RANKING TRAVEL AND TOURISM ENABLERS IN INDIA USING A FUZZY APPROACH

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Abstract:

This paper seeks to review the enablers for the Travel & Tourism (T&T) industry in India and to rank these factors. The paper aims to introduce a fuzzy TOPSIS approach for this purpose. The paper begins with a literature review to investigate the significant enablers in the T&T sector. The research was conducted among the tourists in the northern state of Uttarakhand, India which is a famous tourist destination both for adventure and pilgrimage. Fuzzy TOPSIS approach is used to meet the objectives of the study. Required information was gathered through a questionnaire. The results show that Safety & Security, Price, Transport and Infrastructure are the most important factors in Indian context. The paper will be helpful in enabling the T&T industry policy makers to identify the key service factors in the sector and take the improvement measures. The concept of ranking T&T enablers using a Fuzzy TOPSIS is a new approach. The study is the unique application of a fuzzy approach to examine and rank customer expectations of the T&T enablers in Indian context.

Keywords: *fuzzy logic, growth enablers, india, topsis, travel & tourism*

INTRODUCTION

Tourism is a service industry which have a significant effect on the countries with surplus labour. India, as the second most populous nation with a large number of young workforces, got a great opportunity for employment to be provided by tourism. Most of the jobs in tourism industry are labour intensive which require relatively short training and spread over different sub sectors like hotel and other accommodation units, travel agents and tour operators, transport services, tourist resorts and complexes, shopping facilities including sales outlets for curious, handicrafts, souvenirs, and so on. A focus on T&T industry thus can be extremely beneficial for providing jobs for the millions and developing the country's economy. The present contribution of tourism in Indian economy is relatively low for instance, just 6.7 percent of GDP originates in this sector in 2014. This implies that there is a large untapped potential in Indian tourism industry. In fact, UNWTO (2015) noted that India recorded the strongest growth in international tourist's arrival during the last decade. Considering that India is one of the fastest growing Asian economies, this implies to its tourism industry can be expected to grow faster in the years to come. There is need for research in Indian perspective aiming at conceptualization of the role and potential of tourism, refining insights and bringing them in line with reality. Thus it becomes imperative to study and examine the enablers which play an important role for T&T industry in India.

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India as a nation is privileged with wide historical and cultural diversity. It presents a wide range of tourist destinations for people of different age and taste. This ranges from forest, wildlife, history to panoramic view of Himalayas. The demand for the Travel and Tourism (T&T) industry in India is expected to grow by 8% by 2019. The industry is expected to employ 4 million people by 2019-20. The hospitality sector is also expected to double in size in the next five years. Thus, the country seems to be a great destination for the tourists worldwide but unfortunately the tourist arrival growth rate is abysmally low. Nowadays every nation wants to attract tourists both domestic and international and there has been tough competition among the nations to promote tourism and attract international tourists. Effective customer perception about the destination is a vital issue for the success of T&T industry. Therefore identifying and prioritising customers' needs and expectations is of utmost importance for T&T industry in the current competitive market. Therefore, this study seeks to review the T&T industry enablers and introduces a fuzzy TOPSIS approach for prioritising these enablers according to customers' expectations.

There remain so many inconsistencies in T&T industry in India as a whole, it is imperative to explore the enablers for the industry in India. This work is an attempt to provide tentative answers to some major questions related to T&T industry in India. The identification and prioritization of the enablers can help realize the growth potential of domestic and international tourism in India. This can be helpful for the policy makers to realize the potential of tourism as an engine of growth.

