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Cheil-12614/22



# It's for your own good

**THIS MONTH WE SAW REPORTS OF FIRMWARE OF MOTHERBOARDS BEING COMPROMISED SINCE 2016.** Imagine that, the malware in question was present in the UEFI firmware of some of the most popular motherboard manufacturers. And these manufacturers don't serve just the DIY PC segment but also serve ODMs who make laptops incorporating these motherboards. So we don't know the full extent of the impact of this attack.

The UEFI firmware is what boots the first when you turn on a computer. It runs before everything and makes way for the operating system to start off. So there is no real way of detecting this. Also, there's no real way for antivirus software to fight it since messing with the UEFI firmware could make your computer unbootable. In a way, you have to give it to the folks who executed this attack because they actually came up with a method that's extremely difficult to combat. Security researchers are still trying to figure out how the attackers managed to compromise the UEFI firmware. My bets are that they managed to gain privileged access to the FTP servers where these firmware files are hosted. And obviously, the manufacturers are at fault for not running hash checks on the firmware. That would have caught the modified firmware right before it got flashed onto hundreds of thousand of motherboards. In case you missed it, they've been undetected since 2016.

UEFI started out as a massive improvement over the legacy firmware that preceded it. It not only allowed for a more user friendly interface but the fact that firmware could be much more feature rich has helped the PC ecosystem evolve by leaps and bounds. It's the unfortunate side effect of having too many features. They all end up being additional vectors for malicious actors to compromise. This is true for a lot of new features in the technology space. It's unintentional but inevitable.

What happens when the intentions of introducing a new feature or technology isn't about helping the users or evolving the ecosystem? What if features were introduced without any noble intentions or with the sole purpose of safeguarding your bottom-

line? That's DRM in a nutshell. DRM is often implemented in a very discreet manner. With video games, we tend to discover them when things go awry and games become unplayable. We've all read countless articles of how Denuvo was implemented in video games. They've either made games unplayable because of a nasty performance hit or some unforeseen circumstance that breaks the game altogether and requires a fix. The former only inconveniences people whereas the latter literally means that people are unable to experience the games that they paid for.

DRM isn't always implemented as a software. There are often hardware implementations as well. Microsoft had implemented Secure Boot around the time Windows 8 came out, which had the potential to lock out the user from installing alternative operating systems such as Linux, if they wanted to. Thankfully, there was a flag to disable secure boot within the BIOS to prevent the system from being vendor locked. Apple, on the other hand, has the T2 chip which has been used to prevent not only third-party hardware repairs but also limited the types of operating systems that can be installed on an Apple device. In a way, it's very similar to the Secure Boot system.

A more recent example of a hardware component that can potentially act as a DRM service is Microsoft's Pluton chip. In its current version, it's very much a security solution that's geared to protect consumers from being unsuspecting victims of advanced intrustion attempts. However, the provisions that help Pluton become what it is, also makes way for it to become a gatekeeper of sorts. There are provisions that could prevent machines with Pluton chips from allowing operating systems other than Windows to be installed. This includes Linux which has been evolving to become quite the competition to Windows.

Pluton is very much in its infancy and it's too early to comment how things are going to turn out. It has the potential to be a great security solution but it also has to become the crux of an anti-trust lawsuit. Let's just hope that it doesn't turn out to be for the better. **d**



**"Pluton is very much in its infancy and it's too early to comment how things are going to turn out. It has the potential to be a great security solution but it also has to become the crux of an anti-trust lawsuit. "**



Let me know your thoughts on this column at:  
@mithun\_mohandas |  
mithun@digit.in

# About being independent

## I REMEMBER WHEN I WAS A WEE BOY, AND CONSTANTLY PESTERED MY DAD TO BUY ME A GAMEBOY

**ME A GAMEBOY** – well, not exactly the original Gameboy, but its cheaper, Chinese knock-off (as I later found out). It was clearly more expensive than any other toy my parents had bought for me until then. The most common retort to my repeated requests for a Gameboy was, “Buy one with your own money when you get a job and start earning a living.” Not to say my parents didn’t indulge most of my desires and demands (they’re nothing but generous and accommodating), they were just against instant gratification of any kind, especially those accompanied by unruly tantrums. It really made me fantasize about growing up and being my own man. I couldn’t wait to become independent – I’d get to watch cartoons all day and night, play on my Gameboy whenever I wanted, and never have to do homework ever again! Oh my childish whims and fancies!

Later on in my teen years, when my parents vetoed my request to purchase the original iMac (circa 1998) because it was the coolest computer I had ever seen, I had to settle instead for an assembled PC which wasn’t as attractive (but was more affordable, as you can imagine). Of course, I couldn’t just have a PC without a dial-up internet connection (in the pursuit of academic excellence), and upgrades to the PC’s graphics and peripherals were demanded periodically. At that point, I absolutely couldn’t wait to get independent to quench my thirst for all things digital, with or without my parents’ consent.

So this whole idea of being independent one day (to do my own bidding) stems from a strong childhood desire for gadgets, games and gizmos. When I moved out of the home to pursue my first job, I didn’t waste any time getting my first laptop, phone, several online subscriptions and other digital distractions. Independence was finally here and I couldn’t have enough of it!

Of course, as readers and followers of Digit, I would imagine most of you have had similar life experiences while growing up. Despite our brain agreeing with our parents’ logic about spending money wisely, I’d imagine that nothing gave our hearts more joy than to indulge in our digital desires – whether it’s buying a slightly cooler phone, or a faster graphics card, or an expensive

audio system for superior sound – and savour every moment. Memories that transcend from mere digital independence to instances of absolute digital nirvana, when you look back and take stock of your personal highlights.

While my yearning for the best digital indulgence I can experience and own has tempered with age, it’s an itch far easily scratched thanks to the absolute privilege of working here at Digit. We get to touch, use and play with some of the absolute best technology products money can buy, every single week. Phones, laptops, TVs, audio products, PC peripherals, and more – we experience them all. Nevertheless, what remains insatiable is the desire for faster Internet connection speed – especially because there’s a huge gulf between the broadband speed I experience at work versus my broadband connection speed at home. Independence from pesky internet speed limits still remains an unfulfilled personal dream of mine, and hopefully it’s just a matter of time before I sign up for a FTTH provider – as soon as they start services in my residential area.

Independence from online corporations who collect and mine our data is another aspect of the Internet’s evolution that I’m looking forward to observing and experiencing. People like Sir Tim Berners-Lee and those running blockchain-based Web3 services will try to promote the adoption of a decentralised world wide web in the coming years, to restore power back into each and every netizen’s hands. Independence will truly take on a whole new meaning online, if this perennial pipe dream is to become a mainstream reality.

Well, this was my two cents on digital independence – its past, present and future. What does digital independence mean to you? Write to me and tell me how you see it unfolding... **d**



**“So this whole idea of being independent one day (to do my own bidding) stems from a strong childhood desire for gadgets, games and gizmos.”**



Let me know your thoughts on this column at: [jayesh.shinde@digit.in](mailto:jayesh.shinde@digit.in) | [@jshinde](https://twitter.com/@jshinde)

Wi-Fi 6E



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TP-Link India wishes you a Happy 75<sup>th</sup> Independence Day

# Chip (in)dependence

**INDIA HAS LONG PASSED THE TODDLER STAGE, LEARNING HOW TO WALK BEFORE WE RUN IN THE FIRST FEW DECADES AFTER INDEPENDENCE,** and even passed through the awkward teenage phase where we matured and found our calling. It's hard to think on an empty stomach, so India needed a green revolution to make us totally self-sufficient when it came to feeding our masses. That happened between the 1960s and 1970s, and once we were properly fed, and could dream bigger, we opened up to the world.

However, it was in the 1990s that we dove into the mad rush that was the technology boom. Digit itself was born in 2001, and wow, what a journey the tech revolution in India has been! The mobile revolution especially has been something the world marvels. I've been privileged enough to own a mobile phone from the 90s where a mobile phone call would cost ₹16 per minute! No, it wasn't because I was rich enough to afford that, I was poor. It was because I was too stupidly in love with technology to miss out on it, and I'd rather experience it than eat all three meals a day. And I wasn't alone – thousands of people like me were FoMo-ing way before the acronym was coined.

Digit was a haven for people like me, and that hasn't changed at all actually. We still attract the technology lovers, all of whom could work elsewhere and earn more, but we all choose to run the gauntlet that is technology journalism because we love the subject matter.

Since 2001 Digit has been eagerly tracking the progress of every aspect of technology growth in India, egging it on, waiting for the tech virus to reach critical mass, and boy has it been fun! I think it's safe to say that India is now hooked on tech. Thanks to a million innovators, startups, established companies and of course, a billion people who are fascinated by technology, India is charting her own course in the technology ocean, and solving uniquely Indian problems while sailing those turbulent seas.

What we are lacking is something akin to the green revolution, which made us self-reliant and self-sufficient when it came to food security. We need a chip revolution to do the same for technology in India, especially when it comes to manufacturing. In December 2021 the government announced a \$10 billion incentive plan for chip manufacturers looking to set up shop in India, and this is a great move. I think it's

at least ten times too small, and it also needs sustained support. And my opinion is insignificant, of course, and it's just another opinion in the sea of opinions, none of whom seem to agree.

Many believe that India should not even waste time and money on trying to become technologically self-sufficient, or become a chip manufacturing hub, because the path is hard, and expensive, and littered with failures. The example of China is often thrown about – China went from manufacturing 0% of global chips to ~25% in a matter of decades. However, people are quick to point out that China themselves only manufacture lower grade, larger fab and lower complexity chips. They're at least 5 to 7 years behind the leaders of the industry such as TSMC (Taiwan Semiconductor Manufacturing Company). That alone is considered a big enough reason for why China wants to annex Taiwan. After all, TSMC produces nearly 90% of the world's advanced semiconductors. In terms of all semiconductors produced, China accounts for 24 per cent, Taiwan 21 per cent, South Korea 19 per cent, Japan 13 per cent, US 10 per cent, and the EU 8 per cent.

Despite all of the might of Chinese manufacturing, if China still cannot break into the top tier of advanced chip manufacturing, what hope does India have of becoming a chip manufacturing hub?

India and China are often looked at as similar because they both have big populations. Nothing is further from the truth. India is an open market, and it has good standing on the international stage. Western countries do not trust China, and this has impeded their potential growth. With 90 per cent of advanced chip manufacturing from Taiwan in danger of being taken over by China, a reliable and trustworthy alternative is needed. While South Korea and Japan, the US and EU are all capable of ramping up production it will come at higher running costs.

India's future as a chip manufacturer is far from dead. It might just need a bigger shot in the arm, but it will still see slow but steady growth. The sheer wealth of knowledge and expertise that will be developed and passed on within the country will be priceless. I'm hopeful that before we celebrate a centenary of independence, we will celebrate our independence from chip-dependence. Just make sure you do your bit and buy Indian-made chips when they come... 



**"India is charting her own course in the technology ocean, and solving uniquely Indian problems while sailing those turbulent seas."**



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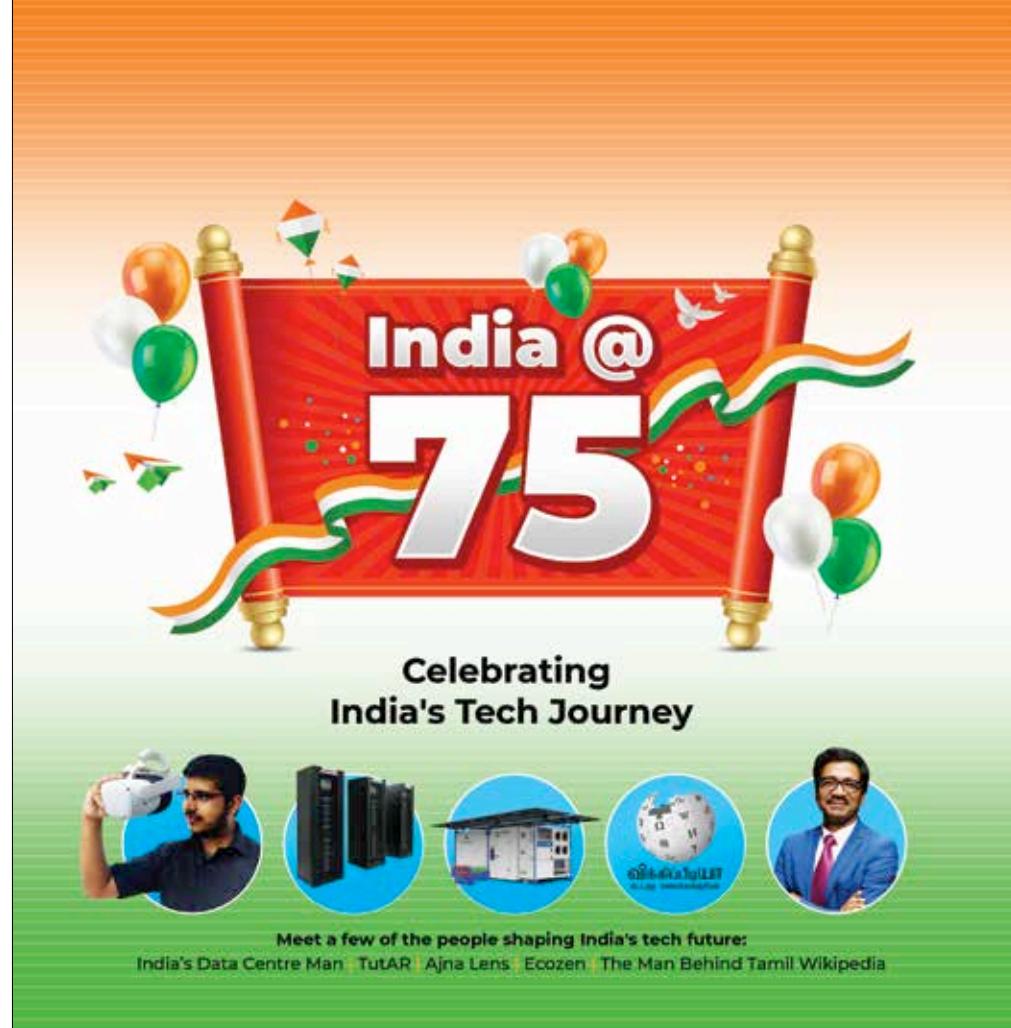
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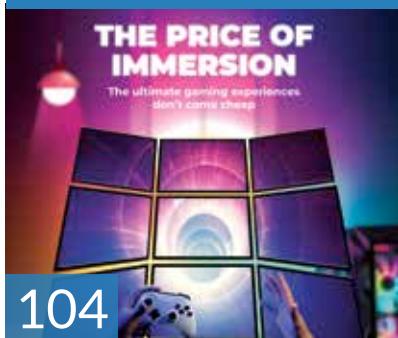
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- and more...

e-mail



## Gmail Inbox refreshed

Gmail received a refresh that tries to bring Google Chat, Meet and Spaces closer than ever before.  
<https://digit.in/aug22-35>



## &gt;&gt; FEEDBACK FOR THE JULY 2022 ISSUE

Hi Team Digit,  
My name is Mohammed Danish Khan currently working as a Lead Design Engineer at NXP Semiconductors. I came to know about digit during my college days in 2010 as a friend of mine used to hop into the library on the 10th of every month. Such a mysterious behaviour initiated the curiosity in me and undoubtedly I can claim that digit always keeps you ahead of your time

Send feedback to [magazine@digit.in](mailto:magazine@digit.in) |  
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giving an edge in terms of technological updates especially back in the days of 2G and 3G network when the internet prices were higher than the annual subscription of the magazine and there were not a plethora of websites covering major tech events across the globe. Since then, I have become an avid reader of digit and presently it has been my favourite pastime as the pandemic restrictions have allowed me to work

**digit diary**

If you are ever curious about what the **Digit gang is up to**, this is the place to get all the inside info. From the **latest game we're obsessing about** to the newest intern we're driving up the wall – it's all here folks.

**G**oing past the halfway mark of 2022, the Mumbai team started the month of July with a trip to IKEA. They shopped, made reels, had meatballs, and came back with supplies to breathe some life into our new studio. Considering this is Prakrit and Ali's new home away from home, they're pretty

excited. Which reminds us: an old minion returned to the Digit centrefold this month. But more on that later.

A road trip took Mithun, Jayesh, and Ali to a data centre. One look at those blinking server lights and Mithun was enchanted. The mechanical engineer (Computer Science, you punk! ~Mithun) within rose to the surface like the wrath of the Nazgul. He was all over the place, prodding servers, typing code and planning elaborate heists to steal their data. The managers shadowed him with impunity after he pointed out what he believed were

from home. I also feel proud to see NXP board ranking 1st in DIY kit board under top 3 recommended buys section of the magazine in 2021. I have a suggestion for the magazine as well -

- Kindly provide a QR code at the end of every page redirecting to websites like linktree, smartlink etc containing all the web links of the respective pages removing the hassle of typing those captcha like links manually.

Before signing off I wanted to congratulate you all on 21st anniversary of the magazine. It is because of the hard work and innovativeness of the team digit making it one of the best tech magazine of the 21st century.

—Mohammed Danish Khan

Hi Danish!

It is always a pleasure to get to hear from long-time fans like you. Thank you so much for the anniversary wishes! We are sure with fans like you we will be able to continue working towards making the magazine better and more engaging.

As for your feedback about the links and the QR codes. Be assured that it has been noted and will be looked into with utmost sincerity.

—Satvik

ways to \*ahem\* 'potentially' break their defences. You're welcome!

On the gaming front, Ali took to F1 circuits, albeit virtually, driving around trying to convince Mithun and Manish that they should give F1 22 a try. Unsurprisingly, the two gaming veterans turned away and went back to Diablo Immortal Immortal. When not playing F1 on the

Aorus FO48U, Ali could be found doing voodoo magic during product shoots. The team also took

turns deciphering the rules of the card game Rook. However, having a combined mental age of 7, we fell below the learning curve printed on the box.

## QUOTE OF THE MONTH

**'I need a new GPU!'**

— Prakrit, while rendering the 'imaginary' unboxing video



### FaceRD app

FaceRD app for Aadhaar identification is now available on Google Play Store.  
<https://dgit.in/aug22-36>

**opening****INBOX**

 This refers to the article “Adios iPod!” (Digit, June 2022). Since its introduction iPod never failed to captivate music lovers all around the world in varied ways. I personally have a plethora of beautiful memories attached to the little device. During my childhood, my family stayed in the state of Assam which receives

some of the heaviest monsoon showers in India. There would be road blockages and frequent power cuts. Stuck inside the house we siblings had nothing to do and would end up curling up in a corner with hot cocoa and our iPod as our only companion of entertainment.

-Gaurav Pant

 Hey Gaurav,  
The iPod was one piece of technology that almost everyone at Digit has had some memory associated with. It was a companion for many and an inseparable part of our lives at its peak. It did well while it was around, and it was about time that we bid farewell to it.

-Satvik

## Letter of the Month

 Hey team Digit!

After about 12-14 years of deciding to write this email to you, and then forgetting for one reason or another, and then deciding to do it the next month; it is finally happening at 1:56 AM on the June 27, 2022.

My journey with Digit started in 2008. It was a winter afternoon in Kashmir (that's where I am from) and I was in the market with my dad when he stopped at a news stand to pick something up and my eyes caught the word Digit. I think it was the November 2008 edition (the one where you guys reviewed Crysis Warhead). I asked my dad to buy me that and was excited on the way home to split open that huge packing you guys did in the old days.

I was born with a Geek energy and this was the day I was taking the first of many steps to channel that energy in the right way. I'm the most curious person I know, and I started exploring all aspects of being a geek. Tech, games, and everything else I found in the mag/dvd/fastracks; I just wanted to explore it all, and I did. This email is being typed by a fulltime geek (professionally, and personally). I work in tech and I chill with tech. Digit was one of the elements that shaped my mind to be an analyser, advisor and troubleshooter.

One thing that really made me write this email today is to tell you that I feel a connection with Digit. Its like you guys know exactly what I am gonna need and then put it in the next issue

of Digit. On the June 25, I had an intense discussion with my friends about the best gaming subscription out there. No one seemed to agree with me and I wished I had some comparison of all the platforms. The next day I received my copy of the June edition of Digit. I am browsing through Skoar booklet and there it is in all its glory. The table that compares all the platforms, and proves my point. I immediately send it in the WhatsApp group, while feeling that connection to Digit.

I then start browsing through the magazine, and I reach page number 30 and that connection I was talking about is what I feel again, much stronger. Why you ask? Right before unpacking this month's edition of digit (around 12 AM), I was doing some research on buying a keyboard. Page no 30 just seems to answer almost every question I had about them and I know exactly the keyboard I want now. It is the Logitech G813. That is when I hit the 'New Email' button and start typing this to express my love for digit. While writing this email, I had a phone call with my fiancé, and I gotta tell you that she felt a lil jealous about how much love I'm expressing towards Digit. There's obviously hundreds if not thousands of lines I could type about my journey over the past more than a decade to express that love, and some of it that I can't even



put into words. I hope the next time I write to you is not after another decade.

BTW, I am unable to find the Logitech G813 anywhere online and I confirmed that its not available offline anywhere near me as well. Could you hook me up with a store/dealer where this may be available at a good price and who can ship it to my city(Srinagar)?

Almost forgot to mention. I'd like to show you my favorite poster I got from Digit so far. Attaching a selfie with the poster showing right behind me.

FYI: including Raabo in the cc. He's been there since the very first digit I read and I'd like it if this email flies by his inbox.

I hope I'm not spamming your inbox Raabo!

Love,

**-Akeel Taj | Full-time Geek**

 Dear Akeel,

My inbox is pretty much all spam, which is why I missed your email in the first place. Thanks for the brilliant feedback, and finally taking the time to write in. Like you, 99.99 percent of our readers are lurkers who never write in, despite reading the mag for years. Hopefully the others can be inspired to change this after reading your letter.

The keyboard you want seems to be out of stock everywhere. Manish has promised to get in touch with Logitech to try and find a source where you can buy one. Watch out for an email from him once Logitech responds.

-Robert

**YOU  
WIN  
MYSTERY GIFT**

DOES THIS SECTION EVEN NEED AN INTRODUCTION? FROM COMPUTERS TO MOBILES, AND HEADPHONES TO GPUs, IT'S ALL HERE...

THIS MONTH IN TECH:  
Learn about India's AR startup, TuAR, the Anjna Lens, and the Yotta Datacentre – the largest datacentre in Asia. Then in Headon, we've got the Sony WF-1000XM4 vs the AirPods Pro, and the Poco F4 5G vs the iQOO Neo 5.



## Failing hard drives

If it wasn't evident already, hard disk drives are losing their market share day by day. Taking a 35 per cent plunge, HDD shipments have fallen to a measly 45 million a year, adding stats to the fact that people are growing out of spiny drives.

<https://dgit.in/nomohd>

### WHAT'S NEW

## YouTube cracks down on comment spam

**Y**ouTube has announced a set of new features that will allow for better filtering of spam comments for videos on the platform. This announcement came via a blogpost where YouTube elaborated on the new measures.

In addition to YouTube channels no longer being allowed to remove subscriber counts, comment moderation options will also be introduced in YouTube Studio. Users can now set their comment moderation settings to 'Increased strictness' inside the 'Hold for review' tab. This setting will basically increase



the level of automatic moderation and monitoring of their channel's comments section by YouTube.

The platform

also announced that the number of special characters that would be allowed to be put in a channel name will now be limited too. This means that channels like "You@ube✓" will be required to change their names.

<https://dgit.in/ytsspam>

## Hackers lifting fingerprints from your Android phone?

**Y**our fingerprints on your Android phone might not be as safe as you think. Recently, two security researchers at the annual Black Hat conference revealed that the fingerprint scanner on your Android devices is quite vulnerable. Researchers Tao Wei and Yulong Zhong of FireEye Inc. showed that Hackers can remotely lift fingerprints from Android devices. The duo talked about how



design flaws in TrustZone, the ARM technology that comes embedded in modern day smartphones, will simply let a 'sensor spying attack' harvest user fingerprints.

It was also mentioned that this vulnerability also affects some laptops that come with fingerprint sensors. The duo has alerted various vendors about this vulnerability and since then, some patches have rolled out for the same. However, if you are using an iPhone, you are quite safe as hackers won't be able to get the fingerprint image unless they have a crypto key for the fingerprint sensor data.

<https://dgit.in/fphack>



### Twitter Blue subscribers on Android finally get custom navigation

Twitter Blue users on Android can now customise their in-app navigation. This service was so far only exclusive to iOS users. Twitter Blue costs \$3/month and is available only to users in the USA, Canada, Australia, and New Zealand.

<https://dgit.in/twitblue>



### Spotify to enable in-app sound recording and editing

New Spotify update allows users to edit and record podcasts. The new update is only available in New Zealand at the moment. The new Spotify update eliminates the need to download an additional app to edit or record sound clips.

<https://dgit.in/spotrec>



### Google rolls out Split Keyboard

Google's Gboard keyboard app for Android is reportedly coming out with a new split keyboard option. The version is expected to arrive with the beta version 11.9.04. Users can visit the app page on the Play Store and sign up for the split keyboard beta if they want to try the feature out.

<https://dgit.in/splitboard>

## SECURITY WATCH

## WhatsApp Head Will Cathcart warns users against modified apps

**O**ne of the many ways WhatsApp users are targeted are through links that lead to fraudulent websites. Another is through malware. To that end, head of WhatsApp, Will Cathcart, has advised against using modified versions of the app as they hide malware within the apps which can steal user data from their phones.

While he can guarantee privacy and security for WhatsApp, he cannot say the same about these third party apps.

In a series of tweets, he also gave an example, mentioning one such third-party version of WhatsApp called 'Hey WhatsApp' by developer 'Hey-Mods'. The malware was found within the app, but the app promised several new features for WhatsApp, which is what enticed users to fall for the scam in the first place.



## MOBILE WATCH

## OnePlus 10T

**O**nePlus 10T is said to debut between July 25 and August 1, 2022. You could expect the OnePlus 10T to bear Snapdragon 8+ Gen 1 processor, up to 16GB RAM, 256GB storage, 50MP+8MP+2MP triplet on the back, a 16MP selfie shooter, a 6.7-inch LTPO 2.0 AMOLED screen with 120Hz refresh rate and FHD+ resolution, and a 4800mAh power cell with 150W adapter support in the Indian market. Elsewhere the phone could boast a 160W charging speed. The phone could come out in Black and Green colours.



With its 16GB of RAM capacity, it could be the highest RAM capacity phone in OnePlus' line-up. At the moment, the phone with the highest RAM capacity in the OnePlus' line-up is the OnePlus 10 Pro 5G, which comes with 12GB of RAM. This is the company's top-of-the-line phone in the market right now. The souped-up version of the device, which has 12GB of RAM and 256GB of storage, currently is listed on the OnePlus' website for ₹71,999. It holds the title of being the phone with the highest RAM capacity offered by OnePlus. However, it seems like it wouldn't be long before this title is taken away and attached with the OnePlus 10T.

## APP WATCH

## FaceRD app For Aadhaar Identification

**I**t looks like you will now be able to confirm your identity through the wonders of facial recognition. This applies to Aadhaar card holders and is avail-

able through an app called FaceRD. The app is currently available on the Google Play Store and has been launched by the Unique Identification Authority of India. The technology that enables this function also allows users to be identified on various other Aadhar Authentication apps. These include the CoWin Vaccination Application, Farmer Welfare Schemes, and many others.

A recent tweet by the official Aadhaar account stated, "#FaceAuthentication Residents are now using the #Aadhaar Face Authentication

feature by downloading the #UIDAI #RDApp, which can be used for various #Aadhaar Authentication Apps like #JeevanPraman, #PDS, #Scholarship schemes, #COWIN, #Farmer Welfare schemes."

There is an air of concern surrounding this app as it pertains to privacy and citizens' rights. However, as far as we know, it should be safe to use. According to the UIDAI, all information will be stored in a Central Identity Data Repository. We will just have to wait and see how the Indian government handles these issues.

### Destiny Lights



A lantern based social media app of sorts, Destiny Lights is an interesting app to explore. When using the app, clicking on the lanterns floating around gives you a random update from someone.

### Linktree



If you have clicked on a link in someone's social media bio, chances are that it was a Linktree link. Such is the ease of use and the popularity of this bio website that also has an app now.

### Woice



If you were to take any messenger right now, and remove the text message feature, Woice is what you would get. Woice also comes with a feature that lets users get transcriptions of the voice notes they exchange.



### Drone, don't drown

A drone saved the life of a 14 year old boy at a beach in Spain's Valencia.

<https://digit.in/aug22-08>



# BEST TWS: WHO TAKES THE CROWN?

An epic showdown between two of the most impressive premium truly wireless earphones in the Indian market

**Dhriti Datta** | dhriti@digit.in

**I**t's a battle between the two titans in the TWS space – one from the Android side of the world and the other from the Apple side. Cue the Sony WF-1000XM4 and the AirPods Pro – possibly two of the most sought-after truly wireless earphones since they launched back in 2019–2020. It's a testament to the sheer quality of these earphones that they're still the most revered earphones in the TWS space even a year or two after their launch.

On one end, we have the Sony WF-1000XM4. It boasts excellent app features and high-quality codec support. On the other, the AirPods Pro that introduces novel features such as

spatial audio with head tracking and handsfree Siri support (exclusive to Apple users). Both have overlapping features such as Active Noise Cancellation, Transparency Mode, and wireless charging – all of which are pretty commonplace amongst flagship truly wireless earphones in 2022. While both earphones look excellent on paper, there can be only one overarching winner in this comparison. So, let's find out which TWS takes the crown.

#### BUILD AND DESIGN

The Sony WF-1000XM4 and the AirPods Pro are flagship TWS from their respective companies, so both buds are built meticulously with incredible attention to detail. The materials used are top-notch on both devices. However, the AirPods Pro has the sturdier case hinge due to metallic reinforcement. The magnets

inside the charging case are stronger on the Sony WF-1000XM4. We dropped both cases a couple of times and the Sony earphones stayed put inside their case more often than the AirPods Pro earbuds.

The Sony WF-1000XM4 have a conventional, rounded earbud design with circular copper accents that look fantastic and premium. The AirPods Pro, on the other hand, are white, glossy, and come with angled stems. While the Sony WF-1000XM4 look more interesting, there's a case to be made for the AirPods Pro's clean and classic look.

The Sony WF-1000XM4's case is well-built and feels robust enough but the AirPods Pro's case is far more pocketable. Both Sony's earbuds and case look bulky when compared to the AirPods Pro which offers a far more sleek and streamlined look. However, we prefer Sony's matte texture over the glossy texture of the AirPods Pro. The glossy texture looks more commonplace and is definitely a fingerprint magnet. Moving on to controls, the



### The uprising begins

A Russian chess playing robot broke the finger of a 7 year old boy who reportedly didn't wait his turn.  
<https://dgit.in/aug22-09>



### HEAD-ON



Sony WF-1000XM4 features capacitive touch controls on the rear panel of the earbuds while the AirPods Pro features pressure-sensitive controls on the stem. We found the AirPods controls to be slightly more precise. However, Sony's touch controls are far improved in comparison to their predecessor and work without almost any hitches or misreadings.

#### *Build and design winner - Tie*

#### **COMFORT AND FIT**

While which pair of earphones has the better design is up for debate, the AirPods Pro are unequivocally superior when it comes to comfort and fit. Now, the Sonys do redeem themselves a bit here due to the bundled foam ear tips. The polyurethane foam ear tips are available in three sizes - small, medium, and large. You simply need to compress the foam tips before inserting them into your ears and the tips will expand to fit the contours of your ear canal.

While the foam tips do provide a far more superior fit than silicone ones would have on the Sony WF-1000XM4, there's still no denying its bulky form factor that does hamper comfort, especially after long periods of usage. The AirPods Pro provide silicone ear tips, but the fit is still far more secure since the earbuds are lighter and sleeker. The AirPods just latch on to your ear and feel secure through moderate and intensive activities such as walking, jogging, and working out. Additionally, Sony's bulky earbuds also start hurting your ears after longer

listening sessions while the discomfort is minimal on the AirPods Pro for the same duration.

Credit where it's due though - Sony has considerably shrunk down the size of the WF-1000XM4 in comparison to its predecessor, the WF-1000XM3. The case is 40 per cent smaller while the earbuds are 10 per cent smaller, which is no small feat. However, we're hoping that with the Mark 5s, Sony continues to shrink down the size of the earphones, especially the earbuds, to provide a more secure and comfortable fit. For now, though, the AirPods Pro definitely knock it out of the park for comfort and fit.

#### *Comfort and fit winner - AirPods Pro*

#### **SOUND QUALITY**

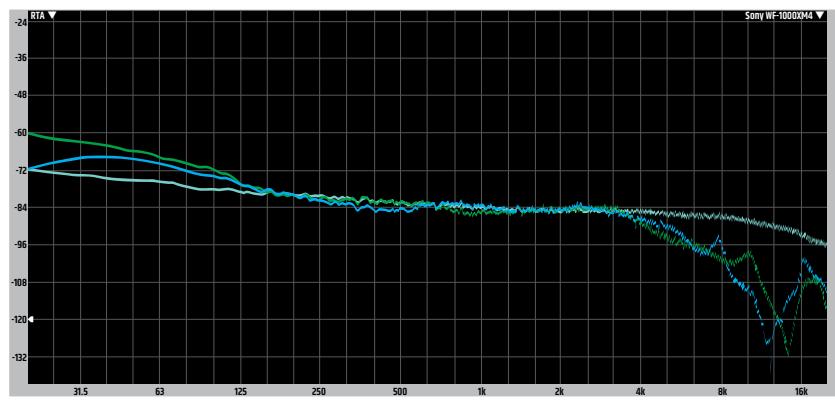
Coming to the most important question of all - how do the Sony WF-1000XM4 and the AirPods Pro compare in the sound quality department? To understand this, let's go into the hardware these earbuds sport. The Sony WF-1000XM4 pack 6mm drivers with support for SBC, AAC and

LDAC codecs. With LDAC, you can listen to hi-res music up to 32-bit/96 kHz over Bluetooth at up to 990 kbps. The earphones are powered by Sony's V1 chip which helps with Sony's DSEE feature that upscales music to near-lossless quality.

Powering the AirPods Pro is Apple's H1 chip that is also built into the second and third-gen AirPods. Apple also brings in spatial audio technology with head tracking. The earphones support SBC and AAC codecs with AAC providing stable and reliable audio when the earphones are used with iPhones. If you were to use the Sony Mark 4s with an iPhone, the codec would default to AAC since Apple doesn't support codecs such as LDAC and aptX.

Now, both earphones are sonically brilliant with Sony adding some more meat to the bass department. The bass response is slightly more pronounced on the AirPods Pro but the Sony WF-1000XM4's bass packs much more detail and character with excellent attack. The AirPods lack some of the clarity provided by the Sony earphones with LDAC active.

The mids are pristine on both earphones with close-to-neutral sonic signatures. As a result, vocals and lead instruments have almost unmatched clarity (in the TWS space). However, the Sony has a slightly wider soundstage which adds a layer of finesse to the audio. The imaging is also slightly better on the Sony WF-1000XM4 when compared to the AirPods Pro. But if you listen to tracks with spatial audio support on the AirPods, the tides





### Shaka Laka Boom Boom

A powerful laser that can be used to "draw in the air" has been created by Chinese Scientists.  
<https://digit.in/aug22-10>

turn in Apple's favour, but there are only a handful of tracks that support this feature on Apple Music.

The highs are slightly more sparkly on the AirPods Pro but the Sony is no slouch when it comes to reproducing highs as well. Cymbals and hi-hats sound clear and detailed on both earphones. Another point in Sony's favour is the fact that you can customise the EQ via the app, so if you prefer a more neutral sound, you can tweak it within the app. The same is not true for the AirPods Pro.

Spatial audio on the AirPods Pro is a magical and immersive experience though, especially when used with head tracking turned on. Apple Music has a bunch of playlists that support spatial audio that you can listen to. Overall though, the Sony WF-1000XM4 still provides a more detailed and refined sonic experience.

**Sound quality winner - Sony WF-1000XM4**

### MICROPHONE

The Sony WF-1000XM4 features beamforming microphones and a bone conduction sensor to pick up your voice and relay it. The AirPods Pro also features beamforming microphones and an inward-facing microphone for noise cancellation, transparency mode, and calls. While the microphones on both earbuds don't come close to external boom mics or desktop microphones, they're one of the best money can buy in the TWS form factor. Both earbuds come with their own form of wind-reduction technology as well.

In our experience, the AirPods Pro's microphone is superior in more ways than one. The microphone picks up the speaker's voice while eliminating most ambient noises. The sound picked up is clear and distortion-free as well. It also sounds extremely natural, preserving the tonality and intricacies of a speaker's voice with more precision than the Sony WF-1000XM4 does. The Sony WF-1000XM4's microphone also relays clear and loud voices on calls and during recordings. However, they don't sound nearly as pristine as on the AirPods. Additionally, Sony

picks up much more ambient sound in noisy environments compared to the AirPods Pro.

**Microphone winner - AirPods Pro**

### ACTIVE NOISE CANCELLATION

At the heart of the Sony WF-1000XM4's noise cancelling abilities is the company's integrated V1 chip and the array of microphones. The AirPods Pro has two microphones on each bud; one on the outside to detect incoming ambient noise and one on the inside to detect noise that makes it through the seal. This sound detected by both earphones is then cancelled out using anti-noise which is bolstered by their respective AI algorithms. The AirPods Pro, in fact, adjusts noise cancelling 200 times per second, something that is only matched by the AirPods Max.

As a result, what you get on both the Sony WF-1000XM4 and the AirPods Pro is highly effective

especially with human voices - which it lets through pretty easily.

Both earphones also come with pressure-relieving air vents that help avoid the feeling of air being sucked out of your ears that some find uncomfortable.

**Active Noise Cancellation winner - Sony WF-1000XM4**

### TRANSPARENCY MODE

We've said it for a while now - no one does Transparency Mode as well as Apple, period. While the Sony WF-1000XM4 are markedly improved in this department over their predecessors, they don't come close to how natural the AirPods Pro's Transparency Mode sounds. The H1 chip on the AirPods Pro works alongside the microphones to power this experience. This mode helps users be more aware of their surroundings in public areas to hear oncoming traffic or announcements in train stations or airports. Or,



noise cancelling that easily dims out constant, low-frequency sounds such as an AC's hum, an airplane's drone, and more. However, where the Sony Mark 4s shine is in cancelling out human voices and more high-pitched sounds. While the AirPods Pro also do a decent job at cancelling out these difficult frequencies, the Mark 4s handle them with a sense of confidence that's unparalleled in the TWS space. So, even in noisy office environments, you're looking at a solid 60-70 per cent of perceived noise reduction in mid and high frequencies. In contrast, the AirPods Pro struggles a bit here -

just to have a quick conversation with someone without having to take off your earphones entirely.

External sounds are amplified so you can hear them even though your music, still, the sounds never get into the territory of sounding jarring or unnatural. While Transparency Mode on the Sonys sounds pretty decent, it can get a bit jarring and unnatural because of how loud the playback is.

**Transparency Mode winner - AirPods Pro**

### FEATURES

The Sony Headphone Connect app is possibly one of the most utilitarian and



### Wait a minute, who ARE you?

A 15 year old Nagpur boy won a coding contest which led to him getting a job offer in the USA!  
<https://digit.in/aug22-11>



### HEAD-ON

versatile companion apps we've ever used with TWS earbuds. The app has nifty features such as a 5-band customisable EQ, sound presets, charging status, and customisable controls. Aside from that, the earbud's app allows users to access features such as Adaptive Sound Control, DSEE Extreme, Earbud Fit test, and more.

Adaptive Sound Control is a useful feature that uses AI smarts to determine your activity (staying, walking, running, or transport) and applies noise-cancellation settings accordingly. DSEE Extreme is a feature that uses AI to upscale compressed lossy files. The Earbud Fit test is convenient and it lets you know if the ear tips you've used are giving you a good seal.

One of our favourite features of the Sony WF-1000XM4 is the Quick Attention mode feature. Simply pressing and holding the left earbud will activate Ambient Sound and turn down the media volume so you can have a quick conversation without having to pause your music. The earbuds are IPX4 water resistant and support Google's Fast Pair and Microsoft's Swift Pair as well.

The AirPods Pro is no slouch when it comes to features as well, but most of these are exclusive to users with Apple devices only, which is a huge limitation. The settings screen allows users to access features such as an Ear Tip Fit Test, and Spatial Audio with Head Tracking. The ear tip fit test allows you to find the best ear tips for your ears, like on the Sony Mark 4. The spatial audio feature is something we've already raved about above.

One feature the AirPods sport that the Sonys don't is handsfree assistant support, in this case, handsfree Siri. Simply saying 'Hey Siri' will invoke the voice assistant who you can give commands to for various actions. It's an extremely nifty feature that takes out the physical element of having to manually trigger assistant every time you need to use it.

Despite this, the Sony WF-1000XM4 takes home the Features crown since not only does it have

a considerably larger feature set in comparison to the AirPods Pro but it also isn't platform exclusive. So, you can use most of the Mark 4s features on an iPhone as well by downloading the Headphones Connect app.

**Features winner - Sony WF-1000XM4**

### BATTERY LIFE

On the face of it, both the AirPods Pro and the Sony WF-1000XM4 seem to have similar battery life with



24 hours of total playback time provided with the earbuds and charging case. What makes all the difference in Sony's case is that it lasts a whopping 8 hours on a single charge (ANC turned on), while the AirPods Pro only lasts 5 hours on a single charge (ANC turned on). So, you will need to juice up the Sony Mark 4s far lesser than AirPods Pros, which is a crucial advantage. Additionally, with ANC turned off, the Sony WF-1000XM4 can provide 32 hours of battery life. In our tests, the Sony WF-1000XM4 lasted 7 hours and 52 minutes with ANC turned on while the AirPods Pro lasted 4 hours and 42 minutes with ANC on.

Both earbuds also come with fast charging support. Charge the Sony for just five minutes and you'll get an hour's worth of usage and charging the AirPods Pro for 10 minutes provides the same playback time, so the Sonys win here. Both earbuds also support Qi wireless charging for the case, which is convenient, but slower than wired charging.

**Battery life winner - Sony WF-1000XM4**

### VALUE

The Sony WF-1000XM4 is priced at Rs 19,990 in India while the AirPods Pro, which launched at Rs 24,990, can now be purchased for around 20.5 - 21K on e-commerce sites. The price difference between the two is negligible enough at this point but not at the time of launch. Both also have a vast feature set and excellent performance to justify the asking price. While we would

have given the win to the Sony WF-1000XM4 for value at launch, as it stands today, it ends up being a tie.

