

GU to get DRDO research centre

Ahmedabad: The chairman of DRDO (Defence Research Development Organisation), G Satheesh Reddy, speaking at the 68th convocation of Gujarat University (GU), on Wednesday, said the varsity will soon get a research centre of the organization.

“The vice chancellor of Gujarat University told me that if we establish a DRDO centre at this university, they will give us the space free of cost. We have been positive towards this proposal. I will be sending a team to look at the infrastructure and facilities and see how can we collaborate with GU in promoting advanced defence technology and other departments,” said Reddy.



Some 45,294 students were awarded degrees at the convocation. About 257 students were awarded gold medals and 65 received special awards.

At the ceremony, neurologist and Padma Shri Sudhir Shah’s daughter, Heli Shah, got the Shrimati Kantiben Gor medal in the Doctorate of Medicine in Neurology.

<https://timesofindia.indiatimes.com/city/ahmedabad/gu-to-get-drdo-research-centre/articleshow/73745289.cms>

BW BUSINESSWORLD

Rs 1,812 cr of FDI in defence and aerospace since 2014: Ajay Kumar, Defence Secretary

Technology development and indigenisation are a must for self-reliance in defence. The DRDO and other agencies of the government, including the service headquarters DPSUs and the OFB are making a lot of efforts to promote technology development and indigenization

By Manish Kumar Jha

Defence Secretary Ajay Kumar is credited with the stance of some critical policies in defence, particularly those that have quickly reached out to startups and private industry. This alumnus of IIT Kanpur, emphasises the Indian government’s focus on indigenisation of defence production and wooing investment into the sector in a chat with Manish Kumar Jha

Foreign direct investment (FDI) in defence was just about \$2.18 million during 2018-19. Is it time to revisit the policy on FDI?

Only companies which require licence under the Industrial Act need government approval for bringing FDI and that too, only if the FDI is over 49 per cent. Other defence and aerospace companies do not require approval for bringing in FDI. Therefore, complete information on FDI flows in defence and aerospace is not available.

Based on information collected from industry sources, FDI of over Rs 3,134 crore has so far been received in the defence and aerospace sectors. Out of this, 34 companies in the defence and aerospace sector have reported FDI of over Rs 1,812 crore since 2014.

What are the implications of the newly formed Department of Military Affairs (DMA)?

Formation of the Chief of Defence Staff (CDS) and the DMA are among the biggest reforms in the history of the defence establishment. It was also long awaited. It will promote greater coordination between the services and greater integration of the forces with the ministry. I think the reform will greatly boost the capabilities of our defence forces and enhance our overall security. Several committees have studied modernisation of the defence forces. The Department of Defence and DMA are working together and within the first few weeks we have made significant progress.

We have already transferred nearly 60 officers from the Department of Defence to the DMA to enable smooth functioning of the DMA. Both the CDS and I have great understanding and I look forward to working with him to achieve the goals of this reform.

Today GST for aircraft and ships are at five per cent while engines and machinery, radars, communications etc., attract 12-18 per cent GST. Do you see scope for uniformity of rates across the value chain?

As part of Make in India in defence, wherever there is duty inversion, we have been taking the issue up with the Ministry of Finance. Based on our intervention, duties have been rationalised in several cases. If there are any other instances wherein such duty inversion is being experienced, the same will also be taken up with the Ministry of Finance for appropriate corrections.

You have spoken of the need for 200 fighter jets. What is the timeline for induction of 114 Multi Role Fighter Jets under a strategic partnership?

The order for 83 light combat aircraft (LCAs) is in an advanced stage of price finalisation. As regards orders for 114 fighter jets, the Indian Air Force is studying the matter based on the responses received.

What benchmark have you set for defence exports? What is the progress on the big ticket export of indigenous LCA Tejas and Brahmos?

During 2016-17, defence exports were worth Rs 1,522 crore and have increased to Rs 10,745 crore in 2018-19. We hope to achieve defence exports of Rs 35,000 by 2024. Private industry has made a major contribution in this jump.

The expansion has been possible because the number of items and the number of companies that are exporting have increased. From very few components in 2016-17, the product mix now includes a range of items including night vision binoculars, weapon sights, wheeled infantry carriers, fire control systems, personal protective items, components of Fuze, containerised tubular shooting range solutions, light specialist vehicles, components of aircraft, parts of small arms, batteries, detonator cups etc., besides bigger platforms and ammunitions. The number of companies who are exporting has increased from 19 in 2016-17 to 58 in 2018-19.

