Need Based Segmentation of Airport Passengers : The Case of Rajiv Gandhi International Airport, Hyderabad

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Abstract

Airport privatization models have largely been successful due to reliance over non-aeronautical revenues from retail, parking, and a host of other services which an airport offers. In this context, it becomes important for airports to understand their customers and tailor their marketing efforts according to these customers' requirements. A need-based segmentation is a first step towards this effort. An empirical research study of passenger travellers of Rajiv Gandhi International Airport (RGIA), Hyderabad, India was conducted in October 2014, and data was collected about the importance of passengers' needs. A survey of RGI airport passengers returned 502 valid responses. Using SPSS 21, empirical data analysis was done through Cluster Analysis to determine the market segments of RGIA air travellers. The market segments were further analyzed using cross tabulation with the demographic data of the passengers to obtain specific profile and main characteristics of the different segments. It was revealed that most of the top-ranked needs of all the passenger segments were similar with regard to primary core needs, but varied with respect to non-core needs. This study also located the 'needs' gaps which can be effectively exploited to maximize the non-aeronautical revenues.

Keywords: **customer segmentation, customer needs, airport infrastructure facilities and services**

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In India, airport development has been earmarked as a development priority of civil aviation infrastructure. Initially, two airports have become operational as the country's first ever greenfield airports under the public-private partnership model and several other airports are planned to be developed in the PPP mode. More than ₹ 87,714 crores total investments are earmarked for airport development during the 12th plan period (2012 – 2017) (Planning Commission, Government of India, 2012).

Rajiv Gandhi International Airport (RGIA) at Hyderabad, India has the unique distinction of being the first of the two greenfield PPP airports to come up in India. This study attempts to understand the different types of passengers passing through RGIA by segmenting them based on their stated importance of airport needs. This is all the more important, in the current scenario, with greater emphasis on non-aeronautical revenues for the private sector airports in which retail and services play a big role. A clearer understanding of the traveller profile can help the PPP airports to suitably market themselves to the different segments that emerge.

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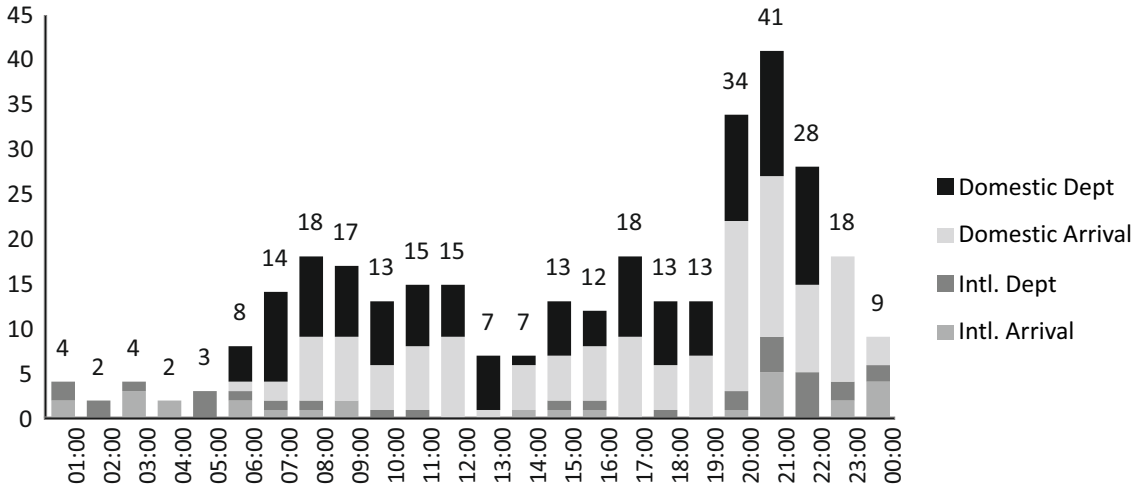
Table 1. Passenger Traffic Data of RGIA

Year (Month: April to March)	Domestic Passengers (nos.)	International Passengers (nos.)	Total (Nos.)
2014-15	7,776,457	2,729,496	10,505,953
2013-14	6,358,189	2,370,067	8,728,256
2012-13	6,282,075	2,084,656	8,366,731
2011-12	6,703,050	1,899,289	8,602,339
2010-11	5,758,608	1,875,557	7,634,165
2009-10	4,793,910	1,700,920	6,494,830
2008-09	4,648,657	1,566,803	6,215,460

Source : Rajiv Gandhi International Airport. (n.d.).

Figure 1. Hourly Flights Handled by RGIA



About RGIA

Rajiv Gandhi International Airport (RGIA), Hyderabad was the first greenfield PPP airport in India. It commenced its operations in the year 2008 with an initial capacity of 12 million passengers per annum (mppa) to be progressively scaled up to 40 mppa. It was only in February 2015 that the airport touched a record handling of 10 mppa. Passenger traffic data of RGIA is given in the Table 1. In its first year, the airport handled 6.2 mppa, which was about 49% less than its initial rated capacity of 12 mppa. RGIA (in 2015) handled a total of 328 landings and take-offs per day (24 hour cycle) constituting both domestic and international flights. The hourly flights handled are depicted in the Figure 1.

