Chapter 4

You Are What You Carry

I want you to take an inventory, either in your mind or on the nearest available surface, of all the objects that you carried with you when you went out today. Set aside your clothes (which are worn, rather than carried) and start by rummaging around in each of your pockets. Next, open up your wallet, bag, handbag, and/or purse, go through each compartment, and fish out each and every item, including the detritus at the bottom of the bag. For any clusters of things such as keys on a keychain, notes, or receipts, place each one side by side. I want you to take stock in them as individual objects, spread out next to one another, and also appreciate the whole.

Now consider how you came to carry each item with you today, and the journey it took to land in its portable home. Given everything that you own, why did you take only these particular items with you? How much of what you carry is based on decisions you made today, and how much is based on habit? Now, out of all those objects, I want you to choose the items

that you wouldn't leave home without, regardless of the day of the week.

If you're an urbanite or suburbanite, the three essential items that you'll have in common with almost every other reader around the world taking this inventory will be keys, money, and a mobile phone. If that seemed like an underwhelming *ta-daaa* moment, it's a testament to the global commonality of how we live and what we value. And if you're not among the vast majority, don't worry: we'll come to the exceptions—which can be just as revealing as the rule—in due course.

What you carry, what you consider essential, and, more important, *why* you carry these things can provide considerable insight into everything from day-to-day activities to hopes, values, beliefs, fears, how people relate to the world around them, and how the world out there relates back to them. For those trying to imagine and build the next wave of products, the subject of why people carry what they carry is fertile ground, touching so many possibilities, especially for those who wish to replace and reinvent those mobile essentials: keys, money, and phone.

On the most basic level, the things we carry, the things we absolutely need when we go out into the world, are the tools that help us survive. In more than a decade of research on this topic, I've found the keys-money-phone triumvirate to be consistent across cultures, gender, economic strata, and age (from teens on up). At their core, all three satisfy our most primal needs. Money can give us access to food and sustenance. Keys provide access to shelter and help keep our things safe while we're away. Mobile phones connect us to each other across space (calling and instant messaging) and across time (texting and email), and as

such it is quite possibly the ultimate safety net for a range of emergencies that require connecting to people and things that aren't immediately present. Of course, keys-money-phone offer far more than survival mechanisms, because people always want more than the bare essentials. Most people in the world, even those in relative poverty, live beyond subsistence, and carry more than they necessarily need to simply survive. As you'll see, many other factors, such as status, self-esteem, addiction, and relationships, play an important role, too.

Fundamentally, carrying behavior is about knowing where our belongings are, being able to access them at just the right time, and feeling secure in their safekeeping. When we go out in the world and when we return home, our ability to function depends on security, convenience, reliable solutions, and peace of mind, and these factors motivate us to carry the things we do. We develop habits and strategies to avoid losing things, forgetting them, or having them stolen, and increasingly we're learning how to apply the ways we carry tangible objects toward our intangible, digitally based possessions.

A Place for Everything and Everything in Its Place

My first trip to Shanghai was in 2004. I arrived hellishly jet-lagged after a long haul from Europe, then took a taxi through a polluted winter landscape to a downtown hotel. The team on that trip included a tall blond Swede by the name of Per, and a colleague from a Beijing research laboratory, Liu Ying. Our purpose in China was to explore carrying and interaction behaviors

for a client interested in designing carried accessories. Shanghai was the third city in our study, after a month in San Francisco and Berlin, and we were beginning to feel a little frazzled. But we were also deep into the research topic, having spent long days sifting through and starting to make sense of the reams of data that had poured in.

In Shanghai we met a young lady, we'll call her Meili, who had agreed to be one of our in-depth participants, and we were using a research method we refer to as shadowing (also known as "stalking with permission") to tag along in her everyday life and capture her key interactions (and try not to overly influence them with our presence).

