

# HUAWEI BAN: THE STORY OF CHINA-USA RIVALRY



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**Adnan Khan**  
Managing Editor

Dear Readers,

Corporate Responsibility is a two-way road. Its fulfillment gives rise to a success wheel that involves the community and the brands, both benefitting from each other and helping one another grow better and faster. The Mobile World has already been contributing a lot in making the world a better place and mobile operators are at the core of this industry thus their support for greater causes lead to the greatest impacts and is always appreciated and proves to be fruitful. We have discussed some of the CSR initiatives in our article, "Corporate Responsibility: How Mobile Operators Are Giving Back to the Society". The story of Huawei and the USA is old. The mistrust among both has been surfaced many times. The past, present and future of their rivalry has been unfolded in our feature article, "Huawei Ban – The Story of China-USA Rivalry".

Cybercriminals are active across the globe making cyber threats too common nowadays. Apparently such attacks affect a single individual by stealing the data from one person's device but that more likely includes the personal details of many other people, potentially endangering a wider community. We have discussed the new cyber policy and its implications in our article, "The New Cyber Governance Policy: How Will It Impact The Country?".

There are many national and international brands that are now available in the market offering some amazing products. In our current issue we have added a smartphone guide, "Pick your smartphone smartly" to help our readers to get the very best handsets according to their needs and budget.

Nokia has been one of the most iconic and recognizable phone brands globally for decades. In the short time since HMD Global was launched into the market, the positive reception they've had has been overwhelming. We spoke to Mr. Arif Shafique Country Head HMD Global Pakistan to talk about how Nokia phones benefit from regular security updates and come with the latest Google-designed software and innovations, from AI to security.

Like always, our regular sections including phone reviews, Smart moves, TVC reviews, top applications and smartphone wish list are also part of our current issue. We always try to bring something new and interesting for our readers, we hope you guys will appreciate our efforts and give us your feedbacks so that we can improve further.  
Enjoy Reading....!!!

Thank you,  
*Adnan Khan*  
Managing Editor

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## Huawei Ban – The Story of China-USA Rivalry

The story of Huawei spying fiasco is an old one, it started in the year 2006 when China was entrusted the task to build African Union HQ, Addis Ababa. The construction was completed in the year 2012, and everything in it was deployed by China even the state of art of computers.

**A French newspaper Le Monde Afrique dropped a bombshell in 2017. It revealed that African Union computer systems had been compromised**

That building was a symbol of close ties between China and Africa until a French newspaper Le Monde Afrique dropped a bombshell in 2017. It revealed that African Union computer systems had been compromised. It also announced that

for the period of five years, the data from AU servers were transferred to Shanghai between hour midnight and 0200. Later on, it was also discovered that microphones were also hidden in the building.

Of course, the reaction was expected, however, officials from both the countries condemned the report and stated it fake and called it an attempt of western media to damage the relationship between both countries.

In all this story, one thing was not mentioned, that was the name of the supplier of IT and communication technology systems to AU headquarters; it was China's top telecom company-Huawei. The spokesperson from



Huawei disapproved this and said that even if the data were transferred to China, it was not done from Huawei equipment as the data centre facilities provided by Huawei to AU didn't have storage or data transfer functions. Since there was no evidence, the news settled down.

**Huawei was added in the list of top 10 companies and it kept on growing until it surpassed Apple in Dec 2018 and stood on number two position globally, after Samsung**

However, there is also another side to the story. Huawei was flourishing, and its revenues have been growing up since 2012. No doubt, the company had launched the best devices; at the same time, it was working on 5G, and providing equipment to the number of countries.

Initially, Huawei was added in the list of top 10 companies and it kept on growing until it surpassed Apple in Dec 2018 and stood on number two position globally, after Samsung. During the same time, President Donald Trump and China's president were in talks to cut off the trading war going on between two countries and it was pretty successful.

While in Canada, Meng Wanzhou, Huawei's chief financial officer and Ren Zhengfei's eldest daughter had been arrested by Canadian officials. Canada was obliged by the US to charge Ms. Meng and Huawei for fraud and breaking sanctions on Iran. The problems for Huawei started.

**USA has turned its back on Huawei and charged it for stealing data trade secrets developed by T-Mobile. This was not the first time Huawei was accused of stealing trade secrets. For years companies including Cisco, Nortel and Motorola were accusing Huawei**

The USA has turned its back on Huawei and charged it for stealing data trade secrets developed by T-Mobile. This was not the first time Huawei was accused of stealing trade secrets.

For years companies including Cisco, Nortel and Motorola were accusing Huawei.

However, US fears are not based on industrial spying alone; Huawei has the largest infrastructures around the world and the best company building the 5G network. But now the USA has warned all the other countries not to collaborate with Huawei for the 5G network as it will be equal to allowing the company to spy on them.

**USA has warned all the other countries not to collaborate with Huawei for the 5G network as it will be equal to allowing the company to spy on them**



Because of USA's influence & manipulation, last year Australia had banned Huawei from supplying equipment used in 5G. Australia had also banned Huawei 5G activities due to

the same security concerns. Huawei was also stopped from launching any 5G technology in New Zealand as the country's international spy agency had banned Spark from using Huawei's equipment in its 5G upgrade.

After this equipment ban saga, Huawei proved that even banning this world's second largest smartphone maker will not stop it from moving forward. The company also decided to bring the US government under the proper lawsuit over unnecessary equipment ban.

**After this equipment ban saga, Huawei proved that even banning this world's second largest smartphone maker will not stop it from moving forward**

This cold war turned in to the fire; news broke that US government called national emergency against Huawei and put it in the blacklist, obstructing any kind of trade services between the companies. The US knew that this move will act as a big hurdle in Huawei's efforts to dominate the 5G wireless industry. Google and other companies were forced to suspend business with the Chinese tech giant.

### **Dramatic Effect of US Ban:**

Initially, it was perceived that after US ban, Huawei Technologies Co Ltd will only lose access to updates of Android operating system and its users will lose access to the popular application and services including Google play store, Google and Gmail app. However, it was much more than that; after Google, Qualcomm, Intel, and Broadcom, ARM also waved goodbye to the company.

ARM, the UK chip manufacturer has sent a memo to its staff asking them to suspend all the contracts and pending engagements with Huawei. One after another, US firms started turning their back on Huawei. End of JEDEC and WiFi alliance with Huawei was another shock.

**This cold war turned in to the fire; news broke that US government called national emergency against Huawei and put it in the blacklist, obstructing any kind of trade services between the companies**

### **Is it the End Game for Huawei?**

In such circumstances, many people thought that Huawei will be no more and termed it as the end game for Huawei. However, the Chinese company was ready; it seems it knew that all this was coming.

So, it was already developing its own operating system named HongMen since 2012 and also revealed that it will be rolled out in China by the end of 2019 and to other countries in 2020.





Huawei is already in action; it is also in talks with Aptoide to replace the Google play store. Moreover, the company also announced that it was working on its own chipsets.

**It seems Huawei knew that all this was coming. So, it was already developing its own operating system named HongMeng since 2012 and also revealed that it will be rolled out in China by the end of 2019 and to other countries in 2020**

After the news of Huawei ban broke the internet, another U-turn came in the story and the US postponed the ban for 90 days so that the company can complete its ongoing deals with US firms. The officials from the company said that they were well-prepared, and they do not even need 90 days to function.

**After Google, Qualcomm, Intel, and Broadcom, ARM also waved goodbye to Huawei**

Among other tech titans, Huawei was also testing 5G technology and planning to launch it as soon as possible, which has been successful in doing. But, the US has taken a strong stand against Huawei. While other countries were planning for the rollout of 5G, US alarmed them not to use any equipment made by the Chinese tech firm Huawei.

**Huawei has already in action; it is also in talks with Aptoide to replace the Google play store. Moreover, the company also announced that it was working on its own chipsets**

After the US ban, the US local players can get ahead and win most of the business. Besides, the influence of Huawei will also be minimized around the world, leaving space for American companies.

## **China is Racing Ahead in 5G - Is the US being left behind?**

Huawei had formally rolled out its 5G multi-mode chipset Balong 5000 along with the first commercial 5G device powered by Huawei 5G CPE Pro. China is the first country which has launched the world's fastest wireless connections.

**Huawei is leading the 5G race by launching 5G and 5G compatible devices when T-mobile, Verizon, and Sprint from the US are still working on it**

Now a point is raised here! Is Huawei really spying people with the chipsets and equipment, or it is just a rivalry between two countries? Huawei is leading the 5G race by launching 5G and 5G compatible devices when T-mobile, Verizon, and Sprint from the US are still working on it.

Huawei is the largest 5G infrastructure maker in the world. This reason is quite enough to understand the cause of the ban. Now Donald Trump has further softened his stance on Huawei by saying that US tech companies can back to do business with Huawei. This further cements the fact that Trump is using Huawei as a bargaining chip in trade negotiations with China.



# OPPO Reno 10X Zoom Speedy Phone with Stunning Camera

## Design

Following the modern trends, Reno flagship is a glass and metal sandwich, with curved glass towards the edges on the back, and a screen that dominates the front. There are some great design touches too, with two particularly stand-out.

First, there's no camera protrusion on the back. The triple camera system sits underneath the rear glass. Second, Oppo has opted for a pop-up front camera in the 10x Zoom. But unlike most smartphones with a pop-up, Oppo has built-in a shark fin-like mechanism that pops up at an angle, featuring the front camera on one side and the LED flash on the other.

## Display

The display on the Reno 10x Zoom is superb rather than Quad HD, you get an extended Full HD panel (that still offers nearly 400 pixels per inch in density) which means there's plenty of detail at arm's length.

What's more, despite being an AMOLED-based panel, the colours are accurate, while also being vivid enough to give you that 'pop' you'd expect.

## Performance and battery

Unlike some older Oppo phones, the 10x Zoom is a true flagship in terms of spec. Inside, there's the latest Qualcomm processor, the Snapdragon 855, which is paired with either 6GB or 8GB RAM depending on the model you go for.

The in-display fingerprint sensor is fantastic too. It seems as though Oppo has increased the optical sensor size, meaning it's not only quicker at registering a fingerprint pattern and unlocks faster, it's also a lot more reliable.

Oppo has opted for 4,065mAh, which is a generous capacity for an everyday flagship. It has fewer pixels to push than Quad HD phones, which means more power efficiency.



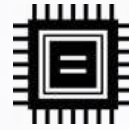
The company's awesome 50W Super VOOC flash charging that can charge a battery to full in 35 minutes, Oppo has opted for the third-gen 20W VOOC charging.