↳ **Facilities and Services Provided at RGIA :** Out of the total built-up area of 117,000 sq.m at RGIA, the Passenger Terminal Building has an area of 105,000 sq. m and an additional 5,000 sq.m of commercial space is allocated to the Airport Village forecourt. The retail shops and passenger services are provided at four main areas:

(i) Domestic Passenger Terminal
(ii) International Passenger Terminal
(iii) Ground Level - Airport Village and Car Park level (including Departure Forecourt)
(iv) Public Transport Centre

Table 2. Retail Shops and Services Provided at RGIA

Location	Retail Shops* Nos.	Food Shops Nos.	Services Nos.
Domestic Terminal - Departure area	31	10	13
Domestic Terminal - Check-in area (common with International Terminal)	3	2	3
Domestic Terminal - Arrivals area	1	2	1
International Terminal - Departure area	22	6	13
International Terminal - Check-in area (common with Domestic Terminal)	3	2	3
International Terminal - Arrivals area	2	1	15
Ground Level - Airport Village area	4	7	11
Ground Level -Car park area	4	5	10
Departure Forecourt area	2	2	9
Public Transport area	2	2	6

Note : *Including vending machines

The services provided by RGIA at different points are listed in the Table 2. Ever since its inception, RGIA has maintained its standard of service, which is supported by the fact that it was awarded the Airport Service Quality (ASQ) Awards amongst the top five airports in the 5 - 15 million category for 6 consecutive years. Since RGIA was developed as a PPP airport, right from the first day of its commercial operations, it was permitted to collect user charges by way of a User Development Fee (UDF) to be levied on departing passengers for both domestic and international sectors. The UDF was brought under the purview of the Airports Economic Regulatory Authority (AERA), pursuant to enactment of the The Airports Economic Regulatory Authority of India Act, 2008 by the Government of India. The Authority has a mandate to monitor the set performance standards relating to quality, continuity, and reliability of service. In February 2014, AERA scrapped levy of UDF by RGIA for the period from April 1, 2014 till March 2016, being part of the first 5 year control period of 2011 -16 which was up for review.

Review of Literature

Cohen and Ramaswamy (1998) believed that market segmentation remains one of the most powerful marketing ideas and since its formal introduction in the 1950s, its use for customer understanding, product development, and marketing strategy has grown. Marketing research has time and again highlighted the importance attached to understanding what a customer wants and profiling him based on the segmentation of the market into clearly distinct groups of customers, who can then be specifically targeted based on the marketing strategy.

Marcus (1998) stated that even though there are many analytic methods for market segmentation, it is the demographic segmentation which retains the position as the most traditional approach to segmentation. However, newer approaches have also taken into consideration buyer attitudes, motivations, patterns of usage and preferences, and a deeper understanding of customers has validated the value of focusing on them. Gillian (2011) recognized that the world is made up of many different customers, each with their own set of needs and behaviours. Segmentation seeks to complement consumers with products that satisfy their individual sets of needs and behaviour patterns. The rationale behind segmentation is to allow businesses to focus on their consumers' behaviours and purchasing patterns. If an organization markets its products or services to a consumer or business, it should focus on the various types of segmentation.

Wyner (1995) observed that many of the basics of segmentation analysis were established decades ago. The segmentation objective is essentially still the same: to identify different types of customers who will be treated differently from a marketing perspective. However, the way segmentation analysis is done has evolved over the years.

Graham (2014) asserted that passengers are clearly of central importance to airports not only because they consume the product that the airline provides, but also because they are direct customers for airport commercial facilities. According to her, there are many ways in which passengers can be segmented at airports. Sometimes, airports may use psychographic and behaviouristic market segmentation in order to match more closely the needs of each market segment. Fattah, Lock, Buller, and Kirby (2009) asserted that in present times, too many airlines and airports have failed to (a) deliver superior customer experience, (b) segment their customer base in meaningful ways, and (c) invest wisely in future service models and solutions. Airports can grow non-aeronautical commercial revenue simply by expanding services in areas such as retail, hospitality, parking, and real estate.

Satchu and Neapole (2009) stated that once an airport identifies distinct segments of travellers with distinct airport habits and purchase behaviours, an airport should develop appropriate retailing propositions to meet the needs of each segment – and ones that maximize revenues and profits for the airport. An airport must first segment and analyze its unique travellers to then be able to strategically improve terminal layout and passenger flow patterns, and provide the right retail offerings to significantly improve its retail revenues.

To truly maximize the value of these services, however, airports need to adopt a customer-centric approach focused on enhancing the passenger experience. Since airlines largely own passenger relationships today, airports need to find ways of partnering with airlines to create an end-to-end passenger journey. Chatterjee (2010) maintained that customer focus is the degree to which a business seeks to understand and satisfy the needs, wishes, and goals of the customer. Mancini (2009) emphasized that for companies seeking to become truly customer centric, a segmentation initiative can go well beyond focused marketing pitches to shape virtually every function that touches the customer.