As we followed Meili on a shopping trip around the city, from bus to shopping mall, street bench to restaurant, we noticed something interesting about her handbag: it never left her sight. What's more, it never even left her grasp. At no point in the entire day did she set it down, not even while she (awkwardly) tried on a fine new pair of black boots in an upscale shoe store. Every city comes with a risk of theft, but nowhere else in the study, from Milan to Berlin to San Francisco, did we see anyone cling to a bag like that, either holding it in her hand or slinging its strap over her shoulder. It wasn't just that she was keeping it within constant touch, but that it was clasped tight and zipped shut. Or at least when she was conscious of security it was. There was one short moment when, just as she was retrieving something from the bag, she received a phone call that distracted her from the task and caused her to leave the bag open and unzipped for a minute or two. When she realized this, she was visibly upset with herself that she had let her guard down for even a moment.

It might seem like extreme caution, although not unwarranted, since the risk of theft in Shanghai is a good deal higher than in most metropolises around the world. However, it got our research team thinking: don't we all act like that to some degree? We don't all clutch our bags at all times, but how often have you been in a dimly lit bar and slid yours under a chair to keep it close? Conversely, have you ever been in a friendly neighborhood café and felt comfortable enough to leave your belongings in the care of strangers while you popped into the restroom?

We termed this phenomenon the *range of distribution*, the distance that people are willing to let physical objects stray when they're out and about. The criteria people use to make these decisions (whether consciously or not) are simple, and fairly universal: the perceived risk of danger, the actual risk of danger, and the perceived and actual need to keep items close at hand for convenience. When risk and convenience factors are low, objects are allowed to spread out; when convenience is high, they stay close by; when risk is high, they stay somewhere safe, which could be very close, very deep under lock and key, or even somewhere completely intangible (we'll come back to that last one later).

Range of distribution is a particularly useful lens in contextual research, as it can provide perspective on the perception of risk of both the environment and the individuals in it. On public transit in China and Brazil you'll often see riders wearing backpacks on their chests (or "frontpacks"), a strong indicator of a short range of distribution, a high risk of theft, and an acute awareness of that risk and the need to react quickly if errant hands start unzipping a pocket.

On occasion, the local infrastructure can force this behavior. When the Shanghai Metro introduced (airport-style) X-ray bag scanners in advance of Expo 2010 (the Shanghai World's Fair), I noticed an accompanying change in behavior among mainstream passengers, and their anxiety, particularly during rush hour, was evident. As they placed their bags on the conveyor, many passengers desperately maintained eye (and sometimes hand) contact with their possessions, as if the conveyor belt would suddenly cause a break in the space-time continuum and whisk their valuables to another dimension. As soon as bags crossed the apparent threshold of no return, the passengers' attention and behavior would rapidly shift to the outgoing end of the machine, where they waited to grab their own bags the instant they emerged. If a passenger let his attention lapse for even a moment, he ran the risk that someone else would whisk his bag away and disappear into the rush-hour throng (if the space-time gremlins didn't get hold of it first).

The optimal or acceptable range of distribution depends on a number of contextual factors, including the physical properties of the space; familiarity with that space; the presence of familiar people (including people we recognize but haven't yet spoken to); the density of strangers; what activities people are engaged in nearby; the general cleanliness of the space and the people in it; the types of objects distributed, their actual value, and the owner's perceptions of their theft-worthiness; the time of day; visibility; weather; and so on. This equation tends to create certain sets of well-understood, if unarticulated, norms for particular contexts, like the "frontpack" on Chinese and Brazilian public transit. Individuals who behave counter to prevailing

norms tend to stand out. If the gap is broad, we might take the outlier's behavior as a sign of paranoia, or a lack of contextual awareness (one of the reasons why tourists tend to be more obvious targets of theft, and why frequent travelers look to locals for cues to blend in), but it could also be an indication of the owner's sense of an object's value. A wallet full of one-dollar bills doesn't look any different on the outside than a wallet full of hundred-dollar bills, but they'll probably have different ranges of distribution.

