



CAPI Tablet Devices Guide

How to choose the best tablet for your CAPI project



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Table of Contents

1	Tablet devices for offline CAPI surveys	3
1.1	Overview	3
1.2	Tablet sizes	4
1.3	Memory	5
1.4	GPS	6
1.5	Cameras	7
1.6	Battery power/life	8
1.7	Screen quality	10
1.8	Networking	11
1.9	CPU & Storage	12
1.10	Android OS version	12
1.11	Various Tablets	13



1 Tablet devices for offline CAPI surveys

1.1 Overview

The Market Research industry is transitioning from PAPI (Paper based surveys) to offline Tablet based CAPI. There are many factors to consider when making the transition to tablets, with the main ones being:

1. **Survey software vendor:** Choosing the survey software vendor is out of the scope of this eBook but we have covered this topic in a very detailed way in our CAPI Success Kit which can be downloaded here: <http://capi.dooblo.net>
2. **Tablets/Phones to use:** The subject of this eBook.

Android tablets and phone devices come in all sizes and with different features. From very cheap low end devices to full featured expensive high end devices. In this eBook we dive deep into the details of the different hardware aspects of the different devices and try to shed light on which of the hardware aspects are the most important to factor when choosing your devices and which can take a back seat if you are on a budget. You will be surprised that many of the low-mid range devices actually provide very good value-for-money and can in fact be used for 99% of the actual fieldwork that is done these days.

The main hardware aspects we will cover are:

- Physical device Size (3-5", 7", 10" and sizes in between)
- Memory
- GPS (yes/no and which kind)
- Cameras (No camera, forward facing or both forward and back facing)
- Battery power
- Screen quality
- Networking
- CPU power & Storage
- Android OS version

Lastly we will provide a few examples of different tablets that can be used from different price ranges ranging from the very basic low-end devices all the way to the most expensive full-featured devices.

NOTE: At the end of each section we have a "BOTTOM LINE" section which sums up the section and gives you the most important tips regarding that specific section.





1.2 Tablet sizes

Tablets come in different sizes ranging from the smaller 3.5” mini-tablets/phones through 7” and 10” tablets. Each size has its pros and cons which are discussed below. In general the bigger the device the higher the cost but read carefully as for CAPI usage, bigger does not always mean better. The size you need highly depends on your unique CAPI environment and projects:

- **3.5”-5” mini-tablets:** These are ideal in situations where you do not need to show a lot of media (photos and videos) and you’re concerned that the device might be stolen. Its size allows the interviewer to conveniently stow it away in their pocket when not interviewing and in general the device draws less attention to it. In addition these devices usually come equipped with both a front and a back camera (see more on this later) which is perfect for enhanced silent-photo capturing for quality control. The drawback of these devices is their small screen which means that there is less space on the screen for showing the question elements and showing videos / photos is usually much less effective than on a bigger screen. On average these devices tend to be the least expensive.
- **7”/8” tablets:** The Ideal size for CAPI. These tablets are small enough to hold with one hand yet big enough to show videos and photos to the respondent. The smaller screen size also in general means bigger battery life than the 10” devices. Please note though that these devices can sometimes come without a front facing camera and while the screen is larger than the 3.5”-5” mini tablets, it is still quite smaller than the 10” devices which means that if your projects are usually very media-intensive it might not suite your needs. These devices on average cost more than the 3.5”-5” devices but less than the 10” devices.
- **10” tablets:** These devices have the biggest screens and are the go-to devices when your projects are usually very media-intensive. The bigger screen means videos and photos will show in their best possible quality and the screen size also allows for bigger grids and question information. However the drawback of these devices is that they are heavier, more expensive and usually have a shorter battery life than the 7” devices. It is also more challenging to hold them with one hand and they do not fit in your pocket in any way.

BOTTOM LINE: Our recommendation is that purchase a 7” tablet. The ideal blend of screen size, weight & costs makes it ideal for CAPI usage





1.3 Memory

The amount of memory of the device is one of the most important factors for CAPI. The reason is that CAPI surveys tend to be very long and contain a hefty amount of complex logic. Due to the internal mechanisms of the Android operating system, even the most advanced tablet surveying apps like SurveyToGo require lots of memory to run the very complex and long questionnaires. The reason is that typical questionnaires have tens if not hundreds of questions that need to be displayed along with media and many times some basic database access. All of these consume lots of memory.

