Vivekananda International Foundation

Synergizing Aspirations

Producing Indian's Own Civil Passenger Aircraft

Gp Capt (Dr) Asheesh Shrivastava

VIF Brief

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With effect from January 01, 2025, the new act; 'Bharatiya Vayuyan Adhiniyam-2024[1]" comes into force. It replaces the 90 years old British era 'Aircraft Act 1934'. Earlier, in August, 2024, the Minister for Civil Aviation Shri Kinjarapu Rammohan Naidu had presented the bill in Lok Sabha and thereafter in the Rajya Sabha during the winter session. The passing of the bill by voice vote in the parliament signifies its acceptance across the political spectrum. Indeed, a historic achievement for the Indian Aviation Sector, as for the first time the words design and maintenance have been introduced in the legislature. It is believed that the new act would promote indigenisation and encourage innovation in civil aviation sector, which till date was dominated by foreign entities. However, will these initiatives of the Ministry provide the required **tailwind** to design, develop and produce our own **Civil Commercial Aircraft**? This article details the design requirements for the aircraft that the nation desires to produce under Regional Transport Aircraft scheme. It also examines the national vision on how to produce this aircraft and dovetail it to meet the emergent need of providing air connectivity under mission RCS-UDAN[2].

Aircraft Manufacturing in India

According to the IMF report 2024, India is the fifth largest economy of the world. The graphics (figure 1) compares the size of world's top

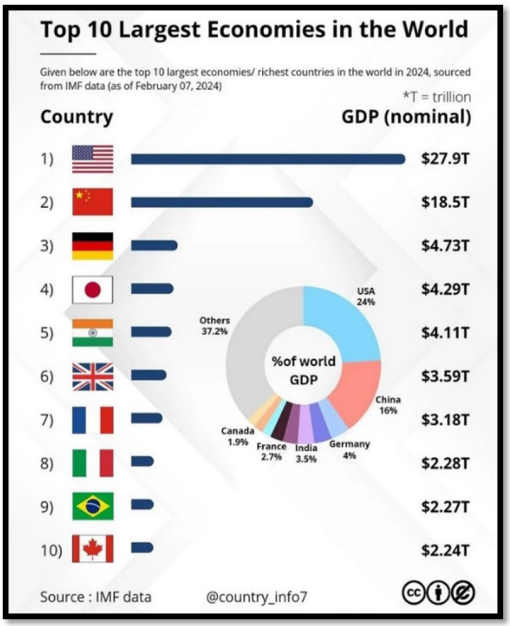

Figure 1: Size of top 10 World Economies. Courtesy: Facebook

ten economies[3] as in February, 2024. India was ranked fifth largest and at current growth rate poised to soon reach third position. However, it is very important to note that ***India is the only nation amongst this elite club of top economies as not having it's own Civilian Aircraft.*** Although, it has been producing indigenous fighters, transport aircraft, helicopters and other aerial platforms for defence sector, but could never produce a passenger aircraft for the civil aviation sector.

Historically, the strength on Indian aviation sector has always been measured by the capabilities of its organizations like the National Aeronautical Agency (CSIR-NAL) under Department of Science & Technology, Aeronautical Development Establishment (ADE), under the Defence Research & Development Organization and Hindustan Aeronautics Limited (HAL), under the Ministry of Defence.

These establishments have over the last few decades designed, developed and manufactured world-class, cutting-edge aviation products for the Indian Armed forces. Indigenously designed and developed aircraft like the two-seater Pushpak[4] (year 1958, figure 2), four-seater Krishak (year 1959) and single-seater Basant (year 1972) were hugely successful and also produced for the civil sector during the last century. However, in this decade, India's fixed wing capability demonstrator aircraft like the Hansa and Saras have had limited acceptance in the civil aviation sector.