**Value winner - Tie**

### VERDICT

So, there you have it! It was an incredibly close race, with the Sony WF-1000XM4 scrapping ahead with the win by earning 5 points as compared to the AirPods Pro's 4 points. While the Sony WF-1000XM4 doesn't quite run circles around the AirPods Pro, it does beat them in key areas such as sound quality, active noise cancellation, and battery life - all of which are integral to a user's end experience. Sony also makes its feature set more accessible to the masses via the Headphones Connect app, something that the AirPods Pro lack. Nevertheless, if you are embedded into the Apple ecosystem, we'd still ask you to cast away the extra points Sony got and go for the AirPods Pro regardless due to the seamless connectivity, integration with Apple devices, and unique feature set. 



# POCO F4 5G VS iQOO NEO 6: THE ULTIMATE COMPARISON

Let's find out which phone reigns supreme in the sub-30K price segment

Sushant Talwar | [feedback@digit.in](mailto:feedback@digit.in)

**T**he sub Rs 30k segment of the smartphone market recently saw the entry of two new blockbuster phones – iQOO Neo 6 and the Poco F4 5G. Both offer

similar core hardware but differ in design and some other ways. As Snapdragon 870 SoC powering devices, the two are primarily



gaming focussed devices. However, they also offer enough in the other departments to help them emerge as good overall smartphones that offer a lot more than just powerful performance. But, despite both being extremely good offerings, the all-important question still remains: Which of the two is the better buy? Well, let's try and answer this in this comparison of the two phones.

## iQOO NEO 6 VS POCO F4 5G: DESIGN

Let's start with the design. In this department, both devices adopt slightly different approaches, with the Neo 6



## Powerpuff girls return!

The Powerpuff girls are all set to make their third return to the small screen.

<https://digit.in/aug22-02>



tech

HEAD-ON

relying on curves, while the Poco F4 5G comes with a flat back panel. Of the two, the Poco F4's design language is more appealing to the eye, especially for those who personally prefer flat-back phones. Otherwise, both the phones are equally good looking with the iQOO Neo 6 feeling slightly better in the hand because of its curves. Thankfully, both the devices also keep things extremely simple at the back, with just the respective branding of the two brands and two-step camera modules on both phones finding space on the back panels of the devices. On the front, both offer thin bezels and an edge-to-edge experience. The cutouts for the selfie lenses are also in the exact same spot. However, the one on the Poco F4 5G is slightly smaller. The biggest point of differentiation between the two, and the one that tilts things in Poco F4 5G's favour is the fact that the device comes with glass both at the front and the back. The iQOO Neo 6, despite feeling quite premium in the hand, only offers plastic at the back.

### IQOO NEO 6 VS POCO F4 5G: DISPLAY

Moving on to the display, both offer similar experiences. This is because both devices use Full HD+ AMOLED panels with support for 120Hz refresh rates. Both these displays offer similar levels of brightness and are also equally vibrant and colour accurate. However, the panel on the iQOO Neo 6 appears to be tuned for more life-like colours, while the Poco F4 5G outputs slightly more over-saturated tones. The Poco F4's panel is also slightly bigger. However, the difference is minimal as the F4 5G comes with a 6.67-inch panel while the iQOO Neo 6 gets a 6.62-inch display. As such, regardless of the phone you choose, the display on it will be good enough to handle all that you throw at it. However, if your primary use is going to be watching a lot of content on Netflix and Hotstar, then bear in mind the Poco F4 also offers support for Dolby Vision giving it a unique advantage over its competition.



### IQOO NEO 6 VS POCO F4 5G: PERFORMANCE

This is where there's very little to choose between the two phones. The reason for this is the fact that both phones offer the same core hardware. As such, general performance on both is quite close, with the devices also performing similarly in games. Both phones ran games such as Call Of Duty Mobile and Asphalt 9 Legends without a hitch. This was mostly down to the Snapdragon 870 SoC which performs really well under load. The chipset's stable peaks help ensure the phone can give you good in-game performance and very little janks to ruin your experience.

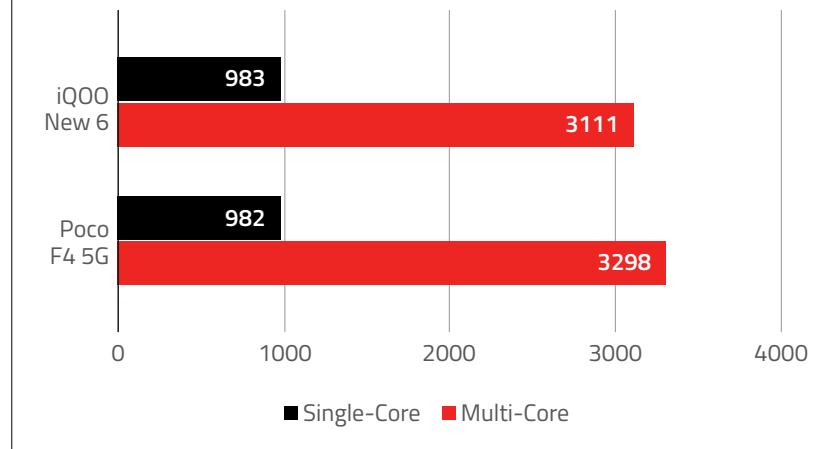
In our testing, we also found both phones weren't overheating, thereby helping with the overall experience of gaming on the devices. However,

because of its curved back, gaming on the iQOO Neo 6 was an overall more enjoyable experience. The iQOO Neo 6 also has slightly louder speakers, which again improves the gaming experience on the device. However, moving away from gaming and on to benchmarks, there was some difference in performance between the two devices, with the iQOO Neo 6 surprisingly running away with a much higher score in AnTuTu. In this crucial test, the iQOO device clocked up 735172 points. In comparison, the Poco F4 5G only managed to score 684902 points. This difference in performance was also observed

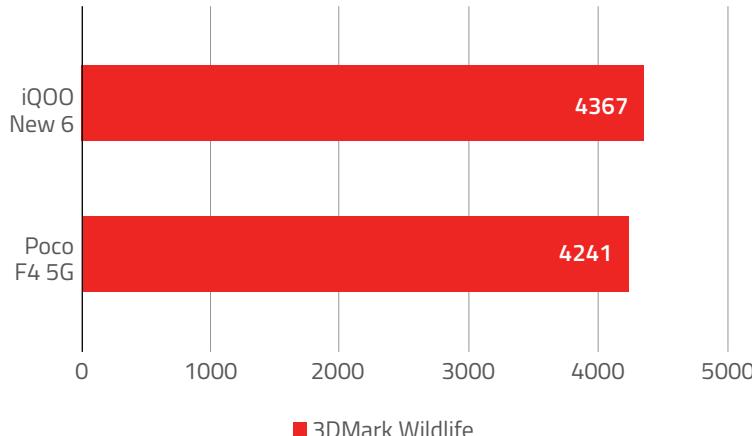


in 3DMark WildLife. However, in Geekbench both the phones ended up getting similar scores. While the difference in scores does not suggest

### GEEKBENCH TESTS



## GPU TESTS



there will be a major difference in the real-world performance of the two phones, they do hint that in the long-term, the iQOO Neo 6 will offer better performance.

### IQOO NEO 6 VS POCO F4 5G: CAMERAS

In terms of cameras, both phones offer a 64-megapixel primary lens on the back. However, there is little

colours. The iQOO Neo 6 is tuned to click shots that look closer to what the eye sees in real life. Although, the difference in output is very minute and only noticed when pictures from the two lenses are opened next to each other. But where the Poco F4 5G takes the lead is that it offers a 3-axis OIS to stabilise shots clicked using the primary camera. This helps it a lot in low light conditions. Coming to the



difference between the two. This is because the iQOO Neo 6 offers a Samsung GW1P sensor, while the Poco F4 5G flaunts an Omnivision sensor with a slightly better aperture. Working in tandem with the camera software, the Poco F4 5G ends up clicking slightly more vibrant shots, with punchier, oversaturated

secondary lens, on both phones, these are 8-megapixel lenses that capture plenty of details and without much barrel distortion. However, for both these lenses, the performance levels of the above-mentioned lenses are only great in well-lit situations. In low-light scenarios, the performance suffers a little. Both phones also of-

fer 2-megapixel macro sensors, but these are there just to make up the numbers, with the performance of the lenses not very satisfactory.

### IQOO NEO 6 VS POCO F4 5G: BATTERY

Now let's get to the battery department. This is where some differentiation emerges between the two phones. And interestingly, it is not because the iQOO Neo 6 houses within its frame a large 4,700mAh battery, which on paper is bigger than the 4,500mAh battery on the Poco F4 5G. This is because in real-world scenarios both the devices offer similar run-time, with both the Poco and iQOO device easily giving over a day's use on a single charge. The real difference between the two in this department is in the charging department, where the iQOO Neo 6 takes a slight lead because of its support for faster 80W fast charging – compared to 67W on the Poco F4 5G. While charging, this does make a slight impact, as the iQOO Neo 6 charges a little faster, going up to 100 per cent in about 30 minutes. For the Poco F4 5G, this number is slightly over 40 minutes.

### IQOO NEO 6 VS POCO F4 5G: VERDICT

Now on to the most important question, which of these two devices is the wiser choice? In my opinion, you can't really go wrong with either of the phones. Both offer very good value and spec sheets to blow away far more expensive phones. But, as always, there is a winner – even if it's by a very small margin. In this case, for us, it's the iQOO Neo 6. But that's only because of its slightly better performance in the battery department and also its slightly superior results in benchmarks, where it outperforms the Poco F4 5G in certain tests. But these aside, it is a very close fight between the two devices, and if design and build quality are of importance to you, then you may find yourself being swayed towards choosing the Poco F4 5G.

# reviews

THE LATEST PRODUCTS  
REVIEWED FOR YOU

The Digit Test Centre receives hundreds of products every month. Each of these products is put through a series of tests and is finally given a score. The final score is arrived at after considering a number of factors and evaluating them in terms of features, performance, value for money, build quality, and, in the case of software, ease of use.

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OnePlus Nord  
Buds

For better understanding of our ratings, here's a quick guide to our overall score

10 to 30

Extremely poor product.

Keep away!

31 to 50

Strictly OK.

Not recommended

51 to 70

Decent product.

Go for it, but there may be better products out there.

71 to 90

Very good product.

Highly recommended.

91 to 100

Ground-breaking product.

We've never seen anything like it before.

A definite must buy!

PLUS

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29 Motorola Moto G42

**BGMI Ban**

BGMI ban in India has reportedly resulted in the game being removed from app stores.  
<https://dgit.in/aug22-37>

# AMD Ryzen 7 5700X

## Earlier would have been better

**W**ith the next family of processors from AMD on the horizon, it was an odd thing for them to release the Ryzen 7 5700X in April of 2022. Most of the Ryzen 5000 series processors have been out for a good year and a half, and Intel has only recently put out their 12<sup>th</sup> Gen Alder Lake processors with SKUs that are actually competing and even beating AMD Ryzen 5000 SKUs in some segments. And Intel having more SKUs at price points which had no competing AMD processors is the reason why we're seeing the Ryzen 7 5700X this late into the cycle. So is it a good competitor or is this an example of too little and too late?

### SPECIFICATIONS

April 2022 saw several AMD Zen 3 processors being launched. There were several 4000 series SKUs in the lower price points which were completely ignored by AMD during the initial Ryzen 5000 launch. And since Intel has several SKUs in that segment, AMD finally released several SKUs to compete with them. The AMD Ryzen 7 5700X, also part of the April 2022 launch cycle, is a Vermeer chip on the inside. It's basically a scaled down Ryzen 7 5800X with lower clock speeds but the same set of cores. The base clock speed is 3.4 GHz and the boost clock speed is 4.6 GHz. It would seem that if thermals aren't a problem, then the performance of the two SKUs might end up being very similar. One of the biggest changes would be the TDP which is 65 Watts for the 5700X. That's 40 Watts less than the 5800X.

Pricing on the 5700X is a tad bit lesser than the 5800X but what remains to be seen is if the price difference makes it a worthwhile option to consider. While the 5800X lies on the higher end of the performance



graph, there's also the 5700G for folks to consider.

The 5700G is a Cezanne chip with an inbuilt graphics core and has a configurable TDP range of 45-65 Watts. It sports higher clock speeds as well but the key difference being the PCIe lanes emerging from the CPU is Gen 3 on the 5700G vs Gen 4 on the 5700X. So there are plenty of reasons for the two SKUs to exist side-by-side.

### PERFORMANCE

Onto the big question - Is it worth the money? We start off with Cinebench R23 where the 5700X scores 13,128 while the 5800X scored 15,147. That's a 15 per cent difference in a synthetic benchmark. Switching to Blender gives us a 13 per cent difference. Being an unlocked processor, we put the screws on the 5700X and managed to get it up to 4.4 GHz and at those clocks, the 5700X managed to nearly equal the 5800X in Blender.

In our productivity benchmarks, the Ryzen 7 5700X was very similar to the 5800X without any overclocking. Precision Boost Overdrive does a good job on its own. Switching to content creation benchmarks painted a slightly different picture since the

workloads would run for slightly longer periods of time and the TDP limits were kicking in. Nevertheless, the performance difference wasn't that much at about 7 per cent. Overclocking again helped the 5700X equal the 5800X in these benchmarks.

Lastly, we moved to gaming. There's literally negligible difference between the 5700X and the 5800X in gaming. We're talking about 1-1.5 per cent difference in FPS values. And that's without overclocking. In fact, overclocking didn't help here at all. So we're looking at a processor that can equal the 5800X with a significant overclock in most benchmarks but requires none of it when you're gaming. If you're getting a really good cooler, then PBO should do most of the work.



PERFORMANCE.....77  
VALUE FOR MONEY...75

### VERDICT

The 5700X costs about ₹24,750 and the 5800X costs ₹27,800. That's a 12 per cent price difference at the time of writing this review. And the performance difference between the two SKUs is also within the same range. So in a world where there aren't any overclocking technologies such as PBO, the two processors can live comfortably next to each other. But all things considered, the 5700X comes across as a better value for money offering for gaming and most day-to-day productivity tasks. Only sustained workloads bring out the difference between the two SKUs making the 5700X a better 8-Core/16-Thread recommendation. Now you can see why the 5700X wasn't launched when the rest of the Zen 3 processors hit the market.

-Mithun Mohandas

### SPECIFICATIONS

CORES: 8 | THREADS: 16 | GPU CORES: NA | BASE CLOCK: 3.4 GHz | BOOST CLOCK: 4.6 GHz | PROCESS NODE: 7nm | L3 CACHE: 32 MB | L2 CACHE: 512 KB per core | TDP: 65 W.

### CONTACT

AMD | PHONE: N/A | EMAIL: support.amd.com | WEBSITE: www.amd.com



## Regulated social media

The Indian Government wants to make social media "accountable" for the content it hosts. <https://digit.in/aug22-38>



tech

REVIEWS

# ViewSonic XG2431 Gaming Monitor

Say goodbye to blurring

**G**

aming monitors with a refresh rate of 240 Hz aren't a rarity anymore. In fact, you can get one for as low as ₹20K which is a huge reduction from just three years ago. Moreover, display manufacturers have, more or less, moved past chasing a higher refresh rate figure. The human eye finds it difficult to perceive the difference between refresh rates north of 240 Hz so aside from a few outliers who've come out with 480 Hz monitors, manufacturers have started improving the quality of the panels. The ViewSonic XG2431 is one such attempt.

Blur Busters, a popular website among monitor enthusiasts, has been coming up with innovative tests to help enthusiasts see the differences in how monitor technologies have been implemented. And they have established a standard for some of the key parameters that affect motion blur on monitors. The XG2431 from ViewSonic is the first monitor to live up to their latest Blur Busters 2.0 standard.

## BUILD QUALITY

Out of the box, the ViewSonic XG2431 might not seem all that impressive. It's still a 24-inch 240 Hz monitor which is what we have been seeing since the first 240 Hz monitor made its way into the Digit Test Centre, six years ago.

The XG2431 has a clean and simple design with really thin bezels on the sides and the top, and a slightly thicker chin on the bottom. The LED indicator lights aren't that bright and distracting. The base is quite wide and the monitor stem is attached to the base via a swivel mechanism with gradations for folks who want accuracy with their adjustments. Speaking of tilting, there is a -5 / +15 degree tilt which is sufficient for most installations. Also, the monitor pivots to the right by 90 degrees.

Then there's a height adjustment of 120 mm and along the back of the step there is also a path to route cables. At



the top of the step, there's a pull out mechanism for hanging headsets. One thing that ViewSonic seems to have missed out on is to have a little handle at the top of the stem.

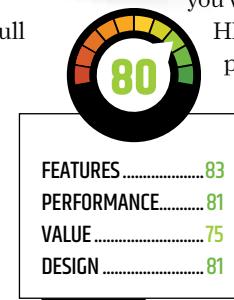
Lastly, we have the panel which is by Innolux and has a matte finish on the viewing surface which helps when viewing content with darker shades with illumination on the back of the viewer. There's also native FreeSync and G-SYNC support making this a great candidate for high FPS gaming.

## PERFORMANCE

On to the performance part. The monitor records a brightness of about 330 cd/m<sup>2</sup> which is very good in this price segment. And the monitor also has DisplayHDR 400 certification so with HDR turned on we have seen a luminance of around 500 cd/m<sup>2</sup>. The panel boasts of a contrast ratio of 1000:1 and in our tests we recorded 900:1 which is close to spec but in this price bracket, we've seen several monitors with 3000:1 contrast ratio. The XG2431 also doesn't have any local dimming feature so we can't get darker blacks. Both the above factors

play a huge role in the colour reproduction and we saw a deltaE of 0.7 post calibration. That's also a very good figure for a high refresh rate panel. When we checked out the viewing angles, the colours didn't appear that washed out from the sides. Vertically, the colour washout is much more prominent. Then again, monitors aren't viewed from such angles.

Gaming performance is next. We can't repeat this enough, but if you are using a high refresh rate monitor, always use a DP cable if you want the full colour depth.



HDMI will only give 144 Hz if the panel is set to 10-bit. FPS games running on the RX 6900 XT experienced no tearing at all with FreeSync enabled. Lastly, in the ghosting test we can see very little ghosting thanks to the tuning done by the Blur Busters folks. The results

are very similar to NVIDIA's ULMB, and that's saying a lot.

## VERDICT

The XG2431 sits right in the midst of all the 240 Hz monitors in terms of pricing but the value added in terms of the well-tuned Blur Reduction technology make the monitor one of the better 240 Hz panels we've seen. The contrast ratio could have been better but if you're a gamer who likes to have the lights turned off while gaming, this is a great pick.

-Mithun Mohandas

## SPECIFICATIONS

PANEL: IPS | SCREEN SIZE: 24-inches | RESOLUTION: 1920 x 1080 | REFRESH RATE: 240 Hz | CONNECTORS: 2x HDMI 2.0, DP 1.4 | AUDIO PASSTHROUGH: Yes | CONTRAST RATIO: 1000:1 | RESPONSE TIME: 0.5ms (GTG) | POWER: 23 W | WEIGHT: 6.8 kg.

## CONTACT

VIEWSONIC INDIA | PHONE: 18002584484 | EMAIL: Web form | WEBSITE: [www.viewsonic.com/in/](http://www.viewsonic.com/in/)



**No more Hangouts**  
Google Hangouts is to shut down completely before the end of this year.  
<https://digit.in/aug22-39>

# Nothing Phone (1)

## Essentially Everything

The Nothing Phone (1) is essentially everything that you expect from a mid-range smartphone that's out to disrupt the foundations of the smartphone ecosystem. It caters to the enthusiast crowd more so than anyone else.

Out to rekindle the fire in the smartphone world, does the Nothing Phone 1 even have enough fireworks to light its own path? Let's find out in this review.

### BUILD AND DESIGN

The design is one of the most divisive parts of the Nothing Phone 1. The back of the phone is transparent which would mean you can see through the phone and look at the internal components, except you cannot because the components are covered to make for an elegant look. Then there's the Glyph interface which lights up perfectly for calls or notification alerts, voice commands, and more.

Overall, the Nothing Phone 1 has a solid build quality and it feels very premium to hold in your hands. It's lightweight and has a wide aspect ratio which lets you enjoy watching movies or shows on that beautiful display with utmost ease.

### DISPLAY

The display on the Nothing Phone 1 is a stunner offering vibrant colours with good contrast and clarity. Nothing claims 500 nits of typical brightness which in our tests peaked at 809 nits. It supports an adaptive 120Hz refresh rate. Also, there is an option to change the colour profile of the display as per your preference along with a manual colour temperature slider.

### PERFORMANCE

The Snapdragon 778G+ under the hood powers through anything you throw at it, from multi-tasking or playing intensive games or daily tasks. The



₹31,999

software is smooth, bloat-free and fluid but not without its share of issues.

The on-screen fingerprint sensor works well and in real-world use, it unlocks the phone in the blink of an eye. As for the speakers, the stereo setup offers good sound quality but the bottom-firing speaker is louder than the front-firing one, giving an impression of an unbalanced sound profile. Another issue we found out with the speakers is the channel positioning when the phone is rotated in landscape mode. Ideally, the right and left channels should switch as the phone is rotated but it doesn't happen in Nothing's case. It can be fixed in the future with an OTA update.

### CAMERAS

In this device, the main camera is capable of producing good-looking pictures that have plentiful details with good natural colours. Meanwhile, the ultra-wide camera is able to take wider landscape shots but is unable to preserve details along the edges and

four corners. The Phone 1 also uses the ultra-wide sensor to capture macro pictures which are pretty good and usable pictures which is something of a rarity in this budget segment.

Switching to night mode leads to better clarity and textures but there's also a lot of noise that creeps into the frame which doesn't bode well for the ultra-wide camera. The front-facing camera does a decent job of taking selfies so long as there's ample light falling on your face. Otherwise, it's a hit-and-miss affair.

### BATTERY

The Nothing Phone (1) has a respectable battery size that will easily last you a day on a full charge. You will be able to get more out of this phone if you're a casual user but anywhere between medium to high power usage and you're looking at less than a day's worth of battery life.

### VERDICT

The Nothing Phone 1 is a value-for-money smartphone that doesn't beat around the bush and offers essentially everything that you'd need in a phone in 2022. It tries its best to be a renegade but some of the OnePlus DNA still creeps through. If you are someone who's looking for a vastly different-looking Android phone, the Nothing Phone 1 is right up your alley. Otherwise, there are many other phones out in the market.

—Siddharth Chauhan



BUILD & DESIGN.....	77
FEATURES.....	78
PERFORMANCE.....	70
VALUE FOR MONEY...	74

### SPECIFICATIONS

DISPLAY: 6.55-inch AMOLED, FHD+, 120Hz refresh rate, HDR10+ | WEIGHT: 193.5g | PLATFORM: Qualcomm Snapdragon 778G+ | RAM: 8GB/12GB LPDDR5 | BUILT-IN STORAGE: 256GB UFS 3.1 | EXPANDABLE STORAGE: No | 5G SUPPORT: Yes | USB-C: Yes | 3.5MM JACK: No | OS: Nothing OS based on Android 12 | REAR CAMERA: 50MP (f/1.9), OIS + 50MP ultra-wide | FRONT CAMERA: 16MP (f/2.5) | SPEAKERS: Stereo speakers | BATTERY AND CHARGING: 4500mAh, 33W wired, 15W wireless charging | COLOURS: Black, White

### CONTACT

PHONE: N/A | EMAIL: Web Form | WEBSITE: in.nothing.tech

**Split Gboard**

Google's Gboard keyboard app for Android is reportedly coming out with a new split keyboard option. <https://dgit.in/aug22-40>



# OnePlus Nord 2T

Not much to get excited about

**A**

fter tasting success with the Nord 2, OnePlus has brought to the market the Nord 2T.

It's the company's latest mid-range warrior, which attempts to offer an impressive feature set, powerful hardware, and a unique OnePlus experience all at an aggressive price point. But given the current market condition, and the abundance of options in the segment, the big question is: Does the OnePlus Nord 2T deserve a buying recommendation? Let's find out.

## BUILD AND DESIGN

The design is definitely something that goes in the OnePlus Nord 2T's favour. Interestingly, the phone follows a similar design language to the OnePlus 9RT that was launched earlier in the year. The phone offers a similar premium in-hand feel as the 9RT and as such feels like an expensive device to carry around in your pocket.

The matte finish on the back is also a nice touch if smudges and scratches are a concern for you. Another thing going in the Nord 2T's favour is that it is lightweight and flaunts a slim profile. It weighs 190 grams and is just 8.2mm in thickness. And yes, did we mention the alert slider on the device?

## DISPLAY

Moving on to the front, we have a 6.43-inch, FHD+, Super AMOLED display that's again something that works in the phone's favour. This is a fast refresh display that can refresh at 90Hz. In our tests we found the panel to be bright enough, clocking 732 nits of brightness. Since this is an AMOLED panel, it handles movies and games well, throwing punchy colours and deep blacks.

## PERFORMANCE

The only area where we feel the OnePlus Nord 2T is a bit of a letdown in the performance department. Powered



by the MediaTek Dimensity 1300 SoC, it is an upgrade over the Nord 2. However, in real life, we see the chipset not truly living up to the billing. This is because the chipset provides only slightly better performance in some benchmarks than its predecessors, losing out to the older chipset in one or two tests.

The phone handled demanding titles such as Call of Duty Mobile just fine. However, we did notice some throttling down to 63 per cent of its performance after about ten minutes of stress testing.

## CAMERAS

The cameras again work in the phone's favour – but just barely. Packing the same cameras as the OnePlus Nord 2 – 50MP Sony IMX766 primary shooter, an 8MP ultra-wide sensor and a 2MP mono-lens – the new OnePlus device does a decent job at capturing shots in good lighting conditions. These shots come out with plenty of detail and rich colours. The sharpness and accuracy of colours is also on point. In challenging shots, we also noticed the camera handling dynamic range quite well. The ultra-wide lens also does well in

good lighting conditions, with little barrel distortion on the edges. However, colour accuracy and details in shots clicked using this lens aren't as great as the ones clicked using the primary lens. Low light performance of both lenses is also satisfactory, with the primary lens proving to be the better of the two. There is still an element of artificial brightening in these pictures though. It's something that's not ideal.

## BATTERY

The battery performance is definitely a department where the phone excels. This is because the phone comes with a big enough 4,500mAh charging pack, which can be topped up using an 80W charger provided in the box, which was a surprise inclusion for the price.

When completely charged, this battery easily gives a day's runtime on moderate use.



BUILD & DESIGN.....	69
FEATURES.....	65
PERFORMANCE.....	74
VALUE FOR MONEY...	70

## VERDICT

OnePlus Nord 2T is an interesting device. It offers just about enough to make a strong case for itself if you're looking to step into the sub-30k segment of the market

for a new phone. Its cameras, the design, and its performance in the battery department are all factors that work in its favour. However, it crucially lets down a little in the core performance. Despite packing the Dimensity 1300 SoC, it is not a phone we'd recommend to gamers. But then again, not everyone is out there looking to buy phones to game on them. And if that describes you, then the OnePlus Nord 2T can definitely be the phone for you.

—Sushant Talwar

## SPECIFICATIONS

WEIGHT: 190g | SIZE: 6.43 inches | RESOLUTION: 2400x1080 | OS: Oxygen OS based on Android 12 | CPU: MediaTek Dimensity 1300 | RAM: 8GB/12GB LPDDR4X | STORAGE: 128GB/256GB UFS3.1 | BATTERY: 4500 mAh | CHARGING: 80W | CAMERA: 50MP + 8 MP + 2 MP (Back), 32 MP

## CONTACT

OnePlus IN | PHONE: 1800 102 8411 | EMAIL: N/A | WEBSITE: [www.oneplus.in](http://www.oneplus.in)



**No more videos on Insta**  
Instagram may stop Video Posts and going forward they will be treated as reels.  
<https://dgit.in/aug22-41>

# OnePlus Nord Buds

## Go for it – with caution



OnePlus has launched the OnePlus Nord Buds, making it the company's first budget true wireless earphones. However, there has been increasing competition in the budget TWS market, with players like Realme and Oppo bringing their A-game to the table with every launch. So, to test where the OnePlus Nord Buds stand, we put these TWS earphones through their paces in our testing process. Here's what we found out.

### BUILD, DESIGN, AND FIT

The OnePlus Nord Buds hold their ground when it comes to build quality. The outer case, which is made of glossy plastic, despite being prone to picking up scratches over time, does give the product a premium feel. OnePlus's attention to detail with the seams and the overall fit of the buds make the purchase feel worth it. Fingerprints were not a noticeable issue in our white review unit. Due to its boxy design, the case is not particularly easy to fit in the pocket. The earbuds are light and feature a boxy stem that tends not to protrude out of the ear. The weight of the earbuds also makes wearing them for longer periods easy. Two silver concave touch-sensitive buttons add tasteful bling to the rather mute buds' design.

### FEATURES

One should not hold high expectations at the price at which the OnePlus Nord Buds slot in. There is no ANC, the range is decent, and there is no wireless charging. These are the features one shouldn't expect in this price range. When we got to our testing, though, all the remaining scoring slots took no time to be populated with what we can call decent numbers.

They come with an IP55 rating, which makes them fit to be worn during workout sessions. The controls are intuitive and responsive. The concave



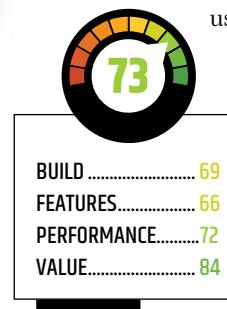
shape of the touch-sensitive area on the buds makes it very easy to locate the touch points. Controls can be modified to trigger various actions in the settings menu in select devices, while other users will have to download the HeyMelody app. The battery level indicator in the app is a nice addition too.

### PERFORMANCE

On the spec sheet, things look impressive. They come equipped with 12.4 mm Titanium drivers that support Dolby Atmos. But the actual performance was underwhelming.

We had set out with high expectations when we decided to play Hotel California on these earphones. It was not long before, though, that we were brought back to the reality that these are a budget pair of earphones. The sound we got was laden with bass, with the highs and the mids missing the punch that one would expect a driver of the size in this pair should have. As we played different tracks, one thing was apparent these are meant for the bass heads. For anyone apart from this section that would love the OnePlus Nord Buds, the listening experience would be pretty underwhelming. In our testing process, they came out behind their direct competitors on the market, the Realme Buds 3. Moving on to the performance of the microphone. This is where OnePlus Nord Buds redeemed themselves. The sound, although

muddy at times, was clear and even in the most challenging situations, the buds held their ground well. Ambient sounds were suppressed well during calls. Again, not to forget, this is when compared to other similarly priced devices. So, tune your expectations accordingly. OnePlus markets support for Dolby Atmos with the Nord Buds. However, it is limited to certain high-end devices and could not be found working with the Nord CE2 that we used during our testing.



### BATTERY LIFE

The OnePlus Nord Buds played music for six and a half hours straight during our testing, with the volume set to around 50 per cent. The case promises to provide another four full charges to the earbuds, which would push the overall battery life to around 30 hours. The lack of ANC and transparency modes helps the OnePlus Nord Buds match the numbers mentioned on the spec sheets. With the additional Flash Charge capability baked in, as advertised, you can get 5 hours of playback with just 10 minutes of charging.

### VERDICT

At ₹2,799, the OnePlus Nord Buds are a good recommendation for anyone looking to buy a reliable pair of TWS earphones in the sub 3k price range. The sound quality is decent and the best available for bass heads. You should look elsewhere though, if you are looking for a well-balanced sound. To sum it up in a single sentence—Budget package, that punches well within its weight.

—Satvik Pandey

### SPECIFICATIONS

FREQUENCY RESPONSE: 20 Hz - 20,000 Hz | DRIVER: 12.4 mm dynamic titanium | BATTERY LIFE (EARBUDS): 7 hours | BATTERY LIFE (CASE): 30 hours | FLASH CHARGING: 10 minutes of charge gives 5 hours of battery life | IP RATING: IP55 | WEIGHT (EARBUDS): 4.82 g | Bluetooth Audio Codecs: SBC, AAC

### CONTACT

OnePlus IN | PHONE: N/A | EMAIL: N/A | WEBSITE: [www.oneplus.in](http://www.oneplus.in)



**Snapchat+ is here**  
Snapchat gets a premium tier that's locked behind a \$3.99/month payroll.  
<https://dgit.in/aug22-42>



# Google Pixel 6a

For the hardcore Android purists

It's been a hot minute since Google brought one of its beloved Pixel phones to Indian shores. We're glad the Pixel 6a has arrived, but boy has it arrived to rife competition. So, will the Pixel 6a make a solid mark in the high-end smartphone segment in India or will it fade back from users' peripheral vision? Let's find that out and more.

## BUILD AND DESIGN

The Pixel 6a carries over the same design language as the Pixel 6 and Pixel 6 Pro. The black camera bar on the back of the phone breaks up the coloured area of the Pixel 6a's rear panel, providing a pretty clean look overall. The back finish, however, is a notorious fingerprint and smudge magnet. The camera bar protrudes from the frame slightly.

It carries an IP67 dust and water resistance rating. The front has a small punch hole cutout for the selfie camera and fairly thick bezels with a thicker chin bezel and comes with an in-display optical fingerprint scanner.

## DISPLAY

As for the display, the phone sports a 6.1-inch OLED panel with Full HD+ resolution. You also get HDR support and a High Brightness Mode on the device. The display has a fairly commonplace 20:9 aspect ratio with support for 24-bit colour. It provides true blacks, vivid colours, excellent viewing angles, and good sunlight legibility. We recorded a maximum brightness of 502 nits, which is pretty decent and the display is capable of going higher on High Brightness Mode. The refresh rate is where the display stumbles in comparison to the competition. The Pixel 6a supports only 60 Hz refresh rate, which seems downright comical for a phone at this price.

## PERFORMANCE

The Pixel 6a houses Google's in-house



developed Tensor chipset paired with 128 GB UFS 3.1 storage and 6 GB LPDDR5 RAM. The phone performs well as a daily driver with barely any hitches. The phone did heat up considerably when clicking photos, shooting videos and updating apps (touching 45 degrees Celsius). This caused some minor lags and stutters. Google's Titan M2 security chip shows that atleast they doing the work to ensure user security and privacy.

## CAMERA

The device houses two rear camera sensors - a 12.2 MP primary sensor - which has been tried and tested since the Pixel 2 days - and a 12 MP ultrawide shooter. But honestly, there's not much to complain about even with the older sensor we have got here. Photos in daylight look fantastic, with crisp details and realistic colours. Primarily because of Google's tuning and exceptional computational photography. In low light, Google's exceptional Night Mode worked wonders - clicking photos that you could barely tell apart from well-lit ones. The 8 MP selfie camera

also clicks some good pictures with true-to-life colours and decent detail, but they appear softer than the primary sensor. Add to this stellar performance Google's editing features such as Face Unblur, Magic Eraser and more, and you get a reliable and well-rounded performance matched by almost no phone at this price.

## BATTERY

Some global Pixel 6 and 6 Pro reviews have complained about mediocre battery life. Thankfully, this didn't translate to the Pixel 6a in our experience. The phone routinely lasted a day with ease with normal usage. We got a screen-on time of about 5 hours which is pretty good for a 4,410 mAh battery. The 18 W fast charging speeds though are nothing to write home about. The phone took 1 hour and 49 minutes to go from zero to full. Also, there's no wireless charging on the phone. The company also hasn't packaged a charging adapter in the box.



BUILD	70
FEATURES	69
PERFORMANCE	68
VALUE	68

## VERDICT

The Google Pixel 6a provides nothing short of stellar performance in two areas - software

and camera. For the price, this is pretty much the best software and camera experience you can get. This phone isn't meant for a power user or a feature seeker - it is meant for those who truly enjoy the Pixel experience and want a set of reliable shooters for every occasion. And for those individuals, it is truly a Pixel Perfect smartphone.

-Dhriti Datta

## SPECIFICATIONS

PROCESSOR: Google Tensor (5 nm) | GPU: Mali-G78 MP20 | INTERNAL STORAGE: 128 GB | RAM: 6 GB | DISPLAY: 6.1-inches OLED display, Full HD+ resolution, HDR certified | DISPLAY REFRESH RATE: 60 Hz | OS: Android 12 | CAMERAS (REAR): 12.2 MP primary, 12 MP ultrawide | CAMERA (FRONT): 8 MP | VIDEO: Up to 4K @ 60 fps | BATTERY: 4,410 mAh | CHARGING: 18 W fast charging USB PD 3.0 | COLOURS: Chalk, Charcoal | WEIGHT: 178 g

## CONTACT

GOOGLE | PHONE: 1800 419 0157 | EMAIL: NA | WEBSITE: NA



**And you get unknown content!**  
Zuckerberg said Instagram and Facebook will double recommendations from unknown accounts. <https://digit.in/aug22-43>

# Oppo Enco X2

## Playing in the big leagues

**I**t isn't often that a value-for-money product outclasses its more expensive counterparts in more ways than one and the Oppo Enco X truly wireless earphones from 2019 did just that. It's safe to assume that our excitement has been stirred up, since all signs point toward the Oppo Enco X2 becoming the new "flagship killers" for months, or even years, to come. Is the excitement warranted, though or is it all just hype? Let's find out.

### BUILD AND COMFORT

The base design of the Oppo Enco X2 has been altered only slightly in comparison to the Enco X. The design is muted and commonplace. .

The case and earbuds are glossy white. The earbuds have an in-ear design with silicone ear tips. While the case and earbuds are primarily made of plastic, the quality is pretty good, and doesn't feel cheap. The charging case has a small footprint with an OPPO branding on the top and a Dynaudio logo at the back.

As for the earbuds, they're lightweight and comfortable to wear over long periods. The pressure-sensitive controls are in the middle of the stem, making them difficult to access accurately every time. With the IP54 dust and water resistance rating, you've got a pair of earphones that are well equipped to handle the outdoors.

### FEATURES

The Oppo Enco X2 brings with it several features such as Hi-Res certified audio with high audio transmission rate. It supports an array of codecs including high-quality ones such as LHDC and LDAC, alongside the legacy AAC and SBC codecs. LHDC and LDAC can be toggled on within the app itself, so you don't need to mess with the Bluetooth settings or Developer Options.

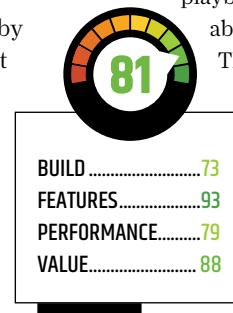


Additionally, it is powered by Bluetooth v5.2 with support for binaural low-latency Bluetooth transmission. All of this equates to fantastic connectivity with no audio drops or jitters.

### PERFORMANCE

These are the most sonically-advanced, consumer-grade TWS earphones available under 11K. The proof lies in the pudding, and the pudding is the exceptional hardware coupled with fantastic tuning. Once again, the tuning has been done in collaboration with the Danish company, Dynaudio, which has an imposing reputation in Hi-Fi circles. The soundstage is excellent as well and has improved in comparison to the Enco X.

The Enco X2, like the Enco X, brings dual coaxial drivers, which is unheard of at this price point in the TWS earphones category. You get 11mm dynamic drivers paired with 6mm planar diaphragm drivers - each taking care of a different part of the frequency range. The earphones are equipped with a triple-core chipset which includes a standalone DAC. Imaging is great too with instruments' location being easily discernible in the mix. Overall, these are incredibly versatile earphones that sound divine for their price



when listening to almost any genre of music. In terms of ANC, the company claims 45 dB of noise cancellation with the new Enco X2s - an improvement over the originals. The difference is actually pretty palpable with the Enco X2 being able to drown out quite a lot of ambient noise and chatter.

### BATTERY LIFE

In our tests, the Oppo Enco X2 earbuds lasted a little over 5 hours on a single charge with ANC turned on and LDAC codec active. The earbuds also support fast charging, which means a quick 5-minute charge will net you 2 hours of playback time and the earbuds take about an hour to charge to full. The earbuds also come with Qi wireless charging support, which is super convenient.

### VERDICT

The Oppo Enco X2 follows the footsteps of its predecessor and even goes above and beyond what the Enco X achieved.

It punches away above its weight with exceptional audio quality and an array of nifty features on offer at ₹10,999. Oppo has taken numerous steps to improve the user experience with the addition of features such as personalised sound and ANC, LDAC codec support, great battery life, and improved ANC. These will be our go-to pair of TWS earphones to recommend to those who want to experience every feature a 2022 TWS can offer without paying a hefty premium.

-Dhriti Datta

### SPECIFICATIONS

COLOURS: Black, White | DRIVER: 11mm dynamic driver + 6mm planar diaphragm | AUDIO CODECS: LDAC, LHDC, AAC, SBC | FREQUENCY RESPONSE RANGE: 20 Hz - 20 kHz | BLUETOOTH: v5.2 | BLUETOOTH RANGE: 10 m / 33 feet | BATTERY LIFE: 5 hours (ANC and LHDC on), 20 hours with case (ANC and LHDC on); 9.5 hours (ANC off and AAC active), 40 hours with case (ANC off and AAC active) | CHARGE TIME: 60 min (earphones), 90 min (case) | QI WIRELESS CHARGING SUPPORT: Yes | WEIGHT: 4.7g per earbud | IP RATING: IP54

### CONTACT

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**BSNL + BBNL**

BSNL will be merged with BBNL in order to strengthen its position in the market  
<https://dgit.in/aug22-44>

**REVIEWS**

# Motorola Moto G42

## Impressive phone, but not for power users

**M**otorola has also been a solid player in the Indian budget phone market and with the launch of the Moto G42, they've added another option for users under ₹15K. It proves to be a tough competition to phones under this price bracket. Well, at least, on paper. How does the phone hold up in real life and is it a viable option under ₹15,000? Let's find out.

### BUILD AND DESIGN

The Moto G42 is extremely lightweight; only 174.5 g. It is also pretty thin at 8.26 mm. This makes it one of the more lean and streamlined phones in its price range. It feels good in the hand, but the edges are slightly sharp which can be a tad uncomfortable.

The back panel sports a premium glass-like finish. However, it's very prone to smudges and it is slippery. The fingerprint sensor is embedded in the power button and it worked flawlessly throughout our testing. The volume buttons are a bit difficult to reach if you have smaller hands. The phone also has stereo speakers on the top and bottom. You also get IP52 dust and water resistance.

### DISPLAY

The Moto G42 rocks a 6.4-inch AMOLED display with Full HD+ resolution. However, there's no high refresh rate support. It produces good visuals with pretty accurate colours and good viewing angles. You get good screen legibility, even in sunlight, which is a win at this price point. FHD+ content pops and looks vivid with true blacks due to the AMOLED screen. The display is immersive enough and the stereo speakers with Dolby Atmos support add to this. The display, however, isn't HDR certified but it does come with Widevine L1 support.

