

Analytic Hierarchy Process (AHP) to Select a Business School Based on the Rankings – Business World as a Case in Point

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Abstract

The ranking of Business schools (B-Schools) has become an industry in itself that further creates confusion in the mind of aspirants due to information overload than to give a clearer picture. Analytic Hierarchy Process (AHP) makes decision making process more meaningful and easy for the aspirant as it considers the interaction between the criteria unlike most of rankings which are more direct by nature and do not consider interaction effects. This paper uses AHP as a tool to provide another way of deciding an alternative apart from the methods the ranking magazines or websites follow. AHP as a tool serves the purpose when the nature of attributes is mostly qualitative. This paper provides detailed explanation of arriving at decision when several attributes are considered. This paper has considered 5 main criteria and 57 sub-criteria. Though the literature claims that AHP is better tool when fewer criteria are involved, this paper makes an attempt to use AHP when several criteria are involved by allotting them weights. The role of weights is mostly to get the consistency in pairwise comparison right. The scope of the paper is both horizontal (across industries) and also vertical (within the education industry).

Keywords: *Analytic Hierarchy Process, AHP, B-School Ranking*

Introduction

Every student finds it difficult to evaluate the institutes, they wish to join, with many institutes in the fray offering similar pay-offs across categories. Use of Analytic Hierarchy Process (AHP) would help them to ease their decision-making process of selecting an institute where they would pursue their further studies. The complexity in deciding an institute is increased by the following situations:

- i) Short time-period during which most of the institutes conduct their admission process.
- ii) Students have with them multiple offers from multiple institutes.
- iii) Students are lured with similar offers from those institutes.
- iv) Students are apprehensive of seats getting filled in institutes which finish their admission process early while they

(students) wait for admission process of good institutes.

This paper tries to apply AHP using the rankings given to business schools in India by various magazines like Businessworld, Business Today, Outlook, Career360 etc. and also the websites like Pagalguy.com, MBAUniverse, Shiksha.com etc. The case in point here is business magazine Businessworld, a weekly, which has its own method to rank the business schools.

The Selection Process:

The students currently don't have any formal selection process and criterion based on which they select a particular institute, while the institutes have their own set of criterion for selection/admission process to select students of their choice. Students usually have an informal selection process where they mentally calculate the ranking on which they base their choice of an institute. This paper tries to explore the possibility of providing a formal selection process which is more scientific than the current informal one followed by students in selecting an institute, b-school in this case. The criteria are selected from Business world magazine which is a case in point as mentioned in the title that has ranked the b-schools in the year 2012. There are five main criteria which have 57 sub-criteria under their umbrella.

Literature Review

T.L.Saaty (1994) published this path-breaking research paper to show how qualitative attributes can be handled in decision making by using Analytic Hierarchy Process. The way AHP has been rightly used in education industry is shown by Asma (2003) where the author has used the tool to decide upon best students to be sent abroad for graduate studies. The author has shown how AHP can be used where both qualitative as well as quantitative attributes are considered.

Jaykumar, Raju, Mariappan and Ravivikram (2010) have discussed the application of Analytic Hierarchy Process to select an Engineering college in TamilNadu but the number of criteria handled was too few. The authors have considered only 5 main criteria without any sub-criteria under the main criteria, while this paper has considered 57 sub-criteria under 5 main criteria. Perera and Costa (2008) have shown the use of AHP as a tool while deciding the type of ERP software a manufacturing company needs to have. They have discussed the procedure to arrive at an ERP package by extensive use of AHP tool.

Similarly Avinash and Sannapwar (2010) have discussed AHP used in selecting the supplier. The authors have used the SCOR model to decide upon the criteria to be considered for AHP in order to arrive at the decision of selecting a supplier.

Objectives

The objectives of this application based research paper are:

1. To explore another application of the tool – AHP with consistency index mostly certain.
2. To utilize the rankings or ratings provided by the ranking magazine in order to be sure of consistency.
3. To provide an insight to the ranking magazine (their online version) or website that a pair-wise comparison tool would enhance the usability of the scores by the aspiring students.
4. To understand the basics of Analytic Hierarchy Process as an effective tool for decisions involving qualitative attributes.