We've all been in group situations where one person casually displays an object with the obvious intention to impress: using a car key fob to steer a conversation toward a new car; letting a particular (or particularly expensive) brand label slip into view; calculatedly pulling out the latest and greatest smartphone to check for messages. Maybe you consciously do it, too—in subtle or not-so-subtle ways. The ability to project status in the form of tangible objects depends on their (momentary, at the very least) visibility but also highlights an inherent tension: the desire to show off one's property versus the desire to keep it safe. The high visibility and symbolic value that at one point made Apple's white earbud headphones so popular (as discussed in chapter 2) are also significant drivers for theft. Thus, deciding on a comfortable range of distribution for a status object requires a trade-off: project it or protect it.

In the home, where risks to possessions are relatively minimal and convenience is paramount, we tend to distribute things in the places we'll need them, or where we'll know we can find them when we need them. Just as most people put their food close to where they cook and their toilet paper within arm's

length of the toilet, things people carry into the outside world (coats, bags, keys, etc.) tend to linger around the front or back door. For most adults, mobile phones usually gravitate to the edge of a desk, and for teens these objects are left closer to the bed—both preferably within a cord's distance of a power supply.

We call these places where portable objects tend to cluster *centers of gravity*. A center of gravity is the bull's-eye where we aim to set an object down and the first place we look to retrieve it. Their purpose is fairly obvious: they are our spatial mnemonic devices. People who keep keys on hooks by the door are unlikely to lose their keys. People who keep cash, ID cards, credit cards, public transit fare cards, library cards, business cards, and such in their wallets, which they keep in their pockets, don't have to think twice when they need to access any of those things. In terms of range of distribution, centers of gravity are signs that mental convenience can be just as important as physical convenience.

But even the act of clustering objects in places where we are more likely to find them is no guarantee that we'll remember to take them with us, or keep them within an ideal range of distribution. When our awareness is impaired, whether we're busy, tired, drunk, or daydreaming, objects quickly become ostensibly invisible, and thus forgotten. To counter this natural tendency to forget important objects, one of the simple, widespread behaviors people exhibit when leaving one space and heading to another is what we call a *point of reflection*, that moment when a person pauses in order to run through a mental checklist of what they're carrying and what they may be forgetting. For someone leaving home, this usually includes the essentials—keys,

money (or the wallet/purse containing it), and mobile phone—and whatever travel items the day calls for. In a highly ritualized motion, we pat pockets and look in bags to reaffirm these objects' persistence before walking out the door, stepping out of the car, leaving the work desk, or getting up from a restaurant table. Some people even recite the checklist aloud.

That little pause at a point of reflection is such a simple, mundane behavior that it may not scream "business opportunity," but the potential is certainly there, if perhaps at whisper volume. The idea of periodic, systematic reminders based on context and necessity is one that can extend to problems and needs far beyond physical objects.

It's easy to tell if your phone is in your pocket when you can feel it; however, it's impossible to discern how much credit you have left on your fare card just by touching or looking at it (unless the amount is printed on its surface). One of the reasons why wallet mapping is such a useful research technique—literally sifting through and documenting the contents of people's wallets and/or bags, and asking about the stories behind each object—is that people often do things to compensate when things like fare cards aren't designed with adequate points of reflection. The most common form of compensation is redundancy: if you don't know how much credit is on your primary fare card, carry a backup that you know will have enough to get you through the turnstiles when you're in a hurry and you spot your train pulling into the station.

From a service design perspective, such a redundancy means there's an opportunity to make the system more efficient. For instance, most vending machines in Tokyo, and not just in metro

stations, have a mechanism that allows anyone to check their fare card balance just by swiping it against that machine—a very intentional and well-thought-out point of reflection, and it doesn't require a purchase. This simple interaction is both intuitive and useful, allowing people to use infrastructure in the world around them to query the status of their belongings.

Pocket-taps and habitual pauses by the door will always be easy ways to check up on physical objects, just as key hooks and tight grips on handbags will help us keep track of those things. But as more and more of our possessions become digitized, we have to reexamine these fundamentals of carrying behavior—ranges of distribution, centers of gravity, and points of reflection—in terms of their intangible equivalents. With change comes opportunity.

