10 Ways Mobile Technology Is Changing Our World

Monday, Aug. 27, 2012 (Time Magazine)

From the battle for the White House to the dynamics of a first date, our lives are being reshaped by the constant presence of our phones — and our evolving relationship with the idea of being connected to everyone and everything all the time. In this special report, TIME looks at the consequences, the opportunities and what you can expect next.

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1 Elections Will Never Be The Same

By Michael Scherer

Barack Obama's Arlington, Va., campaign office looks a lot like a kindergarten classroom, with walls decorated with butcher paper, tempera paint and colored marker. But on a recent Saturday morning, Ian Redman, a 19-year-old field organizer wearing Converse high-tops patterned after the American flag, sat there glimpsing the future of politics in his hand. "This is what is really cool," the Wisconsin native said to a handful of volunteers around him, who all looked down at their smart phones.

The volunteers tapped along on their individual screens, exploring deeper into the electioneering app that the Obama campaign released in August. Tap one button and there are forms to register voters, automatically tailored to the precinct that the phone and its user are in. Tap another and there is a way for donors to give money using the device. Tap a third and there are locally tailored factoids, Twitter messages and other social-media links that can be easily shared with friends. Tap a fourth and suddenly election workers are looking at a Google map of the neighborhood around them, with a little blue flag at each house where the Obama campaign wants a door knocked. Another tap produces sample scripts for approaching voters, complete with first names for residents of the flagged houses. "If a volunteer is hanging out on a Saturday and they want to go canvassing but they are not really sure where to go canvassing," Redman explained, "they can click 'Load households in this area' and it pulls a list from their general radius."

Just as important as the fieldwork it facilitates, the app helps the campaign build and refine its most valuable asset: its database. All the information helping canvassers is tied in real time to the campaign's main voter list, Vote Builder, so no two people are sent to the same address. The phones prompt volunteers to report back to the main database how the door-knock went, recording each household as a committed voter, an undecided one or a foe of the President, so future campaign communications like direct mail can be targeted.

Just four years ago, when Obama mounted what was considered a cutting-edge campaign, the U.S. was living in another technological age. Twitter was a geek's pastime. Facebook was used by fewer than 40 million Americans, compared with 160 million today. Smart phones were still largely a professional luxury. But in this cycle, virtually every American voter not only has a phone but also increasingly uses it to go online. The political potential of this shift is huge. "It's not a one-trick pony anymore. It's a Swiss

Army knife," says Peter Pasi, a Republican digital consultant who worked most recently for Rick Santorum's presidential campaign. "Everything you want to do online you can do on mobile."
The result is a blizzard of innovations, many of which will be tested for the first time in this presidential campaign. The Obama camp has deployed a new program, Quick Donate, that allows people to give repeat donations by simply sending the number of dollars by text message. Though the return rate is a campaign secret, Obama officials say people are much more likely to give again when they don't have to re-enter their credit-card information. In the coming months, the Federal Election Commission is on track to approve a request from presidential campaigns to allow cell-phone carriers to serve as middlemen for low-dollar donations, eliminating the need to enter credit-card information even for the first donation.

Mobile digital campaigning is also changing political advertising, allowing candidates to woo voters while they wait in line at the supermarket and to target people with advertising when they attend large gatherings. On the first weekend in August, for example, tens of thousands of young people gathered near Grant Park in Chicago for a concert featuring Jack White, the Red Hot Chili Peppers and the electronic-dance phenom Avicii. As a thunderstorm approached, many checked the weather on their phones, only to find at the top of the screen a display ad with a picture of kids dancing at a concert, overlaid by the words "Obama failed us. We can do better." The ads were seen only by those at the concert and in the immediate vicinity. "We weren't paying for the entire city of Chicago," says Patrick Ruffini, the Republican digital consultant for Crossroads Generation, a conservative group that targets young people. Campaigns now have the ability to place mobile ads, often at a discount from desktop ads, anywhere large groups of targeted voters are gathering--on a college campus, at a NASCAR race or even at a parade in a swing neighborhood. "You will see a lot more of this in swing states," he predicted.

In July, Mitt Romney's campaign persuaded hundreds of thousands of supporters to download a mobile app that promised to inform them "first" about his vice-presidential pick. The promise proved empty, since the news media broke word of the announcement hours before the app sent Paul Ryan's name, but the Romney campaign collected valuable data on its most committed supporters and can send push notifications to their phones throughout the campaign. Romney officials promise more app functionality in the coming weeks.