Research Methodology

The tool used is Analytic Hierarchy Process (AHP), first developed by T.L.Saaty (1994), to arrive at a decision of selecting the right B-school given the rankings by any magazine or website. The ranking magazine or website usually use their own method of ranking an institute which can be as simple as addition of all the ratings or weights and then rank the institutes never considering pair-wise comparisons of all the criteria and sub-criteria like AHP does. Here magazines rank the institutes on the basis of their past experience and set standards for each criteria and sub criteria. AHP takes several criteria and sub-

criteria at all levels and performs pair-wise comparisons at each level giving the final rankings to alternatives a holistic approach. The methodology used in this paper is as follows:

Step 1: To decide upon the various criteria and sub-criteria to facilitate decision-making. Various criteria and sub-criteria can be identified from literature review involving past research papers and also different magazines and websites that rank the institutes.

Step 2: Starting with the objective, design the hierarchy to the lowest level with the alternatives tagged to the lowest echelon of the hierarchy.

Step 3: Weight these main criteria and sub-criteria. The weights would make pair-wise comparisons easy to maintain consistency. This eliminates the step to find the consistency Index to check the consistency of pairwise comparison ratings. The weights also help to remove the constraint of AHP to include less than 10-12 criteria or sub-criteria as it is believed that consistency in comparing the criteria is lost when more number of criteria and sub-criteria are considered.

Step 4: Prioritize all levels and finally the alternatives with respect to sub-criteria of their immediate upper level.

Step 5: Rank the alternatives to select the best.

In this case, alternatives are B-schools. The priority of B-schools is arrived at by the mathematical expression, Perera and Costa (2008),

$$PW_a = \sum_{m=1}^l \sum_{s=1}^k W_m, W_{sm}, W_{sa}$$

Where a = alternative, m = main criteria, s = sub-criteria

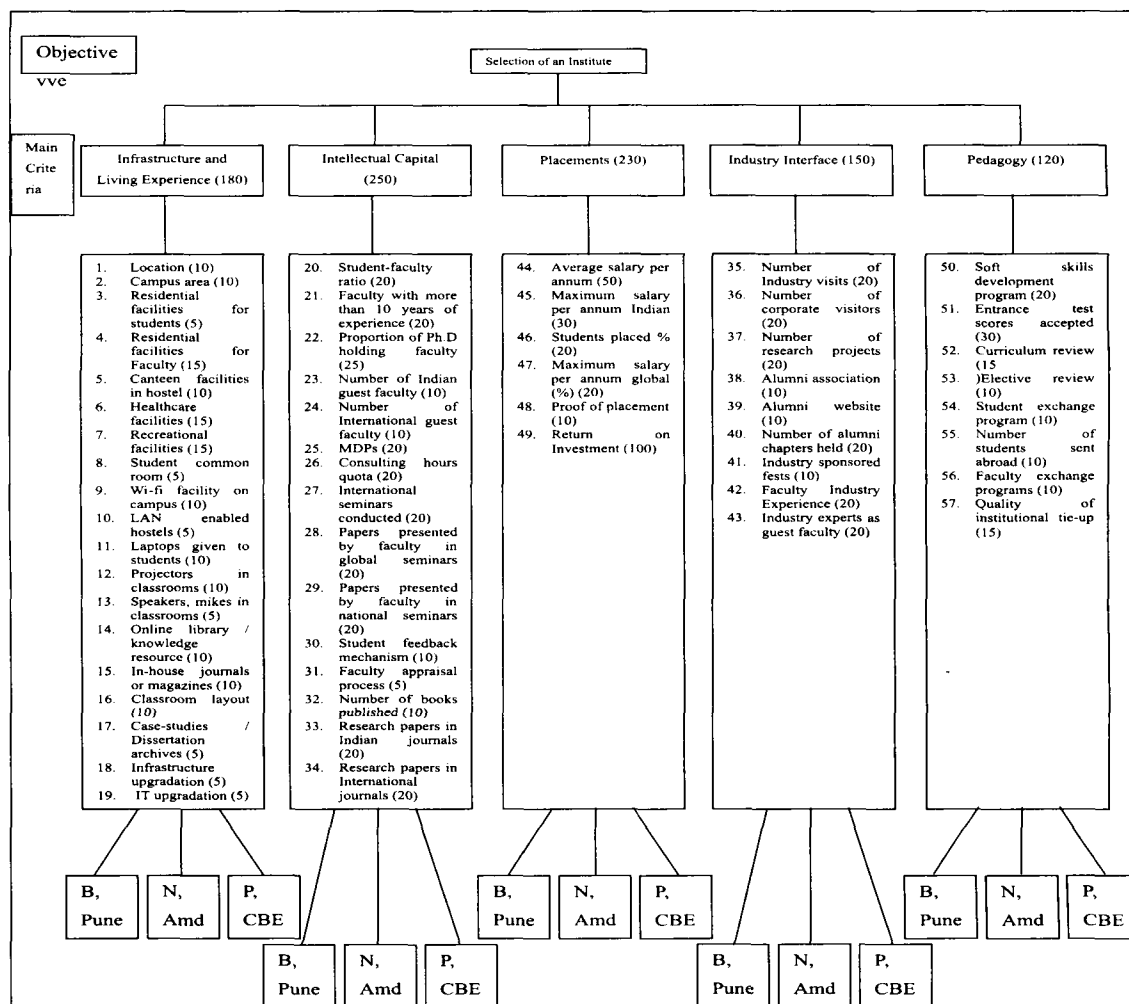
First multiply the priority value of the alternative with all sub-criteria weights at the upper level of the