Now in general, tablets are categorized into 3 “Memory categories”:

- **Low: <512MB:** Usually found in the most low-end tablets as memory adds to the price of the device. It is our experience that 512MB will run small & less complex surveys just fine but will quickly generate out of memory issues when running more complex and media rich surveys and this will impact the integrity of your fieldwork. We therefore strongly recommend against purchasing a device with 512MB or less memory. As hardware investments are done once every X years, it would be a mistake in our opinion to choose a device which you are guaranteed memory issues with your more complex projects.
- **Medium: 1GB:** Found in most low-mid range devices today. It is our experience that 1GB is enough to run 95% of field surveys and unless you know for certain that your projects are huge in size and complexity (many hundreds of questions with super complex logic, quotas, DB access & media) you should be fine with 1GB of memory. We recommend purchasing a device with 1GB of memory unless your budget allows for more.
- **High: >1GB:** Found in mid-high range devices today. 1.5GB or more would be more than enough to run any field survey regardless of its complexity. As this memory size usually adds to the cost of the device, we would only recommend getting this amount of memory if your budget allows for it or in case you are certain your projects will require it.

BOTTOM LINE: We highly recommend purchasing a device with 1GB of memory or more. Try to stay away at all costs from devices with 512MB or less as you will be risking data integrity of your fieldwork.





1.4 GPS

GPS is very important for CAPI. The reason it is important is that GPS Locations of interviews and tracking interviewer routes is in 2016 a de-facto standard of quality control and without it you do not have the ability to know where a certain interview was performed nor where a certain interviewer walked around at a certain date-range. Luckily, today, almost all tablets are equipped with GPS however GPS is not a single yes/no parameter.

Instead there are 3 main aspects when checking out the GPS feature of a tablet:

- **Hardware GPS Receiver:** This is the GPS hardware that captures accurate location by contacting ~36 available satellites to pinpoint your tablet location anywhere in the world. While it might seem counter intuitive, some lower-end devices might not have this hardware chipset installed but will still be listed as having GPS because of their A-GPS support. Acquiring the initial hardware GPS location is both a time consuming operation (30 seconds and up) as well as battery consuming. Please read on to see how tablets overcome this.
- **A-GPS (Assisted GPS):** Assisted GPS is a system that uses the GPS information that comes from the network instead of relying on the true triangulated satellite based location data. For example, the GPS location of the nearest cell tower will be used by A-GPS. This sacrifices accuracy but gains faster startup times and less battery drain. Often times, tablets will have both GPS and A-GPS and will combine the data from both sources to provide an optimal reading even in places where standard GPS location can't be captured (like inside closed malls and other places). However be warned – some of the ultra-low-end devices have A-GPS only and this would mean that the accuracy of the location information is very poor.
- **GLONASS Support:** GLONASS is the Russian GPS system comprised out of 24 Russian satellites and has the same purpose as the regular GPS. GLONASS is more accurate in the Northern latitudes. When a tablet supports GLONASS it means it will use these 24 satellites in addition to the GPS satellites and this means accuracy will improve even more.

BOTTOM LINE: Make sure the tablet you choose has a true hardware GPS receiver. A-GPS and GLONASS should be considered as nice-to-have features.





1.5 Cameras

While maybe initially the camera might not seem as an important concern, as you get more proficient with using tablets for CAPI the more important the cameras become from a Quality Control point of view. In today's CAPI world, the camera is used both as a way for the interviewer to snap pictures of where he/she is right now (the POS, the household, retail shelves planograms etc) but also for the QC department to perform silent-photo-capturing to get a direct glimpse of the interviewer surroundings to confirm the fieldwork is done according to the highest standards.