### PERFORMANCE

The Motorola Moto G42 is powered by



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the Qualcomm Snapdragon 680 SoC, paired with 4 GB LPDDR4x RAM and 64 GB uMCP internal storage. The internal

memory is also expandable up to 1 TB via a microSD card. In real-world usage, the Moto G42 performs without hitches for most basic tasks. However, multitasking is another ball game where the G42's 4 GB RAM proves to be a deterrent. Basically, don't expect more than 3-4 apps to run concurrently without hitches.

### CAMERA

The camera experience is crucial in smartphones, no matter the price, but, unfortunately, this is where the Moto G42 fails to live up to expectations. In daylight, the primary lens outputs decent HDR shots with good colours and sharpness. However, the dynamic range is not the best we've tested at this price – details in shadows are often crushed and highlights are often overexposed. There's a 50 MP mode as well which outputs unbinned images with more clarity but the dynamic range drops even further. Indoor images look

decent, but in low light, the Moto G42's images are extremely noisy and soft, even with Night Mode active, which is disappointing. The ultrawide lens, outputs mediocre images and the colour is not consistent with the primary lens. Selfies are, again, mediocre with good colour but blown-out highlights. Night-time selfies are grainy and noisy. For video, the footage is not the best, once again, when it comes to dynamic range and sharpness. Overall, the camera experience is mediocre.

### BATTERY

The Moto G42 has you covered on the battery front. The phone is equipped with a sizable 5,000 mAh cell with a 20 W TurboPower charger provided in the box. Do note that the phone only supports 18 W charging though. In our tests, 15 minutes of playing Call of Duty: Mobile drained the battery by 4 per cent from 82 per cent. Viewing Netflix for 30 minutes drained the battery by another 6 per cent from 77 per cent. The charging speeds are slow as you only get 18 W fast charging support.

### VERDICT

The Motorola Moto G42 is an extremely impressive smartphone under ₹15,000. Not only do you get a premium-looking smartphone, but you also get an array of features such as an AMOLED display, stereo speakers with Dolby support, near Stock Android experience, good battery life, and decent real-world performance. All at the competitive price. The Moto G42 offers a pretty balanced experience across the board; with the exception of its camera system.

—Dhriti Datta

### SPECIFICATIONS

OPERATING SYSTEM: Android 12 | INTERNAL STORAGE: 64 GB, expandable up to 1TB | RAM: 4 GB LPDDR4x | PROCESSOR: Qualcomm Snapdragon 680 | BATTERY SIZE: 5000 mAh non-removable | CHARGER TYPE: 20W TurboPower charger | DISPLAY SIZE: 6.4-inch | REFRESH RATE: 60 Hz | RESOLUTION: FHD+ (2400 x 1080) | DISPLAY TECHNOLOGY: AMOLED | WEIGHT: 174 g | THICKNESS: 8.26 mm | IP RATING: IP52 | CAMERAS: 50 MP + 8 MP + 2 MP, 16 MP selfie | VIDEO: FHD at 30 fps

### CONTACT

MOTOROLA | PHONE: NA | EMAIL: Web form | WEBSITE: <https://www.motorola.in/>

# India's Datacentre Man

In conversation with Yotta CEO  
Sunil Gupta on India's datacentre industry journey

Jayesh Shinde | [jayesh@digit.in](mailto:jayesh@digit.in)

**F**or those of you who've never stepped foot inside a datacentre, imagine it to be the digital footprint of a huge township - a tiny city within a megacity like Mumbai. A heavily guarded fortress of data unlike anything you will have ever seen, processing an insane amount of data every single second, according to Sunil Gupta.

"If I have to give you some perspective, we have an average bandwidth of close to 1Tbps here," Sunil Gupta told us, "And my monthly electricity bill easily crosses into eight figures, roughly making up 60-percent of this datacentre's operational cost." Makes your average monthly internet and electricity bill feel infinitesimally small, doesn't it? But that's exactly what you'll experience when you learn more about datacentres.

Popularly known as the 'Datacentre Man of India,' we met Sunil Gupta, CEO of Yotta, at the Yotta Datacentre

Park on the outskirts of Mumbai.  
Edited interview excerpts follow:

**Q** How would you explain a datacentre to someone who has absolutely no idea about it?



India's Datacentre Man – Sunil Gupta

**Sunil Gupta:** To put it very simply, knowingly or unknowingly we all are users of datacentres. If you connect to the Internet for doing anything, you are directly connecting to a datacentre somewhere in the world. Whether you're using WhatsApp or someone else using Instagram, Snapchat or booking a train ticket or cab on Uber, watching a film on Netflix or netbanking on your bank's app at this very moment. So all this data from our mobile or desktop goes through a 2G, 3G or 4G network provider's node, from there all that information from your digital devices travels through a network of fiber-optic cables to get processed and stored in a place called the datacentre. Every digital transaction which we are doing in our personal or professional life today, through our mobile, desktop, laptop, or smart TV's have only three components: a device, the network in between and the backend - that backend is nothing but the data centre.

I think now you understand that all of us are using datacentres, one way or the other. Every moment the data we generate or consume online, it involves the datacentre to complete the feedback loop. Most of the online data we consumed in the past resided in datacentres outside our country, but due to rise of digital work and digital habits into all aspects of our life, there's a need to set up more datacentres in the country – just due to the sheer volume of data being generated, processed and consumed by local Indians and Indian companies. Because anything and everything is happening with an increased online and digital component, the size and scale of the infrastructure required at the backend to power the whole experience needs to grow exponentially.

#### **Q How have datacentres evolved in India?**

**Sunil Gupta:** I remember a time when the whole of Indian online data, maybe due to lack of good quality datacentres, was hosted in foreign datacentres – mostly in the US. I'm talking about the 1990s and early 2000s, when dial-up internet was making way for broadband, and cellular Internet connectivity of 2G and 3G had just started entering our lives. Soon, e-commerce started coming alive online and big companies started realising the need to have good datacentres in India – just to serve the local market, which was on the verge of a major upheaval.

Good data centres started popping up in India, as a result of all the increased demand, and by 2013-2014 the sector had leveled up quite well. After the launch of 4G in India, and Reliance Jio's disruptive effect on the entire nation's data consumption needs, fibre-to-the-home services also started coming up in major Indian cities. Due to the Flipkart and Amazon phenomena and food delivery services like Zomato and Swiggy, people started getting more comfortable with buying goods and services online that fundamentally enhanced commerce. The combined effect of all this was that suddenly even cloud operators like Amazon,

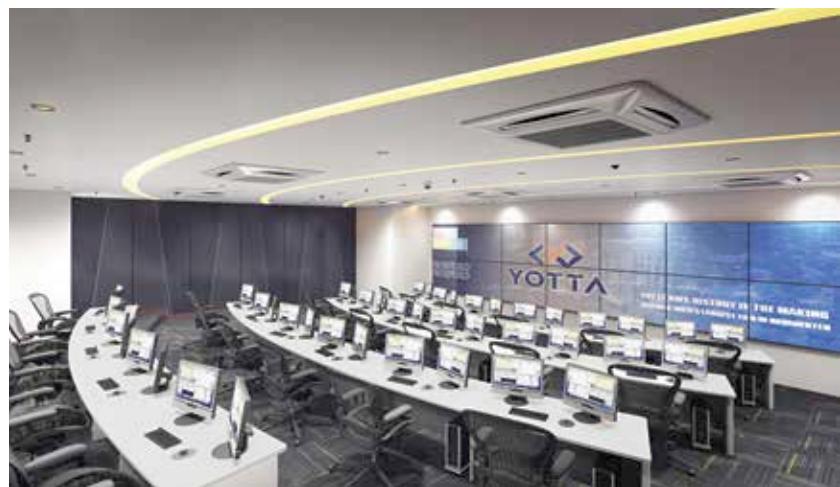
Google, Microsoft Azure, realised that if they had to tap a big market like India, they cannot serve it from outside, that they need to create their own clouds in India. Cloud essentially still means some hardware and software functionality, which we give to the end customers to run their applications and that hardware software ultimately still runs in a physical building, which is what is called a datacentre.

Since the last six or seven years we have seen this industry grow like crazy. If I talk about datacentre capacity in terms of MW (amount of power being consumed), that's how we measure our datacentre capacity. India's data centre industry which

in the next five years – of this we at Yotta are preparing to deliver at least 1000 MW in the same timeframe. India's datacentre sector has already grown three times and we are talking about growing another 6-7 times in the next five-to-six years. So the data centre story of India has suddenly become very interesting, where Yotta is going to play an important role.

#### **Q What kind of Indian online services are powered by Yotta's data centre?**

**Sunil Gupta:** There are many online things we use in our digital lives that we don't completely know where they come from, right? Because Yotta is still a B2B business, we may not be serving a consumer directly, but we



was just about 200 MW in 2014 has already become almost 600 MW as we speak in a matter of seven years. Given the various digital market drivers, 5G just around the corner, which will increase data download speeds anywhere from 50 to 100 times; with smart machines and rise of smart cities, connected driverless cars, all of this will generate massive amounts of data, requiring the setting up of more data centres to handle all that data processing traffic. With the data protection bill, the government will increasingly demand Indian data to reside inside Indian data centres, because of various geopolitical reasons. The Indian government is quite clear that the data centre capacity in India from its current 500-600 MW needs to possibly cross the 3000 MW mark

serve those online companies who in turn are serving the end customer. I won't be able to divulge names, of course, but for example: if you are using net banking online for money transfer or checking your bank balance, there's a good chance that those banks are actually running out of Yotta's data centre. We have a large Stock Exchange running in our data centre with increased data requirements, since more Indians are getting into alternative modes of investment. There are many manufacturing companies, fintech companies, and healthcare companies running out of our data centre. We also have large hospitals as our clients. A media company creating dynamic content, cartoons and graphics uses our data centre's special GPU based power workstations.

E-commerce players and food delivery services are trying to increase speed of delivery from same-day to under 30 mins and now even under 10 mins. This reduction in delivery time wouldn't have been possible without increased processing speed of the request inside a data centre somewhere, I can guarantee you that.

**d Challenges of setting up and operating a data centre in India?**

**Sunil Gupta:** Behind the obvious digitisation layer, there is an underlying infrastructure layer dealing with land procurement, getting multiple approvals and clearances, getting lots of power, storing a huge amount of fuel, getting environmental clearances, etc. Once these challenges are overcome, then we arrive at the data centre constructors and operators from an IT standpoint. The shortage of really high-skilled people, those who really understand the designing, engineering and operations of the data centre is very real. Having spent over 20 years in this business I can literally count the number of these highly-skilled people on my fingertips – and they won't go into double digits, believe me. For an industry of this scale, which is supposed to become seven times bigger in the next five years, it's a scary scenario.

One way we are trying to solve this high-skilled labour shortage facing the data centre sector in India is by hiring people from allied industries. So somebody may be working in the chemical industry or in a nuclear plant or having experience in sophisticated industry work, we actively hire them. We also have a program of taking on fresh graduates in a technical course and training them on the job here at Yotta.

**d Why is it necessary to have more data centres within India?**

**Sunil Gupta:** A whole lot of innovation will happen at the mobile device level, at the sensor level, at the smart machine level, and there are a whole lot of startups and good companies who are doing work in this space.

## YOTTA NM1: IN NUMBERS...

The Yotta NM1 Datacentre has a power plant that can power 50,000 families, enough fuel to fill up 11,000 SUVs, 400 metric tonnes of cooling, enough CCTVs for 10 high-security facilities and one expensive piece of paper which certifies it as Asia's largest Tier-IV datacentre. It's almost impenetrable with a state-of-the-art seven layers of security cover enabled by technologies like: Under Vehicle Scanning System, Automatic Number Plate Recognition System, 1200 CCTVs and AI monitoring every inch of the facility and its perimeter.



In the heart of the datacentre, there are six dedicated server hall floors, each can house 1200 racks or up to 52-U with 1500 kg of load per sq metre. There are 7200 server racks in just one building inside the Yotta NM1, while an additional 30,000 racks are coming up soon in adjoining structures inside the datacentre park. The terrace has an MS-Grille platform with 34 chillers of 400 TR to serve as chilled water distribution plants. Hot water coming out of the server racks is usually at 28 degrees, which is chilled down to 15 degrees and recirculated for cooling the servers. And as Sunil Gupta himself confirmed, there's roughly 1 Tbps of data flowing in and out of the datacentre every single second, and the entire facility's electricity consumption is in the range of crores of rupees per month.

Very soon 5G is going to get started in India, where all the telecom operators will compete to provide great network connectivity across the country. As a result, data generated by Indians is expected to go through the roof over the next five years!

Hence, India needs to focus on the IT layer on the top of the datacentre which is represented by cloud, which is primarily hosted by Amazon's AWS, Microsoft Azure and Google's Cloud. There's a need to have more Indian cloud operators to offer Indian businesses more choice. We also have to be sensitive towards geopolitical situations around the world right now, where we see countries get-

ting isolated because of their foreign policy or bordering countries – for example, the situation between India and China. Some of the Indian data which the Indian government feels is absolutely critical needs to be in Indian hands, comply with Indian law, and should be processed and stored here in India and nowhere else. But doing so is easier said than done, because companies like Amazon and Google spend billions of dollars, building so much intelligence and core competency in this sector, but we definitely have to start somewhere and up our R&D spend to innovate around these gaps in the roadmap as efficiently as we can. **d**

# SuperchARging India's Teachers

How Kerala edtech startup TutAR is empowering schools and teachers to make teaching relevant and fun again in classrooms

Anup Semwal | [feedback@digit.in](mailto:feedback@digit.in)

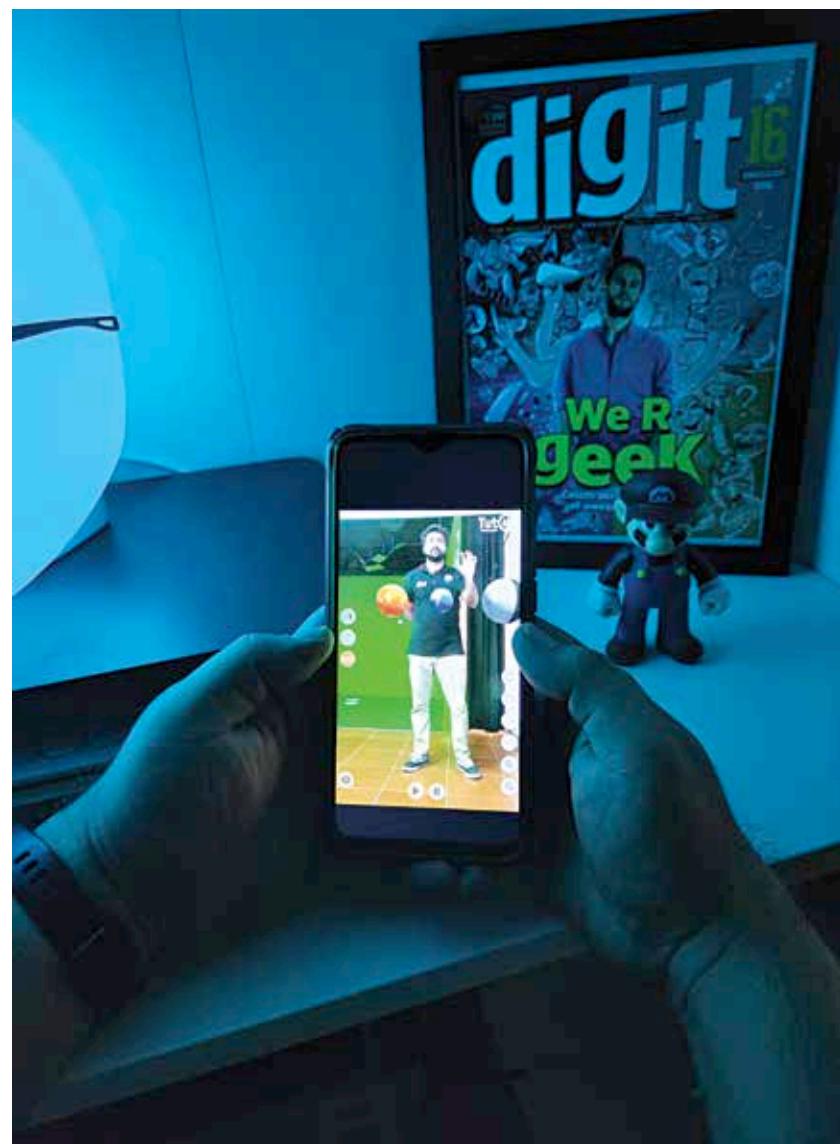
Last month, Suvith S was flitting around Chennai promoting TutAR Next Reality Classroom, an app powered by augmented reality. It is developed by Thrissur-based startup Infusory, in which designers have covered wide-ranging subjects through eye-popping 3-D models – boars, zebras and hippopotamus for kindergarten kids; anatomy of teeth, skull and muscles for middle schoolers; and wheatstone bridges, potentiometers, and carnot engines for high school nerds. These 3-D models pop up beside teachers on interactive panels – or on Zoom if someone is still taking classes online – and can be rotated and flipped, upside-down, left to right, and front to rear.



In his usual, time-tested strategy, forty-year-old Suvith, who heads sales and marketing at Infusory, was standing before teachers in Maharishi Vidya Mandir, a privately owned co-ed school in Chennai, when he asked the teachers how they utilise interactive panels installed in classrooms. He got the answer he was expecting: teachers played videos in the classroom, from either YouTube or ed-tech startups. In almost a practiced tone, he recalled telling them, "At the end of the day, these edtech companies and youtubers are teaching your students, and then, what is the point of you being a teacher in the classroom?"

Thomson Tom, founder and Chief Executive Officer at Infusory, agrees with this stance. "If you're having a YouTube video, the only role the teacher is playing in class is to play and pause. That is not how education is supposed to be." Shyam Pradeep Alil, Infusory's co-founder and Chief Technology Officer, feels that the indiscriminate use of bland powerpoint presentations and borrowed videos in classrooms that started after the smartboard revolution in the 2010s led to school teachers losing their importance in education. "There is no student-teacher interaction if all a teacher does is play videos. It's bad for students. They will not develop character."

A year ago, Dr Meena, then a principal in Trivandrum's Sree Gokulam Public School, was convinced by these arguments and started employing TutAR's 3-D models in classroom learning. "To be frank, I was very happy with the results in classrooms, especially in the Science subjects," she said. "For example, when a teacher is teaching about a heart, this 3-D model comes right in front of the students, and standing there, she can turn it around and poke it. I can actually show students a beating heart, pumping blood, and it is amazing." As per the principal, after using augmented reality in classrooms, students have increasingly started



interacting with teachers and come up with a lot more questions.

"But that does not mean they don't need to improve. Rather, they should improve," she stressed. "They also need to develop interactive models for social sciences and languages. What they have right now is very limited."

Thomson Tom, the twenty-seven-year-old CEO, wants TutAR to be a teacher's tool. "We want to empower teachers. With these models, they can make classes a lot more interactive than relying on ready-made content. At the same time, it is the feedback of these teachers who use TutAR that helps us get better. We frequently update and add new models in our app based on teachers' suggestions."

## THE MAKING OF TUTAR

The app TutAR was launched in 2020 after a few local schools came onboard with the idea of leveraging augmented reality in classrooms. When TutAR was just an idea – no app, no content – Suvith and co pitched the concept to Thrissur's Nirmalamatha Central School. The administration came on board and asked them when they'd be able to provide the app. "Covid played a major role in enabling tech inside classrooms," Thomson said. "Covid made teachers create online classes, made them video producers, made them creative directors, made them so tech-savvy that now when we were pitching augmented reality to them, they actually were excited."

With the promise of getting a solution in three months, Nirmalamatha Central School handed over one lakh rupees to the TutAR trio – Shyam, Suvith and Thomson – and the work began. In the meantime, almost five more schools came forward, and the first version of the app was rolled out in the month of August with a modest fund of around rupees five lakh. “We started with zero. Around the time we registered ourselves, we had around ₹5 lakh to ₹6 lakh, and in three months, we had an app and a full-fledged team of about 30 members,” Thomson said.

Currently, the founders say that TutAR is used by around 200+ schools and over 25,000 teachers across India as well as a few dozens of teachers from Russia, Egypt and the Middle East. The schools are mostly situated in South India – Kerala, Tamil Nadu and Karnataka – with a few up in the North, including Delhi, Jammu, Haryana and Uttar Pradesh. TutAR has curated a library of over 5000 3-D models. The company also recently raised an undisclosed amount in its seed round from April Ventures and SalesboxAI’s founder Roy Ranjan, which the company said in an official statement that it will be



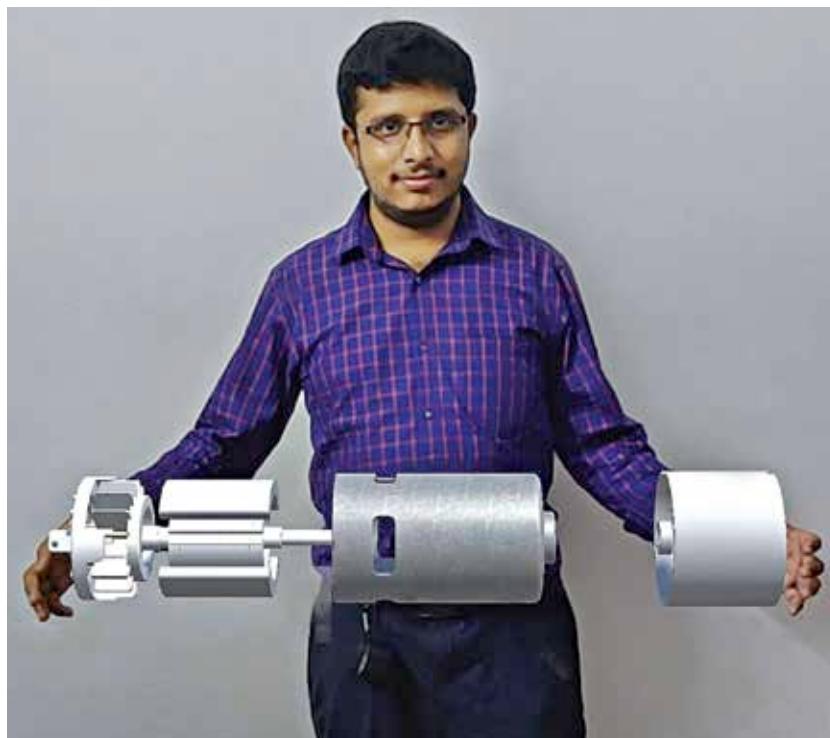
used for bolstering technology and hiring world-class content. Along with it, the company sells a contract to a school for around ₹50,000, in which as many as 25 teachers can use the app.

#### THE FUTURE OF TUTAR: TUTARVERSE

With the plans of expanding across India underway, the founders are also shifting the goalpost. They want to

create a metaverse, where students and teachers can collaborate virtually, leveraging augmented as well as virtual reality. “Online education is here to stay. We want it to make it more interactive and bring one-on-one interaction between teachers and students in the ring of online education, too”, Thomson said. The founders are expecting to roll out the metaverse, or so to speak, Tutarverse, in a few months. On the sidelines of all-consuming work, Thomson also has an interesting tale to tell. When he was in college, he was the boss; he ran campus startups. His parents were worried. “My parents wanted me to become a banker, which was considered a safe, secure job. Both of Shyam’s parents were also government employees; they wanted him to follow suit,” he said. In the parents-teachers meeting, Thomson’s teachers told his parents that he might be good, but it would not be worth it if the grades fall.

With half-a-chuckle and little gleam in his eyes, Thomson said, “Now my parents advise other youngsters that they should also apply their brains outside classrooms, maybe run a startup or two.” There might not be any need to say it, but anyway here it goes: Thomson never entered the job market, and he’s proud. □





# levelUp

A COLLECTION OF PRO TIPS FOR EVERYTHING. Without being limited to a particular topic, these tips are from popular software, to coding, to browsers, search, storage rules, password rules, mobile device hacks, bios cracking, tweaks explained and everything tech under the sun.

# macOS Monterey

## Deeper into the ecosystem, we go!

**Satvik Pandey**

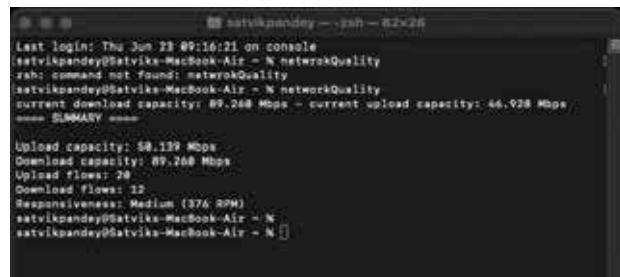
satvik@digit.in

### APPLE HAS CONSISTENTLY ANNOUNCED YEARLY UPDATES TO ITS MACBOOK

**OPERATING SYSTEM.** The latest entry on this list, macOS Monterey, since its launch last year, has found its way onto the devices of many Apple users. There are tons of tweaks and changes that can be made to improve user experience. However, there are a few features here and there that tend to miss the eye of enthusiasts. In this article, we cover some such tips and tricks that you can put to use on your Macbook running on macOS Monterey.

### MONITOR LIVE NETWORK QUALITY

macOS Monterey brought along a very useful feature for the ones who settle for nothing but the best network speeds. It is the in-built network quality monitoring feature. In the latest iteration of Apple's MacBook OS, users can measure their network's performance locally instead of going to online speed test services.



To test the network quality on macOS, all you need to do is go to the Terminal window and type the following command in there – `networkQuality`. The terminal window will then display all the required metrics that can be gathered after running a speed test. These include upload and download speeds, latency, and responsiveness.

### AIRPLAY VIDEOS AND AUDIO TO MACBOOK

Apple's ecosystem, no matter how polarising it may be, has a lot of advantages. The company added to the list of its offerings within the ecosystem by introducing the Airplay to Mac feature in its latest OS. Using this, Apple device owners can stream music, podcasts, or videos directly from their iPhone or iPad to their Macbooks.

All that they need to do is, from the app window on

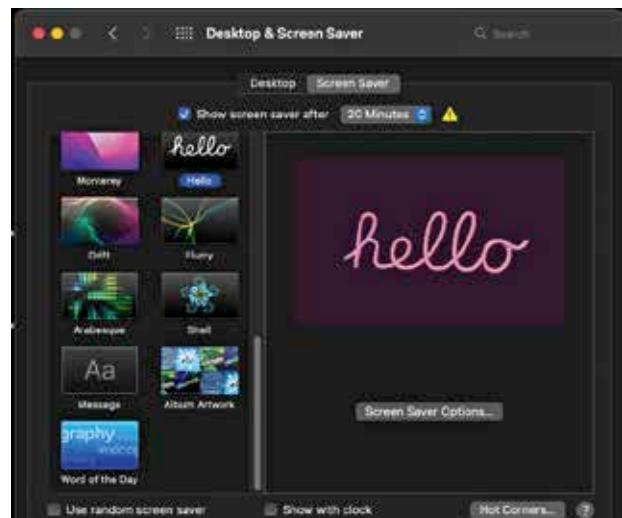
their iPad or iPhone, click on the streaming icon, and from the list that appears, choose their Macbook. Once that is done, audio files will start playing from the device's speakers or any external device that has been connected to the system. In the case of videos, the file will start playing in full screen on the Macbook's screen, and the playback controls for it can be found in the Control Center as well.



### USE THE HELLO SCREENSAVER

This one is a gem Apple fans. The company, in macOS Monterey, introduced two new screensavers, one of which is the iconic 'Hello'. The true fans must already have a grin on their face. However, for the ones who don't know, this screensaver is a homage to the original Macintosh computer that had this text.

The screensaver can be found in the screensaver selection menu of the device. Further customisation options are also available once you click on the 'Screen Saver Options' button in the window. When you click on the button, things like language controls, that let you choose the language to display text in, are available.



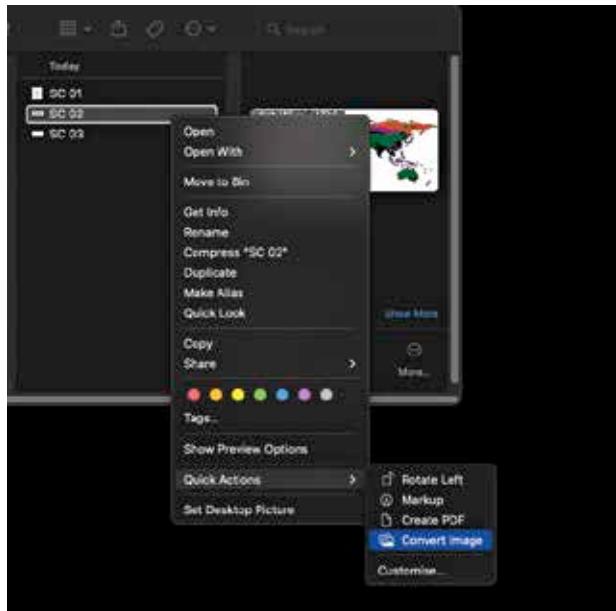


## IMAGE CONVER-

### SION

For the ones who have to frequently deal with different image formats, the pain of having to use the limited and painstakingly difficult services is a truly sour experience. Well, Apple brought respite to this section of their userbase by introducing an on-device image conversion option.

In the menu that opens when you right-click on an image file, you will find the 'Convert Image'



option. Using this, you can convert your image to any of the three formats available. These include JPEG, PNG, and HEIF. Apart from choosing the format, one can also select the size they want their file to be. It can be made to be small, medium, large, or, if needed, of the same size as the original file. To ensure that the metadata of the image is not modified, users can click the checkbox stating the same, and macOS Monterey will prevent it from being modified during the file conversion process. After

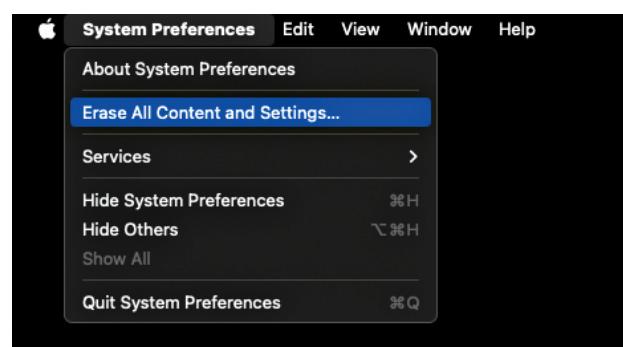
conversion, the image file is stored in the same folder as the original file.



## ERASE CONTENTS

### AND SETTINGS

It is a known fact that Apple devices tend to retain a good chunk of their value, and the users can get a good resale value out of their old devices when looking to upgrade them. However, before the sale, it is often a hassle to effectively remove all the data that is stored inside the device.



rything can be removed easily and securely using this option.



## ADD LINKS TO

### QUICK NOTES

In an attempt to boost productivity, Apple added the new add link features to Quick Notes. When using this, the device detects what app is in use or was recently used and creates a list of items available in the Quick Notes app window.

Just click on the link icon in the screen's top right corner and select the link you want to add to your notes. The device will handle the rest. Using this feature, links can also be created to specific items in apps like Mail too, providing a direct link to the message/item you want to view/take note of.



## USE MEMOJIS IN

### YOUR USER PROFILE

Ever since their launch, Memojis have been a hit amongst Apple users. Users have been able to use Memojis in all sorts of places, including different messaging apps. Now, Apple lets users add Memojis to their user profiles on their Macbooks as well. To activate a Memoji as your user profile picture, all you have to do is to go to the Users & Groups menu in System Preferences. There, you will find the option to edit your profile photo. Once you click on it, you will be presented with a host of Memojis that you can use to greet you. The Memojis can also be customised here, as per the user's preferences. d



# PC Maintenance



## Learn all about how you can effectively maintain your PC

**Paarth Pareek |**  
feedback@digit.in

**MOST OF US HAVE A PC, BE IT AT HOME OR AT WORK.**  
Doesn't matter if it's top of the line or the one that your dad passed down to you, it needs some love and caring. In this article, we are going to tell you exactly how to do that. From software to hardware, this piece covers it all!

### SOFTWARE MAINTENANCE

First, let's get down to the things that don't require you to open up the screws in the back of your PC. Getting into software maintenance isn't as difficult as it may seem to some people and with this guide, you'll be able to go on and make it all look like a piece of cake!

Before we get into it however, make sure you create a backup of your most important files and

folders so that in the case of a data loss or an unfortunate damage to parts, you wouldn't have to worry.



#### APP LEVEL

Let's start with the easiest things to do first, you can check in on which apps you use the most and determine what to do away with by using the Task Manager on your PC itself.

Here's how :

1. Right click on the taskbar of your PC, and click on Task Manager.
2. Once the Task Manager opens up, click on the App History tab which will show you various different parameters which your PC has recorded for you to look at and decide which apps you don't need.
3. From the now available sub-sections, you can click on CPU time and you'll be able to see the programs which have used your CPU for the longest duration. Click on it again and you'll see the list of programs that have barely used your CPU at all!
4. Once you get that list, you can judge which programs

you want to keep and which ones you want to do away with and once you have your mind set, we move on to the cleansing!

Now, you know which programs you want to remove from your PC and which ones you need to keep. So keeping in mind the fact that some programs are more persistent and stubborn as compared to others, we suggest you get an uninstalling software.

Geek is one of the most popular uninstallers and we recommend you use it to cleanse your PC of the apps that you don't need anymore. Here's how you can get it :

1. Head over to <https://digit.in/geekuninstall>
2. Click on the download button.
3. Click on the ZIP option under the free version, your download should start immediately.
4. Once the file is downloaded, open it up and extract the exe file to someplace convenient.
5. Run the program and you should see a list of the programs that are installed on your PC.
6. Simply double-click on

the program you want to remove, and Geek ensures that the program is uninstalled from your PC.

7. Once the program is uninstalled, it will also check your PC for leftover files, folders and registry items and will do away with them if you want it to, making it very convenient to get rid of apps that you don't need.

And that, people, is how you can make sure that your PC does not contain any excess applications that may be eating up resources in the background on your precious PC! Moving on, however, we will now learn about the importance of regularly updated drivers!

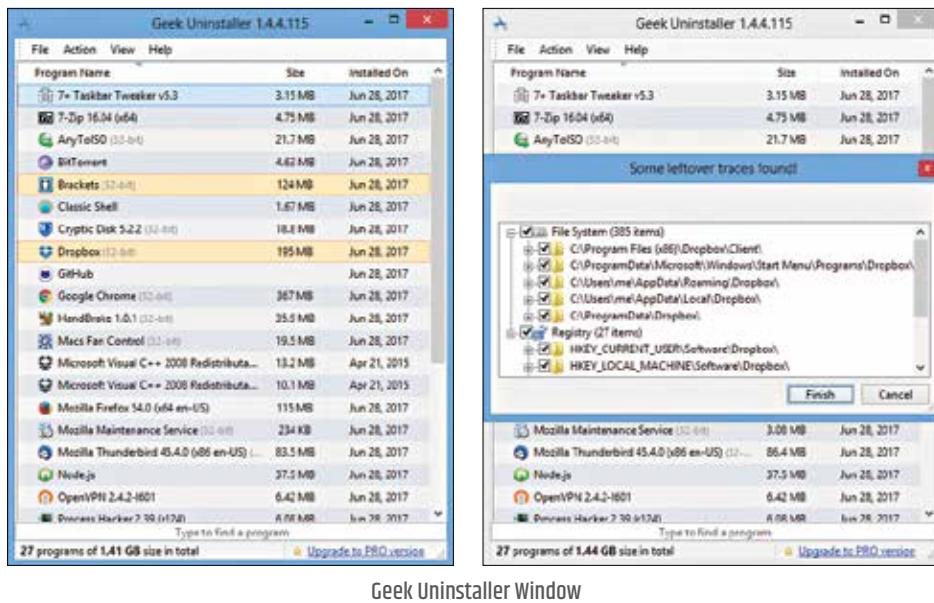


#### DRIVER LEVEL

Now that we have cleared the apps that you don't need on your PC anymore, let's move our attention toward the smooth functioning of your PC's components, and to do that, let's take a look at drivers!

Now, if we are talking in the most basic of terms, a driver is basically a software component that allows your Operating System to communicate with the hardware that you are running on your PC. They also get regular updates much like any other piece of software that you might have on your PC and it is **VERY** important that your drivers are the one piece of software you update once a new one comes along.

With the constant updates to operating systems, it can sometimes get difficult for drivers to function



Geek Uninstaller Window

as expected if they are not updated as well.

Think of it this way, if you, without any idea of what has happened in the past 5 years were placed in the future 5 years from now, you would have no idea what was happening around you and no way to tell how to function! Well, that is exactly what you're putting your drivers through when you don't update them and the operating system moves along.

An easy way to stay on your toes with these types of things is an all-in-one driver updater which you can get easily after finding a good one with a little bit of research online.

Most of such software is free to use and comes in very handy as you don't need to keep checking for

new drivers being released by companies since the software will do it for you!

And now that we have made sure our drivers are up to date, let's head on over to our operating system.

### OPERATING SYSTEM LEVEL

Now that we have cleared off the app level maintenance and the driver level maintenance as well, let's get on to the operating system.

Even though your PC may have a lot of storage and be well maintained, there are certain things at an inner level which, if not paid attention to, will cost you performance in the long run.

Make sure you are running diagnostic scans on a regular basis and checking for abnormalities and making sure you

fix them by looking for solutions for the little things.

A good way to make sure you keep a track of these scans is by setting a monthly reminder (or sooner if you feel like it) on your phone to run the full scale diagnostic check.

Make sure you also check files that have been blocked by your firewall and take the right course of action for the same so as to prevent any damage that the dormant file may cause.

Apart from this, you should check up on what files and folders are taking up space on your hard drive and try to free up space. Though, you should also keep in mind not to mess with files that you don't have a lot of information about as this may end up doing more damage than it would actually help.

Last but not least, you should also defragment your hard drive or at least make sure that the disk defragmenter on your PC is doing the task on regular intervals and not missing out on the process. Defragmentation is also a good process to turn your heads to if you feel like your PC is slowing down.

## HARDWARE MAINTENANCE

Now that we have solved up the maintenance for the software of your PC, it is time to bring out your screw driver and get to work with your PC!

Keep in mind these are only recommendations for things that you should do and extreme caution should be practiced when you are opening your PC. We shall not be responsible for any damage that might be caused by your mistakes while trying to follow our guide.

Now, on to the list of components that you should be performing maintenance on, how to do it, and most importantly, what precautions to take while doing so.

Now, without further ado, get a let's begin!

We shall be starting off in the order that one would generally open their PC in. So, GPU, then CPU, then Motherboard, and so on.

So, as we open up your Case side panels, let's take out your GPU.



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**GPU** The GPU, or the Graphics Processing Unit, more commonly known as the graphics card, isn't something that a regular consumer can perform much maintenance on, so we would advise keeping your screw driver set away for now and simply clean up some dust that may have gathered in and around the fans while also blowing some pressurised air through the heatsink to get some excess dust out.

This will help in the better ventilation of air through the PC and also result in better GPU performance.

In case it has been some time since you bought your GPU, we would also recommend taking it to an experienced professional who can take it apart and change up the thermal paste that is applied on the dye, i.e., the main chip that does the most amount of work, as this would make better contact with the heat spreader reducing the temperatures when the GPU is under load.



**CPU** Once you have taken out your GPU and performed maintenance on it, the next thing to unplug and take out, is your motherboard along with the CPU attached to it.

Ensure that you unscrew all the screws on it before taking it out. Once out, place it on a non-conductive surface to make sure the mother-

board doesn't receive any stray ESD charges that may damage the chipset.

Unscrew the heatsink on the CPU in a cross pattern so the pressure remains constant on the CPU and as the heatsink comes off, don't forget to take the backplate out as well.

Once you have access to your CPU, wipe the thermal paste off using some rubbing alcohol and dry wipes. Next, apply some fresh thermal paste on the CPU in an X pattern while putting in a dot in the center of the free spaces. This method of application ensures maximum amount of spread which helps in the conduction of heat from the CPU to the heatsink.



**HEATSINK** Once you have your CPU clean, divert your attention towards the heatsink.

For your heatsink, use pressurised air in between the fins and clean up the fan that is attached to it in a similar way. Once it is clean enough that you can see through the fins, make sure you wipe the contact piece with rubbing alcohol and dry wipes as well before putting the heatsink back on.



**MOTHERBOARD** Moving on, we now get to the motherboard, if we are being honest, there's not much that one can do in order to perform maintenance on the Motherboard except



Worth its weight in gold

for getting rid of dust using pressurised air and changing out the CMOS battery if it has been about 3 years since it was last changed.

You can get a compatible battery for the CMOS at any computer hardware store and should be easy enough to replace.



**AIR FILTERS** If your case has air filters, make sure you take them out and dust them off well. In the long run, it is not uncommon for people to find large accumulations of dust on the filters which block the flow of air into the case making it a space heater because of insufficient cooling.

Once you have your dust filters out, use some pressurised air to get the dust buildup off of it and then use a soft bristled brush to brush off any other smaller dust buildup on or around the filter.

If you feel that there is still quite some dust left on the filters, you may wash them under running water and only place the filters back into the case once they are fully dry or else you might be putting your PC at risk.



**CASE** The PC case – this is a tricky one to maintain as there are multiple levels to it. You could either dismantle the case completely and clean out every last bit of it, or you could simply put it through some pressurised air and be done with it.

Either way, some good cable management is something that always goes a long way for the case and its configuration.

The way each case is structured is different so it is a lot more subjective as to how you can place your fans

and in what configuration to get the optimal amount of airflow through your PC and its components.

Though it is something that takes some time to figure out, but finding a good flow path for the way air enters your PC and then exits is a necessity that a lot of people overlook.

An easy way to look at it and plan for airflow in your case is to look at all the possible inlets and outlets in your case for air and placing fans on them in either a push, or a pull configuration to direct the air that comes in or goes out of the case.

Once you have an airflow pattern in mind, go ahead and place the fans at the desired grills and then, start putting things back into the case in the reverse order that you pulled them out.

## CONCLUSION

You might be wondering, why we didn't go into power supplies, well the answer to that is simple, opening up a power supply is simply not recommended because of the sheer amount of danger that it poses to your life and so, we don't advise it.

Apart from the power supplies, we also didn't go into maintenance for hard drives and SSDs as those simply require them to keep them well and clean in terms of software and they're usually good to go.

Well folks, that is it for the maintenance for your PCs and we hope you will shower your computers with more and more love now that you know how to! And if you don't, trust us we'll know and the goblins of dust will talk your PC into submitting to the darkness unless you get rid of them! **d**



## Founded by IIT-Bombay alumni, AjnaLens is aiming to disrupt India's defense and enterprise training sectors

Jayesh Shinde | [jayesh@digit.in](mailto:jayesh@digit.in)

**S**ituated on the outskirts of Mumbai, AjnaLens is a mixed-reality startup started by three IIT-Bombay alumni in 2014. In fact, AjnaLens claims to be the first XR hardware OEM to manufacture augmented reality glasses 100% in India, according to Co-founder and CTO, Abhishek Tomar.

