To Smartphone Photography

1. The rise of smartphone photography
2. Understanding your phone’s camera
3. Composing a good shot
4. Cameraphone comparison: Which is the best one out there?
5. Aftermarket accessories - lenses, tripods, grips, battery cases
6. Tips and tricks for making the most out of your smartphone camera
7. Best apps for taking pictures across platforms
8. Best apps for post processing across platforms
9. Best apps for photo management and display
www.thinkdigit/forum

Join the forum to express your views and resolve your differences in a more civilised way.

thinkdigit FORUM

Post your queries and get instant answers to all your technology related questions

One of the most active online technology forums not only in India but world-wide

JOIN NOW www.thinkdigit.com
FAST TRACK to SMARTPHONE PHOTOGRAPHY

powered by digit
The rise of smartphone photography
They say the best camera is the one that's with you. And what could make a better camera than the humble smartphone that is with us all the time.

Understanding your phone’s camera
So you just bought a fancy new camera phone. But what do all those settings mean? Let's find out.

Composing a good shot
A photograph is only as good as its composition.

Cameraphone comparison
Which is the best camera phone out there? Based on our tests, we come to some conclusions.

Aftermarket accessories
While smartphones are capable of pulling off some really impressive feats when it comes to photography, what can you add to it to take your images to the next level?
Tips and tricks
These little tips and tricks will help you get the most out of your smartphone’s camera

Best apps for taking pictures across platforms
Any photography enthusiast would agree that the inbuilt camera apps that come with smartphones are just not good enough to give you the quality photograph that you crave for. Thankfully, there are a bunch of apps across all platforms that better complement your smartphone cameras.

Best apps for post processing across platforms
Reality is never as cooperative as you would like. So it doesn’t hurt having a few post-processing apps to add the finishing touches to your perfect composition. We take a look at the best apps just for this purpose available across all platforms.

Best photo management and display apps
Even after you’re done tweaking your hundreds and thousands of photographs to perfection something more is still needed - managing and displaying them via your phone. The following apps give the best means of managing, sharing and displaying your photographs.
Smartphone photography has come of age

Die hard dSLR enthusiasts will probably scoff at the idea of using a smartphone as a primary camera; and for good reason. Smartphone cameras admittedly do have a few intrinsic weaknesses but they also have a lot of advantages – the biggest one being that your trusty smartphone is the one camera you have with you at all times. Smartphone cameras let budding photography hobbyists experience a freedom of movement which is unmatched by any other type of camera. Phones are easy to handle, quick, and most importantly discreet – pulling one out won’t make people stop and stare. Besides, to burst the elitist bubble, the quality of smartphone cameras has increased dramatically over the years, giving rise to smartphone photography as a worldwide phenomenon. Consider the fact that on Instagram alone around 50 million photos get uploaded each day. That’s staggering by itself. Add to it Facebook and hundreds of other photo sharing services and you have something mindboggling.

This social aspect of smartphone cameras is another advantage. Enthusiasts can click and share their creativity for instant feedback and fame. Also touching up images, adding filters and correction required computers earlier. Now all of that is possible with a few taps on your smartphone itself. This FastTrack will get you acquainted with not just that but tons of other helpful tips on understanding your camera’s settings, composing a good shot, working with lighting conditions, and lists of apps that’ll help enhance your camera’s default functionality.

We start with exploring a bit of history on how and why smartphones have become a viable option for serious photography. Increase in sensor sizes, lens technology and other aspects are explained in the first chapter.
The next chapter gets you acquainted with your camera’s settings – practical explanations on exposure, white balance, scene modes, HDR and other esoteric settings which you’ve seen but didn’t really know what they meant or how they affected your shot. We also look at some aftermarket accessories such as lenses, tripods, grips, battery cases and a look at which are the best smartphone cameras out there based on our testing. We finally wind up with apps for different purposes – taking pictures, post processing, photo management and viewing.

Remember behind each smartphone is a potential photographer. So go out there click away!

But first read this FastTrack of course :-)}
THE RISE OF SMARTPHONE PHOTOGRAPHY

They say the best camera is the one that’s with you. And what could make a better camera than the humble smartphone that is with us all the time.

The camera on our smartphones has become as much an inseparable part of our lives as the smartphone itself. We never thought we would but we have come to rely on it so much these days that it’s become impossible to imagine owning a phone with a camera.

Things weren't always like this, though. Wind the clocks back by about ten years and remember what it was like back then. Cameras had just started making an appearance on phones and only the most expensive models had them. It wasn’t often that you’d come across someone with a smartphone, first of all, much less someone with a camera on their phone.

The cameras on phones back, to quite an extent, were a gimmick and a bit of a joke. The popular resolution back then was CIF, with the more expensive models having a VGA resolution camera, which was just enough pixels to be able to distinguish a person from a tree. As usual, though, reso-
The rise of smartphone photography isn't everything and it would be an understatement to say that the quality left a lot to be desired. After all, it's not like we haven't seen better photos before. There were point and shoot digital cameras producing much better photos. And of course, the film cameras that produced great photos.

Other than being able to take photos that looked like they were captured by a potato, phone camera software back then was also a lot basic. The camera 'experience' back then basically involved starting the camera app, pointing and shooting. But then there was also a certain charm to it. Because of its absolutely basic nature, it encouraged a very casual approach to photography, something that a proper camera would not. This meant that even people who have never used a camera before or not much into photography as such, could take a photo without worrying too much about how they are shooting. It's this ability to quickly and casually take a photo is what has always been the most endearing aspect of mobile photography.

But what about after you took the photo? Well, there wasn't much you could do with it. You could either look at that low resolution image on an even lower resolution display of your phone (with individual pixels so big they could be seen from the moon) or you could use the limited sharing options to send it to someone. The popular way back then was to use Bluetooth, which allowed more than one person to have a copy of that mediocre photo.

But this clearly did not stop people from using the cameras on their phones. As mentioned before, the speed and ease of use of taking photos with their phones meant more and more people were starting to take photos with their phones. Taking terrible photos, but taking them nonetheless. Eventually the smartphone companies noticed this trend and that's when all the fun started.

If you were from the era I just mentioned, then you will remember that back then, Nokia and Sony Ericsson were top dogs as far as mobile phone cameras were concerned. The two companies often traded blows and the battle continued for quite a few years, before Sony Ericsson finally con-
ceded from the race. Had it not been for their rivalry and urge to one-up each other, the mobile phone camera progress would have perhaps been a lot slower, and a lot less interesting.

Back in 2002, the Nokia 7650 was the first smartphone in the world to have a camera and was also Nokia’s first camera phone. It had a measly VGA resolution sensor and things like flash and video recording were unheard of back then on phones. The first Sony Ericsson phone to have a camera was the T610 and it was only a CIF shooter. It was with the P900 that Sony Ericsson joined the prestigious VGA Resolution Club, along with the Smartphone with a Camera Club.

A year later, Nokia released the 3650 with the world’s most confounding keypad arrangements. But other than that, the other interesting thing about it was that it was the first smartphone to be able to record videos. Granted they could only be 15 seconds long (this was to be able to send them over MMS that could only be 100KB in size at that time) and looked blurrier than the moon landing videos; after all, we were looking at a 176 x 144 resolution video. But it added another interesting dimension to mobile phone photography. Now you could shoot videos. Shoot terrible quality videos, but shoot them nonetheless.

But it took Sony Ericsson to release the first serious camera phone a year later; in fact, the first phone worthy of the title ‘camera phone’, which didn't exist as such back then. It was the K700i. If you owned one of these or used one of these, you’d know what we are talking about. We are still talking VGA resolution here, but this phone had a genuinely good cameras, with photos you’d want to take, want to store, want to see and want to share. This was the first legitimate camera phone that we can remember of.

Then Nokia decided to rain on Sony Ericsson’s parade and launched the 7610. This was the first phone ever to have a 1 megapixel camera, or even
use the word ‘megapixel’ anywhere. It was the first time most people had heard that word and hardly knew what it meant (that continues till today but that’s what we are here to change). It dominated everything that was out there by sheer number. Suddenly, everyone wanted a phone with a 1 megapixel camera. After all, it sounded so impressive. And that’s basically how the megapixel war was kicked off.

Not willing to let Nokia take away its glory, Sony Ericsson retaliated with the S700i that had a 1.3 megapixel camera. As was usual back then, Sony Ericsson actually had a better camera phone at its hands but Nokia was a much bigger brand so no one really cared about the S700i and later when Nokia released the 6630 that too had a 1.3 megapixel sensor, it was once again the market leader.

2005 saw the release of phones with front facing cameras, which are all the rage these days. Nokia had its 6680 and Sony Ericsson its K600. Before this, phones used to have a tiny convex mirror next to the rear camera to help you frame yourself to take a self portrait (or “selfie”, as it is now rather annoyingly called these days) but these phones changed that. Sure, the front camera quality was even more abysmal than the rear cameras of older phones but once again it was something new and exciting and something people wanted. (They were really meant to be used for video calling but no one ever used that.)

We eventually reached the 2 megapixel milestone, courtesy of the Sony Ericsson Cyber-shot K750i and Nokia N90. Now we were deeply into the really good quality camera stuff. Both these phones were very good, even by today’s standards. We are talking features like autofocus, LED flash, dedicated shutter keys, and even Carl Zeiss optics on the N90. The N90 also had VGA resolution video recording, which was
quite a big deal back then. To put it into perspective, the first two genera-
tions of the iPhone that came out two years later actually had worse camera
than these two phones.

The two companies kept going at each other with several more phones,
with the likes of the K790i and the N93 until finally a year later, Nokia
dropped a bomb that Sony Ericsson never quite recovered from. It was
the time that Nokia launched the N95, a phone so far ahead of, not just
the Sony Ericssons, but any other phone on the market, that it seemed for
quite some time that Nokia had simply won and others should just wrap
up and go home.

It was the first phone ever to have a 5 megapixel camera. It was as if Nokia
was quickly tired of 2 and 3 megapixel phones and decided to just skip 4
and go straight for 5 and get it over with for everyone else. The camera was
fantastic, as was the rest of the phone. And even before Sony Ericsson could
respond to that, Nokia launched the N82 that replaced the N95’s LED flash
with a xenon flash, the first on any phone. And although Sony Ericsson
tried to fight back with the K850, it was clear that the game had ended for
the Swedish company. Nokia had won the camera war, at least for now.
Eventually, other players on the market started participating in this race. After a few slow years Samsung slowly started making its presence felt in the market. The G600 was the first serious effort by the company at a camera phone and it was quite good, with a 5 megapixel sensor that was close to, if not better, than the one on the N95. Then there was the LG Viewty, which also had a 5 megapixel camera with Schneider-Kreuznach optics and a unique 120fps slow motion video recording option (albeit at QVGA resolution). And let’s not forget the Motorola ZN5, a phone with a fantastic 5 megapixel shooter and xenon flash along with Kodak branding (which didn’t extend much over being just branding).

Soon we entered the golden era of 8 megapixel phones, with Sony Ericsson launching its C905, Samsung its INNOV8 (and later the Pixon) and Nokia with the N86 8MP. While there was nothing particularly special about the first two phones, Nokia went ahead and introduced a 28mm wide-angle lens (compared to the standard 35mm) and variable aperture, the latter of which is not even found on today’s smartphones. A wide-angle lens meant that you could now have a greater field of view and the variable aperture would smartly adjust the aperture size depending upon the ambient light.

When it came to hitting the 12 megapixel mark, Sony Ericsson was once again first with the incredibly forgettable Satio. Samsung merely plonked a 12 megapixel sensor in the Pixon and called it a day. But Nokia went all-out in a glorious fashion with the N8 in a way that people still look back and reminisce about. It had the biggest sensor yet on any phone and the photos it produced were phenomenal. Not that the SE or Samsung phones were bad as such but nothing compared to the quality of the N8 camera and even to this day few phones can hold a candle to it.

After that things continued to progress at a steady pace, with more evolutionary than revolutionary changes being seen. That was until Nokia
The Rise of Smartphone Photography

decided to shock everyone again with the 808 PureView. The 41 megapixel sensor on that phone was beyond what one could have imagined, even in 2012 and it wasn’t just the sheer number of pixels but the way they were used, being combined to create a lower resolution but sharper and noise-free image. Or to use all those pixels to create lossless digital zoom. Today that same technology with a few improvements can be founds under the Lumia 1020 and it is just as incredible today as it was back in 2012.

The next important event in the world of mobile photography did not come as a megapixel boost (Nokia made sure no one would top 41 megapixels for a long, long time) but rather in the form optical image stabilization on the Lumia 920, once again, debuted by Nokia. This little piece of technology, which had existed for years in bigger cameras, allowed the lens to be stabilized, which resulted in blur-free photos and videos. More importantly, because it prevented camera shake, it allowed the use of a longer shutter speed in very low light environments than what would be possible with a non-stabilized optical system.

One thing would be clear from what we have seen so far is that Nokia had a huge impact on the progress of mobile phone cameras. From having the first smartphone with a camera, to first phone with video recording, first phone with a xenon flash, first phone with wide-angle lens, first phone with variable aperture, first phone with a 41 megapixel sensor, first phone with optical image stabilization, first phone with high resolution microphones for video recording, Nokia brought a lot to the table over the years. Soon the company will cease to exist, at least in the form we know of today. But its contributions to the world of mobile phone photography (and of course, mobile phones in general) shall never be forgotten.

Of course, you can’t talk about mobile photography and not mention the iPhone. The camera on the iPhone surely did not have a great start. It seemed while Apple had reinvented the smartphone in every other way with the futuristic iPhone, the camera was decidedly from the past, what with its fixed-focus 2 megapixel sensor and a complete lack of video recording or flash. Also, there was no front-facing camera. This continued on to the
second generation iPhone 3G, which quite similar to the first model under its new plastic case.

It wasn’t until the iPhone 3GS that it seemed that Apple was starting to take the camera more seriously. We now had a 3 megapixel sensor, autofocus and VGA video recording. It wasn’t the greatest of cameras (and no match for what Nokia and others were churning out) but it was still a big improvement over its predecessors.

