

Fluid Friction

The Case for Friction in Public Safety Design

JOSHUA BURRAWAY, *Motorola*

I DON'T KNOW WHAT TO DO...

The moment she heard the beep come through her headset, Tess switched gears immediately. Moments earlier, she'd just wrapped up a non-emergency 101 call with a man who had found himself face to face with a weasel in his back garden. She and her colleagues had been shaking their heads, chuckling away in disbelief at some of the benign, decidedly non-emergency situations that are beamed into their ears – stray cats urinating on front lawns, a neighbor's tree trespassing across a garden fence, unanticipated weasels. There was nothing benign about this call though. The man on the other end, Sid, was inconsolable. He sounded elderly, soft and gravelly at the same time. His son had assaulted him and threatened to kill him. Where was his son now? Asleep on the sofa, passed out drunk. Sid didn't know what to do anymore. He loved his son – what father doesn't? – but he couldn't handle it anymore. He was terrified of him, especially when he'd been drinking. His son is a martial arts expert. A violent man, he repeats, over and over. Tess tries to keep Sid calm. The elderly voice is a torrent of grief, pain, and regret. But Tess needs to keep Sid focused. She needs to know the address. She needs to know the nature of the threat. Already, she's heard enough in these first few seconds to mark the call as the highest priority – her controller on the other side of the room dispatching officers to the address immediately. Sid wants to tell the whole story – which tumbles out of him in fits and spurts. How things took a turn when his wife died last year. How lonely he's felt. How much he wishes he could help his son. How much he loves him. But also, that he's afraid he'll wake up from his drunken stupor and kill him. Tess, though, doesn't have time for the whole story. She's assertive, cutting Sid off to get what she needs. His son's name and date of birth. The layout of the house. How much he has drunk. His attitude towards the police. Whether Sid has anywhere to hide until the police arrive. I don't know what to do, Sid repeats, lost in the paralyzing reality that he has been forced to call the police on his own son, knowing what this will mean for what little remains of their relationship. Tess has gotten the information she needs to wrap up the call, satisfied that the officers who arrive on scene have the context they need to make an optimal risk assessment. Tess takes a deep breath, finally allowing her tone to shift into a gentler, more compassionate register. She asks if Sid is okay. He doesn't answer. Instead, he sobs. She says she's sorry that this has happened to him, reassuring him that help is on the way. She tells him to call 999 if anything changes. The call ends and Tess takes another deep breath, waiting for the next beep.

INTRODUCTION

The vignette above concerns a single emergency 999 call from a period of ethnographic research carried out in a UK-based Force Control Room (FCR) – the place where call operators take emergency and non-emergency calls from the public.

During this project, I was plugged into the headsets of various call takers who made up the FCR. As a UX (User Experience) Research lead for Motorola Solutions, my assignment for this particular project was to understand how call takers did their jobs. This meant mapping out their workflow, identifying their needs and pain points and, more broadly, giving an analytical language to the cultural, social, and institutional context in which they operated. The aim was to take these ethnographic insights and use it as scaffolding to design and develop a new kind of software to help call takers better manage their calls, triage their callers, run data-base searches and more broadly build new efficiencies and interoperabilities into their existing ways-of-working.

Squint, and the above process tracks like most UX research projects in the software development space. Structurally speaking, that much is true. After all, UX research is fundamentally about observing and questioning users as they interact with products and systems, teasing out needs, goals, motivations and pain points, making sense of these insights in the context of product and/or system usability, and then translating these insights to inform more human-centered design (HCD). This notion of human-centered design is something akin to the moral dogma of the UX field. Its purpose is to ensure a humanistic lens sits at the center of the design process, such that a person's needs or goals, as well as the broader context of their usage, are used to underpin and drive design decisions and development. It is not difficult to see, then, how anthropological methods – with their intrinsic focus on context, culture and behavioral nuance – have been so readily adopted within UX circles in the question for deeper user-centricity. Whilst this explicit foregrounding of the user marked a radical break from previous approaches – which tended to be informed by a designer or product manager's (typically limited and often biased) imagination of user needs – the subsequent ubiquity of the term has led to blindspots. Indeed, one of the pioneers of HCD thinking, Donald Norman (2005), has leveled just such a critique. In Norman's eyes, the dominance of the HCD model has fostered a kind of epistemological laziness, with many of its fundamental principles no longer critically evaluated as part of an evolving intellectual genealogy. This paper echoes Norman's critique that a number of fundamental presuppositions that orbit the HCD paradigm have become so self-evident as to remain critically unexamined in design circles, thereby impoverishing the field's capacity to meaningfully evolve and explore new ways of thinking.