Sharma and Lambert (1994) stressed upon the idea that the importance of segmenting markets in emerging industries based on customer service is also critical, they emphasized that two aspects of the segmentation method are critical. First, the segmentation method should be needs-based. Second, the segments should be externally identifiable, making segmentation an inexpensive strategy to follow. Similarly, Udupa and Kotreshwar (2010) in their study of segmenting medical tourists identified need based segmentation of the customers as per the treatments required by them.

Research Methodology

Using non-probabilistic snowball sampling technique, a total of 800 questionnaires were distributed in October 2014 to passengers who had travelled through RGIA, Hyderabad. A total of 548 questionnaires were returned, out of which 502 were usable valid responses ($n = 502$).

Scale and Reliability : Based on the Review of Literature, three focus group discussions, and passenger feedback responses on various social media, a total of 65 different needs of passengers at an airport were identified. The respondents were required to rate the relative importance of each need on a Likert Scale ranging from *most important* to *least important* (Table 3), the scores were added later during the coding of the survey results. The reliability was tested using Cronbach's alpha, which showed good internal structural reliability with Cronbach's alpha of 0.958. The conceptual framework of this study is given in the Figure 2.

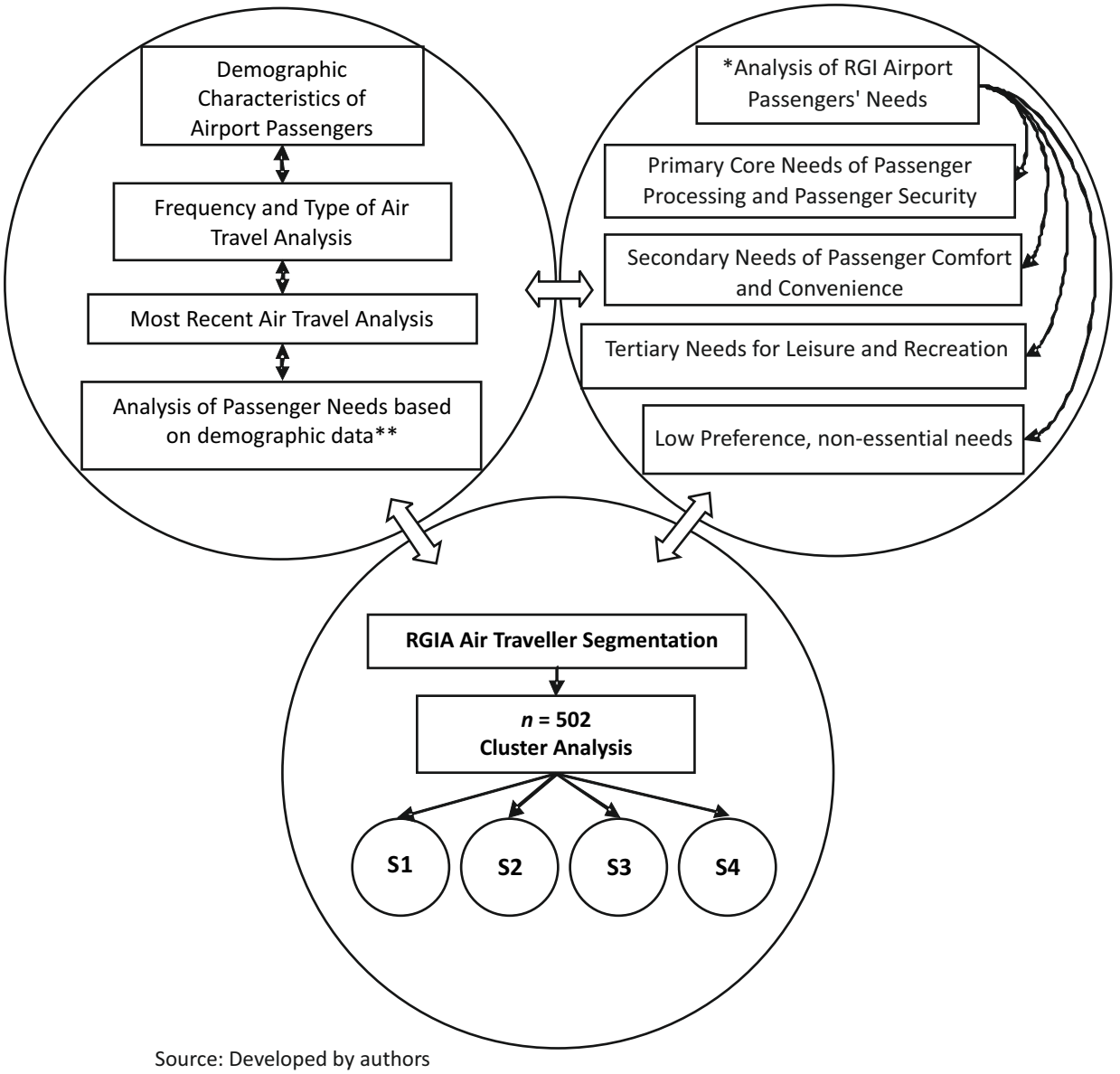
Empirical Analysis and Results

While describing the traditional approach to segmentation, Wyner (1995) stated that typically, an abundance of variables are candidates for inclusion in the segmentation analysis. Often, the proliferation of variables generates redundancy among them, creating the need for data reduction techniques. The traditional next step is a cluster analysis to group the customers according to similarity of their response pattern on the variables. The decision with

