WALLET APPS IN CELL PHONES

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SUMMARY

"Wallet Apps" in "iPhones" and "Android" cell phones make both in-person purchases and online purchases faster and safer.

TOPICS

- Basic Information About Wallet Apps
- "Wallet" in Apple's iPhones
- "Google Pay" in "Android" Phones
- "Samsung Pay" in Samsung "Android" Phones
- Wallet Functions in Store Apps

BASIC INFORMATION ABOUT WALLET APPS

- Three bundled wallet apps in cell phones:
  "Wallet" in iPhone uses "Apple Pay"
  "Google Pay" app in all Android cell phones
  "Samsung Pay" app and/or "Google Pay" app in Android phones from Samsung

BASIC INFROMATION ABOUT WALLET APPS (continued)

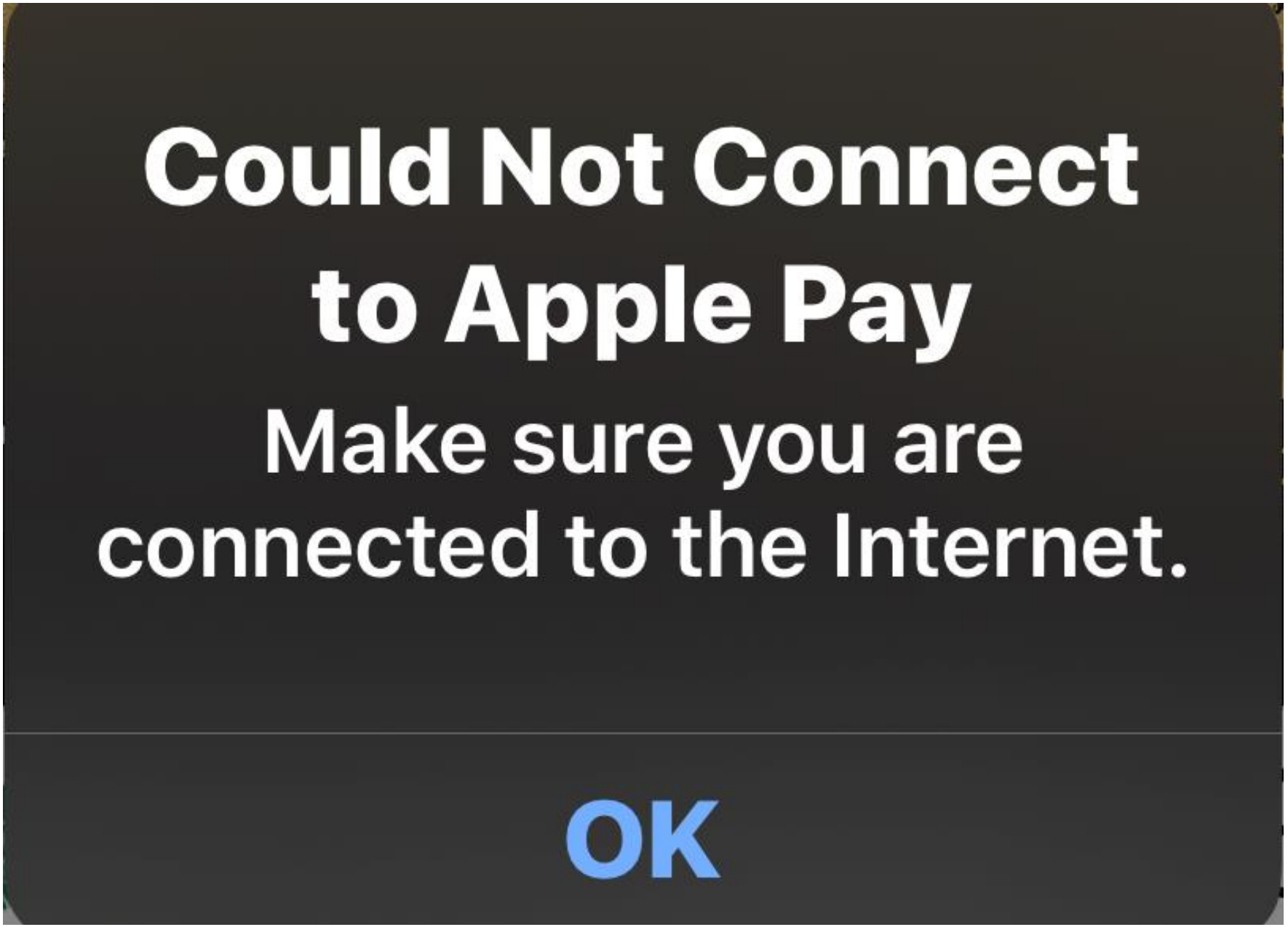
- The differences between the three wallets are explained in the "Abstract" section at https://pdfs.semanticscholar.org/8e3d/937d069429ff00f615a90c13e49805a8467d.pdf