The presupposition – not mentioned in Norman's critique – that I want to focus on in this paper is the concept of “frictionless” UX. This relates to design approaches that aim to make the user's experience of software as fast, smooth and effortless as possible. Couched in the language of HCD, the design focus is on removing anything that might impede, distract or slow down the user as they try to complete a particular task. In no small part, this often-unquestioned ethos reflects the history of modern design's intimate ties to the consumer sphere, which has increasingly fetishized convenience, comfort and satisfaction as the core human

values that should be elevated in a person's experience with a thing, physical or digital. Frictionless-ness, then, becomes a kind of catch-all design model for this cluster of values. The result of this is that its perceived opposite – friction – becomes de facto devalored, becoming a shorthand for user experiences defined by frustration, imposition and unmet goals. This, though, is a very limited understanding of friction or, better yet, the work that certain modalities of friction can do.¹ Here, the point is not that we should be throwing the baby out with the bathwater and aim for “frictional” design at the expense of frictionless. Rather, instead of seeing them as opposing forces, we should instead consider them as *obverse* – two sides of the same coin, with a shared edge. This kind of reframing can help us more expansively think about the way that frictionless and frictional affordances can coalesce to produce more meaningful forms of user engagement. This is especially important, as this paper will demonstrate, when thinking about UX within the domain of public safety.

Public safety is, unsurprisingly, a markedly different world from the consumer sphere. For one, those who work in this field are not using its software as an expression of market preference, tied in some way to their social identities and/or individual tastes. They are using it because they *have to* – their ability to do their job depends on these pieces of software and the systems they in turn are built on. Of course, public safety professionals are not the only class of workers who have to use software programs to successfully execute their professional duties – far from it. Where they do differ, however, is in the stakes of *not* doing their jobs, or even simply doing their jobs sub-optimally. If an HR specialist doesn't correctly structure a compliance module, or an academic forgets to upload a lecture to the student intranet, there can certainly be consequences – embarrassment, legal issues, perhaps even dismissal. None of these consequences, though, are life and death. But when a call taker like Tess doesn't flag – for whatever reason – to their controller that the suspect in question has a history of violence towards police and owns a gun, that can have fatal consequences. Indeed, the public safety field is littered with these tragic cases. In many of these cases, it is not so much an individual error that is at the root of the tragedy, but rather a system failure, of which software and digital technologies are an increasingly prominent part.

This, then, is the realm of hard choices, of ethical and moral chasms, of cognitive and emotional overload. It is also a uniquely fluid realm, defined by hyper-contingency, fluctuating paths and competing exigencies. In this realm, friction is not synonymous with failure, but rather an integral aspect of the fluid dynamics of emergency situations. Public safety professionals – notably emergency dispatchers and police officers – are constantly being bombarded with information, from multiple angles, across multiple technological systems and in dynamically changing social and relational contexts. This information is often incomplete, contradictory, and fiendishly difficult to absorb and interpret. Not to mention laced with serious risk. Contending with these multiplex surges of information means that there can

never be one single “unified” user experience or flow to design for (compared to, say, the online shopper who is looking for the most convenient way to browse and complete a transaction). As the remainder of this paper will show, frictionless paths – where speed is of the essence – must coexist with instances of interruption, where frictional affordances stop users in their tracks, demanding new modalities of attention and deliberation. There is value in friction – so long as it is harnessed in the right way, in the right balance, and in the right circumstances. Indeed, there are voices within the design literature that have begun to think in this vein, notably through the concepts of “slow” and “reflective” technology (Hallnäs and Johan Redström 2001; Sengers et al. 2005) as well as “uncomfortable design” (Benford et al. 2012). Broadly related, these principles hinge on the idea that activities that are less efficient, more difficult, and even actively uncomfortable can still add value and enrichment to the user experience. Building on this body of work, Cox et al. (2016) have discussed the value of instilling “microboundaries” within interaction design. They use this term to denote small obstacles, digital speed bumps almost, that slow people down by creating “micropauses” that snap them briefly out of autopilot and encourage more agentive, mindful action. Ericson (2022) echoes these principles in a recent paper, making the case that rather than reflexively removing friction, we should be thinking about how we might intentionally design appropriate modalities of friction, grounded in a deeper understanding of what experiences and goals are most meaningful for people engaging with the system.

