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## Distributed Aviation Infrastructure in a Competitive Intelligence perspective:

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### Understanding the socio-economic relevance of airports at Meerut & Jewar

*Pradhuman Singh<sup>1</sup>, Oran Malka<sup>2</sup>, Corelia Kostovic<sup>3</sup>, Dr Neeraj Anand<sup>4</sup>, Bharti Singh<sup>5</sup>,  
Priya Singh<sup>6</sup>*

<sup>1</sup> PhD Scholar UPES & International BDM, Damac Properties, UAE

<sup>2</sup> Former Airborne officer IDF, KMIA, Israel

<sup>3</sup> CI Analyst, Montreal, Canada

<sup>4</sup> Head of Department of Transportation, SBS, UPES

<sup>5</sup> Associate Professor Department of Aviation Management, SBS, UPES, Dehradun, India


<sup>6</sup> PhD Scholar, Department of Aviation Management, SBS, UPES, Dehradun, India

**Email ID- serviceheb@gmail.com**

#### ABSTRACT:

India has highlighted itself on the global aviation space slated to become the 3rd largest aviation market by 2025 as per IATA. India also became the first country to secure direct flights to Israel through Saudi Arabian airspace using its geopolitical leverage, thus bypassing regional conflicts and conventional transportation restrictions. Indians are fast growing as frequent flyers in spite of the challenges being faced by aviation majors the world over. With schemes such as UDAN and NABH Nirman, the world's fastest growing large economy is also set to become an investors as well as aviation startups paradise in the making, given the lower cost of flying and penetration and reach into smaller cities and regions. Not to mention, there has been a sizable jump in the usage of UAVs and drones by military as well as civilian agencies. This has thrown up several challenges not just for military and civil administration but also raised the need for dual and multiple usage of existing aviation infrastructure in the new global security and economic environment. In the light of such developments, there have been speculations for making airports at 2 cities, namely Meerut and Jewar at GB Nagar, which have both been agreed upon, however, the ground work is yet to take off to a significant start. Given the need for multi-modal transport and benefits of amphibian aviation, these two locations, besides being close to New Delhi, also have close proximity to large water bodies that may bring about a sea change in innovating to a level never been done before, except in Canada, where remote locations depend on Amphibian airports that serve as a lifeline between various centers of habitation. This paper explores the applicability of competitive intelligence in analyzing the benefits of socially relevant aviation infrastructure under planning at Meerut and Jewar.

**Keywords:** Aerodrome, Aeronautics, Airport, Aviation, Avionics, Connectivity, Drone, Flight path, Maintenance, Multi-modal, Overhauling, Repair, Trajectory.

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## **INTRODUCTION**

Aviation has been a very essential process in the spectrum of living beings as a mode of transfer, for those who were gifted with organs that could facilitate lift and gliding mechanism. This ability to fly not only was an asset for birds and mammals who flew, but it also inspired human beings to dream and eventually achieve this ability to travel through air. This dream had been much realized in works of mythology where ability and devices to fly have been mentioned across several cultures across the globe. This dream, when realized by the Wright brothers had brought about a new dimension to both the fields of transport as well as warfare and eventually became man's pathway to space exploration.

In the modern times, the discipline of flight has evolved from aeronautical perspective where it was focused on covering nautical miles into the era of aerospace where it became a media for launching satellites and stations into outer space. Air travel, however, accounts for a sizable chunk of touching human lives, all set to become far greater in magnitude compared to any other mode of transport. And India seems no different. Being the largest democracy and a promising aviation market, the infrastructure to support aviation systems and framework leaves much to be desired. On the forefront are challenges that also plague its largest airport at New Delhi known as Indira Gandhi International Airport with a domestic, international, cargo and military aviation component. In this point of time, the volume of air traffic demands that there is a need to have complementary aviation infrastructure of dual airports just like New York has JFK and Newark airports. This is also seen in case of London having Heathrow and Gatwick airports. Also, it has been seen in the UAE which has 2 airports at Dubai and Abu Dhabi, plus the upcoming mega aviation infrastructure of Al-Makhtoum airport for Expo 2020. This brings us to look at two potential aviation centers of Meerut and Jewar in the light of new global developments.

## **I. OBJECTIVES**

The first objective is, to understand the relevance and utility of having supplementary and complimentary airports alongside a major aviation infrastructure. In this case, we have focused on Meerut and Jewar for being in the news as well as geographically and economically viable aviation hubs.

The second objective is, to understand from Competitive Intelligence point of view, the viability of choosing either or both or none using Analysis of Competing Hypothesis.

## **II. LITERATURE REVIEW**

Singh , Rakesh , Yadav & Singh (2016) study the advances and prowess established by agricultural practices in Western Uttar Pradesh and how floriculture had become a mode of earning. More importantly, how aviation based can help the agro supply chain given the recent demand in cut flower production at Meerut has been a reason for establishment of an airport [1].