## Camera

The Reno 10x Zoom has a triple camera system. There's a primary lens with a pixel-packed sensor, an ultra-wide lens, and a telescopic zoom lens using a periscope style makeup to offer impressive zoom, without adding thickness to the body. Both the primary and the telescopic lenses are stabilized optically.

That zoom lens is made up of multiple glass elements inside the phone, lying horizontally inside the phone body, with a right-angled prism at one end to direct the light/image towards the sensor.





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octa-core**



**(Li-Po Non removable), 3765  
mAh**



**6.4 inch**



**48MP + 13MP + 8MP  
Front 16MP**



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### Pros

- Bezel-free screen makes an impact
- Battery life is up there with the best
- Versatile and good quality camera

### Cons

- Still a few software quirks
- No dust/waterproofing
- Big and heavy

### Verdict

This phone looks good, with intricate design, it has one of the most versatile camera systems on the planet, a cool-looking pop-up camera, great battery life and software that is miles better. Make no mistake, the 10x Zoom is a real flagship phone, and the one that'll make you start taking Oppo seriously.

## Jazz and LUMS Come Together for Digital Excellence



The lecture halls overflowed in Lahore and Karachi, as enthusiastic Pakistanis flocked to a lecture on 'Learning How to Learn'. This lecture, based on the world's most subscribed massive open online course or MOOC, held the audience spellbound as Dr. Barbara Oakley explored practical insights from neuroscience about how to learn more effectively.

This lecture was a part of the recently signed MoU between Syed Ali Naseer, Jazz's Chief Corporate & Enterprise Officer and Dr. Arshad Ahmad, Vice Chancellor of Lahore University of Management Sciences (LUMS). Both these entities have prioritized innovation and digitization as core strategic goals to advance the overall development objectives of Pakistan's vision 2025.

Part of this collaboration is a speaker series DisruptEd: Ideas that matter to showcase some of the best thinkers in digital learning. The inaugural talk for this series was given by Aamir Ibrahim, CEO Jazz, on 'Leadership in the Age of Rapid Digitalization'.

"Youth development has always been one of Jazz's agenda, both internally through our various development programmes, and externally through synergies with public and private institutions," said Aamir Ibrahim, CEO – Jazz.

"The advent of the 4th Industrial Revolution requires workforce with new skills and competencies. This is where our partnership with LUMS will look to set the stage for developing young talent across Pakistan with current and future-ready skills. We are glad to have partnered with LUMS to roll out our digital learning initiative across Pakistan."

Digital learning takes on a special meaning in Pakistan because it is the sixth most populous

country in the world with a demographic profile where 2 out of 3 people are in their 20's or younger.



Ali Naseer, Chief Corporate and Enterprise Officer at Jazz (2R) and Dr. Arshad Ahmad, Vice Chancellor, LUMS (2L) signing the MoU for youth development in the digital age.

The communication industry is being disrupted and with partnerships like these, efforts are being combined to provide access through online learning by reimagining how the youth can participate in digital entrepreneurship and discovery learning. LUMS is at the forefront of imagining new direction in higher education by offering more integrated transdisciplinary programs that unite disciplinary expertise.

In the coming months, the partnership will raise public awareness, inspire and engage Pakistani youth and beyond in digital learning, initiate credentialed digital modules and courses through education channels supported by Jazz and LUMSx, and disseminate white papers, host conferences and other public events.

Jazz is an established market leader connecting millions of Pakistanis and creating opportunities to improve their economic and social well-being. LUMS is a national comprehensive university that has produced over 13,000 alumni who have made their mark in leading companies and not-for-profit organizations in Pakistan as well as around the globe. Both organizations strive to continuously improve quality and reach new levels of excellence.



## Kalsoom Lakhani

### The Power Woman of Pakistan

A graduate from the University of Virginia in Foreign Affairs and Middle East Studies, Kalsoom Lakhani is the Founder and CEO of Invest2Innovate (i2i), which supports start-ups and the broader entrepreneurship ecosystem in developing markets, beginning in Pakistan. She is also the co-founder of The Hero Project, a storytelling platform that celebrates and highlights everyday hidden heroes.

Kalsoom has trained young entrepreneurs, change-makers, and civil society leaders in Cambodia, Ireland, Ukraine, and Kazakhstan. She has been a Washington, D.C. co-ambassador for Sandbox, a global network of innovators under 30, and is a member of the World Economic Forum's Global Shapers. She was featured in Diplomatic Courier's Top 99 Foreign Policy Leaders under 33 in 2012, and was named an Ashoka Change-makers / American Express Emerging Innovator for 2013.

The i2i company not only recognizes the budding entrepreneurs in Pakistan, but also trains them through a four month programme and finally connects them to investors. It encourages and motivates entrepreneurs and helps them stabilize. The company started its work in Pakistan in 2011 and is determined to expand to other countries as well. Before i2i, Kalsoom has also worked as a managing director in Social Vision.

Kalsoom Lakhani is also the director of Social Vision, the venture philanthropy arm of ML Resources, LLC, an investment firm in Washington, D.C. At Social Vision, she assesses and approves seed funding for innovative organizations and initiatives in their pilot stages, and recently partnered with Pakistani Peace Builders to launch Relief4Pakistan, a grassroots, rapid-response campaign to raise funds and awareness about the floods in Pakistan. Prior to her work at Social Vision, Kalsoom was a senior analyst at the Lincoln Group (now Strategic Social), a strategic communications firm in Washington, D.C.

Kalsoom, who earned her Masters' from The George Washington University's Elliott School of International Affairs in International Affairs / Conflict Resolution, also founded the popular blog, CHUP, or Changing up Pakistan in January 2008, and has written for the Washington Post, the Huffington Post, Foreign Policy, NextBillion and Pakistan's Dawn Newspaper.

Kalsoom is also the editor of CHUP, or Changing up Pakistan, a blog that aims to break the black and white depiction of Pakistan in the media through news analysis, contributions by young Pakistanis and interviews. She also contributes regularly to Foreign Policy's AfPak Channel.



# ONLINE EXTREMISM

## SOCIAL MEDIA PLATFORMS RESPONSE

Social media has become an active vector for violent radicalization that is facilitating the rapid increase of violent and extremist ideologies. The propaganda materials produced by several groups on social media are intentionally crafted to cause, inspire, and encourage individuals to violence.

**The propaganda materials produced by several groups on social media are intentionally crafted to cause, inspire, and encourage individuals to violence**

The aggressive people have produced propaganda in the form of text, audio, and video that play a vital role in influencing individuals around the world to join extremist groups and to conduct deadly attacks across the globe. On several social media platforms, it has been noticed that they have even offered specific guidance on how to do so.

Social media is becoming a powerful platform for extremist groups, ranging from ISIS to white nationalist alt-right groups.

By using social networks, these groups are

spreading hateful propaganda and incite violence and terror attacks.



**Abdurizak Warsame**, a young guy at the age of 19 was arrested for attempting to join ISIS abroad, he was inspired by watching violent ISIS execution videos on YouTube, and started to believe that he was doing something for “a greater cause” by joining the group.

Recently, the largest tech companies of the world including Amazon, Facebook, Google, Microsoft, and Twitter have signed an agreement to fight terrorism and violent extremism on their platforms, after the attack on a Christchurch mosque that was live-streamed on Facebook.



The footage was widely shared - sparking ranging condemnation of social media networks' ability to control the content shared on their platforms.



**The largest tech companies of the world including Amazon, Facebook, Google, Microsoft, and Twitter have signed an agreement to fight terrorism and violent extremism on their platforms**

These tech companies have confirmed that among other efforts, they would work with governments and NGOs in order to establish "crisis protocols" for responding to active events so information is shared and acted upon faster. These tech companies at the Paris Summit have confirmed that they would collaborate to help eliminate "extremist" material from the internet.

All the leaders from Canada, the European Union, Senegal, Indonesia, U.S., France and Jordan, as well as representatives from Facebook, Google and Twitter joined hands to ensure the removal of violent content, modifying their algorithms, and share data with governments.



A month ago France and New Zealand's leaders met in Paris and directed tech

companies and governments in order to stop the acts of violent extremism appearing online.

The New Zealand Prime Minister **Jacinda Ardern** stated that their aim may not be simple, but it is clearly focused to end terrorist and violent extremist content online, this can succeed through collaboration. Meanwhile, Canada also announced several measures to combat online extremism.

Canada Government is teaming up with Twitter, Facebook, Microsoft and Google to host a youth summit in order to help young people learn about online terrorism and violent extremism, and sound out ideas on how to combat the issues. It is planning to provide up to \$1 million CAD (\$762,000) to a program called Tech against Terrorism.

Twitter is also removing the violent content from its platform actively. Previously it has removed the account of Richard Spencer, an American white nationalist who popularized the term "alternative right."

**Leaders from Canada, European Union, Senegal, Indonesia, U.S., France and Jordan, as well as representatives from Facebook, Google and Twitter joined hands to ensure the removal of violent content, modify their algorithms, and share data with governments**

All the social media platforms have increasingly recognized online extremism to be a global issue after the Christchurch mosque incident and plan to combat hate speech. The Call to Action is providing the political pressure and support for social platforms to prevent violence.

Facebook, YouTube, and Twitter are hiring thousands of new moderators in order to filter out content they consider to be in violation of their standards and that is spreading hate in the general public. These are not media companies as they call themselves tech

companies but they have the power to act as traditional media companies. Therefore, they should serve an editorial function in choosing what to publish and what not to publish.

**Facebook, YouTube, and Twitter are hiring thousands of new moderators in order to filter out content they consider to be in violation of their standards and that is spreading hate in the general public**

The social media platforms should create a pleasant environment for users. They should strictly check the content uploaded by the users and should implement some precautionary measures that can check whether the free speeches are turning into hate speeches or they are positively motivating people. All the big social platforms should make comprehensive strategies to control hate speeches in order to stop the spreading of violence.

**Only removing the toxic content from the Social Media platforms will not solve the issue, rather there is a need to take the threat posed by these violent ideologies much more serious**

These Companies should censor, block, or terminate accounts for communications related to terrorism that violate their policies. However, only removing the toxic content and videos from their platforms will not solve the issue, rather there is a need to take the threat posed by these violent ideologies much more serious.

The authorities should ask internet service providers as well as domain name providers to remove extremist content. No doubt that it is extremely difficult for the social media firms to tackle these grey areas but they must try harder after the New Zealand tragedy.