Table 3.Likert Scale Used in the Questionnaire

Airport Need	*Most Important*	*Important*	*Fairly Important*	*Less Important*	*Least Important*
Score	5	4	3	2	1

Figure 2. Conceptual Framework of Air Traveller Segmentation Study



Source: Developed by authors

*developed by Gupta and Venkaiah (2015) ** developed by Gupta (2015)

respect to how many and which segments to choose for the final solution depends upon numerous factors, such as how the segmentation will be implemented, how interpretable the groups are, and how statistically differentiated the groups are. Bruning, Hu, and Hao (2009), in their study of airline passengers in the NAFTA (North American Free Trade Agreement) market, created cross-national consumer segments by using a cluster analysis based on the

Table 4. Number of Cases in Each Cluster

Cluster	1	144.000
	2	152.000
	3	141.000
	4	65.000
Valid	502.000	
Missing	.000	

Table 5. Demographic Characteristics of the Passenger Segments

	Segment-1	Segment-2	Segment-3	Segment-4
n **= (502)**	***n*** **= 144**	***n*** **= 152**	***n*** **= 141**	***n*** **= 65**
Gender				
Male	47.20%	54.60%	66.00%	53.80%
Female	52.80%	45.40%	34.00%	46.20%
Age				
< 25 years	19.40%	23.70%	27.70%	10.80%
25-34 years	21.50%	24.30%	26.20%	26.20%
35-44 years	24.30%	21.10%	17.70%	36.90%
45-54 years	22.90%	17.10%	17.70%	12.30%
55-64 years	7.60%	7.90%	6.40%	9.20%
>65 years	4.20%	5.90%	4.30%	4.60%
Education				
PG and Above	62.50%	53.90%	55.30%	63.10%
Graduate	33.30%	38.40%	37.60%	29.20%
Diploma	1.40%	2.80%	2.10%	3.10%
Intermediate (12th Std)	2.80%	3.40%	3.50%	4.60%
Secondary (10th Std)	0.00%	1.40%	1.40%	0.00%
Marital Status				
Single	29.90%	38.80%	35.50%	15.40%
Married	70.10%	61.20%	64.50%	84.60%
Family Size (no. of persons)				
1				
2	0.70%	2.00%	1.40%	4.60%
3	12.50%	12.50%	12.10%	20.00%
4	24.30%	25.70%	21.30%	9.20%
5	40.30%	42.10%	41.80%	49.20%
6	16.70%	10.50%	17.80%	9.20%
>7	2.10%	5.30%	5.00%	7.70%
	3.50%	2.00%	0.70%	0.00%
Employment				
Government	4.90%	5.90%	7.80%	7.70%
Private Sector	65.30%	55.90%	51.80%	49.20%
Self-Employed	11.10%	10.50%	12.10%	16.90%
Not Employed	18.80%	27.60%	28.40%	26.20%

Table 6. Air Travel Data of the Passenger Segments

	Segment-1	Segment-2	Segment-3	Segment-4
***n*= (502)**	***n* = 144**	***n* = 152**	***n* = 141**	**n=65**
Hyderabad Residency Status				
Resident	85.40%	75.70%	75.90%	72.30%
Visitor	14.60%	24.30%	24.10%	27.70%
Air Travel (past 12 months)				
Nil	11.80%	14.50%	9.90%	10.80%
1 trip	14.60%	19.10%	15.60%	3.10%
2-5 trips	14.60%	19.10%	15.60%	3.10%
6-12 trips	16.70%	17.10%	9.90%	12.30%
>12 trips	3.50%	9.20%	9.90%	21.50%
Air Travel from RGIA (past 12 months)				
Nil	13.90%	14.50%	13.50%	10.80%
1 trip	18.10%	19.10%	21.30%	4.60%
2-5 trips	51.40%	46.10%	50.40%	64.60%
6-12 trips	16.00%	13.20%	9.20%	12.30%
>12 trips	0.70%	7.20%	5.70%	7.70%
Direct International Travel through RGIA				
Yes	49.30%	46.70%	41.80%	63.10%
No	50.70%	53.30%	58.20%	36.90%

relative importance scores. Our study too uses case-wise cluster analysis to determine the passenger segments of the respondents based on the 65 needs (see Table 11). For hierarchical clustering, Ward's Linkage method with squared Euclidian distance was used to generate the agglomeration schedule, which indicated a four cluster solution which was also supported by the Dendogram pattern.

With the minimum distance between initial centres being 17.117, the four cluster solution was considered adequate and the final four cluster membership for each case was generated as per the Table 4. For all these four clusters, cross tabulation analysis with the demographics of the airport passengers was conducted to understand the segment-wise break-up of the various demographic factors. These are given in the Table 5 along with the air travel data, and the most-recent air travel data is given in the Tables 6 and 7.