You Are What You Upload

When Apple released the first iPod in 2001, they touted it as "1,000 songs in your pocket." By 2009, that figure was up to 40,000 songs. But by 2011, the new promise was . . . zero.

Sure, if you wanted to do things the old-fashioned way you could still store thousands of songs on the device's hard drive, but you could just as well keep your entire music library on Apple's servers and stream them through iCloud, freeing up plenty of memory for all your different versions of Angry Birds.

Just as smartphones have changed the notion of the phone from a two-way communication terminal into a gateway to the world's knowledge base (it's never been easier to look up Liberace's birthday while riding the bus), server-based storage systems like

the cloud offer the promise of revolutionizing how we transport our own digital belongings. Rosy as its near-limitless capacity and whenever-wherever-access value propositions may seem, cloud-based offerings still have to contend with the challenges of providing security, convenience, reliability, and peace of mind—the underlying drivers that create carrying behaviors like range of distribution, centers of gravity, and points of reflection.

It's easy to see how digitization and cloud storage represent a lightening of our physical loads—a Great Unburdening, if you will. Imagine going back to the twentieth century and trying to carry everything you can now store (and, equally important, access) on a smartphone, laptop, tablet, or e-reader. Walking out the door in the morning, you'd be towing along one set of shelves with every CD, cassette, and LP in your music collection (if you're carrying the equivalent of an on-demand music streaming service like Spotify, your shelves might number in the millions); another set of shelves with all your books, including a twenty-nine-volume *Encyclopaedia Britannica* set and a twenty-volume *Oxford English Dictionary* set; a third with all your photo albums; and a shoe box full of all the letters you'd sent and received over the past year, as well as bills and bank statements, and every map of every part of the world at every scale. If you wanted entertainment, you might even bring a few movies—and your TV set and VCR or DVD player. Leaving work in the evening, you'd not only be hauling all that back home, you'd also have your four-foot-high metal filing cabinet, Rolodex, and in/out memo tray. Factor in the tangible equivalent of Internet access and you'd be lugging around several Libraries of Congress. On top of all that, you'd be carrying quite a few things you probably never owned before, like a weather

station that collects data from every corner of the world and a compendium of the opinions of millions of strangers on everything from restaurants to manga. Not only would you have one hell of a sore back, but you'd also be quite hard-pressed to keep an eye on everything as you towed it about town.

Now, just because you can easily fit all those things in your pocket doesn't mean you constantly need them when you're on the go, or can even keep track of them well enough to access them when you do need them. And simply because you can reduce them to bytes doesn't mean you're ready to get rid of their tangible forms. One faulty hard drive, hacked server, or unpaid cloud-storage bill and you could lose everything if it's not backed up elsewhere. Plus, that convenient bundle of personal material and work material folded together into one travel-size container can easily muddle the boundaries between the two. While the Great Unburdening is indisputable on a physical level, the psychological tradeoffs associated with going to zero have far more challenges, but just as much potential.

Consider the things that impact the range of distribution, how closely we hold our belongings or allow them to stray, in terms of both physical distance and level of consciousness, as a yo-yo. How long can we comfortably let its string go out and still be able to snap it back when we need it in hand? And how fast can we snap it back?

When things become digital, the range of distribution equation changes. Those yo-yo strings can be much longer, in terms of physical distance (retrieving a document saved on a computer or server far, far away), time distance (retrieving an email you sent a year ago), and distance from consciousness (listening to a

song you hadn't heard in years until your randomized playlist decided to play it). A long string on a tangible object makes it much harder to snap back, at the very least requiring you to expend time moving from point A to point B and then back to A to retrieve the object. But if it's digital, you can snap it back incredibly quickly even if you don't know where it is, as long as you have the option of a reliable search function. Going digital means you can juggle many more strings at once, crisscross them in myriad ways (for example, embed a video in a slideshow presentation, attach a photo to an email), and, like a cat's cradle, create collaborative networks of strings between multiple users. It even allows you to cut some of the tangible-object strings and still snap those objects back later by creating perfect reproductions on demand; in the past this has meant burning CDs, but in the future it will mean 3-D printing. Forget to pack your dentures for a trip? No problem, just call ahead to the hotel and have them find a local dentist to 3-D print a duplicate set that will be ready for you when you arrive.