A large majority of Young people are using all these social platforms actively. By identifying and removing extremist users and their

content from social media platforms, would significantly impact their ability to spread incite violence.

The extremist groups target and attract younger audiences via these interactive user-friendly platforms. Once the toxic content is controlled by social media platforms, it will automatically discourage the hate factor among young people.

**The extremist groups target and attract younger audiences via these interactive user-friendly platforms**

By removing the extremist groups from social platforms will make it difficult for them to approach the youth so easily. It will also bring peace and will reduce the violent radicalization to a great extent.

It is a need of time to explore and research how both online and off-line platforms can be harnessed to mobilize young people to develop narratives of peace, promote inclusion, equality, and intercultural dialogue.

To counter the violent extremism and terrorism, there is a need for online professional and independent journalism. Just like Canada, Pakistan and other countries should also take initiatives and use technology to counter online extremism. The problem will not be solved until governments take the charge and support media platforms to counter online threats.







## Infinix Smart 3 Plus the hottest budget Phone!

With the recent launch of the Infinix Smart 3 Plus, an emblem of “Empower Your Passion,” new standards of the budget segment of the smartphone market have been set.

At PKR 16,999, Infinix Smart 3 Plus smartphone offering a splendid triple-camera, exceptional design, and a stunning water-drop notch display.

Infinix Pakistan, Country Head, Joe Hu said “We at Infinix are amazed and delighted by witnessing such a lively response from our customers at the pre-booking campaign of the Infinix Smart 3 Plus. We vow to provide you with great value in the future as well. The Infinix Smart 3 Plus is undoubtedly the best overall package at this price point”.

It is worth to mention that highlighted features of the Smart 3 plus include the superb AI (Artificial Intelligence) based, featured-packed, Triple-Camera setup at

the back capable of capturing stunning shots specializing in low light shots & perfect bokeh effect. Besides, it offers a gorgeous 6.2” HD+ display panel with a modern water-drop notch housing the front-facing camera, terrific build quality coupled with stylish looks and decent performance.

It supports a fast “face recognition” unlock system, providing you the ease and convenience of use. There is also a fingerprint unlock function, an additional feature to protect the security of your mobile phone data.

With the Smart 3 Plus, Infinix has continued to live up to its image of being a premium smartphone manufacturer. They represent trend-setting and profound experiences for young people around the globe. Their focus is on achieving infinite possibilities and distinctive characteristics in bringing in the best tech to the market in affordable prices. Infinix aims to meet and deliver up to the curiosity and needs of intelligent digital technology lifestyles.



## The New Cyber Governance Policy: How Will It Impact The Country???

Cybercriminals are active across the globe making cyber threats too common nowadays. Although such attacks affect only one individual by stealing the data from one person's device but that more likely includes the personal details of many other people, potentially endangering a wider community. In this way, the Malware and viruses spread from one person's device to another, much like a contagious disease.

The solution to minimize cyber threats is Cyber Governance. The term Cyber Governance is related to providing visibility into business risks

based on cyber threats. It helps you monitor for compliance and improves overall security posture. The Government of Pakistan has recently drafted a new Cyber Governance Policy.

**The Malware and viruses spread from one person's device to another, much like a contagious disease**

The policy focuses on the potential of information and communication technologies that can help in the socio-economic development of Pakistan. Furthermore,



Before moving on, let's have a look at the major blocks that the Cyber Governance Policy Draft includes. The policy draft lays out the roles and responsibilities of policy formulation on the subject. In addition to all this, it clearly hints at the implementation mechanism where the central institution will be responsible to set up policy mandated standards.

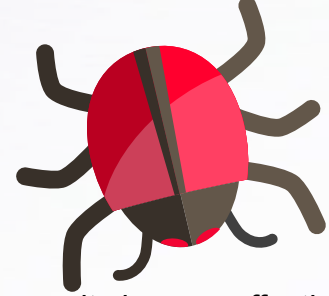
Furthermore, they need to set up a coordination process between threat environment grading mechanisms, various tiers and dynamic critical infrastructure classification mechanisms and risk mitigation assurance mechanisms for all classes of users and entities across various sectors of Pakistan.

- (i) vision, scope, objectives;
- (ii) governance model;
- (iii) institutional structure and functions;
- (iv) standards;
- (v) cross structure collaboration model and processes;
- (vi) risk assurance framework;
- (vii) capacity building;
- (viii) R&D and indigenization;
- (ix) model for international collaboration;
- (x) awareness;
- (xi) and legislative cover for the institutional model/operationalization of PECA 2016.

- (i) vision, scope, objectives;
- (ii) governance model;
- (iii) institutional structure and functions;
- (iv) standards;
- (v) cross structure collaboration model and processes;
- (vi) risk assurance framework;
- (vii) capacity building;
- (viii) R&D and indigenization;
- (ix) model for international collaboration;
- (x) awareness;
- (xi) and legislative cover for the institutional model/operationalization of PECA 2016.

Government of Pakistan is considering the option of establishing a specialized and autonomous body for cybersecurity through the proposed draft, under an appropriate high-level reporting mechanism. The proposed Policy will have an autonomous functional model and broader oversight board with





the representation of relevant stakeholders. Furthermore, it will be equipped with all the modern and necessary tools to effectively address the issues of cyber security in the country. All kinds of users and organizations compliance will be ensured through relevant sectorial cybersecurity apparatus across various sectors.

The new policy will carry out a significant role in the socio-economic development of Pakistan. We all know Cyber threats are quite a serious matter in our country nowadays. To combat that issue, the government has taken the step of such policy formulation. It will allow them to deal with such threats.

**New policy will allow the creation of scenarios for response, resolution and crisis management using effective predictive, preventive protective response and post-incident recovery actions**

The policy aims at the creation, enhancement and drafting specifications of technical interface. Moreover, it also focuses on the processes for national, provincial sectoral and organizational level mechanisms for assessment of threats to ICT infrastructure.

This policy will allow the creation of scenarios for response, resolution and crisis management using effective predictive, preventive protective response and post-incident recovery actions. In this way, it will play a very critical role in combating cyber threats.



The major focus of this policy is on threat prediction and anticipation as well as reactive

capacities. It will result in an effective response to cyber incidents.

The threat prediction will alert the companies, agencies or individuals letting them know their data is at risk. In addition to that, those who will, unfortunately, get attacked by the cyber threats will be able to recover through post-incident recovery actions.

**The main focus of policy should be on the practicality and manageability of structure. There should be a balance between safety and growth/economic considerations**

The cyber governance policy is a public policy that will not only create expectations but will raise awareness among businesses and the civil society of Pakistan.

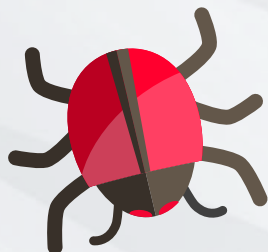
However, there are some important things that the government needs to consider while formulating this policy. There should be transparency while formulating and implementing it.

The government should not breach Public Trust as civil liberty plays a very important role by limiting the reach of government to stay within the bounds of what is regarded as acceptable in one's life.

**The most substantial reason that Pakistan is struggling to counter cybersecurity attacks is due to lack of capacity and gaps in the country's cybersecurity strategies**

The main focus of this policy should be on the practicality and manageability of structure. There should be a balance between safety and growth/economic considerations. The policy must have sustainability together with international compatibility.





The policy should support individual citizens, as well as businesses, in a more practical and proactive way, to manage the particular society risk. For example, individuals can be provided with free face-to-face assistance and cybersecurity support.

**If the government wants to handle the issue of Cyber threats , it needs a better long lasting solution for that, all institutions require strong coordination**

Everyone should be given clear guidelines regarding policy. The Government of Pakistan can work with mobile phone service providers so that security-related software updates can be batched and issued via their trusted channels. In addition to that, they can also prompt people to install these by disseminating the need for the updates using text messages, and also publicize this via other media outlets.

We all know cybersecurity is a complex issue that requires in-depth analysis from various perspectives to formulate counter strategies. The most substantial reason that Pakistan is struggling to counter cybersecurity attacks is due to lack of capacity and gaps in the country's cybersecurity strategies. So, the government should focus on that as well while formulating the policy.

**A separate sectoral level strategy should be made to tackle more sector-specific challenges**

A number of institutions are working on cybersecurity ; including the civilians, military and academia, but the sad part is that all of them are working in isolation. If the government wants to successfully tackle the issue of Cyber threats, it needs a better long lasting solution, for that all institutions will require strong coordination.

As a result of coordination, analysis from various perspectives can be done resulting in the



National

formulation of a better policy. Secondly, it will create a consensus among stakeholders to develop a comprehensive national strategy for cybersecurity. Moreover, a separate sectoral level strategy should be made to tackle more sector-specific challenges.

Last but not least, the government should focus more on raising awareness among the public at large. It should be taught as a subject in schools and colleges as it will ensure individual privacy and security from cyber-attacks.

The policy draft document will be presented to the cyber governance policy committee and thereafter the draft will be broadly consulted with the telecom industry as well as other cross-domain stakeholders. So, all including sectors and bodies of the country that will be consulted while formulating this policy should focus on all the important factors after deeply analyzing things.

We hope this policy would help the government in combating the cyberattacks. It's definitely a good initiative for the safety and security of the country's critical infrastructure and information systems.





## Our phones keep getting better with time Mr. Arif Shafique – Country Head HMD Global Pakistan

How often do you have to upgrade your smartphone? With Nokia phones, you'll get the best experience with devices that just keep getting better with time!

If you think no phone can sustain its high levels of performance for more than 1-2 years, read on. Nokia has been one of the most iconic and recognizable phone brands globally for decades. In the short time since HMD Global was launched into the market, the positive reception they've had has been overwhelming.

Driven by the desire to keep up with the latest tech innovations, we've all got caught up into

manufacturers' upgrade cycle. But people have had enough. No longer are they satisfied with a device which is unusable after a couple of years, nor (at a time when cyber security threats are at a high) do they want to worry about whether their phone could be vulnerable to hackers.

That's why Nokia phones are changing the smartphone ownership paradigm. It's not just about specs anymore but about the experience throughout the ownership of device – and with a Nokia phone that's an experience that just keeps getting better.

We spoke to **Mr. Arif Shafique** Country Head



HMD Global Pakistan to talk about how Nokia phones benefit from regular security updates and come with the latest Google-designed software and innovations, from AI to security.