(1) The Similarity Profile Approach : Wyner (1995) mentioned that one of the new developments in segmentation is the use of response function as a basis for the analysis. Rather than relying on grouping consumers on the basis of their similarity on a profile of characteristics, this method defines segments using a similarity of response. This has long been recommended as a criterion for evaluating segments; what's new is defining a segment on this basis. The similarity – profile approach would find segments that have like scores, such as high levels of stated importance on delivery and reliability, and low levels on problem resolution. The responses of the four segments were analyzed based on Gupta and Venkaiah's (2015) 'Needs Clusters,' which break-up the airport needs into four clusters of primary, secondary, tertiary, and low preference needs.

In this study, we postulate that $D1$ to $D65$ are the needs of the airport passengers at RGIA. Let NC_1, NC_2, NC_3, NC_4 be the four 'Needs Clusters' and let S_1, S_2, S_3, S_4 be the four air traveller segments determined as per our cluster analysis of 502 cases. Then, the mean score of (NC_x, S_y) can be stated as :

Table 7. Most Recent Air Travel Data of the Passenger Segments

	Segment-1	Segment-2	Segment-3	Segment-4
n **= (502)**	***n*** **= 144**	***n*** **= 152**	***n*** **= 141**	***n*** **= 65**
Most Recent Trip Financed				
By Self	81.30%	78.30%	78.00%	70.80%
Sponsored	18.70%	21.70%	22.00%	29.20%
Type of Most Recent Air Travel				
Domestic	67.40%	74.30%	77.30%	63.10%
International	32.60%	25.70%	22.70%	36.90%
Most Recent Air Travel Company				
Alone	38.90%	46.70%	45.40%	52.30%
Accompanied	61.10%	53.30%	54.60%	47.70%
Purpose of Most Recent Air Travel				
Work	26.40%	27.00%	30.50%	43.10%
Leisure	44.00%	28.90%	25.50%	21.50%
Study	5.60%	6.60%	5.00%	3.10%
Sports	0.70%	0.00%	0.00%	0.00%
Medical	1.40%	2.00%	2.10%	0.00%
Conference	11.10%	5.90%	10.60%	7.70%
Employment	4.90%	3.30%	2.80%	3.10%
Religious	4.90%	6.60%	10.60%	4.60%
Social Visit	45.80%	41.40%	41.10%	40.00%
Emergency	12.50%	11.80%	11.30%	6.20%

$$MS(NC_x, S_y) = \frac{\Sigma_{i \in NCx} MS(D_i, S_y)}{n(NC_x)}$$

where,
MS = Mean score,
$NC_x = NC_{1...4}$,
$S_y = S_{1..4}$,
$D_i = D_{1...65}$

Segment-wise, the stated importance score of each need within that particular cluster was summed up to get the total response scores, and the results are reported in the Table 8.

Table 8. Summary of Average Response Scores

Needs Hierarchy	Needs Identified	Stated Importance Score			
		Segment 1	Segment 2	Segment 3	Segment 4
Primary Core Needs of Passenger Processing and Passenger Security	29	4.62 (92%)	4.75 (95%)	4.05 (81%)	3.78 (76%)
Secondary Needs of Passenger Comfort and Convenience	16	3.99 (80%)	4.37 (87%)	3.35 (67%)	2.60 (52%)
Tertiary Needs for Leisre and Recreation	11	3.47 (69%)	4.38 (88%)	3.35 (67%)	2.45 (49%)
Low Preference, non-essential needs	9	2.62 (52%)	3.85 (77%)	2.73 (55%)	1.56 (31%)

Table 9. Two Way Gaps to be Exploited

Non-Aeronautical Needs emerged as:		Segment 1	Segment 2	Segment 3	Segment 4
n **= (502)**		***n*** **= 144**	***n*** **= 152**	***n*** **= 141**	***n*** **= 65**
Tertiary Needs for Leisure and Recreation(11 nos.*)	↑ **Move up the Needs Hierarchy**	3.47 (69%)	4.38 (88%)	3.35 (67%)	2.45 (49%)
	Exploit Gap (Potential) →	31%	12%	33%	41%
Low Preference, non-essential needs (9 nos.**)	↑ **Move up the Needs Hierarchy**	2.62 52%	3.85 77%	2.73 55%	1.56 31%
	Exploit Gap (Potential) →	48%	23%	45%	69%

*Fine dining Restaurants, Fast Food, Shopping, Books and Periodicals, Souvenir & Gifts Shops, Duty Free Shopping, Recreation Facility, Children's Play Area, Prayer Room, Infant facility - Diaper Change, Nursing Room, Public Television

** Bar, Beauty Parlour, Spa and Massage, Smoking Zones, Florist, Translators, Post Office, Courier, Photo Kiosk

Table 10. Analysis of Top Twenty Needs of Passenger Segments

Top Twenty Needs Analysis	Segment 1	Segment 2	Segment 3	Segment 4
n **= (502)**	***n*** **= 144**	***n*** **= 152**	***n*** **= 141**	***n*** **= 65**
Similarity of Primary Core Needs of Passenger Processing and Passenger Security	✓	✓	✓	✓
Dissimilarity of Primary Core Needs of Passenger Processing and Passenger Security	Quick Immigration, Friendly customs	Quick Immigration, free Wi-fi	General Information Counter, Taxi, Money Exchange	Quick Immigration, Friendly Customs, Escalator, Aerobridge, Free Wi-fi, ATM, Snack Counter, General Information Counter, Travelator, Lift