Technological advances may also change our need to measure out those yo-yo strings. We might think of range of distribution as a "sixth sense" for certain people in certain situations, like a parent walking through a busy shopping mall with a small child, but less instinctual when carrying less valuable (and not so irreplaceable) items. However, the desire to maintain preternatural awareness for the purpose of avoiding loss and theft is still strong enough to make this area ripe for disruption, especially as the means to track things grow ever more sophisticated.

In the summer of 2012, I accidently left that most eminently connected device of the time—an iPhone—in a taxi in Shanghai.

Upon returning home, I used an online find-my-device service to track it as it bounced around the city. I'd already put in a call to the taxi company, which their controller routed to the driver (whose contact information appeared on the receipt), who denied it was in his taxi, despite the fact that I could pinpoint its location, speed, and direction it was heading, and despite the loud alerts I kept piping through to the itinerant phone itself. Watching hundreds of dollars' worth of personal gear zigzag, come to a halt, double back, and at some point pass within blocks of my apartment was quite mesmerizing, though it heightened the frustration of never getting it back.

Although I had mislaid the phone, it wasn't lost in the sense of sitting in an unknown location, but rather that it was simply out of reach. Part of my assumption about its ultimate loss was that it had a (gray-market resale) value that exceeded any social obligation to return it, a bonus equivalent to a few days' wages for a Chinese taxi driver, with perhaps a small cut for the controller. And just to be clear, I'm not begrudging him for keeping the phone, as I would expect taxi drivers in most countries to do the same.* But it is a fine example of a near-term look at what "losing" something will mean over time as technology allows much of what we own to communicate its location, either as GPS-embedded objects like cars, bicycles, remote controls, and jewelry, or because we are inherently recording much more of

* In fact, one side experiment I conducted explored the honesty of random strangers by giving them cash and asking them to hand it to a third party (previously unknown to the participant). Six out of ten lots of money ended up being passed on—far more than initially hypothesized.

the world around us and can ascertain from this data where something is.

In the future, connected devices may include a return-to-sender feature—an incentivized reward for a stranger who moves an object from a place where the object would be considered "lost" to one where it would be "found," or retrievable. To extrapolate, this traceability would theoretically change our sense of what it means to own something, if the consequences of misplacing it are diminished and the ease of retrieval heightened. Most people might prefer to have a lost object returned, but what if it had its value automatically calculated and was then offered for sale to the finder, or claimable by the highest nearby bidder? Some would lament reducing the world to sentimental-valueless numbers, but others might build a lifestyle around buying and selling rights to use if not ownership itself.

The power of location-based mobile data adds yet another dimension to the range of distribution: just-in-time decision-making. Not only does it allow us to forgo things like paper maps in favor of far less clunky digital ones; it also allows us to venture out in the world with a near-total lack of awareness of what we're going to do, and trust that our mobile device will connect us to the things that are important to us. Instead of planning routes, we can rely on GPS; instead of planning a night on the town, we can walk out the door, check Foursquare to see what our friends or our friends' friends have done and are doing, and base our decision on that; instead of arranging meeting times and places, we can agree on a general part of town and microcoordinate via calls and messages to get closer and closer until we find one another. Those yo-yo strings that

connect us to people and things can be infinitely long—so long that we can allow ourselves to lose conscious awareness of the things on the other ends—and yet we can snap them back instantaneously whenever we want (provided the network cooperates).

We can even take things a step further from consciousness and delegate the snap-back to automated systems. It's something we already do in the form of reminders and alerts through our phones' calendars and services like Mint.com. As a thought exercise, let's look at an example mentioned briefly when we were contemplating the future of thresholds: predictive shipping.