echelon. Then multiply this value with the main criteria priority weight to get the final priority weight of an alternative.

Results and Discussions

The first step involved collecting various criteria and sub-criteria from sources. They were arranged in hierarchy and weights were allotted as shown in brackets beside every criteria and sub-criteria in Fig 1. As it can be seen from the figure, the objective appears at the top - to select the best institute for a student to pursue higher studies.

Figure 1: Hierarchy of Criteria and Sub-Criteria with an Objective at the Top and Alternatives at the Bottom of Hierarchy.



hierarchy shows the main criteria that decide the selection and third level shows sub-criteria that can be attributed to each main criteria. Finally, there are three alternatives shown here – B, Pune; N, Ahmedabad (Ahd) and P, Coimbatore which are institutes under study.

The weights allotted for main criteria were: Infrastructure and Living Experience (180), Intellectual capital (250), Placements (230), Industry interface (150) and Pedagogy (120). Further 180 points of Infrastructure and Living Experience were split amongst 19 different sub-criteria shown in Fig 1 with their weights mentioned along-side. Similarly 250 points of Intellectual capital were split amongst 15 sub-criteria, 230 points of placements amongst 6 sub-criteria, 150 points amongst 9 sub-criteria and finally 120 points of pedagogy amongst 8 more sub-criteria. Totally 57 sub-criteria were

identified which formed part of 5 main criteria.

Step 1, Step 2 and Step 3 partially has been shown in Fig 1. Step 4 involved prioritizing at all levels starting from first level where 5 main criteria are present. Prioritizing involved following steps:

- 1) Finding the difference between weights allotted to each criteria and sub-criteria to find how much more is one attribute more important than the other.
- 2) Based on the difference, using T.L.Saaty's (2008) guidelines providing scale of numbers to rate the importance of one attribute against another, a rating number is provided. T.L.Saaty (2008) has provided Fundamental scale of absolute numbers as shown below:

Table 1: Fundamental Scale of Intensity of Importance

Intensity of Importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
2	Equal to Moderately more Important	
3	Moderate Importance	Experience and judgment slightly favor one activity over another
4	Moderate Plus	
5	Strong Importance	Experience and judgment strongly favor one activity over another
6	Strong plus	
7	Very Strong	An activity is favored very strongly over another
8	Very Very Strong	
9	Extreme Importance	The evidence favoring one activity over another is of the highest possible order of affirmation
Reciprocals of the above	If activity <i>i</i> has one of the above values when compared with activity <i>j</i> , then activity <i>j</i> will have the reciprocal of that value when compared with activity <i>i</i> .	
1.1 – 1.9	If activities are very close	This can be difficult to assign

3) Perform Synthesization:

- Sum the values in each column of the pairwise comparison matrix.
- Divide each element in the pairwise comparison matrix with their column total. This will provide us with Normalized pairwise comparison matrix.
- Take the average of each row to get the Priority rating of that criteria or alternative.

4) Calculate the final priorities of all the alternatives to choose the best alternative.

