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Tools of Entry, No Need for a Key Chain

By **MATT RICHTEL** and **VERNE G. KOPYTOFF**

SAN FRANCISCO — Front pockets and purses are slowly being emptied of one of civilization's most basic and enduring tools: the key. It's being swallowed by the cellphone.

New technology lets smartphones unlock hotel, office and house doors and open garages and even car doors.

It's a not-too-distant cousin of the technology that allows key fobs to remotely unlock automobiles or key cards to be waved beside electronic pads at office entrances. What's new is that it is on the device more people are using as the Swiss Army knife of electronics — in equal parts phone, memo pad, stereo, map, GPS unit, camera and game machine.

The phone simply sends a signal through the Internet and a converter box to a deadbolt or door knob. Other systems use internal company networks, like General Motors' OnStar system, to unlock car doors.

Because nearly everyone has a cellphone, a number of start-ups, lock companies and carmakers are betting on broad acceptance of the technology.

Schlage, a major lock maker, markets a system that lets homeowners use their mobile phones to unlock their doors from miles away, and manage their home heating and air-conditioning, lights and security cameras. Customers buy locks that are controlled by wireless radio signals sent from an Internet-connected box in their home.

Recently, Dwight Gibson, vice president for connected home solutions at Ingersoll Rand, Schlage's parent, said that he used the system to let a friend into his house while he was sitting at his desk at work. "She thought it was magic," he said.

Daimler-Benz now has it on its Mercedes. Zipcar, the car sharing service, has a mobile phone app that allows customers to unlock their car doors by pressing a button on their phone screen that looks like a lock. They have used it 250,000 times since it was introduced two years ago.

In October, General Motors introduced an app that lets owners of most 2011 G.M. models lock and unlock the doors and start the engine remotely. It allows car owners to warm up the engine on a frigid day or fire up the air-conditioning on a hot one from the comfort of their office cubicle, said Timothy Nixon, who oversees “infotainment” products for the automaker. “In the winter, when my wife and I went to dinner and the check came, I pulled out my phone and started the car,” he said. “By the time we got to it, it was toasty and warm.”

Other times, Mr. Nixon has landed after a flight and used his phone to double-check that he had locked his car door at his departure airport.

But having a phone double for entry or ignition does not yet feel fail-safe. “You don’t want a dead phone battery and discover you can’t go anywhere,” Mr. Nixon said.

It’s unlikely you’d hide a spare phone under a rock or in the bushes. (Though a homeowner may want to stash a physical house key outside in case the home Internet connection goes down.)

Another sticking point is that the technology remains fairly cumbersome by requiring users to push buttons on their phone to establish a connection with a system in the car or house.

Mobile phone industry analysts say that process will get easier with the emergence of a technology called near field communications, or N.F.C. It allows a phone to be waved like a magnetic card near a device that can capture the signal and click open a door.

N.F.C is now in only a handful of phones, but manufacturers should ship around 550 million N.F.C. phones in 2015, according to IHS iSuppli, a technology consulting firm. Rajeev Chand, head of research for Rutberg & Company, a boutique investment bank that focuses on emerging companies and technology in the mobile phone industry, said keys might seem like outdated technology in a few years. “Keys are not going away, but they will become an arcane thing.”

In an eight-month trial that ended last month using N.F.C technology, visitors to the Clarion Hotel in Stockholm were invited to use their phones to gain access to their rooms.

On the day of their arrival, guests received a text message with a Web address where they could check in. After the check-in process was complete, the hotel sent an electronic room key to the guest’s mobile phone. The guests loved it, said Tam Hulusi, senior vice president for strategic innovation for HID Global, a smart card company that, along with its parent, Assa Abloy, a Swedish lock maker, participated in the test.

He said that mobile phone keys could cut costs for hotels by doing away with plastic key cards

and by reducing the staff needed to check in guests. The company is also testing such keys at offices and universities.

“The idea is not to prove the technology — this isn’t rocket science,” Mr. Hulusi said. “It’s to see how humans react.”

One advantage of the technology is the keys can be set to expire. Apigy, a start-up in Palo Alto, Calif., is marketing its Lockitron system for companies that use contract workers and for people with vacation rentals.

“We’re making a virtual copy of a key,” said Cameron Robertson, 24, one of two co-founders of Apigy. “It allows you to give people instant access — temporary or permanent.”

Joey Mucha, 24, installed a Lockitron system at his San Francisco apartment last year. It cost \$300 for the system and \$40 to replace his deadbolt and door handle.

Mr. Mucha says it was worth the expense because he participates in an Internet service, Airbnb, that helps him rent his one-bedroom apartment when he is out of town. He has dispensed with the inconvenience of making copies of physical keys and arranging to give them to guests, and also the risk that the keys could be copied.

Instead, he issues temporary passwords to get into his apartment. In one case, he unlocked his door for a guest while he was hundreds of miles away in Arizona, standing on a golf course.

He said he had run into the occasional problem, like one guest whose cellphone ran out of power and who had to use his laptop to open the door.

“I am trying to come up with a backup plan,” he said. “Maybe I will leave a cellphone charger at the corner deli.”