Obama's new app is intended to be used primarily by occasional, self-directed volunteers. Most canvassing will still be undertaken by regular staffers and volunteers with clipboards and paper, and responses will be entered later into the campaign's database. But the campaign has options it has not yet exercised. It could, for example, cross-reference the friends lists of Facebook supporters using its app against the Democratic voter file to better target potential voters who might not be planning to vote. Wary of possible complaints of privacy invasion, neither the Romney nor the Obama campaign has yet announced how far it will push the new data-gathering side of mobile technology.

Just how much will the mobile revolution affect the 2012 vote? It is too early to tell, but since the 2010 midterms, a wave has been building. According to a Pew study, 14% of American adults used their cell phones in that year to tell others they had voted, and 12% of adults used phones to keep up with political news; the Romney and Obama campaigns are determined to get those numbers higher. The larger question is whether all this new technology is changing politics in a broader sense, altering and facilitating the way Americans engage in self-governance. The answer to that could be as important as the outcome of the 2012 election itself.

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2 Doing Good By Texting
By Kate Pickert

To understand what makes the cell phone such a uniquely powerful tool for community organizing and activism, consider three facts about text messaging: it is almost completely spam-free, it's personal, and nearly every message gets read. Websites, e-mail, paper mail and phone calls don't come anywhere near achieving this trifecta.

"It's as close to reaching everyone as anything--here and everywhere else in the world," says Jed Alpert, co-founder and CEO of Mobile Commons. Alpert, 48, is a leading voice in the growing field of mobile activism: using cell-phone technology--mostly text messaging--to dispense information, raise money and advocate for political and social change. Mobile Commons, based in a former box factory in Brooklyn, works with clients including Habitat for Humanity, Planned Parenthood and President Obama's re-election campaign. (The firm also works for profit organizations.) In exchange for monthly fees ($2,000 to $30,000, depending on usage), clients can use Mobile Commons software to send mass text messages (to those who opt to receive them), collect and mine data and even route phone calls to lobby on behalf of political agendas.

It's particularly effective at engaging young people. DoSomething.org a national nonprofit that encourages teens to participate in community service, saw its text-message list of 500,000 members surpass its e-mail list this month. With Mobile Commons software, DoSomething.org uses geographic data to text teens about nearby volunteer opportunities. It also recently conducted a campaign to send quirky messages to teens from an imaginary cell-phone baby--"I'm up now and need food"--to emphasize the challenges of unintended pregnancy. Half of teens contacted through the campaign said it made them realize that caring for a baby is harder than they thought.

Originally from Fall River, Mass., Alpert attended Connecticut College and Cardozo School of Law, then had an unhappy stint as a corporate lawyer before moving into entertainment law and movie producing. He got into mobile after helping launch a 2001 promotional campaign for Britney Spears that allowed fans to hear recorded horoscopes read by the singer on their cell-phone voice mail. It was fairly crude, but Alpert saw its potential for political and social change. He launched Mobile Commons in 2007 with partner Benjamin Stein, a programmer who helped build the Bloomberg trading platform.

Alpert says raising money via text donation is exciting but unlikely to revolutionize the charitable universe. The Red Cross received $32 million in $10 texts after the 2010 Haiti earthquake--impressive but still less than 10% of the total amount it raised. Says Alpert: "$10 is a trivial amount of money for an organization to raise. What they want is an ongoing conversation with you." What if you sent $10 to a food bank via text and received a return text suggesting a local soup kitchen--chosen on the basis of your area code--where you could volunteer this weekend? How might this stack up against an e-mail routed to your spam folder or a generic U.S.-mail postcard?

Alpert admits that mobile is not a panacea. But maybe it doesn't need to be. "It doesn't revolutionize things, but it's nice for this population who wouldn't otherwise be giving and just likes it," says Ira Glass, the host of public radio's This American Life, which uses Mobile Commons to raise funds. "The thing about it is just that it's cool."

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3 Bye-Bye, Wallets
By Harry McCracken

To hear certain people in Silicon Valley tell it, cash is teetering on the edge of obsolescence. In the not-too-distant future, the theory goes, we're going to pay for everything with our cell phones--and it'll be quicker, smarter and safer than using paper money or plastic.

There are already several ways to do this. The most widely accepted one, Google Wallet, requires you to have a special chip in your phone (now on only a handful of Android models). You pay by tapping your phone on a credit-card reader equipped with near-field communication (NFC) technology. At best, it's no easier than swiping a card.