But it was with the iPhone 4 that Apple finally showed everyone that it too can make great camera phone. The 5 megapixel camera on the iPhone 4, with LED flash and 720p video recording was brilliant and one of the best on any phones available at that time. And even though the camera quality had improved by leaps and bounds, it still maintained the simplicity of the first iPhone, allowing people to quickly take great photos, something that we all expect from a mobile phone camera. And now we also had a front facing camera.

The iPhone 4s propelled the iPhone camera from great to utterly fantastic. The 5 refined the camera experience further and the 5s took it up a notch. In the seven years that the iPhone has existed, it went on to become the most popular camera phone in the world. It is also the most popular camera on Flickr, with the highest number of uploads, more than any other device, including standalone cameras and other phones. The iPhone has remained the epitome of mobile phone photography thanks to its simplicity but without compromising on the quality.
We talked mostly about still photography so far but you can’t ignore video recording. From the humble days of the Nokia 3650 to the Galaxy Note 3 recording in 4K resolution, video recording on phones has also come a long way. In the early days, Nokia was the first to push video recording on smartphones. Still for a fairly long time, video recording was firmly in the standard definition phase, even though still cameras were reaching 12 megapixel resolution.

This is when Samsung launched the Omnia HD, which was the first phone to have 720p or high definition video recording. The next step came two years later in the form of the LG Optimus 2x, which was the first phone to have 1080p or Full HD video recording. And then it was the Samsung Galaxy Note 3, which reached the 4K mark four years later.

The growth in video recording resolution did not follow the same quick pace of growth as still recording, simply because it requires a lot more processing power to increase video recording resolution than that for still images. This is why even today we don’t have a lot of professional 4K cameras and most of them max out at 1080p. Which is why the mere presence of 4K on phones today is such a big deal and a testament to how far we have come.

So why the long history lesson? It’s because it is necessary to look back to our not so distant past and see what we had back then to truly appreciate what we have today. From the days of the Nokia 7650 mentioned at the beginning of this chapter, a lot has changed. We now have better quality image sensors that can be smaller and still be more sensitive to light, capturing images that can beat point and shoot cameras. The optics have come a long way and we even have professional grade lenses on our phones now. The camera software has improved leaps and bounds and now offers a wealth of options to adjust various parameters of an image before shooting so you have full control even if you’re not on a proper camera. And a ton of sharing options means you have more ways than you need to put those great images you captured to use.
From being a gimmick taking blurry, unusable photos to being an integral and inseparable part of our lives with quality now good enough to replace standalone cameras, the journey of the humble mobile phone camera has been nothing short of exciting. Now that we are more familiar with its past, let see how we can use it better to get the most out of it.
So you just bought a fancy new camera phone. But what do all those settings mean? Let’s find out.

There was a time when phone camera software had just one button that allowed taking a picture. But as the hardware responsible for taking pictures improved so did the software behind it. These days you can adjust practically every parameter of the shot before you take it, similar to the way you can on a proper camera. From things like white balance and exposure to ISO, shutter speed, metering modes and much more.

For the layman, these terms can be quite daunting and thus most people don’t seem to bother with them and just choose to point and shoot. But while this may give decent results most times, you’d be surprised how much better you can make your shot if you just spend some time adjusting a few settings. Here, we will be taking a look at some of the settings you commonly find on phones and how you can use them to get the most out of your photos.

**Resolution**
One of the most basic settings is the option to change the camera resolution. This essentially lets you control the amount of pixels in your captured
image, with the highest option being whatever is the maximum resolution the sensor supports along with a few lower resolution options.

As some of you may know, resolution is measured in pixels. Because there is usually a lot of them, they are grouped together in a bunch of million pixels and called a megapixel. A common resolution these days is 8 megapixel, which means the sensor is capable of capturing 8 million pixels at once.

So how important is resolution and how important are megapixels? A lot and at the same time, not so much. A higher resolution image can have more detail, provided it is captured natively and not just an upscaled version of a low resolution image, in which case the resolution will increase but the amount of detail will remain the same. So on a technical level, yes, an 8 megapixel image is better than a 5 megapixel image. But it’s rarely that simple.

Often, as it happens, some sacrifices have to be made to achieve a higher resolution image. The ideal thing to do would be to keep the size of the pixels on the sensor the same and just add more pixels every time you wanted to increase its resolution. But this would also increase the physical size of the sensor, which is not ideal, especially on a smartphone, where space is at a premium. So often, the sensor size is kept mostly the same while increasing the resolution, which results in smaller pixels. Think of this as cutting a pizza into eight slices instead of six. It’s the same size pizza so even though you are getting more slices, the individual slices are now smaller.

What happens when the pixels on the sensor are smaller? They are able to capture less light, which results in grainier images in low light situations.
as the camera has to use a higher ISO rating (more on this later) to compensate. So as you can see, the higher detail comes at the cost of worse low light performance, compared to a sensor of the same size but with a lower resolution. Of course, as technology progresses and we get better sensors on our phones, we are now able to cram in more pixels and yet achieve good light sensitivity per pixel. This is why companies like Nokia can achieve ridiculous resolutions like 41 megapixels without compromising much on low light performance.

So what setting should you choose on your phone while shooting? Ideally, the highest one. These days, some companies will set the resolution to a lower option than what is the sensor’s maximum resolution. This option usually has a 16:9 aspect ratio designed to fill your smartphone’s widescreen display in landscape mode but this is achieved by cropping the top and bottom of the image off (since the sensor is usually not 16:9 itself but rather 4:3) and thus you get lower resolution. You can change this by going into the settings and selecting the maximum resolution option. The image will now be squarer but you will get more pixels and if required you can always crop it later through the gallery application.

The lower resolution options can come in handy when you’re short on space and need to take some photos anyway. Better thing to do, however, is to delete some data and then take pictures at maximum resolution.

**Exposure**

Exposure, or exposure compensation, is where the
camera allows you to increase or decrease the exposure over what it assumes to be the ideal exposure for a particular scene. It allows you to overexpose or underexpose a scene as desired over the default value. You will see the default value as zero in the middle on the exposure scale, and you can increase or decrease it in stops like -2, -1, 0, 1 and 2. In simple terms, it lets you brighten or darken a scene.

At times a camera may overexpose a scene by default. This is where you can use exposure compensation to dial down the exposure a bit and achieve correct level of illumination for the scene where things are neither too bright with clipped highlights nor too dark. It is one of the more useful tools available on a camera and wise use of it can achieve really good results.

**Metering Mode**

This is related to exposure and determines the way the camera adjusts its exposure for a particular scene. There are usually three types of settings here that you can choose from. There is spot metering, where the camera will determine the correct exposure for a particular scene depending upon a small spot in the center of the screen. You can often change the location of this spot by tapping elsewhere on the screen (which also changes the focus point). Now depending upon how light or dark that spot is, the camera will determine the overall exposure of the image, ignoring everything else.

Then there is center-weighted average, which is usually the default setting. Here, the camera will look at the subjects in the center of the frame and then base the overall exposure on that. This is usually default because it
works best for portrait shots, which is often what people take with mobile phone cameras.

Lastly, there is matrix mode, where the camera measures the light at various points in the frame and then takes an average of them to arrive at an overall exposure for the scene. This is a very versatile option and can be used for all sorts of photos.

**ISO**
The ISO setting allows you to adjust the sensitivity of the sensor to light. The name is a remnant from the days of film where the ISO rating determined the sensitivity of the film to light and its speed (more sensitive film could be spun faster). Today, it is used to approximately match the sensitivity of a digital sensor to a film sensor of a particular sensitivity at a particular exposure.

Under ISO settings, you'll see values such as ISO 80, 100, 200, 400, 800, 1600, etc. The higher the number, the more sensitive the sensor becomes to light. When a sensor is more sensitive to light, you can choose to have a faster shutter speed or smaller aperture. So, for example, when you are in low light conditions, you have the option of either choosing a longer shutter speed, thereby letting the shutter stay open for longer or keep a faster shutter speed but increase the ISO value. The problem with the first option, even though it is preferable, is that you need some sort of support to stabilize the camera, such as a tripod, otherwise you risk getting a blurry image.

So then let's just crank up the ISO value, you might say. The problem with that is, when you increase the sensitivity of sensor to light, you are also boosting the amount of noise or grain in the image. The sensor has a particular sensitivity to light, that is it can output a particular signal for a particular amount of light that falls on it. By increasing the ISO, you are artificially boosting the signal it delivers, which affects the signal to noise ratio, creating more noise. The higher you push the ISO settings, the higher will be the noise in the image.

Depending upon how good the sensor is, you will get different results at a particular ISO setting for different cameras. High quality cameras will let you crank up the ISO value without adding too much noise. This is one way to judge the quality of a camera, by seeing how it performs compared to another camera at a particular ISO rating, especially at higher values.

So, which one should you select on your phone? Honestly, this is one setting that is best left at its default value, which is auto. Since most phones don't have manual shutter speed or aperture settings, there is little sense in
adjusting the ISO value manually. And on most phones, the camera usually does a good job of selecting an ISO value that is appropriate for a scene, even beyond those that are available to choose manually. Only in rare cases would you feel the need to intervene but otherwise, just leave this at Auto.

**Shutter speed**

Very few phone cameras have this setting and so far we only know of Nokia’s Pro Camera app on newer Lumia phones that allow you to choose your shutter speed.

Shutter speed determines how long your shutter stays open. A slow shutter speed keeps the shutter open for longer. As you can guess, the longer the shutter stays open, the more light that would get in. But you can’t always have a long shutter speed every time.

When the shutter is open, the camera is recording all the light that comes in. During this period, if the camera or the subject moves, it results in blur. This, at times, can be used for artistic effect, such as light paintings, where the shutter is kept open for a long time and then a light source is moved around to create a pattern, or to capture the trails of head/tail lights of vehicles at night. But other times it can result in blurry images that don’t look very good. On the other hand, a fast shutter speed means very less light gets in, which results in dark images in low light conditions.
Understanding Your Phone’s Camera

Depending upon what you are shooting and what conditions you are in, you should choose whether you should go for a slow or fast shutter speed. A slow shutter speed is recommended when you’re in low light conditions and have a tripod, where you can afford to keep the shutter open much longer. Or, as mentioned before, planning on light painting or capturing light trails. A slow shutter speed also lets you choose a lower ISO value and thus have less noise in your image.

Conversely, a fast shutter speed is useful when you’re doing sports photography. A fast shutter can capture moving images much better and can freeze a shot with no blur. Of course, this can only be done when there is plenty of light around.

Shutter speed is measured in seconds. Experiment with the correct value before you decide which one is appropriate for the moment. Or leave it at automatic if you don’t want to be bothered.

White balance

White balance helps remove the color tint left by the light source on objects. You’ll often see that when you’re shooting indoors under an incandescent light source such as a bulb the scene has a distinct yellowish-orange tint to it. Now all cameras these days have auto white balance, which is designed to analyze the scene and remove the color cast but often it does not do its job properly, which is where the manual controls come in.

If you go through the white balance settings,
you’ll see a list of various lighting conditions, such as sunny, cloudy, incandescent/tungsten, fluorescent, etc. Depending upon the lighting condition you are in, if you think the auto white balance is not doing a good enough job it is highly recommended you switch to one of these manual modes immediately.

It might happen that sometimes even the manual option may not give best results. In which case it is recommended to mess around with all the available options and see which one gives the best results. It is important to judge based on what you see with your eyes rather than what the camera thinks is right. If you think the manual options give a stronger and unnatural color cast then switch back to auto, even if the manual mode many seem appropriate for that lighting condition.

**Focus mode**

Focus mode lets you choose how the camera will focus. There is the usual Auto mode, which means the camera can now focus from its farthest to its closest focusing range automatically by judging the distance from the subject. The Macro mode lets you shoot close up objects with ease. Some cameras will let you get close to a subject even in Auto mode whereas some will required being switched to Macro mode to come within a certain distance from the subject.

The minimum distance you can have from a subject differs from camera to camera, with some letting you get very close and others choosing not to, even in macro mode. If you think you are not able to get very close to a subject, you should then take the photo from a distance the camera is comfortable with and then crop the image to get close to the subject.

Occasionally you will find a Landscape mode option, which puts the camera in a fixed focus mode set to infinity. If you’re lucky, you might have a manual focus option on your phone, that lets you manually control the focusing distance to your liking.

On touchscreen phones, you can also tap on the screen to lock the focus at a particular point. In most cases this also locks the exposure at that point, especially if spot metering is selected. Some third party apps, however, will let you select different focus and exposure points.

It’s important that you are always in the correct focusing mode for the situation and that the image is always properly focused before you hit the shutter. Nothing ruins an image more than the lack of proper focus.
Flash settings
This one is relatively self-explanatory. You can either choose to put the flash in always on mode, where it will fire for every shot, always off mode, where it is permanently switched off or Auto mode, where it will fire depending upon the amount of ambient light and if it thinks the scene is too dark.

Some phones will also have a red-eye reduction mode. You may have seen photos taken with flash often leave bright red spots in people’s eyes. This is the result of the light from the flash bouncing off the retina and being captured by the camera. This can only happen if the pupil of the subject’s eyes are open wide, so what the red-eye reduction mode does is fire the flash several times before taking a shot with the final flash. The first few flashes will cause the subject’s pupils to constrict, so when the final shot is taken you don’t end up with red-eyes.

Scene settings
Most camera apps these days come with a bunch of preset ‘scene’ settings meant for various conditions, such as a beach, or a sunset or fireworks or snow. Each of these uses various values of exposure, white balance, ISO, etc. to arrive at a particular setting that the manufacturer thinks would be appropriate for that condition. It’s not necessary nor ideal that you use these settings in those conditions. You could try them and see if they work well; photography is all about experimentation after all. But if not, revert to your manual settings and continue as you normally would.
**Geotagging**

This feature takes advantage of the GPS on your phone to locate your position on the planet and then save the location coordinates into the EXIF data of your photos. Later on, applications that can read geotags will let you see your photos on a map so you can see exactly where you took a particular photo, in case you have a particularly bad memory.

If you don't want other people seeing your location information when you share your images, it is recommended you disable geotagging from your camera settings.