The mathematical calculations involved in the above four points are shown step by step below:

For Main Criteria

Step 1: For the first level of main criteria, the differences in weights allotted were as shown below:

Table 2: Differences in Weights Between Five Main Criteria

		Infrastructure & Living Experience	Intellectual capital	Placements	Industry Interface	Pedagogy
	Points allotted to each criteria	180	250	230	150	120
Infrastructure & Living Experience	180	0	70	50	30	60
Intellectual capital	250	70	0	20	100	130
Placements	230	50	20	0	80	110
Industry Interface	150	30	100	80	0	30
Pedagogy	120	60	130	110	30	0

Step 2: Based on the differences which can be seen in table 2 shown in bold, the following

ratings were provided for each pairwise comparison:

Table 3: Pairwise Comparison Ratings of the Main Criteria

	Infrastructure & Living Experience	Intellectual capital	Placements	Industry Interface	Pedagogy
Infrastructure & Living Experience	1	1/6	1/4	3	5
Intellectual capital	6	1	2	8	9
Placements	4	1/2	1	7	9
Industry Interface	1/3	1/8	1/7	1	3
Pedagogy	1/5	1/9	1/9	1/3	1
Total	11.5333	1.9028	3.5040	19.3333	27.0000

The above ratings were arrived using both the tables – Table 1 and Table 2 as follows:

Table 4: Modified Scale on the Basis of Difference of Weights Between Criteria

If the difference in weights was	Then, Definition	Rating
0	Both equally important	1
20	Equally to Moderately Important	2
30	Moderately to Strongly more Important	3
50	Strongly More Important	4
60	Strongly to Very Strongly More Important	5
70	Very Strongly More Important	6
80	Very Strongly to Very Very Strongly More Important	7
100	Very Very Strongly More Important	8
>= 110	Extremely More Important	9
Reciprocals of the above	If criteria <i>i</i> is Extremely more important than criteria <i>j</i> , then it gets rating of 9 in pairwise comparison. But <i>j</i> gets rating of 1/9 when it is compared back with <i>i</i> .	

Step 3 and Step 4: Synthesization and priority weight of main criteria

Table 5: Priority of Main Criteria

	Infrastructure & Living Experience	Intellectual capital	Placements	Industry Interface	Pedagogy	Priority
Infrastructure & Living Experience	0.087	0.088	0.071	0.155	0.185	0.117
Intellectual capital	0.520	0.526	0.571	0.414	0.333	0.473
Placements	0.347	0.263	0.285	0.362	0.333	0.318
Industry Interface	0.029	0.066	0.041	0.052	0.111	0.060
Pedagogy	0.017	0.058	0.032	0.017	0.037	0.032

It is clear from the above that the Intellectual capital criterion has got higher priority rating as expected as it had higher weight allotted. It was quite obvious here in the first level as the weights allotted were of varying degrees. But when we compare sub-criteria and find the product of weights of criteria and sub-criteria, it becomes complex to visually decide which of the three alternatives is a better alternative.

The consistency ratio for the paired comparison of main criteria Table 3 is 0.056 which is within 10% limit. The consistency ratio for other paired comparison matrix has not been evaluated due to lack of Expert Choice software. Similarly, the paired comparison and the priority of sub-criteria are as shown:

For Infrastructure and Living Experience:

Table 6: Priority of 19 Sub-Criteria that are Categorized Under First Main Criteria – Infrastructure and Living Experience