With tablets there are 2 types of cameras:

- **Backward facing camera:** Sometimes referred to as the “Main camera”. This camera is the one you use to take pictures of places and resides on the back of the tablet. This camera will usually have a higher resolution than the front-facing camera. In some lower-end devices, this camera will not be present and only a front-facing camera will be available. We highly recommend only getting tablets that have a backward facing cameras as taking pictures during interviews/audits is something that is quickly becoming a de-facto standard in CAPI work in addition to performing silent-photo-capturing during interviews to confirm quality control checks.
- **Forward facing camera:** The forward facing camera is traditionally used for video conferencing, taking selfies etc. and usually is used to shoot the face of the person using the tablet. This camera will usually have a significantly lower resolution when compared to the main camera. While the regular usages are not important for CAPI work, taking a silent-photo-capture from this camera angle when combined with another silent photo capture from the regular camera can reveal super-important QC information. So while not 100% critical we do recommend getting a tablet that has both cameras as it will allow you to perform more effective silent-photo-capture activities as getting the silent-photo-capture from both camera at the same time will give you a complete view of the surroundings of the interviewers.

Camera optics and resolutions: when looking at the specs of the cameras you will see different MP (megapixels) specifications along with various features like geo-tagging, auto-focus, face detection etc. Now as CAPI work rarely requires high-end photographs and actually most often than not the size of the photo is a concern and photos are compressed by the data collection app, the actual MP specification of the camera is usually not a concern and the MR firm should not shell out extra cash for a higher-end camera nor for advanced features. The only important feature is geo-tagging and usually almost all tablets with GPS and a camera will have this but still it would be recommended to confirm.

BOTTOM LINE: Backward facing camera is a must. Specs are not important. If possible get a device that also has a front-facing camera.





1.6 Battery power/life

The battery within your tablet is responsible for providing “air” to your device so it can breathe. Since CAPI projects naturally are performed in the field getting the most battery life out of your device is critical.

There are essentially 3 technology considerations that affect the amount of work hours you can get out of your battery when in the field:

- **Battery size (XX mAh):** This is the amount of power that will be stored in the device for you to use when disconnected from the charger. The bigger the number the better, although bigger battery also means a heavier device.
- **Battery technology:** there are 2 common battery technologies in use today, Li-Po and Li-Ion. Essentially both rely on the same battery cells but the Li-Po costs more to produce and is slightly lighter than the Li-Ion. It is our opinion that both are fine for CAPI work and no preference should be given to the technology of the battery.
- **Battery consuming hardware:** Now here it gets tricky. While a device with a large mAh size should theoretically mean longer battery life, this is only true if all other hardware items are kept the same. In real life however devices have different CPU’s, screen sizes, GPS hardware and other chips which all consume different amounts of energy for normal operation. This means that 2 devices with the same battery size but one having a much faster CPU that consumes more energy will have entirely different battery life.

In addition, there is one even more important factor that affects how much battery time you will get from your device in the field which is how you use your tablet it has a dramatic impact on the daily work hours you will get out of the battery. The main consumers of the battery are listed here:

- **Screen:** The #1 consumer of battery life. Keeping the screen brightness at the lowest possible setting will give you considerable more battery life. Keeping the device “on” for the shortest time possible will contribute as well to a longer battery life. The shorter the time the screen is on and the lower the brightness will have a dramatic effect on your battery life.
- **GPS:** Accessing the GPS hardware to capture a location causes the GPS receiver to contact the satellites in the sky and consumes battery. Therefore properly configuring your GPS settings in SurveyToGo to only periodically access the GPS and not constantly will have a big impact on the battery life. In addition switching the location settings to “Battery saving” will try to use the network instead of the GPS to capture the location and will sacrifice accuracy for battery life.
- **Networking:** Keeping 3G and WIFI on will drain the battery life as these network chips are constantly busy either being connected or searching for a connection. Try turning on the networking modules only when necessary which will drastically improve your battery life.



- **Apps:** Running apps that are CPU/network intensive will drain your battery. If possible try to shut down background running apps like Whatsapp, Facebook, Snapchat, Instagram and other social network apps. These apps have built in components to constantly deliver updates to you and these components drain the battery. Expect up to 25% increase in battery life by switching these apps off.

In general, device manufacturers state batteries can be re-charged 300-600 times before the end-of-life is reached. In real-world use, this number is usually much higher although battery capacity decreases considerable over time and recharge cycles so even though a battery might last longer than 600 recharges its capacity is guaranteed to deteriorate over time. Average numbers state ~20% loss in capacity after 250 recharges.