**HDR**

HDR stands for high dynamic range imaging. To understand what HDR is, we must first understand what dynamic range is. The dynamic range of a camera determines how much detail it can resolve in the light and dark areas of a scene simultaneously. A good camera will have a wide dynamic range, which means it will be able to resolve details in the bright and dark areas simultaneously. A camera with poor dynamic range will tend to blow out bright areas to pure white spots with no detail and dark areas will just appear black.

It's not always possible to have a camera with exceptional dynamic range every time, especially in mobile phones. Even when you do have a very good camera, it is not always possible to capture all the detail in a scene, especially with those with extreme lighting conditions. This is where HDR comes in.
The way HDR works is by taking multiple shots at different exposure levels and then combines them. It will take a shot at low exposure level, which will have sufficient detail in the bright areas of the scene. Then it will take a shot at the default exposure level and then it will take a shot at high exposure level, where it will then get details from the darker areas of the scene. Then it will combine all three images, which means you now have details in all areas of the scene.

In older cameras, you had to take multiple shots using bracketing and then combine them in an image editor to get an HDR image. But today’s smartphones can quickly capture multiple images at varying exposures and then stitch them in roughly the same time it takes to capture a single image. The result is an image with a much wider dynamic range.

Because of the way dynamic range works, i.e. by taking multiple images, it is best used when the camera and the subject are completely stationary. Although the images are captured in quick succession, fast moving objects can still cause some ghosting in the final image. So make sure you refrain from shooting moving subjects using HDR.

**Countdown timer**

Countdown timer lets you set a timer after which the camera automatically takes a picture. This is useful for when, say, you want to take a group photo and want everyone to be in it. You put the phone on a tripod or a support, point it in the right direction, set
the timer, pose in front of it and the camera will automatically take a picture after the timer runs out.

The timer can also be used to take a picture without disturbing the camera. You can prop the phone somewhere and then to avoid shaking it while taking a picture, just use the timer instead.

**Panorama mode**

Panorama mode lets you take an extremely wide shot, also called a panorama. Since a camera cannot take such a wide shot by default, the way this feature works is by having you move the camera horizontally and the camera takes multiple photos and then stitches them together to form one single continuous shot.

Depending upon how good the camera software is at stitching, you may end up with unusable results or something that looks like it was shot at once rather than stitched together later. Some phones, such as the iPhone 5s do a brilliant job at this, stitching together multiple high resolution images while adjusting white balance and exposure for each to get a near perfect panorama. Others, not so much. Panoramas are a nice way to capture landscapes so give it a try next time instead of taking the same old boring photos.

Now that we have talked about the camera software, let us take a look at some of the hardware. One of the most important aspects of any camera system is the lens. Two figures that worth talking about the lens is the focal length and the lens speed.

The focal length of a lens determines the amount of area it can capture. This number is usually measured in millimeters and you may find it written next to the lens as, say, 35mm. The smaller the focal length of a lens, the more area it can capture. So a wide angle lens will have lower focal length (usually 28mm) than a standard lens (35mm). Now a wide angle lens isn’t always better. On phones, for example, where you cannot zoom in, having more area in your viewfinder means everything looks smaller than with a standard, non-wide lens. This means it works out well to capture wide
Understanding Your Phone’s Camera

Landslides but for everything else you have to get much closer to get the subject in the frame.

Most phones don’t have optical zoom, so you will get a single focal length figure. Some, such as the Galaxy S4 Zoom, have two figures, indicating the focal length at minimum zoom (or wide mode) and focal length at maximum zoom (or tele mode). Zooming is essentially artificially increasing the focal length of the lens, which reduces the field of view, thereby giving the illusion of getting closer to the subject.

The other figure we mentioned earlier is lens speed. This number denotes the width that the aperture is capable of opening. On standard cameras with variable aperture, you will find two figures, one denoting the smallest aperture size and the other the maximum aperture size. Since mobile phone lenses usually have a fixed aperture size, you get just one figure, occasionally printed on the side of the lens like, say, f/2.0.

Aperture is measured in f-stops, and is often written as f/1.8, f/2.9, f/2.4, etc. The smaller the f-number, the wider the aperture is capable of opening and vice-versa. As you can imagine, an aperture that opens wide is preferable as it allows in more light for the same shutter speed compared to a narrower aperture. This means you can use a faster shutter speed with a lens with a wide aperture and still get the same amount of light as using a slow shutter speed with a narrow aperture. This is why lenses with a wide aperture are called ‘fast’ lenses.

Other than allowing more light in, a fast lens, i.e., one with a wide aperture, also has a shallower depth of field. This is not really apparent on a mobile phone camera as the lens is too small physically for this to be noticeable but if you’ve played around with DSLR lenses then you’d have noticed how fast lenses have a deliciously shallow depth of field compared to slow lenses. Depth of field is inversely proportional to the size of the aperture, so a wide aperture has less or shallow depth of field and vice-versa.

Mobile phone camera lenses are usually made of plastic but some manufacturers, such as Nokia, choose to go with higher quality branded lens from companies like Carl Zeiss who make glass lenses. A lens is the single most important part of the camera system as all the light passes through it. If the lens is bad then the image is affected negatively. A lens can make or break an image and having a good lens is of utmost importance. A good lens will be free of distortion, such as purple fringing, corner softness and barrel/pincushion distortion. However, advancement in camera software means that often the camera is able to fix some of the problems of a cheaper lens in post processing.
Quite a few smartphones these days come with optical image stabilization, that stabilizes the lens from physical movements. The lens system (and in some cases the entire camera system) is suspended in an array of springs. The camera takes the input from the accelerometer and gyroscope and determines the camera shake and then moves the camera system in the exact opposite direction of the shake, thereby canceling most of it. OIS cannot completely cancel out all the camera shake but it does help reduce it significantly. This allows you to get smoother videos and better low light images, as the camera can now use a slightly longer shutter speed to allow more light in without having to worry much about camera shake.

The sensor is just as important as the lens. The image sensor is what converts the incoming light into electrical signal, which is then turned into a digital image. The quality and physical size of the image determines the final output of the image. A bigger sensor can naturally capture more light. Two sensors of the same size and lens system will have the same amount of light falling on them. The higher resolution sensor will try to split the same amount of light into more parts, which results in a more detailed image but in low light it also results in darker image as the smaller individual pixels will receive less light than that on a sensor with bigger pixels.

To tackle this situation, HTC recently introduced the UltraPixel camera on their HTC One. Basically, this is like any other camera sensor but instead of putting in more pixels for the same sensor size like everyone else, HTC went the other way by putting in fewer pixels, four to be precise. This results in individual pixels being much bigger than on any other phone, which in theory gives much better results in low light. To HTC’s credit, the UltraPixel camera does produce good images in low light but the 4 megapixel resolution is not sufficient to resolve enough detail in daylight conditions.

Advancement in camera technology means we don’t have to worry about that too much about pixel size now. We even have advanced tech such as backside-illumination now available on mobile phones, which was once considered too complicated and expensive for these devices. A backside-illuminated sensor places the wiring layer behind the sensor instead of in front of it. This allows more light to fall directly on the sensor instead of first passing through the wiring layer. The sensors themselves are more sensitive now, which allows them to be smaller without output.

The last part of the camera hardware is the flash. Almost all phones that have a flash have an LED or light emitting diode flash. Compared to xenon flash on proper cameras, an LED can stay on for much longer and
is also more power efficient. However, it cannot achieve the same blinding intensity of a xenon flash and has its own color cast that is not as pleasing to the eye as the pure white light of a xenon flash.

This is why serious camera phones in the past, particularly from Nokia, have had a xenon flash on them. Because xenon flash stays on for just a fraction of a second, the camera also uses a very, very fast shutter speed. Due to this, you can freeze the action with a xenon flash that you just can’t do with an LED flash. Try taking a picture of a moving fan with a camera having a xenon flash and you’ll see the blades perfectly stationary in the picture as if the fan was switched off.

Most companies, however, avoid the use of xenon flash on their phones due the cost and its sheer size compared to the tiny LED. Some compensate for the intensity by having two LED units. This just causes more annoyance to people you try to photography, as staring into dual LED for full two seconds can leave you dazzled (and not in a good way), unlike a xenon flash that is only on for a split second.

To take care of the color cast, Apple recently introduced dual tone LED flash on the iPhone 5s, which it calls True Tone flash. It uses a white and an amber LED in a pair and depending upon the ambient light the camera smartly adjusts the intensity of each LED unit, thereby trying to get the correct color tone for the flash. This results in a more natural flash color regardless of the situation you are in.

Now that we know enough about the camera software and hardware, we will next learn how to use all that knowledge to capture great photos.
A photograph is only as good as its composition.

It can’t be stressed enough how important composition is to a good photograph. Composition is the way you arrange your subject in the frame or rather how you frame your subject. Composition is what separates a photograph from an image and a professional from an amateur.

Granted, a huge part of good composition is having a photographer’s eye. You need to have that vision that lets you visualize a photo even before you take it. Where you can spot something special even in something mundane and make it look special to everyone. Admittedly, not everyone is born with this gift, in the same way not everyone can sing or paint. But with a few tips, you can turn your photos from mediocre to good and from good to great.

One of the basic rules of composition is the rule of thirds and something all photographers follow. Imagine your viewfinder is
split into nine equal parts by two horizontal and vertical lines. According to the rule of thirds, you should always try to place the subject along these lines or where they intersect, instead of right in the middle. The reason for this is that an image where the subject is placed one thirds into the frame looks more pleasing than one where the subject is right in the middle.

Let’s say you’re shooting a portrait of a person or, say, a lamp post on the street. Instead of having the subject right in the middle, align it alongside one of the vertical lines one thirds or two thirds into the frame and the shot will turn out to be a lot more interesting.

Similarly, when you are shooting something such as a sunset, try and align the horizon along one of the horizontal lines and the effect would be lot more pleasing than splitting the frame in half. Depending upon whether you want to focus more on the water or the sky, you should align the horizon on the upper third or lower third line, respectively. If you are dealing with a small object, it makes sense to place it along one of the four points where the grid lines would meet, ideally the lower two.

The rule of thirds is not a hard and fast rule and as is often the case with photography you are encouraged to experiment. It is, however, a tried and tested rule and in most cases gives the best results.

Another style of composition is symmetry. This works particularly well for 1:1 aspect ratio or square shots typically used for Instagram. As you can
tell, in symmetry, you try and get the left and right side of the frame to look like mirror images. You may often come across structures or patterns that exhibit this design that makes them good subjects for symmetrical shots.

Opportunities to take a symmetrical shot are more common than you’d think and you just have to keep an eye out for them. When you do spot such an instance, it is important to frame the subject correctly. Observe it carefully through the viewfinder to ensure the subject is split evenly across the middle of the frame. If not, it is recommended you move around so that you can capture it from the exact center. Observe the sides, especially, to check if everything is even on both sides and make sure the alignment is proper. Check other aspects of the shot as well, that may not be prominently visible initially but may seem misaligned even if the rest of the subject seems perfect. If done correctly, you will have a perfectly symmetrical shot, ready to be posted on Instagram.

Some other things to look out for while composing a shot:

- **Patterns:** Look for patterns, shapes that repeat themselves after a while. Examples of this would be bricks in a wall, windows on the side of a building, flower petals, a spiral staircase, etc.

- **Geometric shapes and patterns:** Injecting a little geometry into your photos can make them a lot more interesting. Look for diagonal lines dominating the frame, or square or triangular subjects, such as the
corner of a building’s roof. You can have a lot of fun with geometry and it always turns out better than simply taking a photo with no regards to your surroundings.

- **Leading Lines:** You can use subjects and lines in the frame to draw your eyes towards the horizon or towards a vanishing point. This works
Composing a good shot particularly well when used with symmetry. For example, if you stand in the middle of a straight road, you can see the sides of the road leading towards the horizon. This can also be done over a disused railway track or on a bridge and in many other cases.

**Negative space:** Usually when a photograph is taken, the subject is made the focus of the frame and often it fills the view. However, to change things up a bit, you can instead make the subject a small part of your frame, and instead leave the rest blank, ideally by having a simple background. You could, for example, photograph someone or something in front of a white wall and let the subject occupy a small part of your frame, leaving the white wall to occupy an overwhelming majority of the frame. Even though the empty space is more in the frame, it acts to reinforce the presence of the smaller subject and bring attention to it.

**Framing:** You can use structures or other objects in your surroundings to create a frame for your subject. For example, you can shoot a subject through an open door, which would create a frame of sorts for your subject. The same can be done by shooting something through a window, with the edges of the window being part of the frame but out of focus, so they frame the subject without becoming the subject themselves. You can also shoot through large arches using the arch as a frame for your shot.

**Asymmetry:** We talked about symmetry before but sometimes you can get interesting results by deliberately introducing some asym-
Composing a good shot

metry into your shots. Having a frame where the subject is on one side with the background in the rest of the frame (negative space) can give some results.

Viewpoint: More often than not we try to take a photograph by keeping the camera on roughly the same height as the subject. However, some shots can benefit a lot by experimenting a bit with the viewpoint. Instead of shooting at shoulder height, try holding the camera down low and pointing it upwards at the subject. Or you can keep it on the ground and shoot straight, which will include the ground in the shot and give a nice sense of depth. Alternatively, you can climb higher and try to take a shot from above for a different viewpoint. Point is, experiment with how you hold your camera and you may get some interesting results.

Alignment is something that is very important in composition and also something so many people just can’t get right. To be honest, this is the easiest thing to check and correct while shooting but most people can’t be bothered with it, which results in awfully tilted shots.

Unless you are using some of the third party apps, none of the phone camera apps by default come with a level meter to show if you’re holding the phone perfectly level. You can, however, use your judgement and the grid lines to roughly level the shot, which in most cases works out perfectly fine.
Getting the alignment right is especially important when you’re shooting a landscape shot, such as the sunset, for example. In that case, it is important to get the horizon level or else the entire shot is ruined.

These days you get apps that will help you finely rotate an image to align the image properly in case you messed up. That can always be your last resort, but it is always better to make sure you shoot the image correctly the first time around.

There are times, however, where a perfectly level image isn’t particularly interesting. A tilted perspective can make certain subjects way more interesting rather than capturing them perfectly straight. It’s important to occasionally try and rotate the camera around and see if you can make it more appealing.