**PW: How are Nokia phones more secure than other Android phones?**

Consumers need phones that are not obsolete, smartphones that understand their needs and behaviors and, most importantly, are safe and secure at all-time is the biggest requirement.

Unlike other Android phones, all Nokia smartphones benefit from regular security updates for three years, OS updates for two years and will come with the latest Google-designed software and innovations, from AI to security.

**Unlike any other Android phones, all Nokia smartphones benefit from regular security updates for three years, OS updates for two years and will come with the latest Google-designed software and innovations, from AI to security**

Our consumers will always enjoy being on the latest operating systems across all price points without compromising the consumer's experience and the device performance.

Nokia phones that sit under our Android One family are also guaranteed to receive two later upgrades from the time of their public launch. These include Nokia 8 Sirocco, Nokia 7 plus, Nokia 6.1, Nokia 6.1 Plus, Nokia 5.1 Plus, Nokia 5.1 and Nokia 3.1.

For instance, in 2017, we launched the Nokia 5 and Nokia 6 under the Android Nougat software and in a span of just two years; they have been upgraded to latest Android 9 Pie.

This means that our fans can enjoy devices that get better with time and they can make the most of the unique and enhanced features of

the software – regardless of the model range or price point.

We remain committed to our fans in the region by following our pure Android approach while ensuring that each phone gets better with time, thanks to the latest Google innovations and regular security updates.

**PW: How does Android One partnership help with smartphone security and experience?**

Android One is Google's flagship partner programme for Android. Together with Android, we are committed to offer technology that enhances everyday experiences.

Aligned with this premise, we have consistently delivered monthly security updates and a pure Android experience on all our smartphones. By partnering with Android One, we will now be able to bring the latest innovations from Google to our consumers, even faster.

In addition, we have a joint belief that people want a smartphone experience which is free from bloat, kept up to date and secure. Hence, as a lead partner of Android One, we will continue to deliver pure, secure and up-to-date Android on all of our phones.

**As a lead partner of Android One, we will continue to deliver pure, secure and up-to-date Android on all of our phones**

This means that each phone will stay fresh over time with the latest Google innovations and regular security updates, and our pure Android commitment means they don't come preloaded with any bloatware.

**NOKIA**



**PW: How long and often do Nokia phones receive security and OS updates?**

We strongly believe technology should be accessible for everyone and tuned with our belief, our customers will always enjoy the latest operating system on their phones, all across the portfolio irrespective of their pricing. Our consumers get the same experience across the portfolio with no compromise on device performance.

As I said earlier, all of our smartphones will

benefit from regular security updates for three years, OS updates for two years and will come with the latest Google-designed software and innovations, from AI to security.

**We have consistently delivered monthly security updates and a pure Android experience on all our smartphones**

**PW: Do you actually deliver monthly security updates?**

We publish the monthly security patch date for every device on our website. We are also committed to giving our customers access to the latest Android innovations, which is why we make sure all Nokia phones are updated to the latest operating system as soon as possible.

We have consistently delivered monthly security updates and a pure Android experience on all our smartphones. The security updates are delivered across the range, and even our older devices are equally secure.

**Since Nokia phones don't come with pre-loaded bloatware, UI or skin changes, our phones are much faster**

**PW: Can you explain how Nokia smartphone portfolio upgrades twice as faster as compared to competitor brands?**

Since Nokia phones don't come with pre-loaded bloatware, UI or skin changes, our phones are much faster. We are committed to our promise of pure Android approach ensuring that the phones get better with time.

We've made it a point to be one of the fastest adopters of the latest Android operating systems, which we've achieved with Android Pie updates. Android 9 Pie includes AI-powered features to make your device smarter, faster and adapt to your behavior as you use it, so your smartphone experience gets better with time. And, our commitment of up-to-date Android helps us deliver on that promise.





**PW: Nokia phones keep getting better. What makes you say that?**

Currently, we are witnessing the non-ending hardware race. However, while having great hardware is essential in this day and age, we should also pay close attention to software.

We believe in purposeful innovation and not innovation for the sake of innovating. This is why at HMD, we teamed up with Android AI and machine learning where Nokia smartphones become more efficient over time and get to know more about users' daily usage while assisting them with their everyday tasks.

People need phones that are not outdated, and that not only understand their needs and behaviors but also are safe and secure at the same time. What happens across other smartphone brands is that once there is a software update, the devices becomes slower or start underperforming, which forces people to buy a new device.

However, with Nokia smartphones, our consumers will benefit from regular security updates. This means, that our customers can always enjoy being on the latest operating systems regardless of the device price range. This great experience that we deliver across all price points is underpinned by our belief that technology should be accessible to everyone.

**we teamed up with Android AI and machine learning where Nokia smartphones become more efficient over time and get to know more about users' daily usage while assisting them with their everyday tasks**

This is proof that our phones keep getting better with time.

# Realme 3 Pro

## A New Budget Contender

### Design

The front of Realme 3 Pro is predominantly occupied by the full HD+ screen with dewdrop notch (V-shaped), narrow side bezels and 2.5D Gorilla Glass 5 protection.

The phone isn't as premium as glass phones but it is more likely to withstand an accidental drop. Realme is continuing with the gradient finish for the Pro variant as well, and it does make the Realme 3 Pro trendy.

### Display

The Realme 3 Pro debuts with a 6.3-inch IPS LCD screen (19:9) with 2340 X 1080p resolution and a pixel density of about 408 ppi. Just like the last three or four Realme phones, this one too sports a dewdrop notch (that you may hide).

The screen goes 400nits bright and the phone was useable under direct sunlight. Overall, the Realme 3 Pro's Full HD panel is one of the better ones available in the segment right now.

### Performance and Software

Realme 3 Pro rocks a Qualcomm Snapdragon 710 SoC which is built on 10nm FinFET process. The octa-core chipset uses dual Kryo 360 cores and six Kryo 350 cores which could reach up to 2.2GHz clock speed under stress.

The processor is backed by the Adreno 616 GPU and has received additional optimization for Tencent (maker of PUBG) and Unity (maker of Fortnite) games.

As for the software, Realme is still using Oppo's Color OS 6. The custom OS is based on Android 9 Pie and has ample customization options.

### Camera

The phone pairs the same 16MP Sony IMX519



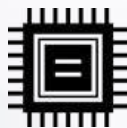
that's there on the OnePlus 6T, with a 5MP depth sensor. The primary camera has an aperture of f/1.7 and is able to take fairly detailed shots in both day and night. There's the usual AI scene recognition on this one too.

### Battery

The Realme 3 Pro packs a massive 4,045mAh battery which can comfortably last for more than a day (on most days).

There are also a couple of power saver modes, like Super High Power Efficiency mode to extract some extra mileage during critical times.





**64GB Built-in, 4GB RAM**  
octa-core



**(Li-ion Non removable), 4045**  
mAh



**6.3 inch**



**Dual 16MP + 5MP**  
Front 25MP



**PKR.33,999/-**

### Pros

- Class-leading camera
- Great screen
- Fast charging

### Cons

- Fussy Software
- No NFC
- outdated microUSB port

### Final Verdict:

With a powerful camera, nippy performance, great battery life and an included fast charger, the Realme 3 Pro makes a great impression. This is only slightly dulled by a micro USB port, no NFC and divisive software.



By Onsa Fatima

# Your Smartphone smartly



Smartphone world is expanding day by day with so many innovations. Whether it's in-display fingerprint scanning, wireless charging or even high-quality cameras, there's always a fantastic feature you "can't live without". On the other side, some people do not have a better idea about the features that they want in their smartphones therefore, it is important to have at least some idea about the latest brands and latest smartphone features so that picking out a new phone is easier.

**Whether it's in-display fingerprint scanning, wireless charging or even high-quality cameras, there's always a fantastic feature you "can't live without"**

There are many national and international brands that are now available in the market offering some amazing products.

Here are the top five brands in the market:

## **Samsung**

Android-based smartphone manufacturer,

Samsung, is the leading brand that stands first in the global smartphone shipment with 23.1 % market share as per IDC's 2019 first-quarter report. Samsung is famous for its variety of lower price to high-end flagship devices.

**Samsung, is the leading brand that stands first in the global smartphone shipment with 23.1 % market share as per IDC's 2019 first-quarter report**

Its recent Galaxy A and Galaxy M series got enormous popularity because of the high-end specs at an affordable price. If you do





not worry about your budget and want a true flagship device then its Galaxy S and Note series are most appropriate.

## Huawei

Another Android-based Chinese brand, Huawei, is globally known for its variety of smartphones with amazing specs. Huawei gets the second position in the top Global smartphone shipments brands as per IDC's 2019 first-quarter report with the market share of 19% in no time. Although the company got banned in the U.S. However, the company is quite optimistic about the future of the company.

**Huawei, is globally known for its variety of smartphones with amazing specs**

The company got famous because for its sub-brand Honor, Mate, and P- series. Recently announced, Huawei P30 was a real hit which helps the company to retain its second position in the global smartphone shipments.



## Apple

If you have a bigger budget and want a fashionable and modern phone, than Apple's iPhones are the best option for you.



According to the IDC 2019 first-quarter report, Apple stands third in the global smartphone shipment with 11.7% market share. iPhones are secure and easy-to-use. However, Prices are high. Not everyone can afford it.

**iPhones are secure and easy-to-use. However, Prices are high. Not everyone can afford it**

## Xiaomi



Another Chinese brand, Xiaomi, is best known for its range of entry-level to high-end flagship devices. Xiaomi is famous for its sub-brand "Mi" that offers affordable smartphones.

**Xiaomi, is best known for its range of entry-level to high-end flagship devices**

## Vivo

Another Android-based Chinese brand, Vivo, is known for its variety of smartphones with amazing specs. Basically, all the Android-based smartphones offer inexpensive smartphones as compared to Apple.

**Vivo is famous for its V-series smartphones with high-end specs including in-display scanner, pop-up selfie camera, and powerful battery**

Vivo is famous for its V-series smartphones with high-end specs including in-display scanner, pop-up selfie camera, and powerful battery. Its V-series contain all the specs mentioned above. IF you want a Vivo phone

then its V-series is the best option to avail.

With excellent new flagships from Apple, Google and Samsung all vying for your attention, plus dozens of high-quality options for those on a budget, choosing the right smartphone has never been more challenging. But we're here to help.

Our Smartphone Buying Guide covers everything you need to know before you buy, including operating system, screen size, camera, processor and price. Use this advice to make sure you get the very best handset for your needs and budget.