Another is Square's Pay with Square app, accepted mostly at mom-and-pop shops but heading to 7,000 Starbucks locations this fall. Unlike Google Wallet, it's compatible with the iPhone and a bevy of Android

models. And it lets you pay without removing your phone from your pocket. The app communicates wirelessly with the tablet or phone the merchant uses to accept payment; the cashier IDs you by checking your name and photo. Both systems are at least as safe as paying with plastic and can be remotely disabled if your phone is stolen or lost. Under most banks' policies, the consumer isn't liable for unauthorized charges.

So what's it like to go cashless and pay by phone? To find out, I woke up one recent Monday and ceremonially stuck my wallet in my sock drawer. My plan: to spend a week around San Francisco making purchases exclusively via Google Wallet and Pay with Square.

I managed to make it through seven days without cheating, unless you count mooching off my wife. But there were enough glitches--at one point Google Wallet stopped working altogether--that I was glad to get my wallet back. Here's a look at my week.

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4 The Phone Knows All

By Massimo Calabresi

If someone wanted to create a global system for tracking human beings and collecting information about them, it would look a lot like the digital mobile-device network. It knows where you are, and--the more you text, tweet, shop, take pictures and navigate your surroundings using a smart phone--it knows an awful lot about what you're doing.

Which is one reason federal officials turned to Sprint, Verizon, AT&T and T-Mobile in early 2009 when they needed to solve the robbery of a Berlin, Conn., branch of Webster Bank. Using a loophole in a 1986 law that allows warrantless searches of stored communications, the feds ordered the carriers to provide records of phones that used a nearby cell tower on the day of the crime. The carriers turned over to the prosecutors the identities, call records and other personal information of 169 cell-phone users--including two men who were eventually sentenced to prison for the robbery. With a simple request, the feds cracked a case that might have otherwise taken years to solve. In the process, they collected information on 167 people who they had no reason to believe had committed a crime, including details like numbers dialed and times of calls that would have been protected as private on a landline.

Such cases are common. In response to a request from Representative Ed Markey, major cell carriers revealed in July that they had received more than 1.3 million requests for cell-phone tracking data from federal, state and local law-enforcement officials in 2011. By comparison, there were 3,000 wiretap warrants issued nationwide in 2010. That revelation has added to a growing debate over how to balance the convenience and security consumers now expect from their smart phones with the privacy they traditionally have wanted to protect. Every second we enjoy their convenience, smart phones are collecting information, recording literally millions of data points every day.

The potential for good is undeniable. In recent years, the average time it takes the U.S. Marshals Service to find a fugitive has dropped from 42 days to two, according to congressional testimony from Susan Landau, a Guggenheim fellow. Cell phones have changed criminal investigation from the ground up. "There is a mobile device connected to every crime scene," says Peter Modafferi, the chief of detectives in Rockland County, New York.

But as smart phones' tracking abilities have become more sophisticated, law enforcement, phonemakers, cell carriers and software makers have come under fire for exploiting personal data without the knowledge of the average user. Much of the law protecting mobile privacy in the U.S. was written at the dawn of the cell-phone era in the 1980s, and it can vary from state to state. Companies have widely differing privacy policies. Now conservatives and liberals on Capitol Hill are pushing legislation that would set new privacy standards, limiting law-enforcement searches and restricting what kinds of information companies can collect.

Government snooping is part of the worry. But market demand is driving some of the biggest collectors of data. Mobile advertising is now a $6 billion industry, and identifying potential customers based on their personal information is the new frontier. Last year, reports showed that free and cheap apps were capable of everything from collecting location information to images a phone is seeing. One app with image-collection capabilities, Tiny Flashlight, uses a phone's camera as a flashlight and has been installed at least 50 million times on phones around the world. Tiny Flashlight's author, Bulgarian programmer Nikolay Ananiyev, tells Time that his program does not collect the images or send them to third parties.

In November, news broke that a company named Carrier IQ had installed software on as many as 150 million phones that accesses users' texts, call histories, Web usage and location histories without users' knowing consent. Carrier IQ says it does not record, store or transmit the data but uses it to measure performance. In February, Facebook, Yelp, Foursquare and Instagram apps, among others, were reported to be uploading contact information from iPhones and iPads. The software makers told the blog VentureBeat that they only use the contact information when prompted by users. "No app is free," says one senior executive at a phone carrier. "You pay for them with your privacy."