One of the most important things about composition, however, is imagination. Sometimes, you need to create a scene in your mind, something you would like to photograph and something you can actually go and shoot. Quite often we just shoot what we see but at times we also have to see in our minds what we want to shoot and then work towards achieving that. If you know you are going somewhere picturesque and if you’ve already been there, try creating scenarios in your mind that you’d like to photograph. This
way you would already have an idea of what you need to do when you get there, which would also save you a lot of time.

Another important thing is observation. A good photographer is also a good observer and you should constantly be on the look out for interesting things in your surroundings. Sometimes, even the most mundane things can look good when shot properly. Get into the habit of seeing things the way they would look after they were photographed and soon enough you’ll start seeing photo opportunities everywhere. Don’t just look at things but also think in your mind’s eye as to how you can photograph it and if it would look good. If you think it would, take out your camera and give it a shot. Avoid shooting anything and everything. Keep the signal to noise ratio low. Don’t be the person who takes pictures of everything. When shooting, shoot with the final result in mind, not just with what you’re looking at. Shoot photos you’d want to see, and you’d want people to see.

**Editing**

Most people don’t realize this but editing is as big a part of photography as the actual shooting of images. Most of the great photos you see online are edited and enhanced to look better than what they actually were. A good editing job can salvage a poor image and make it look decent and can turn a great picture into something exceptional.

As for the first part, sometimes you take a shot that is not properly composed. Fortunately, you can fix some of the follies in post processing. The crop tool is very important and helps you keep just the part of the image you want while leaving the rest out. If you misjudged your composition you can crop the photo in such a way so that it appears much better than the original. You can edit it such that the image complies with the rule of thirds or the golden ratio even if the original image failed to. Or you could use the rotation tool to level the horizon in the image.

But of course, editing goes beyond just cropping and rotating. Among the many things you can do in post processing, is adjusting the exposure, contrast, white balance and saturation. With exposure, you can increase or decrease the amount of light in the image. You can either use the simple exposure tool for this or if you know your way around apps like Photoshop better, then something like the Curves tool. You can also use the shadows and highlights tool to increase the amount of details in the shadows and try to reduce blown highlights respectively.
Contrast and saturation adjustment will let you add some pop to the images. Unlike DSLR images, most camera phone images have heavier built-in processing, which means the phone’s software already does quite a few adjustments before saving the image to JPEG format, which often involves bumping up the contrast and saturation slightly to make the image more appealing. But if you feel that it is not enough, you can always make increase it slightly in editing. The trick here is to maintain the balance between attractiveness of the image and believability. The colours and contrast should not be increased to the point where they appear over the top and outrageous. With judicious use of these controls, you can get get great results without the image having an over processed look.

Adjusting white balance often necessary for photos taken indoors. Even if you set the camera in the correct white balance mode, you often get images with a colour cast to them. Thankfully, this can easily be removed in images in most cases later on. You can use, for example, the Levels tool in Photoshop to get rid of the colour cast and get a more natural white balance for your images.

Filters, when used correctly, can be enormously beneficial. Filters can set a mood for an image with their colour tone and depending upon the filter you use you can either enhance the mood of the image or just ruin it completely. Choosing a filter is not just about selecting the one that has the most contrast or the brightest colours. The filter has to match the mood of the image and complement it. Filters on mobile phone photographs also help hide typical image quality issues such as compression artefacts and noise. Choose your filter wisely, and you can improve your photograph substantially. And if you think an image does not need a filter, don’t bother with one. Some images are best left alone.
Cameraphone Comparison

Which is the best camera phone out there? Based on our tests we come to some conclusions.

Saying that cellphones have come a long way would be one of the biggest understatements of the year. They’ve gone from large, clunky monochromed bricks to devices that are designed with elegance and have rendered the notebook, the mp3 player, and even wallets (in some cases) obsolete! The cellphone advancement is heading in the direction of being the “onedevice-to-rule-them-all”. It has its eyes set on replacing your point and shoot camera.

With society becoming increasingly connected, thanks to social media and its increasing need to share information in a world where individual citizens try to grasp on to the fading idea of privacy, the camera has become extremely essential for the proper functioning of this social machine. Earlier, it was “take your camera, shoot the party, go home, transfer photos to your PC and THEN post them online.” The process was long and tedious and someone had the genius idea of “what if you could just take the photos on your phone?” While it was a solid notion, the problem was that cellphone cameras with their miniature sensors just couldn’t match up to the quality of even the basic point and shoot.
Today, all that changes. We have with us 10 cellphones with industry-leading camera modules. We present them to you in the order that we ranked them and follow it up with a detailed battle between the top two contenders of this list.

### BEST CAMERA PHONES

List of best camera phones in India. These are smartphones with best imaging performance in terms of picture quality and video quality. The list is based in-depth reviews of the camera performance of smartphones available in India. This list has best camera phones from Nokia, Samsung, Apple, Sony and more.

<table>
<thead>
<tr>
<th></th>
<th>Model</th>
<th>Description</th>
<th>Price</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nokia Lumia 1020</td>
<td>The Nokia Lumia 1020 is the best camera phone in the market today. Thanks to it’s large, 0.6” BSI CMOS sensor and 41MP output. You get excellent details and enough resolution for large poster size prints</td>
<td>₹42,990</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>2</td>
<td>Sony Xperia Z1</td>
<td>The Xperia Z1 produces excellent, sharp images with its 20 MP BSI sensor coupled with Sony G lens. It’s rapid start-up time makes it the best camera phone for capturing instant images.</td>
<td>₹44,990</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>3</td>
<td>Apple iPhone 5S</td>
<td>The iPhone 5s produces excellent images in day light, comparable and occasionally beating the Lumia 1020 in color fidelity and details. It’s unique dual-flash system aids low-light shooting.</td>
<td>₹53,500</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>4</td>
<td>Nokia Lumia 925</td>
<td>The Lumia 925 is the best camera phone to buy after the lumia 1020 on the Windows phone platform. It boasts of optically image stabilized lens and a fast f2.0 aperture backed up by carl zeiss optics.</td>
<td>₹33,499</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>5</td>
<td>Nokia Lumia 920</td>
<td>The Lumia 920 performs almost identical to the Lumia 925. The Lumia 920 is a good choice for anyone wanting same camera performance in a heavier and robustly built body, that can take some rough use.</td>
<td>₹38,999</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>Device</td>
<td>Description</td>
<td>Price</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>LG G2</td>
<td>The most unique aspect of the LG G2 is the optical image stabilization and the shutter button at the back for self shots. The LG G2 is a good camera phone as long as you have ample light.</td>
<td>₹41,500</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Apple iPhone 5</td>
<td>The iPhone 5, while being a generation older, is a very capable shooter. Its shutter response and overall response time is at par with the best camera phones in the business.</td>
<td>₹45,500</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Samsung Galaxy S4</td>
<td>The Samsung Galaxy S4 has tons of software tricks that allow you to tweak your results after they are captured. We were particularly impressed with its fast AF system. White balance is slightly off though.</td>
<td>₹41,500</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>HTC One</td>
<td>HTC One’s larger pixels philosophy is a step in the right direction, allowing better results in low-light. But, 4MP is too low a resolution for even a camera phone, dismissing any chance of crops.</td>
<td>₹42,900</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Apple iPhone 4S</td>
<td>The Apple iPhone 4S just about manages to sneak into our list of the best camera phones in India. Thanks to its color, white balance and contrast performance, it still manages to be a capable camera phone.</td>
<td>₹44,500</td>
<td></td>
</tr>
</tbody>
</table>

**iPhone 5S vs. Nokia Lumia 1020: The Definitive Camera Showdown**

The iPhone 5S or the Lumia 1020? Which is the superior camera? You think specifications are all that matter? Well, we’re putting it all to the test!

The iPhone has been a game changer ever since it was introduced and even though the pace has considerably slowed down since, it is still the most
sought after mobile phones in the market. One of the areas that it really made an impact was imaging. Up until the introduction of the iPhone, photography was the domain of actual cameras, but since its inception, the iPhone has become the defacto camera of choice for many across the world. Then Nokia changed the game again with the Pure-View 808, and then again with the Lumia 920 and no with the Lumia 1020.

The Lumia 1020 is a 41 megapixel shooter, courtesy of a much larger sensor complimented by Zeiss optics with optical image stabilization.

The iPhone 5s has none of that. It has an 8 megapixel sensor with a slight increase in sensor area. It has a fast f/2.2 aperture lens, which the Lumia 1020 does as well. So which of the two is better? We set out to determine just that.

Like: The iPhone’s accurate white balance. The 1020’s Bokeh!

The left image (iPhone 5s) is clearly a much better balanced image than on the right, which was shot by the Lumia 1020. We used the full resolution file from the 1020, which was downsampled to 8 megapixels before making the 100% crop, which you see on the top right corner. In terms of sharpness, both
the cameras seem to be on top of their game, although the 38MP file from the Lumia 1020 does harbour far more detail. The larger sensor also lends to a more pleasing bokeh, but the white balance seems to be completely off.

Once again, the lower contrast levels of the Lumia 1020 are present, but the centre crop shows that the Zeiss optics are totally dominating the iPhone’s lens. The crop shows that the Lumia 1020 renders a much sharper image, something to be quite mindful of.

This is oil on canvas and as you can see from both the shots, the 100% crops are rather devoid of the canvas texture. However, what is evident
is that the Lumia 1020 shot has lesser noise, while the one from the iPhone 5S shows a little bit of grain. We explore more low capabilities in a few moments.

One of our colleagues being lit mostly by the light from his laptop. The iPhone shot seems to be more colder (and accurate) in white balance than the Lumia 1020 shot. It also seems to have retained more detail in the blacks, as you can see in the bottom edge of the 100% crops. The facial hair is still discernible in the left shot, but not so in the Lumia 1020 shot.

Going all out, we went out! Bad puns aside, a lot of us shoot outdoors under the harsh light, so to that end, we see that while the iPhone 5S shot has a slightly warmer tone, it has a richer saturation that the Lumia 1020 (and more contrast too). The 100% crops on the top right corner are of the tree leaves and from what we can tell, its rather impressive that both these cameras are able to clearly capture this fine level of detail.

Like: Iphone's level of detail even in tough conditions. Lumia 1020's overall sharpness and dynamic range

Like: The detail from both cameras!
This shot was shot under shadows, but during the day. Both the phones were set to focus and meter according to the orange flower that stands the tallest. As visible here, the Lumia 1020 did a much better job of nailing the exposure and white balance as we start to see some detail get lost due to over saturation on the iPhone shot. Also notice the bokeh, where the leaves in the pot of the Lumia shot are blurred, while the ones from the iphone shot are not. The larger sensor shines here and in a few other places that we’ll talk of later.

Clearly, we love shooting flowers, since there seem to be so many of so many kind all over the city! We found a little patch by the road just around sunset and took this photo. It would seem that in order to compensate for the light and colour, the iPhone warms up the image, while the Lumia 1020 retains its cooler tones. We, quite frankly love both the shots, the Lumia’s for its soft out of focus bits and the iPhone’s for its crisp colours.
The reds, pinks and the greens are so well complimented by the Lumia’s ability to maintain the correct white balance even in the not-so-ideal lighting conditions.

The iPhone, on the other hand, has seem to have done a better job at metering the correct exposure. Something we have seen consistently in at least 90% of our shooting time with the phone.

So here, too, the choice depends on your own personal usage of the phone’s camera, not to mention your own taste in colour. Some people may just prefer a warmer tone of the iPhone over the cold bluish tone of the Lumia.

Shot in absolute dark, a signboard in one of the residential colonies.

While taking this photo, we had a very interesting revelation. The AF on the iPhone actually managed to lock onto the text on the sign (that’s where we told it to focus) despite the fact that the screen showed nothing. The Lumia 1020’s screen was also blank due to the darkness, but it needed the AF assist lamp in order to lock focus (it just didn’t focus without it!). As for
the image, the Lumia 1020 shot its image at 1/3 seconds at ISO 4000 while the iPhone’s was at 1/15 seconds at ISO 2500. Despite that stark difference in ISO levels, the Lumia 1020’s image seems to have lesser noise than the iPhone’s, but that isn’t to say the iPhone’s image is bad. If it wasn’t for the overtly strong orange tone, the iPhone would have been the winner here.

Another low-light shot illuminated by a small CFL lamp 20 feet away. Both the cameras were instructed to focus on the nose. The iPhone’s image is not only well-exposed (actually just slightly over, but that is ok) while the Lumia 1020’s image is underexposed. Worse yet, it seems like the optical image stabilization was of no help as the camera shake is evident on the shot on the right.

Like: iPhone managed a crisp shot despite not having OIS. The Lumia 1020 on the other hand...

Like: The Lumia 1020’s ability to retain blacks, the iPhone 5S’s optics that curtail halo and flare
This shot was taken to determine how the two cameras would handle strong sources of light placed just outside the frame. The bookshelf (yes, that’s what it is) was lit by a very bright 23 Watt CFL lamp just 15 inches above it. As you can see, the iPhone totally kills the blacks in an attempt to bring out detail, while the Lumia 1020 retains the smooth blacks on the drape. However, the Lumia 1020’s optics are susceptible to the halo effect (and even flare in some condition), but the iPhone 5S seems to be somewhat impervious to such artefact.

A Flower arrangement shot at a wedding, being lit by those ugly purple-red-blue kind of LED lamps.

Again we see in the crop that the Lumia 1020 has lesser noise than the iPhone, but we also see that the iPhone shot is just slightly brighter than the Lumia’s. The Nokia device seems to have a sharper image though.

Like: BACON

Yes. Bacon. Everyone loves it. Both shots are simply amazing, because they have bacon as the subject. Bacon, Bacon, Bacon. Actually this test is kind of redundant, because seriously, is it even possible to photograph bacon wrong? Look at it! The texture, the colour, the beauty in every curve – every little detail of this scrumptious delight highlights its incomparable beauty and makes even the most staunch dieter’s mouth water in anticipation of what comes next.