Let's say a company, like Amazon, that uses algorithms to analyze and predict its customers' shopping habits develops those algorithms to such a point that they can ship products that haven't even been ordered. They're so confident that the customer will want or need those products that they're willing to eat the costs if they're wrong. Let's say you love travel, and you affiliate yourself with a brand like *Condé Nast Traveler.* One morning you open your front door to find *Condé Nast Traveler*'s ultimate travel shirt, in your size, in the style of a magazine shoot that you lingered on for a few minutes yesterday, on your doorstep. From your past purchasing behavior, they've seen that you've worn similar shirts and bought some pants and accessories that would match this shirt. They know what style you like by analyzing your peer group and your fashion adoption habits via social media, and they know you trust the tastemakers at *Condé Nast Traveler* to bring you something that is not only relevant to you but also relevant to the culture you engage in.

If Amazon's analysis proves correct and you decide to wear the shirt, it could relay back to them that you've worn it and automatically debit your credit card. If you decide not to keep the shirt, simply put it back in the box, leave it outside your door, and let Amazon do the rest. With similar nodes, Amazon could even monitor your supplies of groceries or toilet paper and ship you fresh stock before you run out.

Too many false positives and this is the worst form of junk mail, and the much higher up-front cost of delivery would ultimately make the business model unviable. But for certain products, brands, and demographics, it could work. Where is there intense brand loyalty and incredible insight into the lives of consumers, including their offline and/or online window-shopping? In one sense we already have this with subscription services: if you get a newspaper delivered to your doorstep every day, you don't know if it will always have desirable content, but you know enough about it (and the paper knows enough about you and its other readers) that you willingly pay for it. Of course there are issues around privacy invasion, homogeneous consumption, and irregular behaviors that algorithms don't quite understand, but it's just one possible trajectory to get you thinking about how the possibilities of technological advancement could create a new kind of marketplace for predictive products.

Such a service might not seem like it has much to do with carrying behavior, other than saving consumers from carrying shopping bags home from stores. But it actually gets at the very essence of carrying behavior: having things at hand when we need them, where we need them, and using memory and proximity to

keep track of them. What would it take for Amazon to know that you forgot to pack a swimsuit for your trip to the Bahamas, and for them to have a new one in your size and style waiting for you at the hotel before you got there or even had a chance to realize your mistake? It could simply be a matter of putting a few tags and sensors on your clothes and suitcase, asking you a few questions about your travel behavior, and programming some basic automation.

Imagine walking into your home after a long day at work, only to encounter one of the strangest sights you've ever seen. While you were out, someone flipped an antigravity switch in your home, and as you float through the door you see your kitchen sink and your nightstand drift past, side by side. Your rug is on the wall; your dog is on the ceiling. Nothing has left the house, but it still feels like everything is lost.

Would it freak you out? The craziest thing about that scenario is that it's one we can't seem to easily avoid and must face constantly—albeit in the digital realm. Where do people expect to find their online things? And what knowledge do they need to retrieve them? Without a framework that cues us to where things should sit and how to access them, we're all a bunch of Major Toms floating in the digital ether. A good interface makes a world of difference, but search functionality can also create ad hoc centers of gravity. What if, in the spirit of the Great Unburdening, a system was designed to create these centers of gravity ahead of time and unburden the user from the search? Say you have a meeting coming up about a particular project; if the system knows about it in advance, and understands how you typically access files before or during a meeting, it can cluster them for

you and preload them onto your phone or computer so they're there when you need them.

In the same spirit, there are opportunities to design digital points of reflection, when the system knows what you're forgetting before you forget it. Gmail has done this already: if you put the word *attach*, or any variation of it, into the body of an email without attaching a file, Gmail asks if you want to attach a file before sending.

Of course, the easiest way to never forget anything is to never have anything to remember.

Why Carry Anything?

Afghanistan can be a chaotic place by any measure, but its perils don't always come in the form of bombs and kidnappings. In urban areas, the risk of theft is almost always present, and you could say the country as a whole has a relatively tight range of distribution. But theft isn't always about what's being taken from your pockets: it's also about what's not being put into them.