Sub-Criteria	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Priority
1	0.05	0.05	0.048	0.048	0.050	0.048	0.048	0.056	0.050	0.056	0.050	0.050	0.056	0.050	0.050	0.050	0.056	0.056	0.056	0.051
2	0.05	0.05	0.048	0.048	0.050	0.048	0.048	0.056	0.050	0.056	0.050	0.050	0.056	0.050	0.050	0.050	0.056	0.056	0.056	0.051
3	0.1	0.1	0.095	0.095	0.100	0.095	0.095	0.083	0.100	0.083	0.100	0.100	0.083	0.100	0.100	0.100	0.083	0.083	0.083	0.094
4	0.1	0.1	0.095	0.095	0.100	0.095	0.095	0.083	0.100	0.083	0.100	0.100	0.083	0.100	0.100	0.100	0.083	0.083	0.083	0.094
5	0.05	0.05	0.048	0.048	0.050	0.048	0.048	0.056	0.050	0.056	0.050	0.050	0.056	0.050	0.050	0.050	0.056	0.056	0.056	0.051
6	0.1	0.1	0.095	0.095	0.100	0.095	0.095	0.083	0.100	0.083	0.100	0.100	0.083	0.100	0.100	0.100	0.083	0.083	0.083	0.094
7	0.1	0.1	0.095	0.095	0.100	0.095	0.095	0.083	0.100	0.083	0.100	0.100	0.083	0.100	0.100	0.100	0.083	0.083	0.083	0.094
8	0.025	0.025	0.032	0.032	0.025	0.032	0.032	0.028	0.025	0.028	0.025	0.025	0.028	0.025	0.025	0.025	0.028	0.028	0.028	0.027
9	0.05	0.05	0.048	0.048	0.050	0.048	0.048	0.056	0.050	0.056	0.050	0.050	0.056	0.050	0.050	0.050	0.056	0.056	0.056	0.051
10	0.025	0.025	0.032	0.032	0.025	0.032	0.032	0.028	0.025	0.028	0.025	0.025	0.028	0.025	0.025	0.025	0.028	0.028	0.028	0.027
11	0.05	0.05	0.048	0.048	0.050	0.048	0.048	0.056	0.050	0.056	0.050	0.050	0.056	0.050	0.050	0.050	0.056	0.056	0.056	0.051
12	0.05	0.05	0.048	0.048	0.050	0.048	0.048	0.056	0.050	0.056	0.050	0.050	0.056	0.050	0.050	0.050	0.056	0.056	0.056	0.051
13	0.025	0.025	0.032	0.032	0.025	0.032	0.032	0.028	0.025	0.028	0.025	0.025	0.028	0.025	0.025	0.025	0.028	0.028	0.028	0.027
14	0.05	0.05	0.048	0.048	0.050	0.048	0.048	0.056	0.050	0.056	0.050	0.050	0.056	0.050	0.050	0.050	0.056	0.056	0.056	0.051
15	0.05	0.05	0.048	0.048	0.050	0.048	0.048	0.056	0.050	0.056	0.050	0.050	0.056	0.050	0.050	0.050	0.056	0.056	0.056	0.051
16	0.05	0.05	0.048	0.048	0.050	0.048	0.048	0.056	0.050	0.056	0.050	0.050	0.056	0.050	0.050	0.050	0.056	0.056	0.056	0.051
17	0.025	0.025	0.032	0.032	0.025	0.032	0.032	0.028	0.025	0.028	0.025	0.025	0.028	0.025	0.025	0.025	0.028	0.028	0.028	0.027
18	0.025	0.025	0.032	0.032	0.025	0.032	0.032	0.028	0.025	0.028	0.025	0.025	0.028	0.025	0.025	0.025	0.028	0.028	0.028	0.027
19	0.025	0.025	0.032	0.032	0.025	0.032	0.032	0.028	0.025	0.028	0.025	0.025	0.028	0.025	0.025	0.025	0.028	0.028	0.028	0.027

There are 19 sub-criteria which are shown in Figure 1 with the numbers and are shown only in numbers in Table 6. Pairwise comparison is made and then synthesization has been carried out to arrive at the last column in Table 6 that

shows Priority. Consistency ratio has not been found for this due to lack of Expert Choice software. Similarly the priority of sub-criteria under other main criteria has been found as shown:

For Intellectual Capital:

Table 7: Priority of 15 Sub-Criteria that are Categorized Under Second Main Criteria – Intellectual Capital

Sub criteria	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	Priority
20	0.079	0.079	0.075	0.085	0.085	0.079	0.079	0.079	0.079	0.079	0.085	0.080	0.085	0.079	0.079	0.081
21	0.079	0.079	0.075	0.085	0.085	0.079	0.079	0.079	0.079	0.079	0.085	0.080	0.085	0.079	0.079	0.081
22	0.159	0.159	0.149	0.113	0.113	0.159	0.159	0.159	0.159	0.159	0.113	0.100	0.113	0.159	0.159	0.142