Excuse me. We skipped breakfast. We’ll be right back.
The best show of the Lumia 1020’s large sensor’s capabilities. As you can see the shot for yourself, you will notice that the shadow areas have far more detail. That is due to the fact that the larger sensor on the Lumia is able to capture far more dynamic range than what the iPhone 5S is capable of. Does this make the iPhone 5S a bad camera? Well, do you think the image on the left is bad, because we sure don’t think so!

**Conclusion**

After using the iPhone 5S and the Lumia 1020 side by side for a lengthy period of time, we have come to the conclusion that both cameras phones have their strong suites and weak points.

The iPhone’s optics seem to be better than that of the Nokia 1020 in most conditions, with better visibly and corner sharpness. It would also seem that the white balance on the iPhone is great under harsh sunlight, but tends to be a little off when the light goes down. The Lumia captures great detail for a camera phone and stands quite undefeated in that arena, but the camera is as slow as a tortoise and so very frustrating to use!

Both the iPhone and the Lumia 1020 spit out excellent images. So we can safely conclude that the ‘better’ phone is more of a personal opinion than anything else.

However, what remains clear is that the iPhone 5S will nail the shot at least 95% of the time.

The Lumia 1020’s camera requires tweaking and a lot of patience and any burst capabilities are out of the question. Also, do you really NEED 38 Megapixel images when you easily make do with 8 Megapixel ones?

**Bottomline:** Choose your camera phone according to how you use the camera on your phone. 😁
While smartphones are capable of pulling off some really impressive feats when it comes to photography, what can you add to it to take your images to the next level?

It wouldn’t suffice to say that smartphones have come a long way, moreso to say that they have made a few things obsolete. From books to the postal service, the smartphone has picked up and swallowed just about everything.

The smartphone camera that was once infamous for producing photos of such low quality that the world began to call it a tuber, has begun to catch up, giving digital cameras a run for their money.

And when you suddenly remember someone saying ‘the best camera is the one that’s with you’, you wonder why you don’t own any accessories for your smartphone’s camera to give it that edge.

Let’s look at the accessories you can add to your smartphone to turn it into a photo-beast.

**Stability**

Nothing is more annoying than a perfectly good shot ruined by an unsteady hand. Sure you could use a tripod but nothing short of a roll of duct tape
would allow you put your smartphone and the average tripod together. That was until Joby’s GripTight came in to the scene.

Now before you say ‘I’m sure it works only on the iPhone,’ let me point out that it works with any phone that is between 2.1 to 2.8 inches on the short side. It even works with most cases slapped on to the smartphone. It is small, folds away neatly in your pocket and is compatible with the standard sized screws found on tripod base plates.

You could also take a look at Square Jellyfish’s spring tripod mount. It accommodates larger phones of up to 3.5 inches on the short side and can go from ‘vertical to horizontal in seconds’. It’s got a ball head design which the GripTight doesn’t have and they’ve also got a whole bunch of accessories that go with this accessory.

Last but not least on the matter of stability would be the smartphone monopod or the Quikpod. Better known as the smartphone selfie stick, its use is best experienced if you are socially awkward and wouldn’t dare ask people if they would take your picture. Back packing through a country where the crime rates are through the roof is a close second. It is basically a monopod with a mirror on it so you can position yourself and take full advantage of the hi-mega pixel sensor on the back of your phone instead of the potato on the front.

If your wallet is your major constraint, Tina Sieber from makeuseof.com has a solution for you. With some duct tape, a hex nut, a binder clip, pliers and your tripod’s base plate, Tina claims you can build your own tripod mount in under a minute.

Step one would be to wrap the binder clip with duct tape so that it doesn’t scratch your phone. Make sure that the fit is good and not too tight.

With the pliers, get rid of the washer that’s keeping the base plate’s screw in place and throw in a longer screw with a hex nut.

Thread one of the binder clip’s handles in to the screw and tighten the hex nut to hold it in place. You might need to bend the handle a little bit and your DIY tripod mount is ready. Just watch out for how tight the binder clip is. There’s another DIY tripod mount put up by Tina on the website that’s a little more complex but not worth giving a miss.
Lenses and Filters
Let’s face it, we’re all tired of kids running around with DSLRs clicking closeup pictures of the road and zoomed in photos of your eyes. Well it’s time we gave them a run for their money at a fraction of the cost. We are talking lenses for your smartphone and we are also throwing in fish-eye lenses that no fast talking, trouser saggin’, DSLR holding juvenile delinquent could ever dream of. Unless his dad is rich. Then we are better of staying quiet.

In the interest of fairness, we are only going to be talking about lenses that allow universal compatibility. So, the iPhone compatible Olloclip that ‘clips’ on to the corner of your iPhone and can turn the standard iPhone lens in to a 2X zoom, a wide angle and a macro lens will be completely ignored.

What we will talk about is the Photojojo Lens Set available at photojojo.com. Made of solid aluminium and high quality glass, these lenses can be mounted on anything from an iPad to an Android phone of your choosing. How is that possible? Well, it involves a metal ring, some adhesives and magnets.

By sticking the adhesive metal ring around your smartphone’s camera lens, you can use the magnets embedded in to the lenses to attach them firmly to your smartphone. The entire lot consists of a 2X tele, a wide/macro, a 180 degree fisheye, a 235 degree super fisheye and even a polarizer.

Photojojo claim that their lenses are compatible with every smartphone and have designed rings specially for the iPhone 4, 4s, 5, 5s and the 5c.

The next on our list is the pricey and supremely capable offerings from the same people who gave us the portable cassette player. They have given us what is essentially a camera lens that doesn’t even need to be attached to a body.

Using NFC, Sony’s QX 10 and QX 100 which contain the sensors inside them turn
Aftermarket Accessories

Your phone in to the display/viewfinder. You can either attach these ‘lens cameras’ to your phone and take a more traditional approach or your could take selfies in glorious 18 to 20 megapixels without worrying about whether you are following the rule of thirds or not. The choice is yours, although, needless to say, these things cost a bomb.

Since we are talking about things costing bombs, we must talk about rapper Will.i.am’s offering to smartphone photography. Costing a cool $475, critics have dubbed the i.am+ foto.shosho as garish. But on the plus side, it’s gold, comes with its own flash and has interchangeable lenses and some models come with their own sensor.

Filters

With Instagram taking the world by storm, filterless photos are a photographic faux pas. The filters that are available are limited and have become boring. Also, the hipster in us feels bad because back in the day, these effects were created with graded filters, sweat, vaseline and toil. Long live analogue and before you know it, you’re on lomography.in.

Well, fear no more for the hipster inside us will behave like a cat after a bellyrub when you feast your eyes on this.

What we have is The Pro Phone Filter Stack. Three gradient filters in red, blue and yellow on a universal smartphone adaptor. Stack them and rotate them to create photo effects that are truly unique. You can even throw in some artistic lens flare with these filters.

A good alternative to this is the Jelly Cameraphone Filter, another universal smartphone filter accessory. Instead on relying on a case to hold the filters in place, these filters come with a reusable sticky, jelly ring that peels away without any residue. These colourful little plastic lenses come with a kaleidoscope effect, a staburst effect and a wide angle lens.

But what list of analogue filter effects is complete without Holga’s little creation. Once again compatible with only the iPhone, the Holga Lens Filter Case brings to the macworld nine analogue filters. Just slap it on to your iPhone like any other case and line the filter up to the lens using the rotating dial and voila! A true example of what happens when hi-tech meets lo-fi.
**Lights**

It’s a pain having to use your smartphone in dimly lit spaces. The built-in flash just doesn’t cut it whether it’s a xenon flash or just a dinky little LED. To overcome this, the good folks at Manfrotto, the Italian company renowned for making some of the best tripods have diversified and have given us the Klyp.

What it is, is essentially an iPhone case with mounts. You can mount the LED bank that comes with it on any one of the four mounts and pick one of the remainders for use as a tripod mount. The LEDs are balanced for daylight and since they run on separate batteries, they won’t run down the charge on your iPhone.

A more than worthy alternative that’s Android compatible as well is the Kick. Made by Riftlabs, the Kick is a bank of LEDs that not only serves the purpose of a constant source of light, it also comes with a whole lot of light effects that can be controlled via its smartphone app available for both iOS and Android devices. What kind of effects you ask? The Kick can not only project a myraid of colours, it can also mimic the flicker of candle light even the flicker of a TV. With no cables involved, the Kick connects to your smartphone over Wi-Fi and gives you a free reign over its features.

Last but not least would be the cheap and basic Pocket Spotlight once again from photojojo.com. It is a simple array of LEDs that can either be mounted on a hot shoe or plugged in to the 3.5mm jack on your smartphone. It’s not exactly bright but what it does give is a reasonable amount of room for creative lighting without breaking the bank.

Of course it is possible for the average joe to make a simple LED bank at home and instructables has a few ranging from Light Boxes to Ring flashes.

**Shutter Releases**

You get the family ready for a portrait and because you now have an amateur studio at your disposal, you mount your smartphone on your tripod, you set up the lights, you throw on the wide angle lens, your family is ready. Everything is set except for one thing. You are not in the frame and because you spent all your money on your smartphone studio, you didn’t bother calling a photographer to take the shot. What are you going to do now?
Simple, you get yourself a shutter release for your smartphone and Hong Kong based Muku’s Shuttr is just that. Paired with your smartphone via bluetooth, the Shuttr can even become a part of your keychain. Compatible with most smartphones, the Shuttr is superbly built and is in fact that first remote shutter release for a smartphone.

Similar to the Shuttr is the ShutterBall and it does what it says- it’s a ball that operates your camera’s shutter. Once again bluetooth based but what sets it apart from the Shuttr is the fact that the battery lasts up to five years.

Not exactly an alternative but still something on similar lines is the the Red Pop, a physical shutter button for clicking photos on the iPhone. Using it is as simple as attaching it to your iPhone. The Red Pop app starts immediately and you can start clicking right away.

A similar device called Snappgrip is one step up from the Red Pop left off. Currently only compatible with the iPhones and with Android support coming soon, Snappgrip is a camera controller that snaps on to a proprietary case. It communicates with the Snappgrip app via bluetooth and give the shooter complete control over the shutter, the shooting modes and the zoom. The grip even has a tripod mount on the underside and snaps off when you don’t want to click photos.

**Power**

A long day of shooting and your smartphone is out of juice. Well it’s not exactly a surprise but it is very annoying to have a smartphone that has the tendency to suddenly turn in to a paperweight. Only solution is to juice it up.

The first thing you can do is find a battery case. A battery case is nothing more than a battery pack that sits piggy back on the back of the phone. They certainly make your device weigh considerably more and also make it a lot more clunkier but if your smart phone leaps from barely lasting a
day to running a three day long marathon, who’s complaining? Most of the cases in the market also double up as protection for your smartphone but finding reliable cases for older models, especially older Android models is where these guys tend to lose out.

If you fall in to the above category, your only choice is to go for a clunky battery pack that charges your device via USB cables. Banks can be as tiny as using AAA batteries to charge devices to a massive 26,000 mAh Li-ion battery if you spring for something like the Intocircuit Power Castle. Sure, 26,000 mAh may seem like a lot but you will definitely thank yourself when you’re out trekking and it manages to charge your laptop, your phone and your GPS.

If you prefer something a little more minimal and you feel that a little elbow grease never hurt anybody, you should consider a hand cranked charger. The design is pretty basic really, the charger is a crank that turns a dynamo that generates electricity. Plug your device in to the charger and start cranking to charge the battery. The advantage here is the fact that you really don’t need to worry finding a power source or pray that the sun comes out to charge your solar panels.

An interesting crank charger is the SOSCharger. Why it is different is because it has a 2000 mAh lithium ion battery built in to it. You could charge the built in battery using a plug point or you could charge it by hand.

At the end of the day, it’s really about whether you really need all these accessories or of you’re just suffering gear acquisition syndrome so choose wisely and happy clicking.
TIPS AND TRICKS

These little tips and tricks will help you get the most out of your smartphone’s camera

By now we have learnt about the history of smartphone cameras, their software and hardware, some composition techniques, best camera phones on the market and accessories for them. Now let us talk about some tips and tricks to get the most out of your smartphone’s camera.

Keep the lens clean
We have talked about before as to how important the lens is in the whole equation that is photography. Considering all light passes through the lens, the lens being in perfect condition is of utmost importance. On a smartphone especially, where you can’t just change the lens the way you can on a DSLR, you have to be very careful with it.

The first thing to remember with the lens is to keep it clean. You don’t have to keep cleaning it all the time but it is very necessary that you clean it every time you take your first shot. The unfortunate positioning of the camera lens on the back of the phone means it often ends up as the resting place for our fingers. This results in smudges all over the lens cover (the actual lens is inside and inaccessible), which can really spoil your image quality.
The trick is to wipe the lens thoroughly before you take a picture without fail. You can't just rub it over your shirt or trousers once but take a few seconds and wipe the lens with the end of your shirt or handkerchief. If you wear glasses then you can also use the cloth that comes with them. Or if you want to be thorough, then you can carry a cleaning cloth with you.

A clean lens can make a world of difference. A clean lens will basically allow your camera to operate at its full potential. A dirty lens will throw distorted light onto the sensor, which causes visual aberrations such as purple fringing and smudged light sources with long streaks or halos surrounding them. You must also take care not to scratch the lens, as there is no wiping that away and it will permanently affect your photos every time.

**Familiarize yourself with your camera software**

If you take some time out to familiarize yourself with your phone's camera software, you could save valuable time when you're actually taking photos.
Most of them have the same basic settings but their location could vary wildly. Some may have options others don’t and vice-versa. Some allow you to customize the layout of certain settings that allows you to access them quickly, so you should definitely take advantage of that. Some of the settings, such as white balance, can be set in advance if you know what you are going to shoot, which again saves some time later.

If you feel like the default camera software on your phone is not good enough then you can consider investing in a third party alternative. Both iOS and Android have a good variety of camera applications available that offer a wealth of options that you can use while shooting.

**Hold the camera properly**

This might sound silly but most people don’t really hold their phones properly while shooting. The correct way to hold the phone is with both hands, with your elbows tucked in. This helps stabilize your elbows, which in turn stabilizes your arms, reducing camera shake. Floating hands tend to shake much more. It’s also important to have a firm grip on your phone as that will also help stabilize it and also reduce the chances of dropping it.