Many consumers are happy to do so, and so far there hasn't been much actual damage, at least not that privacy advocates can point to. The question is where to draw the line. For instance, half of smart-phone users make banking transactions via their mobile device. The Federal Trade Commission has brought 40 enforcement cases in recent years against companies for improperly storing customers' private information.

Law enforcement is subject to some oversight. Absent an emergency, prosecutors and police must convince a judge that the cell information they are seeking from wireless companies is material to a criminal case under investigation. An unusual alliance between liberals and conservatives is pushing a bill to impose the same requirements for getting cell tracking data as those that are in place when cops want to get a warrant to search a house. Another bill would increase restrictions on what app writers can do with personal information. Cases moving through the courts may limit what law enforcement can do with GPS tracking.

Tech companies are trying to get a handle on the issue. Apple has a single customer-privacy policy. Google posts the permissions that consumers give each app to operate their phones' hardware and software, including authorization to access camera and audio feeds and pass on locations or contact info. The rush to keep up with technology will only get harder: the next surge in surveillance is text messaging, industry experts say, as companies and cops look for new ways to tap technology for their own purposes.

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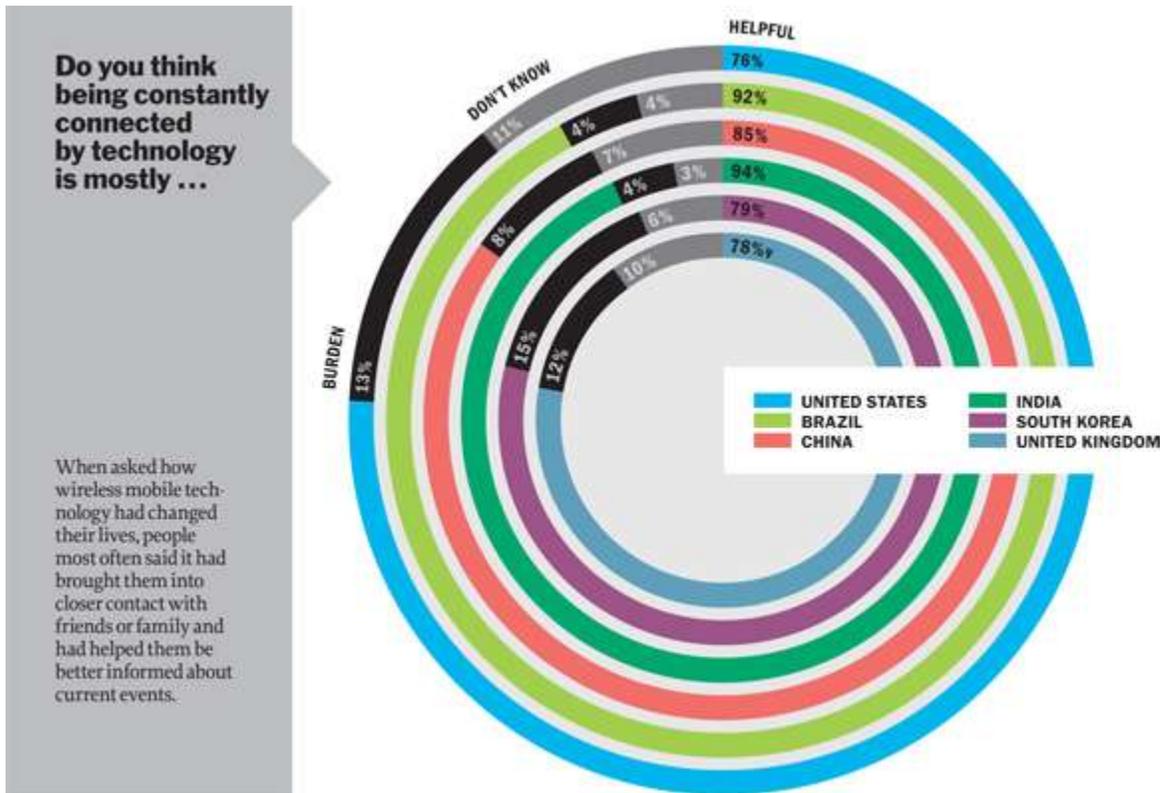Thursday, Aug. 16, 2012

5 Your Life Is Fully Mobile

By Nancy Gibbs

Just as remarkable as the power of mobility, over everything from love to learning to global development, is how fast it all happened. It is hard to think of any tool, any instrument, any object in history with which so many developed so close a relationship so quickly as we have with our phones. Not the knife or match, the pen or page. Only money comes close—always at hand, don't leave home without it. But most of us don't take a wallet to bed with us, don't reach for it and check it every few minutes, and however useful money is in pursuit of fame, romance, revolution, it is inert compared with a smart phone—which can replace your wallet now anyway.