"We are building next-generation, modern warfare-related technologies in association with the Government of India, in order to make our defense force self-reliant and less dependent on foreign imports," said Abhishek.

This involves enhanced training of soldiers through haptics-based VR courses that allow soldiers to train in real-time simulations. AjnaLens has also indigenously developed an advanced see-through armour system named AjnaESAS, which enables the tank crew to have a 360° field of view from inside the tank and keeps drivers informed and safe.

### AJNALENS' FOCUS ON UPSKILLING WORKFORCE

"We have a mixed reality headset which is a mix of AR & VR, it does eye tracking, time and space tracking

as well with haptic gloves – rather than just a controller," Tomar told us. "When you are touching or interacting in the virtual world through the XR headset, you can interact exactly as you would in the real world. We have a platform called AjnaVidya, where we teach and give developers and creators an SDK – it's just a drag & drop system, no coding required. We provide the SDK in such a way that developers can create any type of virtual experiences," he claimed.

In terms of the manufacturing and training of the hardware and software kit AjnaLens has built, Tomar emphasized how it's all being done within India, with the aim to help upskill ITI



AjnaLens in action

students. In fact, AjnaLens and Tata Technologies have digitized around 150 ITIs in Karnataka.

"They learn SOPs of manufacturing related to the assembly of any electronic component. We train them through our glasses, and after the training, they can start the assembly of our glasses in India, even in Maharashtra," he said. Apart from this, SOPs for welding, painting, other assemblies, and embedded manufacturing are also done on a virtual platform as per Tomar.

### METAVERSE JOBS AND BEYOND

All this virtual training isn't for nothing, there are real jobs at the end of the AjnaLens rainbow, emphasized Tomar. As many as 10,000 students are being trained by AjnaLens right now, a number that's expected to reach 50,000 by the end of the year.

Tomar explained, that their courses are based on hands-on learning and how all courses are provided with an industry partner's certificate. It's like a master class as well as they get the certificate that they have a practical experience on real tools through AjnaXR, the startup's phygital based training. "Students can use whatever real-world tool they use in the XR space which can track almost everything, their hands, any object they are holding – whether it's a plumbing tool or electrician's gauge or something else. For example, in our Metaverse training course, trainee's hands will be tracked and they don't need to replace it with any controller, they can use their hands as is inside our simulators. This helps build muscle memory because they're working on actual virtual machines," exclaimed Tomar.

AjnaLens launched their first product last year and their courses are designed in consultation with companies who are looking for this trained workforce from the very first day, as per Tomar's claims. They are working with Tata, Vedanta, Mahindra, L&T and the defense sector within India. They're also working with a few companies in the Oil & Gas refineries sector in the Middle-East, opening an office in Dubai just a few months ago. **d**



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# Entrepreneurial Metacognition

Discover an entrepreneur in yourself

**Akshat Jain** | [feedback@digit.in](mailto:feedback@digit.in)

*"Entrepreneur Metacognitive awareness is an individual's aggregate consciousness of their own thought process to perform any specific entrepreneurial task or how they take decisions in the business for the long term benefits. And, there is a lot of research and techniques, which can help develop entrepreneurial skills in youngsters."*

**T**hink about thinking as a practice of purposeful introspection. Developed metacognitive abilities bring a

person's thought processes to the foreground, where they can be improved by analysis. Metacognition requires you to make space for self-reflection, such as journaling your

thoughts, review your own thinking, and partnered conversation about the process with like-minded peers. Beware any cognitive biases you might hold. Systematic errors in your thinking can occur while processing information. Being aware of thought processing errors is an important step in managing cognitive biases.

Given the Darwinian nature of the free market, where most businesses perish or languish in mediocrity, it is



Individual awareness and aggregate conscious has been exhibited by way of modern science

a daunting task to try and set off by yourself. It is so much easier to find an existing business where you join the ranks and minimise risk. Then again, the appeal of entrepreneurship is the potential success. Starting an entrepreneurial endeavour has always been difficult, even in pro-business and banking-focussed countries such as Germany and the U.K. Half of the startups in those countries collapse in five years or under. India, amongst the biggest supporters of new business alongside Europe and the U.S, sees the majority of its start-ups fail within the first year itself, while America fares little better. There is an eighty percent failure rate for independent businesses within ten years of their opening.

### PATHS TO SUCCESS

James Hayton and Gabriella Cacciotti from Harvard Business Review have conducted interviews with 65 entrepreneurs, which revealed that the common metacognitive phenomenon was the fear that start-up founders share, however, somewhat surprisingly, it also revealed that these same fears can be helpful. While fear can often inhibit actions, there are some fears that can motivate us to work harder towards our goals. Worries about financial security, opportunity costs, and obtaining funding can all be positively associated with the persistence that defines an entrepreneur's success.

Hamish Hughes, an investor and Cambridge graduate told his alma mater, "Fail Fast, but learn from your failures. There's no point in throwing things at the wall to see if they stick, and not paying attention to why they don't. And there's a fine line between believing in your product and being delusional. At the first sign of failure, you don't want to pack up, go home and say 'clearly no one wants this'. But if you're hearing over and over again that people hate the idea – or an aspect of it – it's time to learn and take action."

It might seem unrelated, but Alanna Nash writes in her biography of Elvis Presley about how his manager, realising there was a backlash against



Success not only depends upon teamwork but it is a conglomerate of various functions and tasks. There are three important triangular points – Ideas, Success and Goals

Elvis's sudden surge in popularity in the 1950s, used the opportunity to sell anti-Elvis material! The manager in question, Colonel Tom Parker, was an unsuccessful travelling grifter before he became the star's manager. Despite being poorly educated, Parker had the wily drive for success that meant he could capitalise on any situation he found himself in and came out on top. By modern standards, his Entrepreneurial Metacognitive abilities meant he could make the best of the situation to come out financially on top.

### THINKING RIGHT

While writing for Ness Labs, an online think tank, Anne Laure Le Cunff muses on an idea from Albert Einstein. All of science is nothing more than the refinement of everyday thinking. Why is it that a skill as important as thinking is not a key focus in traditional schools? Why don't we have classes on decision-

- making, cognitive biases, and mental models? Le Cunff breaks down better thinking into three points through which one can develop their entrepreneurial metacognitive abilities, paraphrased here:
1. Logical fallacies and linear thinking should be avoided. Second-level thinking helps us to consider any ramifications that stem from decisions yet to be made. Investor Howard Marks states that "First-level thinking is simplistic and superficial, and just about everyone can do it. All the first-level thinker needs is an opinion about the future. Second-level thinking is deep, complex and convoluted."
  2. Use mental models. These constitute frameworks that offer representations of how things operate. Mental models work best in context, or in combination with one another.
  3. Emotional agility is important. Don't dismiss the influence our emotions can have on our decision-making process. Emotional agility teaches us to think despite negative impacts on our cognitive ability such as fear or anxiety.

### THINK YOURSELF INTO THE PART

The amount of focus put on metacognitive thinking as a means to increase productivity in education, science and philosophy means it is foolish not to consider it for other applications. A marketer needs to understand how marketing people think in order to successfully engage them. Using an earlier example, Colonel Tom Parker didn't get bogged down thinking about how he could get people who weren't fans to like Elvis, instead he gave them



Le Cunff suggests a refinement to everyday thinking through which one can develop their entrepreneurial metacognitive abilities

a way to indulge in their biases without doing the hard job of converting their thinking to their own. This is what the journal of business venturing describes as an "entrepreneurial mindset". A study conducted by Per Davidson from the Jönköping International business school, Sweden, found that students given metacognitive treatments as a learning aid gained strong entrepreneurial expertise faster than those who were not. Other studies have found that close interactions with mentor entrepreneurs do not necessarily help people become 'business savvy'. What we do know is that helping people understand their own thought processes can actually achieve that goal faster. In essence, teaching people HOW to think is a lot better at developing new entrepreneurs than teaching them WHAT to think by giving them



Conscious thoughtfulness can lead to an entrepreneurial mindset which equips an entrepreneur for eight core critical decision-making tasks as shown here

examples of past success stories. And it's not just helpful for entrepreneurs, such thinking can benefit us all for all difficult tasks we take on in life. We certainly hope this article has challenged you to think better, so remember to write in and offer us feedback and let us know if we set off a few cartoon light bulbs above your heads!

Akshat Jain is a Research Scholar in the field of Psychology and Neuroscience at IIT Delhi.



### Space debris

The remains of the Long March 5B rocket is descending uncontrollably from its orbit.  
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# Your next laptop

**Agent001 makes a simple list for folks looking to buy a new laptop**

Agent001 | agent001@digit.in

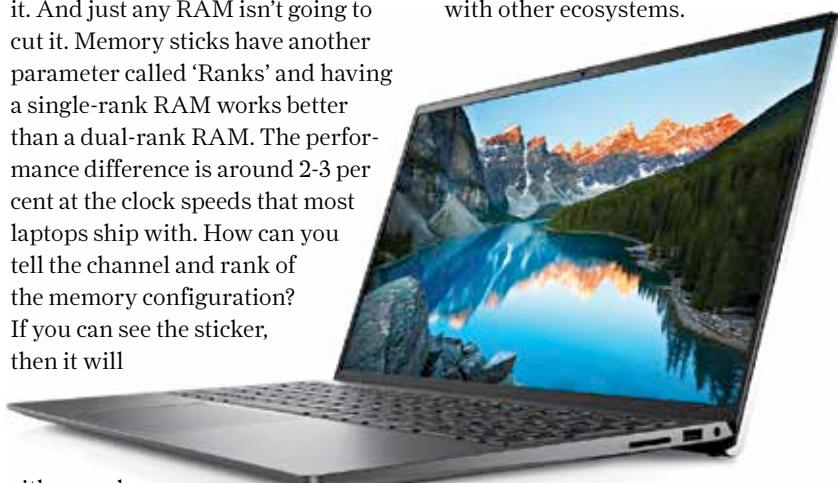


**E**very couple of months, I start getting a lot of queries from folks about their next laptop purchase. Over the years, the needs of users have grown complex and the budgets have grown to match. The pandemic saw a lot more people purchasing new laptops for themselves, their kids and their folks across a wider price bracket ranging from cheap Chromebooks for students, to expensive content creating machines for budding YouTubers and of course, for work. I'm distilling all those recommendations down to a simple list of priorities for you to consider when you're out in the market looking for your next laptop.

Performance matters. The baseline that you should be looking for is either an AMD Ryzen 5 or Intel Core i5 processor from the current gen or previous gen. Gone are the days when core counts did not matter beyond four cores. The applications of today are increasingly utilising more of the cores made available to it. And the operating systems have also evolved to split workloads across more threads. Processors should be coupled with a decent amount of RAM. Never go below 8 GB of RAM. In fact, I'd say go for 16 GB in a dual-channel configuration. Manufacturers tend to

only offer a single-channel configuration in the budget segments but you will find a few good SKUs with dual-channel RAM configuration in all budgets. Why am I insisting on dual-channel memory? Because you tend to lose out approximately 11-17 per cent of performance without it. And just any RAM isn't going to cut it. Memory sticks have another parameter called 'Ranks' and having a single-rank RAM works better than a dual-rank RAM. The performance difference is around 2-3 per cent at the clock speeds that most laptops ship with. How can you tell the channel and rank of the memory configuration? If you can see the sticker, then it will

Windows. Linux based machines can run additional software to make Windows apps run on Linux but there's no guarantee that they'll all run. macOS is easy to use only if you have an Apple ecosystem around you. Apple devices are notorious for making it difficult to interoperate with other ecosystems.



either read 1R or 2R. That tells you the rank. And if you have two sticks of RAM, then you're most probably running a dual-channel configuration. The most certain way is to run a third-party software such as CPU-Z which will highlight all of the above information clearly.

The operating system is also very important. Windows is the most popular operating system and most software that we need to use on a day-to-day basis is made for

Graphics cards are strictly optional. The integrated graphics capabilities on processors are more than capable of running most applications with ease. Only if you need to run content creation apps or wish to play video games, should you opt for a powerful discrete graphics card. College-going kids might need laptops with discrete GPUs if they have classes that teach powerful CAD/CAM software. For everything else, the integrated graphics does great.



## Slavaged shorts

YouTube Shorts can now be created from long videos using the in-built shorts maker.  
<https://dgit.in/aug22-48>



tech

AGENTOO1

Next up is the storage. Don't make your decisions on the basis of capacity alone. If you're chasing capacity, then you'll mostly end up with a HDD or an SSD+HDD combo. The former should be avoided since current gen operating systems really show their age with HDDs. It's mostly due to poor coding practices but throwing in an SSD into the mix makes all that disappear.

The display size matters if you're on the go all the time. A 13-inch or 14-inch laptop is much lighter than the 15.6-inch and 17.3-inch monsters. There's also a clear difference in terms of GPU offerings as well since

the more powerful GPUs tend to ship with the thicker machines. All that horsepower requires a lot of cooling and heat sinks take up space. Gaming on thin machines doesn't lend to immersion but that's a matter of getting used to. If push comes to shove, a gamer will game even on the smallest of screens to get their daily fix. Believe me, I speak from experience.

And now, for the gimmicky features. Refresh rates around 120 Hz is good enough for gaming. Anything higher is gimmicky. Networking with advanced software is also not needed for most folks. As for gamers, the operating system prioritises the

active application so you don't need a separate solution. Lastly, most laptops are used with headphones and a powerful speaker configuration is only needed if you do a lot of content consumption with your family and friends.

If you keep these things in mind, you'll end up with a laptop that will last you a good 5-7 years or more. And you don't even need to break the bank since most laptops with the features that I've mentioned start around the 50K mark. As for those of you who feel that you have certain peculiar needs for your next laptop purchase, you can always reach out to me.

### BUYING ADVICE

#### BUY A GRAPHICS CARD?

**Q** Hi Agent OO1,  
I Am Confused In Which Laptop To Buy For My Studies As I Am In Class 12 th and Simultaneously Preparing For CA Exams. The Following Shall Be The Specifications:

- A Wide(big) Display
- Should Have Both 2.4 GHz and 5 GHz For Internet Connection
- Big Storage In Both Ram And Hard Drive
- Most IMPORTANTLY Should Work When There Is No Electricity Meaning must have Battery For 7-8 Hours.

My Budget Is 40K - 50K

Thanks

**-Harshvardhan Singhvi**

**A** Hey Harshvardhan,  
From what you've described, just about any laptop within that price range should work fine. Most laptops these days ship with dual-band Wi-Fi networking so you will get support for 2.4 GHz and 5 GHz bands. Also, processors have become very efficient in handling their power consumption and laptops also ship with high-capacity



HP 15s with Ryzen 5 5500U

batteries, so a lot of laptops will last you 7-8 hours as long as you don't play games. In fact, if you do away with a discrete graphics card, it'll help with the battery life.

The Intel Core i5 Mi Notebooks cost about 55-60K and will meet all the specifications that you've stated here. The 60K variant will give you 16 GB of memory instead of 8 GB which is always desirable these days. There's also the Lenovo ThinkBook 15 and HP

15s with the Ryzen 5 5500U which are also great models to consider. And if you're planning on heading out to your local store, then look for a laptop with a 15-16-inch screen, AMD Ryzen 5500U or Intel Core i5 11300H or better processor, 16 GB RAM and 512 GB NVMe SSD. They'll all be in the 50-60K price bracket. And anything with a 40 Wh or more capacity battery will last you 6-8 hours depending on what all apps you run.

# digit Config

Everything you'll ever need to build your own PC. Whatever your budget.

## INTEL

Basic Rig	₹42,054
Basic Gaming	₹80,792
Entry-level Gaming	₹1,02,767
Mid-Range Gaming	₹1,40,098
Semi-pro Video Editing Rig	₹2,75,702
Ridiculous Gaming	₹3,96,963

## INTEL

### BASIC RIG

Processor	Intel Core i3-12100	11,850
Motherboard	ASUS PRIME H610M-E D4	7,200
RAM	Crucial DDR4 3200 MHz (2 x 4GB)	3,400
HDD	WD Blue 2 TB WD20EZBX	4,299
Graphics Card	Intel UHD Graphics 730	0
PSU	Corsair CV450	2,950
Speakers	None	0
Mouse	Logitech MK200 Wired Keyboard and Mouse Combo	980
Keyboard	Logitech MK200 Wired Keyboard and Mouse Combo	0
Sound Card	None	0
Sub-total	(Excluding Monitor)	30,679
Monitor	LG 22MK600M 21-inch 60 Hz	10,375
Cabinet	OEM Cabinet	1,000
<b>TOTAL</b>		<b>₹42,054</b>

### ENTRY-LEVEL GAMING

Processor	Intel Core i5-12400F	15,700
Motherboard	ASUS PRIME H610M-E D4	7,200
RAM	G.Skill Sniper X Series DDR4 (2 x 8GB) 3600 MHz	6,299
HDD	WD Blue 1 TB (WD10EZEX)	3,125
Graphics Card	NVIDIA RTX 3060 Ti Founders Edition	38,000
PSU	Corsair CV450	2,950
Headset	Cooler Master MH630	4,599
Mouse	Razer Viper Mini	2,900
Keyboard	HP K500F	1,299
SSD	Kingston NV1 500 GB	3,295
Sub-total	(Excluding Monitor and Cabinet)	85,367
Monitor	Samsung Odyssey 24-inch LF24T352FWXXL	11,950
Cabinet	MONTECH X3	5,450
<b>TOTAL</b>		<b>₹1,02,767</b>

### SEMI-PRO VIDEO EDITING RIG

Processor	Intel Core i9-12900K + Noctua NH-D15	63,488
Motherboard	MSI MAG Z690 TOMAHAWK WIFI	25,199
RAM	Kingston FURY Beast (KF552C40BBK2/32) 5200 MHz 16GB x2	23,199
HDD	Seagate Barracuda 2 TB (ST2000DM005)	4,399
Graphics Card	NVIDIA RTX 3060 Ti Founders Edition	38,000
PSU	Cooler Master V1000 Fully Modular	15,000
Headphones	beyerdynamic DT 770 PRO Studio Headphones	12,999
Mouse	Logitech MX Master 3	6,995
Keyboard	Logitech MX Keys	11,690
SSD	Crucial P2 1TB SSD	7,599
Sub-total	(Excluding Monitor)	2,08,518
Monitor	Dell U2723QE	59,000
Cabinet	Cooler Master MASTERBOX TD500	8,184
<b>TOTAL</b>		<b>₹2,75,702</b>

## BASIC GAMING

Processor	Intel Core i5-12400F	15,700
Motherboard	ASUS PRIME H610M-E D4	7,200
RAM	Corsair Vengeance RGB DDR4 (2x 8GB) 3200 MHz	5,400
HDD	WD Blue 1 TB (WD10EZEX)	3,125
Graphics Card	Gigabyte GeForce GTX 1650 D6 OC	19,999
PSU	Corsair CV450	2,950
Headset	ASUS TUF Gaming H3	3,099
Mouse	Razer Viper Mini	2,900
Keyboard	HP K500F	1,299
SSD	Kingston NV1 500 GB	3,295
Sub-total	(Excluding Monitor and Cabinet)	64,967
Monitor	LG 22MK600M 21-inch 60 Hz	10,375
Cabinet	MONTECH X3	5,450
<b>TOTAL</b>		<b>₹80,792</b>

### MID-RANGE GAMING

Processor	Intel Core i7-12700F + Noctua NH-C14S	33,348
Motherboard	MSI PRO B660M-A DDR4	13,650
RAM	Corsair Vengeance LPX DDR4 (2 x 8GB) 3600MHz	6,190
HDD	Seagate Barracuda 1 TB (ST1000DM010)	3,250
Graphics Card	NVIDIA RTX 3060 Ti Founders Edition	38,000
PSU	Cooler Master MWE Gold 650W V2	6,900
Headset	Cooler Master MH630	4,599
Mouse	Razer Viper Mini	2,900
Keyboard	Cooler Master CK550 V2	6,962
SSD	WD SN570 500GB NVMe M.2 SSD	4,199
Sub-total	(Excluding Monitor and Cabinet)	1,19,998
Monitor	LG 24GN650-B 24-inch 144 Hz	16,150
Cabinet	Cooler Master Masterbox K501L	3,950
<b>TOTAL</b>		<b>₹1,40,098</b>

### RIDICULOUS GAMING

CPU	Intel Core i9-12900K	55,299
Motherboard	GIGABYTE Z690 AORUS MASTER	46,393
RAM	Kingston FURY Beast (KF552C40BBK2/32) 5200 MHz 16GB x2	23,199
HDD	WD Blue 2 TB WD20EZBX	4,299
Graphics Card	NVIDIA RTX 3080 Ti Founders Edition	1,13,000
PSU	Cooler Master V1000 Fully Modular	15,000
Headset	HyperX Cloud II	9,990
Mouse	Razer Basilisk V3	6,565
Keyboard	SteelSeries Apex Pro	27,999
SSD	AORUS Gen4 7000s SSD 1TB	15,289
CPU Cooler	Fractal Design Celsius S24 Prisma Liquid Cooler	16,690
Monitor	Samsung Odyssey G7 32-inch 2K 240 Hz	43,750
Cabinet	Fractal Design Torrent	19,490
<b>TOTAL</b>		<b>₹3,96,963</b>

## CONFIGS

REJOICE PC MASTERRACE! FOR THE FIRST TIME IN A LONG TIME WE HAVE SEEN A DROP IN THE PRICES OF GPUs AND OTHER COMPONENTS. IS THIS THE SIGN OF ALL THE GOOD THINGS TO COME, OR A FALSE HOPE?

### AMD

■ Basic Rig	₹42,054
■ Basic Gaming	₹80,792
■ Entry-level Gaming	₹1,02,767
■ Mid-Range Gaming	₹1,44,072
■ Semi-pro Video Editing Rig	₹2,75,702
■ Ridiculous Gaming	₹3,54,228

## AMD

### BASIC RIG

Processor	AMD Athlon 3000G	5,750
Motherboard	GIGABYTE GA-A320M-S2H	4,340
RAM	Crucial DDR4 3200 MHz (2 x 4GB)	3,400
HDD	WD Blue 2 TB WD20EZBX	4,299
Graphics Card	Radeon Vega 3 Graphics	0
PSU	Corsair CV450	2,950
Speakers	None	0
Mouse	Logitech MK200 Wired Keyboard and Mouse Combo	980
Keyboard	Logitech MK200 Wired Keyboard and Mouse Combo	0
Sound Card	None	0
<b>Sub-total</b>	<b>(Excluding Monitor)</b>	<b>30,679</b>
Monitor	LG 22MK600M 21-inch 60 Hz	10,375
Cabinet	OEM Cabinet	1,000
<b>TOTAL</b>		<b>₹42,054</b>

### ENTRY-LEVEL GAMING

Processor	AMD Ryzen 5 5600X	17,850
Motherboard	ASUS PRIME A520M-K	5,225
RAM	G.SKILL Sniper X Series DDR4 (2 x 8GB) 3600 MHz	6,299
HDD	WD Blue 1 TB (WD10EZEX)	3,125
Graphics Card	NVIDIA RTX 3060 Ti Founders Edition	38,000
PSU	Corsair CV450	2,950
Headset	Cooler Master MH630	4,599
Mouse	Razer Viper Mini	2,900
Keyboard	HP K500F	1,299
SSD	Kingston NV1 500 GB	3,295
<b>Sub-total</b>	<b>(Excluding Monitor and Cabinet)</b>	<b>85,367</b>
Monitor	Samsung Odyssey 24-inch LF24T352FHWXXL	11,950
Cabinet	MONTECH X3	5,450
<b>TOTAL</b>		<b>₹1,02,767</b>

### SEMI-PRO VIDEO EDITING RIG

Processor	AMD Ryzen 9 5950X + Noctua NH-D15	56,139
Motherboard	ASUS ROG Strix X570-F	29,280
RAM	Kingston FURY Beast (KF552C40BBK2/32) 5200 MHz 16GB x2	23,199
HDD	Seagate Barracuda 2 TB (ST2000DM005)	4,399
Graphics Card	NVIDIA RTX 3060 Ti Founders Edition	38,000
PSU	Cooler Master V1000 Fully Modular	15,000
Headphones	beyerdynamic DT 770 PRO Studio Headphones	12,999
Mouse	Logitech MX Master 3	6,995
Keyboard	Logitech MX Keys	11,690
SSD	Crucial P2 1 TB SSD	7,599
<b>Sub-total</b>	<b>(Excluding Monitor)</b>	<b>2,08,518</b>
Monitor	Dell U2723QE	59,000
Cabinet	Cooler Master MASTERBOX TD500	8,184
<b>TOTAL</b>		<b>₹2,75,702</b>

### BASIC GAMING

Processor	AMD Ryzen 5 4500	12,650
Motherboard	GIGABYTE A520M S2H	5,970
RAM	Corsair Vengeance RGB DDR4 (2x 8GB) 3200 MHz	5,400
HDD	WD Blue 1 TB (WD10EZEX)	3,125
Graphics Card	Gigabyte GeForce GTX 1650 D6 OC	19,999
PSU	Corsair CV450	2,950
Headset	ASUS TUF Gaming H3	3,099
Mouse	Razer Viper Mini	2,900
Keyboard	HP K500F	1,299
SSD	Kingston NV1 500 GB	3,295
<b>Sub-total</b>	<b>(Excluding Monitor and Cabinet)</b>	<b>64,967</b>
Monitor	LG 22MK600M 21-inch 60 Hz	10,375
Cabinet	MONTECH X3	5,450
<b>TOTAL</b>		<b>₹80,792</b>

### MID-RANGE GAMING

Processor	AMD Ryzen 7 5800X + Noctua NH-C14S	33,599
Motherboard	ASUS TUF GAMING B550 PLUS	15,400
RAM	Corsair Vengeance LPX DDR4 (2 x 8GB) 3600MHz	6,190
HDD	Seagate Barracuda 1TB (ST1000DM010)	3,250
Graphics Card	NVIDIA RTX 3060 Ti Founders Edition	38,000
PSU	Cooler Master MWE Gold 650W V2	6,900
Headphones	Cooler Master MH630	4,599
Mouse	Razer Viper Mini	2,900
Keyboard	Cooler Master CK550 V2	6,962
SSD	WD SN570 500GB NVME M.2 SSD	4,199
<b>Sub-total</b>	<b>(Excluding Monitor and Cabinet)</b>	<b>119,998</b>
Monitor	LG 24GN650-B 24-inch 144 Hz	16,150
Cabinet	Cooler Master Masterbox K501L	3,950
<b>TOTAL</b>		<b>₹1,44,072</b>

### RIDICULOUS GAMING

CPU	AMD Ryzen 9 5900X	36,200
Motherboard	MSI MPG X570S CARBON MAX WIFI	32,700
RAM	Patriot Viper RGB (2x 16GB) DDR4 3200MHz	13,256
HDD	WD Blue 2 TB WD20EZBX	4,299
Graphics Card	NVIDIA RTX 3080 Ti Founders Edition	113,000
PSU	Cooler Master V1000 Fully Modular	15,000
Headset	HyperX Cloud II	9,990
Mouse	Razer Basilisk V3	6,565
Keyboard	SteelSeries Apex Pro	27,999
SSD	AORUS Gen4 7000s SSD 1TB	15,289
CPU Cooler	Fractal Design Celsius S24 Prisma Liquid Cooler	16,690
Monitor	Samsung Odyssey G7 32-inch 2K 240 Hz	43,750
Cabinet	Fractal Design Torrent	19,490
<b>TOTAL</b>		<b>₹3,54,228</b>

# Bun – The New Runtime On The Block

Get cracking with  
Socket.io

**Kshipra Javad** | feedback@digit.in



avaScript is the language that we all know and love. Well, some of us dislike it for our own reasons.

On one hand, JavaScript is a very flexible and easy to use language with a very large community behind it. You can build anything you want in JavaScript. It may be a complex backend of a website, in-memory databases, really pretty looking frontend or even physics simulations and games! On the other hand, there's so much undefined behaviour in JavaScript that it's easy to get frustrated and drowned in a pile of console errors if you don't know what you're doing. As the famous YouTuber Fireship.io once said "There are a lot of ways to shoot yourself in the foot using JavaScript".

## WHAT IS A JAVASCRIPT RUNTIME?

Enough about JavaScript now. Let's talk about JavaScript runtimes. What are JavaScript runtimes? Why do you even need a JavaScript runtime? Let us explain it to you in brief. You see, as the world moved on to better things, people felt the need to run JavaScript outside the browser too. Until then, the only way that you could run and execute JavaScript was inside a browser. Which made JavaScript a client-side scripting language. And it still is a client-side scripting language. But one man by the name of Ryan Dahl thought to himself, "What if we made JavaScript

to execute outside the browser too?" and then, NodeJavaScript was born. Node allowed users to run, execute and work with JavaScript outside a browser. Node now made it easier to develop server side applications with JavaScript since none of the JavaScript code could now be seen by the client because it lived on the server. Node took the web development world by storm and well, the rest is history. Now, a runtime is an environment to execute some code. JavaScript now has two runtime environments.



One, inside the browser and the other one outside the browser. Node is a JavaScript runtime environment. Similarly, Deno, which was made by the same guy who created Node, is a JavaScript runtime environment too. The topic of this article – Bun, is a JavaScript environment too. Well, if all of the JavaScript runtime environments can essentially execute the same JavaScript code then why do we need so many of them? What even is Bun? And why are we even covering it with this article? Read on to know.

## WHAT IS BUN?

Bun, at its core, is essentially a JavaScript runtime. Just like Node or Deno, it will allow you to run JavaScript outside the browser. You will be able to execute JavaScript files with it and do all the stuff that you would usu-

ally do with Node. Okay, that sounds pretty boring to begin with. If it does the same stuff as Node then what's the need for it? Well, just because it is a JavaScript runtime doesn't mean that it has to be similar in architecture as Node or Deno. For comparison, Node and Deno both are built on top of Chrome's V8 engine which is an open source JavaScript engine. But Bun? It uses something entirely different. Bun uses the JavaScriptCore Engine from WebKit. WebKit is Apple's implementation of a JavaScript engine. Just like Chrome uses its V8 engine to power its Chrome browser, Apple uses WebKit to power AppStore, Safari, etc. WebKit, according to Bun, is a little bit faster to start and perform as compared to Chrome's V8 engine. Aside from that, Bun is written in a low level language called Zig. And since Zig is a low level programming language, it provides much more manual control over memory as compared to other languages. That's exactly why Bun is marketing itself to be a lot faster than the other guys in the market.

The best thing about Bun, at least in our opinion, is the native transpilation. Quoting a line from Bun's website, "In bun.js, every file is transpiled. TypeScript & JSX just work". That's a really good thing. Usually, if you wanted to write a Node project in TypeScript, you would have to run two terminals – one which compiles the TypeScript and the other which runs the actual Node app. But now, since everything is transpiled, we don't have to worry about that!

## GETTING STARTED WITH BUN!

Unfortunately, Bun is still in beta. That means it hasn't reached its 1.0 major release yet. But that does not mean that we don't get to try this



### 3 billion phones on Android

According to Pichai, there are no less than 3 billion monthly active Android users around the world.  
<https://dgit.in/aug22-23>



tech

DEVWORK

cool JavaScript runtime out! There's just a small problem. Bun won't run natively on Windows just yet. Mac and Linux users can rejoice since they can get Bun running natively but Windows users will have to use Windows Subsystem for Linux or WSL for now. Although it goes without saying, the Bun team is definitely working on a native Windows implementation of Bun.

If you're a Windows user and you don't have WSL enabled on your system, you can follow this very comprehensive and easy guide made by Microsoft and get it up and running – <https://dgit.in/bun1>

After you're done installing WSL, Windows users can run this command on their WSL shell (probably Ubuntu) and Mac / Linux Users can just run this command directly on their terminals :-

```
curl https://bun.sh/install | bash
```

Once executed, your terminal should look something like the first picture. Note that we did have to install the package unzip to install this but the bun installer will guide you on the packages that it needs to run and how to install them. Anyway, after doing all of that, your terminal should look something like the second picture.

But you won't be able to use Bun just yet. You'll need to add it to your bashrc file or a similar file (if you're using zsh, fish, etc.) and add bun to your environment variables. To do that, copy the two lines that show up after the title "Manually add the directory to your \$HOME/.bashrc (or similar)". After copying, execute the following command which will open the `bashrc` file in the nano text editor :-

```
sudo nano $HOME/.bashrc
```

Press the down arrow till the cursor reaches the end of the file and paste the two lines that you copied with the usual shortcut `Ctrl + V`. Finally, your `bashrc` should look something like the third picture on this page.

Press `Ctrl + S` to save and `Ctrl + X` to exit the text editor. You now have to reload your `bashrc` file in order to make your changes permanent. You can do

```
kshipra@kshipra:~$ curl https://bun.sh/install | bash
% Total    % Received % Xferd  Average Speed   Time     Time      Current
Dload  Upload Total   Spent   Left Speed
100  5046    0  5046    0     0  44263      0 --:--:--:--:--:--:--:--: 14654
#====#
bun was installed successfully to /home/kshipra/.bun/bin/bun

Manually add the directory to your $HOME/.bashrc (or similar)

export BUN_INSTALL="/home/kshipra/.bun"
export PATH="$BUN_INSTALL/bin:$PATH"

To get started, run

bun --help
```

```
# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if ! shopt -oq posix; then
  if [ -f /usr/share/bash-completion/bash_completion ]; then
    . /usr/share/bash-completion/bash_completion
  elif [ -f /etc/bash_completion ]; then
    . /etc/bash_completion
  fi
fi

export BUN_INSTALL="/home/kshipra/.bun"
export PATH="$BUN_INSTALL/bin:$PATH"
|
```

```
bun: a fast bundler, transpiler, JavaScript Runtime and package manager for web software.

dev   ./a.ts ./b.js          Start a bun Dev Server
bun   ./a.ts ./b.js          Bundle dependencies of input files into a .bun
create next ./app           Start a new project from a template (Runn c)
run   task                  Run JavaScript with bun, a package.json script, or a bin
install @compiled/react    Install dependencies for a package.json (Runn i)
add   @compiled/react       Add a dependency to package.json (Runn a)
remove redux                Remove a dependency from package.json (Runn r)
upgrade                            Get the latest version of bun
completions                         Install shell completions for tab-completion
discord                                Open bun's Discord server
help                                 Print this help menu

kshipra@kshipra:~$ |
```

that by writing and executing this line in your terminal :-

```
source ~/ .bashrc
```

Now, hopefully, if you've done everything right up to this point, you should be able to execute `bun` and it should look something like the picture on the next page. We know that the setup process was quite a task but trust us, once you see the results, it will be worth it.

## HELLO WORLD!

Here comes the fun part. Its time to get our hands dirty with Bun. So, after the installation, we made a blank project by executing this command : `bun create blank`

[hello-console](#) which created a blank project for us and set us up with some initial dependencies and even a `tsconfig.json` if we wanted to write TypeScript! The blank project's folder structure should be accessible now.

We go to the `src` folder and find that a basic JavaScript file with the contents `console.log("Hello, World");` have been created automatically along with `node_modules`, `package.json` and `tsconfig.json` which were created automatically in the root folder. To execute a JavaScript file, simply execute `bun run [file-name]` and you'll be good to go.



**Flipkart partnered with Pocket FM**  
Flipkart to sell audiobooks and other streaming audio content, after partnership with Pocket FM.  
<https://dgit.in/aug22-24>

```
kshipra@Kshipra:~/bun-tests$ tree
.
├── bun.lockb
├── node_modules
│   └── bun-types
│       ├── package.json
│       └── types.d.ts
├── package.json
└── src
    └── index.js
    tsconfig.json

3 directories, 6 files
kshipra@Kshipra:~/bun-tests$
```

```
kshipra@Kshipra:~/bun-tests$ tree
.
├── bun.lockb
├── node_modules
│   └── bun-types
│       ├── package.json
│       └── types.d.ts
├── package.json
└── src
    └── index.js
    tsconfig.json

3 directories, 6 files
kshipra@Kshipra:~/bun-tests$ cd src
kshipra@Kshipra:~/bun-tests/hello-console$ cat index.js
console.log('Hello, World!');
kshipra@Kshipra:~/bun-tests/hello-console$ bun run index.js
Hello, World!
kshipra@Kshipra:~/bun-tests$
```

```
kshipra@Kshipra:~$ bun create
Welcome to bun! Create a new project by pasting any of the following:
bun create blank ./blank-app
bun create discord-interactions ./discord-interactions-app
bun create hms ./hms-app
bun create next ./next-app
bun create react ./react-app
# You can also paste a GitHub repository:
bun create sharmar/calculator calc

This command is completely optional. To add a new local template, create a folder in $HOME/.bun-creates/
To publish a new template, git clone https://github.com/jarred-sanner/bun, add a new folder to the "examples"
folder, and submit a PR.
kshipra@Kshipra:~$
```

And that was pretty much how you would create a Hello World program with Bun. Note that the command that you used at the start can also create React, Next Apps and much more. Just execute `bun create`

and it will show you the different types of projects that it can set you up with! Okay, that was just the introduction. Now, let's get to the real meat of this runtime. Let's go ahead and benchmark it!

## BENCHMARKING BUN

All the benchmarks that we'll do will be against Node version 18.6.0 and Bun version 0.1.4 which were the latest versions of the respective runtimes at the time of writing this article.

The first benchmark will be a simple hello world test. We'll execute `console.log("Hello World")`; and benchmark it using the `time` command and see who does it faster.

As you can see, Bun and Node are really close but at the end of the day, Bun is still a little bit faster than Node.

We found this cool script that calculates the value of pi in an overly complicated manner. We put that to the test too and we have some interesting results at our hands.

We first ran the script with Node and then ran it with Bun. In the results, if you see the “real” value, it shows the total time elapsed between when the user pressed “Enter” and the script completed execution. Now, the “real” value for Node was 0.298 seconds and the “real” value for Bun was 0.599 seconds. We repeated this test several times and got around the same results. Node was faster than Bun in native JavaScript.

But, we saw that in Bun, everything is transpiled by default and it supports TypeScript too. Let's check the performance of the same script but in TypeScript. We will be using the `ts-node` module which compiles and run TypeScript with a single command. Ladies and gentlemen, would you look at that! Bun is more than 2x faster than Node here! Bun completed the test in around 0.300 seconds and `ts-node` took more than one second to complete the test! See, that's the advantage of a native TypeScript transpiler. Also, we got even worse results when we manually compiled the TypeScript file and ran it through Node.

This just goes to prove that if you're a TypeScript fan then you're going to love Bun!

Let's test Bun's speed on creating React and Next apps. We'll

**Tuned Is Dead**

Tuned, a couple-focused messaging app launched by Meta is discontinuing its services this year.  
<https://dgit.in/aug22-25>



```
kshipra@Kshipra:~/bun-tests/first-test$ cat app.js
console.log("Hello, World");
kshipra@Kshipra:~/bun-tests/first-test$ time bun run app.js
Hello, World

real 0m0.031s
user 0m0.000s
sys 0m0.038s
kshipra@Kshipra:~/bun-tests/first-test$ time node app.js
Hello, World

real 0m0.039s
user 0m0.029s
sys 0m0.010s
kshipra@Kshipra:~/bun-tests/first-test$ time node app.js
Hello, World

real 0m0.036s
user 0m0.036s
sys 0m0.000s
kshipra@Kshipra:~/bun-tests/first-test$ time bun run app.js
Hello, World

real 0m0.023s
user 0m0.015s
sys 0m0.015s
kshipra@Kshipra:~/bun-tests/first-test$
```

```
kshipra@Kshipra:~/bun-tests/calc_pi$ cat calc.js
const N = 100_000_000

function calculate_pi(n_terms) {
    let numerator = 4.0
    let denominator = 1.0
    let operation = 1.0
    let pi = 0.0

    for(let i = 0; i < n_terms; i++) {
        pi += operation * (numerator / denominator)
        denominator += 2.0
        operation *= -1.0
    }

    return pi
}

console.log('Value of pi :- ${calculate_pi(N)})'
```

```
kshipra@Kshipra:~/bun-tests/calc_pi$ time node calc.js
Value of pi :- 3.141592643589326

real 0m0.298s
user 0m0.279s
sys 0m0.019s
kshipra@Kshipra:~/bun-tests/calc_pi$ time bun calc.js
Value of pi :- 3.141592643589326

real 0m0.599s
user 0m0.619s
sys 0m0.081s
kshipra@Kshipra:~/bun-tests/calc_pi$ time node calc.js
Value of pi :- 3.141592643589326

real 0m0.282s
user 0m0.262s
sys 0m0.020s
kshipra@Kshipra:~/bun-tests/calc_pi$ time bun calc.js
Value of pi :- 3.141592643589326

real 0m0.357s
user 0m0.273s
sys 0m0.155s
kshipra@Kshipra:~/bun-tests/calc_pi$
```

```
kshipra@Kshipra:~/bun-tests/calc_pi$ time tsc pi_calc.ts && node pi_calc.js
real 0m0.589s
user 0m0.335s
sys 0m0.467s
Value of pi :- 3.141592643589326
kshipra@Kshipra:~/bun-tests/calc_pi$ time tsc pi_calc.ts && node pi_calc.js
real 0m0.691s
user 0m0.532s
sys 0m0.468s
Value of pi :- 3.141592643589326
kshipra@Kshipra:~/bun-tests/calc_pi$
```

be using [npx](#)  
[create-react-app](#) and [npx](#)  
[create-next-app](#) for this test.

Bun also comes with native functionality to create React and Next apps with [bun create react](#) and [bun create next](#) and hence it would be interesting to see which one comes out at the top. This will also indirectly check how fast it downloads and installs dependencies. npm is notoriously slow for that and that's why many users shift to either yarn or pnpm.

For the React App, npx took a solid 1 minute and 12 seconds to install and set up the whole thing while Bun only took four seconds. Yes, you read that right! Also, since Bun has a very clever caching mechanism, the next time you make a react app, you'll be done in less than a second because it'll load everything from cache!

For the Next App, npx took around 23 seconds to complete the whole process while

Bun just took 9 seconds. Bun is the CLEAR winner here.

**FINAL THOUGHTS**

Here, we want to talk about the future of Bun. If we see Bun, as of now as a standalone runtime for JavaScript, it is still incomplete. Very incomplete. But still we'd like to appreciate the devs of Bun for making such a feature rich runtime for JavaScript which hasn't even hit its major 1.0 release yet! For example, if you've worked with the fs module, Buffer module, etc. then you know that they're native Node APIs and how useful they are in everyday Node programming. Well guess what, you CAN use them with Bun too! Around 90 per cent of Node APIs are implemented natively with Bun and hence you'll feel right at home if you jump from Node to Bun.