The aim, then, of this paper is threefold. First, it is to build on the literature cited above by infusing a deeper sense of the ethnographic, which it currently lacks. This is because, as I intend to show, few methodologies are as capable of tracing the boundaries between meaning, agency, context and lived experience. Second, it is to explore – through two distinct ethnographic cases – how different modalities of friction manifest in public safety contexts, especially in situations that are mediated by digital communication technologies. Third, it is to outline how these ethnographically informed analyses might inform novel innovations in public safety software design patterns (and perhaps software design more broadly). To achieve this, I develop the conceptual lens of “viscosity” to illustrate the relative value of friction in dynamic, fluid situations constituted by multiplex flows of information. This allows us to envision friction on a “viscosity spectrum” of design interventions that can be applied in high-stakes public safety contexts, with both micro and macro implications.

The two cases I present in this paper seek to thread the needle between the micro and macro, offering two distinct yet interrelated lenses through which to apply the concept of viscosity. The first concerns the vignette that opened this paper. Here, a deeper analysis of Tess’ workflow captures the need, at a micro-interactional level, for low- and high-viscosity design to co-exist as call takers balance the needs of their callers against the risks posed to responding officers. The second case concerns the macro-level impacts of “garbage data” on police operations. This case illustrates

how, as digital technologies become more prevalent across all aspects of front-line policing, high-viscosity UX design patterns in police reporting software have the potential to dramatically improve data quality, mitigating some of the “vicious cycle” ripple effects that are linked to so-called “garbage” inputs. Before delving into the ethnographic cases sketched out above, I unpack in greater detail the concept of viscosity as a means of unsettling the orthodoxy of frictionless UX design.

UNSETTLING ORTHODOXIES: VISCOSITY

Anthropology, as recent debates in the ontological and phenomenological turns have shown (Holbraad and Pedersen 2018; Zigon 2018), is not just about describing cultural worlds as they are, but rather what they *could* be. According to this argument, it is the ethnographic encounter, as an exposure to radical difference, that shines a light on our own conceptual inadequacies. It is an invitation to go beyond translating otherness into our own terms, and instead harness the destabilizing spirit of that alterity to create new conceptual and analytical paradigms. To imagine, as Povinelli (2012) might say, to take seriously the possibility of making the world *otherwise*. In this regard, scholars in this space have much in common with UX practitioners, even if they are speaking very different languages. Still, the analytical and perhaps even spiritual impulses of the “otherwise ethnographer” and UX practitioner are broadly similar – to imagine and bring into being different human possibilities, inspired by the needs, beliefs and perspectives of those who are often radically different from themselves. For this to happen, though, a new vocabulary is required to fill the vacuum left in the wake of ethnographic exposure which, if sufficiently glaring, will often leave our own orthodoxies in tatters. Which is where metaphor comes in. Metaphor, as the philosopher Max Black (1962) has argued, is a tool with which to fill the gaps in our conceptual vocabulary.

Viscosity is such a tool – one that is uniquely fit for the problematising of frictionless UX, a metaphorical orthodoxy that has become so entrenched in designer lexicon as to become an unquestioned assumption. The risk, as Mattingly (2019) and others have argued, is that when concepts ossify into doxa or “second nature,” they reproduce themselves in such a way that we lose track of their blind spots and, often without realizing, deny ourselves the room to creatively experiment with different ways of thinking. Put another way, even the freshest bread goes stale in the end. We should, she argues, always be looking to unsettle and challenge our own orthodoxies. To keep baking fresh bread or, in business lexicon, to innovate. Ethnography, from this standpoint, is a core ingredient of innovation (which always begins with thought).

Viscosity, then, offers a new way of thinking beyond the orthodoxy that frictionless UX represents the zenith of user-centricity. Borrowed from the discipline of fluid mechanics, viscosity is a type of friction – understood as a force that opposes the relative motion of two surfaces in contact. When lighting a match, for

example, friction between the matchstick and the striking surface causes the match to ignite. In fluid contexts, viscosity is a property of fluids that describes their resistance to flow. The higher the viscosity of a fluid, the greater the friction between the fluid and the surfaces it is in contact with. This is because, the more viscous a fluid is, the trickier it is for the fluid's molecules to move past each other. Honey, for example, has a higher viscosity than water – it literally pours at a slower rate. Hence why stirring a pot of honey is harder than stirring a glass of water – the molecules in honey are more densely packed together than the water molecules and thus more difficult to move past one another, which in turn creates more “drag” on the spoon.

Returning briefly to the ethos of frictionless UX, it is telling how often this aim is in service of so-called user flow. Awash with liquid imagery, the user is imagined as a kind of digitally embodied flotsam, carried along on the gentle river currents of the interface, sometimes detouring through different tributaries, but always arriving at the same predetermined destination, their satisfaction with the flow of their “journey” intrinsically related to whatever obstacles they encountered and/or navigated along the way. The problem with this low stakes, consumer-centric conception of flow is that it bears little resemblance to public safety contexts. In the above image, the (intended) user flow follows a smooth, consistent, efficient pace, the end result is pre-known, and any human interactions that occur along the way are, in relative terms, extremely low stakes. This, though, bears little resemblance to the flow that public safety users experience. Or rather flows, plural.