Whatever people thought the first time they held a portable phone the size of a shoe in their hands, it was nothing like where we are now, accustomed to having all knowledge at our fingertips. A typical smart phone has more computing power than Apollo 11 when it landed a man on the moon. In many parts of the world, more people have access to a mobile device than to a toilet or running water; for millions, this is the first phone they've ever had. In the U.S., close to 9 in 10 adults carry a mobile, leaving its marks on body, mind, spirit. There's a smart-phone gait: the slow sidewalk weave that comes from being lost in

conversation rather than looking where you're going. Thumbs are stronger, attention shorter, temptation everywhere: we can always be, mentally, digitally, someplace other than where we are.

So how do we feel about this? To better understand attitudes about mass mobility, Time, in cooperation with Qualcomm, launched the Time Mobility Poll, a survey of close to 5,000 people of all age groups and income levels in eight countries: the U.S., the U.K., China, India, South Korea, South Africa, Indonesia and Brazil. Even the best survey can be only a snapshot in time, but this is a crisp and textured one—revealing a lot about both where we are now and where the mobile wave is taking us next.

Do you think being constantly connected by technology is mostly …

HELPFUL
76%
92%
85%
94%
79%
78%

DON'T KNOW
4%
11%
4%
7%
4% 3%
6%
10%

BURDEN
13%
8%
15%
12%

UNITED STATES
BRAZIL
CHINA
INDIA
SOUTH KOREA
UNITED KINGDOM

When asked how wireless mobile technology had changed their lives, people most often said it had brought them into closer contact with friends or family and had helped them be better informed about current events.

A tool our parents could not have imagined has become a lifeline we can't do without. Not for a day—in most cases not even for an hour. In Time's poll, 1 in 4 people check it every 30 minutes, 1 in 5 every 10 minutes. A third of respondents admitted that being without their mobile for even short periods leaves them feeling anxious. It is a form of sustenance, that constant feed of news and notes and nonsense, to the point that twice as many people would pick their phone over their lunch if forced to choose. Three-quarters of 25-to-29-year-olds sleep with their phones.

If Americans have developed surprisingly intimate relationships with their gadgets, they are still modest compared with people in other countries. The Time Mobility Poll found that 1 in 5 Americans has asked someone on a date by text, compared with three times as many Brazilians and four times as many Chinese. Fewer than 1 in 10 married U.S. respondents admitted to using texting to coordinate adultery, vs. one-third of Indians and a majority of Chinese. It may be shocking that nearly a quarter of all U.S. respondents—including a majority of 18-to-35-year-old men—have sent a sexually provocative picture to a partner or loved one. But that trails South Africans' 45% and Indians' 54%. Brazilians are especially exuberant, with 64% baring and sharing all.

In most respects, overseas mobile users value their devices the same way Americans do but with a few revealing exceptions. Americans are grateful for the connection and convenience their phones provide, helping them search for a lower price, navigate a strange city, expand a customer base or track their health and finances, their family and friends. But in some ways Americans are still ambivalent; more than 9 in 10 Brazilians and Indians agreed that being constantly connected is mostly a good thing. America's 76% was actually the lowest score.

Carve up the U.S. population into the general public vs. high-income, highly educated elites and some contrasts come into focus. Elites are more likely to say that they work longer hours and have less time to think but also that mobile has made them more efficient and productive, able to manage more, be away from the office, stay informed about the news and be a better parent. Four in 10 Americans think mobility has helped them achieve a better work-life balance, vs. three-quarters or more of Indians, Indonesians, Chinese and South Africans.

Like any romance moving from infatuation to commitment, the connection between people and their mobile devices reflects what they brought into the relationship in the first place. In countries where connection and convenience were difficult, these mobiles offer a kind of time travel, delivering in the push of a button or touch of a screen the kind of progress other countries built over decades. Which makes you wonder: Just how much smaller and smarter and faster and better might our devices be a decade from now? And how much about our lives and work and relationships is left to be completely transformed as a result?