Honestly, we'd like to see Bun as a replacement for Node. We felt that Bun is a really intuitive JavaScript runtime and it does away with many of the issues of Node with really good features like native TypeScript support, caching modules, native dotenv support (Yes, .env files just work with Bun, no need to install dotenv everywhere). The best part – Bun is designed in such a way that it can work with the existing npm packages too. Unlike Deno which has its own marketplace for packages which is fairly limited due to its relatively low popularity, even if you switched to Bun, you would be able to install all of the npm packages that you were using before without any workarounds!

We had a really fun time testing Bun out and we hope to see it grow and overtake Node one day. You can check out Bun here :- <https://dgit.in/bun2>.

# digit TOP 3

## RECOMMENDED BUYS

From LED TVs to fitness trackers, here's what we recommend for your next purchase.

### LED TVs



Sony Z8H .....	₹13,99,990
LG Nano99 75-inch.....	₹6,56,235
Samsung Q900A.....	₹13,49,990



### Big Screen Smartphones

Samsung Galaxy S22 Ultra.....	₹139,999
iPhone 13 Pro Max .....	₹1,29,900
Asus ROG Phone 6 Pro.....	₹89,999

### Gaming Laptops



MSI Raider GE76 .....	₹429,940
ASUS ROG Strix Scar 15.....	₹280,990
MSI Stealth 15M.....	₹134,990



### Headphones with mic

Bose NC700 .....	₹34,500
Sony WH-1000XM4 .....	₹22,900
Apple AirPods Max .....	₹59,900

### Gaming Controllers



Microsoft Xbox Elite Wireless.....	₹25,365
Sony DualSense .....	₹7,990
Astro C40 TR .....	₹15,200



### Budget Tablets

Apple iPad 10.2 inch .....	₹30,990
Samsung Tab A7.....	₹17,800
Lenovo Tab M10.....	₹18,990

### Bluetooth speakers under ₹10,000



Bose Soundlink Micro .....	₹8,990
Sony SRS-XB23.....	₹8,990
JBL Flip 5 .....	₹8,998



### Premium Point and Shoot Digital Cameras

Leica Q2 .....	₹3,89,831
Sony ZV-1.....	₹110,267
Nikon COOLPIX P1000 .....	₹64,990

### Multifunction Printers



Brother DCP-7065DN .....	₹15,100
HP 410 Ink Tank Printer.....	₹12,999
Brother DCP-7060D.....	₹10,100



### Fitness Trackers

Honor Band 6 .....	₹2,780
OnePlus Band .....	₹2,199
Noise Colorfit Pro 2 .....	₹2,799



## AbacusBasic

**Funding:** US\$ 266,529 pledged of US\$ 42,236 goal

**Link:** <https://dgit.in/abacus>

London-based startup Pentaform has just made a keyboard that's a whole computer! No joke, the AbacusBasic is a keyboard equipped with a custom Intel Atom x5-Z8350 Cherry Trail quad-core processor and 2/4/8 GB of LPDDR3 memory for basic computing. Of course, this isn't a powerful PC but it should get most basic tasks done with ease. The AbacusBasic comes equipped with an eMMC module for storage with capacities ranging from 16 GB to 128 GB. Not just that, you also get microSD card support up to 512 GB for some additional storage. The device plugs into any monitor or TV and can be used as a full-fledged working PC. The company states, "You can browse, work, watch Netflix, code, and all the usual computer stuff". The PC is also pretty power efficient, consuming 75 per cent less energy than a traditional desktop PC, according to the company. The device comes preinstalled with Windows 10 and also supports most Linux distros. As for I/O, you get a single HDMI 2.0 port, two USB 2.0 ports, one USB 3.0 Type-A port, one USB Type-C port, Gigabit Ethernet, Wi-Fi 5, Bluetooth 4.2 and 3.5mm audio. The device is priced at £120 but early bird orders get a 20 per cent discount on this price.

## ONE Pro Portable Tire Inflator

**Funding:** US\$ 132,079 pledged of US\$ 5,000 goal

**Link:** <https://dgit.in/onepro>

Most portable tire inflators on the market have complicated corded designs and take a long time to do their job. Additionally, most typical electric tire inflators aren't the most accurate at gauging tire pressure. Oak & Iron Tech sets out to remedy these issues with their new product – ONE Pro. This is a portable tire inflator that is reportedly 4x faster than typical ones on the market. According to the company, it is the world's first smart electronic cordless tire inflator that is capable of inflating a 195/65 tire from empty to full in merely 3 minutes. In contrast, typical portable tire inflators would take anywhere between 8 to 15 minutes to do the same.



The company also claims that the ONE Pro has zero pressure inaccuracy as seen on regular electric tire inflators. The device is equipped with a 3.2-inch digital screen with indicators for different modes such as Car, Motorcycle, Bike, Balloon, and Custom. The screen also displays real-time information about tire pressure and battery life. Speaking of battery life, the device is powered by a massive 10,400 mAh cell giving users 400 days of standby power. The device retails at \$149 but early bird orders on Kickstarter get a 50 per cent discount.

## B1600 Professional Electric Microscope

**Funding:** US\$ 57,263 pledged of US\$ 3,822 goal

**Link:** <https://dgit.in/b1600>

Developed by Microscope World, B1600 is an electric microscope that offers a whopping 1600x magnification with 4K definition. All that power is contained in a fairly compact form factor too. The device comes with a 9-inch screen that can be folded downwards to allow for easy portability. The B1600 comes packing three different lenses which allow three levels of optical zooming – 100x, 800x and 1600x. The use cases for an electric microscope like the B1600 include precise instrument repair, experimental detection, jewellery



identification, and even observing microscopic specimens. The 9-inch screen offers touch screen operation and a pretty easy-to-use user interface. The

microscope can be connected to a phone, tablet or computer via a cable to further analyse the subject. The B1600 uses orbital mobile platform design instead of the Vernier caliper which, according to the company, makes it easier to capture stills. The height of the console can also be adjusted manually if you need to get even closer to the subject.

The device also allows real-time data transmission when connected to a PC via BeaverLab. The B1600 is priced at \$299 but there's a \$50 discount on early bird orders.

## WHAT'S NEW

# Anime for cheap!

In news that surprised many, the popular anime streaming service Crunchyroll has announced price cuts on its subscription fee. This comes on the back of the completion of Sony's merger of Funimation with Crunchyroll, as it takes steps towards becoming the one anime streaming service to subscribe to.

The company released a press release stating the changes in its pricing model and is hosting an FAQ page. The press release has in it the list of countries that are included in this reduction in pricing. And it would come as music to the ears of our anime fan readers; the list consists of India. The revised membership price in India would be ₹99/month. The



price of \$9.99/month, which is significant.

However, for the ones in North America and Western Europe, things will remain the way that they are. Crunchyroll subscribers residing in the US, Canada, Mexico, Australia, Germany, France, Italy, Spain, etc., will have to continue paying the price that they have been paying so far.

<https://dgit.in/crunchyrollprices>

GEEK CULTURE IS OUR WAY OF LIFE, AND ENCOMPASSES MOVIES, GAMES, COMICS, AND TRENDS FROM ACROSS THE GLOBE

**THIS MONTH IN CULT:**  
We recommend some upcoming anime you must check out and Team Digit lists out their most awaited upcoming shows. Boo-Man takes a dig at gaming smartphones, do you agree with him?



## Adam Scott joins Madame Web

The *Severance* star Adam Scott is all set to join the upcoming Sony film, *Madame Web*. It is a spin-off of *Spiderman* and will have Dakota Johnson taking the lead role. The film is expected to release in July 2023.

<https://dgit.in/spideyspinoff>

# 'Genshin Impact' developer opens first SEA HQ

Expanding its presence in the up-and-coming market of Southeast Asia, the developer of the popular gaming title, 'Genshin Impact', HoYoverse, has confirmed the opening of its first headquarters in the region. It will be located in Singapore, in the Razer building at One North on the 6<sup>th</sup> level.

This is the fifth such office of the game developer, following



Source: GeekCulture

the establishments in Montreal, Los Angeles, Tokyo, and Seoul. It is expected to be developed and equipped like the establishments the company has in North America, which means

that it would also, most likely, play an important role in the development of the titles in the coming days.

At the moment, the company has two games in the works. They are – *Zenless Zone Zero* and *Honkai: Star Rail*. So, it will be interesting to see how big of a role this new HQ has to play in the development of these titles. <https://dgit.in/genshinimpacthq>



## Skechers x 'Demon Slayer.'

The famous sneaker manufacturer Skechers has yet again partnered with an anime franchise to launch a new sneaker. The new Skechers x 'Demon Slayer' sneaker collection brings to the shelf four new designs for men and women. <https://dgit.in/skechersdemonslayer>



## Netflix unveils cast of live-action Yu Yu Hakusho

The wait is finally over for fans as Netflix has finally unveiled the cast of the upcoming live-action anime *Yu Yu Hakusho*. Netflix took to Twitter to make the announcement about this manga-inspired show. <https://dgit.in/yuyuhakusho>



## Dunder Mifflin, this is Pam!

Bringing the office of the famous Dunder Mifflin Paper Company from the sitcom 'The Office (US)' to the shelves of toy stores, Lego has launched its LEGO 21336 The Office set. It is a replica model of the famous fictitious paper company. <https://dgit.in/officexlego>



## 5G spectrum auction begins!

India's 5G spectrum auction started recently. Jio and Airtel are the major players to look out for.  
<https://digit.in/aug22-26>



culture

**BOO-MAN**



# Gaming Phones

Just get a console

**Boo-Man** | [boo@digit.in](mailto:boo@digit.in)

H

ave you ever seen a person setting their hard-earned money ablaze? No? You haven't seen someone buy a gaming phone? Well, if you haven't, then you've saved yourself from a world of misery. If you have, though, then that is what burning your money looks like. Gaming phones are the worst category of smartphones to exist, matched closely by gimmicky folding devices. Those look like ugly butterflies that people spend money on for a reason I don't comprehend.

Let's come back to the topic of gaming phones before I spiral off and burst a vein. What do people see in gaming phones when buying them? Both literally and figuratively. They have a bright, bulky, and light-up logo-laden design that screams - I AM A GAMER!!!! Who would want that? I am a fan of reading, but I do not wear a T-shirt with book covers printed on it. I wear a beautiful monotone black suit that makes me look presentable. I pack performance, but I do not show it. Unlike gaming phones and their owners. Do you know what they look like? Circus clowns. Pulling off gim-

micky movements and stunts that are of no real value while dressing like a rainbow spilt some of its unused colours on them.

Many might argue that their displays are great. Really? Sell that argument to someone from 2014 who had not seen a high refresh rate display on the phone until a 'gaming' phone introduced them to it. Nowadays, almost every phone on the market has a high refresh display. The one that used to be a selling point of these overpriced sandwiches of glass and silicon. Take the high refresh rate out of the equation, and their displays would look like they are from an old device.

Talking about the things that are terrible about gaming phones, I am reminded of their cameras. What do these people think when making a gaming phone's camera set up and software?! They are absolute garbage. Even if, someone gets to the top spot in a tournament using a gaming phone, they will not be able to take half decent pictures of themselves winning the trophy! All that they will have from one of the best days of their lives will be a collection of subpar pictures that look like a blob of pixels on a screen. You do not want to be that person.

There's still a lot left for me to talk about. The most important of which is the performance of these devices. To prevent my house from being burnt

down by the fans of this type of smartphone, I ran a few tests to prove my point. I took three devices, a pseudo-gaming phone, an actual "gaming" phone that the marketing people go on rambling about, and a normal person's everyday carry. All three had the exact same chipset, which was the SD 888. And here's how their results were in the test (AnTuTu 8.0) that I ran:

Pseudo Gaming Phone	827163
'Gaming' Phone	825825
Normal Smartphone	815612

The 'Gaming' phone may have inched slightly ahead in terms of the numbers. But when factoring in the cost and the rest of the things like the camera performance, these numbers start looking pretty bad. In terms of just getting the sheer bang for your buck, which you should, given that the recession is on the horizon and indulging in unnecessary expenses isn't wise, the gaming phone falls behind by a huge margin. Do not be fooled by the numbers that the marketing agencies put out for the gaming devices. They are achieved with those huge bulky accessories attached, which, trust me, you will never even pull out of the box after that initial honeymoon period with your device. Because they are just inconvenient.

Adding to it is the lack of battery management options available in most of these devices. On the spec sheet, it would look like they have higher than average battery life. However, once they start sucking the juice out, the 'gaming' phones never stop. They only take a breather once you are left with a sub-5 per cent battery, stuck on a random highway in the middle of nowhere in a broken car.

There's a lot more to say that I am holding back because my overlords give me only so much space. But know that my commentary is not over. There's a lot more to say. If not today, I shall emerge some other time and tell the world about how much of a poor investment gaming phones are. **d**

# Indian sci-fi books and authors

Indian science fiction literature has come a long way from where it was a decade and a half ago. Here are some of the best works of Indian science fiction and authors working in the genre.

Satvik Pandey | [satvik@digit.in](mailto:satvik@digit.in)

## AUTHORS:



**GAUTAM BHATIA**

A recent debutant in the world of Indian sci-fi writing, Gautam Bhatia made waves with his book *The Wall*, which came out in 2020. A lawyer by profession and a writer by passion is one line that would describe Bhatia's journey in the best way possible.



**SAMIT BASU**

If you have been reading science fiction books coming out of India, then there are chances that you already would know who Samit Basu is. His expanse is wide when it comes to genres, and the storylines of his books are extremely engaging, to say the least.

(Source: [Samitbasu.com](http://Samitbasu.com))



**S.B. DIVYA**

A lover of science, math, fiction, and the Oxford comma, as stated on Goodreads, S.B. Divya is one of the gems of the Indian science fiction writing circles. Author of several books, the reviews on her creations are enough for anyone to gauge her influence on the Indian science fiction book genre.

(Image Source: [sbdviya.com](http://sbdviya.com))



**VANDANA SINGH**

Weilding the titles of a science fiction writer and a particle physics professor is as cool as it gets. And Vandana Singh happens to have it attached to her name. With an impressive portfolio of sci-fi and poetry, she is not one to be missed when naming the best Indian sci-fi authors.



**KUMAR L.**

Kumar L. would be an ideal candidate to choose if you wanted to get a work of science fiction written. His experience in the field of engineering, passion for science, and knack for storytelling reflects well in his work.

(Image Source: [kumarlauthor.com](http://kumarlauthor.com))



**PRIYANKA SARUKKAI CHABRIA**

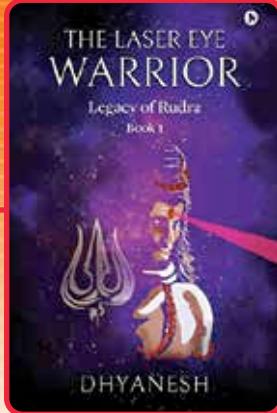
An author, a poet, a novelist, and a translator, Priyanka Sarukkai Chabria is the kind that takes up all the trades and masters them. Her work in science fiction that grabbed our eyeballs was *Clones*.

(Image Source: [priyasarukkaichabria.com](http://priyasarukkaichabria.com))

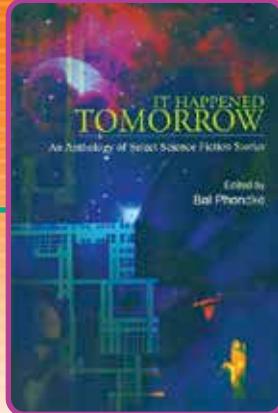
## BOOKS:



**SULTANPUR CHRONICLES**  
This work of science fiction written by Achala Upendran is bound to exceed your expectations with its mesmerising depiction of the Sultanpuri Empire. We seriously recommend you all to go ahead and check it out.



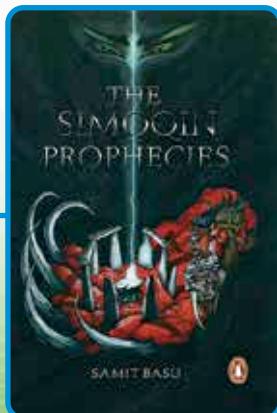
**THE LASER EYE WARRIOR (LEGACY OF RUDRA #1)**  
The story of the exploits of a celestial warrior prince, who is blessed with the unmatched power of a laser, The Laser Eye Warrior is a science fiction book that you would not want to miss.



**IT HAPPENED TOMORROW**  
You would ask yourself why did the book not land on your shelf sooner once you are through reading It Happened Tomorrow. This book is a compilation of the best science fiction stories ever written by Indians, including S.B. Ranade and J.C. Bose.



**प्रेषित (PRESHIT)**  
Written by Indian cosmologist Dr Jayant V. Narlikar, Preshit is a novella dabbling in the stories of aliens and their existence in the vast universe, which coming from someone like him, are quite believable too.



**THE SIMOQIN PROPHECIES**  
This is a Samit Basu classic. There could not be a better description for this than the one listed on GoodReads – “Monty Python meets the Ramayana, Alice in Wonderland meets The Lord of the Rings and Robin Hood meets The Arabian Nights in this novel...”



**EARTH TO CENTAURI: ALIEN HUNT**  
Set in the year 2118, which is not that far from now, the story of this book elaborates the mission given to the protagonist who has left a civil war-ridden Earth, forcing him to back to the planet.



### Google Workspace optimisation

Google Drive, Docs, Sheets, Slides, and Keep to be optimised for Android tablets soon.  
<https://digit.in/aug22-27>

# Anime to watch this season!

Clock in your hours for this binge will be long

Satvik Pandey | satvik@digit.in

The season of fresh anime releases is here, rather, it has already begun. So, here's a list of shows that we think you should not miss out on!



#### Hataraku Maou-sama!!

The Devil is a Part-timer!! season 2 is back to serve the fans with the story of the Devil himself working part time and doing chores on Earth. He just wants to live a normal, mundane life, but as usual, doesn't look like that's in the cards for him even this season.



#### Youkoso Jitsuryoku Shijou Shugi no Kyoushitsu e 2nd Season

This seems to be a season of returns as Classroom of the Elite is also back with a second season. This time, with a new class-scrambling test awaiting the characters. The last season aired back in 2017, so don't forget to catch up!



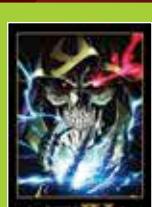
#### Yofukashi no Uta

The only anime on this list that's not a returning sequel, Yofukashi no Uta has already hit the top of the fan charts, with a score of 8.04 on MyAnimeList. It's boy meets vampire, but with a twist. Still a better story than Twilight? Let's see.



#### Dr stone: Ryuusui

We were big fans of Dr Stone when it first aired; the science vs fiction setting was great, and only improved by an excellent cast of characters. Dr Stone: Ryuusui is a 58 minute long movie that serves as the bridge between Season 2 and the upcoming Season 3.



#### Overlord IV

Rejoice Overlord fans! The show is back with the fourth season. The isekai anime that put a refreshing twist on the genre has been a fan favourite for some time now, and we can't wait to see the Overlord himself, Ainz Ooal Gown, back in action.

**Spider-Man PC Requirements**

Check out the link below to find out the minimum system requirements for Marvel's Spider-Man on PC.  
<https://digit.in/aug22-28>

**FEATURE**

# Team Digit's Picks

Here are the movies and TV shows that Team Digit is looking forward to...



**Jayesh Shinde**

**Rings of Power (Amazon Prime)****Web Series - Drama**

It's uncharted territory, there's so much of Middle-Earth and beyond waiting to be revealed, I just hope the showrunners don't ruin it all for book nerds.



**Satvik Pandey**

**The Morning Show (Season 3) (Apple TV)****Web Series - Drama**

After watching the first two seasons of this intense newsroom drama show, it is hard to wait anymore to see how and where the story progresses.



**Dhriti Datta**

**Locke & Key (Season 3) (Netflix)****Web Series - Fantasy Drama**

A bunch of kids wreaking havoc with a bunch of magical keys. What's not to like? It's a premise that's been a fantasy for numerous kids across the globe. Plus, the first two seasons have been riveting with great SFX and decent character development. Can't wait for Season 3!



**Mithun Mohandas**

**The Sandman (Season 1) (Netflix)****Web Series - Superhero**

Having read the comics I am excited to see how they translate the story on to the screen.



**Prakrit Dhondiyal**

**Dungeons & Dragons: Honor Among Thieves (Theatres)****Movie - Fantasy**

After the fiasco that was the Early 2000s TV movie series, the modern adaptation of the TTRPG game has been a long time coming. Having played the Forgotten Realms games over the past few years (Digital and IRL) and their lore, I've been looking forward to this movie for a while. Quite excited to see what they come up with.



**Manish Rajesh**

**My Hero Academia S6 (Crunchyroll)****Anime - Shounen**

MHA is easily one of the best Shounen anime of the current generation, filling the void that was left by the greats (although One Piece isn't going anywhere anytime soon). We can't wait to see Midoriya's growth in the 6th season, which is slated to be the darkest season yet.





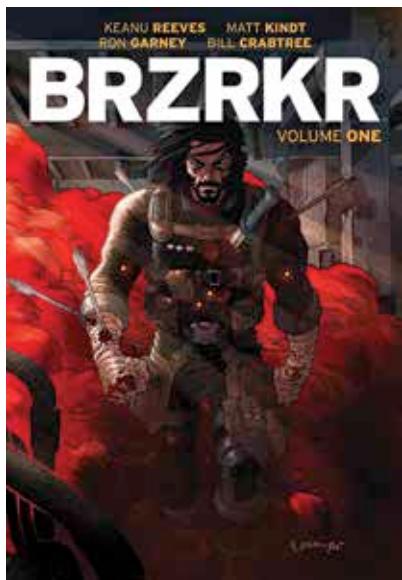
### PlayStation VR2 confirmed

The Sony PlayStation VR2 will feature a see-through view, custom play area, and more. <https://dgit.in/aug22-32>

# San Diego Comic-Con 2022 – Biggest news from the event

From Keanu Reeves's anime to The Rock cosplaying, fans were treated with everything.

Satvik Pandey | [satvik@digit.in](mailto:satvik@digit.in)



### **BRZRKR- Keanu Reeves's Anime**

If there could have been a surprise that every fan would wish for at SDCC, then a Keanu Reeves anime would be the first thing that everyone would have wished for. Well, they did not need to, as the actor teased the upcoming anime on Netflix, based on his book BRZRKR.

### **Black Adam – Rock cosplay, anyone?**

Making the best use of his cosplaying abilities was Dwayne Johnson, aka The



Rock, as he made an appearance at the event in a full-fledged costume to promote Black Adam. He fired lightning bolts into the crowd while they cheered and celebrated the launch of a new trailer of the film that is set to release in October this year.

### **MCU Phase 4 to 6 – The Multiverse Saga**

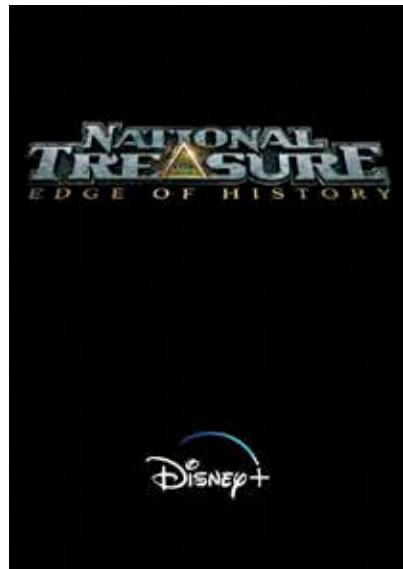
Well, the heading gives away most of what was announced by Marvel with regards to the next phases of the MCU. Marvel Studios' Kevin Feige announced that Phases 4 to 6 will be called The Multiverse Saga. There was a slew of



other announcements, including that of two new Avengers movies, that kept the fans on their feet.

### **National Treasure: Edge of History – An epic spinoff?**

Bringing back the iconic National Treasure franchise, much to the delight of the fans, was Disney+ as the cast of



the upcoming show walked into their SDCC panel. The streaming platform treated the fans with the first look at this new upcoming show.

### **X-Men '97 – Nostalgia, anyone?**

It was another iconic franchise marking its return during SDCC 2022, as Marvel Studios announced their upcoming



original series – X-Men '97. The series will be streaming on Disney+ in Fall of next year. **d**

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SCIENCE IS  
THE PATH TO  
KNOWLEDGE, AND  
FINDING OUT ABOUT  
HOW OUR UNIVERSE  
WORKS, YOU CAN'T  
BE A GEEK AND  
NOT KNOW YOUR  
SCIENCE!

## THIS MONTH IN SCIENCE:

In Earth, we learn all about wildfires, in Space Age, we marvel at the first pictures taken from the James Webb Space Telescope and in Health, we learn about an odd phenomenon known as Phantom Ringing.



## Alien messages coming soon

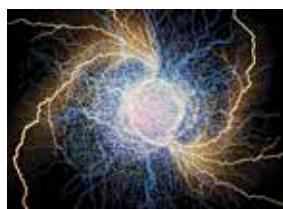
A series of new calculations done as a part of a study by researchers Arjun Berera and Jaime Calderón-Figueroa suggest that aliens could send quantum messages to Earth. During their study they examined "possibility of achieving quantum communication using photons across interstellar distances".

[https://digit.in/  
alienmessages](https://digit.in/alienmessages)

### WHAT'S NEW

## First electron whirlpools

**R**esearchers at the Massachusetts Institute of Technology and Weizmann have finally been successful in discovering electron whirlpools. The presence of electron whirlpools had previously been predicted; however, it had never been confirmed, until now. Commenting on this finding, Leonid Levitov, a professor of physics at MIT, said, "Electron vortices are expected in theory, but there's been no direct proof, and seeing is believing." He added, "Now we've seen it, and it's a clear signature of being in this new regime, where electrons behave as a fluid, not as individual particles." Previously, the closest scientists had gotten to discovering such behaviour was in the year 2017. A team of researchers from the University of Manchester



reported that they were successful in observing fluid-like electron behaviour in graphene. To get a visual representation of the electron vortices, the researchers observed tungsten ditelluride (WTe<sub>2</sub>). They synthesised pure single crystals of the same. After that, structured sampling was done, and current flow was observed in the material using special equipment. The findings brought out experimental evidence that could now be "leveraged for low-power next-generation electronics".

<https://digit.in/electronwhirlpools>

## The reason behind tiny arms of dinosaurs found

**A** newly discovered meat-eating dinosaur named Meraxes gigas has been able to provide clues helping answer the age-old question – why did dinosaurs have tiny arms? This dinosaur could provide further clues about the evolution and biological structure of Carcharodontosaurus and Tyrannosaurus rex. This is because it bears a resemblance to the famous carnivorous dinosaur. Commenting on this, a member of



the research team said that this dinosaur's body plan was "surprisingly similar" to that of T. rex. He added, "But, they're not particularly closely related to T. rex. So, having this new discovery

allowed us to probe the question of, 'Why do these meat-eating dinosaurs get so big and have dinky little arms?'" Statistical data found from the discovered remains showed that the growth patterns in all the three families of theropods were almost the same. The study found that Meraxes and the related dinosaurs underwent rapid evolution. However, it did not take long for them to go extinct too.

<https://digit.in/dinoarms>



### First fires

Researchers, using advanced AI techniques, have finally been able to uncover the first evidence of the use of fire. These date back to at least 80,000 years and stand as one of the oldest known pieces of evidence of the use of fire.

[https://digit.in/  
ancientfire](https://digit.in/ancientfire)



### Shifting shapes, aiding growth

MIT chemists have uncovered new insights into the functioning and influence of the EGFR receptor in the human body. These discoveries about the EGFR could potentially help in the development of more effective cancer medication.

[https://digit.in/  
shiftingshapes](https://digit.in/shiftingshapes)



### Making artificial hearts

A team of bioengineers from the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) have made great leaps towards developing effective bio-fabrication techniques, solving a 300-year-old mystery in the process.

[https://digit.in/  
artificialhearts](https://digit.in/artificialhearts)

# डिजिट अब हिंदी में

देश का सबसे लोकप्रिय और विश्वसनीय टेक्नोलॉजी वेबसाइट डिजिट अब हिंदी में उपलब्ध है। नयी हिंदी वेबसाइट आपको टेक्नोलॉजी से जुड़े हर छोटी बड़ी घटनाओं से अवगत रखेगी। साथ में नए हिंदी वेबसाइट पर आपको डिजिट टेस्ट लैब से विस्तृत गैजेट रिव्यू से लेकर टेक सुझाव मिलेंगे। डिजिट जल्द ही और भी अन्य भारतीय भाषाओं में उपलब्ध होगा।

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डिजिट



### Qualcomm next-gen Watch SoCs

Qualcomm has unveiled the next-gen chips for wearables called W5 Gen 1 and W5+ Gen 1. <https://digit.in/aug22-33>



# Wildfires

Just like the saying goes

Satvik Pandey | satvik@digit.in

**F**orest fires are one of the most devastating ways in which nature expresses its wrath. Toxic gases are released into the atmosphere, wildlife gets severely affected, and people's belongings get destroyed. In the last few years, we have seen a lot of forest fires not only on foreign land but in our own backyard. Forest fires are a serious problem for India's forest cover and the well-being of individuals residing close to these areas. In this article, we bring you the recent findings and historical data about the effects and causes of wildfires and how, in India, things are poised to take a turn for the worse if not dealt with effectively.

#### INCREASING FREQUENCY

Forest fires today are primarily triggered by rapidly changing climate conditions. In 2020, Australia saw one of the worst instances of forest fires, and since then, there have been several severe instances across the globe. The United Nations Environment Pro-

gram published a report earlier this year titled, Spreading like Wildfire: The Rising Threat of Extraordinary Landscape Fires, in which they elaborated on the causes and effects of the increased instances of wildfires globally. The report called for the adaptation of a revised and ready action plan to combat wildfires.

The report stated that wildfires, instead of being a one-off natural calamity, have become a regular part of the seasonal calendars. Not a single continent on the planet apart from Antarctica is untouched by them. It also mentioned that climate change is not the only factor causing a steep rise in the number of wildfires. The report stated, "A wildfire results from a complex interaction of biological,

meteorological, physical, and social factors that influence the likelihood of a wildfire breaking out, its propagation and intensity, duration and extent, and its potential to cause damage to economies, the environment, and society."

Given that the factors affecting wildfires, especially the climate and land management practices, are rapidly getting worse, so is the risk of wildfires. The report showed that by the end of the century, the risk of wildfires would increase by a "factor of 1.31 to 1.57" due to the contribution of multiple factors.

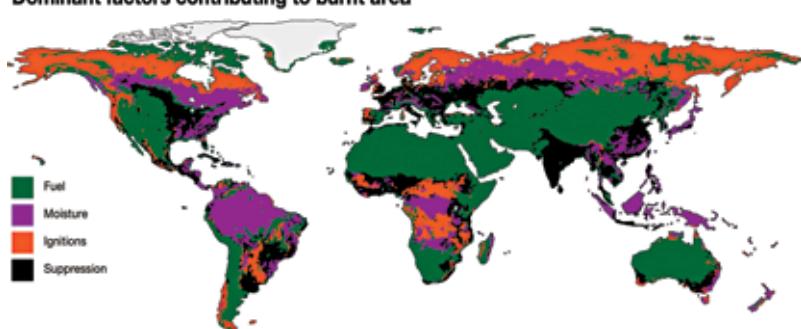
#### WHAT ABOUT INDIA?

The numbers stated above may not directly represent the situation in India. But, it does not look promising for India as well. As per the numbers published on the official website of the Forest Survey of India, there were "52,785 forest fires were detected using MODIS (Moderate Resolution Imaging Spectro-radiometer) sensor, and 3,45,989 forest fires were detected using SNPP-VIIRS (Suomi-National Polar-orbiting Partnership - Visible Infrared Imaging Radiometer Suite) in forest fire season from Nov 2020 to June 2021."

In the first three months of 2022, there were 1,36,604 recorded instances of forest fires in the country. These have led to a loss of human and animal life and a stark reduction in the cover of the lush green forest.

The future does not look any better. As per FSI, forest fires have increased ten times in the last decade, and if things remain the same, we may see worse numbers being reported. About 22 per cent of India's forest cover is

Dominant factors contributing to burnt area



Source: UNEP



## Insta Shopping via DMs

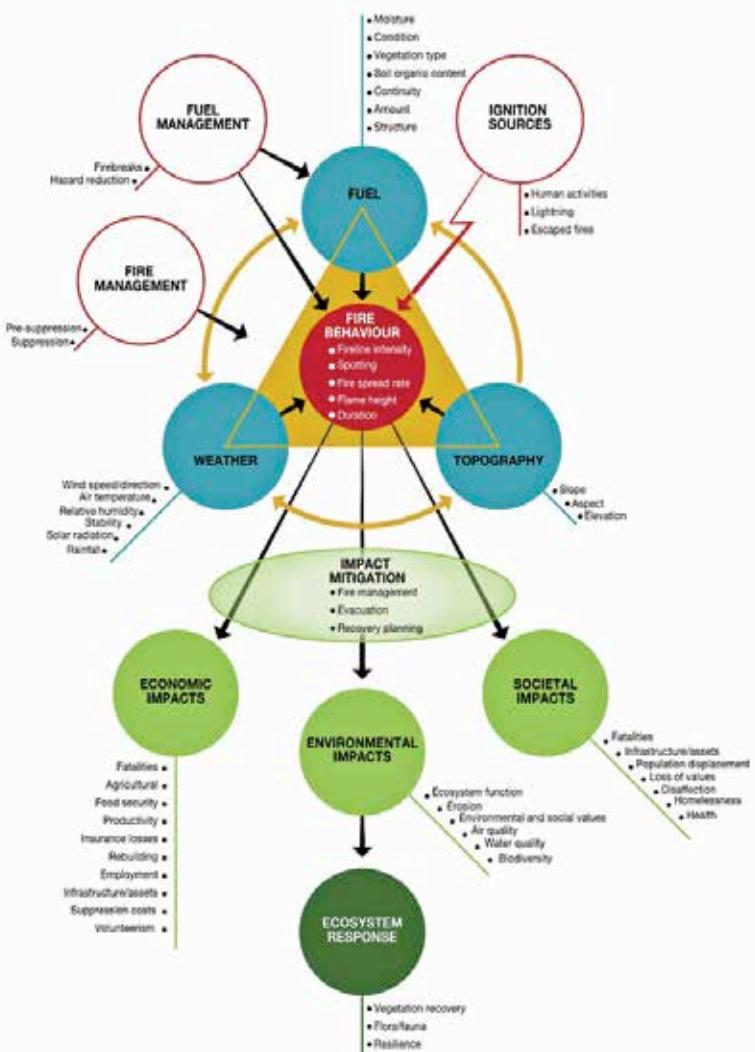
Instagram announced a deeper integration of Instagram Shops and Direct Messages features.  
<https://dgit.in/aug22-34>



sci

EARTH

### Factors influencing wildfire outcomes and management actions



SOURCE: UNEP

SOURCE: FSI

Category	Forest cover (in sq km)	% of Total forest cover
Extremely Fire Prone	20,074.47	2.81
Very Highly Fire Prone	56,049.35	7.85
Highly Fire Prone	82,900.17	11.61
Moderately Fire Prone	94,126.68	13.19
Less Fire Prone	4,60,638.36	64.54
<b>Total</b>	<b>7,13,789.03</b>	<b>100.00</b>

India's forest cover classification according to susceptibility to fires

reported to be prone to forest fires. So, with the worsening conditions, it's anyone's guess what might unfold in the coming years.

### SWOTTHREATS

We cannot afford to have forest fires

happening at the rate they are happening right now, and certainly not at the level they are projected to rise to in the coming years. The effects of these fires are much worse than what we can imagine to be. Even the smallest of forest fires contribute to the problem

of the changing global carbon cycle. They tend to increase the positive feedback loop of the cycle, thus making it more difficult to combat the increase in Earth's temperature. Not only this, the fires negatively impact water catchments, facilitating unwanted erosion and inflicting extensive damage to the productivity of the soil in the affected region.

The wildlife in the affected areas also has to bear with the severe consequences of forest fires. It has been proven that the increased instances of forest fires are pushing certain species of the animal kingdom towards extinction. This, in turn, affects the balance of the ecological balance of that area, the effects of which can be felt trickling down to our day-to-day lives in one way or another.

### ANSWERS... ANYONE?

Having read about wildfires' effects and other statistics, it may look like there's no hope. But, if the right steps are taken, and things are done in the manner in which they are supposed to be, there's still a chance.

At institutional and governmental levels, the UNEP report called for the adoption of a new 'Fire Ready Formula'. This would include developing a better understanding of ecosystem restoration, preparing better for facing adversity, and establishing a concrete plan to restore things effectively in the aftermath of such instances.

Individually, there's little that can be done. However, even small efforts by the billions of people living on Earth can bring about a big change. Cutting down on environmentally damaging practices can surely be of help. If you spot wildfires, you can report them to the authorities too, helping them contain the damage at the earliest. All you will have to do is go to the Forest Survey of India (FSI) webpage and file a report on the Forest Fire Portal operated by the institution.

Apart from this, educating yourself more and spreading the message about the effects of forest fires can work wonders as well. **d**



### Realme Pad X And Watch 3

Realme has finally launched its Pad X and Watch 3 in India.

<https://dgit.in/aug22-20>

# Phantom ringing catching up quick



After braving a pandemic, invasive work from home, and way too many online classes, we have now got a new problem

Anup Semwal | [feedback@digit.in](mailto:feedback@digit.in)

**I**magine a time when you are in your room, engrossed in a task, when your phone starts vibrating. But did it vibrate really?

After expecting the call for close to two hours, which were spent looking at your phone every fifteen minutes to check if there were any phone calls, you almost give up. Just when you are too tired to stay awake, you hear your phone vibrate faintly and then ring. The subsequent tragedy that unfolds is in two parts: it wasn't a phone call that got your phone vibrating; in fact, your phone was not vibrating at all. The vibrations, if any, were all in your head.

Scientists and researchers like to call these false auditory sensations phantom vibrations – an ugly trick that our mind plays at us every now and

then, and we start hallucinating our cell phones buzzing.

#### ENTER RINGXIETY

For some people, it is not the vibrations, but the ringtone of their mobile phones that they imagine hearing, hence the name goes phantom ringing. According to a 2018 study published in the Indian Journal of Psychological Medicine, background phantom sensations like phantom vibration (PV) and phantom ringing (PR) – the sensations of vibration and ringing of the phone when they are not, respectively – are among the latest in the category of “technopathology” to receive global attention. Both these syndromes are fairly common. A research suggests that nine of ten mobile phone users suffer from them, and briefly, they were clubbed together into ‘ringxiety’, a portmanteau that blends ringer with anxiety.

The man who coined this word, David J. Laramie, was also, the first

scholar to formally record this phenomenon. In the summer of 2007, he submitted his dissertation to the California School of Professional Psychology. In that it was mentioned that as many as two-thirds of 320 adult mobile-phone users, in an online survey reported that they had heard their mobiles ringing when they weren't. For many Gen Zs and young adults, it is the first time in their young lives that they're having a brush with ringxiety.

Wajiha Haider was in Bangalore, working from home for Qatar-based ed-tech start-up Wise, when she got her first phantom ring. It was March 2021, the deadly second wave of Covid-19 had again pushed everyone behind the doors, and work from home was now a thing. From dawn to dusk, the twenty-two year old marketing manager was glued to her mobile phone and laptop, and rarely stepped outside the dizzy world of the internet.

“So I was in the kitchen, okay,” she told, over a half-an-hour long call, “my phone was with me only, I was looking for a recipe on YouTube, so I was sure it was not my phone vibrating.”



### Update your Apple Watch

CERT-In wants the Apple Watch users to update the WatchOS to 8.7 or above.  
<https://dgit.in/aug22-21>



She shared her rental apartment in Bangalore with her co-worker at Wise. She knocked on her door, annoyed, and recalled telling her, "Your phone is ringing. Come on, pick it up or either cut it. It's annoying." Of course, nobody's phone was ringing.

Her roommate later told her that she must be on the cusp of a spiritual awakening because, according to her, that is when humans feel a lot of vibrations. Wajiha didn't give it much thought, but the spooky vibrations never stopped.

"They come out in very, very weird places," she told. "You're around a bunch of people, and you start saying, somebody's phone's ringing, somebody's phone's ringing, and of course, nobody's phone's ringing. I feel ridiculed."

Lately, along with other people's mobiles in her vicinity, she has also started hallucinating her own phone vibrating, sometimes twice or thrice a day. When asked how these regular phantom vibrations make her feel, to which she first chuckled, and then replied, sheepishly, "I ignore most of them. I'm like, maybe, you know, I'm just paranoid or something."

### THE PSYCHOLOGY OF AUDITORY HALLUCINATIONS

This business of hearing imaginary noises, however, is not wholly unnatural. New mothers imagine their babies crying and check on them when in fact the babies are actually asleep. And, who on Earth has ever walked on a lonely, dark, cobbled street and not thought they've heard unworldly, creepy noises?

As Adarsh Tripathi, assistant professor from the psychiatry department of Lucknow's King George's Medical University (KGMU), explained it, "If you're walking in a calm corridor, you expect insects, and then probably even if there is nothing, your mind starts perceiving noises that insects make."

"So people who are engaged in their mobiles, maybe expecting a call or a text or a Facebook like," he further explained, "they at times feel

that there is a vibration or their cell-phone is ringing."

In the scarce number of studies we have on phantom vibration syndrome, most participants say that they don't find it much bothersome. In our teeny-tiny, very unscientific, personal sample of people hallucinating their phones buzzing; again, nobody has yet found it problematic enough to mention it to a medical professional.

However, a few studies hint at the possible adverse effects that ringxiety can cause. For starters, a study published in the Iraqi Postgraduate Medical Journal noted that phantom rings might cause discomfort or loss of concentration during driving. Phantom ringing is a Covid-19 side-effect as well, according to a May 2022 clinical study.

Last year, in the month of November, a twenty-one-year-old accountant Rupesh Mishra, who, by his own admission, gets up to ten phantom rings a day, indeed lost his control on the steering wheel. On a wintry morning, he was driving his car on NH 1, en route to Delhi from Kurukshetra, when he felt, in his phone vibrating in his pocket.

"I had not informed my father that I was going to Delhi to pick my elder brother from the airport, so I took my phone out, unlocked it, thinking he'd be the one calling," Rupesh recalled, "but there was nothing, no one." When he raised his eyes from his phone, he found himself – and his car – on the verge of a collision with a heavy duty truck. "I have now grown accustomed to these vibrations," he added, "whenever I get them while driving, I try my best to ignore them. I know – most probably – they're fake."



### IS PHANTOM RINGING A SERIOUS DISORDER?

Are phantom vibrations a cause for concern? Is it a disorder? Adarsh Tripathi had an interesting answer: One single phenomenon does not amount to normalcy or pathology. "Phantom ringing is closely linked to excessive mobile phone use," he explained, "and nowadays doctors understand it as addiction."