BOTTOM LINE: From your shortlisted devices, pay attention to the number of mAh and choose the one with the biggest number. Keep in mind though that the #1 factor that will affect your battery is how you use the device and not the amount of mAh you have.



1.7 Screen quality

Why does screen quality matter? That's a great question. When thinking about CAPI work we often neglect this important aspect and while this aspect is less important than a few other critical ones, it is still an important aspect. The screen quality will affect both your battery consumption, how the screen is visible in the sun and how sharp & crisp videos/photos appear on the device.

The following main aspects control the screen quality:

- **Screen resolution:** The higher the screen resolution the sharper and crisper the screen. A Full-HD resolution screen will display videos and photos and great quality and will be easier on the eyes of interviewers when compared to a lower resolution screen. For bigger physical screens, for example those of 10" tablets, a high resolution is important as otherwise due to the size of the screen the image might look blurry. While the newest tablets have 2K resolution screens, a Full-HD (1920x1080) screen or close to this resolution should be fine for CAPI work. If no videos or photos are typically shown then even a lower-resolution tablet will perform fine.
- **Screen type (technology):** It is beyond the scope of this book to describe each of the screen technologies available today. However, it is important that you understand that the screen technology affects both the viewing angle, brightness & battery life of the device. The older TFT LCD screens consume more battery life and provide a narrow viewing angle (meaning when tilting the device the screen contents are less visible) and perform worse in direct sun-light than the newer IPS LCD / AMOLED Technologies. However, the newer screen technologies are also more expensive. It is our opinion that unless the majority of your work is done in direct sunlight or squeezing out a few extra minutes of battery life is your top concern - for general CAPI work, the older less expensive TFT LCD is good enough to perform your CAPI work.
- **Screen-to-body ratio:** The Display to body ratio is a simple data that tells you how much of the surface the screen represents when compared to the whole device. For example, a device with a ratio of 50% would have as much body surface visible from the front as it has screen surface. On the other hand, a device with a 100% ratio would have no visible body when looked at from the front. This metric is particularly important when considering the final size of the tablet as it will depend on this ratio. The smaller the ratio the smaller the device will seem and the better it would feel from an ergonomic standpoint. Especially for mini tablets.

BOTTOM LINE: If the majority of work is done in bright sun-light, get an IPS LCD screen. If majority of work involves showing videos/photos, insist on getting Full-HD screens and up. Otherwise, no special consideration is necessary.





1.8 Networking

While in CAPI the actual fieldwork will usually take place while being completely offline, eventually though either at the end of the day or week or month the tablet will upload the data back to the data center and it will do so using its networking components. Different tablets have different components present and it is important to plan ahead and get the tablets that have the networking components you need. As networking components are relatively expensive it can have a real impact on the price you will pay for your tablet.

The following components can either be all present or only one or two of them:

- **WIFI:** This is the most basic networking component. Different standards exist and thus different WIFI types and components but for CAPI work, it doesn't really make a difference which WIFI network is supported. Almost 100% of tablets will have WIFI available. Please note though that WIFI will only work near a WIFI network and so it will not allow you to upload and sync data from the field, only once you are either back in the office or maybe at the hotel or restaurant.
- **Cellular/3G:** Usually not present in low-end/mid range tablets. This component is expensive both in that it costs more to include in the device but also in order to use cellular data transfer usually a data plan needs to be put in place and depending on where you are in the world it can get rather expensive. Unless you have an urgent need to upload the data as soon as you collect it we would recommend thinking carefully if you wish to get a device with this component as the tablet itself will be more expensive and of course the on-going payments for the data plan. In case you do decide to get a device with cellular capabilities, please make sure the tablet supports your network carrier technology (for example: GSM / HSPA / LTE)
- **Bluetooth:** Not always present in lower-end tablets but will usually be included in the mid-range and up. Bluetooth allows you to connect another tablet/pc to the tablet and upload files and data through that wireless technology.

BOTTOM LINE: For most cases, WIFI is enough with Bluetooth being optional. If you foresee presently or in the future that you will need real-time data upload make sure to get a device with a 3G/Cellular component even if you will not use it now you might use it later.