We are building on this interest. Our defence attaches have been tasked to promote defence exports. Process changes have been made to streamline defence exports.

Indigenisation is a buzzword, but without a roadmap. The Defence Research and Development Organisation (DRDO) has a paltry budget of Rs 18,000 crore. How do we plan to raise our stake in indigenisation?

Technology development and indigenisation are a must for self-reliance in defence. The DRDO and other agencies of the government, including the service headquarters (design bureaus) and defence public sector undertakings and the Ordnance Factory Board are making a lot of efforts to promote greater technology development and indigenisation. Several new projects have been undertaken, which will take us to leadership positions. We are expanding the frontiers of R&D and technology development in the defence and aerospace ecosystem in partnership with industry. Under the Make-2 procedure, industry is partnering with the services to develop new technologies.

<http://www.businessworld.in/article/Rs-1-812-Cr-Of-FDI-In-Defence-And-Aerospace-Since-2014-Ajay-Kumar-Defence-Secretary/29-01-2020-182933/>

Hanging Fire

Tardy implementation of procedures and policies and lack of swift decision making have impeded the modernisation of India's defence forces

By Manish Kumar Jha

Defence procurement involves long gestation periods and delay in procurement will impact the preparedness of our forces, besides resulting in opportunity cost. The needs of the armed forces being a non-negotiable and an uncompromising aspect, flexibility in the procurement process is required... Thus the DPP favours swift decision making, provides for suitable timelines and delegates powers to the appropriate authorities to ensure an efficient and effective implementation of the procurement process, by all stakeholders concerned.”

So states the preamble to the Defence Procurement Procedure (DPP) 2016, the key policy document guiding the modernisation of the Indian armed forces through indigenisation and self-sufficiency. But action on the ground seems to be starkly different from what's professed in the preamble. A number of modernisation projects are stuck at various stages of implementation due to lack of swift decision making and effective implementation of the processes involved.

“The Expression of Intent (EoI) for Naval Utility Helicopters were issued on 12 Feb 2019. Responses to this were submitted on 26 April 2019. The shortlisting of strategic partners and foreign OEMs is still pending. These were to be completed and

Request for Proposal (RFP) issued by September 2019,” says Jayant Patil, Whole-time Director (Defence & Smart Technologies), L&T.

Similarly, according to Patil, EoI for P75 (I) conventional AIP submarines were issued on 20 June 2019 to Indian companies and on 3 July 2019 to foreign OEMs. These were responded on 11 and 24 September 2019 by Indian and foreign OEMs, respectively. The RFPs were supposed to be issued to shortlisted strategic partners in December 2019, but are still awaited.

VOICES FROM INDIA'S DEFENCE INDUSTRY

- Formalise Defence Production Policy 2018 (Draft)
- Increase the allocation for Defence Capital Acquisition in line with the AoNs worth Rs 4,09,000 crore granted since 2014
- Set time frame for the procurement cycle. From release of RFPs to contract signing in defence takes anywhere between 3 and 7 years; even in the case of repeat orders for similar systems the process consumes a minimum of two years. Firm implementation of time frames from AoNs to issuance of RFPs to contract signing at the apex level will boost Make in India in defence
- R&D in defence: As the government funds DRDO, it must give a proportion of the fund to the private industry through Make-1 to encourage R&D in the defence sector
- Exports to friendly nations via line of credit (LoC) – provide preferred forex credit at globally competitive terms for funding working capital for defence exporters
- Implement Strategic Partnership model for Indian industry — the procurement of platforms initiated through this policy will be the most crucial step to develop systems and platform capabilities to realise Indigenous requirements at differentiated cost structure and eventually build exports
- GST: All defence equipment must attract a uniform rate of 5 per cent
- Defence budget: Rollover fund. It must be respectable at 18-20 per cent of the total central government expenditure. It will have a spillover effect on the economy

Then, the Future Ready Combat Vehicle (FRCV) and fighter aircraft programmes too are stuck at the pre-EoI stage.

The modernisation exercise has also been hamstrung by a lack of investments, whether foreign or domestic, government or private. Real investments in production is needed if India wishes to attain self-sufficiency in the manufacture of quality defence equipment.