"WALLET" APP IN "iPHONES"

- Uses "Apple Pay" for in-store Point-of-Sale and online transactions. Has proprietary "SE" chip inside iPhone for security. ("SE" = "Security Element")
- Uses the "Near Field Communications" ("NFC") transceiver inside the iPhone for "Point of Sale" payments

"WALLET" APP IN "iPHONES" (continued)

- "Apple Pay" requires Internet access during initial setup of a credit card or a store loyalty card:
  If you tap on the "+" in the upper-right corner of "Wallet" (to add a credit card or a store loyalty card) and your iPhone has no access to the Internet:


Could Not Connect to Apple Pay
Make sure you are connected to the Internet.
OK

"WALLET" APP IN "iPHONES" (continued)

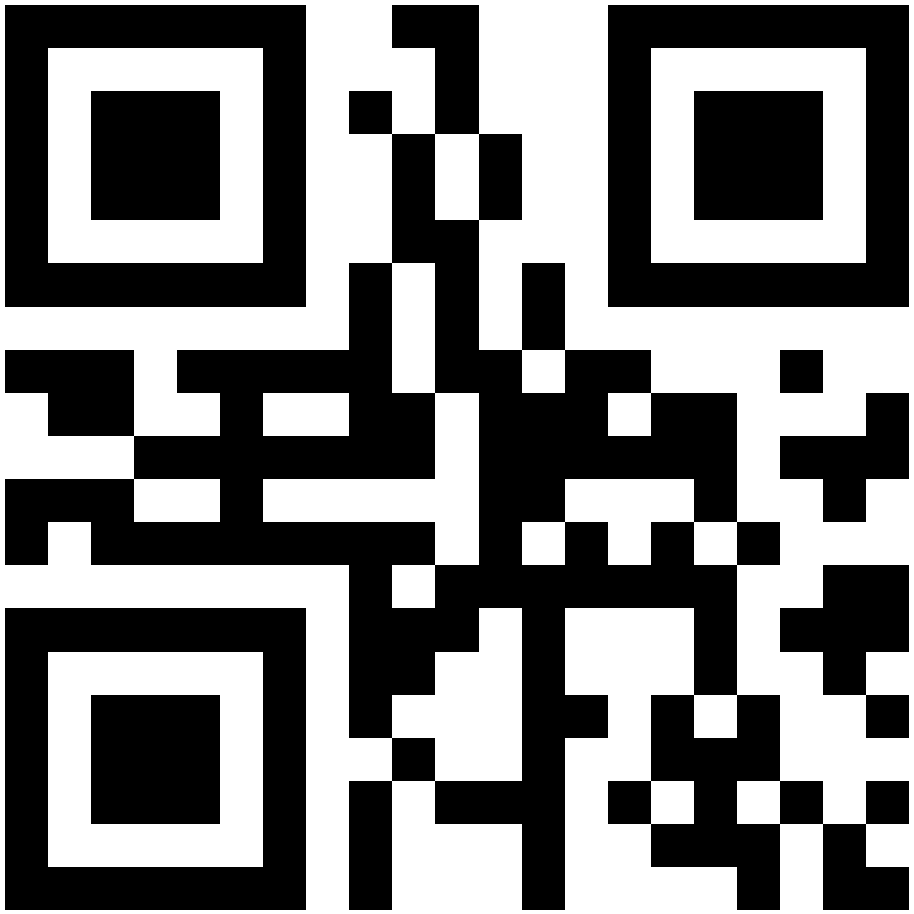
- Does not ever require Internet access after you set up a credit card or a store loyalty card

"WALLET" APP IN "iPHONES" (continued)

- In the future, the "Wallet" app in an iPhone probably will also be able to use "QR code" communications for Point-of-Sale transactions according to https://9to5mac.com/2020/07/07/exclusive-apple-is-working-on-qr-code-payments-for-apple-pay-ios-14-code-reveals/

"WALLET" APP IN "iPHONES" (continued)