(2) Locating Potential : When we look at the specific needs in the primary needs cluster, it is observed that Segments 1,2,3 have given high importance to these needs, but Segment 4 has given relatively lower importance, not only for the needs of these clusters, but even for needs of other clusters, showing innate potential for needs development within Segment 4. Similarly, for the secondary needs cluster, Segments 3 and 4 have given relatively less importance to these needs. In the tertiary and low preference clusters, we observe that these are essentially those needs which generate non-aeronautical revenues, but have scored low on stated importance as well as in the needs hierarchy. Retail and food have emerged as the tertiary needs for leisure and recreation. The airport marketers can effectively utilize the gaps (Table 9) to move these needs up the needs hierarchy as well as exploit the potential within each segment to maximize the stated preference scores.

(3) Segment-Wise Top 20 Needs Analysis : For each of the four passenger segments, a ranking of the stated importance means was done to ascertain the most important to the least important needs of each segment. A comparison of the top 20 needs across the four passenger segments reveals that the primary core needs of passenger processing and passenger security are common across the segments, and barring a few needs, all the passenger segments display the same requirement for these needs as given in the Table 10.

The mean scores of similarity responses for all the four segments having minimal variance necessitated testing for significant differences between segments to confirm the above differences observed. Accordingly, those needs where the difference between the mean scores was less than 0.60 (Table 11) were tested for the Freidman Test and Kendall's *W* Test. The results are reported in the Table 12.

As the *p* values of the needs with low variance between segments is < 0.05, we reject the null hypothesis and accept the alternate hypothesis that there is a significant difference between passenger segments. Kendall's *W*

Table 11. Mean Scores of Needs of Different Traveller Segments

Code		Segment 1	Segment 2	Segment 3	Segment 4	Max Mean Score	Min Mean Score	Difference between Max & Min
	***n* = (502)**	***n* = 144**	***n* = 152**	***n* = 141**	***n* = 65**			
	Percentage	**28.68%**	**30.28%**	**28.09%**	**12.95%**			
D1	Taxi	4.47	4.61	4.09	3.52	4.61	3.52	1.09
D2	Car Rental	4.03	4.22	3.34	2.63	4.22	2.63	1.59
D3	Bus	4.15	4.3	3.7	2.68	4.3	2.68	1.62
D4	Train	3.71	3.76	2.95	2.18	3.76	2.18	1.58
D5	Metro Rail	4.4	4.41	3.63	2.69	4.41	2.69	1.72
D6	Parking	4.64	4.78	4.09	3.75	4.78	3.75	1.03
D7	Valet Parking	4.03	4.34	3.27	2.49	4.34	2.49	1.85
D8	Quick Check-in	4.76	4.79	4.22	4.54	4.79	4.22	0.57
D9	Baggage Trolley	4.77	4.8	4.21	4.35	4.8	4.21	0.59
D10	Flight Information	4.83	4.85	4.38	4.57	4.85	4.38	0.47
D11	Security	4.88	4.86	4.43	4.45	4.88	4.43	0.45
D12	Friendly Customs	4.65	4.71	4.06	4.08	4.71	4.06	0.65
D13	Quick Immigration	4.76	4.8	3.99	4.11	4.8	3.99	0.81
D14	Quick Baggage Arrival	4.81	4.84	4.22	4.45	4.84	4.22	0.62
D15	Weighing Machine	4.43	4.55	3.67	3.49	4.55	3.49	1.06
D16	Seating	4.59	4.76	4.03	4.11	4.76	4.03	0.73
D17	Terminal Comfort	4.64	4.77	4.06	4.18	4.77	4.06	0.71
D18	Aerobridge	4.5	4.64	3.73	3.83	4.64	3.73	0.91
D19	Lift	4.59	4.71	3.69	3.6	4.71	3.6	1.11
D20	Travelator (automated people mover)	4.49	4.63	3.5	3.62	4.63	3.5	1.13
D21	Escalator	4.67	4.76	3.89	4.03	4.76	3.89	0.87
D22	Buggy (battery cars) carts	4.22	4.49	3.43	2.6	4.49	2.6	1.89
D23	Porter	3.76	4.16	3.06	2.75	4.16	2.75	1.41
D24	Rest Rooms (Toilets)	4.75	4.81	4.26	4.35	4.81	4.26	0.55
D25	Business lounge	3.99	4.52	3.46	2.88	4.52	2.88	1.64
D26	Special lounge	3.83	4.51	3.11	2.63	4.51	2.63	1.88
D27	Free Wi-fi	4.48	4.82	3.86	3.8	4.82	3.8	1.02
D28	Computer with Internet facility	4.03	4.53	3.36	3.05	4.53	3.05	1.48
D29	Public Telephone	4.31	4.47	3.51	2.86	4.47	2.86	1.61
D30	New mobile connections-local SIM cards availability	3.94	4.41	2.97	2.86	4.41	2.86	1.55
D31	Pharmacy	4.60	4.78	4.03	3.43	4.78	3.43	1.35
D32	Hospital Emergency	4.76	4.84	4.25	3.46	4.84	3.46	1.38
D33	Doctor	4.79	4.82	4.21	3.52	4.82	3.52	1.3
D34	Police	4.77	4.84	4.22	3.65	4.84	3.65	1.19
D35	Hotel Lodging	4.02	4.49	3.4	2.37	4.49	2.37	2.12
D36	Shower Rooms	3.56	4.38	3.23	2.15	4.38	2.15	2.23