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6 The Grid Is Winning
By Katy Steinmetz

Finding a bar in hot Springs, Mont., is easy: there's Fergie's Pub, right there on Main Street. Finding a bar on your phone is another matter. Hot Springs has no cell-phone service. The closest spot for a decent signal is 15 or 20 miles away, depending on whom you ask and which way they're headed.
Whether that needs to change is an argument that has divided this town's 544 residents. Their debate distills all our ambivalence about our hyperconnected age to one question: Do we really want a cell-phone tower here?

Until recently, the question was moot. Rustic places like Hot Springs aren't high on the list of areas where big companies want to build out their services. But even hinterland hamlets get their day: Alltel and then AT&T started talks with cattle rancher and county commissioner Glen Magera about putting a tower on his land above town. Concerned about jobs at the local landline company, Magera tried to secure it some revenue in negotiations.

Meanwhile, citizens began holding meetings, discussing how the tower might affect their health and lifestyle. Many here say they like to feel removed from society's trappings, to live at a slower pace. Scott Wigton is glad he doesn't have to worry about his employees at Buck's Grocery neglecting customers while they bury their faces in a screen. Workers at the Symes Hotel say their guests feel freed by being unreachable. The high school principal says teachers are thrilled not to have the disruption. Others simply don't like how cell phones seem to encourage distracted or even obnoxious behavior. "More and more, when I go out of town," says Mayor Randy Woods, "I'm glad we don't have cell phones."

People in Hot Springs actually do have cell phones, for use when they're out of town. Residents say they know cell service is convenient and can save lives, especially in such a remote location. And even those who appreciate life off the grid see upsides. Wigton, whose family has run the grocery store for 75 years, says cell-phone service would "connect this little town with the rest of the world."

Despite all the misgivings, Hot Springs is likely going to get its bars. Magera signed a contract with AT&T with approval of the Hot Springs Telephone Co. ("You lose, so you might as well join them," says owner Sandy Prongua.) Still, the cell tower has yet to go up, and AT&T won't say when or if it will.

For now, Hot Springs seems happy enough to wait. "There isn't any cascading, growing voice of people saying, 'Damn it, we need cell-phone service,'" says Robert McDonald, an American Indian who works for the local tribes. "I would equate it more to the nuisance of running over a deer on your way to work."

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7 A Camera Goes Anywhere

By Michael Christopher Brown

Like many photojournalists, I've been shooting with my iPhone for a while. Using a mobile phone allows me to be somewhat invisible as a professional photographer; people see me as just another person in the crowd. Invisibility is particularly useful in the eastern part of the Democratic Republic of Congo, where a potpourri of armed groups and governments have used conflict minerals as the latest way to help fund the warfare, atrocities and repression that have afflicted the area for more than a century.

The electronics industry is one of the main destinations for these minerals, which include tourmaline, cassiterite and coltan. They are used to make critical components of mobile phones, laptops and other gadgets. So it is fitting—if ironic—that I shot this entire essay with my iPhone. I arrived in Congo in early August to document some of the mines in an attempt to highlight how the minerals travel out of the country—and the trade's effect on the lives of the workers who handle them along the way. At a camp for internally displaced people in Kibati, the phone helped me shoot scenes unobtrusively. Taking photographs with a phone also raises my awareness as a photographer. Instead of concentrating on camera settings and a large piece of equipment, I am better able to focus on the situation before me. It becomes more about how I feel and what I see.

In Congo, the effects of the mineral trade on every person's life—even the lives of people who aren't working at the mines—are palpable. At a Heal Africa clinic in Goma, I met an emaciated teenage girl who had been gang-raped by three Hutu militiamen allegedly funded by profits from the mines. I'm not advocating giving up our gadgets. The causes of problems in Congo are far more complex. There are industry sponsored programs like Solutions for Hope, which tries to monitor coltan. But auditing the origins of these minerals is complicated by inaccessibility and danger. I'd like people to pause when they look at these photographs, taking time to think about where the material for modern technology comes from—and what lives are affected before they get into the phones in our hands.

