

Digital Key Case Study

Saxon Knight & Mario Canul
University of Hawai'i at Manoa

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Overview of Digital Keys

Digital keys are part of a new era in physical and digital security. They represent the combination of smartphones and physical access delivered seamlessly to end users such as patrons in a hotel. According to OpenKey, a company started in 2014 focusing precisely on this technology notes that over 85% of hotel guests use smartphones. (OpenKey)

There is an increasing list of different hotel companies already implementing this technology. The most well known is Hilton hotels (Hilton Hotels Corp.) and even Walt Disney Resorts. (Orlando Sentinel) Other, smaller hotels may still implement this technology through outsourcing to third party digital key providers such as OpenKey, Assa Abloy (Assa Abloy), Legic Identsystems (Legic Identsystems), DigitalKeys.io or MyMobileKey by Simmons Voss technologies. (Simons Voss)

Digital keys offer convenience in a few aspects when compared to their mechanical or magnetic-strip counterparts (InstaKey), but a little research may show that like many new advances in technology, security, ironically, was perhaps not the primary concern during some versions' development and implementation.

A digital key in its most recognizable form is a piece of information often delivered to a smartphone and used to open physical doors through the use of an associated app. (Apple App Store) The app used is often custom and proprietary (Crunchbase), but a few third party digital key solutions do exist as well. (USA TODAY)

Why Digital Keys are a Selling Point on Hotel Websites

As a product, digital keys offer ease of use, simplicity, and convenience to hotel patrons. Their advantages include perhaps most notably that users of the technology need not visit the front desk or any other physical location prior to gaining access to their room when checking in through the app. (Legic Identsystems) Another key advantage, is the avoidance of loss or theft, save that the actual phone be lost or stolen. The user can decide for themselves which is more likely. (Hotel Management)

As far as pertains to marketing, this is the newest way to open a door, and arguably it is pretty impressive to-date. Some third-party companies are also offering smartwatch integration, which is sure to interest tech enthusiasts on the go. (Nerdwallet)

However, despite the seemingly aggressive rollout of digital key technology to many hotel locations, magnetic-strip key cards are supposedly going to remain available according to some sources. This makes sense, as not everyone who stays in hotels necessarily owns a smartphone, and still others may be unwilling or unable to install yet another app on their phone.

Brief Technical of Digital Keys

Most digital key solutions are proprietary and custom implementations, sharing in common a few basic components such as smartphones / smartwatches, an app for their use, and compatible door locks / controls. Under the hood, it would seem there are a few different mechanisms for their operation depending on the provider. Some providers instruct users to hold their phones against the locks (Orlando Sentinel), while others require that the phones be within about five feet of the lock they wish to open. (Telecompetitor)

The first case is suggestive of the use of NFC or Near-Field Communication technology, which operates over very short distances (< 4 cm / 1.6") and is most recognizable by such a requirement, although technologies with longer range may also work perfectly well at those distances. In the second case, the likely technology is Bluetooth, which has a typical range of less than 10 m or roughly 33 feet. Other technology such as the Narrowband Internet of Things or simply NB-IoT, is also potentially in use. (DigitalKeys.io)

Ideally, there should be a secure method of authenticating the user's phone or app and verifying the valid key is in use by them; however, there have been reports that some digital key implementations are susceptible to what are known as replay attacks (ABC News), in which a wireless transmission has been captured and replayed by an attacker with little or no modification of the transmitted information. Such vulnerabilities suggest a greater interest in the appearance of the security solution rather than the actual security itself. Replay attacks could be

mitigated through the use of NFC technology, where the connection cannot be captured without notice. (Fast Company)

Benefits of Digital Keys

Like all new technologies, there are challenges to overcome, but the technology required to ensure digital keys are a viable security mechanism does already exist in the form of secure authentication protocols and proper use of cryptography. Under the assumption that digital keys are at or will be brought up to a sufficient standard, they offer many benefits over their counterparts as discussed above.