Sexton, Dean, Ghaswala, & Konyi (1948) had studied the hangar at Karachi in which later became a full-fledged airport and how it led to the growth of city as a center of economy and commerce for

Pakistan. This model is worth emulating in several other smaller cities in South Asia [2].

Shah (2018) had deduced having studied the socio-economic factors within Gautam Buddha district to establish the reasons as to why the Jewar airport in all its likelihood will become a hub of aviation activities in the region. This will add a shot in the arm of the economy of National Capital Region and help in environmental perspective as well [3].

Raghuram & Mehta (2011) conclude that not only fighter aircrafts which are of much smaller stature in terms of sizes but also conventional passenger jets can be accommodated to land on expressways and thus can help build a true multi-modal multi-use infrastructure in the longer perspective. The Yamuna Expressway has demonstrated the landing of combat aircrafts and thus the new expressway stretches can be built to accommodate the landing of larger and heavier aircrafts [4].

Raghunath (2010) explores the trend of Airport privatization in India in the light of new developments that have taken place in the global as well as local aviation passenger's requirements. This has led to creation of new investment opportunities not only in aviation technology but also in hard aviation infrastructure as well, especially in smaller cities [5].

Kumar (2019) dissects the concept of smart city implementation in conjugation with a functional airport within an urban zone. In order to actualize and meet smart regional aspirations in the National Capital region, a single airport at Delhi alone may not suffice to meet the growing connectivity issues [6].

Sharma, V. (2009) asserts that business opportunities can be created using Public Private Partnerships and newer models that engage aviation assets to bring about serious inclusive Rural Development thereby enabling new businesses to come up and flourish [7].

Jain & Korzhenevych (2017) concludes that serious spatial disparities exist in terms of Transportation Infrastructure which can only be addressed with overhauling and implementation of a decentralization plan as a part of policy making process in the national capital region. Aviation is one of the central components and it must be done in complementation with rural-urban aviation connectivity on all fronts [8].

Vasudevan (2013) observes the life on a working professional in an urban environment of the satellite towns in India such as Noida and Gurgaon. Fast developing as centers of business and trade, some of the load on services must be transferred to sub satellite towns and outer NCR to address major bottlenecks that these cities face [9].

Bonnefoy, De Neufville & Hansman (2010) ponder over the evolution and development of multi-airport systems in the local as well as global perspective. Aviation must not be limited to a small section of people who can afford it but also be extended to the masses for whom that can bring about an economic as well as socio-psychological change [10].

Bagler (2008) analyzed the distribution of the airport network in India as a complex weighted network using various statistical tools deduced that there is a large scope for greater efficiency without increasing the cost of operations [11].

Hooper (2002) surveyed the trends in privatization of airports in Asia with a stress on India and China

including the growth centers of Singapore, Dubai and Hong Kong [12].

Raguraman (1998) concludes that inspite of having major scope for trade and tourism, India lags behind due to a poor infrastructure in terms of connectivity and reach. This has proven to be a major deterrent for investments and foreign exchange coming from visitors. Building smaller airports may do away with the need to build roads and work in the short term perspective [13].

Panagariya (2007) carries out a comparative analysis between the economies of India and China and suggests a path that takes the aviation route instead of focusing on road, rail and water based transport systems. It would involve lesser investment and much higher returns as demonstrated in case of Canada in specific and Australia in general [14].

Saraswati (2001) deduced that the operating environment for a civil aviation industry in India has no other way to make profits until and unless it provides low cost operations on smaller routes and make air travel as easy for the masses as rail or bus transport [15].

Abeyratne (2018) examines the facts that have emerged in the recent times where aviation had become a tool of state policy and diplomacy. The biggest example is the breakthrough made where India managed to convince Saudi to allow flights to Israel over its airspace, in spite of the Arab-Israel conflict on several issues. This is the power of air transport taken to another level [16]