HAL's rechristened 19-seater Hindustan-228 (Do-228) and 11-seater Advance Light Helicopter ALH Mk-I are today the only indigenous machines flying commercially under civil license. ***Although India had made reasonable attempts in the past to build its own commercial aircraft, but it is still maturing after seven decades.***

Figure 2: Privately owned Civil Pushpak in UK.
Courtesy: Ruth AS

Growth of Indian Civil Aviation Sector

India's aviation sector has witnessed phenomenal growth and presently evolving as one of the largest and most dynamic markets. Globally, it is the fastest growing aviation market and presently, the 3rd largest by volume in domestic segment. In the last decade, the number of aircraft in India have increased from 400 to over 800 and airports have grown exponentially from 74 to 157[5]. The government's ambitious initiatives like the RCS-UDAN (Regional Connectivity Scheme- Ude Desh ka Aam Nagrik) have enhanced regional connectivity by expanding airport infrastructure. These efforts have integrated remote areas with the international aviation network thus creating a healthy ecosystem for economic development, innovation and job creation. The efforts of the policy changes are reflected in the fact that the domestic airlines have ordered over 1000 aircraft during the FISCAL 2023-24. The confirm orders for new aircraft placed by domestic carriers is tabulated as figure 3. India's aviation landscape is definitely poised for an exciting future, marked by sustainability, collaboration and technological advancements**.**

Sl No	Seating Capacity	Aircraft Type/ Model	Operators (New Orders)	Total
1.	400-480	A350-900/ 1000 (XWB)	Air India	40
2.	350-400	B777-9	Air India	7
3.	240-250	B787	Air India (20), Vistara (2)	22
4.	220	A321 Neo	Air India	70
5.	180-210	B737 Max	Air India (190), Air India Express (7), Akasa (53), Spicejet (2)	252
6.	140-170	A320 Neo	Air India (140), Air India Express (27), Indigo (500), Go First (18), Vistara (8)	693
7.	40-50	ATR-42-600	Alliance Air (2)	2
8.	9-19	DHC-6, Twin Otter	Flybig, IndiaOne Air (3)	3

Figure 3: Confirm Orders placed by Indian Operators with AirBus[6], Boeing[7] & other OEM

From figure 3 it emerges that the favourite new order inventory amongst the operators is the narrow bodied, highly fuel-efficient A320/321 and B737 aircraft. These have a seating capacity 140-220, depending on class configuration, and fuel-efficient range of 1000-1200kms. *However, when seated at full capacity and depending on the altitude of the airfield they would require a runway of over 2.5 km to operate.* According to the Original Equipment Manufacturer (OEM)[8], the aircraft-airfield compatibility requirements for these aircraft are as tabulated in figure 4.

Aircraft Type	Wing Span	Main LG Wheel Span	Max Take-Off Weight	R/W Length	ICAO Ref Code
Airbus 321/320 Neo	35.8m	8.97m	97.0T	2.3-2.8 Km	4C
Boeing 737 Max	35.9m	7.0m	82.6T	2.5-3.0 Km	4C

Figure 4: B-737 and A-320 can be operated from 4C or larger Airports

Aircraft for UDAN

UDAN is a highly acclaimed scheme of the Indian Government for the Indian Aviation Sector. The term was coined on 27 April 2017[9] by the Honourable Prime Minister Shri Narendra Modi while inaugurating the first flight between Delhi and Shimla under this scheme. Domestic operators, regulators and media regularly deliberate the generous incentives under this scheme.

The UDAN initiatives are granted under this flagship program of the Ministry of Civil Aviation (MoCA) to contribute towards regional growth. As per ICAO, the aviation sector is perceived to have an economic growth multiplier of 3.25 and employment generator multiplier of 6.1[10]. Promoting Small Aircraft Operations was the rationale behind RCS and key element to reach out to over 400 small remote area airports. The regulators understood that connectivity to small/ tier-3 cities having stage-length route below 350 Kms from big cities would typically have a traffic density of below 20 Passengers. Therefore, the concessions under the scheme were typically designed as per seating capacity of aircraft, Category-1a for below 9-seater, Category-1 for 9–20-seater, Category-2 for 20–80-seater and Category-3 for > 80-seater. Since its launch in 2016, the scheme has encouraged airlines to operate on regional/ remote routes through enabling policies and financial incentives.