They are not only catching up so to speak to the standard of security had by magnetic-strip key cards and physical keys, but perhaps possess the potential to surpass it. Magnetic-strip card keys and physical keys are plagued by their ability to be copied, and while magnetic-strip card key readers may be quickly updated to accept a new key in the event copying or loss has occurred, copying of digital keys could perhaps be made infeasible.

Digital keys are already providing seemingly magical access to rooms in over a thousand locations across the world (CN Traveler) and facilitating the streamlined check-in hotels seem so eager to market. They're yet another way to use smart devices to handle the more menial tasks we otherwise would need to ourselves, as long as your smartphone can be locked and charged.

References

Hilton Hotel Corp. - <http://hiltonhonors3.hilton.com/en/hhonors-mobile-app/digital-key.html>

DigitalKeys.io - <https://www.digitalkeys.io/>

Crunchbase - <https://www.crunchbase.com/organization/leapin>

Apple App Store - <https://itunes.apple.com/us/app/digital-keys/id1252040093?mt=8>

InstaKey - <http://www.instakey.com/accessintelligence/mechanical-vs-digital-keys-the-pros-and-cons/>

BBC News - <https://www.bbc.com/news/technology-44457166>

ABC News - <https://www.wmar2news.com/business/consumer/the-pros-and-cons-of-digital-room-keys>

Nerdwallet - <https://www.nerdwallet.com/blog/credit-cards/hotel-mobile-keys-safe-hackers/>

Hotel Management - <https://www.hotelmanagement.net/operate/digital-key-safety-vs-ease-use>

Orlando Sentinel -

<http://www.orlandosentinel.com/travel/attractions/theme-park-rangers-blog/os-bz-disney-hotel-digital-keys-app-20180403-story.html>

CN Traveler -

<https://www.cntraveler.com/stories/2015-09-09/your-hotel-key-is-the-smartphone-you-already-own>

Telecompetitor -

<http://www.telecompetitor.com/smartphone-key-to-personalized-hilton-connected-room/>

Simons Voss - <https://www.my-mobilekey.com/int/welcome/>

USA TODAY -

<https://www.usatoday.com/story/travel/hotels/2014/06/26/hotel-room-key-goes-mobile/11418971/>

Open Key - <https://www.openkey.co/>

Assa Abloy - <https://www.assaabloy.com/en/com/>

MarketWatch -

<https://www.marketwatch.com/story/can-you-trust-a-hotel-mobile-room-key-2018-01-18>

Fast Company - <https://www.fastcompany.com/1843696/your-mobile-phone-door-key>

Legic Identsystems -

https://www.legic.com/application-areas/hospitality/?gclid=EAlaIQobChMI8dzclDe2wIVBqrsCh3uvwPvEAMYASAAEgKuAvD_BwE

Sample Case Study Questions

1. Discuss key advantages for using digital keys in hotels. How do these advantages impact perceived “quality service” in a hotel setting?

Key advantages include convenience for guests [do not need to go to front desk and can proceed directly to room upon check-in, avoidance of loss/theft (assuming phone not lost/can be locked), smartwatch integration]. Tech savvy guests are especially keen to this type of technology and associate/equate it with the value of convenience, timeliness, and speed.

2. What challenges do digital keys present to hotel guests?

Some guests may not know how to use application. Authenticating the user’s phone or app and verifying the valid key is in use by them is another challenge.

3. Discuss the “downside” of digital keys from a hotel staff perspective.

Cost (locks/keys, initial training for employees) and replay attacks which may result in theft, image of hotel brand if security is compromised.

4. What is a replay attack and what are the implications of a replay attack? How can it be mitigated? How does this impact a guest’s experience and perception of quality service?

A replay attack is a wireless transmission that has been captured and replayed by an attacker with little or no modification of the transmitted information. It can be mitigated through the use of NFC technology, where the connection cannot be captured without notice.

A replay attack may result in theft and negatively impacts a guests’ loyalty and trust to a hotel company.

5. Digital keys *have the potential* to surpass the standard of security had by physical and magnetic-strip key cards? What do you believe are issues that need to be addressed in order for this technology to get buy-in from more hotel companies?

- Need to mitigate replay attacks
- What if there are multiple guests per room? Hotel companies generally have one digital key per room
- Cost/benefit analysis