Problems of Indian Tourism Industry

The T&T industry has definitely registered allround growth in the country during last few decades. Yet it can be said that the growth is far less than the potential, and much remains to be fullfilled. There has been various reason for not being able to exploit fully the potential of the sector. There has been shortage of basic infrastructure facilities which is required to promote tourism. Inadequate airline capacity, appalling condition of airports, frequent flight cancellations and delays make India often a nightmarish experience for foreign tourists. The train network although one of the largest in the world is overcrowded and often lacks basic health and hygiene. There is also lack of hygienic and comfortable accommodation for the tourists specially for the low spending middle class people. A lack of information systems with quick retrieval facilities increases the inconvenience of the tourists. The T&T industry is highly seasonal in India with the busy season being limited to six months from October to March and heavy rush in November and December. This puts the industry with huge idle capacity during lean months. There has been a complete ignorance towards an integrated tourism promotion programme during the five-year plan periods. Many states have been indifferent towards tourism and have not accorded it the desired status. Changing political situation and agitations in some of the northern states, famous for tourism has also hampered the sector. Unfortunately there has been a lukewarm attitude towards the domestic tourists by the authorities and the emphasis was mainly on attracting foreign tourists. This has resulted in a skewed policy and hampered the growth.

Research on understanding needs and expectations of tourists in India has been scarce and fragmented. To date, not much comprehensive research assessing the important factors related to T&T industry in India has been achieved on the topic. Roy (2011) in his research assessed the competitiveness of hotel industry in India but not as a whole on T&T industry.

Ranbir (2016) did a comprehensive review of literature related to Indian tourism and hospitality research and found an increased interest and diversification in the tourism research related to India. This can be attributed to increase importance of the sector in improving the economy and earning foreign exchange. According to Ranbir (2016), after the launch of the "Incredible India" marketing campaign (2012), both Indian and foreign

researchers have started devoting attention to the study of the tourism and hospitality industry in India. Gooroochurn and Sugiyarto (2005) discussed an innovative approach for measuring tourism competitiveness using eight main indicators – price, openness, technology, infrastructure, human tourism, social development, environment and human resources – for over 200 countries. Choi and Sirakaya (2006) used a modified Delphi technique to develop indicators to measure community tourism development.

Extensive studies on growth enablers have not been carried out in T&T industry in Indian context and no study had been carried out to identify, classify and analyse the enablers in T&T. This paper is based on extensive literature review to identify the important factors that act as enablers of T&T industry which impacts the tourist's perception. The literature review to identify the enabler's spans across the geographies as there has been considerable research done in International context. The identified enablers are later assessed in Indian context. This is followed by the ranking of the factors using fuzzy TOPSIS approach and analysing them.

Literature Review and Tourism Enablers

On the basis of the literature review carried out, it can be summarised that the growth of Travel and Tourism is boosted significantly by some or all of the following enablers:

Safety and security:
The places more susceptible to crime and terriorism makes them naturally less attractive for the tourists. The costliness of common crime and violence as well as terrorism, and the responsiveness of the local police services to provide protection from crime are one of the the most considerable factors. The incidence of road traffic accidents in the region and related regulations also plays an important role. Martin Gill et al (2002) analysed the role of the security manager in UK hotel industry. They also provided a qualitative suggestions on how to handle crimes on issues like health and safety, IT security, fire safety and insurance. Some researchers also mentioned the impact of information security breach on hotel customers in the US (Katerina Berezina et al, 2012). Mohammad A. Hassanain (2009) investigated a qualitative fire safety risk assessment in hotels. Karen Groenenboom and Peter Jones (2003) suggested about the role of security staff and the role of a good security system. Cyril Peter et al. (2014) suggested about the preparedness for an attack, and also assessed the attitudes and approaches to risk management. Eric S.W. Chan and Doris Lam (2013) studied the gap between managers and guests. The study observed the aspects of security training and systems and the need for female guest floors and associated safety related matters to keep customers satisfied. Safety and security measures of international leisure and business tourists are quite important in Thailand (Bongkosh N. Rittichainuwat and Goutam Chakraborty, 2012). Some research focused on longterm crime management strategy involving multiple stakeholders ranging from the level of government to the individual hospitality establishment (Noel M. Cowell et al, 2012). Tourism is also affected by terrorism, safety and security in Scotland (Linda Walker and Stephen J. Page ,2007). Hotels acquire customer information, stored in database and utilize this information to support various marketing activities which is not ethical and quite risky for customers (Hong-bumm Kima et al, 2013). Sometimes management are not aware about the risks associated with Hotel Information Technology (Jungsun Sunny Kima et al, 2013). Carey K.L. Goh and Rob Law (2007) discussed about the different security loopholes in the hospitality industry.