Another thing you can do to further stabilize your phone is to stand with your feet apart. When your feet are further apart, your upper body has to work less to keep you upright, which results in less movement, which all adds up to a more stable picture.

If you have the luxury of a stable platform where you can rest your phone, use it. Keeping the phone on a stable platform is always preferable.
to holding it in your hands, no matter how still your hands are. Just make
sure you don't press any of the buttons on the side of the phone when you
keep it on a surface. That can be really frustrating.

But of course, the best way to stabilize the camera is by using a tripod.
You get tripod mounts these days for phones that can accommodate a large
variety of phones and let you use any old tripod with them. You could also
consider investing in a Gorilla Pod as it is more portable and more suitable
for use with a smartphone than a full size tripod.

With video recording you have a few more things to remember. Just as
with photos, camera shake affects videos as well and gets recorded into
it, which may not be noticeable while shooting but can be jarring when
you watch these videos later on a bigger screen. To solve this problem,
many of the high end smartphones these days come with either digital
image stabilization or optical image stabilization. The former may or may
not give good results depending upon how good the software is. What
it does do, however, is cut into your field of view when you activate it,
so if you think you won't be needing video stabilization, like say if you
have support, then disabling it from the settings will gain you a wider
field of view.

Optical image stabilization is free from this nonsense and usually also
works a lot better than digital image stabilization. If you have a phone with
OIS, you are bound to get smoother videos but it is still recommended to
keep the phone relatively steady.

When you're shooting a video, you must be careful not to block the
microphones on the side. Most people hold the phone by its sides while
shooting and this can block the mics placed there. They are there to give
you a stereo sound effect and blocking them not only reduces the effect but
also dulls the audio quality. So make sure you locate the mics on your phone
and make sure you don't block them while shooting a video.

One last thing to remember while shooting a video, and this one is very
important, is to always shoot in landscape mode. Videos are meant to be
watched horizontally. Our eyes are horizontally placed. Monitors and
televisiones are horizontally designed. Cinema screens are horizontally
designed. So videos should also be shot in landscape mode. It might seem
fine when you're recording or watching a portrait video on your phone
because a phone can be held in any orientation but you can't do that with
your monitor or TV. So don't be the person who holds the phone in portrait
to shoot vertical videos. Nobody likes that person.
Lighting

One can’t stress the importance of lighting in photography enough. All cameras need a sufficient amount of light to take good pictures. A camera is at its best in bright light, which is why photos taken in the daylight are sharper and clearer than those taken indoors. Sufficient lighting is especially important for mobile phone cameras with their small lenses and sensors that can’t capture as much light as a big DSLR.

It is therefore important to get sufficient light on to your subject before taking a picture. If you can move the subject, then move it to where you can get more light on it. If you can’t move the subject and are taking photos in low light, then switch to low light mode on your camera while keeping the camera very still as in this mode the camera usually switches over to a slower shutter speed.

Sometimes you have enough light but the way light falls on your subject is also important. You can’t have the camera facing the light, for example, or have the light source behind your subject. Unless it’s desired, it will result in silhouette effect where the front of the subject will be in its own shadow. The light source also can’t be directly behind you and your camera as this will result in your shadow falling on the subject.

Another thing to keep in mind are reflections. Shooting glossy objects often results in the camera or the entire photographer being reflected.
off them and being captured. This should be avoid as much as possible and always position yourself or the camera such that it is not caught in the reflection.

When you’re taking portraits with a light source directly above the subject, it is important to note the effect of the lighting. When a light source is directly above someone, the facial features tend to cast shadow upon the face, which results in dark areas under the eyes and nose. To avoid this, it is recommended the subject sit back a little or look slight upwards to reduce the effect of the shadows.

At times you can also try and reflect light onto a subject. For example, when a light source is on one side of the subject, the other side will be dark and in its own shadow. To avoid this, you can reflect light off from the opposite side of the light source to make it fall on the darker side and balance out the lighting a bit.

When this is not possible it is always a good idea to resort to using HDR mode. HDR will help reduce the shadows and bring out the details in the darker regions. HDR also helps when there is just far too much light, such as during the middle of the day in summer. It will help bring out the detail in the extremely bright areas that may otherwise be blown out by all that light.

**Focus correctly**

No one like seeing a photo where the subject is blurry and out of focus. It is of paramount importance that you ensure the subject is in focus before you hit the shutter button. Some cameras have mechanical shutter button that
lets you half press the button to lock focus. Some will do it for you when you hit the shutter button and then the camera automatically focuses and takes a picture. The latter can be a bit unreliable and if possible you should always take multiple shots just to be sure or try and lock focus before you take the photo.

Most phones will let you tap on the screen to lock focus and exposure to that point. Instead of messing around with the exposure settings, you could always use this to tap at various points in the frame to select the appropriate exposure level for the entire frame. Sometimes, you will have one bright spot in the frame, in which case it is preferable to focus on that and adjust the exposure to it so that it doesn’t get blown to a bright white spot in the final image.

You can trick the focus into focusing at a particular and stay there. Most phones don’t have manual focus, which means you can’t just leave the focus at one particular point. What you can do instead is find an object with the right amount of distance and light value and lock focus (and exposure) on it. Then, keep the shutter button held and then release it when the subject you intend to shoot comes into the frame. This is useful for capturing moving objects that don’t stay in the frame long enough to capture using auto focus.

**Flash**

There is only one rule when it comes to the flash on a camera and that is to avoid using it as much as possible when you are going for artistic photography. Flash produces a harsh white light that upsets the mood of the situation and makes the subject appear far too bright. A photo taken without flash has the natural lighting and looks far more pleasing to the eye. The only time you should use flash when it is absolutely essential, that is when it would otherwise be difficult or impossible to see the subject but otherwise you should avoid using the flash altogether.

**Digital Zoom**

Unlike proper cameras and maybe a handful of phones, most smartphones don’t have optical zoom on them. Optical zoom is the only real zoom, where you don’t compromise the image quality while zooming in. Digital zoom is not real zoom. The camera software essentially crops the image and then blows it up to fit the original resolution. This results in blurry, pixellated images and why you should always avoid using digital zoom. A better solution would be to take the photo without using any digital zoom and
then cropping the photo manually later to focus on the portion you want. At least this way there won’t be any quality loss.

**Take multiple shots**

It’s highly unlikely that you will get the right shot at the first attempt. Which is why it is always recommended to take multiple shots. Between shots, try to adjust the composition slightly every time and try to capture from different angles. You can always discard the bad ones later and keep whichever looks best instead of taking just one shot and then regretting it later when the moment is past.

When you are dealing with a moving subject, say, kids running around, it can be difficult to get a shot that is properly framed and blur-free. This is where it is recommended to use the burst mode on your phone. Burst mode takes multiple photos per second in quick succession and all you have to do is press and hold the shutter button. Some phones will let you take up to a hundred shots at a time and it’s highly likely at least one of them turns out just right.

**Self Portraits**

Self portraits have become such a rage today that the alternate word for them - *selfie* - has made it to the Oxford English Dictionary, much to the chagrin of some of us. If you’re someone who takes regular self portraits, one thing to always remember is to look at the lens when taking the picture. Sure, you can look at the screen when you’re composing the shot, but when you think you’re ready and about to hit the shutter, turn your gaze towards the camera lens located just above the display, somewhere next to the earpiece (refer to the phone’s manual if you don’t know where it exactly is). If you have multiple people taking a self portrait together ask all of them to look at the lens instead of the screen. This will result in the final image where you are looking directly at the viewer, instead of some random point below.

All the composition methods talked about before apply for self portraits as well. Make sure you take the photo in enough light and have the light falling directly on your face. Front cameras on phones are far, far worse than the rear cameras and thus even bad at handling low light. Even in the most perfect lighting conditions the images from front cameras are usually terrible, which is why you have to be even more careful indoors. Have as much light on your face as possible, with the light falling on you without any shadows.
Also be mindful of what is directly behind you when taking a self portrait. You may not notice it while you are admiring your reflection on the screen but whatever is behind you will also get recorded in the image and will be seen by anyone you send the image to. You don’t want a Scarlett Johansson situation on your hands.

Memory
This might seem like a very basic thing but it’s also quite easy to lose track of it. Unlike our cameras, we have a lot of other stuff on our phones and it can get easy be out of touch with the amount of space we are using on them. You wouldn’t want to be in a situation where you missed an opportunity for a great shot because your phone ran out of storage space at the wrong moment. Always keep a track of how much memory you are using and make space if you feel you are running out so you don’t run out at the wrong time. If your phone supports removable memory cards, you can carry spare cards with you.

It’s also recommended to keep a backup of the images. You can either keep backing up the images to your computer or enable a cloud backup service such as Dropbox, OneDrive, iCloud or Google+. If you think you have important photos on your phone, never let there be just one copy of those images residing on your phone. In case you lose your phone or if something else happens to it, you will end up losing all your photos.

Battery
This one is also fairly obvious but it’s important to keep an eye on the battery when using your phone’s camera. Again, unlike regular cameras, phones have to do a lot more than just take pictures and the battery runs down even faster when you’re taking photos. Make sure your photo taking does not run down the battery when you need the phone for other activities and vice-versa. Always keep a portable charger at hand when you are going out and know you will be taking a lot of photos.
Any photography enthusiast would agree that the inbuilt camera apps that come with smartphones are just not good enough to give you the quality photograph that you crave for. Thankfully, there are a bunch of apps across all platforms that better complement your smartphone cameras.
Retro Camera

Definitely one of the more popular photography apps available for Android, Retro Camera is the Hipstamatic for Android users. This vintage camera app basically allows you to add various effects such as vignetting, film scratching, black and white & cross processing effects to add an old-school look to all your pictures. It has a set of 5 different cameras, thus allowing you 5 different sets of these effects. The UI, though not extremely intuitive at first glance, can still be worked out. The app isn’t all that perfect though – the shutter button isn’t the best, and changing it to a physical hardware button seems like a better option. The viewfinder is relatively small, and with larger phones, this becomes slightly inconvenient. Even though there haven’t been any updates for almost a year now, the app is still slightly heavy on the newer, quicker phones that have come out (tried it on a nexus 5). There have also been complaints that the camera shutter sounds even in the silent mode after turning the setting ‘off’. In all though, the app does what it has to – take good, low-fi retro photos with a nostalgic feel to it – and does it well.

Price: Free

iOS: http://dgit.in/retrios
Android: http://dgit.in/retrand

Camera Zoom FX

To put it in a nutshell, this app is all about taking better photos. And boy, does this app work wonders in doing that. This award winning photo app can actually replace all the other apps single-handedly. Packed with a ton of features such as a stable shot that only takes the picture once the camera is steady, a voice-activated shooting mode, a fullscreen shutter, and a Best Photo mode (apart from the standard burst mode) that lets you take several shots and then decides the best photo by itself – the app as a standalone is
very impressive. The only apparent con with this app is that it comes with some amount of bloatware, including the extremely corny feature that allows you to take pictures with Famous buddies. One major problem we faced was that the app just refused to work well with our Nexus 5 – and upon further research, found out that we weren’t the only ones. This is quite disappointing, especially considering that the Nexus doesn’t really have a great stock camera. Keeping that aside though, the absolute multitude of features that this app offers, along with its front camera functionality places it at the top of the photography app stockpile – a must have.

Price: Android only - Rs.180
Android: http://dgit.in/zoomand

Photaf panorama

This is definitely one of the best apps out there to create 360° panoramic pictures. This app uses an auto-stitch mechanism to stitch together photos taken side-by-side turning it into a complete 3600 view. The best part is that, from the startup, the menus make it very simple to follow and understand. To create a panoramic photo, all you will need to do is to select automatic shooting and rotate your phone - albeit with some stability - and the app will automatically recognise the right hand characteristic of the previous image and sound a beep. Thus, the app takes the continuous set of pictures and stitches them together making a panorama, all by itself. The free version comes with a bunch of annoying ads, and also does not allow you to shoot in HD, both of which are tackled in the Pro version. There might be slight problems with various light settings in the same panorama, and the light
and dark differences might show up. Photaf also has a designated website that lets you showcase your panoramas to the world. All in all, it’s a brilliant, sophisticated app that lets you, without much bother, take stunning panoramic pictures.

Price: Android only: Pro-Rs.316/Free

Android: http://digit.in/pbtfand

Pro HDR Camera

This is one for the more serious photographers out there. High Dynamic Range imaging or HDR imaging is an old photography technique that involves taking three photographs – all at different exposures – and then using image editing software to put the three images together, thus highlighting the best parts of each photo to form one photo of extreme awesomeness. Pro HDR brings this technique to smartphone photography – and boy, does it make your photos look that much better. This app lets you create photos with a perfect blend of shadows and lights even with a sub-standard camera. Sure, when you turn on the HDR mode, it takes longer to take the same picture, but this is because it takes 3 images, and not one, and luckily for us – the layman smartphone photographers – the app does the image editing by itself and gives you the final product in its entirety. Though it definitely qualifies as one of the more advanced photography apps, it is relatively simple to use – with the only trick being to hold the camera very still while its capturing the images. Therefore, Pro HDR is probably not the wisest option for taking motion pictures. The app also gives you an option to tinker around with settings such as brightness, contrast and saturation after you’re done taking the pic. The app allows you to load pics taken by other apps as well, and also has a manual mode, where you can adjust the exposures and the focus. So, whether it’s night time photography, or just creating bright – almost surreal – images, Pro HDR is the app for you.
Best apps for taking pictures across platforms

Price: iOS – Rs.110 / Android - Rs.107

Android: http://dgit.in/prbdra
iOS: http://dgit.in/prbdrios

Fast Camera

It might not have the most creative of names, but this app is a definite must-have in your list of camera apps. Why, you ask? Well, for one – it can take up to 800 pictures per minute! Yes, eight hundred – that wasn’t a typo. If you want to capture fast moving targets at absolutely the right moment, then this app is the perfect bet. And the best part is that the 800 pics aren’t stored in your memory for you to browse - instead you can pick your favourite pic from the app itself, and the rest of the images are deleted. And you also have the option to store the pictures as a video. The app also offers you different ways to shoot the pictures. The default ‘Auto-on’ feature starts taking pics as soon as you start the app – so you might just end up having a hundred or so pictures of the floor before you realise it. It also has a manual mode, and our favourite – the burst mode, which takes pictures continuously till you hold a button and stops once you let go. The number of pictures the camera takes, changes automatically by altering the quality of the images – The higher the quality of the images, the lesser the number of pictures. Navigating the app is a breeze – and it also works with both front and rear cameras. All in all, for any occasion where you don’t want to miss a moment, Fast Camera is the app for you.