- QR code = "Quick Response" code
- Here is one that I put up at http://aztcs.org

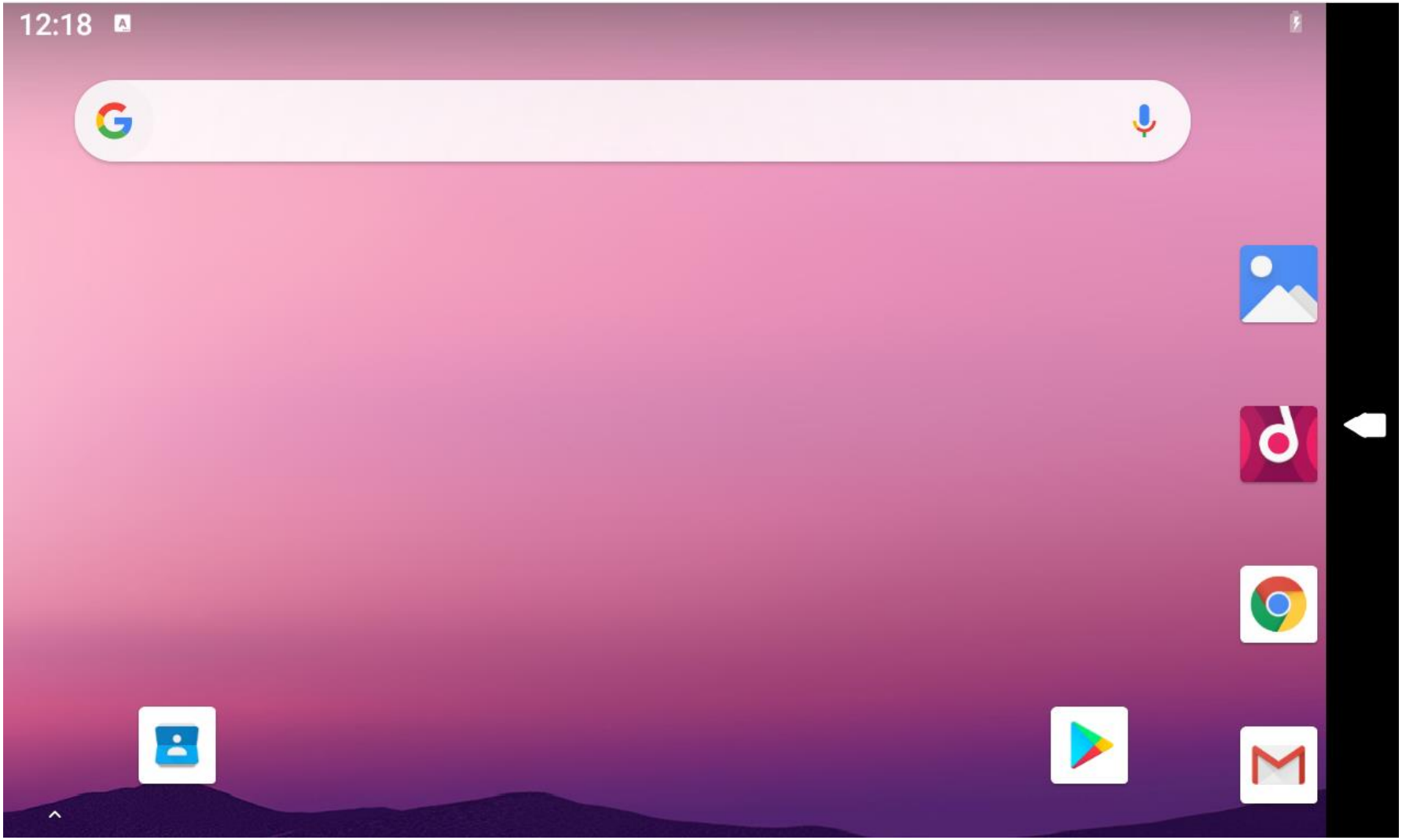


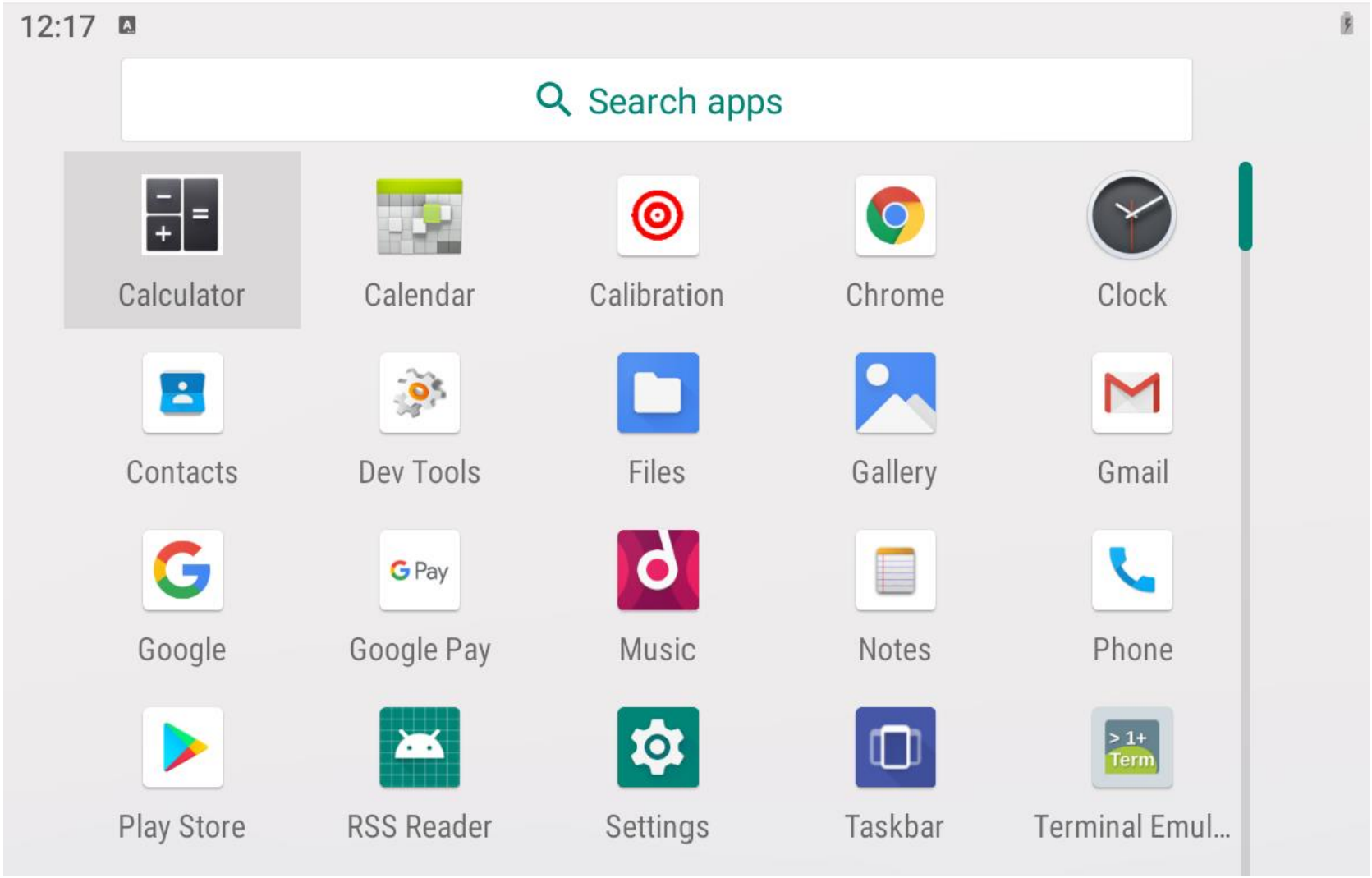
"WALLET" APP IN "iPHONES" (continued)