Health and hygiene

Access to proper health facility and clean drinking water and sanitation plays an important role for the health and safety of the tourists. The heath care facility should be there to provide necessary support if the tourists become ill. The facility should be safe and clean and ensure the availability of physicians and hospital beds. The food safety standards (often also established by law) should adhere to the required standards and this should not be limited only to the high-class establishments only. Mini Sheth et al, (2011) showed how consumption of foods in small and medium-sized restaurants in Vadodara, India poses a high risk to the consumers. Some research was made in the USA to understand the importance of food safety behaviours of consumers at restaurants, particularly in the areas of personal hygiene and workplace sanitation, food handling, and food preparation (Andrew J. Knight et al, 2007). Restaurant Business operators' lack of hygiene sense and their attitudes toward food control can affect the hygiene in their restaurants. (Tina Läikkö-Roto and Mari Nevas, 2014). The main reason why the Japanese travel for their visit to Australia is the concept of a safe and clean destination, with unique nature, warm climate, beautiful beaches and up to date facilities. (Hendry, J., 1987; Leiper, N., 1985).

Transport (Air, Road, Railways and port) Infrastructure:

To commute to and from countries, as well as movement to destinations within countries, quality air transport infrastructure is must. This has to be adequately supported by quality roads, railroads, and ports. The national transport network as a whole should offer efficient, accessible transportation to key business centres and tourist attractions. Paul J. Upham and Julia N. Mills (2005) conducted a research based on decision support tool to assess a core set of environmental and operational sustainability indicators for airport benchmarking. Graham (2005) did a benchmarking study on the quality of airport facilities. In the same line Héctor Rodríguez-Déniz and Augusto Voltes-Dorta (2014) used a hierarchical clustering method before carrying out benchmarking analysis. Herzberg's two-factor motivation theory was used to explore most frequently mentioned attributes of airport service quality (Vanja Bogicevic et al, 2013). The research indicated key satisfier in the airport context, such as cleanliness and pleasant environment to spend time in. On the other side, security-check, confusing signage and poor dining offer were recognized as major dissatisfiers in the airport setting. Carlos Pestana Barros et al. (2011) did a research on heterogeneity on the technical efficiency in Japanese airports. A conceptual model for airport service quality was developed with the help of qualitative and quantitative research on nearly 1,000 airport users. It was found that passengers' expectations of airport service quality are a multidimensional, hierarchical construct that includes three key dimensions: function, interaction and diversion (Dale Fodness and Brian Murray, 2007). Airport safety and security related key performance indicators (KPI) were identified in the UK (Aghahowa Enoma and Stephen Allen, 2007). Researchers found that intelligence and information sharing were vital in combating acts of terrorism and crimes at the airport. These are an ongoing and continuous exercise with clear scope for improvement; with the aid of rigorous benchmarks, KPIs, measurement and performance targets. Facilities management can influence airport security (Andrew W. Brown and M.R. Pitt, 2001). A good technology based transportation model can improve the operations in airports (Michael Pitt et al, 2002). A modified SERVQUAL model was developed and zones of tolerance were identified for transport related dimensions (Robert Y. Cavana et al, 2007). Three new transport dimensions (comfort, connection, and convenience) were added to the original five SERVQUAL dimensions (assurance, empathy, reliability, responsiveness, and tangibles). Laura Eboli and Gabriella Mazzulla (2014) conducted a survey for services offered by rail operators in Northern Italy and found that cleanliness, information and service characteristics like punctuality and frequency of runs have the highest positive effect on service quality. Gupta and Datta (2012) did a research on service attributes in Indian railways. The results indicated that passengers were most dissatisfied with "extent of waiting"; thereafter, there was a desire for further improvement of the

"security" system. The "travel associated facilities" such as Automated Teller Machine and use of cashless facilities at ticket counters; and "passenger amenities" such as station furniture and refreshment room have also been ranked higher in terms of the need for improvements. India's supply of transport, ICT, and energy infrastructure remains largely insufficient and ill-adapted to the needs of the T&T competitiveness(Roy S., 2014).