23	0.026	0.026	0.037	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.028	0.040	0.028	0.026	0.026	0.029
24	0.026	0.026	0.037	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.028	0.040	0.028	0.026	0.026	0.029
25	0.079	0.079	0.075	0.085	0.085	0.079	0.079	0.079	0.079	0.079	0.085	0.080	0.085	0.079	0.079	0.081
26	0.079	0.079	0.075	0.085	0.085	0.079	0.079	0.079	0.079	0.079	0.085	0.080	0.085	0.079	0.079	0.081
27	0.079	0.079	0.075	0.085	0.085	0.079	0.079	0.079	0.079	0.079	0.085	0.080	0.085	0.079	0.079	0.081
28	0.079	0.079	0.075	0.085	0.085	0.079	0.079	0.079	0.079	0.079	0.085	0.080	0.085	0.079	0.079	0.081
29	0.079	0.079	0.075	0.085	0.085	0.079	0.079	0.079	0.079	0.079	0.085	0.080	0.085	0.079	0.079	0.081
30	0.026	0.026	0.037	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.028	0.040	0.028	0.026	0.026	0.029
31	0.020	0.020	0.030	0.014	0.014	0.020	0.020	0.020	0.020	0.020	0.014	0.020	0.014	0.020	0.020	0.019
32	0.026	0.026	0.037	0.028	0.028	0.026	0.026	0.026	0.026	0.026	0.028	0.040	0.028	0.026	0.026	0.029
33	0.079	0.079	0.075	0.085	0.085	0.079	0.079	0.079	0.079	0.079	0.085	0.080	0.085	0.079	0.079	0.081
34	0.079	0.079	0.075	0.085	0.085	0.079	0.079	0.079	0.079	0.079	0.085	0.080	0.085	0.079	0.079	0.081

First pairwise comparisons were performed to arrive at the ratings using the fundamental scale of intensity of importance provided in Table 1. then normalization was carried out by summing up the columns to get the column total and then each element is divided by its column total. The average of each row is the priority value of the sub-criteria, shown in the last column of Table 7. There are 15 sub-criteria under the main criteria Intellectual capital that are shown in figure 1 which are numbered and their weights also shown. The numbers in the first column and first row of table 7 are the respective sub-criteria shown in

figure 1. The weight of 250 was allotted to Intellectual capital which was apportioned amongst 15 sub-criteria. Using the weights allotted, the pairwise comparisons were performed. The consistency ratio has not been found due to lack of Expert Choice software which is widely used to solve AHP related cases.

For Placements:

There are six sub-criteria under placements. The total weight allotted to placements main criteria is 230 which are apportioned amongst these six sub-criteria. The priority of sub-criteria is shown as:

Table 8: Priority of Six Sub-Criteria that are Categorized Under Third Main Criteria – Placements

	Average salary per annum	Max Salary per annum Indian	Students placed %	Max salary per annum global (%)	Proof of placement	Return on Investment	Priority
Average salary per annum	0.124	0.243	0.242	0.242	0.227	0.100	0.197
Max Salary per annum Indian	0.041	0.081	0.121	0.121	0.136	0.086	0.098

Students placed %	0.031	0.041	0.061	0.061	0.091	0.075	0.060
Max salary per annum global (%)	0.031	0.041	0.061	0.061	0.091	0.075	0.060
Proof of placement	0.025	0.027	0.030	0.030	0.045	0.066	0.037
Return on Investment	0.747	0.568	0.485	0.485	0.409	0.599	0.549

For Industry Interface:

Table 9: Priority of Six Sub-Criteria that are Categorized Under Fourth Main Criteria – Industry Interface

	No. of Industry visits	No. of corporate visitors	No. of research projects	Alumni association	Alumni website	No. of alumni chapters held	Industry sponsored fests	Faculty Industry Experience	Industry experts as guest faculty	Priority
No. of Industry visits	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143
No. of corporate visitors	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143
No. of research projects	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143
Alumni association	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048
Alumni website	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048
No. of alumni chapters held	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143
Industry sponsored fests	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048
Faculty Industry Experience	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143
Industry experts as guest faculty	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143	0.143

For Pedagogy:

Table 10: Priority of Eight Sub-Criteria that are Categorized Under Fifth Main Criteria – Pedagogy