The armed forces are always ready with their requirements for modern equipment. But money has been hard to come by so far. In FY2019 the Indian defence sector officially attracted foreign direct investment (FDI) of just \$2.18 million. When contacted for their comment, all that the Ministry of Defence (MoD) could say was there is a lack of complete data on this front. It is estimated that 34 companies in the defence and aerospace sector reported a combined FDI of about Rs 1,812 crore after 2014.

If Indian industry is to become a participant in the national endeavour of achieving self-reliance in defence equipment, it must do so with real term investment. And in order to do that, industry must not only be aware of the capabilities the Armed Forces are seeking, but also the technologies required to achieve these over a reasonable period of time. But neither is the industry buzzing nor do they have any road map to achieve advanced technology. Every new equipment that's touted as 'indigenous' is either assembled or done in association with foreign original equipment manufacturers (OEMs) under a jointly formed entity or an entity that have been granted a license to execute such projects.

Banking on the budget

In India, defence projects are mainly funded through budgetary allocations. But defence budgets have been grossly inadequate of late. "The capital portion of the budget is simply exhausted to fund existing commitments," says Patil, adding, "While there has been a gradual increase in defence modernisation budget, the inclusion of GST (since July 2017) and customs duties (since April 2016) as additional outflows from funds allocated to the Ministry of Defence (MoD) has effectively cut the allocations in real terms."

After factoring in inflation, the current year's allocation just matches the budget for FY16-17. "The consequent decrease in funds available for defence modernisation are visible from the dropping volume of orders placed to Indian companies," says Patil.

Going by the answers provided in the Parliament and the reports of the Parliamentary Standing Committee on Defence, budgetary allocation for defence modernisation has not been sufficient to even cover the committed liabilities of the past two years. Not only that, the foreign companies tend to get paid on the due date but not the domestic industry. Payment deferrals due to lack of funds is a matter of routine for home-grown defence OEMs. The lack of funds for new acquisitions resulted in around Rs 77,000 crore worth of orders placed with Indian industry in the last three years.

However, there have been some shining examples of 'Make in India' over the past 3-4 years. These include deliveries of the Akash missile programme, Pinaka MRLS programme, K-9 Vajra tracked self-propelled gun programme, BrahMos programme, army bridging systems, offshore patrol vessels for the Indian Coast Guard as well as the Navy, floating docks for the Navy, interceptor boats for Coast Guard, P75 submarines, P28 ASW corvettes, P15A destroyers, Dhanush howitzers, LCA operationalisation, to name a few significant ones.

With the Union Budget around the corner, what would be the wish-list of the private sector, especially for defence? Patil recommends increased allocation for defence acquisition in line with the Acceptance of Necessity (AoN) worth Rs 4,09,000 crore granted since 2014. "This will bring immediate positive impact on the sector with its ecosystem of large players as well as MSMEs leveraging their respective strengths."

Levy of the Goods and Services Tax (GST) on defence hardware is another thorny issue that the MoD must take up with the finance ministry. For example, aircraft and ships are levied 5 per cent GST whilst engines and machinery, radars, communications etc. are charged 12-18 per cent. "All defence

equipment must attract a uniform rate of 5 per cent GST across the entire value chain. This will release at least Rs 30,000-40,000 crore for procurement,” says Cmdr Sujit Samaddar of NITI Aayog.

Indigenisation & LTIPP

As the world’s second largest importer of military hardware after Saudi Arabia, India spends billions of dollars to buy the latest technology and build capability. As such, India’s quest for an indigenous fighter aircraft with comparable 5th generation platform should have been achieved by now. The country could have been saved \$50 billion by investing in R&D and setting benchmark time.

Recently, the Defence Research and Development Organisation (DRDO), India’s sole agency for defence R&D went to town when LCA Tejas completed extensive trials on the shore-based test facility (SBTF), and the naval version of LCA did a successful arrested landing on-board INS Vikramaditya in January as if these were history-making developments. In fact, these events were a sad testimony to our capability as ‘arresting cable systems’ were first used by aviation pioneer Eugene Ely on way back in 1911 when he made his first landing on a ship — the armoured cruiser USS Pennsylvania.