1.9 CPU & Storage

While CPU Speed & storage plays a big role when choosing a tablet for consumer use, however, when choosing a tablet for tablet CAPI surveys this has almost no implications. Any CPU should run CAPI surveys fine, even the low end devices. As for storage, for surveys with no videos this has no implication at all as survey data output size measures in ~30KB in size while even the low-end devices these days have ~8GB of internal storage (not memory) available which essentially means you can store over 200,000 interviews on the device before the need to upload and free the space. The only exception for storage would be if you are capturing lots of videos/photos. Photos tend to be about ~150KB in size and full-HD videos can quickly consume 3-5MB of storage space per second. So in case you are capturing a huge amount of photos or videos, you should definitely make sure the device has enough storage and potentially can be expanded with an external SD card based on your needs.

BOTTOM LINE: Do not worry about CPU speeds as they are not relevant to CAPI. Storage space should only be a concern in case you are capturing videos or huge amounts of photos, otherwise it is not a concern as well.



1.10 Android OS version

There are many Android OS versions out there and different devices have different OS versions loaded. Some devices will allow you to upgrade to newer versions and some won't. The Android OS versions out on the market today range from the super old Android v2.2 (for example, the [Dell Streak 7 Wi-Fi](#) is an example) through the 4.X versions all the way to the newest 6.1 version. However the real question is whether the OS version number has any effect on your CAPI field work? Well, the short answer is "No, it doesn't". The only requirement is that your CAPI Software will support the Android version your tablet has. However, we would recommend going with a tablet that runs v4.x and up as while there is nothing specifically that requires this version, it usually means the device is newer and will probably perform better overall.

BOTTOM LINE: Do not worry about the Android OS version, just as long as your CAPI vendor supports the OS number your tablet runs. Before buying the device, check with the CAPI vendor to make sure the app supports the Android OS Number.





1.11 Various Tablets

In this section we will list some possible tablets to consider for your CAPI fieldwork. As there are over 1,000 different Android tablets on the market today and more are released every day, we will only list here a few models so bear in mind there are much more tablets out there than this list and you should only use this list to get an idea of the possibilities. Please also note that we do not have any commercial relationships with any of these manufacturers.

- **Low end devices: <\$150**

Device name	Price	Size	Memory	GPS	Camera	Network
Lenovo Tab 2 A7-10 	~\$100	7"	1GB	Yes+ AGPS	Front only, No geo-tagging	WIFI
Asus Memo Pad 7 ME176C 	~\$150	7"	1GB	Yes+ Glonass	2 Cameras + geotagging	WIFI
Samsung Galaxy TAB 3 Lite 7" T110 	~130	7"	1GB	Yes+ Glonass	Backface ony + geotagging	WIFI

Color Legend

Serious Limitation. Be warned.

Limitation. Make sure it fits your needs.

Not a limitation but still an item that you need to be aware of.



- Mid range devices: <\$150

Device name	Price	Size	Memory	GPS	Camera	Network
Samsung Galaxy Tab 4 7.0 	~\$150	7"	1.5GB	Yes+ Glonass	2 Cameras + geotagging No flash	WIFI
Asus Google Nexus 7 (2013) 	~\$199	7"	2GB	Yes+ AGPS	2 Cameras + geotagging	WIFI+ Cellular (GSM / HSPA / LTE)
Samsung Galaxy Tab A 7.0 (2016) 	~\$149	7"	1.5GB	Yes+ Glonass	2 Cameras + geotagging	WIFI+ Cellular (GSM / HSPA / LTE)

Color Legend

Serious Limitation.
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Limitation.
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Not a limitation but still an item that you
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- High range devices: > \$200

Device name	Price	Size	Memory	GPS	Camera	Network
Sony Xperia Z4 Tablet LTE 	\$580	10"	3GB	Yes+ Glonass + BDS (Chinese)	2 Cameras + geotagging	WIFI+ Cellular (GSM / HSPA / LTE)
ASUS TF701T 	\$340	10.1"	2GB	Yes+ AGPS	2 Cameras + geotagging	WIFI
Samsung Galaxy Tab S2 9.7 	\$500	9.7"	3GB	Yes+ Glonass	2 Cameras + geotagging	WIFI+ Cellular (GSM / HSPA / LTE)

Color Legend

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