TURBULENT WATERS

Let us first consider the multiple, often contradictory flows that constitute Tess' work, in particular as it relates to her interactions with the digital and technological systems that shape the immediate context of her experience of call taking. In truth, her job title itself is something of a red herring. This is because call takers don't take calls. Well, they do in the technical sense that they receive a call that is routed through to their workstation. From that moment onwards, though, they are *triaging complex situations* – rather than taking singular calls. Triaging because, at heart, call taking is about making a risk assessment, based on their interpretation of the fragments of information they receive, to determine the urgency of need. Complex situations because, situations are not bounded, singular things. Rather, they are dynamic, heterogeneous assemblages of persons, objects, practices and affectivities that are in constant flux (Zigon 2015). Call takers know this all too well. Things can, and do, change in an instant. An assailant who initially fled the scene returns. A person witnessing a fight suddenly notices one of the involved parties holding a weapon. In Sid's case, his son could wake up at any moment to hear him on the phone to police, tipping him over the edge into another violent, potentially homicidal rage. Hence why Tess must be so assertive with Sid in this kind of situation. His loneliness in the wake of his wife's death; his deep moral ambivalence about having

to call the police on his own son – these are essential, uncontainable parts of Sid’s story, quite literally bursting out of him over the course of the call. To Tess, though, they are ultimately peripheral. It is the immediate context of the threat that matters. She needs an accurate location. She needs to summarize to her controller what has happened. She needs to make sure it has the right priority level.

This is where the relative viscosity of the user interface matters – both within systems and between them. The more efficiently Tess can move between different data fields and transfer any narrative updates over to her controller, the better. Every second where Tess is forced into extra “mouse work” to jump between different fields or systems, every time she has to jump between one window and another, every time she has to re-orientate herself – these transition “jumps” create a kind of drag. And, as I sit next to Tess and observe her in full flow, there is plenty of jumping. In the course of a single call, Tess might have to jump between her CAD (computer aided dispatch system) where she records and prioritizes information from her caller, her localized RMS (record management system) where she scans data-bases for intelligence on involved entities (persons, property, vehicles, etc.), the PNC (Police National Computer) where she can access national level information, her firearms database to search for any links to known firearms, her mapping system to establish and search for relevant locations, her telephony system through which she manages her call and can conference with colleagues, any CCTV systems relevant to the incident, plus any word processing systems she might use to take rough notes. This is to say nothing of the jumping she is doing *within* each system as she moves between different features, functions and data fields. Concurrently, Tess must also maintain emotional control, develop rapport with the caller, skillfully manage any distress or hostility, and continuously organize what she’s hearing and analyzing into a coherent, intelligible story.

The connective tissue between and within these disparate systems² is far from optimal, with the ecosystem as a whole lacking the kind of joined-up design thinking that might accurately reflect a call taker’s workflow. As Tess puts it, “*we’re constantly fighting against the software. You can tell a call taker was never asked about any of this when they designed it.*” Faced with this intrinsic lack of user-centricity, Tess – like the rest of her colleagues – have learned how to improvise. Her workstation – spanning three screens – is fully customized, with different systems homed in different parts of each monitor. It’s a kind of UI feng shui that allows the different systems she depends on to reflect her particular way-of-working. She knows the geography of this set-up inside-out, the screens and their embedded elements an extension of her embodied cognition and dexterity. This, then, is testament not to the slickness of the system’s design (far from it), but the intrinsic adaptability of human beings as, through practice and repetition, they develop their own modalities of mastery and expertise, such that workarounds become, in the end, the most efficient way to get the job done (Norman 2008). Here we can see how, for all the ingenuity and embodied praxis (Merleau-Ponty 1962) of her workarounds and feng shui, there is a viscosity

issue. Namely that, for this particular workflow, things are too viscous, creating the kind of drag from which inefficiencies emerge. Cumulatively, these inefficiencies ramp up a call taker's cognitive load (the mental effort required to process information), increasing the likelihood of fatigue and impaired decision-making. Here a lower viscosity design – complete with an optimized information hierarchy reflective of her critical priorities – that enables Tess to navigate between fields and across systems with limited drag would be ideal.