Price: iOS – Rs.270
iOS: http://dgit.in/fstcmios

Groupshot

Imagine all the times when the perfect group picture is ruined by that one face that is looking elsewhere or blinking at the exact right moment.
This app that claims to perform magic just solved that problem for you by letting you take faces from other photos and ‘stitching’ it onto the same body in an existing photo. The app lets you take a series of pictures, or import photos from your library to the app.

Then it loads into a split panel view that lets you see the main/template picture on the left and a set of smaller thumbnail images on the right. Then you can select the face that you want to change by just rubbing your finger on it, and then Groupshot shows the faces from the thumbnails that you can stitch onto the original. Just select the best out of the options available, and voila! the app after “performing magic” just let you replace a face on your iphone.

Price: iOS – Rs.55
iOS: http://dgit.in/grpsios

Instagram

This is the most popular and the most obvious app on this list, but it would be a shame if it weren’t. Because this app is perhaps almost single handedly responsible for converting most smartphone users into hardcore photographers. Thanks to its simplicity and its pricing (it’s free!) it has over 150 million users worldwide! Functionality might not be its forte – it lets you take a pic, add some cool effects, and when you’re satisfied you can add a caption along with geotagging and then share the picture – all pretty basic. What makes Instagram the most powerful photo app is the fact that its user base lets you share your pictures with an enormous social network. These stylized photos have become a medium for story telling for millions of users with
millions alike listening. Photography for most is about sharing something special, and Instagram lets you do that better than any other app – which is why it is on this list.

Price: Free

Android: http://dgit.in/instand
iOS: http://dgit.in/instios

Camera awesome

An app that started out primarily for Apple devices, its popularity surged extremely high getting it a spot on the playstore as well. The camera awesome app basically acts as a replacement for your native camera app and offers more shooting modes and editing and effects features. It has a very easy to use interface to begin with, and most menus can be accessed with a single touch. Features such as ‘big button’, ‘image stabilisation’, ‘slow burst’, ‘fast burst’ and self timer are all included. It also allows the user to control the exposure and focus points, which can come in very handy in badly lit situations. There’s an ‘awesomize’ button that automatically adjusts the temperature, sharpness, contrast etc. to make your picture look that much more awesome. This can also be done manually by resetting the sliders yourself to tweak the above mentioned effects. You can also edit the picture by cropping, rotating or adding filters or text. The app also has some neat sharing features that let you share pictures on your favourite social networking websites with just one tap of a button. Overall, Camera Awesome lives up to its name and provides a very decent (and free) alternative to your inbuilt camera app.
Best apps for taking pictures across platforms

Price: iOS - Free / Android - Rs.190
iOS: http://dgit.in/cmawios
Android: http://dgit.in/cmawa

Gifboom

Everybody loves gifs right? These quirky, short, animated pics are what keeps the internet going. Now you can make your own gifs on your smartphone for free! Gifboom lets you do exactly that and more. This app is the Instagram for GIFs – it lets you create GIFs and then join a community where you can share and view some of the best animated GIFs on the internet. Upon starting you will need to create a free account which does not take long to setup. After creating your account, you can start making your own GIFs to be able to share them. Making gifs isn’t very complicated either – all you have to do is click the red camera icon at the bottom to begin recording. After you’re done recording, the app also lets you add bevy of filters, frames and texts along with the options to crop or adjust the speed of your gif. Audio track can also be added manually to the gif by the user. All in all, it is a swift app that does its job quite exceptionally.

Price: Free
iOS: http://dgit.in/gifbios
Android: http://dgit.in/gifband

With Nokia being purchased by Microsoft, it is pretty clear that the Finnish company and their monstrous camera phone lines (namely the Lumia series) are all going to roll out with the Windows platform. We have a couple of apps for those users who do not want to miss out on their photography life upon the switch from an Android or iOS platform.

Fhotoroom

Fhotoroom is probably the best free photo app out there for the windows platform. It is a powerful photo app that has a ton of features – including a lot of editing tools, exposure and focus adjustments, a timer, and more than
75 filters to play around with. It also lets you share photos on its own community site, and other major social networks. While the filters are good and stacking of filters is allowed, there is no option to moderate how much of the filter is applied. It is a pretty decent photo editor at the end of the day, though not being able to zoom to edit is a bit of a problem. Considering that it is a free app, Fhotoroom is definitely worth a try.

**Price:** Free

**Link:** [http://dgit.in/fhtwin](http://dgit.in/fhtwin)

---

**Super Camera**

Super camera is another free app for windows that lets you make the most of the stock camera. It has a bunch of filters, but they can't be applied real time because of which some post-processing is required. It also provides basic image options along with interesting features like collages and speech bubbles. Perhaps its most standout feature though is that it also lets you create GIF images from video and text – removing the need for another app for the same.

**Price:** Free

**Link:** [http://dgit.in/sprewin](http://dgit.in/sprewin)
BEST APPS FOR POST PROCESSING ACROSS PLATFORMS

Reality is never as cooperative as you would like. So it doesn’t hurt having a few post-processing apps to add the finishing touches to your perfect composition. We take a look at the best apps just for this purpose available across all platforms.

Mobile phone photography has never been more popular or easy than it is today. And with the falling prices of high quality mobile phone cameras, this trend is only going to increase. People are turning to mobile phones as their primary device for recording and preserving their most precious memories; from birthdays and anniversaries to even weddings, the power of the mobile
camera has made everyone a photographer in just a matter of years. And although mobile devices don’t have the range of processing options that a desktop device might offer, some apps do come very close. However, as more and more photographs are clicked, the number of apps that promise to enhance, polish and improve on your compositions has also increased. But most of these apps rarely live up to their promise. This is where we step in and separate the men from the boys and sift through these many apps with a photographer’s eye. The ability to post process your compositions will forever change the way you make your photographs. We filter through all the options across mobile platforms and present you with a short list of apps which are sure to help you get the most out of your photographs.

Snapseed

One of the most powerful processing apps available it isn’t surprising that Snapseed is a Google product. More than its traditional offerings of stylised hipster friendly filters and effects, Snapseed also comes with the option to manually adjust your photographs. Using its variety of adjustment settings along with its impressive Auto Correct feature, any photograph can quickly be turned into a polished image fresh from the photo lab. The neatly organised user interface is intuitive and gesture supported which allows for an easy start to finish workflow that can turn any image into a masterpiece. The tablet version of this app also makes for a great user experience as the extended screen space is maximised for effect by the apps layout.

Price: Free
Link: http://digit.in/snapspd

Pixlr-o-matic

Another app offered by a giant company, Pixlr-o-matic is Autodesk’s
Best Apps for Post Processing Across Platforms

Premiere Mobile Device App for Post-processing Images. The app comes with the usually expected assortment of filters and effects, and connects directly with the device’s camera to augment any image with a combination of three editing options - overlays, frames, and effects. Each of the options comes with scores of sub-options that allow for hundreds and thousands of effect outcomes for every edit. The app also lets you tweak around with the many options along with a Randomiser option which makes for a quick and easy edit on every image. But there’s always more if you’re not satisfied with the free options as the in-app purchases lead to more premium editing options that are definitely worth the expense. But if you are not too inclined to spend for the extras then worry not, additional effects are only for sale on the iOS platform, Android is free all the way.

Price: Free
Link: [http://digit.in/pxlr_om](http://digit.in/pxlr_om)

Photo Editor by Aviary

Photo Editor by Aviary has long been the favourite when it comes to hassle-free secure image editing. And although it can be criticised for not having as many features as the other apps in this list, it does offer a straightforward workflow when it comes to making the fundamental edits that can improve almost every image. Its greatest strength is its one touch auto-enhance option which more than makes up for the lack of options and is extremely clever in its outcomes. The photographers friendly options of fixing colour temperature, blurs, sharpness, brightness, contrast, orien-
Best Apps for post processing Across Platforms

You couldn't ask for more from a free app.

**Price: Free**

**Link:** [http://dig.it/NA4kUa](http://dig.it/NA4kUa)

---

**Photosynth**

Photosynth by Microsoft, isn't like the other post processing apps mentioned on this list but it’s a must have for any photographer who's interested in capturing the most with their photography. Photosynth initially started off as an experimental application to create amazing browsable three dimensional images of popular locations around the world. Now the app brings the power to capture your entire surroundings easily into the reach of a mobile phone camera. The app allows you to take panoramic photographs like never before by simply scanning your surroundings through the in-app camera view. The on screen indicators automatically photograph and stitch together your surroundings to a remarkable depth giving you a panoramic view that extends across dimensions. And even in hard to shoot environments, the app accepts your commands to shoot at a touch of the screen, when it can’t be sure of whether what it sees is the right image. As a user experience the app is a wonder to work with and the online community gives you a doorway towards experiencing amazing places from all over the world.

**Price: Free**

**Link:** [http://dig.it/1mkSjBe](http://dig.it/1mkSjBe)

---

**Repix**

The Repix photo app is an all in one editing and effects tool for mobile devices that tries to give the user complete control of all its features. Unlike simple
overlay effects, Repix comes with a variety of brushes that individually associate with a unique type of style or effect that can be used on the image. The different brush effects include styles like cartoonify, flaring, dripping and posterising. And with the brush option the app allows the user to apply the effects wherever they wish on the image with a stroke of their finger. This highly controllable method of applying edits and effect makes the images unique in their style and can be used selectively without distorting the whole image. The ability to combine and apply multiple brushes further makes this app a lot of fun to play around with when you’re experimenting with image editing. Thankfully, the app also has an infinite undo option, so you can always go back from a mistake. And if you need to broaden your stylistic pallet a variety of brush packs are available for purchase.

Price: Free
Link: http://dgit.in/1im1sWe

Pixlr Express

Autodesk’s other mobile image editing app is a league of its own as it brings the power of desktop image editing algorithms right into the grips of your hands. The Pixlr Express app is by far one of the most professionally designed apps for image
post processing in any app store. And one of its best features is that it comes with no ads whatsoever. For most users, just this one app is enough to fulfill all their post processing needs. The app is designed for a mobile device layout and makes discovering its features a breeze. The intuitive interface offers you quick adjustments as soon as you open or take an image, with autofix, crop and red-eye correction in the first step. After the basics are done with a wide variety of options are at your disposal including filters, effects, overlays, frames, stickers and text type. In total there are over 600 different effects that can be used to enhance and image, the best of which is the ability to save processed images at a variety of resolutions. The app even allows you to combine multiple images together for a higher megapixel resolution that can directly be used for printing. This is the app for all those people who just want everything in one place and can’t wait to start editing.

Price: Free
Link: http://digit.in/pxJlwH

**Bright Camera**

Rarely do we come across an app that is so grounded in a singular objective - to make selfies awesome. Bright Camera is an app that is designed to do exactly that, by providing you with a range of “beautification” effects and filters that are intended to improve the look of the human face. The app takes into account the other aspects of taking selfies like shaky hands and unstable environments, and adds anti-shake mode to provide a stabilised image when taking photographs with the app. The app also allows you to make basic adjustments to the photo and tweak it with simple effects that retain the selfie quality. And although it doesn’t match up to all the features of a fully packed post processing app, its has all the features you need if most of your photographs are selfies.

Price: Free
Link: http://digit.in/pxJmAS
InstaPhoto

InstaPhoto is one of the best post processing apps available in the Blackberry app store and given the limited options currently available, we are thankful that it is there. The workflow of the app is a bit restrictive since it forces you to work on an image in a fixed series of steps, such as having to crop every photo first and then rotating it. But apart from these minor annoyances, the 26 filters that come with the app do allow you to tweak your image a fair bit along with the ability to add captions and apply a default favourite filter for all your future shots. This QuickPost option is perhaps the apps biggest strength as it makes taking and sharing photographs from the Blackberry an easy and convenient process.

Price: Blackberry Rs.150
Link: http://digit.in/1gij7ZE

Papercamera

Papercamera is a funky app. It’s layout and design are intended to invoke a strange science fiction setting which is equally reflected in the effects it employs on your photographs. Its greatest feature is the ability to take photographs from the app with a filter-view enabled which lets you see how an image would appear with any filter before you actually shoot it in real time. The various cool and quirky filters make for a lot of fun when experimenting with taking photographs which include effects like comic, sketch and noir. In total the app comes with 12 funky filters which can make any photograph appear like something pulled right out of a dream or comic book. Another key feature of the app is the ability
to apply these same filters to videos shot from your camera. The easy and user friendly interface makes switching between photo and video intuitive. The developers are also eagerly adding new features to the app so you never know what you might end up with as you continue to use the app.

**Price:** iOS Rs.170; Android Rs.119.99; Blackberry Rs.250

**Link:** [http://dgit.in/1euhVXO](http://dgit.in/1euhVXO)

---

**PicShop Lite.**

PicShop Lite has already proven itself to a favourite of the Android crowd and is now being embraced by iOS and Blackberry users as well. The app comes with an impressive bundle of filters, frames and overlays along with a very slick user interface. The workflow of processing any image is elegantly laid out in the apps interface and takes you from shot to sharing in a matter of seconds. In total the app gives you access to 18 filters an 17 frames along with the editing options such as auto-enhance, brightness/contrast, focus point selection and colour correction. The extras provided with the app also let you play around with the image by adding bubbles, stickers, RGB tweaks as well as a “meme maker” which can turn any photograph into an epic statement of online witticism with just a few touches.

**Price:** Free

**Link:** [http://dgit.in/1d7Ughn](http://dgit.in/1d7Ughn)

---

**Phototastic**

Any Windows Phone would be incomplete without the Phototastic photo editing app. The app can take images directly from your Pictures Hub as well as your online image storage accounts like Flickr and Photobucket.
Apart from the extra features like photo collages and frames, the app also comes with a variety of filters that can easily process any image to like polaroid, grunge, film etc. The app works well on any Windows Phone and fits in well with the interface design to present a simple and elegant experience to make any photo look great in a matter of seconds.