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8 Toys Get Unplugged

By Harry McCracken

FITBIT ULTRA
The thumb-drive-size Ultra is designed to be your constant fitness companion. Clip it on and it counts the steps you take, tracks the hours you sleep and uploads a bevy of stats to Fitbit.com for your perusal. $99.95

JAWBONE JAMBOX
Since your phone can hold your entire music library, here's an easy way to turn it into a mini boom box. This tiny wireless speaker works with Bluetooth-equipped devices and doubles as a speakerphone. $199.99

SHURE SE115M+
In the Bluetooth era, this wired headset may look a tad retro. It's one less thing to recharge, though. And the sound-isolating earbuds do a magnificent job of blocking out everything except your music or phone call. $119.99

POWERBAG DELUXE BACKPACK
The more gizmos you've got, the greater the appeal of this bag. Its built-in battery lets you charge your tablet, phone and other devices--up to four at a time--without missing a step. $169.99

EYE-FI
These marvels of miniaturization are SD memory cards with built-in wi-fi. Plug one into your digital camera and you can zap photos wirelessly to your PC, phone or tablet--or straight to sites such as Facebook, YouTube and Flickr. $39.99 to $99.99

LOGITECH ULTRA-THIN KEYBOARD COVER
If thudding your fingertips against the iPad's glass screen isn't your idea of comfy typing, get this superportable wireless keyboard. It snaps on magnetically and runs for months on a charge. $99.99

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9 Gadgets Go To Class

By John Cloud

Even though the vast majority of students own cell phones--something like 80% by eighth grade--more than half of schools prohibit the use of any mobile device. And yet a few pioneering administrators are considering a new approach called BYOT--bring your own technology. BYOT offers an elegant solution to an old problem. Instead of outlawing kids' devices, BYOT policies allow kids to take their phones or tablets to class and use them not just to Instagram stupid photos from Friday night but also to engage with one another in classroom lessons.

To many parents who use a cell phone to juggle the obligations of work and family and Words with Friends, school bans on phones can seem ridiculous. Even a first-generation iPhone is more powerful than some computer labs' ancient desktops. Putting a new laptop at every desk can cost hundreds of dollars per student, so tapping into the tech that kids already have seems like a no-brainer. Why can't schools turn those devices into learning tools?

A small but growing number of schools are giving it a try. Some districts--such as those in Meriden, Conn.; Allen, Texas; and Hanover, Pa.--have developed BYOT policies that allow kids not only to take their mobile devices to school but also to access school networks. The districts--all in relatively wealthy enclaves where a new iPad causes no stir--enforce strict rules. Kids can use devices only with a teacher's permission; activating a screen during tests can be grounds for expulsion.

Companies like Avaya and HP, as well as many smaller players, are racing to develop in-classroom apps for mobile devices. One idea is that a teacher presenting a math problem can ensure that every student has responded and then compare the answers. It's not as convoluted as it sounds. At many colleges, professors are using clickers--remote-control-like devices that let students answer questions from their seats--to gather real-time information about whether students are comprehending lessons.

Cell phones are the easiest fit for BYOT. Even for kids from poor neighborhoods, cell phones have become nearly biological appendages. Ask 10th-graders about, say, mitochondria, and they can deploy a phone to give an answer in seconds. Do you really expect them to walk over to that dusty shelf with the Britannicas? Many parents want their kids constantly connected for safety reasons, and, of course, teachers and administrators have their own devices. Teachers look away when kids pull phones from backpacks during lunch, but the classroom remains a contested arena. That's partly because school officials fear getting caught up in lawsuits. "The technology has great promise, but it has created huge legal issues for school districts," says Daniel Domenech, executive director of the American Association of School Administrators. "Some kids use their phones to bully students or to sext or make inappropriate phone calls."

One concern is that schools could run afoul of the Children's Internet Protection Act (CIPA), which President Bill Clinton signed in 2000. The law says schools can lose federal funding if they don't adequately monitor the online activities of minors. CIPA predated smart phones and social networking, but administrators must hold to its letter. If, say, a student tweets something from a locker room that is gross and compromising, cops could arrive.

BYOT also raises equality issues. It's true that most kids have cell phones, but they aren't necessarily carrying smart phones that are capable of running elaborate apps. Some families can't afford a cell phone of any type. School districts can lend devices to students who have less money. But the choice may create a high-tech version of who's on the free-lunch list in the cafeteria.

Tech advocates are convinced that it's worth the trouble. "Parents are desperate for kids to be prepared for the jobs of the future," says Julie Evans, executive director of Project Tomorrow, a nonprofit that studies how to use mobile tech in schools and is partly funded by HP. "We have to create a classroom experience with the tools they already own. If we do that, they won't wander off into Facebook or play a game." When Project Tomorrow studied a classroom pilot project in North Carolina, it found that students who had used the mobile devices to collaborate on school projects scored better on standardized tests than kids who hadn't.

Those test scores are at once encouraging and dispiriting. Any parent knows that mobile devices erase the idea of separation between work and home. Kids may be right that using their mobiles at school will be fun--but they might feel a little less fun when deployed to do homework.