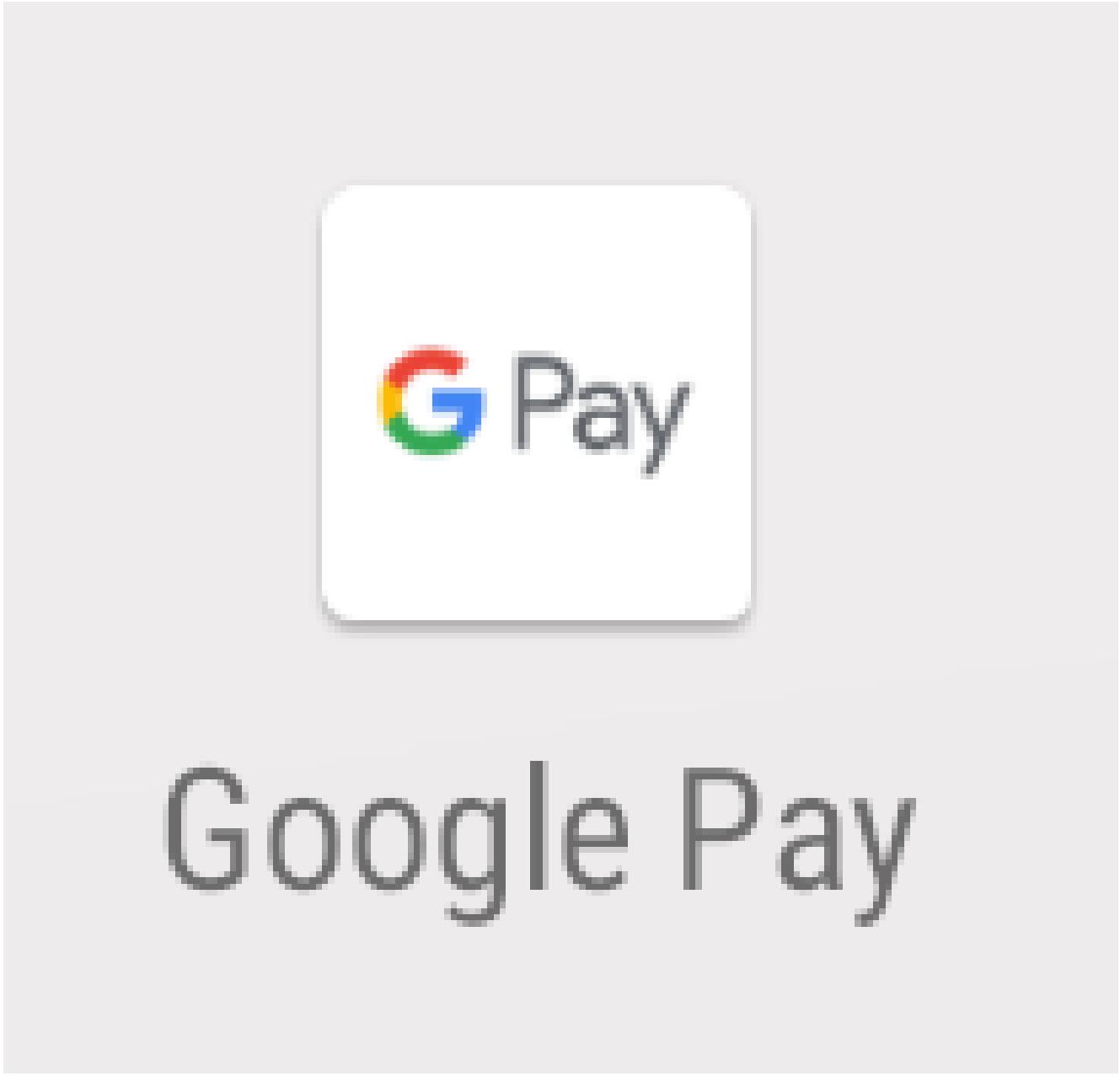
- For details on using the "Wallet" app in "iPhones", see https://support.apple.com/en-us/HT204003#:~:text=With%20Wallet%2C%20you%20can%20keep,to%20movies%2C%20or%20redeem%20coupons.