### III. METHODOLOGIES

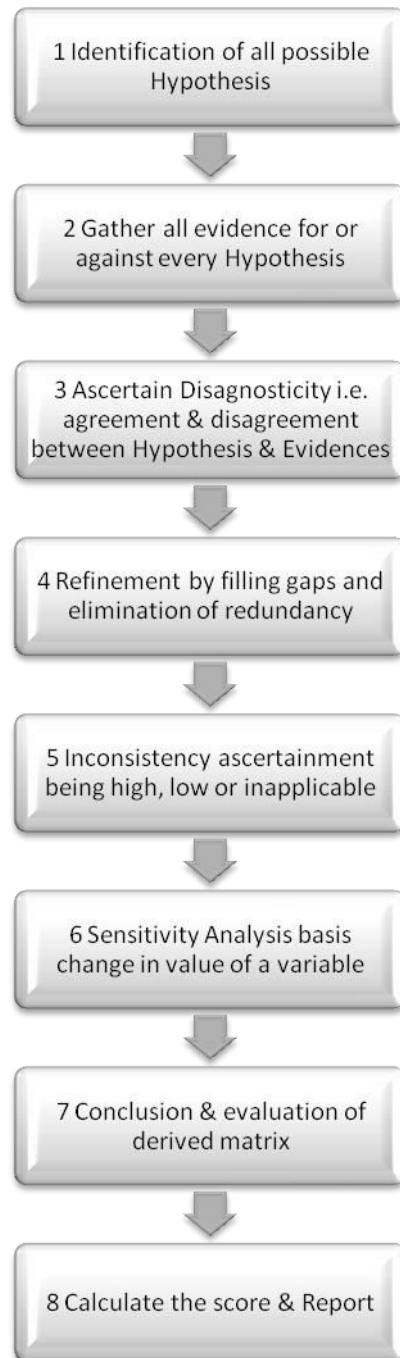
In case of first objective, secondary analysis is carried out based on information available in published, printed, telecast or web domain. The approach is observational driven and uses qualitative analysis without quantifying any variables.

This leads us to the second methodology with is called Analysis of Competing Hypothesis (ACH) which uses parameters of Relevance, Credibility and Consistency to reach the most precise and highly likely scenario bearing in mind various competing evidences that rise. This is by far most reliable tool available, originally designed by the National Security Agency of the United States in the 80s basis a Central Intelligence Agency Director Richard J. Heuer's own research which helped him make robust decisions in the times of crises [17].

Open source Intelligence (OSINT) has been used from field to provide inputs for the ACH matrix. The civilian version used by aerospace, defense and energy majors is used provided by Palo Alto Research Center (PARC) California, United States.

#### IV. RESEARCH DESIGN

Analysis of Competing Hypothesis uses an 8 step approach. This can be explained by the help of the following flow diagram:-



**Fig. 1: 8 Steps followed in analysis of competing hypothesis**

## V. ANALYSES & FINDINGS

4 Key Hypothesis were identified.

H1 : Delhi airport is sufficient to meet present and future needs

H2 : Additional airport at Jewar alone is sufficient

H3 : Additional airport at Meerut alone is sufficient

H4 : Additional airport at Meerut and Jewar each is necessary for National Capital Region.

Credibility and relevance were measured in following degrees.

HIGH

MEDIUM

LOW

Consistency/ Inconsistency score was evaluated on

Consistent [C]

Highly Consistent [CC]

Not Applicable/Neutral [N]

Inconsistent [I]

Highly Inconsistent [II]

5 Key evidences using OSINT were identified

E1 Dual & Triple use of aviation infrastructure

E2 Absence of dedicated aviation cargo systems

E3 Lack of true aviation enabled multi-modal infrastructure

E4 Limited R&D in aviation tech

E5 Insufficiency of Singular airport at Delhi

After punching in the inputs, H3 & H4 had shown the minimal inconsistency score. H1 scored the maximum inconsistency.

This implies that Delhi does need a dual airport support system and if it were to chose between Jewar and Meerut, then Meerut may emerge as a better choice vis-à-vis Jewar.

Classification:		Type	Credibility	Relevance	H: 1	H: 2	H: 3	H: 4
Triple Hypothesis Delhi Meerut Jewar					Airport at Delhi is sufficient to meet the present and future needs.	Additional Airport at Jewar alone is sufficient for National Capital Region	Additional Airport at Meerut alone is sufficient for National Capital Region	Additional Airport both at Meerut & Jewar is necessary for National Capital Region
Project Title: Feasibility of airport at Meerut & Jewar								
Available Matrices: Main								
E5 Evidence Link:								
E5 Evidence Notes:								
E5	Single airport at Delhi does not suffice, unlike New York and London which have 2 airports each.	HIGH	HIGH		II	N	C	C
E4	Research and development of aviation technology has been limited in India, thus making vertical lift aircraft and amphibian planes a non-starter.	LOW	HIGH		N	CC	C	C
E3	A truly multimodal transport infrastructure is missing which interconnects inland water based as well as land aviation infrastructure is absent.	MEDIUM	MEDIUM		N	C	CC	C
E2	There is absence of a dedicated cargo airport which can work as a backup for civil and military infrastructure	MEDIUM	HIGH		II	I	C	C
E1	There have been voices within the government as well as private sector for having dual and triple use aviation infrastructure.	HIGH	HIGH		I	C	C	CC

Figure 2. ACH Matrix

VI. RECOMMENDATIONS

In the wake of new developments a few new phenomenon were observed. Instances of military aircrafts landing on expressways have been a very visible sight in the Israeli perspective. This has found much acceptance in India as well [18]. Aviation infrastructure must exist in dual and even triple nature with civil, military and even industrial cargo in tandem.

