

# How Smartphones Revolutionized Society in Less than a Decade

BY: Casey Phillips, Chattanooga Times (TNS) | November 20, 2014

Talk about punching above your weight class.

Despite being lighter than a roll of quarters and occupying less space than a paperback book, the smartphone's role in shaping human interaction in the 21st century has been as dramatic as it is far-reaching.

"My smartphone has had a monumental impact on my life," says DeWayne Hamby, a Chattanooga-based communications specialist.

"I used to talk on the phone much more as a social connection, and now I use texts and social media to keep up with everyone," he explains. "Information is also so rapid and up-to-the-minute. ... Ten years ago, we'd all be crowding around a television to hear what's happening, and now we have our phones."

The launch of the iPhone in 2007 transformed the humble mobile phone from a one-trick tool for communication into a catch-all platform whose functionality is constantly evolving. When the editors of Popular Mechanics drafted a list of "101 Gadgets That Changed the World" in 2012, the smartphone topped the heap, trumping technological milestones such as the TV (No. 3), the personal computer (No. 5), the telephone (No. 7) and the light bulb (No. 10).

"The smartphone ... is now a pocket-size PC," the editors wrote. "It facilitates instantaneous personal connections that make phone conversations seem like cave paintings. ... The device seems to have limitless potential."

Last year, researchers at the Nielsen group reported that smartphones accounted for four out of every five phones purchased in the U.S. They estimated that a smartphone now sits in about two-thirds of American adults' pockets.

According to the Massachusetts Institute of Technology's Technology Review, the smartphone paced the TV as the consumer technology with the fastest adoption rate, reaching 40 percent market saturation in just 2 1/2 years.

With more than 1 billion users worldwide and 2.5 million apps — and counting — available across Google and Apple's digital marketplaces, smartphones are impacting day-to-day life in some surprising ways.

## Human memory

According to a report released in June by researcher ComScore, the majority of Internet traffic (60 percent) now comes from mobile devices rather than desktops, which long served as the dominant online portal. And with search engines and digitally managed contact lists just a touch away, analysts say smartphones are affecting how the brain processes information.

The authors of a study published in the August 2011 issue of "Science" conclude that persistent access to information via search engines — Google, in particular, which fields more than 1 billion search queries per day — is changing how the brain catalogs knowledge. In a sense, the study authors conclude, Internet-connected devices such as smartphones have become a kind of "external memory source."

"These results suggest that processes of human memory are adapting to the advent of new computing and communication technology," the authors write. "We are becoming symbiotic with our computer tools, growing into interconnected systems that remember less by knowing information than by knowing where the information can be found."

Chattanooga Tris Vickery says, "I appreciate the vast amount of recorded knowledge that is now accessible at any time [via smartphones]. As [punk vocalist/poet] Henry Rollins said not too long ago, 'There's no longer an

excuse for stupidity.”

In a 2012 survey by Elon University and the Pew Research Center, technology experts debated the merits and pitfalls of the hyper-connectivity and instantaneous access to information afforded by smartphones. If adoption rates and the always-on lifestyle continue unabated through 2020, respondents suggest future generations will have different priorities about what they choose to remember.

“The human brain is wired to adapt to what the environment around it requires for survival,” writes Amber Case, a cyber-anthropologist and CEO of mobile platform Geoloqi, in her survey response. “Today and in the future, it will not be as important to internalize information but to elastically be able to take multiple sources of information in, synthesize them and make rapid decisions.”

## Social interaction

In a 2010 TED Talk lecture, “We Are All Cyborgs Now,” Case argues that smartphones — and the connection they represent to a global social network — have become more than just a device in our pockets but something closer to a digital extension of ourselves.

“This is the first time in the entire history of humanity that we’ve connected in this way,” she says in a transcript from the speech. “And it’s not that machines are taking over. It’s that they’re helping us to be more human, helping us to connect with each other.

“We’re just increasing our humanness and our ability to connect with each other, regardless of geography.”

In 2012, Time Magazine and mobile technology company Qualcomm conducted a joint survey of 5,000 smartphone users in eight countries. When asked how the smartphone had changed their lives, the most common responses were that it brought them into closer contact with their friends and families and helped them be better informed. At least 75 percent of respondents in every country agreed that this constant connection was mostly positive.

Earlier this year, researchers at Analysys Mason reported that average smartphone use per day doubled between 2011 and 2013, from 1 hour 38 minutes to 3 hours 15 minutes. That’s 1 hour 15 minutes shy of a full day every week, during which time researchers at marketing agency TecMark say most users will look at their phones 1,500 times.

But in 2012, security company Lookout’s Mobile Mindset Study reflected the ways smartphone users’ obsessive need to remain connected is growing by leaps and bounds. According to the study, 60 percent of users don’t go more than an hour without checking their phone. More than half (54 percent) said they check their phones while in bed, before going to sleep, upon waking and even during the night. For those aged 18 to 34, that number jumps to 74 percent.

The ability to remain in constant contact can sometimes lead to a disconnect with loved ones. According to Pew Research’s 2014 study “Couples, the Internet and Social Media,” smartphone attachment can create romantic friction when someone feels ignored in favor of what’s on their partner’s screen. About 25 percent of married or partnered respondents to the study say they find their significant other’s phone use distracting. Among younger users — ages 18 to 29 — more than 40 percent report feeling ignored.

But the networking and interpersonal connectivity offered by smartphones aren’t all bad. They also can be boons to those seeking to start or maintain connections.

A Match.com survey released in September found that 39 percent of respondents think they dated more than they normally would because of their smartphones.