### Pick an Operating System

The most significant thing is to choose an operating system. There are three types of phone available in market-based on Operating system. iOS, Android, Window. iPhone, which has iOS is best known for security, ease of use and clean integration with other Apple products.

Then comes the Android OS, which is offered by most of the smartphones manufacturer, i.e. Samsung, Huawei, OPPO, Vivo, OPPO, LG, HTC, and Motorola etc. The third one is Windows phones offered by Microsoft. However, there are very few people who are using windows phone in this era when they get more functionality and easy-to-use features in Android and iOS-based smartphones.

When you pick an OS, it will be quite easy

for you to choose the smartphone. The latest smartphone with the iOS 11 was the last year's iPhone 9. However, iOS 12.3 is the latest version which will be available in this year's iPhone, as every year we see a new iPhone in September.

### There are three types of phone available in market-based on Operating system



On the other hand, Android Q is the latest upcoming version for Android phones. Many smartphone manufacturers have updated their phones with the previous year's Android Pie. Now Android Q Beta is available for various devices including Huawei Mate 20 Pro, OPPO Reno, Xiaomi X27, LG G8, Pixel 3 series and many others.

### Set Your Price Range

Another important thing is to set your budget. If you are clear about your budget, it will reduce the number of smartphones to compare, and you can easily choose the smartphone as per your desire.

Now some Huawei 's Y-series smartphones i.e. Y5 Lite, Y6 Prime, Vivo's Y-series phone including Y93, Y91c, Many of Infinix phones, Samsung's J core series, are all low priced smartphones with great features.

Similarly, Huawei Mate series and P-series, Samsung's M series i.e. M20 and A-series phones, OPPO F11, Vivo V11 and Xiaomi Redmi Note 7 are all mid-range phones. This year Huawei P30 gets immense popularity because of its high-end specs. Other phones



also come with striking features. The price of all these phones lay under PKR 45,000.

**If you are clear about your budget, it will reduce the number of smartphones to compare, and you can easily choose the smartphone**

Now as far as high-end expensive phones are concerned, you can buy iPhone XS, OPPO Find X, Vivo V11 Pro, Vivo V15 and V15 Pro, Note 9, Galaxy S10, S10 Plus, Huawei P20 Pro, Mate 20 Pro, etc. All these phones cost above PKR 55,000.

### **A Powerful, and long-lasting battery**

Your smartphone could have a shrink-ray or turn lead into gold, and it would still be useless without juice. For a person who does most of his work on a smartphone, then a long-lasting battery is essential.

**Your smartphone could have a shrink-ray or turn lead into gold, and it would still be useless without juice**

Although there are ways to boost the battery life, at the end of the day, a massive battery is going to last you longer. So, choose a smartphone with a gigantic battery that could last longer.

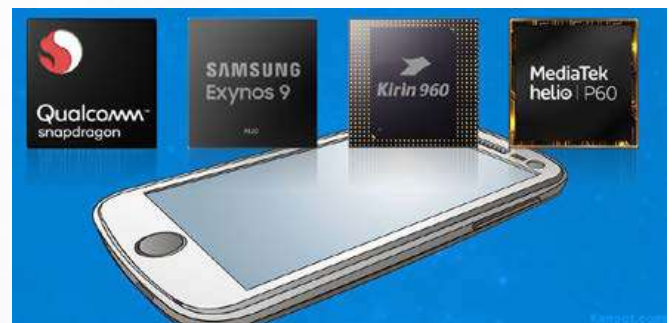


All the smartphones with greater than 3500 mAh battery capacity are good enough to be used. There are many smartphones with 5000 mAh battery available in the market as well. Galaxy A9 Pro, Lenovo P2, Xiaomi Mi Max

Prime, ZTE Blade A2 Plus are some of the phones that have 5000 mAh battery.

### **High-speed processing**

Speed is still the ultimate goal in the smartphone arms race. You get irritated when apps lag or when swiping takes perpetuity. So, choose a smartphone with the latest SoC as numerous brands use different chipset. Along with chipset, there is a need for the larger RAM size. Smartphone with at least 4GB RAM is good to use.



Samsung Galaxy S10 Series, Xiaomi Mi 9, LG G8 ThinQ and Lenovo Z5 Pro GT are some smartphones that debuted with Qualcomm's latest Snapdragon 855 processor.

All smartphones with Snapdragon 855 processor have 5G-enabled technologies and are used in all high-end smartphones. Qualcomm has introduced another Snapdragon 730 processor for mid-range smartphones.

### **Crystal-clear Full HD display**

Smartphones are as much about enjoying media as they are about communicating. You watch movies, play games and view photos on your mobile screen and you want the crunchiest display around.

Also, the notch-less display is quite preferable. If you have small hands, a smartphone with a screen size of fewer than 5.5 inches is also good. But small screen smartphones will not contain all the mentioned features.

Xiaomi Black Shark Helo, Huawei Mate 20 Pro, Huawei Nova 2i, Galaxy S10 Plus, Huawei P30 Pro, Note 9, Vivo V15 and V15 Pro are some of the smartphones that come with Full HD Display.

**Smartphones are as much about enjoying media as they are about communicating**

### High-end Camera

Put more focus on specs like aperture (lower numbers are better.) and special features such as optical image stabilization and at least dual lenses. A great camera is essential not only for great photography but also for visual search.

Nowadays all companies are focusing more on triple camera setup i.e. wide-angle, ultra-wide angle and telephoto sensors, to make the photos more enriching.

**A great camera is essential not only for great photography but also for visual search**



There are plenty of smartphones with triple camera setup available in the market. Samsung Galaxy S10 Plus, Huawei Mate 20 Pro, OPPO Reno 10x, Vivo iQOO, Galaxy A80, are some latest phones that come with the triple camera setup.

Quad camera setup phones are also available in the market. Samsung Galaxy A9, Huawei P30 Pro, Lenovo Z6 Pro are some of the

smartphones which have a quad camera set up. Quad camera set up means that the phone has four cameras at the back.

One Plus 7 Pro and Honor 20 Pro were launched with the biggest camera capability. OnePlus 7 Pro has a triple camera set up with 48 MP main sensor and Honor 20 Pro also has 48 MP camera but has a total of four cameras at the back.



### Plenty of storage space

Most smartphones come with anywhere between 32 and 64 Gigabytes of storage. Extra space is a subtle luxury, but these days, people store their media in the cloud.

Many mid-range and low priced smartphones have at least 32/64 GB of storage. Readme Note 7 Pro, OPPO F11 Pro, Vivo V11 Pro, POCO F1 by Xiaomi, have 128GB of storage.



### Fingerprint sensor

For the security of your phone, a fingerprint scanner is quite necessary. Although most of the phones also come with a face detection algorithm.

But I, personally, prefer a fingerprint scanner



as it is more secure. Using PIN code or pattern is now old-fashioned, and also not everyone has time to type the code or to draw a pattern.

**For the security of your phone, a fingerprint scanner is quite necessary**

Now almost all the mid-range smartphones and some low-priced smartphones come with a fingerprint scanner. However, Galaxy S10, S9, Vivo V11 Pro, V15 Pro, Huawei P30, OnePlus 7, Xiaomi Mi 9 are some phones that come with the best in-display fingerprint scanner.



**Wireless or Fast charging**

As it is necessary to have a long-lasting battery, there is also a need for fast charging technology, so that the phone gets charged in lesser time.

**As it is necessary to have a long-lasting battery, there is also a need for fast charging technology, so that the phone gets charged in lesser time**



charging technology. Wireless charging is a handy feature for those of you who don't want to plug in your phone. Just set it down, and it's charging.

Samsung Galaxy S10 series, Note 9, Google Pixel 3 series, Nokia 9 PureView, LG G7 and G8 ThinQ are some phones that come with wireless charging technology.





## Corporate Responsibility: How Mobile Operators Are Giving Back To the Society

Corporate Social Responsibility refers to the social work a business supports or initiates to help establish a better society. It has become much of a trend lately. Companies are built to generate profits and make revenues then why do companies invest in social work?

Firstly, through fulfilling its corporate responsibility, a company gets nationwide recognition even outside its target market. Also, the company doesn't let pass its initiative go unnoticed and makes sure that people talk about it so, indirectly this may be viewed as a promotion tactic.

Secondly, what is more important to a company than 'Customer Opinion'? And what can be a more favorable opinion than being the 'generous' 'well-wishers' in the eyes of

society? People tend to buy from brands they trust. They may also be willing to invest an extra fortune if they know that part of it may be utilized to support a bigger cause.

**Through fulfilling its corporate responsibility, a company gets nationwide recognition even outside its target market**

Thirdly, most of the employees seem to be more loyal and dedicated to a firm that makes them feel being a part of something big and prestigious. Another thing that compels the companies to fulfill their corporate responsibilities is that it gives them the opportunity to meet and develop business relations with competent and new talent. Thus, provide a gateway to upgrade and progress all the time. While sometimes, giving back to



society is the only reason behind the social initiatives of a company.

Corporate Responsibility is a two-way road. Its fulfillment gives rise to a success wheel that involves the community and the brands, both benefitting from each other and helping one another grow better and faster.

The Mobile World has already been contributing a lot in making the world a better place and Mobile Operators at the core to this industry thus their support for greater causes leads to the greatest impacts and is always appreciated and proves to be fruitful.

**Corporate Responsibility is a two-way road. Its fulfillment gives rise to a success wheel that involves the community and the brands, both benefitting from each other and helping one another grow better and faster**

We expect wonders from these companies as they take along the society while ascending the heights progress. Here are some of the key initiatives taken by the mobile operators for the betterment of our society.

### Telenor

Telenor is one of the leading mobile operator of Pakistan. The company recently revealed its Sustainability Report 2017-18 wherein is the company's revolutionary efforts towards building Pakistan stronger, both socially and economically.

Telenor proved to be a great employment opportunity for Pakistanis, offering 1,600 direct and 220,000 indirect and induced job opportunities.

They then initiated programs like 'Naya Aghaaz'- A women empowerment program to support women gear-up who have been on a career break whereas, 'Open Mind Pakistan' is flagship training program for the differently abled people.

Telenor also joined hands with UNICEF Pakistan to promote digital birth registration through which every child born may get an identity and possibly basic necessities of life. 580, 000 children have been reported of being registered from 5 districts of Sindh and Punjab.

**Telenor also joined hands with UNICEF Pakistan to promote digital birth registration through which every child born may get an identity and possibly basic necessities of life**

They further extended their generosity to Agricultural wellbeing of Pakistan by introducing several programs like 'Khushaal Zamindar', 'Khushaal Angan', 'Khushaal Mawaishi', 'Khushaal Sehat, etc. All intended to upgrade the village life and agricultural industry in Pakistan.