	Soft skills development program	Entrance test scores accepted	Curriculum review	Elective review	Student exchange program	No. of students sent abroad	Faculty exchange programs	Quality of institutional tie-ups	Priority
Softskills development program	0.158	0.126	0.200	0.188	0.188	0.188	0.188	0.200	0.179
Entrance test scores accepted	0.474	0.380	0.400	0.313	0.313	0.313	0.313	0.400	0.363
Curriculum review	0.079	0.095	0.100	0.125	0.125	0.125	0.125	0.100	0.109
Elective review	0.053	0.076	0.050	0.063	0.063	0.063	0.063	0.050	0.060
Student exchange program	0.053	0.076	0.050	0.063	0.063	0.063	0.063	0.050	0.060
No. of students sent abroad	0.053	0.076	0.050	0.063	0.063	0.063	0.063	0.050	0.060
Faculty exchange programs	0.053	0.076	0.050	0.063	0.063	0.063	0.063	0.050	0.060
Quality of institutional tie-ups	0.079	0.095	0.100	0.125	0.125	0.125	0.125	0.100	0.109

For Alternatives:

While considering alternatives, the Business world ratings for these alternatives – B, Pune; N, Ahd and P, Coimbatore for all of

the subcriteria were considered. The ratings provided by Businessworld for these alternatives are as shown:

Table 11: Businessworld Ratings of Three Alternatives Under Study with Respect to 57 Sub-Criteria

Subcriteria	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B, Pune	5	2	15	15	10	15	15	5	10	5	10	10	5	10	10
N, Ahd	5	2	15	15	10	15	12	5	10	5	10	10	5	10	10
P, Coimbatore	2	2	15	15	10	15	15	5	10	5	10	10	5	10	10

Subcriteria	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
B, Pune	8	5	5	5	14	5	3	5	0	0	20	10	0	0	10
N, Ahd	10	5	5	5	14	18	17	10	6	15	0	5	20	10	10
P, Coimbatore	10	5	5	5	12	14	17	2	6	15	20	20	15	15	10

Subcriteria	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
B, Pune	5	0	10	0	15	10	15	5	0	65	5	20	0	10	10
N, Ahd	5	5	15	15	25	10	10	0	5	70	5	20	10	10	10
P, Coimbatore	5	5	15	15	10	5	15	0	0	70	5	20	10	10	10

Subcriteria	46	47	48	49	50	51	52	53	54	55	56	57
B, Pune	0	10	10	16	20	10	15	0	0	0	0	0
N, Ahd	15	10	16	20	20	20	15	10	10	2	0	3
P, Coimbatore	5	10	10	20	20	30	15	10	10	6	10	1

Considering the above ratings, the priority of alternatives is calculated for all the sub-criteria under every main criterion. The priority table is shown below:

Table 12: The Priority of Alternatives with Respect to all 57 Sub Criteria Under Five Main Criteria

Alternative	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
B, Pune	0.25	0.333	0.333	0.333	0.333	0.333	0.375	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333
N, Ahd	0.25	0.333	0.333	0.333	0.333	0.333	0.25	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333
P, Coimbatore	0.5	0.333	0.333	0.333	0.333	0.333	0.375	0.333	0.333	0.333	0.333	0.333	0.333	0.333	0.333

Alternative	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
B, Pune	0.25	0.333	0.333	0.333	0.375	0.131	0.111	0.255	0.182	0.111	0.455	0.239	0.098	0.122	0.333
N, Ahd	0.375	0.333	0.333	0.333	0.375	0.542	0.444	0.497	0.409	0.444	0.091	0.137	0.602	0.293	0.333
P, Coimbatore	0.375	0.333	0.333	0.333	0.25	0.327	0.444	0.187	0.409	0.444	0.455	0.623	0.301	0.586	0.333

Alternative	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
B, Pune	0.333	0.2	0.2	0.111	0.239	0.4	0.4	0.5	0.25	0.2	0.333	0.333	0.143	0.333	0.333
N, Ahd	0.333	0.4	0.4	0.444	0.602	0.4	0.2	0.25	0.5	0.4	0.333	0.333	0.429	0.333	0.333
P, Coimbatore	0.333	0.4	0.4	0.444	0.15	0.2	0.4	0.25	0.25	0.4	0.333	0.333	0.429	0.333	0.333

Alternative	46	47	48	49	50	51	52	53	54	55	56	57
B, Pune	0.137	0.333	0.308	0.2	0.333	0.106	0.333	0.143	0.143	0.22	0.2	0.266
N, Ahd	0.649	0.333	0.385	0.4	0.333	0.224	0.333	0.429	0.429	0.26	0.2	0.408
P, Coimbatore	0.216	0.333	0.308	0.4	0.333	0.672	0.333	0.429	0.429	0.52	0.6	0.326