The first list of airports under UDAN 1.0 was released in December 2016. It included 16 underserved airports and 398 unserved airports, totalling 414 airports. By March 2017, over 128 routes were awarded to five airlines. Viability Gap Funding (VGF) on airfare was also provided by the Ministry to the operators, which was about 1.5 to 2 times the maximum chargeable airfare to the passengers. The preferred aircraft by the operators were the 72-seater ATR and 78-seater Q400 under Category-2, 18-Seater Do-228 and 18-seater M-28 helicopter under Category-1. The routes connected 36 newly operationalized airports with metro cities across India[11]. Later, MoCA added another 73 airports to the list, including helipads, seaport

for seaplane operations and tourist hotspots in coordination with Min of Tourism. The aircraft size criteria for VGF was also relaxed. However, until the launch of UDAN 4.0, only 26 RCS routes were served by small Category 1/ 1a aircraft and connecting just 12 small/ remote airport/ cities[12].

Figure 5: Inauguration of Seaplane Services from Kevadia.
Courtesy: Bhupendra Rana, Indian Express

In August 2023, six years after its launch, the Controller & Auditor General of India (CAG) tabled its audit report on the RCS-UDAN scheme before the parliament. It brought out that as in March 2023, only 174 routes out of 774 routes awarded by MoCA under UDAN were operational[13]. It also highlighted that although operations stared on 371 but only 112 routes (30%) completed their full concession term of three years. Out of these 112, only 54 routes which connected 17 RCS airports could sustain operations beyond the concessional term. *Thus, projecting a success rate of only 7% i.e. 54 out of 774 routes were operational for six years, signifying its economic non-viability without VGF*. Similar underutilization was also observed in respect of helicopter operations. Of the 83 routes connecting 31 heliports identified and awarded, operations could commence only on 34 routes (41%) connecting nine heliports. Later, within less than three years, operations were discontinued on 14 routes and four heliports. Signifying, that inspite of bold initiatives, ***the government found limited eagerness amongst operators to reach out to new/ small airports with commuter aircraft.***

Later, under UDAN 5.0, the GoI decided to provide greater impetus to Category 2/ Category 3 aircraft rather than Category 1/1a aircraft. It also removed the cap on stage-route distance of 600km and prioritized connection to already operational airport. With this the GoI expected to

enhance connectivity to smaller towns. Concurrently, special additional benefits were also provided to small aircraft operators (< 20 seats) under UDAN 5.2 & 5.3 to achieve last mile connectivity from places of tourist interest. The ministry also provided opportunities to small regional airlines like Flybig, Star Air, IndiaOne Air and Fly91 to scale up their businesses, in order to meet their expectations under RCS.

However, in order to serve these RCS routes, the operators require small aircraft/ helicopter like the ATR 42, Bombardier Q400, DHC-Twin Otter, Tecnam P2006T, Cessna 208B, Grand Caravan EX, Dornier 228, Airbus H130, Bell 407 helicopter, etc. Unlike the *big jet produced by Airbus and Boeing, the rate of production for regional jets/ small aircraft is very limited.* According to media reports, ATR currently has a backlog of over 2-3 years on new deliveries due production and supply line constraints[14]. While DHC-6 Twin Otter would take over 2 Yrs to fulfil orders for its new Series 400 variant.

Important Relationship between Airports, Aircraft Type and VGF under UDAN 5.3

The UDAN 5.3 was launched in January 2024, and is a much-refined version of the original scheme. It is a well-researched policy built over an experience of seven years and addresses most of the limitations of the earlier policies. MoCA rightfully acknowledged that different aircraft operated over the same stage lengths could have different cost of operations, due to differences in inherent economics of aircraft types[15]. The scheme includes 28 Underserved & 281 Unserved airports, 23 Water Aerodromes and 482 Heliports. However, out of 309 airports over 263 airports bear ICAO reference code 1C/2B and thus capable of handling small commuter aircraft having below 20 seats. Similarly, 22 out of 23 water aerodromes would require to be served by small seaplanes.

By design, small Cat 1/1a (below 20-seater) aircraft are low on acquisition and maintenance cost, but very high in terms of operating cost. A 19-seater

Do-228 consumes three times more fuel per passenger per kilometer than a 180-seater Airbus A320neo, under similar operating conditions. Therefore, the VGF provided to both these aircraft can not be same. Considering this specific distinctiveness of operations, for the first time the rate of VGF for Category 1/ 1A and Category 2/ 3 aircraft over the same stage length has been varied. Figure 6 tabulates the variation in VGF for different category of aircraft operating over same distance/ route length.