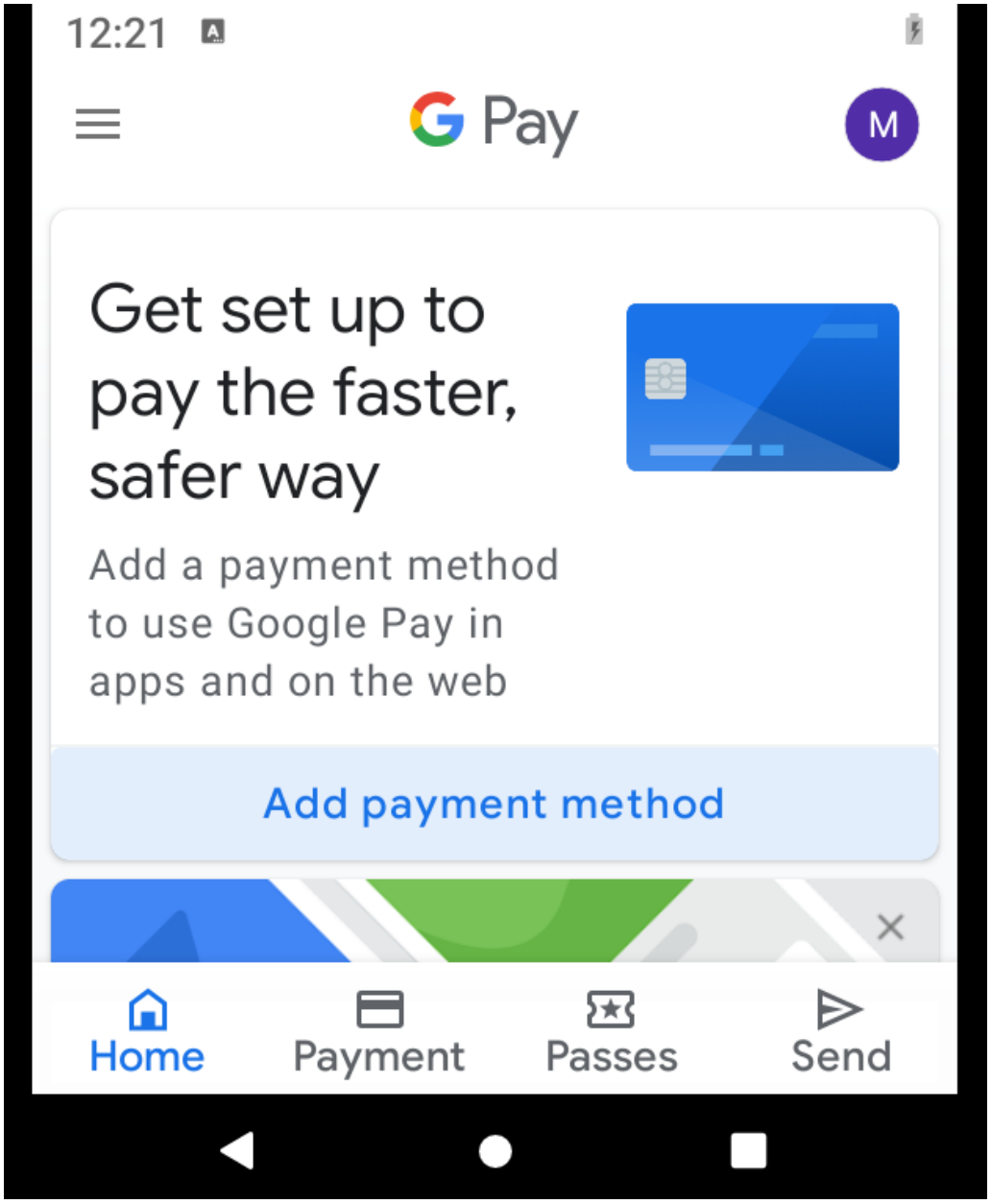
"GOOGLE PAY" APP IN "ANDROID" PHONES

- "Pay with Google" became
  "Android Pay" which then became
  "Google Pay"
  which is stylized as
  "G Pay"
  after you tap on the "Google Pay"
  icon in your Android cell phone


12:18


12:17
Search apps
Calculator
Calendar
Calibration
Chrome
Clock
Contacts
Dev Tools
Files
Gallery
Gmail
Google
Google Pay
Music
Notes
Phone
Play Store
RSS Reader
Settings
Taskbar
Terminal Emul...


Pay
Google Pay


12:21
Pay
M
Get set up to pay the faster, safer way
Add a payment method to use Google Pay in apps and on the web
Add payment method
Home
Payment
Passes
Send

"GOOGLE PAY" APP IN "ANDROID" PHONES (continued)

- For in-person Point-of-Sale transactions, "Google Pay" uses "NFC" (="Near Field Communications") with encryption provided by "HCE" (="Host Card Emulation")

"GOOGLE PAY" APP IN "ANDROID" PHONES (continued)