So if someone gets a phantom ring once in a while, we asked Tripathi, with a little hesitation, should they be thinking about getting a medical remedy? "No," he replied, "unless there are things involved." By other things involved, he meant that phantom ringing, along with excessive mobile phone usage, becomes

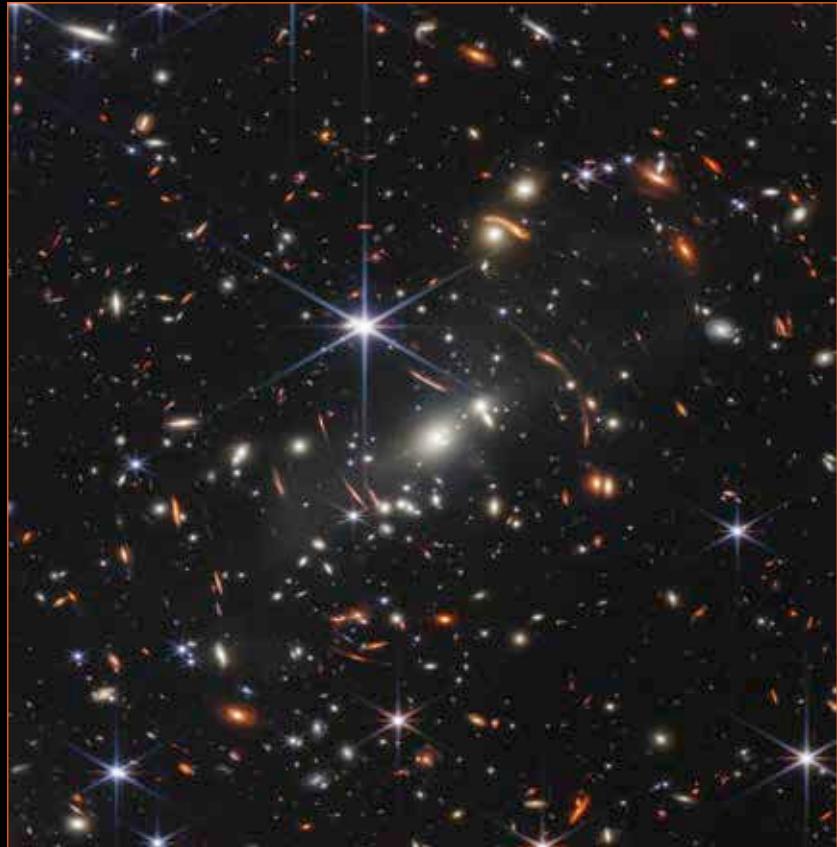


problematic if it starts affecting the person's mental and physical health, and their social functioning and personal relationships.

With second-generation social entrepreneur Shrey Saxena, who runs a company that converts waste into biofuel, that was happening. Shrey was perpetually distracted at work as he always felt something was vibrating. He blocked all the notifications on his phone, but that didn't help much until he stopped keeping his phone on vibration. The frequency with which phantom ringing used to happen drastically – and instantly – dipped.

"I also stopped using my personal phone at work and removed all social media apps from my office phone," he told. "Now if you'd ask me when it happened last, I can't even recall," Shrey said, sounding victorious and relieved, proving that there is a way out. You have to find yours! **d**

# Revealing The Universe In Mind Blowing Detail



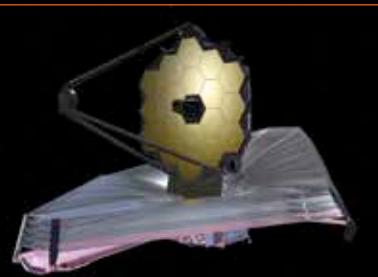
**Imagine looking at a single grain of sand on your finger-tip at arm's length, that's what the James Webb Space Telescope has captured**

**Jayesh Shinde** | Jayesh@digit.in

After seven long months of its launch, the largest and most-sophisticated telescope ever built, the James Webb Space Telescope has revealed its very first pictures – and they're absolutely stunning!

Perceiving its historical importance, none other than US President Joe Biden revealed the very first full-colour image taken from the

James Webb Space Telescope on July 12 (IST). The picture reveals a patch of deep, dark space background full of thousands of glittering



**JWSWT - What a beauty in itself!**

galaxies. This first publicly revealed image taken from the James Webb Space Telescope is also reportedly the highest resolution image of the infrared universe anyone has ever seen, according to NASA. This isn't hard to believe because after the Large Hadron Collider, the James Webb Space Telescope (JWST) is probably the most sophisticated scientific instrument ever built. In case you didn't know, the JWST is the successor of the Hubble Space Telescope and the culmination of over three decades and several billion dollars of multinational, multi-space agency effort to undertake never-before-attempted scientific research from deep space.

## WEBB'S FIRST DEEP FIELD

As for the historic first image captured and made public by the James Webb Space Telescope, it has been christened its own name as the "Webb's First Deep Field." The image specifically shows galaxy cluster SMACS 0723 in unprecedentedly clear detail, captured of course from JWST at an orbit that's 1.5 million kilometres away from Earth – in comparison, the Hubble Space Telescope orbits our planet from just over 500 km away.

According to the James Webb Space Telescope's Twitter handle, capturing the Webb's First Deep Field image literally took "less than a day." This is the most mind bogglingly amazing part of the James Webb Space Telescope's first ever image, in terms of what the telescope was looking at in the night sky millions of kilometres away from Earth, where it had focused its lens for less than a day to reveal the image, we are now calling as Webb's First Deep Field. This is how NASA's Bill Nelson explained it to US President Joe

## JWST VS HUBBLE VS KEPLER VS TESS

All of these are primarily NASA space science missions. The Kepler mission is a retired space telescope launched in 2009, and it was designed to find what fraction of stars have earth-like planets near the habitable zone. Launched in 2018, TESS (Transiting Exoplanet Survey Satellite) practically expands on Kepler mission's findings, trying to find exoplanets orbiting stars that are closer to our solar system for further observation and study. Technically, JWST can do all of this but its field of scientific inquiry is a lot more fundamental – kind of like the Hubble Space Telescope it's supposed to replace shortly.

Think of it this way – the Hubble Space Telescope is the first non-terrestrial, space-based telescope launched and has been continuously operated since 1990. It's essentially a giant magnifying glass suspended in space to reduce earth-based radio interference and look at a wide variety of objects

in the universe. Hubble's findings have led to future missions like Kepler and TESS.

If you thought Hubble was good, JWST is at least a hundred times better than the Hubble Space Telescope. By viewing the universe at infrared wavelengths, the JWST aims to show us things never before seen by any other telescope – like the very first stars and galaxies formed within 100 million years of the Big Bang (which took place over 14 billion years ago). JWST isn't just a space telescope, it's a full-fledged observatory that's far away from earth's electromagnetic interference – ideal to study how galaxies, stars and planets formed in the early universe. That's why JWST is an infrared-based telescope, because infrared light allows us to see stars and planetary systems forming inside clouds of dust that aren't fully visible in ordinary light that we or our eyes can see.

Biden, during the official unveiling of the image. "If you held a grain of sand on the tip of your finger at arm's length, that is the part of the universe that you're seeing (in this picture)... just one little speck of the universe," NASA Administrator Bill Nelson said. "You're seeing galaxies that are shining around other galaxies whose light has been bent."

As sophisticated as the James Webb Space Telescope is, fundamentally it's aimed at doing space imaging largely in the infrared spectrum of light. This fact is confirmed by JWST's official Twitter handle, too. It says that Webb's First Deep Field image "isn't the farthest back we've observed" the universe. "Non-infrared missions like COBE & WMAP saw

the universe closer to the Big Bang (~380,000 years after), when there was only microwave background radiation, but no stars or galaxies. Webb sees a few 100 million years after the Big Bang," it highlighted in no uncertain terms.

### WHAT'S NEXT FOR JWST

According to NASA's Bill Nelson, the James Webb Space Telescope is just getting warmed up, just getting started to do what the Hubble Space Telescope could never physically do – which is to look back at the very beginning of the universe immediately after the Big Bang.

This isn't all, as James Webb Space Telescope's nothing short of a full-fledged science lab in deep space. Its on-board cutting edge capabilities will help NASA researchers on ground here on Earth analyze not just static images of the early universe, but also the chemical composition of the atmosphere of planets beyond our solar system, and whether they can sustain life on them. Humanity's best telescope, the JWST is scheduled to operate for 10 years at the bare minimum, but knowing NASA's ingenuity don't be surprised if we continue to see it operating for several decades into the future – for the sake of unprecedented space science, we sure hope so! 

### MORE IMAGES FROM JWST



Carina Nebula - Like a painting in space



Southern Ring Nebula - Some stars save the best for last



SMACS 0723 - Very far away... There is a collection of galaxies

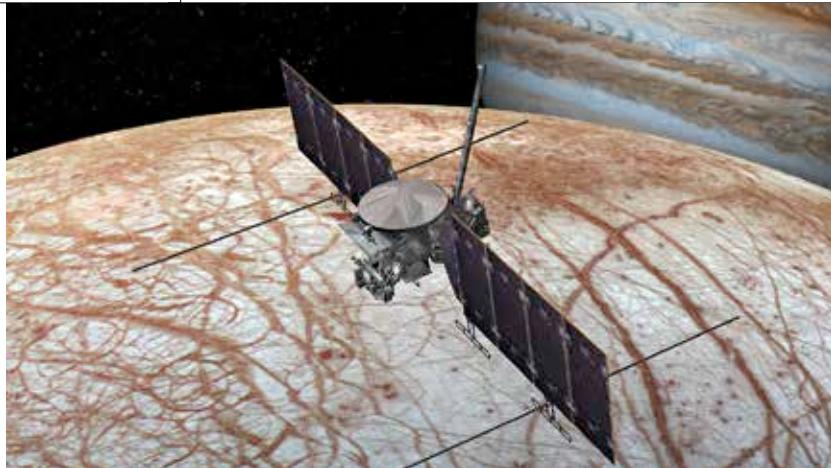


Stephen's Quintet - Five galaxies in a single place



### The Galaxy of the olden times

The James Webb Telescope discovers one of the oldest galaxies to ever be spotted by humans.  
<https://dgit.in/aug22-16>



# TO THE MOONS AND BACK!

In pursuit of habitable land beyond Earth

Priyanka Srinivas | [feedback@digit.in](mailto:feedback@digit.in)

**A**s part of NASA's Apollo programme, 12 astronauts visited the Moon between 1969 and 1972. Since then, humans have not returned, and the Moon remains as only planet that humans have ever visited. The Moon doesn't have an atmosphere similar to Earth's, and there isn't any wind or water to wash the Apollo astronauts' footprints away. The Moon also lacks tectonic activity, unlike Earth and Venus, hence its internal structure has been well preserved since its formation. Scientists now have the chance to comprehend how planets' interiors form. Our Moon is a historical encyclopedia containing information about ancient Earth. Similarly, exploring our solar system and understanding the planets around us

involves closely examining the multiple moons that surround them. Jupiter, Milky Way's biggest planet, has many unexplored mysteries. Its moon or shall we say moons hold the answer.

#### JUPITER AND ITS SEVERAL MOONS

Jupiter has 53 named moons and more than 20 others awaiting formal identification. Currently, it is believed that Jupiter has 79 moons altogether. There are many fascinating moons around the globe, but the Galilean satellites—the first four moons identified outside of Earth—hold the greatest scientific curiosity.

#### THE GALILEAN MOONS

The Galilean satellites are named after Italian scientist Galileo Galilei, who made the first observation of Jupiter's four largest moons in 1610. Simon Marius, a German astronomer, claimed to have spotted the moons at about the same time, but because he didn't record his findings, Galileo is credited with making the discovery. Each of these

big moons—Io, Europa, Ganymede, and Callisto—are unique worlds.

#### 1. Io

The solar system's most volcanically active body is Io. Sulfur is present on Io's surface in a variety of vibrant forms. Io's slightly elliptical orbit around Jupiter causes "tides" in the surface to surge 300 feet (100 metres) high, creating enough heat to support volcanic activity and evaporate any remaining water. Hot silicate magma powers Io's volcanoes.



#### 2. Ganymede

Ganymede is the largest moon in the solar system (bigger than the planet Mercury) and the only known moon to have its own internally generated magnetic field.

#### 3. Callisto

Callisto's surface is severely cratered and old, providing a visible record of events from the solar system's early past. The extremely few tiny craters on Callisto, on the other hand, imply a low level of present surface activity.

#### 4. Europa

The surface of Europa is primarily water ice, and there is evidence that it may be covering an ocean of water or slushy ice beneath it. Europa is thought to have double the amount of water as Earth. Astrobiologists are intrigued by this moon's potential for a "habitable zone." On Earth, life forms have been discovered thriving near subsurface volcanoes and in other harsh settings that could be parallels to what might exist on Europa.

#### THE EUROPA CLIPPER MISSION

##### About Europa

Europa is named after a woman who was kidnapped by Zeus in Greek



## Backing out is gonna cost ya

Twitter sues Elon Musk after he backs out of the \$44 billion deal to acquire the platform.  
<https://dgit.in/aug22-17>



sci

FEATURE

mythology. Europa is roughly 90 per cent the size of Earth's Moon, with an equatorial diameter of 1,940 miles (3,100 kilometres). Because its surface is comprised of water ice, it reflects 5.5 times more sunlight than our Moon. The Sun's light takes around 45 minutes to reach Europa. Because of the distance, sunlight is approximately 25 times fainter on Jupiter and Europa than it is on Earth. Europa orbits Jupiter every 3.5 days and is held in place by Jupiter's gravity, so the same hemisphere of the moon constantly faces the planet.

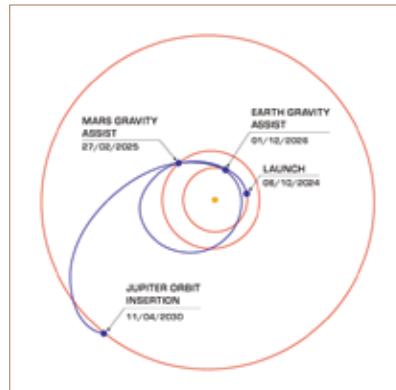
### The Mission

Taking specific interest in Europa and its potential life forms, NASA is preparing a mission called Europa Clipper. It will also search for organics such as sulphates and carbonates. Europa Clipper will help us comprehend the potential for life on additional ocean worlds in our solar system and beyond by establishing whether Europa has the proper conditions for life. One of NASA's most expensive missions, the Clipper will explore everything from the depth and salinity of the ocean to the thickness of the ice crust.

### EUROPA CLIPPER: BUILT AND ASSEMBLY

The spacecraft's main body is a massive 10-foot-tall (3-meter-tall) propulsion module designed and built by Johns

and Sounding: Ocean to Near-surface (REASON), Europa Thermal Emission Imaging System (E-THEMIS), MAss SPectrometer for Planetary Exploration/Europa (MASPEX), Europa Ultraviolet Spectrograph and a Surface Dust Analyzer (SUDA).



The radar device will map Europa's ice, while a magnetometer will estimate the ocean's depth and salinity. Colour and infrared cameras will map the surface and look for hot patches where the ocean might be leaking through the ice shell. Spectrometers will assess the surface's composition and scan any plumes spouting water into space. The mission also has the capability of directly sampling Europa's atmosphere, including potential ocean water and surface particles ejected into space by Jupiter's radiation.

### TO WHAT END?

After all data has been collected, NASA could continue with an extended mission, possibly focusing on sites that are particularly fascinating with repeated near flybys. After four years of science flybys, the objective is to crash the spacecraft somewhere less astrobiologically intriguing than Europa. Scientists do not want to risk contaminating Europa with Earth-based bacteria that escaped NASA's cleanrooms. Thus, NASA's official aim is to crash Clipper onto Ganymede, the largest natural satellite known in our solar system.

By then, Clipper should have returned enough Europian surface data to Earth for NASA to select a landing site for a subsequent lander mission. NASA

Hopkins Applied Physics Laboratory (APL) in Laurel, Maryland. The nine scientific instruments that Europa Clipper will carry are: Plasma Instrument for Magnetic Sounding (PIMS), Europa Clipper Magnetometer, Mapping Imaging Spectrometer for Europa (MISE), Europa Imaging System (EIS), a radar for Europa Assessment

cannot rule out the chance that Clipper will get extremely lucky and detect signs of life during one of its near flybys of Europa. Clipper, however, is primarily a survey expedition. A follow-up surface lander is more likely to be required to find biosignatures on Europa's surface.

### FURTHER MISSIONS TARGETING EUROPA: JUICE

JUICE, or Jupiter ICy moons Explorer, will provide information about the evolution and habitability of icy worlds near Jupiter and Jupiter-like exoplanets. JUICE will most certainly broaden our search for life in the universe.

JUICE is scheduled to launch in August 2023 and land on Jupiter in 2031. It will orbit Jupiter for 2.5 years, often flying within 200 to 1,000 kilometres (120 to 620 miles) of the icy moons. During the initial phase of the mission, the solar-powered spacecraft will pass by Europa twice and Ganymede and Callisto 12 times each, allowing for unparalleled close-up investigations of these moons. JUICE will orbit Ganymede for at least nine months during the next and final mission phase. This would be the first time a spacecraft orbited another moon except our own.

Jupiter is also being studied as part of the JUICE expedition since it impacts the icy moons and their circumstances. Jupiter has a tremendous magnetic field that is 20 times stronger than Earth's; Europa and Ganymede, in particular, are showered in high radiation particles flying along Jupiter's magnetic field lines due to their proximity to Jupiter. JUICE's magnetometer, particle detector, and plasma instrument will map and measure Jupiter's magnetic field, detect particles travelling across it, and investigate how they affect the material of the moons' surfaces.

JUICE and Clipper will be landing around Jupiter at the same time. China is also contemplating a trip to Jupiter's moons, with a Callisto orbiter and lander being one of its top options. All of these missions will tell us not just about the habitability of Jupiter's icy moons, but also about icy worlds orbiting other massive planets in the universe. **d**

# Revolutionizing India's agricultural sector with solar power

**Ecozen Solutions is the brainchild of three IIT-Kharagpur geniuses, who are using solar-powered solutions to increase irrigation and reduce food wastage across India's farmlands**

Jayesh Shinde | [Jayesh@digit.in](mailto:Jayesh@digit.in)

**A**ccording to the Indian government's official figures from June 2021, agriculture and allied sectors still contribute over 20 per cent to India's GDP. Needless to say, modernising Indian agriculture through technology will not only benefit the farmers practicing the trade but also the nation, at large, in terms of ensuring sustainable, long-term food security. That's exactly what three IIT-Kharagpur graduates had in mind, when they decided to start Ecozen Solutions.

"Increasing access to climate-smart technology is what drives us at Ecozen," Co-Founder & CEO, Devendra Gupta told us, underscoring how their agri-tech products have demonstrated the impact clean energy can have on the agricultural sector in the past 12 years.

## SOLVING INDIA'S AGRICULTURAL WOES

Needless to say, agriculture in India needs all the help it can get, because it's plagued by a few fundamental

problems – lack of access to consistent electricity supply and high operational costs. These issues were primarily the reason for only 34.3 per cent of arable land being irrigated in India, which ultimately resulted in lower farm productivity and lower incomes for farmers, according to Gupta. On top of that only 27 per cent of farmers in UP were aware of solar pumps and only

10 per cent believed they were a viable solution, as per a 2018 CEEW report.

Issues related to growing crops in agricultural land notwithstanding, Ecozen's founders were also aware of another huge problem of farm waste. Believe it or not, but nearly 40 per cent of agricultural produce gets wasted in India – even before it gets to market, claimed Gupta. This is primarily due to a lack of access to a cold chain (only 4 per cent of the produce that needs a cold chain has access to it) and proper post-harvest management (PHM) operations. These are some of the core problems Ecozen Solutions is trying to solve. With a 20 per cent market share, Ecozen is leading the adoption of sustainable technology in India's agricultural sector.

"With our technology focus, R&D is a core element of our process at Ecozen," underscored Devendra Gupta. "This has seen us bring a few technology firsts to the solar pumping segment, with innovations in connectivity, advanced motor controls, AI and IoT. The most recent of these innovations is the 4G network connectivity of our



Devendra Gupta, Co-Founder & CEO, Ecozen

Ecotrons," he said. But first of all, what are Ecotrons, you may wonder?

## BUILDING ECOTRONS AND ECOFRSTS WITH AI

In a nutshell, Ecozen's technologies are modernising the irrigation and cold chain sectors of Indian agriculture through climate-smart deep tech solutions. Their Smart AI and IoT-enabled solar pumping solution is called Ecotron, whereas their equally Smart AI and IoT-enabled solar-powered cold room for preventing agricultural waste is called Ecofrost. Both are portable, solar-powered tech solutions, and this is how they're disrupting the agricultural sector in India over the past decade, according to Gupta.

Ecotron smart solar pump controllers provide embedded AI, powerful motor controls, and enhanced 4G connectivity, Gupta highlighted. "With over 70,000 units installed across India, irrigating over 3 lakh acres of land, Ecotron is India's top solar pumping solution," he claimed.

If smart irrigation is increasing agricultural productivity, then Ecozen's Ecofrost solution is aimed towards managing the harvested produce for longer shelf life and reduced wastage. "Ecofrost helps maximise agricultural profitability by increasing shelf life, reducing waste, and expanding market access through proprietary tech for maintaining precise temperature and humidity levels for pre-cooling and storage applications. Ecofrost enables our customers to sell when prices are right and in geographies where favorable market conditions exist," Gupta added.

Don't forget all of this is powered through solar energy, including a thermal energy storage solution called Ice Core which provides Ecozen's customers with up to 30 hours of batteryless backup. InverterTech, another patent-pending technology, ensures



## USING AI, OTHER CUTTING EDGE TECH

Ecozen uses AI with edge analytics to help keep systems running smoothly by diagnosing problems and running fixes without any server-side or manpower intervention. For example, Ecotrons constantly send electrical and mechanical data online for further processing, which helps them use physics and simulation models of motors and pumps to predict issues in advance. IoT devices, for example, enable sending alerts to users on system performance and maintenance requirements, like when the solar panels need to be cleaned. All this smart sensing technology, coupled with 4G connectivity, enables farmers to monitor and control Ecotron and Ecofrosts with user-friendly mobile apps. "Using data science and machine learning frameworks, all data being sent in by our devices are captured in our EcozenAI dashboard and served to customers in an easy-to-understand manner that enables analysis and aids decision making, right from device management to service requests and tracking," claimed Devendra Gupta.

stable cooling performance even during low sunlight conditions.

Bringing Ecotron and Ecofrost solutions together is EcozenAI, an internally built platform, Gupta explained. "We have loaded our solutions with intelligent sensing technologies, smart control, and communication capabilities, all powered by EcozenAI.



Using our AI, IoT, and data science components, it performs predictive diagnostics, preventative maintenance, and device management remotely. EcozenAI is also the foundation of our service platform," he summed up.

"Both of our products are powered by clean solar energy and have till date generated over 1 billion kWh of clean energy," according to Gupta, with presence in 20 states in India and 10 countries worldwide.

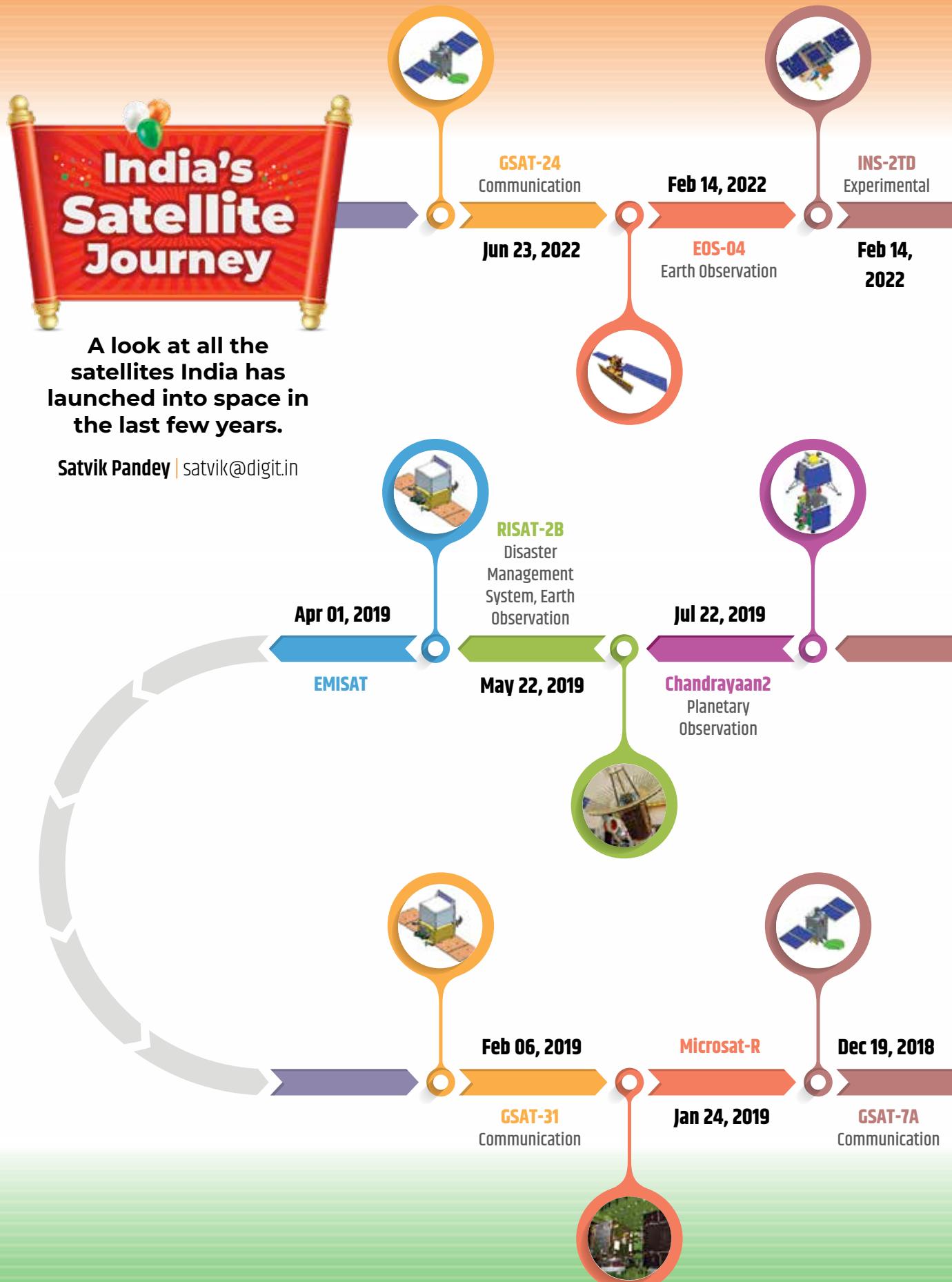
### ECOZEN'S SUSTAINABLE IMPACT

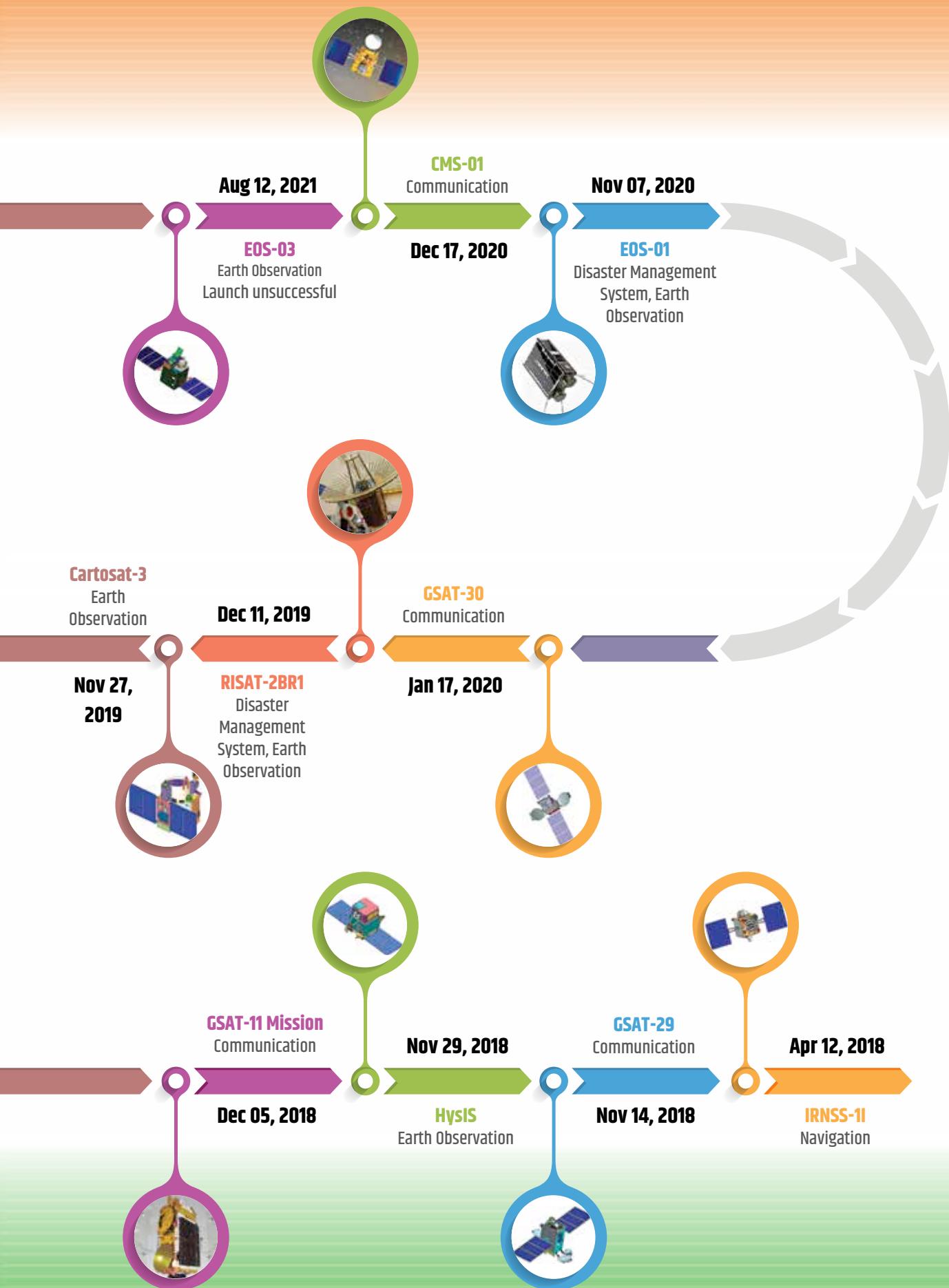
This is the part that gave Devendra Gupta a lot of joy to discuss. It's what brings home the entire value proposition of his agri-tech startup in no uncertain terms, where sustainability is the name of the game.

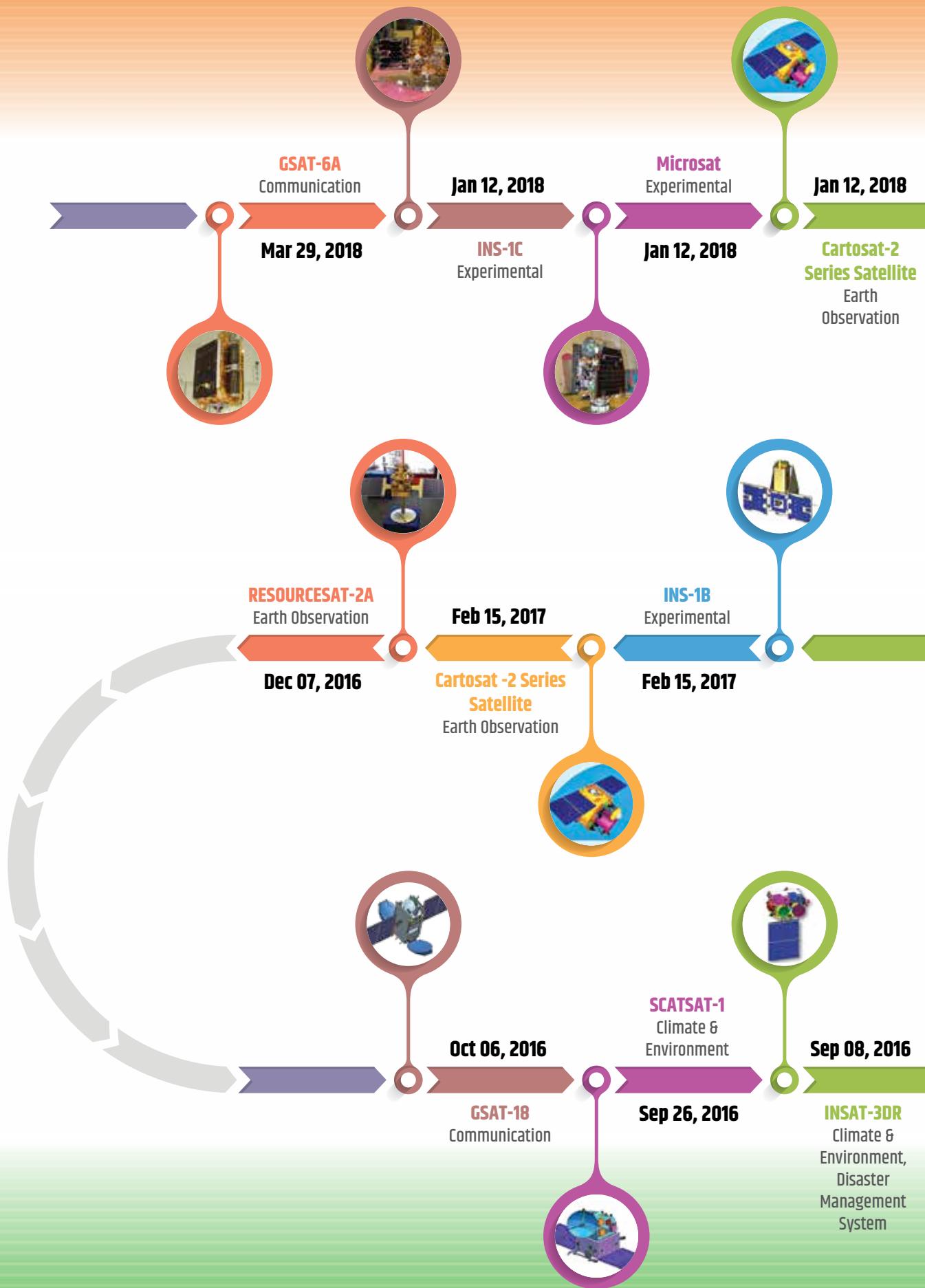
Since the past 12 years of Ecozen's operations, Gupta told me, they've positively impacted over 1 lakh farmers in India. That's not all, they've also abated over "1 million tons of greenhouse gas emissions, reduced over 20,000 metric tons of food waste, and reduced over 33 crore litres of diesel consumption," all the time while irrigating over 3 lakh acres of land in the country's farming belt. Now that's commendable for any enterprise, let alone a technology one!

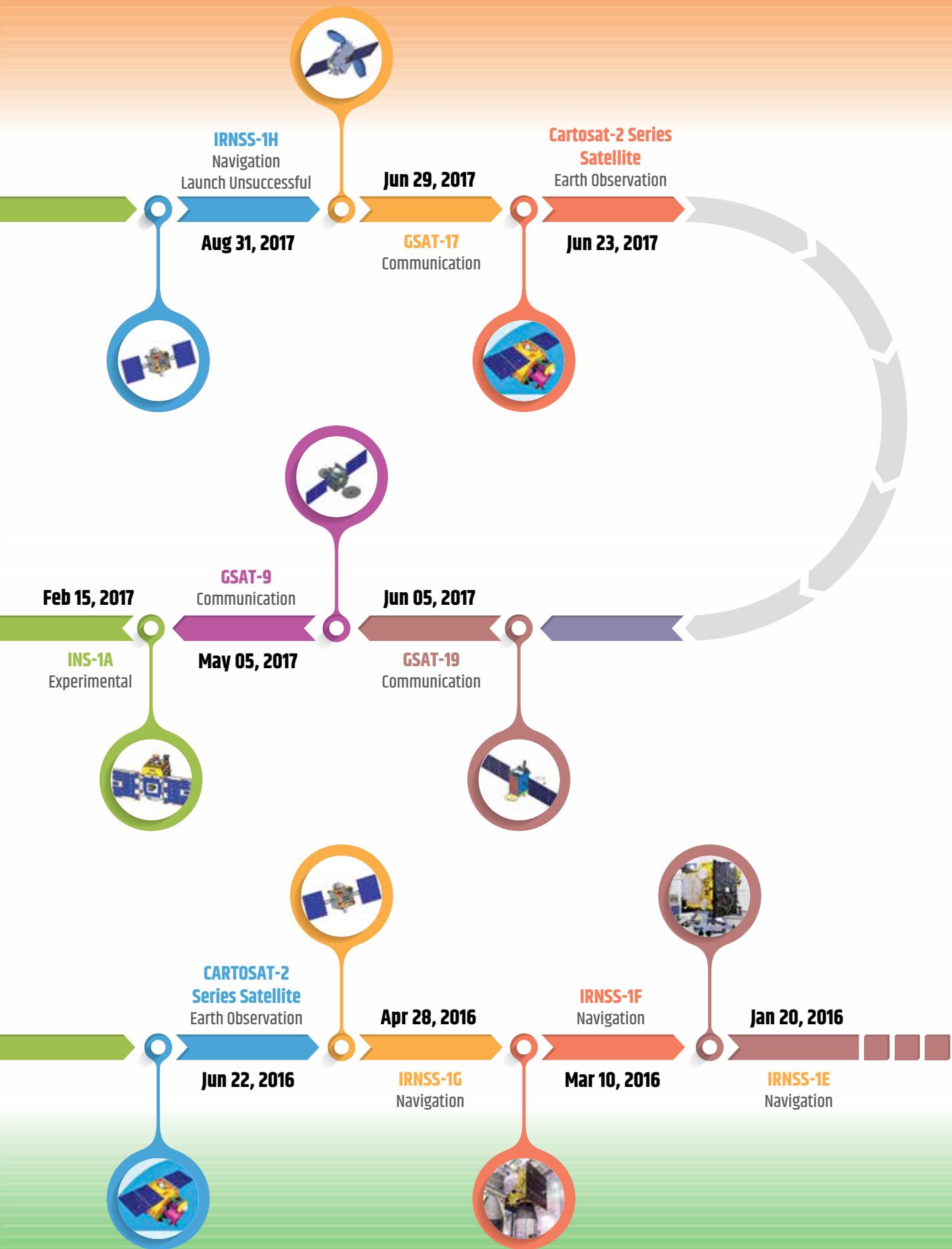
Proliferation of climate-smart technology gives a lot of satisfaction to Ecozen's team, according to CEO Devendra Gupta. "For example, recently in Maharashtra, we received orders of nearly 25 per cent from target markets while facing stiff competition from 8 other players. The adoption was mainly due to the superior operational and connected technology embedded into our Ecotron controllers," he claimed. "Farmers also reap the benefits of sustainability-driven tech solutions," Gupta said. "Through our partner SokoFresh in Kenya, an avocado farmer started storing his produce in Ecofrost to increase his avocados' shelf life," Gupta suggested, something the farmer couldn't do earlier, hence cutting down his agricultural waste in the process.

What began as an idea during their time spent at IIT-Kharagpur has now turned into an industry-leading smart-tech solution that's disrupting Indian agriculture and beyond, the trio at the helm of Ecozen is just getting started, Devendra concluded. □











THIS IS  
TECHNOLOGY,  
CULTURE AND  
SCIENCE WITH A  
DIFFERENCE, AND  
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IS USUALLY ENOUGH  
TO MAKE MOST  
NORMAL PEOPLE  
GO "WTF?"

## This month in ALT:

This month, we talk about Formula E in India, we interview at good folks over at Infinix and Dolby about their journey in 2022 so far and the future, and more.



## React with any emoji on WhatsApp

WhatsApp is now allowing users to react to messages using any emoji. Initially, emoji reactions were limited to just six emojis. WhatsApp beta program participants on Android and iOS can now use this feature.

<https://dgit.in/whatsappreact>

### WHAT'S NEW

## Steam on Teslas soon!

**I**t looks like Elon Musk and his crazy ideas have been unhinged yet again. Musk has announced that Steam would be running on Tesla cars soon. The company's co-founder took to Twitter (ahem) to announce that his company's cars could have Steam running on them as early as next month. Musk, in response to a Tweet by Tesla Owners Silicon Valley (@teslaownersSV), wrote, "We're making progress with Steam integration. Demo probably next month." We have seen countless services making their way onto the dashboard of Tesla cars, and it came as a surprise to no one that Steam was making its way there too! While there are some celebrating the arrival of the popular gaming service, there are people who are also fairly



sceptical of the distracting effect that it might have on the drivers. This is a legitimate concern for many, as there have been several reported cases of accidents caused due to distracted drivers on the road globally. So, it will be interesting to see how Tesla implements the Steam integration.

<https://dgit.in/steamontesla>

## TikTok's security chief steps down after migration

**T**he Global Security Chief of TikTok, Roland Cloutier, has stepped down from his role. This move comes after the company decided to migrate to using servers run by Oracle to store the data of its US user base. He will now be taking on an advisory role, with TikTok's head of security risk, vendor, and client assurance, Kim Albarella replacing him for the time being.



Cloutier wrote, "With our recent announcement about data management changes in the U.S., it's time for me to transition from my role as Global Chief Security Officer into a stra-

tegic advisory role focusing on the business impact of security and trust programs, working directly with (CEO) Shou, (ByteDance VP of Technology) Dingkun and other senior leaders."

There has been a lot of discussion about the user data security at TikTok. There have been several personnel changes in the security department too.

<https://dgit.in/tiktokchief>



### Facebook to allow up to 5 profiles

Facebook will soon allow its users to have up to five profiles tied to a single account. This feature will allow users to dedicate different profiles for different purposes such as work, personal, etc. Users will be able to switch between these profiles whenever needed.

<https://dgit.in/fbprofiles>



### Microsoft to support Netflix's ads

Microsoft has become the Technology and Sales Partner of Netflix in the latter's ad-supported subscription plan. Microsoft will be sharing the Netflix audience and premium-connected TV inventory with advertisers.

<https://dgit.in/netflixads>



### Spotify introduces real-time lyrics on Nest Hub

Spotify has started to enable real-time lyrics on the Google Nest Hub. Spotify hasn't officially announced the launch of the feature yet though. However, a number of users have reported seeing the real-time lyrics on their Google Nest Hubs.

<https://dgit.in/spotifyrtlyrics>

## Alienware M17 R5 / X17 R2

**A**

lienware has yet again managed to raise the bar by giving their latest laptops, the M17 R5 and the X17 R2, 480- Hz refresh rate screens.