Stage Length	Cat 1/1A Aircraft	Cat 2/3 Aircraft
1 -50	2,265	3,023
51-75	4,044	3,420
76-100	5,229	3,680
101-125	6,440	3,941
126-150	7,625	4,203
151-175	8,811	4,464
176-200	9,855	4,602
201-225	10,902	4,740
226-250	11,931	4,864
251-275	12,974	5,082
276-300	14,022	5,455
301-325	15,051	5,814
326-350	16,097	6,186
351-375	17,142	6,559
376-400	18,171	6,917
401-425	18,171	7,290
426-450	18,171	7,664
451-475	18,171	8,022
476-500	18,171	8,395
501-525		8,890
526-550		9,248
551-575		9,605
576-600		9,964
>600		9,964

Figure 6: Variation in VGF as per Aircraft Type (UDAN 5.3)

It is expected, that these subtle changes in VGF policy would provide a positive and sustainable impetus to small regional carriers operating with small aircraft to offer better fare and services to regional commuters. In view of these positives, it is implicit that, ***small highly efficient regional jet operative from small runways, would be an ideal choice for providing affordable connectivity to Indians*** residing at or visiting remote locations under the UDAN scheme.

History of Indian Regional Transport Aircraft.

The pioneering idea of developing an indigenous transport aircraft was made public in early 2007. It was reported that Hindustan Aeronautics Limited (HAL) and the National Aerospace Laboratories (NAL) were planning to jointly design and develop a 70-seater civil regional aircraft. The transport aircraft was to be developed within six to seven years and have a range of 600-800 Kms. The engine could have been supplied by Pratt and Whitney (Canada) or General Electric (US). It was estimated that given the trajectory of growth of air travel in India, over 400 new aircraft

would be required over the next 15-20 years. The HAL-NAL designed Regional Transport Aircraft (RTA-70) was meant to ply short-haul routes and compete with French-Italian aircraft maker Avions de Transport Regional (ATR). Later, on 29 February 2008, Dr Kota Harinarayana, from NAL presented an overview of the RTA program to an august gathering of senior functionaries from CSIR, DRDO, DAE, etc. The RTA program caught national attention in August 2008, when Dr APJ Abdul Kalam said that India could produce its own 70-seater passenger jets by 2020[16]. However, a few days later in September 2008 Defence Minister A.K. Antony directed state-owned Hindustan Aeronautics Ltd to undertake the project with foreign collaboration. It was also decided to increase to seating capacity from 70 to 110 and range from 800kms to 3000kms.

Notwithstanding the constant deviations on desired/ design specifications, NAL worked on the conceptual design and launched the Project Definition Phase for a 90-seater RTA in April 2022. This year, during April 2024, NAL presented a Detailed Project Report on its proposal to the Min of Civil Aviation, concluding 15 years of exhaustive discussions and research studies. The computer-generated image of Indian RTA as conceived in Detailed Project Report submitted to GoI in year 2011-12, is as shown in figure 7. Since than scientist, designer and aeronautical engineer have been speaking and presenting their ideas of the Indian RTA but the dreams of the former President is yet to become a reality.

Figure 7: AI Impression of CSIR-NAL RTA

Satisfying National Aspiration: Designing RTA for RCS

Honourable Minister for Civil Aviation Shri Kinjarapu Ram Mohan Naidu while addressing an industry event organized by PHDCCI said that his ministry is in the process of creating Special Purpose Vehicle (SPV) comprising industry stakeholders which will work towards the development of indigenous passenger aircraft in the country. He elaborated that the government would like to engage with the private sector towards the development of this aircraft. Global aerospace majors have also expressed strong inclination to partner with Indian firms for the development of such aircraft[17]. This statement by a dynamic ministry from a go-getter government could be considered as a serious relaunch of an idea which is over two decades old. However, the core issues still remain, **what to produce and how to produce**. *India may need a blend of talents of Dr Vikram, A Sarabhai and Nambi Narayanan to manoeuver its way into the elite club of countries capable of designing, developing and manufacturing passenger aircraft.*