Price: Rs.110
Link: http://dgit.in/1eZjyJM

LazyLens

As the name suggest, LazyLens is for those users who don’t want to spend forever working their way on every tiny aspect of the image with a bunch of options. The app gives you an simple and effective way of making your images look their best by just selecting from a basic set of options. The added features of image adjustments like crop, contrast, rotate, brightness etc. are easy to apply to any filter and look great on the Windows tile style interface. The 23 different presets makes tweaking any image a quick affair with minimal times spent in tweaking. You can even create your own preset by tweaking around the finer setting of the app. Apart from the pre-sets there are in total 58 different effects that you can choose from for any photograph and an autofix that is surprisingly great at getting the best exposure for your
photograph. For a free app, the bundle of filters, effects and add-ons are more than you are likely to find in any other Windows based app while looking as good as LazyLens does.

Price: Free
Link: [http://dgit.in/1jbLzW4](http://dgit.in/1jbLzW4)

### 6Tag

For those Windows phone users who’ve felt left out of the Instagram club 6Tag has been their home. And even as Instagram rolls out on Windows, it isn’t recommended that you switch over. The 6Tag app with its beautiful user interface design has all the features of Instagram and more without the risk of losing ownership of your shared photographs. The app comes with the ability to work with videos, maps and tagging along with the traditional offerings of numerous filters. But what makes this Instagram alternative really cool is its ability to share images and videos using the NFC option which lets you bump your Windows Phone to another phone and send across files in seconds.

Price: Free
Link: [http://dgit.in/NA4UBb](http://dgit.in/NA4UBb)

### Adobe Photoshop Touch

Now we come to the big shots of the photo editing world - Adobe. And with Adobe's brand name Photoshop Touch app we come close to seeing the true potential of an app when it comes to the ability to transform a photograph. Understandably, the Photoshop Touch is not a replacement for the desktop version but its features are nearly just as good. Apart from the usual fea-
Along with these powerful image processing options, the app also comes bundled with 29 premium fonts that allow you to overlay titles, captions and typography to further enhance the look of any image.

Price: Free
Link: [http://dgit.in/1fMiCbj](http://dgit.in/1fMiCbj)

**Afterlight**

Afterlight is one of those app secrets no one knows about. Exclusively available on the iOS platform it’s an indulgent delight for anyone who wishes their iPhone could become a full time DSLR replacement. The app sets itself apart from filter friendly apps by providing iPhone users with the highest degree of control over their image editing options. The app lets you control nearly all aspects of a photograph, just like any desktop software, including fill light, temperature, saturation, vignette and sharpening. Having these critically fundamental features makes any photograph edited on your device at par with those made on Adobe Lightroom or Photoshop on the desktop.

Price: Rs.55
Link: [http://dgit.in/1pi5Tm1](http://dgit.in/1pi5Tm1)
Camera ZOOM FX

Camera ZOOM FX is unsurprising in its power and options considering its higher than average app price. But it can be assured that it is the most popular and powerful image processing app on the market, making it a bargain. The app’s depth of features has won it numerous awards from prestigious editors, magazines and websites. The app is able to push the camera hardware on any Android phone to obtain the best images, with up to 20 frames per second shots and live preview of any effect. The real beauty of the app comes with two of its most awesome features - an amazing time lapse mode and a voice activated timer, so that struggling for the click button when taking a selfie or group shot is never a pain. Highly recommended.

Price: Rs. 179.99

Link: http://digit.in/1MWYSO
Even after you’re done tweaking your hundreds and thousands of photographs to perfection something more is still needed - managing and displaying them via your phone. The following apps give the best means of managing, sharing and displaying your photographs.

The freedom to create dazzling images has never been greater. The cutting edge camera technologies incorporated into modern smartphones is growing at an accelerating rate. With a variety of choices, users can not only shoot photographs at a higher range of quality but also use the many available accessories to make truly spectacular
photographs. As mobile internet access and cheaper higher quality smartphones become more common, almost everyone will be walking around with thousands of photographs in their pockets. In our culture of instant messaging and sharing phones carry the visual story of our life. In order to make it easier for users to manage, display and share their most personal creations, apps developers from all across the world are introducing new apps almost daily. And even with the variety of mobile platforms available, be it Apple’s iOS, Android, Blackberry or Windows, there is always an app that performs better than the rest. Due to the complexity of apps development and platform hosting some apps are available on nearly all the platforms whereas some are only available on only one. In the case of photo management and display platform-universal apps are almost non-existence. We have culled down the many options and curated the best apps which will suit users of any handset.

**Diptic**

Diptic is a cross platform photo app that provides a host of features at a reasonable cost. More than the name suggests, Diptic allows you to make photo collages with up to five photographs. The collages can be made using over 50 different layout options so that you never fall into a bland repetitive style. In addition to the photographs on your phone’s memory, the app can also import images from your online accounts like Facebook and Flickr. The layouts also have tiny but impactful customisations beyond image adjustment such as tweaking the borders and frames as well. The app is constantly being updated with newer features and has since its last update, added 14 filters which allow you to further stylise your images. And anytime you feel like resetting your changes to an image just shake
the phone and it’ll revert to its original look. Once you’re done, the app allows you to share your image using email, social networks or any other app that accepts JPEG images.

Price: iOS Rs.60.33; Android Rs.54.37; Windows Phone Rs.55
Link: [http://dgit.in/OHKxD2](http://dgit.in/OHKxD2)

PhotoShake!

PhotoShake takes the collage making concept of apps and makes it a bit more dynamic as a shake of the device quickly makes a random collage. Beyond this novelty feature, PhotoShake has a lot more to offer with its recently added Instagram share support which allows you to take advantage of image enhancements outside of Instagram’s fixed options. The app comes bundled with the usual variety of editing options and allows you to customise every aspect of your final image, from frame to filter effects. Using any of the five photo options - Single Image, Multi Image, Grid Image, Wide Image and Wallpaper - you can Instagram your photos directly. Using up to 9 photos at a time, or by pasting an image directly from your clipboard, you can make conventional grid collages or single image phone screen wallpapers of perfect resolution that bear a caption, description and your credentials. Sharing is also easier with options for email, social networks including Tumblr, me2DAY and Flickr.

Price: iOS Rs.110; Free for Android
Link: [http://dgit.in/1hO76hW](http://dgit.in/1hO76hW)

PicFrame

PicFrame is the most user friendly and socially enabled app when it comes to photo customisation. The simple and intuitive design of the app distinguishes it from its many competitors. With 34 unique frames, support for
up to 5 images, and 4 image output ratios, PicFrame gives you plenty of room more improvisation. Image rotation, mirroring and the 17 low-fi filters that come bundled with the app make it seem as if you’ve ripped the best features of Instagram and enhanced them even more. The app also allows you to individually tweak the filter on each of the images of your collage as well as add up to 12 pattern and texture styles. Images once prepared are easily sharable to social media, email and even other apps like Instagram at three different resolutions.

Price: iOS Rs.60.33; Android Rs.61.54; Blackberry Rs.50
Link: http://dgit.in/1jbRxpO

Photo Lock

Image privacy and management are always of critical concern in today’s hacker friendly world. If celebrity phones aren’t safe then should you take precautions as well? On the Windows Phone, PhotoLook is a great way to password protect your images, away from prying eyes. Beyond its password encryption, the app also provides users the ability to edit photographs and record video footage directly from the app. The app also has the full panel of tools such as multiple album creation, slideshow support and built in image effects. The app requires the user to set up a free account to be activated where all images and videos can be secured. Photo Lock currently lacks cut/paste options between Pictures Hub and the apps folder, images secured from Pictures Hub have to be deleted manually, but this change is expected in future updates.

Price: Free, Pro Version Rs.55
Link: http://dgit.in/1mkV6KF
Private Photobox

Private Photobox is an excellent way to manage your hundreds or thousands of mobile photos into neatly organised folders and subfolders. The app is also useful in securing and safely storing your photographs within the device’s memory with customised labels. The app comes with its own set of security features which allow you to pick and choose which folders to protect and if required “hide” from view. The app is also integrated to the Windows system allowing you to pin folders directly to the start menu so they’re only a tap away. It’s worth noting that images are not accessible from Pictures Hub when using Private Photobox, but then again, that’s a good thing.

Price: Windows Phone Rs.110
Link: [http://digit.in/1kPKZKR](http://digit.in/1kPKZKR)

Photo Gallery (Fish Bowl)

Photo Gallery (Fish Bowl) is a quirky and fun way to enjoy all the photographs on your phone. The titular “Fish Bowl” tool of the app presents your photographs as a large wall-collage of snapshots. The images in the wall-collage are centrally magnified giving a spectacular aerial perspective. Other than its Fish Bowl option, the app allows users to create image albums, backup images online and securely lock up the private photographs not meant to be found. The photo archive view arranges your image albums chronologically by month using a calendar view or alphabetically by album name. It also comes with the standard set
of image editing tools along with meta-data access. As one of thousands of Android apps, Photo Gallery (Fish Bowl) has a smooth, fast and elegant interface that leaves others apps trailing.

Price: Free
Link: http://dgit.in/1bO7s8n

Smart Album Photo Calendar

Sometimes you end up with so many images that finding them amongst the many hundreds or thousands stored on your phone becomes a pain. So instead of having you slowly slide your finger across a photo gallery, Smart Album Photo Calendar uses the metadata on your images to organise them for easy access. The app is powerful organisational and utility tool which automatically creates albums based on dates. The app allows you to change album names, update image tags, share on social networking sites and make minor edits. The calendar view of the app is its greatest feature as it provides a beautiful way to display and explore your photographs making it seem as if you’re going back in time with every flip of the date.

Price: Free
Link: http://dgit.in/1g8AP7B

Photoful

Photoful is perhaps the most beautiful photo organisation apps that has been introduced on the iOS 7 platform. The app scans the images from the Camera Roll and albums to create a chronological thumbnail view of
all your images. Tapping the thumbnail magnifies the images to fill the screen. It even allows you to slide across thumbnails for multiple selections. The multi-select option makes applying batch image edits a breeze and can sort them into customised groups. Photoful also has direct button options to create slideshows and collages. The albums made can be easily tagged into categories and searched for later. The in-built calendar view also allows you to scroll through weeks and months of photographs to get to a specific event or day. Any of the individual or album images can be shared via email and social media applications. The greatest strength of the Photoful app is its design which makes the most of the iOS user interface and presents a seamless intuitive experience.

Price: Free

Link: [http://dgit.in/1gFWpLW](http://dgit.in/1gFWpLW)

---

PicMix

PicMix is a Blackberry only photo manager which is invaluable for a smartphone photographer. The app requires an account registration without intruding into your social media profiles. With a wide range of frames, styles and filters, it makes your device a photo editing studio. It even comes with frames that are especially designed for special occasions like birthdays and anniversaries. The app also takes advantage of the phone’s accelerometer (Blackberry 10) to let you shake the device to scroll through frame options. The app also has a
“make-your-own” option with which users can customise the style and dimensions of their frames as well. Other than the usual editing and filter options, PicMix lets you attack cute stickers onto your images to make them just a bit more fun. Images made are by default saved to the Photo Library on a Blackberry and then be posted to social networks and set as a Blackberry profile photo too.

**Price:** Free  
**Link:** [http://dgit.in/1r5XRQV](http://dgit.in/1r5XRQV)

### PhotoStudio

Photo Studio comes with a set of basic tools that measure up to most of your Photoshop usuals. In addition to that, the photo filter options allow you to punch up any image in a matter of seconds. The app also lets you frame and border your images to make collages using any of the more than 29 effects provided. The images are easily posed in Instagram as well as shared on social network sites. The wide variety of options and customisations makes Photo Studio an indispensable app for a photo friendly Blackberry owner. In many cases it’s free version gives a greater value for money then the unusually high priced paid version.

**Price:** Free, Pro Version Rs.199  
**Link:** [http://dgit.in/1giz5d3](http://dgit.in/1giz5d3)

### Photo Editor Ultimate

The Photo Editor Ultimate app is a thorough set of tools for making the
smallest and most detailed changes to any photograph on a mobile device. The series of menu and submenu options allows you to alter every facet of the image and make them look their best. The ability to customise the images using filters, colour options and effects menu’s make the task a lot easier and faster. A unique feature on the app is the ability to combine two images to create a double exposure photograph that can have interesting results. The app is linked to your sharing options and can even use Twitpic and Imgur.

Price: Free, Pro Version Rs.100
Link: [http://dgit.in/1laedH1](http://dgit.in/1laedH1)

**DropBox**

As the only application that’s available across all four major mobile platforms, DropBox deserves a little attention. Although not a photo-only application it can prove invaluable as a means to back up, organise, categories, tag and edit your images. The cloud service makes your images easily available on your desktop devices and can be accessed from anywhere. In case of a device malfunction the images in your DropBox account can also be synced back to the device without any problems. The reverse also allows you to quickly access any photographs that you wish to import on to your phone from any computer device simply by placing it in your account. The ability to edit, two-way sync and organise your photos into folders for cloud security and accessibility makes DropBox a definite option for people who only want organisational utilities for their images.

Price: Free
Link: [http://dgit.in/WOMVcr](http://dgit.in/WOMVcr)
NEWS AND REVIEWS
Comprehensive news, unbiased reviews and ratings to help you make the right purchase

DOWNLOADS
Check out the latest software downloads, games for your Windows, Linux, Mac and PDA/mobiles

All this and more in the world of Technology

VISIT NOW www.thinkdigit.com
Join 200K+ members of the digit community

http://www.facebook.com/thinkdigit

Your favourite magazine on your social network. Interact with thousands of fellow Digit readers.

http://www.facebook.com/IThinkGadgets

An active community for those of you who love mobiles, laptops, cameras and other gadgets. Learn and share more on technology.

http://www.facebook.com/GladtobeaProgrammer

If you enjoy writing code, this community is for you. Be a part and find your way through development.

http://www.facebook.com/devworx.in

devworx, a niche community for software developers in India, is supported by 9.9 Media, publishers of Digit