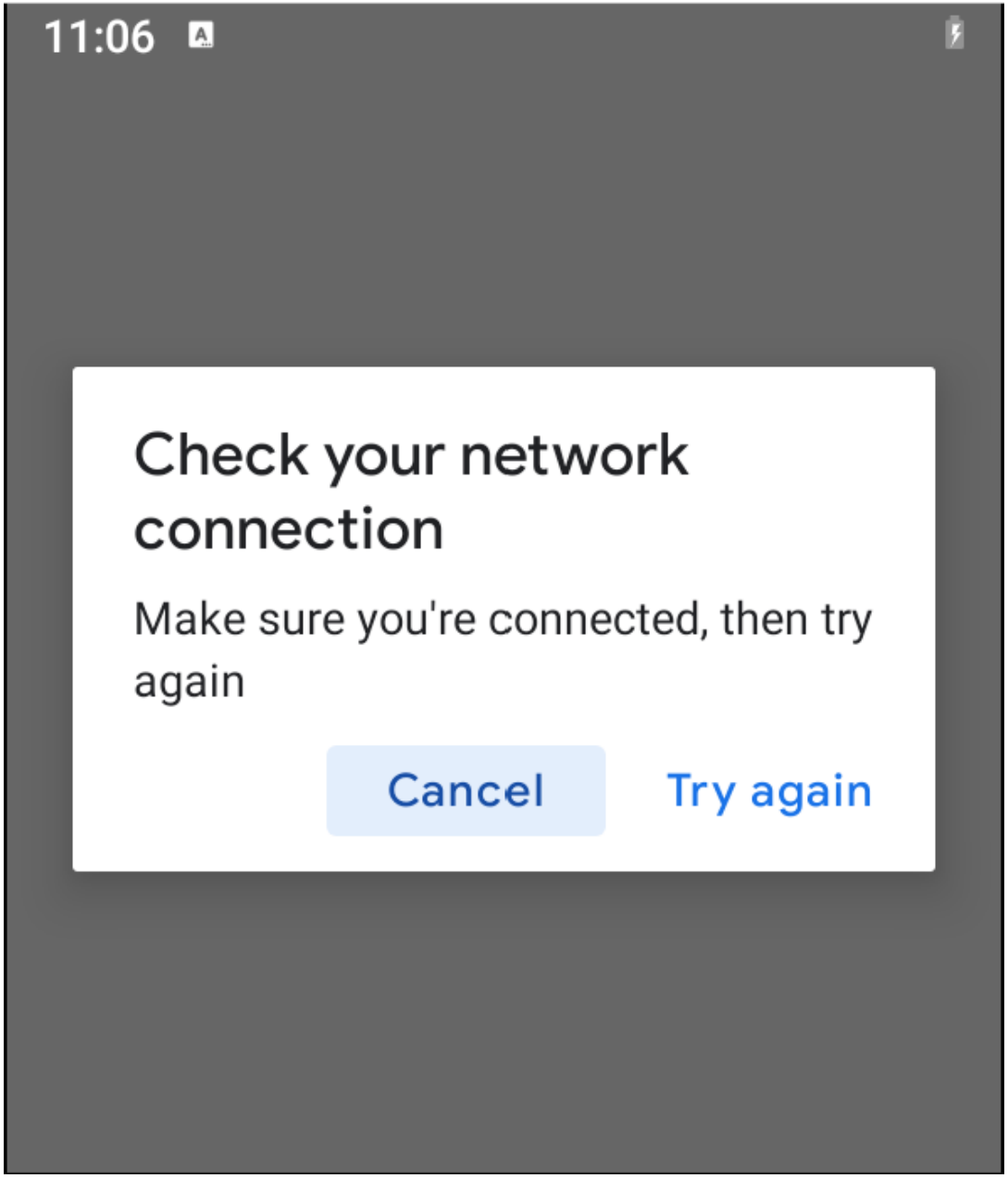
- "HCE" (="Host Card Emulation") is a software-only means of encrypting communications between mobile devices and point-of-sale terminals. It is probably more secure and easier to defend against hackers than the iPhone's "SE" chip.

"GOOGLE PAY" APP IN "ANDROID" PHONES (continued)

- "HCE" (="Host Card Emulation") is described at https://en.wikipedia.org/wiki/Host_card_emulation

"GOOGLE PAY" APP IN "ANDROID" PHONES (continued)

- The "Google Pay" app requires Internet access during initial setup of a credit card or a store loyalty card: If you tap on "Add payment method" and your iPhone has no access to the Internet:


11:06
Check your network connection
Make sure you're connected, then try again
Cancel
Try again

"GOOGLE PAY" APP IN "ANDROID" PHONES (continued)

- After you successfully add a credit card, the credit card issuer will download n number of single-use payment tokens into your cell phone
- The number n depends on the policies of the credit card issuer

"GOOGLE PAY" APP IN "ANDROID" PHONES (continued)

- Your phone does not have to have an Internet connection when you use a single-use token by means of NFC at an in-person point-of-sale terminal