What to Produce? Performance Requirement for Indian RTA

Roger Béteille, mentor of aviation industries' most successful revival program the *Airbus 320*, said before commencing work "I wanted to try to understand what the customers really wanted[18] before developing the aircraft". During the early 1970's Airbus was in tough competition with American giants the Boeing and McDonnell Douglas. To beat this, Airbus decided to design a versatile single-aisle narrow-body airframe which is lighter and more efficient than its American competitors. By 1977, consortium of European aircraft makers commenced the JET (Joint European Transport) program. Sweden's Saab, Germany's MBB Messerschmitt-Bölkow-Blohm, British Aircraft Corporation (now British Aerospace), Aerospatiale, Dornier, Fokker, and Spain's CASA were active stake holders to develop a 180-seater aircraft. The group designed many variants, the smaller versions A318 and A319, the most fuel efficient A320neo, the long

range A321LR, A321XLR. These derivatives could be designed, certified and produced rapidly because, the initial design of 320 was highly adaptive and flexible as regards changes to length of fuselage and choice of onboard engines. The market variants of the basic airframe are illustrated in figure 8. Incorporating subtle changes to basic structure, Airbus could deliver an aircraft satisfying customers' requirement of range and seating capacity without major changes to cockpit layout and design of wings[19]. A similar concept was adapted by ATR for their 42/ 72-seater variants.

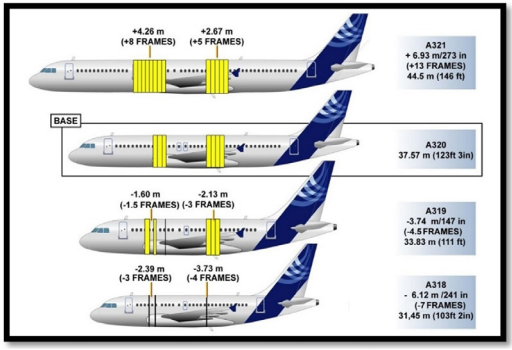

Figure 8: Design Variants of Airbus A320

Drawing a leaf out of the success story of A320 and the emergent desire to provide low-cost regional connectivity under UDAN, it is suggested that country adapts a staircase approach to aircraft design. To start with, designers could aim at developing an aircraft which is capable to reach out to all the **332 airfields and water aerodromes** listed under UDAN 5.3. For this, the design requirements catering to limited availability of real estate at such airfields could be drawn from the following tables. Figure 9 define the aircraft size restrictions on airfield for safe handling. ICAO reference code[20] is assigned to an airfield based on the length and width of airstrip. The location of the airfield also limits the type of aircraft that can use the airfield. The

First Element			
Code (number)	Aeroplane reference field length		Typical aircraft type
1	< 800 m		Piper PA-44, DHC-6 Twin Otter
2	800 m to <1200 m		Dash-8, ATR-72
3	1200 m to <1800 m		Canadair Regional Jet
4	>1800 m		Airbus A321, Boeing 747
Second Element			
Code (letter)	Wingspan	Outer main gear wheel span	Typical aircraft type
A	< 15 m	< 4.5 m	Piper PA-31, Cessna 206
B	15 m to < 26 m	4.5 m to < 6 m	CRJ-200, DHC-6 Twin Otter
C	24 m to < 36 m	6 m to < 9 m	Boeing 737, Airbus A320 series
D	36 m to < 52 m	9 m to < 14 m	Airbus A300, Boeing 767
E	52 m to < 65 m	9 m to < 14 m	Boeing 777, Airbus A330
F	65 m to < 80 m	14 m to < 16 m	Airbus A380, Boeing 747

Figure 9: ICAO Aerodrome Reference Code Table

aircraft category is assigned according to its manoeuvrability, rate of climb/ descend, approach speed, etc which are integral part of its design/ performance parameters. From the code table the following can be inferred as regards the design parameters and capabilities for the proposed RTA.

i. It should be capable to land/ take off from an airfield of length below 1.2 Kms
ii. Airstrip length restriction with maximum payload and from pressure altitude of upto 4,600ft ASL for example Pakyong, Sikkim
iii. Wing span below 25 Mtrs
iv. Tail height below 5 Mtrs
v. Approach IAS (Indicated Air Speed) at approach below 224 Kmph (120 Kts)
vi. Rate of climb above 800-1000 Mpm