While this kind of screen may not be useful for most of us, competitive gamers may see an advantage. That is of course if there were many games that support such high refresh rates. Well at the very least, with hardware like this you can future-proof yourself for a good period



## Porsche Cayenne Turbo GT

**O**ne of the fastest SUVs in the world, the Porsche Cayenne Turbo GT was launched in India on July 21. While it took more than a year for this beast to make its way to the Indian market, the Cayenne Turbo GT has been breaking records on its way. And, breaking records at the Nurburgring Nordschleife no less. The Cayenne Turbo GT is currently the holder of the fastest lap at the famed circuit when it comes to SUVs. Powering the it is a 4-litre twin-turbocharged V8 engine that produces 640 HP and 850 Nm of torque. This level of power gives the Cayenne Turbo GT acceleration that's close to a pointy-nosed supercar. Porsche claims that the car can hit 100 kmph in 3.3 seconds and has a top speed that is limited to 300kmph. Additionally, the car also gets an 8-Speed torque-Converter automatic gearbox, 22-inch wheels and a retractable tailgate spoiler that promises 40 kgs of extra down-force at the car's top speed. As you would expect, all this planet-carving power does come at a price and you would be right. The Porsche Cayenne Turbo GT starts at a cool ₹2.57 crore (ex-showroom).

of time and be the first to experience gaming at 480 Hz once it catches on. This announcement comes alongside the announcement of the AMD Advantage version of the M17 R5 featuring the Ryzen 7 and Ryzen 9 processors. The laptops can be configured according to the needs of the user and can be fitted with the Radeon RX 6 laptop GPUs. If refresh rates do not float your boat too much, the laptops can also be configured with 4K displays which can be used for high-resolution media editing or viewing.

## Vertu Constellation x Ulm

**L**uxury smartphone maker, Vertu has made a bold comeback with a new smartphone with a whopping \$15,000 price tag and a pretty convoluted way of buying the phone via NFTs. The hyper-exclusive smartphone brand has partnered up with cryptocurrency trading platform, Binance. The NFTs required to purchase the Constellation x Ulm will also be sold on Binance along with Vertu's own website and Galler.io. Only 10,555 units of the Vertu Constellation will ever be made and customers who have bought the NFT will have the option to purchase the phone or join and become a part of

the Vertu 3.0 business club with said NFT. But what does that massive price and hassle to buy the device bring you? Well, the phone is said to have an Octa-core processor, a triple

camera setup featuring a 50 MP main sensor, 12 MP ultra-wide sensor and 48 MP telephoto lens, 12 GB RAM, and a 6.17-inch display with a 120Hz refresh rate. We don't have all the information on the phone yet, but from the looks of things, it seems Vertu has gone with what it usually does with super exclusive smartphones and this one has the same kind of design language as the phones it has brought out in the past.



## Xiaomi CyberDog

**H**umanity is probably finally at the stage where we can have pets even if we are allergic to them. Yes, you can now get yourself a robot dog and no this is not a scam. Tech giant Xiaomi showed off their version of a robot dog at MWC earlier this year but now they have brought it to India and was unveiled on Xiaomi's 8<sup>th</sup> anniversary in India on the July 04. The CyberDog is powered by an NVIDIA processor using the Jetson Xavier platform and an internal engine which allows it to run at a speed of 11.52 kmph. As per the brand, it will have 32 Nm of maximum torque output, and a max motor speed



of 220 rpm. The CyberDog also has multiple sensors embedded in it, giving it all sorts of different movements and functions like performing backflips. The 11 high-precision sensors, artificial intelligence cameras and computer vision support allows the CyberDog to work autonomously and can also track objects and people. Lastly, the CyberDog also supports voice control alongside control via smartphone. Does it get any better? You tell us.

## Suzuki Katana

**T**his Japanese litre class bike was launched worldwide a couple of years ago and it was never really clear if it would get the chance to slice through the streets of India. But to our delight, three years after its global debut, Suzuki has launched the Katana in India. The Katana is a retro-themed bike with a design language and bodywork that emulates the 80's version of the Katana which had a legendary fan following and polarising looks for the time. With most manufacturers having at least one retro-styled model in their lineups, the Katana is the one for Suzuki. While it may look old school, the internals are brand spanking new. The Katana is powered by a 999 cc, liquid-cooled, in-line four-cylinder engine and we see a version of the same engine on Suzuki's GSXR-1000 superbike. In terms of power, the engine produces 152 HP and 106 Nm of torque. It also has three power maps that can be used to control the power delivery of the engine. Kayaba provides the suspension which is fully adjustable on the front and back while Brembo supplies the brakes. The bike has been launched at ₹13.61 lakh.



## Insta360 One RS 1-Inch 360 Edition

**I**nsta360 is back with a 1-Inch sensor addition to their 360-degree camera lineup. This 360-degree camera is going to be the most expensive and most powerful 360 camera that Insta360 has ever made. Looking at the specs, we are not surprised by that bold claim. The Insta360 One RS1-Inch Edition is a modular piece of kit made up of four parts. There is the mounting bracket that



holds all the bits together, there is the battery unit, and the camera unit at the 1.3-inch touch screen unit. The camera unit features two 1-inch CMOS sensors and lenses on opposite sides which allows the camera to shoot 6K 360-degree footage at 30 fps. Compared to their previous 360-degree cameras, this new version has larger sensors and as you'd know, larger sensors mean more light intake which makes this camera better in low-light conditions. While there may be improvements in picture quality, the modularity of the camera means that it is only IPX3 water-resistant so don't try to get some 360-degree shots underwater like you might have been able to with the Insta360 One X2 for instance.

# Logitech MX Master 3S

**W**hen it comes to mainstream mice, the Logitech MX Master mouse is one of those models that has been around for ages. For a reason. The latest iteration, the Logitech MX Master 3S, doesn't exactly do anything groundbreaking, but it is a direct improvement over the Logitech MX Master 3 in quite a few ways, and at the same price point. It still remains one of the best mainstream power user mice out there.

Looking at the MX Master 3S, it's evident that this mouse is for right-handed users only. However, we wouldn't exactly call this an ergonomic mouse either. The shape can take some getting used to, especially if you're used to more common, flatter, mouse designs or even gaming mice. Moving past that, we come to

the other functions and productivity features the MX 3S comes with. On the left side, you've got a wide horizontal scroll wheel and two extra buttons right below that. These are



mapped to forward and backward by default. Even further to the bottom, on the thumb rest, you have an additional button, which is by default mapped to gestures. In addition to the left, right and middle click/scroll wheel, you've got an additional

button on the top, which by default locks and unlocks the mouse's infinite electromagnetic scroll wheel. When unlocked, the wheel can reportedly scroll through 1000 lines per second; a feature that's targeted at coders who need to sift through heaps of code.

The clicks on the MX Master 3S are now "ultra quiet", up to 90 per cent quieter than the MX Master 3, according to Logitech. There's a noticeable difference in the feedback, which can be off-putting for some who like to feel their clicks. This is largely subjective, though. We personally did not have too much of an issue with this, but if it's not for you, you may prefer the 3 over the 3S. The MX Master 3S is available in pale grey, darker graphite, or black. For the features it offers, it's quite pricey, but the question is, what is it you want your mouse to be capable of? If you answered everything, then you probably want this.

—Manish Rajesh

## XGIMI Elfin

**G**etting a decent projector for home applications is a tough task. Carrying the baton for decent and reasonably priced projectors is the SGMI Elfin. With its form factor, the projector punches well above its weight in every respect. Be it producing crisp and sharp-looking pictures in a dimly lit environment or producing engaging sound with just the two 3W speakers inside; it does a great job. It has a DLP 0.33" DMD display chip and a peak advertised brightness of 800 ANSI Lumens.

It's HDR10+ certified and is capable of projecting a 1920x1080 picture on the screen, which is good enough for casual content consumption. However, if you want a higher resolution image that looks like you are sitting in a theatre, then you should look elsewhere. The other thing that this projector is short on is the number of features it offers. Due to the nature of its construction, manual zoom and focus adjust-

ment are impossible. There is no option to adjust the aspect ratio of the projection and no option that would enable you to choose the colour of the wall that the picture is being projected on, which pull down the image it is able to project on the wall.

However, it makes up for all of the above problems with the other things it brings to the table. The focus adjustment using the remote, which has a toggle to switch the volume buttons between volume and focus, is very easy and convenient. The sound quality for a projector of this size is pretty impressive. And the keystone adjustment that it performs, coupled with its intelligent obstacle-avoiding capabilities, raised a few eyebrows in the room. Connectivity-wise, it has a USB, HDMI, and 3.5mm audio jack, making

it sufficiently well connected for home use.

In terms of build quality and portability, too, it earns a few extra brownie points, making it an impressive overall package. If you are out in the market looking for a sub one lakh projector for using it in your home for any kind of use, then this should be on your wishlist.

—Satvik Pandey



## ANIME

# Jujutsu Kaisen 0

**★★★☆☆** | Jujutsu Kaisen 0 features Yuta Okkotsu as the main protagonist. Yuta's backstory might feel very cookie-cutter generic for anime protagonists to most. His powers are also poorly defined and kind of overpowered especially towards the latter portion of the movie. Although it is still nice to see a deviation from the "technique-based" fighting styles that all the other characters in the series have. However when a movie's standard plot involves friendship, tragic backstories, and fairytale resolutions, it becomes terribly repetitive and uninteresting. Coming from Mappa Studios the animations were absolutely top-notch and crisp and a pleasure to watch. The fight scenes



are really well drawn, which is pretty much a major reason to consider this movie. However, overall the movie juggles between mid-tier animation and great camera pans.

The soundtracks from the movie are pretty good and suit most of the scenes throughout the story. They

compliment the ambience but there could have been a better attempt on making the tracks remarkable or nostalgic to the original series. The track around the beginning is one of the best ones in this regard.

As a prequel to the original series, the movie captures Maki and the other second-year students as first-year students, and their initial impressions of Yuta, and casts light on the growth of the characters. Additionally, as the movie progresses into its final major showdown, most of the Kyoto students also show up. The only let down in terms of characters is the MC. He feels a bit too lifeless for someone who just so happens to have the most influence in the film. His character development is not very steady either, making it hard to connect to him as an audience. Also, for someone watching the movie before the series, it can be a little hard to grab hold of so many characters and their weight in the story as they keep dropping in with every other scene.

-Nayan Panda

## COMIC

# The Bone Orchard: The Passageway

**★★★☆☆** | If there's one word to describe Jeff Lemire, it would be versatile. The man can write just about anything. From superhero tales to gut-wrenching horror and everything in between, Lemire's work stands out from the glut of substandard comics by giving the reader stories that are definitely worth the cover price. He first shot to fame with his work on Sweettooth, which has been adapted into a semi-successful yet tainted show on Netflix and has since been plying his trade working for Marvel and DC, with the occasional creator-owned work for Image comics. His latest book, The Bone Orchard: The



Passageway is a return to the mind-bending, existential horror first seen in Gideon Falls. The book is illustrated by frequent collaborator Andrea Sorrentino and his art adds a whole new dimension of dread and terror to the story. It begins with a geologist making his way to a

deserted island to study a mysterious phenomenon. What he finds there will take him to the darkest recesses of his nightmares. There's a hole in the ground that seems to have no end but it's alive, somehow, and it wants to feed. Readers will find comparisons to the works of H.P Lovecraft.

Lemire carefully crafts a tale of loss, terror and ultimately hopelessness as Sorrentino's artwork acts as a nail driven through the reader's skull. The Bone Orchard: The Passageway shared more in common with something like the Twilight Zone as it presents different stories that are sort of set in the same nightmarish universe. If you're a fan of intelligent and subtle horror, the likes of which hacks like Jordan Peele wish they could achieve, you should definitely check out The Bone Orchard: The Passageway. And even if you're not a fan of the genre, you should still read it simply because it's a great story complemented by evocative and expressive art.

-Andrew Lu

## MOVIE

## Thor: Love and Thunder

**★★★☆☆** | It's clear that Marvel and Kevin Feige have no clue on how to proceed with Phase 4 of the MCU. Since the conclusion of Avengers: Endgame, it's all been downhill. The MTU (Marvel Television Universe) is an abject failure at basic storytelling and creating characters that the paying customer can root for. When it comes to the MCU, where do I even begin with this dumpster fire of a film? Love and Thunder starts with the genesis of Gorr the God Butcher, played by Christian Bale as he watches his daughter die in his arms and vows revenge on the gods for not helping. To be honest, Bale is the only actor who looks to be trying his best with the terrible script. The film then shifts tone into this humour that



kills any momentum that was built up. What follows is a confusing plot that sees Thor, Female Thor and Valkyrie go on whacky adventures to the land of the gods and beyond, always hitting us with the cringiest of one-liners and ending with another flashy, beam-in-the-sky finale. It's all so predictable and boring at this point that it's a wonder that people are excited about these substandard products.

The action look and feel so flat and fake that it's distracting. Watching Natalie Portman, replete with CGI arms fighting off monsters is hilarious. The visual effects look incredibly cheap and

the whole film just gives off the vibe of being shot on a sound stage with a green screen. There is nothing redeemable about this film and I wasted 2 hours of my life that I'll never get back. Even the costumes, which usually look relatively good, are basic cosplayer quality here. In fact, the entire film just gives off a cheap vibe. Love and Thunder is a \$185 million film and it looks like that money was spent on marketing and not on the actual film.

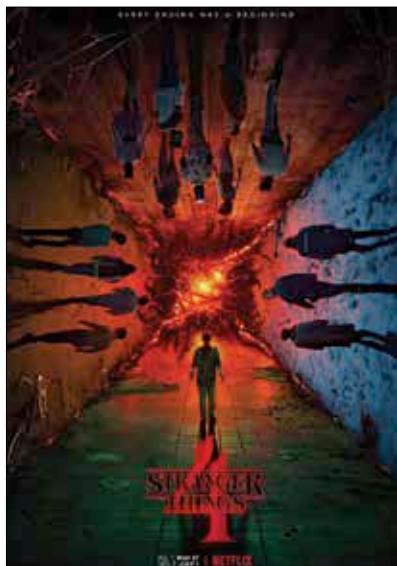
Love and Thunder is a failure on every level of filmmaking. It is boring, long and painfully unfunny. In fact, an autopsy is infinitely more entertaining than this pathetic excuse of a summer blockbuster film. You could go watch Top Gun: Maverick instead. At the very least, the people behind Maverick don't seem to hate the paying customer while the dolts behind the MCU seem to despise the very idea of fans and Love and Thunder is the latest expression of that very feeling.

-Andrew Lu

## TV SERIES

## Stranger Things Season 4: Volume 2

**★★★☆☆** | Stranger Things Season 4: Volume 2 kicks off right where Volume 1 left off – the beloved group of Hawkins natives are still split up in three different locations. However, they are inching closer and closer to a much-awaited reunion. The terror of Vecna / Henry Creel / 001 looms in the air as he gets closer to fulfilling his mission, which of course, threatens the world as they know it. Vecna, with his confounding and terrifying magic, proves to be a dark parallel to Eleven's powers and what she could have become had she not forged the friendships she has with Hopper (David Harbour), Mike (Finn Wolfhard), Max (Sadie Sink), and others. Many secrets are



unravelled and it leaves us convinced that the Duffers' had the storyline planned for a while now, since it all comes together so beautifully.

Volume 2 comprises two movie-length episodes, the second being a whopping 2 and a half hours! But boy, does time fly! It is a true testament

to the pacing and interesting plot line of this season. Before any reunion happens, Eleven has a rematch of sorts with Vecna on an entirely different plane and this sequence provides some of the most breathtaking visuals of the series. There are losses this season, but some characters really do have plot armour, escaping the clasp of death multiple times now. Amidst all the terror, fear, and action, Stranger Things Season 4 Volume 2 still has delicate moments with hope and poignancy with staggering performances from the likes of Noah Schnapp (playing Will) and Sadie Sink (playing Max). We only wish these interactions were played out a bit longer, but there's probably much more to come in Season 5. Overall, Stranger Things is a full-blown phenomenon now, and for good reason. Here's to hoping Season 5 gives the series the conclusion it deserves and doesn't end up being another fiasco like GoT's final season was.

-Dhriti Datta



## New wave of wider EV adoption?

Satvik Pandey | satvik@digit.in

All ardent motorsport fans in India rejoiced when it was announced that the country would be hosting a Formula E race in Hyderabad as early as next year. The FIA, which is the governing body of Formula E races, has confirmed that Hyderabad will be hosting a Formula E E-Prix on February 11, 2023. This could potentially open up a new door for wider adoption of electric vehicles in India. In this article, we will explore the possibilities of the same and look into how and why Formula E could be the push that India needs to shift to an EV-dominant automobile market.

### WASN'T IT FORMULA 1?

Over the last few years, there has been a monumental shift in the outlook of motorsport governing bodies across the globe to ensure that their sport's functioning is environmentally friendlier than it was. Formula 1, for example, has already started making changes. After the introduction of turbo-hybrid engines in its cars, shifting away from the V8 engines, the next goal for the sport is to get to net-zero emissions by the year 2030. The last time Formula 1 raced in India; the cars were running on the older V8 engines, which

consumed much more fuel and had equally high emissions.

Formula E was launched with the vision of serving as a benchmark motorsport event, where cutting-edge automobile performance was put on display without causing much harm to the environment. And it has been successful in doing so too. The controlled use of tyres, deployment of street circuits for races, and the promotion of environmentally sustainable entertainment has garnered a lot of attention and praise. While there is a scope for improvement, overall, the impact has been commendable.

The sport has also seen several drivers jump the boat from Formula

1 to Formula E over the years. There are others like Nico Rosberg. The 2016 FIA Formula 1 World Champion, who, despite having never raced in the series, has been a supporter and owns a stake in a couple of EV racing teams too!

### WHAT IMPACT?

Over the years, Formula E has been the battleground for EV manufacturers all over the world to showcase the cutting-edge technological developments with their car and engine designs. Indian car manufacturer Mahindra also has a team racing in the series under an Indian license in Formula E. The ecosystem here is like an inverted pyramid. There are a host of cutting-edge developments put to display in Formula E cars. Over time, these trickle down to the mass market EVs. At that stage, the fact that the feature was first showcased in a race car by the same car maker becomes a huge selling point.

Just like it is the case with MotoGP and other races that make owing a toned down variant of that vehicle 'cool', Formula E has made EVs 'cool' since its inaugural season. If a bike manufacturer wins a MotoGP rider's or constructor's title, their lineup of motorcycles globally gets a boost; in the same way, if a Formula E team wins a driver's or a constructor's title, then their sales are very likely to go up. Each win with a newer generation car provides further push to their agenda.



## IN THE INDIAN SCENARIO

The Telangana government, which will be hosting the Formula E race in India, has launched several initiatives towards making a push for wider adoption of EVs in the state. The same is the case with governments in different states and at the central level. In the June edition of the magazine, we extensively covered the prospect of EV adoption in India. We weighed the pros and cons across articles, also highlighting the importance and need for EV adoption in the country. In one of those, we mentioned how increased R&D investments would help the growth of the EV industry in India.

Well, the upcoming E-Prix could be a huge motivator for Indian manufacturers to step up their development game. Mahindra is already a participant in the racing series. Considering the eyeballs that they would get and the way they would milk this opportunity to market their offerings; it wouldn't be surprising to see other makers jump onto the hype train and make improvements to their own strategies. Be it in terms of spreading awareness about EVs in India or getting better cars into their own showrooms. It will be the EV adoption that will likely see a boost.

The other side of this conversation is the actual introduction of Indian audiences to high-performing EVs. Whenever a sporting event of this scale happens in a country, there is hype around it. It will be the same in India. And the fact that we would be seeing the fastest EVs doing circles on Indian roads would attract a lot of eyeballs. This would actually be the first time that Indians lay their eyes on high-performing EVs in person. Imagine the surge in demand for EVs that this could bring in.

Increased demand for electric vehicles would mean more investment from companies and governments to improve the EV infrastructure in India. This would be a huge leap towards the widespread adoption of electric vehicles in India.

## CHANGE IS VISIBLE

Months before India sees the For-



Source: Formula E

Source: Formula E

Impressive, isn't it?



Source: Formula E

mula E cars hit the roads, change and development is already visible.

Triton EV has already signed an MoU to set up an EV manufacturing plant in the state of Telangana, and as a part of the state's efforts to promote EV adoption, a web portal has also been launched. While the developments in that particular state have grabbed eyeballs all over the country, there has been an observable change. That depicts a positive

attitude which is needed for such a monumental shift in mindset.

Getting out of fossil fuel-powered cars and getting into more sustainable and environmentally friendly electric vehicles is the need of the hour. So, it will be interesting to see the shift that takes place in the country after the race has taken place. Having a positive mindset is great, but results are what we need. Here's to hoping we get the best! **d**

# The Tamil Superhero Of Wikipedia

**Neechalkaran's automated bot has created over 22,500 Wikipedia articles, including data from Tamil Nadu government, all for his love of Tamil**

Jayesh Shinde | [jayesh@digit.in](mailto:jayesh@digit.in)

Wikipedia has become a necessary touchpoint for online research, whether you like it or not – it's the fourth most visited online destination in the world, behind only Facebook, YouTube and Google. But where Google has Sundar Pichai, Facebook is Mark Zuckerberg, and other big tech platforms have familiar faces, Wikipedia's brand isn't personified by any one individual. On the contrary, Wikipedia's ubiquity is built on the shoulders of anonymous community contributors like Neechalkaran, who's carving a Tamil wiki niche unlike any other.

Originally from Madurai, Tamil Nadu, Neechalkaran started reading and writing in Tamil after he started working for Infosys, which involved relocating to Pune, Maharashtra. "Since I was far away from my native Tamil community, I kept in touch with Tamil by reading online Tamil blogs at the time, and eventually started my own Tamil blog on Blogspot," Neechalkaran explained, who even started writing Tamil poetry.

## FOR THE LOVE OF TAMIL

Soon he discovered the Tamil Wikipedia page and started contributing articles there in his free time, registering on it in 2010. A year or two down the line, he discovered a problem. "People who read my articles on Tamil Wikipedia and even my own blog started commenting that my articles had lots of grammatical errors," admitted Neechalkaran wholeheartedly. But far from getting disheartened

or dejected, Neechal took it as a challenge to solve through tech.

"That was truly the turning point for me, when I devoted some time to learning Tamil grammar and built Naavi, a Tamil spell checker specifically related to Sandhi rule," Neechal recalled. Tamil readers from all around the world, including a few professors, appreciated Neechalkaran's Tamil spell checker tool, he claimed. This only boosted his confidence further, making him learn not only Javascript but also Python and C#, and focusing on solving some of the problems faced by the Tamil Wikipedia's volunteers. At the time, Tamil Wikipedia contributors were able to write articles, but they found some difficulty in doing housekeeping activities, like editing some values in multiple pages or bulk editing, a lot of small tasks that needed to be automated, according to Neechalkaran.

It was in 2015-16 when the Tamil Nadu government was looking to digitize and release some village-level data, where the Tamil Wikipedia got involved in the project, Neechalkaran told. "The Tamil Wikipedia community had several discussions with



Neechalkaran

government officials on how best to publish over 13,000 raw data points related to panchayat-level – it included assembly names, population, demographics, literacy rates, number of buildings in an area, etc,” said Neechal. “The entire data was in Excel format, no sentences whatsoever. So internally, within the Tamil Wikipedia community we discussed and we formed a template with appropriate grammar, automating NLP-related tasks for singular and plural words (for example), and arrived at a perfect article template. We uploaded only 12,000 data points into articles, rejecting the other raw data points due to discrepancy in data,” he explained.

Now that they had a proof-of-concept of automating government records on Tamil Wikipedia, Neechalkaran and the community further automated and published temple records of the Hindu Religious And Charitable Endowments Board containing 24,000 articles related to Hindu temple names, addresses, location, deity name, and more, for the state of Tamil Nadu in 2016-17.

## BUILDING THE BOT

Neechakkaran highlighted how before publishing any of the data received from the Tamil Nadu government, it first had to be sanitized to fit data standards compatible with Wikipedia. He had to build a tool for converting the incoming data into Unicode and saving it on his Google Drive. He also shared the links to his Google Drive with the entire Tamil Wikipedia community, which Neechal said consisted of Tamil expats from Sri Lanka, Malaysia and other places contributing their time and effort, too. Next step was feeding

Final Wikipedia article created by  
Neechal's bot

it all into the Neechal Bot, which was built using Google Apps Script. “I used Google Apps Script because I was more comfortable in JavaScript at the time, and Google Apps Script is nothing but Google’s version of JavaScript, and the fact that it seamlessly integrated with Google Sheets data helped as well,” he explained, as a lot of automation is built into Google Apps Script which allows developers to get started on a project without worrying about web hosts or server infrastructure – everything is free to begin with.

"The bot I developed helped convert raw Google Sheets data into a readable format, and linking it to the Wikipedia API allowed me to create articles on Tamil Wikipedia," said Neechal, explaining how he had to request Wikipedia for API and bot access. He also highlighted how he also made use of the Tamil NLP library he had built a few years earlier.

Raw data in non-Unicode format in Google Sheets

Then something amazing happened, where the power of the community started flourishing. Lakhs of visitors started organically reaching these Tamil Wikipedia pages that Neechal's automated bot had created.

"We had just created basic, simple articles in Tamil on Wikipedia, but people found enough value in them to come and modify and add more data in them. For example, most of our articles didn't have photographs in them, but those who had contextual photographs or pictures related to the page in question, they uploaded it freely to enhance the article. They provided the ultimate validation to the basic idea of creating these articles in Wikipedia, precisely so anyone Tamil Nadu can still contribute to these Wiki pages and enhance their own village panchayat's or constituency's data," Neechal remarked.

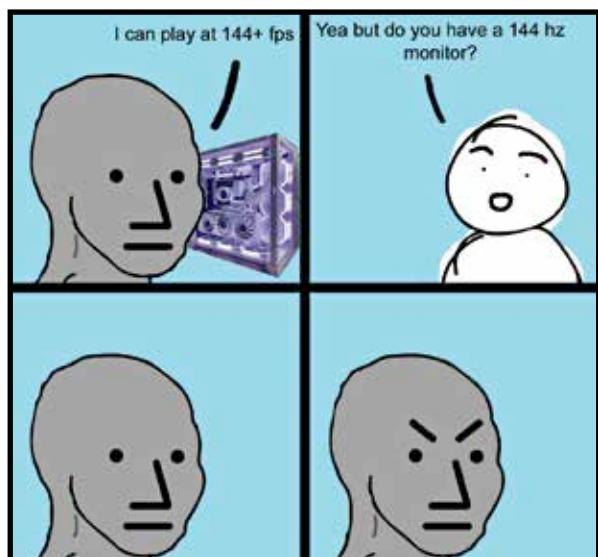
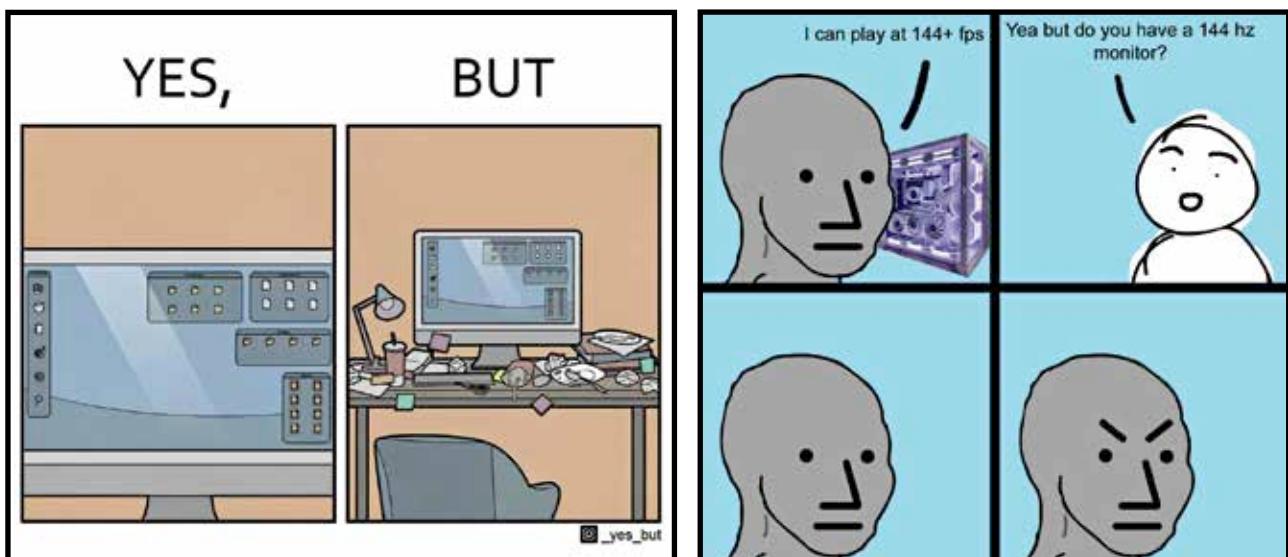
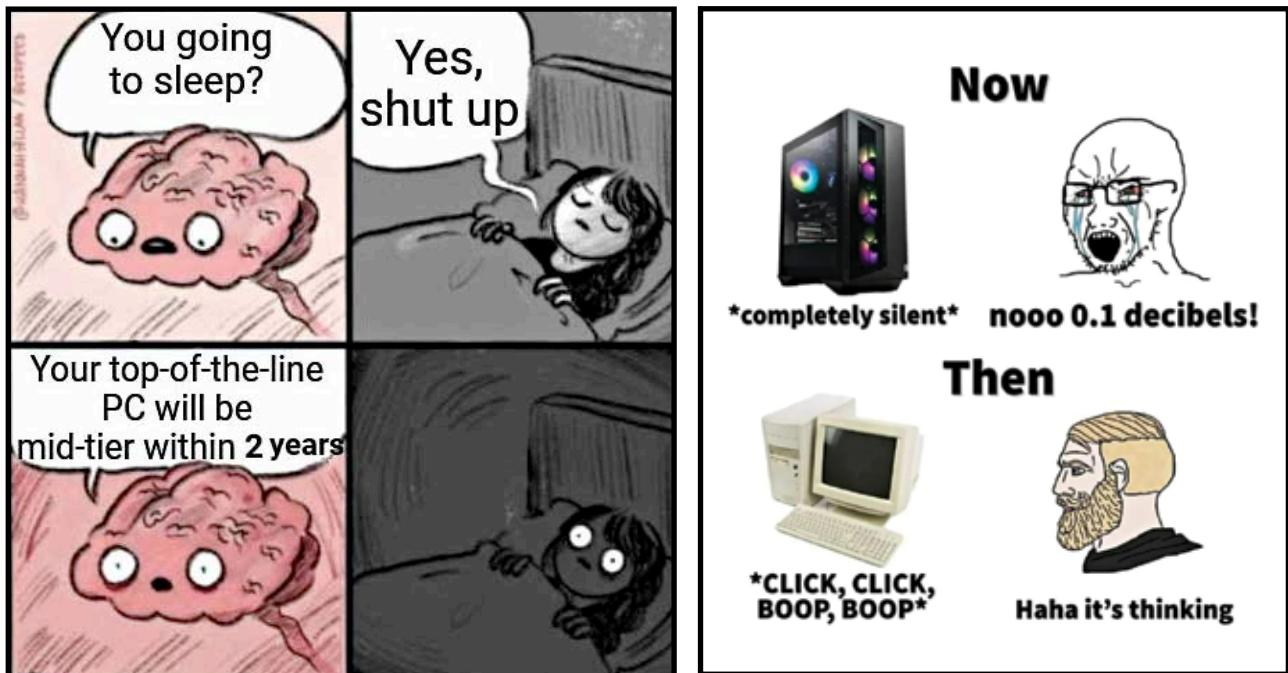
Neechalkaran's "Neechal Bot", which can undertake page creation, editing and statistics collection activities, has created more than 22,500 articles with



Neechalkaran felicitated in Canada. 2015

community consensus – it would have taken 22 humans over three years to create so many Wikipedia pages manually, according to a conservative estimate. The bot can also automatically perform a lot of housekeeping activities on Tamil, Bhojpuri, Hindi Wikipedia, and other Wikimedia projects. It collects periodical stats in these languages and can update them on corresponding Wikipedia pages.

Another brilliant tool Neechal has created is VaaniNLP, a one of kind open-source Tamil NLP python library. This tool is being used by a startup Thiral, an AI-based Tamil News Aggregator. His newest work is a Tamil chatbot for Wikidata, which has executed over 72,000 edits so far in three languages Tamil, Hindi, and Bhojpuri. **d**



## Compiler : throws an error !

Keyboard:



## Seems like Web6 might come sooner than expected

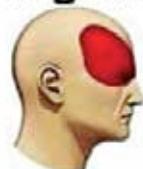
Snoop Dogg   
@SnoopDogg

Working on Web6.



## Types of Headaches

### Migraine



### Hypertension



### Stress



Didn't receive the otp?  
Click here to resend.



# Ubiquitous Immersiveness

In conversation with the folks over at Dolby to understand the company's journey in making their technologies increasingly prevalent

**Dhriti Datta** | dhriti@digin.in

**T**oday, multimedia content is no longer being primarily consumed in movie theatres and on large home theatres but equally, or more so, on devices such as smartphones and tablets. Our smartphones and tablets are increasingly becoming capable content consumption machines, and Dolby has played a pivotal role in this. From Dolby Atmos to Dolby Vision to the new kid on the block – Dolby Music, all have made their way to numerous phones on the market today. Some of them priced at as low as ₹15K. To know more about Dolby's journey through the pandemic, how Dolby technologies have become increasingly pervasive, and more, we delved into conversation with Sameer Seth, Marketing Director India at Dolby Laboratories and Jayant Shah, Director Apps & Solutions Engineering, Emerging Markets at Dolby Laboratories.

**Q Since the pandemic, people have been moving away from the theatres and consuming more content in their living rooms on TVs or on smartphones, on the go. What has Dolby observed in this regard? Any statistics to share? How has Dolby prepared for this shift?**

**Sameer:** So the pandemic, in fact, has had a change in the way consumers consume content, especially in India. What we've seen in various consumer studies that we've done during the pandemic and post-pandemic is that Indian consumers, more than

ever before, have started realising the importance of quality audio and quality visual experience. They are increasingly seeking a better experience, whether it's in their living room, whether it's on the go. And now that they're back at work, even at work. So, talking about consumer studies, we found that what the consumers are definitely doing during the pandemic is connecting with content a lot more than they have connected in the past. So, when I spend more time with content, I'm insisting on a better experience. And for that, I'm now a consumer who's willing to upgrade. We did a recent consumer study Counterpoint on content consumption in

the living room. We did one with CMR on the smartphone side. So, both those studies are actually pointing towards a two-pronged upgrade that the Indian consumer has done because he or she is connecting more with content. One, by upgrading the device for a better experience. So, you know, if I had an old TV, I'm upgrading to the latest television, and at the same time, I'm upgrading from a single device SD plan to a UHD Dolby Atmos or Dolby Vision-enabled plan on a streaming service. So, it's both devices and content and that's what we've seen the consumers doing off late.

**Q How many streaming services are supported by Dolby and is there a plan to have more streaming services in the Dolby ecosystem?**

**Sameer:** I think it is no surprise that we Indians love the content. We connect with content far better than anything else. We work with a lot of streaming services, both global and Indian streaming services. So, you can get a Dolby experience on global services like Netflix, Apple TV Plus or Amazon Prime Video. As for Indian services, there are quite a few services that deliver

Dolby such as Disney+ Hotstar, Zee5 and Hoichoi. Hoichoi is our latest partner, who we worked with very recently, to enable their content with Dolby Atmos. So yes, there is a lot of momentum. There are some services on the AV side. Now, talking also about the audio side of the experience on streaming, we work with Earshot for podcasts. On the music side, we have Apple Music and Hungama Music. So, both global and Indian services are now streaming their music in Dolby Atmos. So, the Indian consumer is spoiled for choice. There's a lot of content out there in Dolby.

**Sameer Seth,**  
Marketing Director – India,  
Dolby Laboratories



**Q Speaking of streaming music or even creating content, what about the content creators? Do they need specific equipment to create Dolby content?**

**Sameer:** What the pandemic has also done is that now the consumer is also the creator. So from a creator's perspective, Dolby Atmos Music is a technology that the creator can use easily. The headphone mix can be done through a

very simple set-up. Of course, there is no limit when it comes to a studio mix experience. But the technology supports a Dolby Atmos mix that you can even do through a PC at home, and that's the beauty of the technology. So for the creator, both the formats are available. They can create it on the laptop, headphones, or in a studio.

**Q We experienced a bit of Dolby Vision and Dolby Atmos in the studio. How do they work in tandem across different devices?**

**Sameer:** I think there are two parts to the question. One, Dolby Vision and Dolby Atmos. So Dolby Vision is a visual technology from Dolby. It's an HDR technology and one can experience it on different devices. It's available in the cinemas, not in India, but outside of India. You get Dolby Vision experience on your televisions, on your phones, on your PC. So it's a visual technology which gives you better colour, brighter brights and darker darks. So, you know, the brights are 40 times brighter and the darks are ten times darker. So you see a better dynamic range of colours and contrast. Dolby Atmos is an object-based audio technology where the content creator creates the mix by treating sound as objects. It's literally something that will transport you into the experience that will bring you closer to the character and the stories you love. So the combined experience of Dolby Vision and Dolby Atmos is the best possible experience that consumera can get.

**Q From what I know, there are three codecs used in Dolby Atmos – Dolby Digital Plus, Dolby TrueHD, and Dolby MAT. Can you delve into their details?**

**Jayant:** Dolby Digital Plus, essentially, is a lossy high compression codec. I think Dolby Digital is the one everyone's familiar with is now pretty old and had bitrate and compression limitations. Dolby Digital was intrinsically invented for cinema and when it served the purpose of cinema, we stopped innovating briefly. The same thing was adapted for broadcast, pretty much, in the early days. Dolby Digital Plus came about from the streaming era. It has better compression and it has, theoretically, a

larger channel capacity. So Dolby Digital was limited to 5.1. In theory, Dolby Digital Plus can do 13.1. So Dolby Digital Plus, we adapted it because it was pretty much universally in many, many devices. When we launched Atmos, we had to figure out a way of keeping it compatible because of the huge device deployment. So, we retrofitted Atmos with a little bit of clever engineering and the same codec can carry Atmos. But, it is, in essence, a compressed lossy codec for streaming and broadcast. TrueHD and MAT, on the other hand, are very very high quality. TrueHD is lossless completely. There's no lossy compression. Again, TrueHD came out with Blu-ray, pretty much. That was the default lossless codec on many Blu-rays. Not all, but many. And Dolby MAT then became a transport mechanism to go from what we call a source device to a seat device, a set-top box connected to a TV, for example. So, you can decode Atmos in a set top box and then over HDMI 2.x, you can stream uncompressed audio. So, if your TV doesn't have a decoder, you can actually decode Atmos into uncompressed audio and then transport it with metadata using MAT.

The set-top box knows what the TV can render or what the downstream device using EDID and various signalling techniques. Then it will do the render. MAT allows you to move spatial audio into that device and then use metadata, which is the object metadata, so we can transport that across.

**Q How is the rendering happening on your end via AI or algorithms, so that it knows what device it's playing on and adjusts accordingly?**

**Jayant:** So in channel-based traditional mixing, stereo for example or 5.1, the mix engineer basically does the render. He or she assigns sound to specific speakers or channels. So if you do a 5.1 mix, you could downmix it, you know, but even the downmix is sort of rigid, it follows

certain rules. You can downmix 5.1 to say stereo or mono, that's it. You can't do fancy configurations like three or four speakers. In an object-based sound format like Atmos, this assignment of sound to the speaker doesn't happen. What happens is that the mix engineer is basically working with a bunch of objects. So, there are certain static sounds assigned by the mix engineer. He or she has a certain speaker configuration which he is monitoring on, and then he just assigns sounds to locations in a room or a 3D space. So, he can place a sound above his head to the left or be just behind him using a joystick kind of a mechanism with a visual display. It shows you where the sound is physically placed as a visual representation. So, how big that sound is, how loud it is and where it is located are all that you need. There's no allocation of any speaker. What you record is

the sound, its location and importance, right? All of this is transmitted with metadata. The consumer may have different types of speaker configurations. So it may be two speakers, a TV, a soundbar, or a home theatre. So the sound system at home knows the speaker configuration and therefore knows how best to render those coordinates. And then it does it. So, in effect, it becomes independent of the speakers. That's the beauty of immersive systems Like Atmos.

**Q Right now we're living in the era of 5G and the Metaverse. So what are Dolby's thoughts here and what is the plan for the future in these scenarios?**

**Sameer:** The technology should be something that should support where ever the consumer moves. For us, we will continue to innovate. We will continue to work with the ecosystem to deliver experiences where the consumer goes. So, nothing specific on these formats to share. But yeah, we believe that the consumer is something that we will follow. **Q**



**Jayant Shah,**  
Director Apps & Solutions  
Engineering, Emerging  
Markets at Dolby  
Laboratories

Infinix is one of the country's fastest-growing consumer tech brands. From smartphones to TVs, and even laptops, the company has a presence across multiple product categories and offerings available primarily across the budget segment. However, in 2022, the company is now looking to expand its portfolio by introducing a new range of products, some of which will be positioned for retail in the higher segments of the market.

Ahead of what looks likely to be a busy second half of the year for Infinix, we sat down with Infinix India's CEO, Anish Kapoor, to understand the company's plans for 2022 and its expansion plans for the years to come. During the free-wheeling interview, we asked him a number of questions to understand what Infinix's fans and us enthusiasts could expect from the company in the coming months.

**d Give us an idea of like what Infinix did in 2021 and what you have planned for the rest of 2022?**

Interesting question. 2021 was a phenomenal year for us across categories. In 2020, we were only into smartphones and then we started with smart TVs and now we have also launched laptops. So I think it has been a great journey. I think we ended 2021 in the top three, or top four for Flipkart, which is our main partner in the online space. So I think it was a great year for us in terms of the spread which we have been

able to do and what we could achieve in the smartphone category. In fact, from a market standpoint, we moved into new categories. So I think we are making that effort to bring much more exciting devices over Rs 10,000. But I think that has been something that we did in 2021 and this journey will continue in 2022 as well.

**d Tell us about your learnings from 2021?**

Our biggest learning from 2021 is that if you're able to bring a unique proposition at any price point, then people are willing to experiment with your products. Well, yes, brand name plays a very critical role. But if you offer

# Infinix's future plans



Anish Kapoor,  
CEO, Infinix Mobile

**Infinix's Anish Kapoor talks about the company's upcoming TVs, laptops and phones**

Sushant Talwar |  
sushant@digit.in

great value, or are first in your segment, I think at least in the online space, people are willing to experiment with a new brand. And that is not to say we are a new brand anymore. I think we have been in India for close to five years now. But yes, what we have seen in terms of how people responded, the kind of love which we have got from them, I think the learning is if we keep on doing what we are doing, we will have a great journey ahead.

