

# A Chat on Smartphones

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Today almost everyone carries a smartphone. For some, it's difficult to put their device down. Smartphones impact our lives everyday, everywhere, and all the time. An earlier article "*Smart about Smartphones*" provided many useful hints about the productive use of your phone. That article can be found in the author's book *Becoming A Computational Thinker: Success in the Digital Age*. See the website [computize.org/CTer](http://computize.org/CTer) for more information.

Here we will take another look from the viewpoint of the modern consumer: Apple vs. Android phones, everyday use, emergency use, privacy and security, preventing loss, switching to a new phone, and more.

This article is part of our *Computational Thinking* (CT) blog. You can find other interesting articles in *aroundKent* ([aroundkent.net](http://aroundkent.net)), an online magazine.

Let's begin with a brief historical look at the smartphone.

## Smartphone's Rise

The concept of a smartphone began in the 1990s with devices like the IBM Simon (1994), which combined a mobile phone with a touchscreen, calendar, and email capabilities. Although basic by today's standards, it laid the groundwork for future smartphones. A few years later, Palm Pilot was released. Those hand-held PDA (personal digital assistant) devices are often remembered as "the first wildly popular handheld computers," responsible for ushering in the smartphone era.

In the early 2000s, Symbian OS (used by Nokia) and BlackBerry became popular, offering more advanced features like email, internet access, and apps. These were primarily targeted at business users.

Microsoft introduced Windows Mobile, bringing a desktop-like experience to mobile devices.

Then came the Apple iPhone (2007 Figure 1) which was a game changer, revolutionizing the smartphone industry with its sleek design, touchscreen interface, and easy-to-use iOS operating system.

The *App Store*, an Apple service mark, followed in 2008, making it easy to download apps and games, which became a central part of the smartphone experience.



*Figure 1: 2007 iPhone*

Shortly after the iPhone, **Google introduced Android in 2008**, an open-source operating system for mobile phones that quickly gained popularity due to its flexibility and the wide range of devices it supported. The first Android phone was the HTC Dream (T-Mobile G1 Figure 2).

It's worth noting the dictionary definition: "*android: a mobile robot usually with a human form.*" Originally Android apps were distributed in the Android Market. Later, in March 2012, it was replaced by the *Google Play*, also known as the Play Store.

Throughout the 2010s, smartphones became faster, more powerful, and packed with features like high-resolution cameras, GPS, and fingerprint sensors. Brands like Samsung and others joined Apple in making smartphones accessible to everyone.

Today, smartphones are essential tools for communication, entertainment, work, and more. They continue to evolve, with innovations like 5G connectivity, facial recognition, and AI-powered apps becoming standard features.



*Figure 2: First Android Phone*

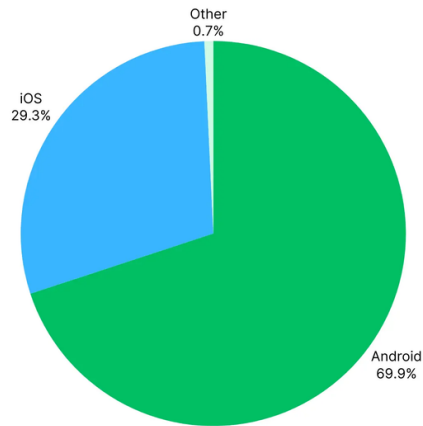
You can now search for and download almost any app imaginable, for nearly any purpose. For example, there is a compass app, thermometer app, step counting app for walking/jogging, and bird identifying app by chirping sounds, not to mention game apps of all kinds and VR (virtual reality) apps.

Such apps make use of physical sensors common in modern smartphones including: accelerometer, gyroscope, magnetometer, proximity sensor, ambient light sensor, barometer, GPS/GNSS antenna, fingerprint sensor, face recognition sensor, thermometer, heart rate monitor, SpO2 sensor (oxygen saturation), infrared (IR) blaster, ultrasonic sensor, LiDAR (light detection and ranging). Moreover, using specialized apps, smartphones are increasingly connected to smart appliances and other IoT (Internet of Things) devices around the house and in modern automobiles. With ongoing advancements, smartphones continue to integrate more deeply into our daily lives.

## **Tale of Two Smartphones**

Basically there are two kinds of smartphones, Android phone (any phone that uses the Android OS) and iPhone (proprietary, uses iOS and made only by Apple). Many might be surprised to learn that Android phones dominate the global smartphone market, often holding a share that exceeds 70% worldwide. Given the sheer volume of smartphones in use globally, this alone accounts for billions of devices. However, iPhones are also highly popular especially in the US. Still iPhone's market share is much smaller, in the hundreds of millions, not billions. According to [mobiloud.com](https://www.mobiloud.com), up to July 2024, Android

phones had a worldwide market share of 69.9% while iPhones had 29.3% (Figure 3).