"GOOGLE PAY" APP IN "ANDROID" PHONES (continued)

- After you use up all of your single-use tokens, your phone has to have a Internet connection so that the credit card issuer can send more single-use tokens to your Android phone

"GOOGLE PAY" APP IN "ANDROID" PHONES (continued)

- If you attempt to use "Google Pay" at a Point-of-Sale terminal and the payment is "declined", you will have to either switch to a different credit card inside the "Google Pay" app or use a physical credit card to complete the purchase

"GOOGLE PAY" APP IN "ANDROID" PHONES (continued)

- Then connect your phone to the Internet,
  start up "Google Pay" (to get more tokens quicker),
  and
  let the credit card issuer send your "Google Pay" wallet more tokens (to get up to n tokens).

"GOOGLE PAY" APP IN "ANDROID" PHONES (continued)

- "Google Pay" details are available at https://pay.google.com/about/learn/

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES

- The "Samsung Pay" app is bundled into an Android phone that is manufactured by Samsung
- You can also go to the "Galaxy Store" and install the "Google Store"
- If you do so, you can use whichever of these two wallet apps you prefer to use.

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- For in-person Point-of-Sale transactions, "Samsung Pay" uses "NFC" (="Near Field Communications") with encryption provided by "HCE" (="Host Card Emulation") if the Point-of-Sale terminal is capable of NFC

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- "HCE" (="Host Card Emulation") is a software-only means of encrypting communications between mobile devices and point-of-sale terminals: "HCE" is described at https://en.wikipedia.org/wiki/Host_card_emulation

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- Most "Point-of-Sale" terminals are not capable of doing "NFC":
  If the Point-of-Sale terminal is not capable of NFC, "Samsung Pay" uses "Magnetic Secure Transmission" (="MST") which is proprietary to Samsung:

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- According to https://en.wikipedia.org/wiki/Magnetic_secure_transmission:

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- <Start of quote:>
  Magnetic secure transmission (MST) is the name for mobile payment technology in which devices such as smartphones emit a signal that mimics the magnetic stripe on a traditional payment card.
  <quote continued on next slide:>

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- <Continuation of quote:>
  MST sends a magnetic signal from the device to the payment terminal's card reader. It emulates swiping a physical card without having to upgrade the terminal's software or hardware to support more advanced technology, such as contactless payments
  <quote continued on next page:>

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- <Continuation of quote:>
  Hence, in contrast to payments using near-field communication, MST technology is compatible with nearly all payment terminals that possess a magnetic stripe reader.
- <End of quote>

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- The "Samsung Pay" app requires Internet access during initial setup of a credit card or a store loyalty card:

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- After you successfully add a credit card that is stored in the "Samsung Pay" app:

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

..an active internet connection is not required to make in-store purchases. Ideally, the device should connect to the internet once per day to ensure that Samsung Pay stays up to date. Most cards will allow you to make up to 10 transactions before you will need to connect to the internet and refresh the Samsung Pay information

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- Source for the previous slide: https://www.samsung.com/sa_en/support/mobile-devices/do-i-need-to-have-an-active-internet-connection-for-samsung-pay-to-work/

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- If you attempt to use "Samsung Pay" at a Point-of-Sale terminal and the payment is "declined", you will have to either switch to a different credit card inside the "Samsung Pay" app or use a physical credit card.

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- Then connect your phone to the Internet,
  start up "Samsung Pay" and
  let the credit card issuer update your "Samsung Pay" wallet

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- Additional information about "Samsung Pay" is available at https://www.samsung.com/us/samsung-pay/

"SAMSUNG PAY" APP IN SAMSUNG "ANDROID" PHONES (continued)

- Additional information about "Samsung Pay" is also available at https://www.pocket-lint.com/apps/news/samsung/132981-what-is-samsung-pay-how-does-it-work-and-which-banks-support-it

WALLET FUNCTIONS IN STORE APPS

- "Other third party wallets and third party store apps ("Walmart Pay" and "Target Pay" are not allowed to use the NFC function in an iPhone but this may change soon because of a court decision in Germany per https://www.gsmarena.com/new_german_ruling_forces_apple_to_grant_third_party_mobile_wallets_nfc_use_on_iphones-news-40125.php

WALLET FUNCTIONS IN STORE APPS (continued)

- At the present time "Walmart Pay" and "Target Pay" use QR codes per https://ailatech.com/blog/ten-retailers-using-qr-codes-for-in-store-payments/