Using Tables 5, 6, 7, 8, 9, 10 and 12 the final criteria and different sub-criteria are shown result is arrived at. The priority values of main below:

Table 13: Priority of Main Criteria

Main criteria	Infrastructure and Living Experience	Intellectual Capital	Placements	Industry Interface	Pedagogy
Priority	0.117	0.473	0.318	0.060	0.032

Table 14: Priority of 19 Sub-Criteria – Infrastructure and Living Experience

Subcriteria	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Priority	.051	.051	.094	.094	.051	.094	.094	.027	.051	.027	.051	.051	.027	.051	.051	.051	.027	.027	.027

Table 15: Priority of 15 Sub-Criteria – Intellectual Capital

Subcriteria	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Priority	.081	.081	.142	.029	.029	.081	.081	.081	.081	.081	.029	.019	.029	.081	.081

Table 16: Priority of Six Sub-Criteria – Placements

Subcriteria	35	36	37	38	39	40
Priority	.0197	.098	.060	.060	.037	.549

Table 17: Priority of Nine Sub Criteria – Industry Interface

Subcriteria	41	42	43	44	45	46	47	48	49
Priority	0.143	0.143	0.143	0.048	0.048	0.143	0.048	0.143	0.143

Table 18: Priority of Eight Sub Criteria – Pedagogy

Subcriteria	50	51	52	53	54	55	56	57
Priority	0.179	0.363	.109	0.060	0.060	0.060	0.060	0.109

The final Priority of each alternative is arrived at as shown:

Table 19: Final Priority Value to Choose the Best Alternative

	Infrastructure & Living Experience	Intellectual capital	Placements	Industry Interface	Pedagogy	Final Priority
	0.117	0.473	0.318	0.060	0.032	
B, Pune	0.328	0.198	0.259	0.255	0.206	0.236
N, Ahd	0.323	0.384	0.423	0.409	0.301	0.388
P, Coimbatore	0.348	0.416	0.317	0.336	0.494	0.374

The final priority value is arrived at using the formula: $PW_a = \sum_{m=1}^l \sum_{s=1}^k W_m \cdot W_{sm} \cdot W_{sa}$. Finally N, Ahd appears as the best alternative.

The workout:

The value under Infrastructure and Living

Experience for B, Pune alternative in Table 19 is 0.328. This is the sum product of priority of 19 sub-criteria of the main criteria Infrastructure and Living Experience shown in Table 14 and the priority value of the alternative B, Pune with respect to 19 sub-criteria shown in Table 12.

$$0.051*0.25 + 0.051*0.333 + .094*0.333 + 0.094*0.333 + 0.051*0.333 + 0.094*0.333 + 0.094*0.375 + 0.027*0.333 + 0.051*0.0333 + 0.027*0.333 + 0.051*0.333 + 0.051*0.333 + 0.027*0.333 + 0.051*0.333 + 0.051*0.333 + 0.051*0.333 + 0.027*0.333 + 0.027*0.333 + 0.027*0.333 = 0.328.$$

Conclusion

When there are multiple attributes represented in hierarchical structure, AHP acts as the right tool for decision making. AHP provides holistic solution to the problems involving qualitative attributes which needs to be quantified using ratings approach.

This research paper uses AHP to arrive at decision involving selection of best B-school by an aspirant given multiple attributes. Finally out of the three alternatives available to choose from, the best B-school selected was N, Ahd using Analytic Hierarchy Process.

Scope for Further Research

There is horizontal scope across spectrum of industries and there is vertical scope in the same education industry to use AHP as a tool when an alternative needs to be selected and the data is qualitative by nature. AHP is a better tool for decision making when qualitative attributes are involved as it finds the interaction effect between attributes before deciding upon the result. Horizontal scope and vertical scope has been studied during literature review as the references listed in reference section indicate. There is scope

within education industry to grade faculty members for their performance review and while deciding upon which courses need to be run to make the entire course more meaningful etc.

Limitations

Non-availability of Expert Choice software has been the biggest limitation partially overcome by the use of MS Excel. Due to non-availability of Expert Choice software, the consistency ratio has not been attempted for several pairwise comparisons done in this research paper. But this limitation again has been partially overcome by appropriate use of the initial weights allotted to various criteria, subcriteria and alternatives.

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