**d Infinix has been becoming increasingly aggressive with its products. What's the idea behind this strategy? Will it continue going forward?**

We have just completed the first half of the year, and we have already seen a lot of exciting launches from us. So I think very, very clearly what we are looking for is to maintain what we have been doing in the budget category, and also attempt to replicate this with products in high-end segments. So I think we will make an aggressive play.

**d July is a big month for Infinix. Can you give us an idea about what's coming this month?**

We are going from one category to multiple categories. And this right now is probably the most loaded month, which we have. We have two smartphone launches on the horizon. We have a launch in the laptop category. We are also launching a new product in the TV category. So I think it's an exciting time for us.

**d Would it still be fair to say that Infinix is focused primarily on the entry-level and budget segments of the market?**

I think yes. We started the journey in India and that was our initial focus. Once we got there, that's where we thought our great strength is in. The focus is clearly now on building value. But more than budget segments, we are focusing on building a great portfolio of 5G products because I think there's a definite shift that is going to happen over a period of time and also giving consumers choices on what they can do with 4G. So it's a choice that consumers will make, whether they will take a 5G or a great value proposition, 4G product. **d**

## INSIDE

- ▶ REEVU | F1 22
- ▶ PHEACHUR | The Return of physical LAN Tournaments
- ▶ REEVU | The Elder Scrolls Online: High Isle
- ▶ INDIE SPOTLIGHT | Rain World

# SKOAR!

LIVE TO GAME

## THE PRICE OF IMMERSION

The ultimate gaming experiences  
don't come cheap



### Tabletop

You'll need a PhD to play this one.

# But do you really need it... ?

This month's cover story is all about excess. Gaming excess. Some of the best possible things you can get to create the ultimate gaming experiences. Without a doubt, the things we have spoken about, will enhance your immersion and take it to the highest level possible. Buuut, with that being said, I'm here to tell you that you don't *really* need to spend your money on all this stuff.

I'm not going to lie, I would personally love to be the owner of even one of the things we've mentioned. However, I don't think I'd need any of this to actually enjoy gaming. Sure, it'd be nice to have, but it's not needed. It's easy to see all of this cool stuff and think "damn, that's the way it should be played". It's not. In hindsight, I enjoyed gaming just as much on my old membrane keyboard as I do on my new mechanical keyboard. I can't recall my old ball mouse hampering the fun I had while gaming as opposed to my fancy gaming mouse. I was just as immersed in my CRT monitor; I didn't start enjoying games more just because I got an LED monitor.

There was a time where I thought that I needed to have the best possible hardware to enjoy games to the fullest. Then I joined Digit and actually got to experience all that stuff. Turns out, it's not that big of a difference. Of course, the basics like a PC that's not a potato are a given, but everything else was just a nice addon.

The quest for the highest possible FPS with the best possible hardware is one that can never be achieved. There's something new just around the corner. So unless you've got an actual money plant growing in your backyard it's a pipe dream. Like I said though, you don't need it. You can play the latest games just fine with hardware that costs less than 1/10th of the stuff we've mentioned. And we're pretty sure the experience will be just as enjoyable. At least I think so. What about you? \*



**-Manish "Trigger-Happy" Rajesh**  
SKOAR! Overlord | [feedback@skoar.in](mailto:feedback@skoar.in)

**"I would personally love to be the owner of even one of the things we've mentioned. However, I don't think I'd need any of this to actually enjoy gaming."**

## International Video Game Day



We celebrated International Video Game Day on July 8, 2022, so in celebration, here are Team Digit's all-time favourite games.

<https://dgit.in/ivgd>

## Forza Horizon 5: Hot Wheels



Forza Horizon 5's biggest expansion yet is out now, and it looks fantastic. It's also a standalone purchase, so you can enjoy just that if you want.

<https://dgit.in/fh5hw>

## Spider-Man PC system requirements



Yes, Insomniac's Spider-Man is making its way to PC! We know the minimum specs you'll need to run the game on your PC. Check it out!

<https://dgit.in/smspec>

## God of War: Ragnarok revealed

In what came as a surprise to many, PlayStation has revealed the God of War: Ragnarok release date. After 2018's God of War reboot knocked everyone's socks off, the sequel has naturally been one of the most highly anticipated games since. After months of being delayed and player anticipation going through the roof, we now know that the God of War: Ragnarok release date will be November 9, 2022. The release date was revealed alongside a trailer featuring a quick look at Kratos and Atreus from the new game.



## PUBG: Battlegrounds new map

PUBG: Battlegrounds has just launched a new map, called Deston. This map is the first one to be released since the game went free-to-play earlier this year. The news was confirmed via a tweet from the official PUBG: Battlegrounds Twitter account. The new map, Deston, introduces a host of new features including mechanised ziplines, new vehicles, like the Pillar Car, and a lot of new weapons as well, like the MP9 SMG and a O12 shotgun. It will be interesting to see if the fans of the game like it.



## UP AND COMING



### Turbo Golf Racing

Turbo Golf Racing is basically Rocket League meets golf. We know, it's not a combination we ever thought we'd see. Nevertheless, this weird combination looks whacky and surprisingly, looks fun, so we're probably going to give this a whirl.

Release date – August 4



### Marvel's Spider-Man

Hit PS5 game Spider-Man is making its way to PC and we can't wait to finally play it. We're huge fans of Sony's decision to finally bring exclusives to PC. Also check out the required specs in the news release if you're planning to pick it up and enjoy that sweet Spider-Man action.

Release date – August 12



### Saints Row

Saints Row is getting a reboot. Kind of a bummer, as we were pretty attached to the old Saints Row games. Then again, the new Saints Row promises to be just as over-the-top and whacky. All we can do now is wait for the game to release and hope it holds up.

Release date – August 23

The Xbox was originally going to be called the DirectX Box which ran on Windows OS.



## ...FALLS SHORT

By Manish "Trigger-Happy" Rajesh  
[feedback@skoar.in](mailto:feedback@skoar.in)

**A**s Dusk Falls is an interactive drama and debut game from studio INTERIOR/NIGHT. At a glance, this is a choose your own adventure game, in a similar vein to Telltale games wherein you're prompted with dialogue and action choices as the game plays out. What we've got here is a midwestern crime thriller soap, which hopes to deliver a memorable story and characters. Does it succeed? Read on to find out.

### Story

Dusk Fall's story spans three decades, and is centred around two families whose fates are tied together after a robbery goes wrong.

We'll try to keep spoilers to a minimum especially since the story is what you'll primarily be playing this game for. As Dusk Falls is set in Two Rock, Arizona. In the very first chap-

ter, you're introduced to the two families the story revolves around. The first chapter lays down the foundation of the rest of the story, and sets up how the two families will collide. As Dusk Falls does this by actively shifting between perspectives. You see the story unfold from the eyes of both families, and as more characters come in, more is revealed about them. Think of these as flashbacks. In most cases this works out pretty well, and allows you to look at things from someone else's perspective; why they're doing what they're doing, what makes them tick, and how they ended up in this situation. However, there are times where it doesn't work out as well. These moments just distract you from the main story with what seems like a pointless side plot that feels unrewarding and unnecessary. Like we mentioned in the intro, the

plot attempts to set itself up to be this dark and twisted crime thriller, and before it was released, the story was even compared to the likes of Breaking Bad. However, at no point does As Dusk Falls ever come close in terms of calibre. While the characters suffice for the purposes of driving forward the game's plot, they otherwise are lacking in any kind of depth. You can pretty much immediately tell what kind of person a character is the moment they enter the scene. It's trope central.

The game consists of six chapters, which should take you about an hour each to finish. At the end of each chapter you're given a rundown based on the decisions you made. These are basically meant to be an assessment of you as a character. Were you honest? Did you care for the safety of your family? Etc. If you're a completionist or enjoyed the story (it's not com-



pletely terrible all things considered), then you'll probably want to play through the game a couple times to see all the various branches.

Speaking of which, at the end of each chapter, the game actually shows you a flow chart. This flow chart shows you all the decisions you've made, and the percentage of players who made the same decision as you. The flow chart also shows you all the possible ways the story could have branched out if you chose differently. With this you can always go back and see what might have happened if you had chosen otherwise. Thanks to this feature one good thing we can say about As Dusk Falls is that your decisions actually do impact the storyline pretty significantly.

As Dusk Falls has a somewhat lacklustre ending, which teases a possible sequel. The game certainly

has potential, but in its current state, and considering how little actual gameplay the game has (it's not something we expected anyway from an interactive game like this one), its strongest aspect - which should have been the story, is unfortunately where As Dusk Falls falls short.

## Visuals and settings

Visually, the game uses a watercolor rotoscope aesthetic. There are no character movements, instead you've got something like a slide-show. The aesthetic understandably is not for everyone, and could take some getting used to. However, we found that it didn't really impede our overall experience and time that

## MOAR!

**DEVELOPER**  
INTERIOR/NIGHT  
**PUBLISHER**

Xbox Game Studios

### PLATFORMS

Xbox One, Xbox Series X and Series S,  
Microsoft Windows

### PLAYED ON

Microsoft Windows  
(Xbox Games Pass)

we spent in the game. In the settings department, As Dusk Falls comes with plenty of options targeted at newcomers to gaming in general, and plenty of accessibility options to boot, which is great. In doing so they've certainly opened the doors for a broader audience to play the game.

This makes sense considering the game also has both online and offline co-op, allowing up to eight players to play together via smartphones, controllers etc. Players can take votes on decisions, and even get a set number of vetos on decisions. It could make for a fun activity with a group of friends or even your family. \*



The Elder Scrolls

ONLINE

# HIGH ISLE™

**TAKE TO THE HIGH SEAS, SORT OF**

By Manish "Trigger-Happy" Rajesh | feedback@skoar.in

The Elder Scrolls Online first released way back in 2014. Eight years later, and the MMO is still going strong with a sizable community, which is saying something. The Elder Scrolls Online: High Isle expansion just dropped last month and takes us to the historic home of the Breton race. We had the opportunity to explore the MMOs newest open world and what it had to offer. Note that we haven't played ESO extensively prior to this, so think of this as a relatively new player's perspective.

### Going new places – The Systres Archipelago

Most previous expansions in The Elder

Scrolls Online have been for locations that people have been familiar with or have visited in previous games. Think Summerset, Morrowind, Skyrim etc. With High Isle, we've got a spankin' new region to explore, the Systres Archipelago, located in High Rock. A location that was only seen on a map way back in the Elder Scrolls II: Daggerfall. There are two things that immediately pop to mind here, the first is that the devs have a clean sheet to imagine this new unexplored region in Tamriel and go wild with it (which they did). And second, player expectation is a lot easier to manage when you don't have existing content to compare with. Two things in favour of the new DLC.

That being said, the Systres Archipelago is a gorgeous place to explore, complete with plenty of greenery, fields of sunflowers, and dotted with ruins, ancient druidic groves, and high castles. It's not all rainbows and butterflies though, across the landscape you've also got a series of volcanic fissures just about ready to explode. It was a lot of fun running around this beautiful landscape and discovering secrets and treasures in all its nooks and crannies, which it has a lot of.

### The Elder Scrolls Online: High Isle story – A somewhat intriguing plot

We haven't played a lot of Elder



Scrolls Online, but, from what little we've played, the story in High Isle is a bit of a change in pace from the usual. This time around, the story is centred around regional politics; there's no apparent big bad that you need to deal with. It begins in Gonfalon Bay, where the Society of the Steadfast are holding a summit in the hopes of bringing the Three Banners War to an end. However, war being the money-making machine that it is, a group known as the Ascendant Order wants to make sure that peace is not an option. Sure, it doesn't sound all that epic on paper, but it's enjoyable enough. It felt like a breath of fresh air from the usual and as a plus, the voice acting and writing are top notch.

### What's new in The Elder Scrolls Online: High Isle

In addition to a new region to explore, High Isle introduces two more companions that can join you while you quest – Isobel Velois and Ember. Isobel is a knight who believes in law and justice; actions you take that aren't in line with that will not sit right with her. Ember on the other hand is a streetwise mage

### MOAR!

**DEVELOPER**  
ZeniMax Online Studios  
**PUBLISHER**  
Bethesda Softworks  
**PLATFORMS**  
PlayStation 4, Xbox One, Microsoft Windows, Xbox Series X and Series S, macOS  
**PLAYED ON**  
Windows  
**PRICE**  
₹2,499  
(including base game),  
₹1,799  
(if you already have the base game)



who believes that the end justifies the means. Both of them have excellent introductory quests which we accidentally stumbled upon.

Next we've got the new world events, the Volcanic fissures we spoke about earlier. These are similar to the Oblivion gates or Harrowstorms from previous expansions. Here, players' aid Stonelore druids to seal these fissures while fire Dae-dra pour out.

The expansion comes with a new 12-man trial, where you deal with the pirate threat to the Systres Archipelago. There are a host of new boss fights, items and achievements to be had.

High Isle also introduces a new card game, Tales of Tribute. Which we didn't get into too much, but we did go through a tutorial and we'll be honest, nothing stuck. Now we can't say it was complicated, but we weren't mentally prepared for another Gwent situation because some of us tend to become obsessed.

### The Elder Scrolls Online: High Isle – Gameplay

There's nothing new in terms of gameplay. That's usually the case

with most MMO expansions when it comes to core gameplay mechanics. However, there have been a bunch of balance changes and tweaks, and we're sure there will be a lot more balance changes and tweaks in the future. Nothing new in terms of new classes or anything either. If you've played ESO in the past or even an Elder Scrolls game you should be fine. However, an issue we had with the game when it first launched and even now, remains to be the game's somewhat janky combat. Despite having more action and skill based combat, it can often feel unresponsive and slow in ESO.

Running around and questing is just as fun, and it's very easy to get sidetracked in High Isle, as you'll often come across side quests while you're in the middle of another quest. This could be a pro or a con for some, but hey that's the Elder Scrolls experience.

There's a lot of running around to be done, especially if you're a new player and haven't got a fast mount. That's one of those things that really irked us about ESO, being able to speed your mount up by 1% every 20 hours (oh and the crafting timers, ugh; yeah we're not even going to talk about crafting).

All that being said, there's nothing new here per se. It's a same-old-same-old situation. While we as relatively new players had a blast, returning veterans may be feeling some fatigue at this point. Speaking of which, we think High Isle is a great place for new players to start off, before they take on the rest of Tamriel.

### The Elder Scrolls Online: High Isle: Verdict

The Systres Archipelago is a gorgeous new region to explore; the storytelling, writing, and voice acting is great. The gameplay is pretty much the same. There are a few new activities to do, and overall we'd say that we had fun playing High Isle and might stick around a bit longer this time around. \*

# The return of LAN Tournaments in India - What's going to be different this time?

**With an increase in the popularity of eSports, what are the changes we can expect to the returning LAN scene?**

By Paarth "Cruciator" Pareek | feedback@skoar.in

**e** Sports has been around for fairly long time now and throughout the entirety of the growth process, there has been one thing that has remained constant - LAN.

What started off as a fun way for friends to get together and duke it out in the early 2000s, has now seemingly become synonymous with the highest level of competitive play.

## The History of LANs in India

While there's no record of when the first ever LAN tournament was played in the country, there has always been a love for gaming cafes. The first one was opened in Bengaluru back in 1996. However, it might not be what you're picturing right now. It did not have RGB lighting, nor did it have state of the art peripherals. In fact, it was a Cafe Coffee Day. This was no regular CCD however, it boasted two full floors with PCs which were ready to be gamed on. It soon became a hotspot for gamers of all ages to play at, which largely helped in fostering an inclusive atmosphere in the gaming scene of the city.

Very soon, India started having its very own eSports tournaments for all the world renowned eSports - From Dota 2 to the ever popular Counter Strike for which the country even managed to produce Major worthy teams!

Throughout this entire period, the LAN scene in India continued to grow and very soon, we saw red carpet events such as Dreamhack and ESL make their way into India giving the



**ESL along with Dreamhack made eSports bigger in India**

people more of what they wanted. These events were very well received by the Indian public and encouraged a career in eSports for the youth that wanted to make a name for themselves. Ever since then, a few people banded together to ensure the growth of eSports in India and today we see boutique Tournament Organisers which have set up a large base of operations and are working to get eSports to the level that it can be at. In other words, unlocking the full and true potential of eSports.

## The Coming of the PC Era

The country had developed a thriving mobile gaming scene when the Pandemic hit, already seeing multiple LANs being held for the then popular PUBG Mobile.

For the longest time, PUBG Mobile took the main stage and saw tournament after tournament, even developing an insanely active Tier 2 and 3 scene which brought into existence millions of players who wanted to make a name for themselves.

The LANs for the game gave players inspiration to make it big. Seeing their favourite players come together to duke it out face to face in an arena while being watched by millions. One can only

imagine what an ecstatic moment that might be for someone who wished to be at the same level. This exact emotion is what made people show up at the events and make them successful.

However, ever since the pandemic started, such events obviously became a thing of the past as everything shifted on to the online world.

Unfortunately, PUBG Mobile got banned and the booming world of eSports slowly started regressing to the way things were, with a lot more enthusiasts waiting for things to go back to normal this time around.

Of course, the pandemic was in no hurry to leave and so, as time passed, nothing made people as excited as the first few tournaments for the newly introduced tac FPS shooter by League of Legends' developers, Riot Games' Valorant.

Valorant was not only able to capitalise on the millions of people wanting a title to play, but also filled the void that had been left due to the absence of PUBG Mobile in the world of eSports in India.

Valorant introduced people to the wonders of PC gaming and Indian stars who had already made a name for



**Valorant came as a lifesaver for Indian eSports**



themselves since the Counter Strike days were giving the new kid in town a chance. Marzil, Psy Gaming, Antidote, Ankit Panth and others had adopted Valorant after the CS:GO scene in India had been butchered because of a certain player who had been accused and found guilty of cheating.

As people received new found inspiration from these people, it rejuvenated a passion for eSports in the country.

### Something Bigger

As Valorant continued to grow, so did the demand for more and more pro play. Initially, it was only NODWIN Gaming that had hosted one of the biggest tournaments in the country, more and more Tournament Organisers started to take form.

One of the earliest and most popular Tournament Organisers to take hold in Valorant was The Esports Club, it popularised the Gauntlet format of tournaments and was THE tournament to be a part of if you were a Pro or wanted to be one.

The biggest teams of the nation back then, namely Global eSports, Velocity Gaming, Reckoning eSports, and the likes were always found to be participating, giving the public a number of reasons to watch and earning more fans in the process.

The Esports Club continued to grow into one of the boutique Tournament Organisers in India today and still hosts numerous tournaments.

The biggest name today though, is that of Skyesports, an organisation which popularised the League format of tournaments by doing things the way the IPL does.

Though the teams formed were obviously only exclusive to the tournament itself and did not bind the players together for anything outside of it, seeing such an interesting format come into play was something that the people loved to watch.

Very soon, Skyesports developed into one of the biggest TOs that India currently has, even extending their reach to Riot Games themselves.

It was only recently that we saw Valorant take the Global LAN stage back in

The Esports Club was one of the first organisers to make it big in Indian Valorant

2021 for Masters Reykjavik and it didn't take time for Skyesports to follow in the footsteps for the same.

They organised India's very first LAN in the city of Mumbai named the Skyesports Souvenir which saw the participation of only four invited teams in order to keep the virus at bay and yet, it was still one of the most historic events for Valorant eSports in India.

The Souvenir served as a sort of green flag for all other TOs that it was now viable to actually host a LAN again and this time, with much more participation from the people.

Skyesports continued to host tournaments both online as well as on LAN including the Skyesports Champions Series whose winners were to get a slot in the APAC Regional Qualifiers for the Valorant Champions Tour Masters Copenhagen which concluded this month itself.



Skyesports continues to be one of the biggest TOs in India

Of course Valorant wasn't the only game seeing some action though, the banned prince of Indian eSports had made a return but this time with a different name and a few small changes.

Battlegrounds Mobile India saw almost the same amount of popularity as it had before, if not, more.

It was in the month of June of this year itself that BGMI also saw its first LAN ever after the pandemic hosted by NODWIN Gaming and even though an audience wasn't allowed, it was as magnificent as you would hope.

With the event being streamed directly on National Television on Star Sports, it surely gained a lot of traction from people across the nation who had never even known that eSports existed.

Seeing the success of these events and the rising number of tournaments being hosted by numerous different



Battlegrounds Mobile brought back the craze for PUBG

TOs, it's only a matter of time before things start taking a turn for the better and the curve starts going up again.

### What does it mean for the future?

Of course, this isn't the biggest that eSports can be and this is definitely not where it's going to stop. With things slowly returning to normal, we can hope to see the popularity of Gaming and eSports go up once again and LANs are going to be one of the binding pillars contributing to the growth of the field.

There are obviously other games that are considered under the eSports umbrella and are slowly gaining more and more popularity with the gamers across the country such as Apex Legends, which only recently got its mobile version as well, League of Legends which already has a small but very active scene in the country, and of course Dota 2, which has been the OG eSport of India but is currently not in the spotlight.

These games are sure to receive more and more traction in the future as eSports continues to grow in India and it is only a matter of time before things go big once again.\*

# THE PRICE OF IMMERSION

The ultimate gaming experiences  
don't come cheap

By Manish "Trigger-Happy" Rajesh | feedback@skoar.in



**F**or some, gaming is just a hobby. For others, it's an obsession. Of course, there are extremes on both ends, but the kind of stuff we're about to show you, well, it's for those people who have no cap when it comes to spending for their obsession. What we have here are gaming setups which offer the ultimate gaming experience. There's no better immersion, than this, currently available in the world, and like all things that are the best in the world, they come with a price tag to match. With that out of the way, let's jump into the most insane gaming setups money can buy. We'll do a breakdown of all the components as well, if you happen to be someone who can actually afford all this stuff.

Let's start simple, with something you'll probably need for the rest of the stuff we're going to talk about.

## THE BEST GAMING PC MONEY CAN BUY

Of course, it needs to look swanky AF too, but it's the specs that are important. There are a lot of options in the market, and most with similar, if not the same specs. But one stood out, and has been standing out for a while now. The MEG Aegis Ti5 (12<sup>th</sup>). Just look at it. Like we said, it's not always about the looks (even if it does look like an alien artifact of some kind), below we've got the best possible configuration that MSI gives these out with.



Possibly the coolest thing about the MSI MEG is the gaming dial on the front which allows you to change and tune performance settings on the fly.

In addition to that, you have all the I/O ports you'll ever need, plus MSI AIO liquid cooling, Bluetooth 5.2 and WiFi 6E as well. The best possible configuration of the MSI MEG Aegis will set you back by over \$6500, which is over ₹5 lacs. But hey, that's just the beginning.

### INSIDE

**CPU:** Intel Core i9-12900K Processor

**RAM:** 4x 32 GB DDR5 4400 MHz U-DIMMs

**GPU:** MSI GeForce RTX 3090

**Sound:** 7.1 Channel HD Audio with Nahimic audio enhancer (ALC1220P)

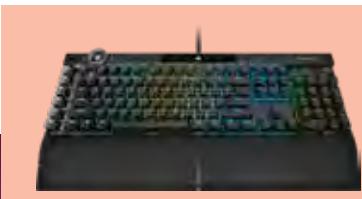
**Storage:** 3x 2 TB M.2 PCIe (2x Gen 4x4, 1x Gen 3 x4/SATA combo)  
2x 2.5" Drive Bays  
1x 3.5" Drive Bay

## PERIPHERALS

A gaming PC isn't complete without peripherals. You'll need the basics. A keyboard, mouse, controller and headset. They won't set you back by ₹5 lacs, but we're still looking at the best of the best here. Of course, the most immersion comes from ditching wires entirely, so they're mostly going to be wireless.



**MOUSE:** The Razer DeathAdder V2 Pro is a safe bet. Take it a step further with the Logitech G502 Lightspeed and the Logitech G Powerplay wireless charging mouse pad.  
Price (combo): ₹24K



**KEYBOARD:** The Corsair K100 RGB Optical is a fantastic mechanical keyboard. It's not wireless, but there's no contest really.  
Price: ₹24,999.



**HEADSET:** While it is ultimately subjective, but the Razer BlackShark V2 Pro offers a good combination of comfort and quality.  
Price: ₹19,999.

## THE DISPLAY

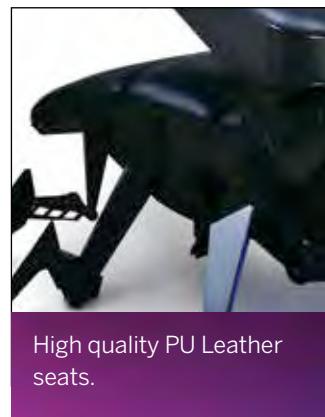
This is important, this is what you'll be consuming all your content on. A fan of multi monitor setups? Get as many of the LG 27GN950-B as you need, to set up an array of 4K gaming monitors with a refresh rate of 144Hz. At 27-inches they're just the right size. That'll set you back by ₹59,990 per monitor.

Of course, if you're not a fan of bezels, you could always go for a (or two if you want) super-ultra-wide 49-inch Samsung Odyssey Neo G9 for just ₹2,80,000.



## THE DESK (JK GAMING STATION)

Now that you've got a PC, Peripherals and Monitor(s) sorted out, you need a desk. Just kidding, desks are for plebs. It's not an ultimate gaming setup without a bangin' gaming station. We've got you covered. What you'll need is the Cluvens Scorpion Cockpit, because you need a gaming station that can support all those monitors (or two super-ultra-wide monitors) that you just got while also gaming like a frikin' badass. This bad boy will set you back by \$4900, or around ₹4 lacs. Hey, at least it's cheaper than the MEG Aegis.



Now, it's time for more specialised builds. The most obvious first setup is racing.



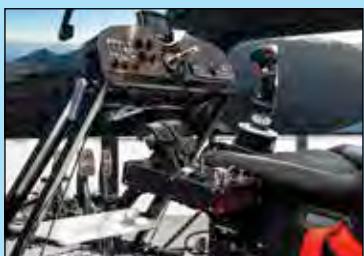
## RACING SIM

Now, if you've got the budget for it, you can ignore pretty much everything we've said so far, and go for the AXSIM Formula Simulator. Just keep in mind that at \$135K, or ₹1.1 cr, this thing will cost more than everything else combined, TWICE! But, if you want as close to the real deal as possible without the danger, this is it. It's literally made using F1 car parts and comes with all the frills, including a precision steering wheel, steering motor, hydraulic brakes, harness, speaker system, a beefy PC (with racing sims pre-installed), and a Samsung The Wall display.



## VIRTUAL REALITY

Did you think a VR headset was all you needed for a fully immersive experience? Wrong! The Virtuix Omni One allows you to physically move around while you're in VR. We're talking complete freedom of movement; walk, run, crouch, jump, and 360 degrees of freedom. It comes with its own VR headset and no PC needed, but you've already got yourself a beefy PC if you've reached this point in the story so you could use that instead. The Omni One will set you back \$2000 (~₹1.6 lacs). Pair this with the TESLASUIT full-body haptic suit to feel everything in VR as well. The TESLASUIT has some crazy tech packed into it, and costs a whopping \$13000 (~₹1 Cr; yeah, that much), but it doesn't get any better than that.



## FLIGHT SIM

When it comes to flight sim cockpits, usually, a racing cockpit will suffice. However, the AXSIM is finetuned for racing. This is where the CXC Motion Pro II Racing Simulator comes in. With the added benefit of being a fantastic all-purpose racing simulator as well, it comes with a package that includes all the flight controls you'll need. Again, it's a complete package like the AXSIM, and comes with all the frills included in the package. And again, comes with a price tag to match at \$90K, or roughly ₹72 lacs.

But hey, you've got a beefy rig, you've got a kickass gaming station, so you could convert that into a makeshift sim with these accessories.



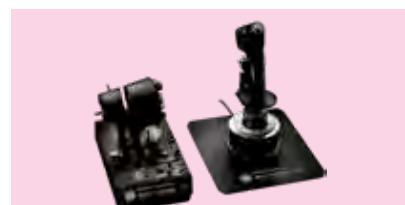
### XBOX ELITE WIRELESS CONTROLLER SERIES 2 - ₹20,000

If all of the PlayStation DualSense controller features worked on PC, we'd probably mention that here instead, but the Xbox Elite Wireless Controller is still an excellent choice, and the best controller for PC you can get your hands on.



### FANATEC GT DD PRO - \$700 (~₹56,000)

If you're understandably not willing to spend a bomb on the sims we've mentioned above, the next best thing would be to get yourself a wheel. The Fanatec GT DD Pro is an excellent racing wheel with all the things you'll need for an immersive racing experience.



### THRUSTMASTER HOTAS WARTHOG - \$500 (~₹40,000)

The Thrustmaster Warthog is the best PC joystick you can get your hands on right now in the market, especially if you're looking for as realistic a flight-stick as possible. Of course, it's fairly pricey as well, but this article doesn't worry about price, does it? \*



**F1 22**

## NEW SKIN, OLD GAME?

By Ali "Genesis" Akbar Merchant | feedback@skoar.in

The 2022 F1 season has brought a ton of changes to the design and aerodynamics of real-life cars with new rules and regulations designed to improve racing and the following of cars behind other cars. What that means is that the cars now have a different way in which they create downforce and although effective, it's not in the same league as the cars from the previous generation. F1 22 incorporates all the regulation changes of its real-world counterpart and that's evident in the design of the cars.

### VISUALS

We played F1 22 on the PlayStation 5. And, as you would expect, the visuals were pretty good. We say pretty good because we didn't get the chance to test the game out on a decked-out PC with a bonkers GPU. While that may

have crushed it in terms of the visuals, the PS5 really didn't leave you wanting. Although it must be said that the visuals were very good when it came to the look of the cars while driving in the "far chase" cam mode and when it came to driving in the "cockpit" cam mode. The details and textures on the driving gloves and the steering wheel were superb. It's a different story when it comes to the other aspects of the game though. For example, the virtual avatars of the drivers, while having some resemblance to their real-life counterparts, looked quite plasticky. It is clear that the devs have put much more effort into the virtual models of the cars and tracks rather than the models of the drivers which is fine. In F1 22 we'd much rather prefer the effort being put to make the car look more realistic than the drivers.

Another issue that we noticed was that the game really didn't offer much in terms of perception of speed. You are there in the fastest racing machines in the world but even at top speed, it doesn't convincingly convey that you are going at a blistering 300+ kmph. A mass appeal game like F1 22 could have done with a bit more in terms of the illusion of speed.

### GAMEPLAY

The F1 22 gameplay is quite similar to the previous generation F1 games as you might expect, apart from the slight changes in the handling and downforce of the cars. F1 22 once again toes the line between being a full-on sim racing game and an arcade racing game. Think of F1 22 as a game specifically developed for fans of the F1 sport who want to get in on some of the action and get a taste

of racing an F1 car around perfectly modelled real-world tracks. However, for someone picking up the controller for a racing game for the first time will not have much of an issue with racing and being competitive within the game thanks to the finely tuned assists. Damage can also be cosmetic (which will not affect the performance at all) or simulation where even minor damage can reduce performance.

F1 22 also has a couple of bonus racing options. In the Solo game tab, you have the option to quickly race any Grand Prix on the calendar. In that mode you can pick any team and driver you want. You can also keep the performance of the car realistic or equal for all. The other mode is Time Trials where you can just master a particular track and even compete in online rankings. You can also do entire Grand Prix's and Time Trials in Formula 2 cars which we highly recommend. F2 cars and teams are true to life as well with realistic performance. Lastly, there is the option to set some laps using supercars as well.

The DualSense controller on the PS5 adds a level of immersion that was previously unavailable to other controllers. For example, if you are a little too aggressive with the throttle and about to lose traction, the R2 trigger tightens up giving you the queue to back off a bit.

## MOAR!

### F1 LIFE (WHY EVEN?)

#### DEVELOPER

Codemasters

#### PUBLISHER

EA Sports

#### PLATFORMS

Microsoft Windows,  
PlayStation 4,  
PlayStation 5, Xbox  
One, Xbox Series X/S

#### PLAYED ON

PlayStation 5

#### PRICE

₹2,999 (PC),  
₹4499 (PS5)

Probably the weirdest part about the F1 22 game is F1 Life. In F1 Life you can deck up your quarters with fancy furniture, art, rugs, couches, lamps and even shove your supercar in there. You can also drape

your avatar in branded clothing which is nice if you're into that sort of thing. And that virtual environment is where you can hang out with your online friends, cuz, you know that's what you want to do in a racing game, hang out in a virtual room.

## GAME MODES

Most people looking to get the game will be interested in the career mode or multiplayer gaming.

The career mode in F1 22 has two options to choose from. The first is the My Driver Career mode and the other is the My Team Career mode. The My Driver career mode allows you to create a new driver to partner up with any of the team's existing drivers. You progress through the career as you normally would as a new driver with the current lineup of teams. You can research parts and upgrade them to yield better performance.

The My Team career mode though is much more interesting. With this mode, you get the chance to create a whole new team as the 11th team on the grid (just in case you didn't know, Formula 1 currently has only 10 teams). You have the option to choose how strong this new hypothetical team will be. The Newcomer mode mode is the one we would go for as a challenge to reach the top over multiple seasons. It's like setting up a whole new team from scratch. The next mode is the Midfield Challenger. Here your research departments are already at a decent level and you have more resources and cash to play with. And the last mode is where you can start a new team that is already in the top echelons of the sport. You have more money available and the research facilities are the best in class.

Multiplayer mode has all the bells and whistles you might expect to get started with racing either your friends or random strangers online. The game also offers Weekly Events for a new challenge every week and you can test yourself



against everyone in Ranked Play. For local multiplayer F1 22 offers Split Screen and LAN Game options as well.

## VERDICT

The newest iteration of the official F1 game rode the hype of this year's F1 season as there was a whole lot of stuff that was new to the sport. A new reigning world champion, brand new cars, new regulations and the maximum number of races in an F1 season to boot.

For the most part, the game brilliantly treads the line between being a full-on dashing car arcade game and a full-on super serious sim. It has pretty much everything an F1 fan would need from a game and it has most things a racing game fan would need from a game. Overall, it is a pretty enjoyable experience for sure.

But there are a few aspects where things could have been better. The game would be perfectly fine without the F1 Life. Instead of that, devs could have given us the option to buy and race legendary F1 cars from yester-years. Not only would that be more appreciated, but it would also give a casual racer a taste of the development that F1 cars have seen over the many decades of the sport. There is also the issue of the illusion of speed, which we must say is more of a personal gripe.

On the PS5 the game worked pretty flawlessly without any drops in frame rate (or at least ones that we noticed). The new DualSense controller is the best controller to experience racing games on. While obviously not as immersive as a feedback wheel and pedals, the DualSense controller gives a new dimension to racing at least with F1 22. \*

# RAIN WORLD



You don't need good graphics. Good gameplay can carry a game too

By Kshipra 'faafdaajalebii' Jadav  
feedback@skoar.in

Sometimes, even though a game's graphics are good, the game is not. A really good storyline, or good gameplay can easily outsell the graphics of a game. Which goes to prove that graphics aren't EVERYTHING in a game.

Rain World is a 2D pixel art platformer game which was released back in 2017. When it was released, critics bashed it and it got very bad reviews. Today, Rain World is sitting on "Very Positive" reviews on Steam, and an 8.6 score on Metacritic. Did something change, or were critics simply being shallow? Let's find out.

## STORY

The backstory of Rain World is pretty simple. You're a cute family of slug cats (we don't actually know what they're called but everyone else seems to be calling them that) travelling through the city. Suddenly the rain starts and everyone runs for shelter. But the rain proves to be a lot more dangerous. Suddenly, you find yourself slipping and falling down into

the sewers leaving all of your family behind. Your mission now is to get reunited with your loved ones.

We didn't really find the backstory to be compelling and motivating enough. Sure, getting separated from your family is cruel and all but it didn't really motivation us enough to get up and complete the game. It was the gameplay that did that.

## GAMEPLAY

To put it simply, Rain World's gameplay is cruel. It's just cruel. Everything is out to kill you. You're literally at the bottom of the food chain. You can eat the flies and the fruits around you but everything else can eat you.

You enter the world in one of the few "waterproof" hibernation chambers. Each time you get out of that chamber, a cycle starts. During the tenure of the cycle, you need to explore the world around you, find new chambers and find "karma symbols" (we'll get to them later). The main thing here is that each cycle only has a limited amount of time which can be seen at the bottom of

your screen. Before that clock is up, you ABSOLUTELY NEED to go back into the waterproof chamber. Each time that timer is up, the place that you're in starts filling up with water as heavy rains start pouring down.

Each time you go into hibernation, you lose some energy points. These are small circles that you see besides the timer. If you have no energy points, the waterproof chamber won't even close. If it doesn't close, you die. Hence, the game FORCES you to go out and explore since the only way you can gain energy points is by eating various insects and fruits. This too, comes at a cost. Even if you find a cosy spot on the map which is coincidentally close to a hibernation chamber and food source, you still won't be able to survive for long. Food takes a couple of cycles to regenerate. Hence, if you pick the fruits from one place and eat them, in the next cycle, they won't be there again. This indirectly forces you to get out of your comfort zone and explore more.

Coming to the karma symbols. The game actually punishes you for

dieing, and it does so in a very creative way. In order to get from one level of the game to the next, you need to be a certain rank which is denoted by your karma symbol. You need to have the same symbol as the gate of the next level for it to open. Each time you die, you de-rank. But fortunately, each time you survive a cycle, your rank increases.

Lastly, coming to the movement mechanics.

Arrow keys to move, 'Z' to jump, 'X' to throw and 'Shift' to pick something up. There are other combinations for eating, jumping and climbing.



## COMBAT

This is our favourite part of the game since we're apparently masochists. Combat in this game is really one sided. One of the disadvantages of being at the absolute bottom of the food chain is that literally anything that you encounter while exploring the world will most definitely kill you. Still, the devs have managed to sneak in a combat option "if" you're skilled enough.

Throughout the levels, you will encounter various sticks and stones and sometimes even explosives. The only thing that you can do with them is throw them at enemies; but even that's not enough. Enemies are a lot stronger than you are. One bite from a green or a purple lizard and you're dead. Whereas it will take you several tries just to kill one lizard. It gets really out of hand when you account for the fact that you can only hold two things at a time. For instance, if you

## MOAR!

### DEVELOPER

Videocult

### PUBLISHER

Akupara Games

### PLATFORMS

Nintendo Switch,  
PlayStation 4,  
Microsoft Windows

### PLAYED ON

Microsoft Windows

### PRICE

₹565 (Steam)

want to kill a lizard, you will have to first throw a stick at it and pray that it impales it. Then, you have to go near the lizard, pull the stick out of the lizard, and throw it again. Chances are, you'll die before the lizard does. So your best bet if you encounter something like that is to run and hide.

Apart from lizards, you've got flying vultures which appear out of nowhere, long legged spiders called "Daddy

Long Legs" and more, just lurking in the dark, waiting to eat you!

## AUDIO

The sound design in this game is a masterpiece. Just to give you a small example of what it feels like, while playing the game, if there is no enemy in your vicinity then there will be absolute silence in terms of music. As soon as an enemy enters the same room as you or is in your vicinity (and keep in mind that if an enemy is in your vicinity doesn't mean that they're in your FOV), a slow eerie

music starts playing which sends chills down your spine. These moments happen quite often in the game and even the official OSTs for the levels are really great.

## CONCLUSION

All in all, we'd like to end this review by addressing two points. The first being the game's difficulty. Yes, this game is difficult and yes, this game is cruel. In fact, we've played this game a lot longer than many single player campaigns despite how annoy-



ingly frustrating it can get just because of what this game has to offer. This game is unique and literally at no point in the game does it get repetitive. Aside from waking up to the same map, everything is different. Enemy spawn locations, food spawn locations and even the locations of the special items. This keeps the random element of the game alive and more often than not, every time you go into hibernation, you'll go there with a feeling of being left at a cliffhanger.

Secondly, this game will also make you rage a lot and even make you bang your desk and make you rage



quit. This game is not for everyone. For people who are looking for a game to quickly complete and move on with their lives, stay away from this game. You won't get anywhere if you rush head first into this game. You'll need to give it time and your energy to explore it fully and only then will you be able to appreciate the true beauty of this game.

We'd like to end this review with a quote from one of the game's Steam reviews-

"I don't know where I am or what my goals are. All I know is that I must slide through pipes cutely". \*



# Tabletop

By Satvik 'SA1NT' Pandey | feedback@skoar.in



## 5 ALIVE

Ever heard of that card game where you throw reverse cards? Well, take that and add some life cards to it, which get deducted over the game, controlling the outcome, and you get 5 Alive. The game in itself is super fun and easy to play with rules that are intuitive for anyone who has been playing card games even for a short time. However, we cannot look past the fact that the game's concept is inspired by another card game, which is undoubtedly more popular than this one. The fact that the game's creators are the same is very clearly reflected in how it plays and is structured.

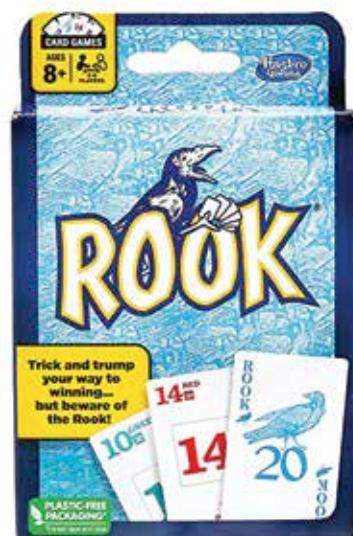
Credit where credit's due, you will have fun playing it. If you have a

group of friends over at your place, this game will perfectly bind the room together with laughs and fun. With fewer players, it mostly boils down to pure luck and most of the fun is sucked out of it. Similarly, when left with fewer players in a bigger group, it is better to choose an alternate way to end the game to avoid being stuck with the same ending every single time. If there were a few tweaks made to the overall gameplay to sneak in a unique playing experience, and some more was thought put into making the imagery on the cards a bit more attractive to the younger audiences, it would have been rated much higher than it is.

Pick it up if you want a simple game to play at parties \*wink\*. If you're looking for unique and interesting gameplay, look elsewhere.

## ROOK

It would take a little less than a PhD in rocket science to understand the rules of Rook. This thought echoed in the room when we sat down to play this game. We have seen people swear by the game, touting it to be one of the best games in the market to play with family and friends. But as per our experience with the game, most of it was consumed in understanding how to play it. Once we got through the two-page rulebook a few times and were able to understand the loop of regulations that the game



runs on, things start to pick up.

After getting the hang of the rules we did enjoy the game. It was intriguing and hooked us for hours and hours on end. The variation in the rules proved to be a great point for us to work around and make the game even more interesting. No two games ended the same. Picking a partner was the toughest part of all though.

Rook is a classic. Once our SKOAR overlord walked in, he took over the space with his tactics and game sense that went over what everyone else collectively had. Turns out, he had played the game before. We guess having someone around who has played the game before definitely helps to fasttrack the learning process, which can take absurdly long. \*



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