Additional desirable operational features required to capitalize on potential capability gaps in market. These features are currently not offered by similar aircraft from established OEMs.

i. Ability to operate from Water aerodromes (Availability of floatation device) amphibious capability.
ii. Pressurized and air-conditioned cabin for passenger comfort, use for Medevac and high altitude flying.
iii. Flexibility in design of main fuselage, extendable central section.
iv. Light weight glass cockpit with essential avionics for IFR capabilities.
v. Flexible seating capacity with variable size cargo compartment.
vi. Light weight Composite Wing design
vii. Integrated High lift devices on wings for Short Take Off and Landing (STOL) capabilities
viii. Ability for optional use of engines and propellers from various OEMs including indigenous Turboshaft Engine
ix. Minimum Cabin height 1.8 Mts and width 2.0 Mts
x. Design variants/ changes (to length of fuselage) as per industry standards and regulatory requirements. The Max Take Off Weight (MTOW) and seating capacity for differed variants could be designed considering the following.
    - MTOW below 8,618 Kgs (19,000lbs) with seating capacity upto 19 passengers as per "EASA CS-23 Certification standards for

Normal Category Aeroplanes".

- MTOW below 8,618 Kgs (19,000lbs) with above 19 seats.
- Avionics/Navigation equipment and CVR/FDR recorders as per requirements of "ICAO Annex 10/ annex 6" for MTOW below 5,700 Kgs/ 19-seats and
- Avionics/Navigation equipment and CVR/FDR recorders as per requirements for MTOW above 5,700 Kgs and below 27,000 Kgs

What to Produce? RTA for Civil Vs MTA for Military.

According to the Flight Global, 2024 World` Air Force directory[21], there are over 53,400 aircraft in active service with the armed forces of 161 nations. Out of these, about 4,273 are fixed wing transport aircraft and 805 Tankers. A closer look at the global inventory of military aircraft suggests that the share of Civil Transport Aircraft Design in Military aviation is just 1.8% (980/53400) which includes old and refurbished airframes.

Sl No	Fleet	Role	In Active use
1.	All World Air Forces	Fighter, Transport, Tanker, Trainer, Helicopter, Spl Mission, etc	53,400
2.	Fixed Wing Transport	Troop Transport, Trainer	4,273
3.	Refurbished	Tanker	805
Fleet-wise strength of Civil Utility Transport Variants in Military FWT			
(i)	King Air	Surveillance & Marine Recognizance	220
(ii)	King Air	VIP transport and Training	288
(iii)	B-737	Spl Mission (AEW/ MPA)	177
(iv)	B-737	VIP Transport	30
(v)	B-747	Tanker	3
(vi)	B-767	Tanker	83
(vii)	A-330	Tanker	51
(viii)	A-310	Tanker	2
(ix)	DC-10	Tanker	20
(x)	Do-228	Communication duties/ MRP	106
Total:			980

Figure 10: Inventory of Fixed Wing Transport Aircraft with World's Air Forces. Courtesy: Flight Global

From figure 10 and detailed analysis of inventory of aircraft held 'by type' with Air Forces across the world, it is evident that ***the operational requirements for Air Forces do not necessarily align with those for the civil aviation sector***. Militaries prefer to use small and light category (ie below 8,618 Kgs) aircraft for surveillance/ intelligence purpose and VIP transport duties. Whereas, for Special Mission/ Airborne Early Warning and long-haul VIP roles, militaries prefer to use medium/ heavy lift aircraft with wide-bodied/ large cargo compartment, rear loading ramp and STOL capabilities. From above, it can be inferred that the design and performance requirements for Military and Civil transport aircraft are widely different and thus very few commercial aircraft ever get inducted into military fleets. *Therefore, considering Indian Armed forces as anchor customer for the RTA program could have limited commercial success*. RTA design should be dedicated to meet the requirements of Civil Commercial market.

How to Produce?

Henry ford had once said, "Coming together is a beginning, working together is success." History is filled with inspirational examples of group of ordinary people delivering extraordinary results due to great teamwork. From the Apollo 11 Moon Landing in 1969 to the Chandrayaan-3 landing in 2023, we realize how the collaborative efforts of selfless, non-attention seeking, dedicated team of people could transcend boundaries and achieve success. Similarly, the India RTA program also needs a dedicated team of selfless people to smell success.