**Telenor's 'Safe Internet and School Outreach Program' And 'iChamp 2' helped 450,000 school going children to learn about the safe and constructive use of the internet that later extended to 1,800 underprivileged schools**

Telenor's 'Safe Internet and School Outreach Program' And 'iChamp 2' helped 450,000 school going children to learn about the safe and constructive use of the internet that later extended to 1,800 underprivileged schools across Pakistan guiding 630,000 students. It was indeed a much needed initiative as the world progresses further into the era of connectivity and the internet.





Telenor didn't ignore the environment protection either; it has been struggling to cut down the energy consumption and going GREEN. For which they increased the total number of solar sites by 51% in Pakistan over the last two years!

## Ufone

Ufone has opted for a different approach to play its part in social welfare. Such as 'Khana Ghar' a Karachi based program by Parveen Saeed which aims to provide suitable meals for Rs.3 only to the needy.

**Ufone has opted for a different approach to play its part in social welfare. It has been supporting various programs initiated by the people**



Another Program 'Operation Eid Child' by Sharmine Aziz has been supported by Ufone which aims to collect and provide children with gift hampers near Eid. Umer And Danial from Peshawar initiated 'Dewar e Meharbani' where things of primary use may be kept in order to be utilized by those in need. This gesture was aired by Ufone to show its support and promote social work.



In the field of Medicine, Ufone also has been a generous donor for The Kidney Centre in Karachi. Ufone has also been working on 'Child Health Care' for which they revamped the PAEDS ward at Polyclinic Islamabad and bought it up to the level of any private institute.



'Ocean Welfare Organization' By Syeda Afnas Ali Shah is an NGO aimed to support the footpath education system. It has 2,500 children on board being educated in the most explicit manner.

Ufone recently supported the cause by purchasing media space on television channels and digital media throughout Ramzan so that it can spread its message to a wider audience.

## Jazz

Jazz started its 'Awareness Programs' to educate the common public about Road Safety. And in collaboration with Shaukat Khanum Memorial Hospital, it also led an awareness campaign on Breast Cancer.

Jazz ran a profound Charity Campaign in the month of Ramazan in collaboration with Pink Ribbon Pakistan, Shaukat Khanum Memorial



Cancer Hospital and Research Centre, and the Layton Rahmatulla Benevolent Trust.

**In collaboration with Shaukat Khanum Memorial Hospital, Jazz led an awareness campaign for Breast Cancer**

Besides volunteering and fundraising, the campaign encouraged people to collaborate and bring about change for the betterment of the community.

During the severe heatwave that hit Karachi, Jazz arranged Heat Camps to provide shade and cold water to the passers-by. In addition to this, Jazz initiated a program for digital awareness in which it set up 11 ICT labs in schools and provided the opportunity of Digital Learning to over 2100 students.

Moreover, Jazz supported 11 Digital Start-ups at the LUMS Entrepreneur Centre with USD 45,000. Jazz aims to empower youth through technology by providing innovative Digital and Financial Solutions to ensure business continuity.



**Jazz initiated a program for digital awareness in which it set up 11 ICT labs in schools and provided the opportunity of Digital Learning to over 2100 students**



Jazz's role in promoting education in the country is also quite commendable. In collaboration with GuarantCo, Jazz started its 'SMS Based Literacy Program' through which they educated 10,000 rural women.

**Zong**

During 2010 to 2013 disastrous floods in Pakistan, Zong launched its 'Disaster Relief Drives' and provided relief goods to around 4,000 affected families.

**Zong initiated its Employees' Volunteer Program under the banner of "A New Hope" aligned with the brand's philosophy of "A New Dream"**

In the field of education, Zong signed the Memorandum of Understanding (MoU) with LUMS in order to develop a state-of-the-art 4G research lab at the university. This made the HEC Digital Library available to all the students nationwide.

In addition to this, Zong actively participated in youth development initiatives like Islamabad Model United Nations, 10th Young Leaders' Conference and on-campus activities in Isra & NUST Universities.

Zong initiated its Employees' Volunteer Program under the banner of "A New Hope" aligned with the brand's philosophy of "A New Dream".



It aims to produce at least 2,000 hours of volunteered social work annually towards different aims covering the areas of Environment, Education and Disaster Relief.



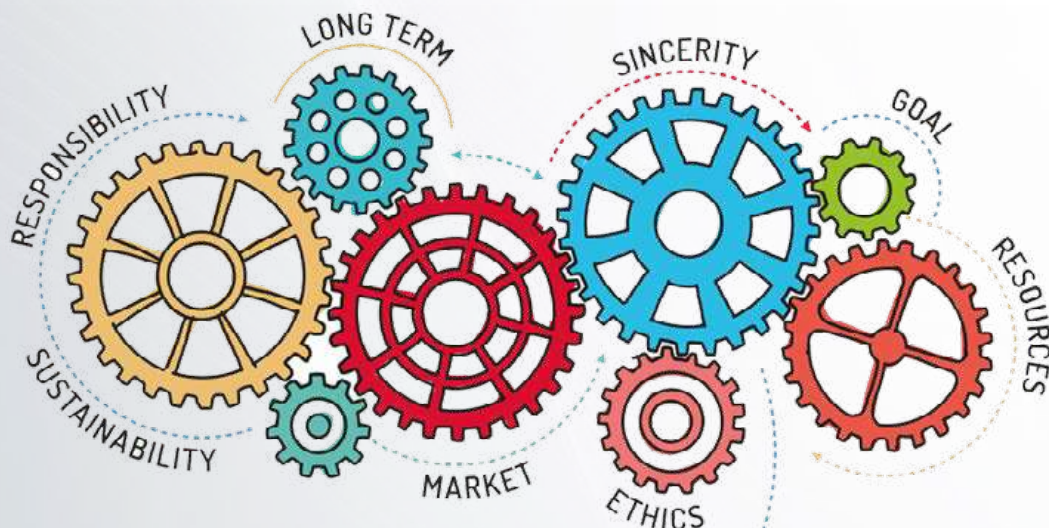
Another interesting thing Zong has done for the Pakistani people is the launch of a full 3D tour of Quaid-e-Azam Muhammad Ali Jinnah's birthplace; Wazir Mansion, Karachi on its website. It allows a life-like experience of visiting the preserved beauty with details as minute as Quaid's wardrobe present.

Corporate social responsibility helps build trust, raise awareness, and encourage social change.

Although there are tens of thousands of companies doing their part, large global corporations' efforts have far-reaching results that can impact major world issues from hunger and health to global warming. But it's not the size of the company that matters; it's the gesture and its impact that makes the real difference.

**It is great to see that our mobile operators understand the importance of social responsibility and are showing the human side of their corporation by playing an active role in building a better and stronger society**

It is great to see that our mobile operators understand the importance of social responsibility and are showing the human side of their corporation by playing an active role in building a better and stronger society.



# Corporate Social Responsibility



## Telenor Pakistan Adds 3 New Infinity 5 Series Handsets



Telenor Pakistan has launched the Infinity 5 Series smartphones in partnership with a smartphone manufacturer, Condor. Following the success of Infinity 4 series, Telenor Pakistan and Condor have introduced Infinity i5, Infinity e5 and Infinity e5 Pro that are equipped with the latest upgrades and eye catching designs.

As a part of its connectivity goals, Telenor Pakistan now has a leading position in providing digital services and devices to contribute towards driving Pakistan's digital ecosystem. With about 15 million mobile broadband subscribers and growing, Telenor Pakistan aims to accelerate the pace of digitization by introducing easy-on-the-pocket smartphones so that everyone can enjoy the benefits of data proliferation.

The new addition of Infinity 5 series to the company's handset range boasts superior quality large screens along with longer battery times and dynamic cameras.

"While we continue to expand our network outreach to connect the unconnected, we are also making sure that we develop the tools necessary for our customers to get access to benefits and opportunities offered by the

increasingly digitized world." Said Bilal Kazmi, Chief Marketing Officer Telenor Pakistan. "By leveraging the power of high speed internet connectivity with a fast paced digital lifestyle, our customers will be able to connect safely and securely to get more done on the move."

The new Infinity 5 series provides its user complete value for money with Telenor Pakistan customers also getting 500MB of free internet, 500 free SMS's to all networks, 500 free on-net minutes along with 50 free off-net minutes for one month and a free one year subscription to Golootlo upon purchase of handset.

Infinity 5 series is an all band enabled range of smartphones that are not SIM locked.

Over the years, Telenor Pakistan has advocated an open market channel policy with its exclusive business partner, Yellowstone, which is a key partner in managing product distribution throughout the country.

# Telenor Infinity E5 Pro A great low Priced Smartphone

Telenor is back in the market with its new 4G devices. The company has already introduced some 4G devices last year. This time the latest 4G device of Telenor is "Telenor Infinity E5 Pro". The price of Telenor infinity E2 is PKR.16,999/-.

The Telenor infinity e5 pro has 6.1 inch screen that supports HD Display with waterdrop notch. It is 4G enabled device available at a very reasonable price.

The system has Quad-core 2.0 GHz processor whereas powerhouse has 3000 mAh battery power. The back camera has triple camera lenses while front one has 8MP lens.

### Display and Design

Telenor Infinity e5 pro is 6.1 inch device with the supportive resolutions of 600 x 1280 pixels. Its resolution is quite average and it supports 240 dpi while the function keys are enabled on the front screen.

### Camera

Telenor Infinity e5 pro carries triple back camera lenses of 8MP+VGA+VGA rear in which videos can be recorded at 1080 pixels. The rear camera also has HDR and panorama modes.

There are different effects in the camera setting that can be set according to the situation.

The front one has 8MP camera lens which captures your moments in good quality. Three rear camera lenses bring impressive

INFINITY **e5** pro



features like HDR mode, GEO tagging, All focus and some other mode.

### Battery

The device contains a 3000 mAh battery that can't last for a really long if you play games, watch videos and use mobile data with its battery.

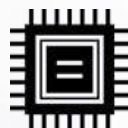




## INFINITY **e5** pro



Rs. 16,999/-



**32GB Built-in, 2GB RAM  
Quad-core**



**Removable 3000 mAh**



**6.1 inch**



**8MP + VGA + VGA Rear**

### Pros

- 4G Device
- Reasonable Price
- Triple Camera Lens

### Cons

- 2GB RAM only

### Verdict

Telenor Infinity E5 pro is a 4G device with 32GB ROM and 2GB RAM. It is a great device available at very fair price.