To take advantage of their technology’s romantic capabilities, however, lonely hearts need to keep their device in tip-top shape. Mobile device replacement provider Protect Your Bubble conducted a survey of its users and found that 61 percent said they wouldn’t date someone whose phone screen was cracked.

Chattanooga Marie Tuggy says she appreciates smartphones’ ability to help families stay in touch, but giving someone the cold shoulder over a cracked screen is a pretty negative side effect of a gadget-obsessed culture.

“I really don’t care for our society these days,” she writes in a post to the Times Free Press Facebook page. “Such an insignificant and trivial thing to not date someone over.”

## Other technologies

It's the nature of technological advancement that newer devices often outstrip their predecessors or offer similar functionality to other devices. Despite only seven years since its introduction to the mainstream, the smartphone's Swiss Army knife-skill set has led to declining sales for a variety of specialized, single-use devices that it rendered redundant.

According to Google's "Our Mobile Planet" survey from 2013, 36 percent of smartphone users would rather give up their TV than their smartphone.

In 2012, Josh Ong, the editor of website The Next Web, decided to catalog and value the devices that were made obsolete by the built-in functions of his smartphone. The resulting list included a feature phone, MP3 player, point-and-shoot digital camera, GPS, alarm clock, flashlight, handheld gaming system, e-reader, guitar tuner, voice recorder, dictionary, infrared remote and web-conferencing device. Collectively, the individual devices weighed more than eight pounds and were worth more than \$1,200.

One of the best cases for depicting the reverberations of the smartphone's introduction is in the fate of Apple's iPod, whose original "classic" edition was removed from the company's product line in September, just weeks shy of its 13th birthday.

According to company news releases, year-over-year sales for the once-dominant MP3 player started to slacken in 2007, when Apple released the iPhone. CEO Tim Cook says the decision to halt production was due to the difficulty of sourcing parts, but most analysts agree the iPod Classic was cannibalized by the success of multifunction smartphones.

"A standalone MP3 player has become too antiquated to keep alive," writes CNET's Nick Statt. "Those [sales] numbers began steadily sliding downward as Apple's iPhone and competing Android smartphones began to eat into the MP3 market."

The baked-in GPS functionality of smartphones is having a similar affect on the market for dedicated navigation systems. By the end of 2013, website Technology Review reported that the value of shares in GPS industry leader Garmin were one-third of when smartphones debuted in 2007.

This year, analysts predicted that almost 1 trillion photos will be taken, but the market for digital point-and-shoot cameras is also reeling from the affect of smartphones, which ship with near-comparable imaging sensors to those of dedicated cameras. Globally, annual shipments of digital cameras fell by 30 percent in 2013 and weren't predicted to improve this year, according to Christopher Chute, the research director of worldwide digital imaging at market analyst the International Data Corp.

"It's especially shocking because this was a market that until recently was growing by double digits," he told the Minneapolis Star Tribune last December. "This is the beginning of the collapse for cameras."

## Cultural change

The European Travel Commission estimates that more than 125 million people in the Middle East region are online, and more than 53 million actively use social networks.

According to Google's "Our Mobile Planet" survey, the United Arab Emirates leads the world in smartphone adoption rates, with 73.8 percent of its population owning one, even more than notoriously tech-savvy nations such as South Korea (73 percent). With 72.8 percent adoption, Saudi Arabia has the world's third-highest percentage of smartphone users. Other nations in the region, such as Qatar, Kuwait and Bahrain, all have a majority of smartphone users in their populations as well, according to Google's statistics.

And when the Arab Spring began rippling through the Middle East in early 2011, the smartphone quickly demonstrated itself as a powerful tool for driving social revolution. The widespread use of smartphones was a defining factor in the development of the spread of Arab Spring both in how protesters shared information with one another and how events were documented by legions of impromptu citizen journalists, says Berry College professor Matt J. Duffy.

"The introduction of smartphones represents a revolution in the ability of a journalist — and any other observer — to gather information and quickly disseminate it," Duffy writes in an academic paper "Smartphones in the Arab Spring."

Smartphones helped protesters to quickly share information with observers outside the region, which in turn helped drive political pressure during the revolution, he adds.

“They could offer first-hand reports using their smartphones connected to Twitter, Facebook and YouTube,” Duffy writes. “Often their information was verified with short video clips or photographs taken from their phones and effortlessly weaved into Facebook or Twitter updates.”

After an 18-day occupation of Tahrir Square in downtown Cairo, Egyptian president Hosni Mubarak left office. That decision likely was fueled by pressure driven by social media posts and live streaming video of the protests, says Naila Hamdy, an assistant professor of journalism at the American University of Cairo, in a 2011 interview with the International Press Institute.

This year, smartphones have played similar roles in documenting events in Ferguson, Mo., after the shooting death of Michael Brown and the ongoing political protests in Hong Kong. After the start of the Hong Kong protests in September, downloads jumped by more than 500,000 for “FireChat,” a smartphone app that allows users to exchange information “off-the-grid,” using the wireless and Bluetooth connections between devices. According to interviews with the app’s developers, users shared information about areas that were blocked, where police were located and the location of people who needed assistance.

Originally, “FireChat” was created to help people connect in cities with poor Wi-Fi coverage or during large-scale events where the volume of users can cause traditional wireless and cellular networks to grind to a halt. Instead, the ability of smartphones to nimbly add functionality such as FireChat’s by downloading an app helped protesters to stay in touch when communication might otherwise have been hampered, says Micha Benoliel, the co-founder of the app’s developer Open Garden.

“Mobiles [smartphones] provide the opportunity to create a new dynamic network,” Benoliel said in an October interview with Vice Magazine. “People can create their own local Internet, and we believe this is, if you like, the beginning of the ‘new Internet.’”

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