At first glance, then, we are back in the realm of the “frictionless” interface. And this might be true, if that were the only thing that Tess was doing. In reality, though, call takers are always engaged in multiple workflows at the same time. Like an octopus whose tentacles have separate but interdependent brains, Tess is required to juggle lots of independent and yet intersectional tasks as part of her situational triage. For example, as she keeps Sid on the line and carefully extracts the information needed to form the narrative of events that any responding officers will be reading en route, she is also punching his son's name into her RMS. From what Sid has told her, he is intoxicated, trained in martial arts, has violent tendencies and is potentially hostile towards the police. Of course, none of this could be true. (Indeed, it is not uncommon for people to call 999 and fabricate stories about friends and family members.) On the flipside, Sid's outline of his son's potential for violence could also be the tip of the iceberg. Tess' job isn't to adjudicate on the veracity of Sid's testimony – indeed, as a matter of precautionary principle she must treat each caller as though they are telling the gospel truth and record their words verbatim. Her job, recall, is to triage the situation and provide as much contextual information as she can to her controller, especially as it relates to any possible risks to officer safety. So, when she inputs his son's name into her RMS, it is paramount that any associated warning markers are not missed. In short, these warning markers need to be interruptive by design. They need to quite literally slow Tess down, stopping her in her tracks, if need be, so that she can attend to the information, interpret it and flag it in her narrative. What is needed in this concurrent user flow, then, is not less viscosity, but more.

As it transpired, Sid's son had a history of violent offenses, several involving the use of knives. He was a high-risk individual who posed not only a significant threat to his elderly father, but also to the officers on their way to the address. Here, then, we can see how low viscosity and high viscosity flows mix as part of Tess' triage. The result of this mixing is, to borrow another term from fluid mechanics, turbulence. Simply put, turbulence is a state of conflict. For Tess, it is actually a necessary state-of-being to be thrown into, insofar as the turbulence created by a warning signal forces her, as a user, to stop, take notice, think, and update her assessment. Crucially, though, she does not want to remain stuck in a turbulent state. Rather, what she needs is the ability to rapidly navigate these turbulent waters, transitioning back into a low viscosity flow that allows her to acknowledge, flag and pass on these warnings in the most clear, efficient way possible.

Rather than the predictable, linear flow of the consumer-centric model, the public safety flows described above are more akin to white-water rapids, brimming with turbulent eddies, unpredictable currents and sudden hazards. Just as rafters must deploy their athleticism, deep understanding of the river and technical mastery of their tools, so too must call takers deploy their expertise to navigate their own turbulent waters. And, in the same way that a rafter's paddle is designed specifically for tight maneuvers in white-water, a call taker's technological ecosystem should also be designed in a way that reflects the unique conditions that shape their experiences. Thinking through the conflicting modes of viscosity that emerge at the intersection of their workflow and technological interactions can help us develop a novel and more nuanced UX design language around their needs, moving beyond existing orthodoxies to open up new spaces of conceptual experimentation which can, in turn, spark new practical innovations.

As noted earlier, ethnography – owing to its unique combination of intimacy, immersion, and exposure to human difference – is an ideal methodological engine for such experimentation and innovation. In the above example, I have sketched out some of the ways in which an analytics of viscosity – underpinned by ethnographic observation – can inform design thinking at the micro-level of individual experience as it relates to interaction design within and between digital systems. Ethnography, though, is not only about the micro level. It is also about connecting micro-level dynamics to large, macro-level forces. The next section will explore this micro-macro dialectic further. It hinges on an ethnographic analysis of US patrol officer workflow, drawing on the concept of viscosity to think through data quality issues in police reporting as it relates to the juvenile justice system and police agency operations more broadly.

LITTLE JIMMY

“If I add mom as a person record on my RMS and list them as a parent of Little Jimmy, when I pick him up again two years later, I just have to search him and get momma's number. When we first encountered Little Jimmy, it may not have been top of mind then, but it will only serve to help me in the future.”

In his decade in law enforcement, Officer Turner has had to deal with more than his fair share of Little Jimmies. By this he means young offenders – people below the maximum age of criminal responsibility (typically eighteen years old but this can differ from state to state) who regularly fall foul of the law. Often, they're picked up for petty crimes – shoplifting, vandalism, minor drug possession, underage drinking. Of course, there are plenty of cases where juvenile offenders carry out much more serious crimes. Officer Turner, it is worth noting, is all too aware of how much of juvenile offending is tied to problematic social, economic and family conditions, not to mention mental health issues and an entrenched scarcity of service provision for disadvantaged children and adolescents (Rekker et al. 2015). His sympathies

notwithstanding, his primary job as a patrol officer was to enforce the law, not critique it. In the state of Georgia where he was based, whatever crime a juvenile committed – petty or serious – the protocol for charging them is the same.