The Long-Term Integrated Perspective Plan (LTIPP) has the work cut out as far as next-generation combat aircraft are concerned. To begin with, LCA Tejas may have started flying but it is still way short of its production target of MK-1 level of worthiness. Another concept—Advance Medium Combat Aircraft (AMCA)—with multi-role capability is still on the drawing board. A generational shift in combat aircraft is indeed challenging to embrace. But that’s what China has managed to do using smart tactics — by leveraging the Russian platform and loading it a bit with advance western platforms. If China could do it, why couldn’t we using various MIGs and Sukhois from Russia and Jaguar from Britain-France?

Today, India’s fighter aircraft squadrons have virtually dwindled by a fourth — from the sanctioned 42 squadrons (on paper), we are down to 30 squadrons. And we may go down further to 12 squadrons. It is evident now that the Indian Air Force (IAF) is facing a huge aircraft shortfall. This cycle keeps repeating in the absence of robust replacement mechanism and accountability.

The Aeronautical Development Agency (ADA), which developed the Tejas, has been working for more than a decade to develop a credible design for AMCA. Can they leverage the reach and expertise of global OEMs as it could propel India’s quest for fifth-generation AMCA and Tejas Mk-2 on fast track? On being asked about the feasibility of such a collaboration, Vivek Lall, Vice President, Strategy and Business Development, Lockheed Martin Aeronautics say: “We are certainly open to supporting India’s AMCA and Tejas MK-2 programmes should the Indian government ask us to do so. Public-private-partnerships or PPPs are a key part of building strategic, long-term international defence partnerships that benefit multiple stakeholders.” “Our F-21 proposal for the IAF would be a key enabler of close collaboration on advanced fighter aircraft,” Lall added.

Need to re-invent DRDO

No account of India’s defence preparedness is complete and meaningful without a mention of the role of the DRDO. “This organisation (DRDO) has to be re-invented. Their structure and charter was relevant 50 years ago. Not anymore,” says Cmde Samaddar of Niti Aayog, an expert on defence. Cmde Samaddar is not the first to call for the reform of DRDO; it has been bugled by committee after committee (Admiral Puri Committee, Rama Rao Committee etc) over the past several years.

Let’s look at the budget allocation for DRDO. For FY20, it was a little over Rs 19,000 crore. It compares poorly with China. “It is spending over 20 per cent of the overall budget for defence on R&D. We, however, are spending not even 5-6 per cent,” says S. Christopher, former Director General, DRDO. The upshot was the Chinese fourth-generation fighter fleet strength increased from 383 jets to 736 jets between 2010 and 2015, a 92 per cent jump in air power. Today, China operates roughly 1,200 short-range fighters.

The People's Liberation Army Air Force (PLAAF)'s fleet boasts up to sixth-generation innovation with its own drones and artificial intelligence and everything latest in aerospace. By 2035, China could be closer to the world's best platforms of fighter aircraft such as Russia's Sukhoi and F-35 of US. And, that is not a miracle but the result of a dedicated plan and investment on technology and sincere implementation of the application.

All this is not to say that DRDO, or more precisely the ADA, cannot do what others are doing. To take an example, when it comes to the SONAR system, ADA is among the best in the world. Cmdr Samaddar, however, makes a fundamental point. "DRDO must simply focus on fundamental science and research and not so much on applied research. In effect, it should refrain from making these toys that never work."

True, our indigenisation efforts have been very uninspiring so far, if not outright disappointing. The Pralay Short-Range Tactical Ballistic Missile (SRBM) and Agni-1P SSM for the infantry, which were supposed to be a 'fast-track' programmes and on trials by DRDO, are still in early stage of development. Similarly, Tejas MK-1 production is behind by 8-16 units a year. The Advance Medium Combat Aircraft and the futuristic Tejas MK-2 are way behind schedule.

What is the way forward? The government must immediately drive the next-generation technology leveraging India's IT prowess. The nature of modern warfare also suggests that such a step, if taken now, will propel India among the best in the development of futuristic defence systems viz, artificial intelligence, quantum technologies, cognitive technologies, asymmetric technologies and smart materials.

As DRDO has recently tied up with leading universities under the DRDO Young Scientist Laboratories (DYSL) programme, it must get the requisite fund and talent. "Focus area must be meta/smart materials, AI, tera hertz electronics, directed energy LASERs, fuel cell, at the fundamental research level," suggests Cmdr Samaddar. He also suggests that DRDO Chairman and Secretary must be separate positions. "Senior Adviser (SA) to the Defence Minister must be a noted academic and Secretary, Department of Defence R&D must be selected from the larger talent pool of the Civil Services, Technical Services, private sector and Chairman DRDO can be from the cadre," adds Cmdr Samaddar.