*Figure 3: Mobile OS Market Share 2024*

Here are some key points that help explain why.

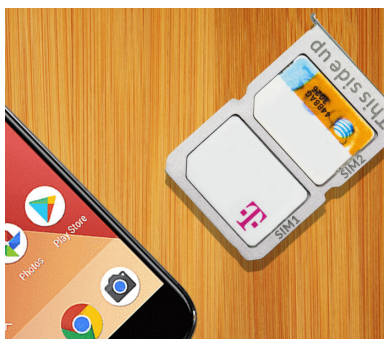
- **Device Variety:** Android is used by a wide range of phone manufacturers, from Samsung, Xiaomi, Oppo, and OnePlus to smaller brands. This diversity leads to a vast number of devices running Android, contributing to its large installed base.
- **Affordability:** Unlike the proprietary iOS, Android is open source and free. As a result, Android phones are less expensive and available at a wide range of price points, making them accessible to a broader audience, especially in emerging markets. This has contributed to its widespread adoption.
- **Customization and Open Source:** Android's open-source (free for all to use) nature allows for significant customization by manufacturers and developers, leading to its adoption across a wide variety of devices beyond just smartphones, including tablets, smartwatches, TVs, and even some IoT devices.
- **Geographical Reach:** Android dominates in many regions across the world, particularly in Asia, Africa, and South America, where the lower cost of Android devices has driven high adoption rates.

Both iOS and Android phones address the basic needs of an ordinary smartphone owner—namely making calls, texting, Web browsing, accessing social media, taking pictures and videos, emailing, navigation, playing games, music and streaming videos.

These uses make certain apps highly popular. Among them are WhatsApp, YouTube, TikTok, Zoom, Gmail, Google Maps, Meta (formerly Facebook), and X (formerly Twitter). Just to name a few.

## Is Dual SIM for You?

Smartphones usually have a slot to insert the SIM (Subscriber Identity Module) card from your mobile carrier. A *dual SIM* phone allows two SIM cards so you can optionally insert a second SIM card (Figure 4). Dual SIM phones have many advantages:



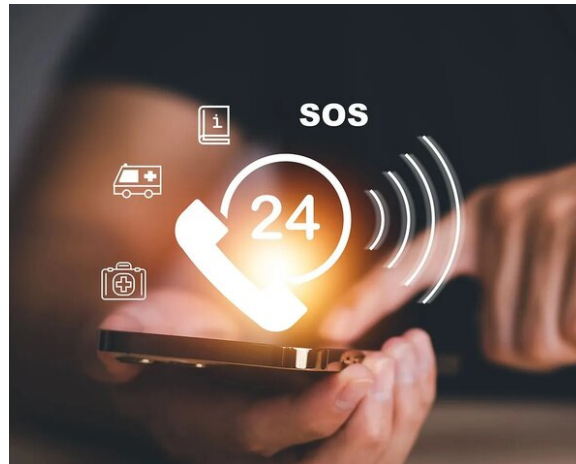
*Figure 4: Smartphone with Dual SIM Tray*

- **Two Numbers on One Device:** Dual SIM capability allows a phone to have two numbers—one for work and one for personal use, or one for domestic use and another for international calls. This way, you can easily separate distinct usages while using just one phone.
- **Cost Savings:** Having two different carriers and two different plans can save money. At the same time, the ability to access two different networks simultaneously can result in better network coverage and availability.

- **Convenience When Traveling:** When traveling, especially internationally, you can keep your home SIM active while adding a locally issued SIM to make local calls easier and less expensive.

## Saving the Day

Yet, the most important use for a smartphone is **emergency call for help** (Figure 5). Even people who hate carrying the phone as an electronic leash realize the need to bring the phone, even not turned on, with them everywhere they go. Hopefully, it will never be needed, but we shouldn't overlook these essential features.



*Figure 5: Smartphone SOS*

Both iOS and Android phones have built-in functionality that allows users to make emergency calls even when the phone is locked or not fully activated. This means that in a critical situation, a smartphone can be used to dial emergency services (e.g., 911) quickly without needing to unlock the device.

To make an SOS call, on modern iPhones, you usually can press and hold the side button and one of the volume buttons until the Emergency SOS slider appears. On Android phones, you can do 5 or more quick presses of the power button to initiate an SOS call. In either case, the call will work even if the phone is off. After the official SOS call (911 for example) other

emergency calls for help will follow automatically depending on your settings. Make sure you set up your emergency contacts list.