Tourism infrastructure:

The tourism infrastructure can be defined as the collection of accommodation infrastructure (the number of hotel rooms), car rental companies as well as a well-knit financial infrastructure for tourists. The strategic factors were identified to improve competitiveness in the Indian Hotel industry (Roy S., 2011). The efficiency of the hotel and restaurant sector in India has been measured with the help of data envelopment analysis (DEA) (Gunjan M. Sanjeev, 2007). This research also explored the relationship between the efficiency and size of the hotel and restaurant companies. Similar research was done by Hao Luo et al (2014) in major Chinese cities. The major dominant factor was technical inefficiency. It was also found that political hierarchy, the degree of openness and level of tourism dependence help explain the cross-city differences in efficiency scores, whereas ownership structure dominantly contributed to the improvement of efficiency over time. A modified two-stage model was developed to evaluate productive efficiency, occupancy, and catering service effectiveness of Taiwan′s international tourist hotels (Chin-wei Huang et al, 2014). Results on a similar research conducted in the luxury hotels in Turkey revealed that the hotels seem to be indecisive in applying a specific strategy (Yıldırım Yılmaz, 2013) and the business strategy and efficiency level of the luxury hotels are related. Gunjan M. Sanjeev and Vinnie Jauhari, (2012) identified the key strategic and financial issues that Indian hoteliers are currently facing. Some of the key emerging areas are risk management, cost management, revenue management, growth challenges, land management and policies, and innovative practices arising from an extended inflationary period. Researchers found that hotel performance was positively associated with hotel category and type of hotel (chain or individual). Customer expectations and actual experiences (the service gap) were identified at different 4-star and 5-star hotels in New Delhi, India. (Asad Mohsin and Tim Lockyer, 2010). It was found that best HRM practices differ based on differences in internal and external environmental factors present in different geographical areas (Suwastika Naidu and Anand Chand, 2014). Constantine Manasakis et al (2013) studied the relative efficiency between hotels operating under a brand and hotels operating independently, on the island of Crete, Greece; identified the inefficiency causes using data envelopment analysis. The inefficiency causes was mainly due to the input/output configuration and not due to their management teams' performance to organize the inputs in the production process. A research in Malaysia with empirical analysis via hierarchical regressions confirmed that returning tourists' intention to stay at a green hotel was influenced positively by perceived behavioural control and attitude (Norazah Mohd Suki and Norbayah Mohd Suki , 2015). Lakshmi Kumar et al (2011) analysed the rapid diffusion of ATM (automatic teller machine) technology in Indian banking sector with the help of constant elasticity of substitution (CES) model.

Information and Communication technology (ICT):

For T&T, Information and Communication technology (ICT) can play a very important role. Robe Law et.al. (2014) did a content analysis based on review of 107 papers and showed how ICT plays a strategic role in hospitality and tourism industries. The development of (ICT) presents great challenges as well as opportunities for Tourism and hospitality businesses.The impact of ICT applications in travel and tourism industry has been studied by Law et al. (2013). The impact of hotel information security on system reliability was studied by Kim et al. (2013a , 2013b, 2013c). Based on the study, they analysed and identified several important factors. On the basis of empirical findings, they highlightred the

importance of establishing technical security for hotels' strategic information. They also explored the reason for adopting security systems and found the association between the extent of technologies currently in use, the availability of IT department and the hotel class. Organisational success in the hospitality industry is typically related to information technology (Ali Sukru Cetinkaya et al, 2014). Travel related Online social networks offer e-loyalty to the customers (Albert Barreda et al, 2013). The online social network travel websites must have innovativeness, perceived utility, and information sharing for Gen Y travellers (Khaldoon Nusair et al, 2013). The use of ICT activities like online promotion and booking, information analysis, report management systems, ERP systems, GPS and ambient intelligence can minimize the negative effects of transportation and some activities related to hospitality on the environment (Maria-Eugenia et al, 2010). Researchers compared the ICT use in hotels situated in established (i.e. Spain) and emerging (i.e. Croatia) tourist destinations (Maria Eugenia et al, 2013) to understand its impact.