Action on Make-II & Make-I

The Make-II category is an important step for our MSMEs. However, of the 44 projects taken up for Make-II since its inception in 2018, only six have reached the project sanction stage. Make-II projects also must be funded adequately as it is not possible for young entrepreneurs to make investments in projects where there is uncertainty – not in terms of product performance, but in terms of purchase. According to Cmdr Samaddar, the entire 'Make' idea has to be rethought and a risk and reward sharing model has to be developed. "The government takes the financial risk and the entrepreneur the rewards. India gains strategically," he says. So the thrust on Make-II must be dealt with lightning speed and awarded on the basis of past acquisition price as the benchmark to an industry proposing such import substitution under Make-II even if it is a single party.

Similarly, the Make-I procurement procedure was introduced in the DPP to develop complex, indigenous defence solutions through maturing Indian industry with the government providing hand-holding and funding support. Although procurement activity for a few Make-I programmes were initiated in 2009, none of them have taken off yet, probably due to the fear of funding the private sector to do R&D which, by its very nature, is fraught with uncertainties.

So what's the way out? Suggests L&T's Patil, "Getting Make-I programmes on track and announcing many more is a key imperative for long-term indigenisation in the defence sector. While the DRDO gets funding to the tune of about Rs 20,000 crore every year, even if a small proportion of this is earmarked for the private industry through Make-I it will go a long way to encourage R&D in the defence sector."

It is time that the government pays heed to such suggestions and make them a reality under the joint leadership of the Defence Secretary and the Chief of Defence Staff at the Department of Military Affairs. Else, we will continue to pretend to 'Make in India'.

<http://www.businessworld.in/article/Hanging-Fire/29-01-2020-182942/>



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We are open to supporting India's AMCA and Tejas Mk 2 Programmes: Vivek Lall, Lockheed Martin Aeronautics

The F-21 will meet all of India's performance, capability and advanced technology requirements, and provide unmatched opportunities for Indian companies of all sizes and suppliers throughout India

By Manish Kumar Jha

Indian American Vivek Lall, Vice President, Strategy and Business Development, Lockheed Martin Aeronautics, who is also part of the US Federal Aviation Advisory Committee, shares with BW Businessworld his ideas on building an aerospace ecosystem in India, the role that Lockheed Martin can play in bringing the scale of innovation, technology and capability of the next generation, among other things. Excerpts:

The idea that India will have robust aerospace clusters in a decade seems far-fetched. What is missing here?

India absolutely has the potential to become a major aerospace and defence player. We see tremendous strength and opportunity in India's defense industry both private and public. We are actively looking for strategic Indian industry partners across the country Indian companies of all sizes, including micro, small & medium enterprises (MSMEs) and suppliers throughout India to collaborate and explore security solutions unique to India.

Our proposed partnerships with Indian industry on the F-21, Naval Utility Helicopter (NUH) and other programs for the Indian Air Force and Indian Navy will put India at the epicentre of the world's largest defence ecosystem and deliver unmatched defence-industrial opportunities.

Just recently, the DRDO and Indian Navy achieved a major milestone with the successful arrested landing of the indigenously-developed LCA Navy Tejas Mk 1 aboard India's INS Vikramaditya aircraft carrier. We heartily congratulate India on this major achievement.

Lockheed Martin's unmanned technologies seem to be taking a giant leap. Will AI, quantum computing and advance machine's autonomous capability redefine the sixth-gen smart fighter jets completely?

Lockheed Martin continues to leverage cutting-edge technologies across its portfolio, including investing in and expanding our AI and autonomy capabilities. AI adds value to almost all our products and systems, supporting both military and commercial customers. Lockheed Martin's unmatched experience designing, developing, producing and sustaining the world's most advanced fighter aircraft platforms positions us to play a key part in defining the future of fighter aircraft.

The internal mechanism for such technology adoption in the country is not yet in place. What must GoI do to harness IoBT?

India is indeed a large IT power and it is poised to take the lead as the world's leading technology innovator. One programme that has been preparing India for this leap is the India Innovation and Growth Program (IIGP), co-sponsored by Lockheed Martin in partnership with the Department of Science and Technology and Tata Trusts. Becoming a global leader in technological advancement does not happen overnight but India has made incredible progress in recent years.