D37	Luggage Lockers	4.04	4.41	3.62	2.35	4.41	2.35	2.06
D38	Travel Desk and Travel Agents	4.13	4.58	3.45	2.43	4.58	2.43	2.15
D39	Bank	3.85	4.47	3.46	2.57	4.47	2.57	1.9
D40	ATM	4.75	4.88	4.3	3.65	4.88	3.65	1.23
D41	Money Exchange	4.63	4.8	4.05	2.98	4.8	2.98	1.82
D42	Snack Counter	4.03	4.56	3.82	3.65	4.56	3.65	0.91
D43	Bar	1.92	3.51	2.54	1.57	3.51	1.57	1.94
D44	Fine dining Restaurants	3.37	4.51	3.3	2.15	4.51	2.15	2.36
D45	Fast Food	3.49	4.44	3.46	3.05	4.44	3.05	1.39
D46	Free Drinking water	4.61	4.82	4.29	3.51	4.82	3.51	1.31
D47	Shopping	3.2	4.43	3.38	2.46	4.43	2.46	1.97
D48	Books and Periodicals	3.76	4.47	3.57	2.85	4.47	2.85	1.62
D49	Souvenir & Gifts Shops	3.4	4.37	3.44	2.35	4.37	2.35	2.02
D50	Duty Free Shopping	3.69	4.59	3.6	2.54	4.59	2.54	2.05
D51	Recreation Facility	3.27	4.38	3.31	2.26	4.38	2.26	2.12
D52	Beauty Parlour	1.99	3.63	2.35	1.51	3.63	1.51	2.12
D53	Spa and Massage	2.07	3.74	2.32	1.54	3.74	1.54	2.2
D54	Children's Play Area	3.42	4.12	3	2.38	4.12	2.38	1.74
D55	Prayer Room	3.04	4.07	2.76	1.85	4.07	1.85	2.22
D56	Infant facility - Diaper Change, Nursing Room	4.11	4.43	3.67	2.45	4.43	2.45	1.98
D57	Public Television	3.46	4.32	3.39	2.6	4.32	2.6	1.72
D58	Smoking Zones	2.76	3.76	3.04	1.57	3.76	1.57	2.19
D59	Florist	2.7	4.01	2.81	1.63	4.01	1.63	2.38
D60	Translators	3.32	4.12	3.12	1.6	4.12	1.6	2.52
D61	Post Office	2.86	3.79	2.7	1.49	3.79	1.49	2.3
D62	Courier	3.31	4.18	3.04	1.6	4.18	1.6	2.58
D63	Photo Kiosk	2.67	3.93	2.63	1.57	3.93	1.57	2.36
D64	General Information Counter	4.49	4.69	4.19	3.63	4.69	3.63	1.06
D65	Wheel chair	4.65	4.72	4.24	2.77	4.72	2.77	1.95

The Hypothesis developed is:
H0: There is no significant difference between the passenger segments.
Ha: There is a significant difference between the passenger segments.

Table 12. Friedman Test and Kendall's *W* Test Results

Needs with mean scores between segments <0.60	Difference in Mean Scores of responses between segments (Max -Min)	Friedman Test			Kendall's Coefficient of Concordance
		Chi-Square	*df*	Asymp. Sig.	Kendall's *W*
Quick Check-in (D8)	0.57	29.313	3	.000	0.150
Baggage Trolley (D9)	0.59	37.081	3	.000	0.190
Flight Information (D10)	0.47	42.603	3	.000	0.218
Security (D11)	0.45	31.162	3	.000	0.160
Rest Rooms (D24)	0.55	39.015	3	.000	0.200

scores are 0.218 and lower, which indicates fairly strong differences between the segments. According to Legendre (2005), Kendall's coefficient of concordance (Kendall's *W*) can be used for assessing agreement among raters. It ranges from 0 (no agreement) to 1 (complete agreement).

Findings and Discussion

The results of the present study are in consonance with the findings of Geuens, Vantomme, and Brengman (2004), who, in their study, found no significant difference between their three clusters in terms of age, travel frequency, and travel capacity. In our study, even though the demographic differences between segments are not large, but we draw parallels with the findings of Geuens et al. (2004) as well as those of Magson and Dipple (2004), who stated that it is possible to create segmentation solutions where a 'customer' can exist in more than one group. This is often referred to as a fuzzy segmentation solution. We state that based on the demographics, stated needs' importance, and the needs analysis, the broadly indicated segments are process efficiency seekers (emphasis on quick needs), comfort and convenience seekers, experience seekers (infrequent travellers) who give high stated preference scores to all needs, and accessibility and special amenities seekers.