Both iPhones and Android phones support Enhanced 911 (E911), a system that allows emergency services to automatically receive the caller's location when a 911 call is made. This feature is particularly important in situations where the caller is unable to communicate their location due to injury or other circumstances. Many smartphones offer the ability to share your real-time location with trusted contacts or family members through apps like Find My (on iPhone) or Google Maps (on Android). This feature can be a lifesaver in situations where someone is lost or in distress.

Both iOS and Android phones are equipped to receive emergency alerts from government agencies, such as AMBER Alerts, weather warnings, and public safety notifications. These alerts are critical for informing users of imminent dangers, such as severe weather, natural disasters, or other emergencies.

Of course, to make an emergency call or any call, your phone needs to communicate with a nearby cell tower. This could be unreliable in rural areas. However, if you are driving, consider a signal booster that can use the battery power from your car to significantly increase your reach. A booster has a larger antenna and amplifies signals both ways, uplink and downlink. It can increase your range by tens of miles.

For people camping or hiking without a car, the best solution would be a smartphone capable of satellite messaging, such as Huawei's Mate 50 (2022), which can send short texts and navigate using China's BeiDou global satellite system. With such equipment, emergency rescue calls are possible anywhere with a clear view of the sky.

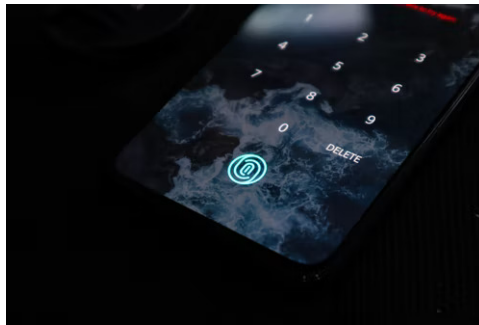
## Protect Your Phone

In this day and age, the importance of your smartphone to you can't be overstated. It is your ID, e-wallet, key to the online digital world, store of your private data, and means to communicate. Basically you must have it and no one else should. Thus, it is important to always protect your smartphone. Here are tips:

1. *Don't Leave Your Phone Unattended:* Keep it with you. Avoid leaving it lying around in public places, at work, or even at home if others have access. This reduces the risk of theft or unauthorized access. When

you can't keep your phone with you, store it in a secure place, like a locked drawer or a safe. This is especially important in shared living or workspaces.

2. *Use Auto Screen Lock:* Configure your phone's auto-lock feature to activate after a short period of inactivity (e.g., 30 seconds or 1 minute). This ensures that your phone locks itself quickly if you leave it unattended. Use a secure lock screen (Figure 6) method, such as a PIN, password, pattern, or biometric authentication (fingerprint, face recognition) to prevent unauthorized access. Note: This is in addition to the SIM PIN which should always be set so that nobody can take and use your SIM card without your permission.



*Figure 6: A Lock Screen*

3. *Be Cautious About Letting Others Use Your Phone:* Like keys, your smartphone is very personal. As a rule, avoid handing your phone to others, especially people you don't fully trust. They could potentially install malicious software or access sensitive information. If you must share your phone, consider using a guest mode (available on some Android phones) and limiting their access to certain apps and information.
4. *Delete Sensitive Text Messages:* Regularly delete text messages that contain sensitive information, such as passwords, financial details, or personal data. This minimizes the risk if your phone is lost, stolen, or accessed by someone else. Use secure messaging apps with end-to-end encryption (like Signal or WhatsApp) for sensitive conversations, and use features like disappearing messages to automatically delete messages after a certain period.



5. *Regularly Review App Permissions:* Periodically review the permissions granted to your apps, such as access to your camera, microphone, location, and contacts. Revoke any permissions that seem unnecessary or excessive. Remove unused apps, especially if they have access to sensitive data. This reduces potential vulnerabilities.
6. *Disable Lock Screen Notifications and Detect Unauthorized Access:* Consider preventing prying eyes from seeing personal information on your lock screen. Also consider using apps such as Lockwatch or Clueful that can detect when someone is trying to access your phone and capture a photo of them.
7. *Avoid Installing Apps from Unknown Sources and Disable Features When Not in Use:* Turn off Bluetooth, NFC, and Wi-Fi when you're not using them. This reduces the risk of unauthorized connections and attacks. Use airplane mode when you don't need to be connected to any network, such as during flights or in secure locations.
8. *Be Mindful of Public Charging Stations:* Be cautious when using public charging stations (e.g., at airports or cafes), as they can be used to install malware or steal data (a practice known as 'juice jacking'). Use your own charger and cable, or consider using a USB data blocker.