“If we want to charge them, first we need to get connected with the juvenile justice system. Then, we’ve got to speak with a juvenile case officer. They’ll look at the kid’s history. They’ve got a points system. I gotta say, we never understood it, they never told us what it was or how it worked. It seemed wildly inconsistent to us. Anyway, if they reach a certain number of points, they’d be like okay, take him to the Sheriff’s, put him in a juvenile holding cell, and then eventually they’d be picked up and taken to a juvenile detention center. But if they didn’t meet the points threshold or whatever, then it was please release them to their parents or legal guardian. And that’s what happened 99% of the time – release them back to their parents. So I’ll be like – Little Jimmy, what’s your mom’s name and phone number. And he’ll be like, hell no – I’m not telling you. When she finds out what I did, I’m gonna be in trouble.”

This kind of situation was incredibly common. If a juvenile, as they often did, refused to tell him the names and contact details of their legal guardian, this meant having to dig around in the RMS, searching for any kind of clue or association that might allow them to track down the right person and contact number. This could take minutes. Or, it could take hours. What’s more, getting through to the legal guardian wasn’t enough. The arresting officer is required by law to place the juvenile directly back into their physical custody.

“I can’t tell you the amount of times where we finally get through to mom. And we say hello Mrs whoever, we’ve got your Little Jimmy in custody here, he was picked up for doing x, y and z. We legally have to put him in your physical custody. Turns out mom is at work in Atlanta, which is like at least a two-hour drive away. So we’re just sitting there for two hours, waiting on momma whilst other calls come in.”

These “Little Jimmy” stalemate cases were frequent enough to be a major headache for Officer Turner. The effect, as described above, was patrol officers getting stuck in a kind of operational limbo, morphing into babysitters who were unable to respond to any further incidents within their zone until they had transferred the kid into custody. In turn, this increases pressure on the agency, which has less resources they can deploy. The root cause of this issue is one of data quality. In other words, when juvenile offenders are picked up, the arresting officer is all too often neglecting to collect and record the details of their legal guardian. In part, Officer Turner suggests, this is because these initial interactions with first time juvenile offenders are typically so legally trivial that it doesn’t feel necessary collecting parental or guardian details. The problem though – as crime analytics have demonstrated – is that first time juvenile offenders don’t tend to stay first timers. A significant majority will re-offend, with patterns of behavior often escalating as they get older. Notwithstanding the major impact that socio-structural forces have in

shaping patterns of re-offending within juveniles, the fact remains that as a patrol officer, when Officer Turner picks up another Little Jimmy whose offense is worthy of criminal charge, but ultimately doesn't meet the state's threshold for detainment and processing, he wants to reduce any babysitting time to an absolute minimum. The quicker he can get hold of a parent or guardian, the quicker he can get back to his primary job – responding to emergency calls.

There are, it should be noted, important variables in terms of how significant an impact a Little Jimmy stalemate will have on an agency's operational capacity. For really small agencies where there might only be two officers on shift at a given time, having one taken off patrol to babysit clearly has a huge impact. In Officer Turner's department, if this situation unfolds during the middle of the day, they might be able to palm off the juvenile to a detective on shift in the office so they can resume their response duties. Whilst this might solve the problem for the officer, it doesn't really solve the broader issue – it just shunts it onto someone else. In this case, the detective has to take responsibility for the juvenile, which detracts from their ability to fully focus on their own investigative work. If it's 2am, then the arresting officer has no way of getting out of babysitting duty. For large agencies that span entire urban areas, they will likely have more resilient human and institutional infrastructure to absorb their Little Jimmies. These Little Jimmies, though, are actually just one instructive example of a much broader problem that impacts police operations. The garbage problem.

GARBAGE IN, GARBAGE OUT

“Garbage in – garbage out” is a phrase you'll often hear in policing circles. It's a colloquial term, common across different industry divides, recognizing how poor-quality data entry drives unreliable and problematic data outputs. As revealed in each Little Jimmy case, it's not just the input of poor-quality data, but any data at all. Absence in, absence out, in other words. Here then, we see how data vacuums create operational vacuums in the form of babysitting juveniles. The operational costs go far beyond babysitting though. As well as being a patrol officer, Officer Turner also worked as an Intelligence Officer – meaning that it was his job to gather, analyze, and disseminate intelligence information to support policing operations. One of the biggest, most frustrating parts of his role was cleaning up other people's garbage.

“One of my responsibilities as an Intelligence Officer was to read all of the reports that were written the previous day. Many times, when reading the reports, they were not filled out correctly. Either the zone in which the incident occurred was incorrect or blank, or the nature field of the report did not match what the narrative explained, or an officer did not fill in each individual charge that was taken.”