Price:

The price competitiveness in the T&T industry always plays a lead role and a differntiating factor. Price is one of the important factors in hotel selection (Lockyer, T.2005). Mattila and O'Neill (2003) identified the relationship among hotel room prices, occupancy percentage, and guest satisfaction using data from 3,875 actual guest satisfaction surveys at an upper midscale hotel in the US. The study concluded that price was a significant predictor of overall guest satisfaction and three key guest-satisfaction components: guest room cleanliness, maintenance, and attentiveness of staff. It was found that both price perception and customer satisfaction played significant partial/complete mediating roles in the Restaurant industry. The employee hospitality and perceived price can improve customer satisfaction in the hotel industry. (Kemal Gürkan Küçükergin and Bekir Bora Dedeoğlu, 2014). Manuel Becerra et al, (2013) did a research on the effects of vertical and horizontal differentiation on pricing policy in a large sample of hotels in Spain. As per the research, the hotels with more stars (i.e., vertically differentiated) offered smaller discounts over listed prices, in addition to charging higher prices. Similarly, hotels that belong to a branded chain also charged higher prices and provided smaller discounts. The degree of local competition moderated the effect of differing on pricing policy, but only for vertical differentiation. An empirical analysis to test for spatial price competition found that hotels compete with more distant neighbours of similar quality than those who are quality-differentiated (Lee, S. K., 2015). Researchers (Kurt Matzler et al, 2006) investigated the drivers of service and price satisfaction, and the impact of service and price satisfaction on loyalty by using structural equation modelling in the hotel industry. A study showed that chain hotel with higher multimarket contact and higher differentiation (i.e. More stars, the Q certificate, common umbrella brand and a unique combination of services) charge higher prices (Rosario Silva, 2015) .Qiang Ye et al, (2012) empirically investigated the influence of price on customers' perceptions of service quality and value by using 43,726 online reviews covering 774 star-rated hotels. They observed that it has a positive impact on perceived quality, but has a negative impact on perceived value. Price also has a more significant impact on perceived quality for the higher-star, luxury hotels than a lower-star, economy establishments. An empirical study for Taiwanese international tourist hotels suggested that the higher prices may signal higher service quality (Chiu et al, 2014).

Human resource:

Quality human resources in T&T industry are an important factor for its growth. The future of HRM in the hospitality industry will need to take into account the various trends, but will also be influenced by local circumstances (Michael C.G. Davidson et al, 2011). Seemingly intransigent human resource issues remain at the forefront of global tourism's challenges (Tom Baum, 2015). Girish Prayag and Sameer Hosany (2015) have identified four key

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factors of Human resource development (HRD) by line managers in the Mauritian hotel industry. These are: Improvements in staff attitude, better teamwork, enhanced productivity and better service delivery. They also found that the link between HRD and corporate strategy is not clear. There is a need to enhance the engagement between supervisor and employees and the modern method of communication can be a great enabler. Paul Barron et al, (2014) opined that employers should take note of generational characteristics and adopt flexible policies attractive to all employees. Hospitality school graduates must have Information Technology skills to succeed in a rapidly changing and developing industry environment (Anil Bilgihan et al, 2014). It is important to understand the context specific ways and factors in which hospitality HR systems may impact a wide array of individual and organizational outcomes (J. Bruce Tracey, 2014). Tsai et al., (2009) explored the link between high-performance work practices and unit-level turnover and productivity (operationalized as sales per employee). They found that more full-time staff were engaged for Commitment-based" practices (e.g. focus on rewards and recognition) whereas more part-time, external staff were engaged for "control-based" practices (e.g. focus on technical training). Lorna Young-Thelin and Karla Boluk (2012) studied the HRM practices of small hotels in Sweden. They found that there has been a lack of attention devoted to the development of human resources systems and processes. The implementation and development of human resources systems and procedures depended on the background of the hotel manager or operator and available financial resources.