Do your best to protect your phone. Make it a habit in the digital age.

## Where Is My Phone?

Misplacing a smartphone is a common and frustrating experience for many users. Fortunately, there are several strategies and tools available to help prevent losing your phone and to find it quickly if it does go missing. Here are some thoughts and tips:

- Avoid misplacing your phone. Form a habit to always place your phone in the same spot when you're at home or work. This could be a charging station, a specific pocket in your bag, or a tray on a table. Consistency reduces the chances of forgetting where you put it.

Before leaving a location (home, office, restaurant, car, bus, airplane, etc.), do a quick check to ensure you have your phone, or other belongs for that matter, with you. It's helpful to develop a routine where you check for your phone, wallet, and keys whenever you're about to leave.

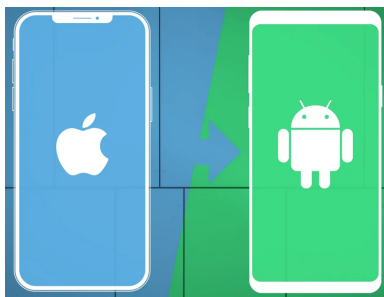


*Figure 7: Can't Believe I Did It Again*

- Consider phone accessories. Using a lanyard or wrist strap can help keep your phone attached to you, especially when you're out and about. This is particularly useful if you're prone to setting your phone down in public places. Keep it easily visible by using a bright or distinctive case.
- Avoid silent mode in public so you can hear by calling it.
- Use a *lock screen message* so if someone finds your phone they can easily let you know.
- Use phone tracking to find a lost phone—Apple's Find My iPhone app allows you to locate your iPhone on a map, play a sound to help you find it, lock it, or even erase it remotely if you believe it's been stolen. The Find My Device app for Android works similarly.

## Switch and Save

Technology advances rapidly so does the smartphone. Many will get a new model just to keep up. Others want to replace a phone that is too old or broken. Yet another reason is to save money. For an iPhone user considering switching to Android, the key question is how much would be the saving. Here's how this aspect can be broken down:



*Figure 8: Switching from iPhone to Android*

1. **Lower Initial Purchase Cost:** Android offers a broad range of price points. While high-end Android phones can match or exceed the price of an iPhone, there are many mid-range and budget options that offer excellent performance at a fraction of the cost. For example, a solid mid-range Android phone might cost \$300 to \$500, compared to \$800 to \$1,200 or more for a new iPhone.

With Android, you also have the flexibility to choose a phone that fits your budget without sacrificing too much in terms of performance or features. This can lead to significant savings upfront.

2. **Savings on Monthly Plans:** With an unlocked Android phone, you can choose from a wide range of carriers and MVNOs (Mobile Virtual Network Operators) that often offer more affordable plans than those typically associated with iPhone purchases. This includes prepaid options, which can be significantly cheaper than postpaid plans tied to iPhone purchases.

Some carriers bundle iPhones with higher-end plans, but with Android, you can opt for more budget-friendly plans without compromising on service quality. Over a year or two, this can add up to substantial savings.

3. **App Costs and Ecosystem:** While many apps are available on both iOS and Android, some paid apps on iOS might have free or cheaper alternatives on Android. Additionally, Android often offers more flexibility with free or open-source apps, which can reduce overall spending on software.

4. Cheaper Accessories: Android-compatible accessories, such as chargers, cases, and headphones, are generally less expensive and more widely available compared to Apple's proprietary accessories. This can lead to additional savings over time.

Here is an example of the savings potential of such a switch. If you switch from an iPhone (\$1,000) with a \$70/month plan to a mid-range Android phone (\$400) with a \$40/month plan:

Device savings: \$600 upfront

Monthly savings: \$30/month

Total over 2 years: \$600 (device) + \$720 (monthly savings) = \$1,320.

We know that high quality products are often more expensive. But, a higher price tag does not necessarily mean better quality. For long-term iPhone users, one hurdle is inertia. After all, an Android could be different and hard to get used to. It is not that different and you may be laughing all the way to the bank. The website [android.com](http://android.com) gives you hand-holding help to make the switch.

## Finally

Smartphones have come a long way and become indispensable. Whether yours is an iPhone or Android phone, you'll be able to do most things you want. Be sure to always bring it with you for security and emergencies. When leaving a place, any place, be sure not to leave your phone behind.

Treat your phone as one of the most important things you have, keeping it safe, private and secure.

When it is time to get a new phone, consider all factors in your situation. An Android phone can usually save money.