In 2010, mobile telecom provider Roshan and the Afghan Ministry of the Interior set up a pilot program to explore paying police officers' salaries via a mobile banking system called M-Paisa.* Instead of receiving bundles of cash from their commanding officers, the police who participated in the M-Paisa program were notified by text message that their salaries had been credited to

* The Roshan M-Paisa in Afghanistan and the Vodacom M-Pesa in Kenya are variations of the same thing; the difference in spelling is deliberate.

their accounts, which they could cash out through any Roshan agent in the country.

To their surprise, many officers found that they had received "raises"—sometimes as much as a third more than they were accustomed to getting. In fact, they were getting their full, actual salaries for the first time, as the money digitally slipped through the sticky fingers of the higher-ups who had been skimming off the top.

On the surface, it seems like a very positive story with a happy ending: less graft, a more efficient payroll system, and everyone's happy except for the corrupt middlemen (one of whom was so upset about the new system that he rounded up all of his underlings' SIM cards so he could collect the money himself; a Roshan employee reported the commander to the Ministry of the Interior, who didn't prosecute him but promptly put an end to his scheme).

However, the upshot was a bit more complicated. You'd think that, aside from the "bonus" money, the police officers who were paid through M-Paisa would enjoy the benefit of an account that safeguarded their money from pickpockets as well as corrupt bosses. But the range-of-distribution culture in Afghanistan, coupled with low levels of financial and technological literacy (only 9 percent of Afghanis have accounts at formal financial institutions), creates a paradox: the perceived risk of theft is so high that tangibility is believed to be the only form of security—if you can't see it, you don't own it.

Most officers in the program reported cashing out immediately after receiving notice of deposits. Some had to travel to neighboring towns because the Roshan agents near them had opted out of the M-Paisa program due to fears of being robbed

of their cash reserves. In Taliban strongholds, agents reported threats of attacks from militants who saw M-Paisa and mobile phones in general as heretical tools of Westernization.

The context of war, poverty, and high rates of illiteracy (on multiple levels) makes Afghanistan an extreme example for many behaviors, not just those around money carrying, but a valuable case study nonetheless. We already live in a world where mobile phones allow us to carry more tools while carrying fewer objects, and we can easily imagine a future where everything that goes into a wallet can be converted into digital forms that we access through a single electronic device. But is that a realistic future? And will people be happy with it?

As it stands, that isn't the future. People are risk-averse, and when you look at what they carry today and the redundancies that exist, it becomes clear that people carry more than the bare minimum because they feel most comfortable when provisioning for contingencies. It might not be efficient to carry cash, a cash card, and two credit cards, but the consequences of a nonfunctioning cash card are severe enough to make the safety net worthwhile. There's no precise formula to determine what combination of risk probability and consequence cost creates contingency provisioning, but this is yet another aspect of life where behavior changes when a threshold is reached.

If our goal is to lighten consumers' loads and help them be more efficient with what they carry, we could try to either reduce the risk of losing things, reduce the cost of recovering or replacing those things, and/or make it easier to live without carrying those things around. One of the simplest ways to accomplish all three is to allow people to use more while owning less.

Entrepreneur and author Lisa Gansky calls this "the Mesh," a model for consumption based on network-enabled sharing, providing access rather than ownership. One of the more famous examples of a Mesh business is Zipcar, the membership-based car-sharing network, which distributes cars around cities and college campuses for people who don't own a car but occasionally need to use one. Public libraries fit the model, too, sans profit. Other networks have cropped up in recent years, thanks to the Internet, providing both public and private goods for temporary use, from tool-lending libraries to children's toy rental services.

Such systems work because of the power of networks, and the ability to access the goods as nodes in the network. For instance, a Zipcar user can search online for a car stationed nearby, reserve it, and then unlock it with a membership card; the doors will open only for the user designated to have access at that time.

