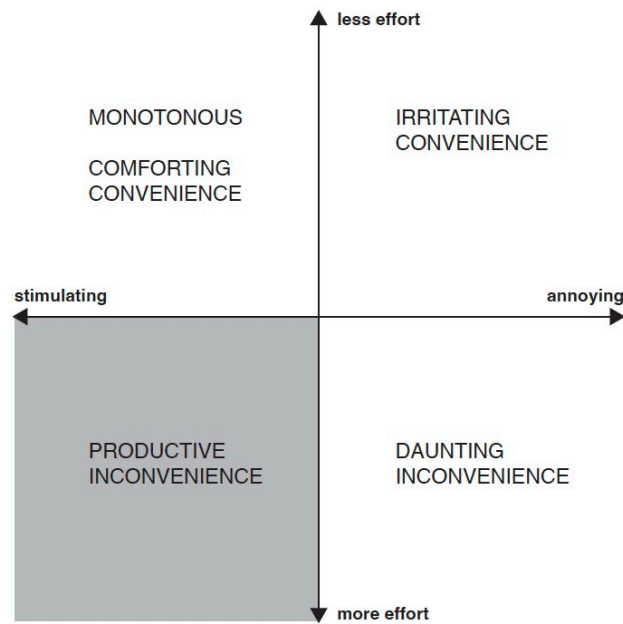


Figure 3: Situating productive inconvenience between stimulating and annoying experiences that require more or less effort.

To give an example, writing with a fountain pen can be seen as inconvenient compared to ballpoint pens or markers that require less care, technique, and maintenance. Fountain pens are always somewhat unpredictable in terms of the ink flow consistency, timing for a required refill, as well as the potential messiness of the refilling process. The more in effort and time, however, does allow for a different kind of connection with the tool and the related writing process. Writing with a fountain pen makes the process of writing longer, slower, and more effort-full and in this way creating a new kind of time for thought and reflection.

Conclusion

Based on the sections above it appears that convenient solutions smoothen the bumpiness of everyday life by reducing time and effort, but they also reduce possible spaces of value. And perhaps surprisingly, inconvenience, if proposed in productive ways, can become an element of more - more opportunities to actively engage with an activity, with one's environment, with other people.

Having started this paper by illustrating some pitfalls of convenience, working with a lack of

convenience and a critical examination of the concept makes clear how convenience itself presents a lack. Inconvenience, on the other hand, provides an opening for filling this lack. Upon close examination, inconvenience reveals itself as a dynamic state of possibility for more and for growth. What inconvenience really lacks is control. By working with inconvenience designers give up control over how people resolve for themselves the inconveniences in their specific life situations. It is that shift away from control and towards possibility that is ultimately at the core of a design approach that embraces productive inconvenience.

Acknowledgements

I want to acknowledge the team of researchers that worked on the Gymnast-CoBot project described here as a case study: Kristian Kloeckl (PI), Taskin Padir (PI), Rui Luo, Patrick Dawson, Mark Zolotas, Zuozheng Zhong, Dipanjan Saha, Salah Bazzi. The term productive inconvenience was born out of discussions amongst the authors when writing the paper "Productive Inconvenience: Facilitating Posture Variability by Stimulating Robot-to-Human Handovers." (Zolotas et al., 2022) This work is supported by the NSF under the award number 1928654.

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