# TECH TWISTS



01

Every minute 24 hours of video is uploaded to YouTube. More video content is uploaded to YouTube in a 60-day period than the three major U.S. television networks created in 60 years. By 2020, video will account for about 80% of all internet traffic.

**The rise of Video content**

**Facebook  
The social media king**

02

Facebook has more than 2 billion active users who have an average of 155 friends. There are more than 300 million photos uploaded to Facebook every day, 800 million likes per day, and 175 million love reactions per day.

03

The Digital Revolution is just starting. A working Quantum Computer could arrive within the next 10 years. It will enable exponential jumps in computing power. Artificial intelligence will outperform humans in many activities in the next 10 years.

**Digital revolution is here**

**Boons of technology**

04

The top in-demand jobs that barely existed 10 years ago are Digital Marketing, Cloud Specialist, Social Media Intern, Fintech Manager, IOS and Android Developer, Uber Driver, Data Scientist, Big Data Architect, Transformation Manager.



# Smart Moves for smarter Nation

## Automation of Large-Scale Examination Systems

The government of the Punjab carries out annual assessment of almost 2.4 million grade 5 and Grade 8 students across the province.

At this scale, efficient systems and processes are a fundamental requirement. Since 2014, the Punjab Examination Commission (PEC) has worked with the PITB to implement an integrated IT-enabled system for student registration, exam conduct and results process. Traditionally, the PEC used to employ a labor-intensive manual registration process with extensive back-office activities to register students and to process and disseminate results.

Automation of the PEC examination processes has shown significant results including, improvement in speed and accuracy during student registration and marks entry, the recently provisioned item-bank software enables PEC to build a secure database of questions – with each question tagged with different qualifiers including SLO, grade level, difficulty-level, taxonomy rating, item aging, and usage history, ability to create multiple versions of each exam paper – thus minimizing the possibility of cheating.



Automation of PEC  
Punjab Education Commission  
Government of the Punjab

2.4 Million	1,950	12,719
Total Students Registered Each Year	Total Cluster Centres	Total Exam Centres

## Pakistan's first official moonsighting website

Federal Ministry for Science and Technology has launched Pakistan's "first official" moonsighting website and a calendar showing main Islamic dates and months for the next five years based on scientific evidence.

The website, pakmoonsighting.pk, has been launched by the Science & Technology ministry "to halt the moonsighting controversy" that rears its head in the country every year prior to religious festivals.

Named Moon Sighting Pakistan, the website features sections such as a monthly Hijri (Islamic) calendar for the next five years, a day-to-day lunar calendar against dates from the Gregorian calendar, and the dates on which the first day of every lunar month will fall.



## Rasta App

The Punjab Information Technology Board (PITB) has developed a smartphone application titled "Rasta" in collaboration with City Traffic Police, Lahore to provide smart solutions to general public's traffic related problems and queries.

This application will facilitate the citizens in various domains such as applying for license, paying challans, and planning driving routes. The app will also generate timely traffic alerts for citizens to ensure hassle-free driving. "Traffic Updates" another feature will allow the users to gain prior information on the intended traffic routes. With the help of Google Maps traffic updates, the source and destination points will guide users to avoid traffic congestion.



## **Xiaomi Redmi Note 7**

### **Heavy on features, Light on pocket**

#### **Design**

The Redmi Note 7 has no lesser an appeal than the expensive devices: it's made of glass with a metal frame. It is very solidly put together and it comes in three beautiful colors, a gorgeous red one, the blue one and a classic black version.

Sporting an insignificant teardrop notch, the display covers almost everything, really giving that immersive experience. And at 6.3 inches, it is a large panel, though it doesn't really feel it due to the slim body. Turning to the rear, the situation is once again a full sheet of glass.

While it does feel nice in the hand, the same concerns around durability once again apply although the sides of the device are made from a glossy plastic.

#### **Display**

At 6.3 inches, there is little else to notice on the Redmi Note 7 at first glance other than its massive screen.

With only a small notch cutting in, this is a panel made for watching videos and consuming content. At 1080 x 2340, it is also sharp enough to please all but the most ardent of pixel peepers while also offering a resulting bump in battery life over QHD+ phones.

#### **Processor and Storage**

The Redmi Note 7 is powered by the Snapdragon 660 processor, coupled with 4GB RAM. This proves to be a nimble combination and the phone runs at a cheerfully snappy speed.

You also get 64 gigs of on board storage, double that of most phones in this price range, and you also have a microSD card slot for expandable storage.



#### **Camera**

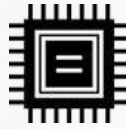
Redmi Note 7 has a 48-megapixel main camera that does a very decent job both during the day and at night.

There are no huge problems with the photos: they look mostly good. If you compare these pictures to photos from more expensive phones, you would notice that colors on the Redmi Note 7 appear a bit on the dull side and the exposure is a bit dimmer, plus you don't quite have the same amount of detail, but really, the differences are not huge by any means.

#### **Battery Life**

You have a big, 4,000mAh battery on board which performs better than the majority of much more expensive flagship phones out there, and unless you really don't put your phone away, you will probably get an average battery life of two days.





**64GB Built-in, 4GB RAM  
octa-core**



**(Li-Po Non removable), 4000  
mAh**



**6.3 inch**



**Dual 48MP + 5MP  
Front 13MP**



**PKR.35,999/-**

**For**  
• **Stellar battery life**  
• **Strong performance**  
• **Big screen**

**Against**  
• **Slightly dim screen**  
• **No NFC**

**Our Verdict**  
With great battery life, a good screen, a decent camera and a powerful chipset, the Redmi Note 7 is a great budget smartphone. The heavy MIUI software skin and lack of NFC prevent it from being an instant classic however.



# How to download Instagram videos?



Downloading Instagram videos isn't as complicated as it might seem, if you have the right tools to hand.

Whether you're using it on your computer or on your mobile or tablet, there are various options you can use to download Instagram videos. Here are some of the best.

## Desktop

There are numerous websites that let you download Instagram videos, and they all work in pretty much the same way. One of the easiest, sleekest and most reliable however is DreDown. To make use of the site, you'll first need to visit Instagram and load up the video you're interested in.

Copy the URL from the address bar of your web browser, switch to the DreDown page, click the Instagram link at the top, and then paste the URL into the text box on the DreDown page. Hit the DreDown button, wait while the video is analysed and then download it.

Other web-based services that work in a similar way include DownloadGram, Download Instagram Videos, and Gramblast.

## iOS

The security restrictions in place with iOS mean that downloading Instagram video is not quite as straightforward as on the desktop, but it's still not too tricky – all you need is the right app.

One option is Blaze: Browser & File Manager. Just copy the URL of an Instagram post from the Instagram app and then paste it into Blaze. Next, you need to tap the download button, and then

select the option to 'Export video To Camera Roll'. Of course, you can also use any of the web based options mentioned above if you prefer.

## Android

For Android users, there are several options when it comes to downloading Instagram videos, including using one of the web-based services mentioned about. There are, however, also apps that you can use to make things a little easier. One such option is Video Downloader for Instagram, a free app that does very much what its name suggests.

As the app is free, you'll have to put up with ads, but this is a minor distraction. Video Downloader for Instagram does an excellent job of explaining how to use it, but it's worth summarizing nonetheless.

Within the Instagram app, tap the three dot button to the upper right of a post you want to save the video from and select 'Copy link'. Switch to Video Downloader for Instagram and select the 'Paste' option. That's all there is to it.



# A.S ELECTRONICS

Brand Outlet of Huawei 



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**PTCL: 021-32229128**  
**Mobile: 03132775947**

 [www.as-electronics.pk](http://www.as-electronics.pk)

 [www.facebook.com/as.electronics.s66](https://www.facebook.com/as.electronics.s66)

# TELECOM CAMPAIGNS

## OPPO RENO



What does it take to see further beyond life's limitations and take the perfect shot? With this question in mind, the TVC starts, featuring Shoiab Malik. The advert blends well with the ICC Cricket World Cup and empowers sports fans to be a shot maker in everything they do. The music, acting, and the message is well conveyed. Oppo Reno being a selfie camera is flawlessly described with all its feature.

**Verdict: Good Effort...!!!**

The main idea of this TVC is built around the concept of spreading happiness and laughter all across while capturing the beauty of relationships and memorable moments which one cherishes for a lifetime. TVC highlights the same message, the bond of friendship and the moments we all live for. When it comes to effectiveness, the advert should be given five starts as it has won the heart of every Pakistani by highlighting the Eid and Ramadan Festival.

**Verdict: Excellent Concept with "ARREY WAHH"moment....!!**

## Oppo Capture Smiles F11



## QMobile

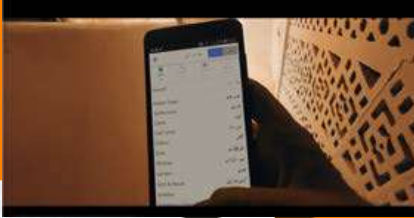


Q-Mobile has come back with a marvelous TVC quite different from its previous TVC line which usually focused on dancing people revealing specifications of the devices. The main theme of the mobile "Q day sab ko technology par brabar ka huk." It focuses on every aspect of Pakistani's life, while covering all of the features if its devices. The underline concept is to promote the use of "made in Pakistan" products, like QMobile

**Verdict: Zabardast Advert...!!**



**Bykea:  
tau samjho bhai kiya!**



The new advert of bykea has a very Brotherliness feel to it. The ad has delivered the message in a very amazing way; how bykea facilitates you in times of need.. When you are in hurry and want to reach on time to your destination, then bykea is indeed a good option as you will not get stuck in traffic jam. The background song is energetic and well sung.

**Verdict: Superb Ad!**

The new Jazz 4G ad is not appreciable at all. I don't know how they link the real life activities with the speed of internet. The overall theme of the ad is honestly not making any sense. We can link the activities of digital world with the internet speed but real world activities? Please ad maker, try to communicate sense.

**Verdict: Lame!**

**Jazz 4G sab kuch ABHI**



**MoreKaShor with TELENOR**



Cricket season is on so the new ad of Telenor 4G also features the cricket mania. The ad is short but delivers its message clearly that now you can get 12GBs of internet data for only Rs: 170 per week. Though it captures the current cricket fever nice but there is nothing outstanding about this ad.