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10 Diseases Can't Hide

By John Cloud

Accurate bookkeeping is on nobody's list of heroic acts. But without it, some revolutions are impossible, including the overhaul of a nation's health care infrastructure. And Uganda's health care system needs quite an overhaul. There aren't enough doctors, just 131 hospitals serve nearly 36 million people, and children are dying of treatable diseases, especially malaria, which accounts for up to 40% of medical visits and almost a quarter of deaths among kids under 5.

The Ugandan Ministry of Health and various NGOs have tried to address the issue with smaller clinics and volunteer village health team workers, some of whom dispense drugs. Malaria can be held at bay with artemisinin-based combination therapies (ACTs). But too often, Ugandans who turn up at local clinics cannot get them. There isn't a shortage of medicine, but supply lines to the clinics have gotten snarled or the drugs have been diverted to private clinics. Without accounting, it's impossible to untangle the knot. While Uganda may not have enough hospitals, it's well served by cellular carriers. A third of Ugandans have mobile phones, which are widely shared. They're not smart phones — the only app most of these $7 handsets offer is a flashlight — but they can send texts.

For all the apps and gee-whiz features of phones, their ultimate transformative power is the ability of one person, no matter where he or she is, to communicate with another. In developing nations, the simple text message represents a quantum leap in connectivity.

In a new initiative called mTrac, supported by UNICEF and the World Health Organization, health workers using these phones to text details of drug supplies and disease outbreaks that they had previously put on paper. This information is amassed and coded into a kind of online dashboard so that public-health officials can see in real time what's going on. "It's easy to track who has a lot of medicine and who has none and to move the stock from one clinic to the next," says Nabukalu Hasipher, a records assistant at the Mpigi district health office. "Before, I had to call each and every one."

Of course, the texts are useless if they're not accurate. And local health clinics aren't eager to report gaps in service. So the system has an alternate stream of data: crowdsourcing. "It's a toll-free SMS complaints hotline," explains Sean Blaschke, who leads UNICEF's health-innovation work in Uganda. "Anyone who wants to report a problem about health care delivery can anonymously send information to a call center." These complaints are collated, checked out and added to the region's dashboard.

And finally, UNICEF has recruited about 140,000 members to a kind of SMS social-networking group called U-report. Communicating entirely by text, U-reporters, who join the group much as people join Facebook, send and receive information about development issues, including health. These texts can be targeted; mothers can be alerted to free vaccinations in their area, for example.

One of the tripartite system's key strengths is that for an innovation so digital, it's actually low tech. This means the ongoing cost of mTrac to the Ugandan Ministry of Health appears to be negligible. The U.K.'s Department for International Development provided the initial capital, including money for building the software, training workers and setting up the Internet, but the workers use their own phones. UNICEF estimates the Health Ministry's outlay to be about $14 per district per month.

If the costs are slight, the value isn't. In January, the health team in the Kotido district noticed an uptick in reported cases of pneumonia. Upon investigation, it found that a village health team worker was misdiagnosing the disease and that patients were being treated with unnecessary and costly antibiotics. The mistake was spotted and fixed within weeks. (The worker was retrained.) The community hotline was also engaged after the Ebola outbreak in Kibaale in July killed 17 people, mostly disproving reports of further cases and limiting public hysteria.

The mTrac program is under way in clinics in 57 of Uganda's 113 districts; the other 56 should be added this year. Initially, about 8,000 village health team workers are being trained. Some texters, says Blaschke, can send in their reports in five minutes. Others have never used cell phones for anything except pressing the green button to make a call.

The further uses to which this method of data collection and bookkeeping can be put are myriad; Blaschke hopes to track and treat a multitude of problems. "In the past, in order for UNICEF to know, for example, how many water boreholes were working, we'd have to spend a couple of hundred thousand dollars sending a team out for months to do surveys," he says. "We could now do that in 24 hours for a hundredth of the price — and involve community members in the process and better represent their needs." mTrac is certainly not a cure-all; having the details of a problem at your fingertips is by no means the same as having a solution. The Ministry of Health has 1,000 reports coming in weekly and sometimes struggles to respond. And the ability to reach public officials — who have gone on TV and radio to address the concerns raised on U-report — has changed expectations among people who formerly felt they had no voice. "In a way," says Blaschke, "it's remaking the social contract between government and its citizens."

Which sounds quite a lot like a revolution.