What you end up with, in the end, are inaccurate crime statistics. For example, if a traffic stop morphs into a drug bust, but the drug offense doesn't make it into the

submitted record because the primary officer forgets to add the extra charge, that means that at the end of the year, the statistics around drug possession are not going to reflect what has actually been happening in the community. This creates two interrelated problems. For one, these are the statistics that get released to the general public. Delivering inaccurate reports that mis-represents the patterns and scales of crime within a community is likely to have a negative impact on public trust which, in America at least, is arguably at an all-time low. Secondly, the amount of crime recorded within a given jurisdiction has a direct on how much funding they receive from their municipal government:

“So, if I've got horribly underrepresented numbers, it's going to look like ‘hey man, crimes gone way down in the city. We can cut the police department's budget. They don't need all this money.’ So, they may cut our budget when in reality, because so many stats have been underreported because of poor data input, our crime rates are actually way up here. The city thinks they're way down here. We actually need an increase in our budget to help combat this rise in crime. So just that little mistake adds up and adds up and adds up and we could be looking at a lack of funding. And that also dictates how many new officer positions we may get for that next fiscal year. So, it can have a huge impact on a department.”

Arguments over police funding in the US are, quite understandably, emotionally and politically charged. The racialized forces that have long haunted and continue to dog US policing should not be minimized and are worthy of far deeper discussion that can be offered in this paper (*see* Brown and Barganier 2018). Those issues notwithstanding, it is not controversial to say that – wherever you sit on the argument of police funding – agencies across the country are facing huge staffing issues, at both the retention and recruitment level. This places more and more pressure on existing front-line officers, who are dealing with more emergency calls than ever before.³ On top of that, a lack of mental health service provision and escalating rates of mental illness and social distress has meant that, much to their despair, in many areas it is police officers who have become *de facto* mental health triage teams for their communities. All too quickly then, we can see how already over-stretched agencies can quickly end up with over-worked and under-trained officers who, as burnout and cynicism become increasingly entrenched, are that much more likely to make poor, even fatal decisions when engaging with members of the public, fanning the flames of an already vicious cycle of mistrust between the police and the corresponding community.

TAKING OUT THE TRASH

Garbage data is not, of course, the only thing driving the vicious cycle outlined above. But it is still one, often overlooked part of it. Overlooked because, in isolation, each datapoint incorrectly entered or neglected feels inconsequential, both

from the standpoint of the officer in question and the system at large. The reality, though, is that these data quality issues are not isolated incidents, but rather a systemic problem that, as I have illustrated, can have serious downstream consequences at both the operational and community level. Whilst UX research and design could not purport to be any kind of silver bullet to the broader, increasingly wicked problem of police-public relations in the US, it arguably does have a role to play in the garbage problem.

This is because, to describe the garbage problem as a data quality issue is to miss the fact that, beneath the hood, this is more accurately a behavioral issue. Moreover, it is a behavioral issue that emerges out of a particular technological and situational context. The field of UX, at its core, is about trying to understand the way in which human behavioral dynamics and technologies co-shape one another, the end goal being to develop new systems that benefit not just the users of one particular element of that system, but the socio-technical system as a whole. Ultimately, each agency will have its own socio-technical configuration through which officers collect, enter and submit data into their RMS systems. Typically, this will involve a combination of paper-based and digital technologies. Most officers, regardless of where they are, still carry a notebook to record key details about an incident. Many will use these notebooks as the foundational text for their reporting duties when they get back to their computer at the station. Others carry their reporting forms with them in the field. Others might rely more heavily on body-worn cameras to capture details and then go through the footage later on. In truth, most officers will cobble together their own way of combining digital and analog technologies to get their jobs done. Or, more accurately, *to get their jobs done as quickly as possible*. The unpredictable, time-sensitive, often overwhelming nature of patrol work, combined with ever-increasing bureaucratic “paperwork” responsibilities, means that officers, by and large, look for the path of least resistance when it comes to completing their data collection and reporting duties. So, when an officer is confronted with a juvenile who has committed a petty crime and a victim who doesn’t want to press charges, it’s easy to see why, given the context they are swimming in, they might choose not to bother taking any parental or guardian details. Police officers, like all humans, are also not immune to the experience of temporal discounting – the psychological tendency to prefer smaller rewards sooner (saving a few seconds by not having to fill in an extra part of a form) rather than larger rewards later (not having to dig through an RMS for two hours to find a young offender’s guardian’s name and contact details).