As more of what we carry becomes digital and networkable (or includes networked components), and as we develop identification systems to allow us secure access and payment to the network, we will see radically different ways of interacting with and using goods. Theoretically, we could go to a "superdistribution" model, like Zipcar but without the reservations or the cards. Goods could be scattered around a city in areas where they're likely to be accessed; when someone picks up an object to use it, the object identifies its user biometrically and automatically bills for the duration of access. If it's easy enough to find and use a laptop while you're out and about in the city, why carry your own around? And if the laptop can identify you, and identify anyone who tries to pluck it from your grasp, why worry about

the risk of theft? There's no way to steal something that has no owner.

A Whole New World Outside Your Door

As we've seen, mobile technology has dramatically changed people's behaviors outside the home, from carrying less to remembering less to owning less. All sorts of things have become possible. It feels like a major advancement just to have a digital map instead of a paper one in a place like Los Angeles; in parts of the world like Uganda it's a major leap forward when a mother with a very sick child can use a mobile phone to find the nearest doctor and not have to worry about carrying her child ten miles to the nearest town only to discover there's no doctor there.

This evolution is certainly not without perils, from the annoyance of losing one's phone to the collective suffering caused by a major system failure or a security breach. We're still learning what it means to be at the mercy of the network; in my own experience, network disconnections have resulted in everything from the minor irritation of losing a phone signal in the canyons of Manhattan to the challenge of being stuck at a hotel in Tanzania with a nonworking credit card and no other form of payment.

Even though we can't entirely trust networks, we still put plenty of faith in them because they can—and increasingly will—do for us what we can't do for ourselves, or at least can't remember to do. Over the next few years we're likely to see more points of reflection designed into objects that are increasingly connected to one another. In Tokyo today you can walk up to vending machines and, before you decide to spend your last few

hundred yen on a soda, place your wallet against a sensor that will read your Suica card and tell you if you have enough credit left on it to take the train home or buy the soda, or both.

As networks and infrastructure get smarter and faster, we'll also see our notions of convenience change; instead of paying for the convenience of having the right atoms and molecules in the right place at the right time, we now pay to have the right bits and bytes where and when we want them. This means more data portals in more places, but it also means more everyday objects that we can interact with, and that can understand us and interact back. Perhaps all those objects will become connected through a public, networked infrastructure, where anyone can walk up to any node of the network, be recognized by the network, and have access approved and initiated within seconds. What would it take to create that? Is it even feasible? I can't say, but it's a possibility that bears considering when we think about the future of how people will carry and use objects outside their homes.

In some ways, we're already in that future, though it's easy at times to take for granted what it really means to be connected when we're out there. Sometimes the best way to get a sense of our networked selves is to see what happens when we get off the grid.

During the Arab Spring in 2011, I had the opportunity to conduct a study in Egypt. Many of the news reports out of Cairo during the weeks of tension had made a big deal of the protesters' use of social media, and although I was skeptical of the dimensions of its impact as they were reported outside the country, it was clear that access to mobile technology and an active network had reshaped the nature of survival and communication during a conflict.

As a researcher, information access is always critical for me to do my work, and I wanted to explore what it would be like to lose the on-the-go resources I'm accustomed to. At the time, Libya's civil war was still raging, and many communications channels had been cut. A colleague and I wanted to get a light sense of the situation there—the "rebels" had hacked into and were piggybacking onto the state mobile phone network, making for an interesting tech angle—so we negotiated with a taxi driver in Cairo to take us over. Eight hours later, we were ready to cross the border.

Immediately upon crossing into Libya, we lost our cell connectivity, which meant losing our entire support structure—maps, email, phone, web access—and with it the ability to call for help, to locate ourselves and the nearest town, to translate without interpreters. Losing those lifelines left us feeling naked, more exposed to the dangers you would associate with a border town in a time of conflict, but it also forced us to heighten our awareness of where we were at every moment, where we had come from, and how to get back there.

We're very fortunate to live in a world where we can go almost anywhere (though certainly not everywhere, at least for now) with tremendously powerful tools for communication and information that fit inside our pockets and bags. They are our tools for survival, but it's important to remember that both our tools and our ideas about what "survival" means are constantly evolving. The more we come to understand the latter, the better equipped we'll be to harness technology and create tools that really matter.