Even existing military aviation infrastructure that is underutilized in times of peace, may be turned in for civilian usage. This has been visible in case of the civil aviation terminal recently being made operational at Hindon Airforce Station, Ghaziabad [19].

Why H3 is more significant is evident from the fact that Meerut also happens to be amongst the largest cantonments in India and a connecting aviation infrastructure can prove a shot in the arm not just for neighboring cities but sizable military divisions and battle formations [20].

Last but not the least, Meerut and Jewar, both have proximities to large water bodies. Meerut touches Hindon, Yamuna, Ganga and Kali which makes it ideal for a multi-modal transport system including Amphibian aircraft landing base as well as Internal Waterway transportation channel. This may actually prove to be a major boost for agricultural supply chain and agribusiness [21].

VII. LIMITATIONS OF RESEARCH

The research has been done using collaborative efforts of authors which span across disciplines. However, due to geographical constraints, certain areas could not be touched.

Factor analysis and conjoint analysis could be implemented for Meerut and Jewar but that was not viable as potential aviation passenger sample was difficult to obtain.

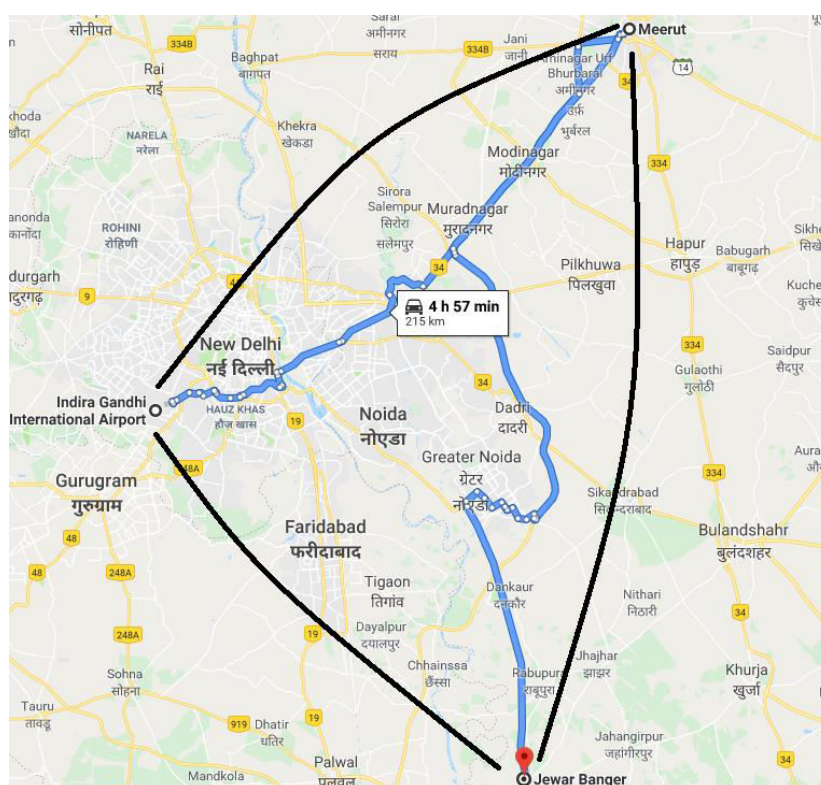
With greater resources, feasibility study as well as contract awarding for tender could also be ascertained, but due to minimal funds, the exercise has been limited to OSINT analysis.

## VIII.SCOPE OF FUTURE RESEARCH

Further research is needed in connecting smaller towns and category B & C cities. In case of Canada, which depends highly on aviation infrastructure for connectivity of its far flung region, reduction of cost is a factor that India could prove of major utility.

A large startup ecosystem for aviation technology exists in Israel which could prove to be a shot in the arm for Indian aviation majors from public as well as private sector organizations. This is not only the best low cost option, but also very suitable for make in India application directly.

Not just triple use infrastructure, but also waterways access must be provided to the aviation infrastructures. This would increase connectivity and bring down the cost by a huge margin.



**Figure 3. Delhi, Meerut & Jewar at a glance (adapted from Google Maps)**

## CONCLUSION

Research is the foundation of innovation and technology which lead to the progress and development of mankind by making lives better. Given the advent of renewable energy such as solar and wind, aviation can gain from the advances and built platforms that are sustainable, environment friendly and contribute to inclusive growth which means access to aviation transport for even weaker sections of the society.

Similarly security and safety are primary concerns with new developments occurring in various parts



of the world which makes aviation business take a note and take up measures that ensure that its platforms are not compromised for clients as well as service providers.

In the end, the joy of flying is in soaring high.

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