An ICLP (2013) report reminds us that the goal for airports must be to maximize revenues from every individual passenger by achieving a much deeper and more intimate understanding of those frequenting their airport. Citing a *Research for Travel White Paper 2012*, the report mentioned that other research reinforces this latent commercial opportunity with findings that an average 55% of passengers in Europe do not spend anything on food and beverage or in a retail store. These passengers were classed as:

- Non-shoppers – passengers who do not intend to buy and do not purchase anything (22%).
- Failed shoppers – passengers who plan to buy something, but fail to do so (17%).
- Window shoppers – passengers who visit shops, but who do not buy (16%).

It estimated that efforts in influencing passenger behaviour resulting in a 10% reduction in the number of failed or window shoppers can equate to additional income of €0.75 million.

Martens (2012) referred to the Amsterdam airport's classification based on the propensity to switch between Amsterdam and other airports. Within the user groups, there were committed customers (entrenched or average) and uncommitted customers (shallow or convertible). Among the non-users, there were open non-customers (available or ambivalent) and unavailable non-customers (weakly unavailable or strongly unavailable).

Geuens et al. (2004) used opinions about travelling by plane and the facilities offered by airports, travel behaviour, purchase behavior at the airport, and socio-demographics to profile the segments into three clusters. They defined mood shoppers as mainly male, impulsive shoppers who preferred centralized shops. Apathetic cluster respondents were seen to be mainly male who did not consider airport shopping as part of the journey, but considered airports merely as a terminus for planes, and they were seen as more likely to pre-plan their purchases. Shopping lovers were predominantly female, preferred one large shop above several small shops, had a slight preference for shops located near the departure gates, experienced travelling by plane as exciting and/or causing tension, and were more likely to buy on impulse than to pre-plan their purchases. No significant difference was found between the three clusters in terms of age, travel frequency, and travel capacity.

Addante (2001), in her research of air travellers, discerned nine market segments : three business classes and six non-business classes. The classifying variables were trip purpose, gender, household type, and education. A small number of trips did not fit into any of the nine segments. These trips were placed in a category termed as "miscellaneous." Some of these groups of travellers, such as retirees or college students, were spread across a number of market segments. The value of segmenting air travel trips by means of demographic variables helped learning about the lifestyle characteristics of the travellers in each group. These lifestyle characteristics were

helpful in understanding reasons for using various airport access modes and planning services to meet travellers' needs.

Freathy and O'Connell (2000) segmented the market by loyalty to the airport, which identified the passengers as loyalists, defectors, mercenaries, and hostages. Yai, Takade, and Okamoto (1997) conducted a passenger survey at the New Tokyo International Airport (Narita) to obtain trip chaining data of foreign passengers. They were able to discern four groups of foreign passengers with distinct characteristics. Ist group : urban recreation, 2nd group : South East Asia traveller, 3rd group : China gateway, and 4th group : recreation.

Young (1996) segmented the airport travellers into agoraphobics, euphorics, confident indulgers, airport controllers, and self-controllers. Young stated that the 'agoraphobics' have the lowest level of need, have a fear of flying and of missing the plane, and do not want to be distracted from the departure monitor. The 'euphorics' are the once-a-year holiday makers who arrive early at the airport and spend money as part of the holiday experience. The 'confident indulgers' are next in the order of needs. They are frequent leisure fliers who are familiar with the airport products and want to be pampered. The 'airport controllers' are typically frequent business passengers flying economy with their families on holiday and feel aggrieved that they do not have privileges they normally experience when flying business class. Most complaints come from this segment. Finally, there are the 'self-controllers'. They are frequent business fliers who just want to be processed through the airport quickly and as efficiently as possible. The agoraphobics spend considerable time at the airport ; whereas, the self-controllers spend the least possible time at the airport.

Although all the studies segmented the air travellers based on their 'needs' criteria or demographics, the results are quite different due to a shift in the focus of the studies which, in some cases, were the airport shoppers, propensity to switch between airports, airport loyalty, and trip chaining of foreign passengers.

Conclusion and Managerial Implications

We observed that the RGIA air travellers are groups of frequent travellers who prefer accompanied travel, and the major purpose of travel is leisure (holidaying) and social visit (visiting friends and relatives), there is blurring of segments at the demographic level, but based on the stated needs' analysis, four segments emerge, that is, Process Efficiency Seekers (emphasis on quick needs), Comfort and Convenience Seekers, Experience Seekers (infrequent travellers) giving high stated preference scores to all needs, and Accessibility and Special Amenities Seekers. The non-aeronautical needs being low in the stated preferences of all the passenger segments show potential for development, and the airport management should consider creating an appropriate marketing strategy for these needs in order to maximize its revenue from these needs. This has far reaching consequences in effectively managing the PPP airports in India.

Limitations of the Study and Scope for Further Research

The limitation of this research study is that it covered only the first PPP greenfield airport in India. However, there is scope for further research by conducting a similar study for other PPP airports in India and comparing the results. Furthermore, if any blurring of segments at the demographic level is observed, then that too can be further explored.

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