**Verdict: Just an OKAY TVC!**

# Top Applications and Games for your Smartphone



## 1Weather

1Weather is arguably the best weather app out there. It features a simple, paginated design that shows you the current weather, forecast for up to 12 weeks, a radar, and other fun stats.



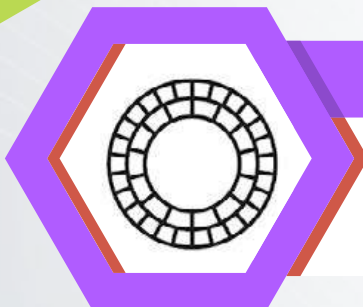
## Bouncer - Temporary App Permissions (Beta)

It's a security app with a unique premise. The app lets you grant temporary permissions to applications. So, for instance, you can let Facebook access your location long enough to check into a place, and Bouncer disables the permission once you leave Facebook.



## LastPass

LastPass is one of those must-have Android apps. It's a password manager that lets you save your login credentials in a safe, secure way. On top of that, it can help generate nearly impossible passwords for you to use on your accounts.



## VSCO

The app has the absolute best photo filters out there, letting you apply an overwhelming variety of film-like effects and make a number of other adjustments before sending your pictures off to Instagram.



## Alto's Odyssey

Alto's Odyssey is a must-have game, especially if your new phone has an edge-to-edge display — its simple, dreamy graphics look stunning scrolling across a wide screen. The game is a ton of fun, too. It's never so challenging to be frustrating, and it's always moving fast enough to keep you engaged.





### Sweatcoin

Some people work to get fit, others need a bit more motivation. Sweatcoin is a fitness app that tracks your progress, giving you Sweatcoins in the process. You can then redeem these coins for real-world rewards. whether shoes, fitness gear, or even an iPhone X (though that requires LOTS of steps).



### Otter

If you find yourself in a meeting or classroom frantically trying to take notes, Otter Voice Notes is here to save you a lot of trouble. This app creates “smart notes” that record live conversations, transcribes them, and can even differentiate between voices for more organization and accuracy.



### Telenor Apollo

Telenor Apollo is a comprehensive application which will digitize the tasks of Telenor Franchises and retailers and would provide them clear visibility of their operational tasks and end to end tracking of inventory.



### Hello Yo – Free Voice Chat Rooms

Hello Yo is an APP which you can create your free voice chat rooms and join others' rooms. Meet new people, chat, sing with others, find game friends and send gifts.



### Live Journal

LiveJournal is a vibrant, social journaling platform that allows users around the world to find each other based on common passions and pursuits.



**Oppo Reno 10X Zoom**

Price : PKR.109,999/-  
Display: 6.6 inches  
Memory: 256GB ROM,  
8GB RAM  
Camera:  
40MP+13MP+8MP



**Samsung  
Galaxy A70**

Price : PKR.67,999/-  
Display: 6.7 inches  
Memory: 128GB ROM,  
6GB RAM  
Camera: 32MP+8MP+5MP

**An Online Store with  
Official Warranty**  
**[www. phoneexpress.pk](http://www.phoneexpress.pk)**



**Huawei Y9 Prime 2019**

Price : PKR.33,999/-  
Display: 6.59 inches  
Memory: 128GB ROM,  
4GB RAM  
Camera: 16MP+8MP+2MP



**Vivo Y15**

Price : PKR.29,999/-  
Display: 6.4 inches  
Memory: 64GB ROM, 4GB  
RAM  
Camera: 13MP+8MP+2MP





**Oppo Reno**

Price : PKR.69,999/-  
Display: 6.4 inches  
Memory: 128GB ROM,  
8GB RAM  
Camera: Dual 48MP+5MP



**Samsung Galaxy A50**

Price : PKR.54,999/-  
Display: 6.4 inches  
Memory: 128GB ROM,  
4GB RAM  
Camera: 25MP+8MP+5MP



**Vivo V15 Pro**

Price : PKR.59,999/-  
Display: 6.4 inches  
Memory: 128GB ROM,  
6GB RAM  
Camera: 48MP+8MP+5MP



**Xiaomi Redmi  
Note 7**

Price : PKR.35,999/-  
Display: 6.3 inches  
Memory: 64GB ROM,  
4GB RAM  
Camera: Dual 48MP+5MP



**Samsung  
Galaxy A10**

Price : PKR.23,499/-  
Display: 6.2 inches  
Memory: 32GB ROM,  
2GB RAM  
Camera: 13MP



**Honor 8S**

Price : PKR.18,999/-  
Display: 5.71 inches  
Memory: 32GB ROM,  
2GB RAM  
Camera: 13MP

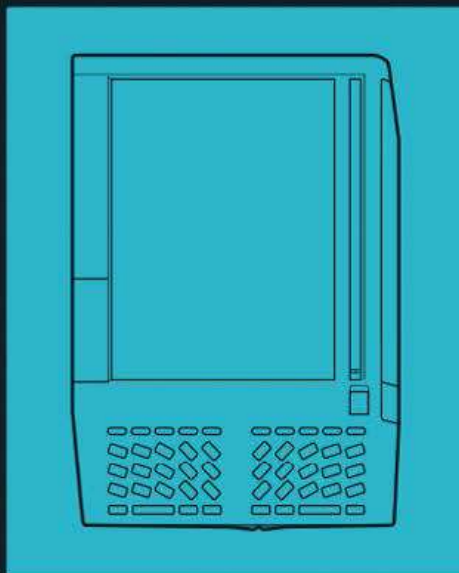
# BYTESSIZED

Analogue, digital, organic – sizing up storage capacities

■ DIGITAL ■ ANALOGUE ● ORGANIC

## MEGABYTES

1 MEGABYTE – APPROXIMATELY 1,000 KILOBYTES  
(ACTUALLY 1,024 KB)



256MB  
**Kindle**  
first generation



0.004MB  
**Apple I**  
RAM in Apple's  
first computer, 1976



0.004  
**Oyster card**  
London public transport



0.02  
**Punched paper tape**  
largest feasible reel



0.02  
**Tandy 200 computer**  
amount of RAM, 1984



0.02  
**Word document**  
single page



0.7  
**Audio cassette**  
90 min



2.5  
**War & Peace**  
Kindle ebook



1.5  
**3.5" Floppy disk**



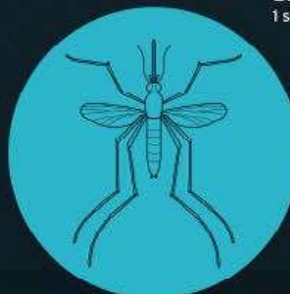
1  
**ebook**  
average size



5  
**William Shakespeare**  
complete works



9  
**Blu-Ray**  
1 sec at HDTV quality



66  
**Mosquito genome**  
DNA for malaria mosquito



20  
**10,000 pages of text**  
about 20 novels



## PETABYTES

1 PETABYTE - APPROXIMATELY 1,000,000,000 MEGABYTES  
(ACTUALLY 1,073,741,824 MB)

CHANGE  
OF SCALE  
10:1



**20PB**  
**Google**  
data processed per day 2008



**3.5PB**  
**Radio programming**  
globally 2002



**16**  
including repeats



**6**  
**World's largest  
climate data archive**  
NOAA National Climatic  
Data Center



**15**  
**Large Hadron  
Collider**  
data produced per year



**40**  
**Titan  
supercomputer**  
storage capacity



**22.8**  
**Internet  
traffic**  
for all of 1996



**15.4**  
**YouTube**  
video uploaded in 2012



**70**  
**TV programming**  
globally 2002



**45.7**  
**Human nose**  
small receptor neurons



**47.4**  
**Telephone calls**  
globally per day, 2002



**100**  
**Facebook**  
photos and videos  
stored in 2012



**152**  
**Human sperm**  
created per man,  
per day



**211**  
**Human male  
ejaculation**



**2,400PH**  
**Human skin cells**  
shed in a month

DIGITAL ANALOGUE ORGANIC

## EXABYTES

1 EXABYTE - APPROXIMATELY 1,000,000,000,000 MEGABYTES  
(ACTUALLY 1,099,511,627,776 MB)

CHANGE  
OF SCALE  
10:1



**2.4EB**  
**human skin cells**  
shed in a month



**0.2EB**  
**Human eye**  
light receptors in retina



**0.2**  
**All printed  
material on Earth**



**0.27**  
**TV programming**  
globally including  
repeats, 2002



**0.59**  
**Mobile internet**  
traffic per month, 2011



**0.66**  
**Emails sent**  
globally 2002



**0.5**  
**Internet traffic**  
per day  
2012



**1.5**  
**Dog's nose**  
small receptor neurons



**1**  
per month,  
2004



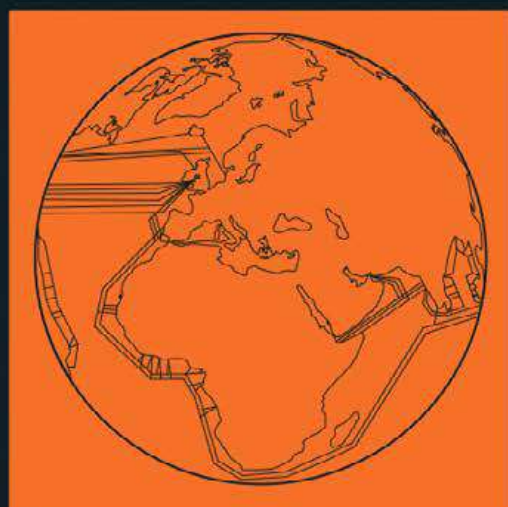
**4.9**  
for all of 2002



**56**  
**Human sperm**  
created per man, per year



**17.3**  
**Telephone calls**  
globally for all of 2002



**330EB**  
**Internet traffic**  
for all of 2011



**MWC19**<sup>TM</sup>  
Los Angeles

IN PARTNERSHIP WITH  
**ctia**<sup>TM</sup>

October 22-24 2019

WELCOME TO THE ERA OF  
**INTELLIGENT  
CONNECTIVITY**

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Experience the first live 5G networks rolling out in North America, and see how Intelligent Connectivity can work for you.

**#MWC19**

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MOBILE  
WORLD CAPITAL  
BARCELONA





CHAHO JO BHI,  
MILAY ABHI  
WITH **JAZZ**  
**SUPER 4G**

dunya ko bataa do

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vivo

Rs. 29,999  
ONE YEAR  
OFFICIAL WARRANTY



**AI Triple Camera | 5000mAh Battery**  
4GB RAM + 64GB Storage