For example, the first ten years of the IIGP focused on building an innovation pipeline and best practices in India. Since then, the ecosystem has matured, which led to Version 2.0 of IIGP launching in 2017 to ensure the continued success of these innovative startups. At Aero India 2019, the Ministry of Defence announced a list of 25 promising aerospace and defense startups. Nine of these were IIGP startups. Several of these startups have partnered with global industry leaders, demonstrating their value not only to those companies but to the world.

Can ADA and DRDO leverage the exponential reach and expertise of Lockheed Martin to fast-track India's quest for fifth-gen AMCA and Tejas Mk 2?

We are certainly open to supporting India's AMCA and Tejas Mk 2 programmes should the Indian government ask us to do so. Our F-21 proposal for the Indian Air Force would be a key enabler of close collaboration on advanced fighter aircraft. The F-21, in concert with India's Rafale and Tejas, will fill an operational gap and be a game-changer for the Indian Air Force, Indian industry, and India-US strategic ties.

What is the update on Lockheed Martin's proposal for MMRCA 2 and the technical evaluation for F 21?

The F-21 will meet all of India's performance, capability and advanced technology requirements, and provide unmatched opportunities for Indian companies of all sizes and suppliers throughout India. The F-21 delivers an advanced single-engine, multi-role fighter at the most optimal life cycle cost for the Indian Air Force, with the longest service life of any competitor – 12,000 flight hours. An F-21 partnership integrates India into the world's largest and most successful fighter aircraft ecosystem – a \$165 billion market.

We designed, developed and produced the world's first operational stealth aircraft and the world's only two current operational fifth-gen fighters.

The offset policy which is global standard for technology assimilation has failed to contribute any significant capability, especially in aerospace in India. What is the way out?

This is ultimately a question for Indian policymakers to decide, based on their unique requirements. Otherwise, Lockheed Martin has been diligently discharging its offset obligations in India since 2009. This has delivered extensive economic benefits through investment, skills training, transfer of technology and exports. Our successful joint ventures in India have been a key part of helping India achieve its goal of developing an aerospace and defence supplier ecosystem.

What can we expect from LM in 2020 for Indian aerospace?

We are committed to strategic, long-term international defence partnerships with India. We hope to strengthen and grow our relationship with India as part of an unprecedented F-21 fighter aircraft partnership "For India, From India."

<http://www.businessworld.in/article/We-Are-Open-To-Supporting-India-s-AMCA-And-Tejas-Mk-2-Programmes-Vivek-Lall-Lockheed-Martin-Aeronautics/29-01-2020-182928/>

Blending science, entertainment

Bhubaneswar: The 10th edition of Wissenaire-2020, the annual techno-management fest of IIT Bhubaneswar, is all set to begin January 31. The theme of the three day mega fest is ‘Cosmic Expeditions: Astounding Odysseys Ensuring Humanity’s Existence.’

The opening day of Wissenaire will be graced by Manas Kumar Mandal, Director General (Life Sciences), DRDO, Ministry of Defence, the chief guest on the occasion, who will inaugurate the festival.

This year’s Wissenaire will showcase exhibits from the DRDO, the Indian Army and various other gadgets and innovations with a series of talks on the second day tagged ‘TekNite’ by industry specialists Abhinay Bhasin (Director, Data Sciences, Dentsu Aegis Network) and Gururaj Rao (Systems Chief Engineer, IBM Systems).

R.V. Raja Kumar, Director, IIT Bhubaneswar, said, “With greater influx of capital pouring into this new frontier of modern-era research, we have witnessed enormous strides in technology that promise to secure an optimistic prospective. What excites IIT Bhubaneswar the most about space technologies is that it’s an opportunity for us to put the best of humanity forward into the future.

This apart, there are various attraction in terms of entertainment. The second day of the fest will see funny gigs performed by *Comicstaan* fame stand-up comedian Shashwat Maheswari.

The biggest catch of this year’s event will be the performance of youth sensation and popular singer Dhvani Bhanushali. Several workshops pertaining to latest standards and topics such as Mercedes Engine Analysis, IoT with Google Assistant, Hexapod, Big Data & Data Analytics and Bridge Design among others will be conducted during the fest.

<https://www.orissapost.com/blending-science-entertainment/>