Recently, the Honourable Minister of Civil Aviation had announced that the Government is contemplating the formation of a Special Purpose Vehicle (SPV) for taking forward the RTA project. The constituents and scope of work of the SPV is yet to be announced. This could be a landmark decision towards realizing India's dream to design and produce its own civil aircraft. However, the success of the project can be fathomed from the strength of its team members and the perseverance of its mentor. In the interest of nation, the deliverables should be time bound, therefore

all participants should have considerable revenue stakes in the SPV. All members should commit by contributing equally to the project and sharing responsibilities. Suggested list of shareholders could be as follows:

i. Entities/ organizations currently engaged in manufacture of Aircraft structure like HAL, TASL, Mahindra Aerospace, Dynamatic Technologies Limited, etc
ii. Entities/ organizations currently engaged in civil aviation operations.
iii. Entities/ organizations currently engaged in design/ development and manufacturing of aircraft avionics and major components/ assemblies.
iv. Non-banking sector financial organizations involved in leasing and marketing commercial aircraft.
v. Govt of India/ Ministry could be a major contributor with proportional equity.
vi. State Govt and large Ministries/ Departments of GoI like Home, Highways, Railways, NDMA, etc alongwith participating customers, should act as anchor customer for suitable variants.

Further, consultancy services could be hired for limited period and role. Support from domestic and international research/ test agencies can be taken for designing, developing and testing of specific elements/ components/ assemblies. The team may work on mission mode with declared schedules and targeted deliveries. All efforts should be made to ensure that the design should be ready within 3rd year prototype at 4th year and flight testing to commence with in 5th year.

The Way forward: Synergizing R&D towards fulfilling UDAN dream

India has set the goal of becoming a developed nation by 2047 (Viksit Bharat@2047) and is emerging as world's largest user market for commercial aircraft. Domestic operators have placed orders for over

1000-1200 passenger aircraft and expected to acquire about 1000 more in the coming 20-25 years. Despite having a blooming aviation sector, India has not been able to develop its own aircraft to meet the aspirational needs of the nation. The country has been discussion about developing its own "Regional Transport Aircraft" for over 20 years, with CSIR-NAL being in the driving seat, however it has achieved limited success.

It's time India captures the customers need and dovetails it with the national vision for a truly indigenous commuter aircraft. The project should be designed, developed and manufactured using a Public-Private Partnership model. The base design should also be scalable like the Airbus 320 program. Multiple options for use of foreign and indigenous engine should be integrated into the design. Concurrently, a strict timeline which matches the expectations of the market forces is necessary for the success of the RTA program.

Dr Asheesh Shrivastava is a veteran from the Indian Air Force and presently working with a Maharatana Defence PSU. While in the IAF he was deployed on Russian Military transport aircraft and had undergone specialised training at aircraft facilities at Uzbekistan, USSR and Israel. During his military service he had participated in various exercises in India and abroad. He is an Engineering Graduate with Masters in Computer Application. He also holds a MBA in Operation Management and Doctorate in Aviation Management. He has also been posted as a Research Scholar at CAPS and pioneered the development project on use of indigenous SAF on Indian Military transport aircraft. He received the IAF's Indigenisation Awarded from Honourable PM on 09 October 2019. He has also worked closely with the BIS, Dte of Indigenisation and the Ministry of Civil Aviation towards development, certification and manufacturing of indigenous products for aviation sector. He has published reports, papers, briefs and numerous articles in journals, edited books, magazines, newspapers and academic websites. His research interest includes synergising the growth of domestic Defence-Civil aviation industry.

Endnotes

1. New Act: Bharatiya Vayuyan Adhiniyam replaces Aircraft Act of 1934, Rohit Vaid, January 01, 2025, The Hindu, Businessline. https://www.thehindubusinessline.com/economy/logistics/new-act-bharatiya-vayuyan-adhiniyam-replaces-aircraft-act-of-1934/article69049173.ece#:~:text=In%20a%20gazette%20notification%2C%20the,Minister%20Kinjarapu%20Ram%20Mohan%20Naidu. Accessed on January 02, 2025.
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