Here, then, we can see where the concept of viscosity might be helpful. Indeed, as more and more agencies transition their patrol officers from paper-based approaches into digital applications underpinned by emerging technologies (such as machine learning), a new set of potential affordances and behavioral levers begins to open up. Imagine, for example, how the interaction design of a digital form might create inflection points of high viscosity that, for a brief moment, create drag on an officer’s flow, encouraging them to input a piece of information – like a guardian’s

name and number if the person involved falls into the juvenile category – that can drive major efficiencies downstream, be it for their future selves or, more likely, their future colleagues. There is also an opportunity for macro data analytics to identify which “garbage” inputs have the biggest downstream impact in terms of statistical dissonance, operational vacuums, and extra “clean up” labor. Identifying the reporting fields with the highest future operational costs could provide a strategic roadmap to guide UX effort around where micro-behavioral nudges and high-viscosity design might have the biggest impact, allowing product development teams to work out the optimal trade-off between user friction in the short-term and long-term operational gain (of which those same users are fundamentally part).

CONCLUSION

This paper has demonstrated the way in which ethnographic research can work as a methodological catalyst to upend established orthodoxies within UX design, in the process allowing us to experiment with new modes of design thinking and innovation. The concept of viscosity – taken here as the relative amount of friction in fluid situations where multiple, often conflicting user flows must co-exist – is one such example. Through this concept, I have sought to challenge the established wisdom that “frictionless” design is intrinsically human-centered. Being truly human-centered means understanding, analyzing and engaging with the messy contexts and conditions – the worlds – that human beings are always already embroiled within. In the particularly fluid worlds inhabited by public safety professionals, frictionless and frictional affordances in the software they rely on need to exist cheek by jowl, undergirded by a design language that authentically reflects this reality. Viscosity has the potential to be part of this emerging vocabulary. As the two ethnographic examples at the heart of this paper have illustrated, building differing degrees of viscosity into interaction design is essential in public safety contexts. As Tess’ vignette illustrated, the need for a call taker to move at speed to protect a vulnerable caller is always counter-balanced by the need to protect any responding officers, which – depending on the nature of a given situation – may simultaneously require a slowing down and shift of focus to ensure that any risks or hazards are not inadvertently glossed over. In these unpredictable, time-sensitive, ethically charged situations where lives are literally on the line, finding the sweet-spot between low- and high-viscosity design patterns could not be more important.

In Officer Turner’s case, the temporality of “garbage in, garbage out” is different. Certainly, it lacks the immediate urgency and danger associated with overlooking a warning marker during a high-risk call. Data quality issues are a slower burn, their impact not so much explosive as implosive. Poor data quality corrodes from the inside, accumulating and accumulating until the downstream costs eventually fold back into the lived experiences of front-line officers, fanning the flames of burnout, impaired decision-making and, in the end, playing its own unique, all too hidden part

in the deterioration of public trust. The conceptual language of viscosity – informed by a mixed analytics of ethnographic research and big data – can enable UX design to do its part in mitigating the impact of garbage data, threading the needle between the micro-dynamics of human-digital interactions and macro-level forces that shape how police agencies are run and governed.

As ethnographic methods and anthropological frameworks become more integrated within the field of UX, the opportunity to unsettle our thinking as UX practitioners must not go unseized. The public safety space is just one domain where orthodoxical destabilization and ethnographically-inspired experimentation with new design languages can yield truly impactful innovations, benefiting not only the users we serve, but the discipline that serves us.

NOTES

1. In truth, it seems reasonable to suggest that when most UX practitioners use the term friction to describe what happens when something gets in the way of a user completing a desired action/goal, they are more accurately referring to obstacles. The difference between an obstacle and friction is subtle but important. Whilst both concern the impediment of movement, friction concerns the relative dynamics between surfaces, whereas an obstacle concerns the experience of being blocked by something. Friction can be reduced, altered or eliminated, whilst obstacles can only be moved or avoided.

2. Beyond the multiple user flows that relate to Tess's movement through the various user interfaces, there are also several external, cultural and relational flows that are constantly criss-crossing into her lived experience as a call taker. She and her caller are connected in flow – the flow of information and mutual regard. She and her colleagues are engaged in the flow of mutual support. Call takers talk about having one ear for the caller, the other for the room, always making sure they are available to support their colleagues, whether that's running an RMS search or grabbing a supervisor. There are also flows of power and policy to contend with – the cultural flow of expectations as supervisors move around the FCR and monitor the call takers, their presence actively funneling the flow of particular operational policies and departmental values.

3. According to the National Emergency Number Association (NENA), the number of 911 calls in the US increased by 15% from 2017 to 2021. This increase is due to several factors, including: the increasing population; the increasing number of cell phones; the increasing complexity of emergencies; and the lack of social and mental health services for people in crisis, who end up relying on 999 as a form of emergency care/crisis intervention.

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