Natural and Cultural resources:

Heritage, medical tourism, destination and marketing can boost natural and cultural resources which act as an important enabler. Heritage tourism can be improved by stakeholder participation, private sector initiative, public-private partnership and effective urban management. (Stephen Nana   et al 2006). Cultural heritage can improve sustainable development in tourism. (Ana Pereira Roders and Ron van Oers, 2011). Jason Ryan and Sari Silvanto (2009) prepared a list of World Heritage Site (WHS) to improve and manage the World Heritage brand. Michael Guiry et al. (2013) observed that for all five service-quality dimensions (tangibles, reliability, responsiveness, assurance and empathy) the expectations of experienced medical tourists were significantly lower than potential medical tourists. The perceived medical quality, service quality and enjoyment were critical components that significantly influenced the perception of value in medical tourism (Hsiu-Yuan Wang, 2012). A significant relationship is there between tourism destination dominance and marketing website usefulness (Arch G. Woodside et al, 2011). Das Gupta and Utkarsh(2014) used a content analysis of official tourism websites of the top ten tourist attracting nations. They opined that there is a need to improve the websites on certain factors, specially related to Security and Responsiveness. The websites should also include features to support decision making at different stages of travel thus enhancing their effectiveness. The study also discussed the implications for tourism organisations in developing websites that create destination image and attract tourists across the globe. Innovative experience marketing design is an essential ingredient of tourism and hospitality firms(Alistair Williams, 2006). The country as a whole can be promoted as a favourable destination to international tourists with the help of a strategic long term marketing plan (Austin Uzama, 2009). Future direction of tourism marketing research should be concentrating on consumer behaviour, branding, e-marketing and strategic marketing (Rodoula Tsiotsou and Vanessa Ratten, 2010). A research was conducted in Korea, which revealed that the destination preferences, including different cultural experiences, safety, and convenient transportation, have a positive relationship with tourist's loyalty to the destination. Results from a path analysis showed that past trip experience affects tourists' destination preference (Joseph S. Chen and Dogan Gursoy, 2001). Destination Marketing Organisation (DMO) effectiveness is depending upon branding and positioning (Steven Pike & Stephen J. Page, 2014). Graham

Hankinson (2005) identified eight clusters of brand image attributes. They did factor analysis to identify the underlying dimensions to be - overall destination attractiveness, functionality, and ambience. While all three were correlated with perceived quality, commercial criteria were dominated by a destination's functional rather than ambience attributes. Destination Marketing Organisation (DMO) branding is quite complex (Steven Pike, 2005). Destination's repositioning strategy can be implemented with recreational, sports, culture and eco-tourism (Essam E. Ibrahim and Jacqueline Gill, 2005). Youcheng Wang and Shaul Krakover (2008) found the different relationships of cooperation and competition coexist among the tourism stakeholders.

Environment

In the rising concern for cleaner environment and green tourism, the importance of the natural environment becomes more crucial for enhancing environmental sustainability and increasing the attractiveness of the destination. Skender Kabashi et al. (2011) did a research on Greenhouse gas (GHG) and air pollution emissions and options for reducing it by using STELLA software. The annual total emission of air pollutants (CO, NOx, CHx, SO2 and dust) and GHG (CO_2) from the year 2000 up to 2025 has been calculated. The year 2000 was taken as the base year for emission. This model predicted that high emission of air pollutions and GHG in the short term from 2000 to 2010. Over 2015, due to implementing the emission reduction policies and introducing new technologies in transportation, a continual reduction in air pollution is expected, whereas the CO2 output up to 2025 will be reduced by 25 percent in comparison with the emission values of 2007.

Policy rules and regulations

Government plays a very important role and carries the responsibility of laying proper policy, rules and regulation and to ensure that is being adhered to. This can ensure the development of the sector and attract tourists. It also has to be ensured that the policy does not act as deterrent by encouraging red tapism. Baum, T. (1993) discussed the key elements or considerations which should be evaluated by those Policy makers of T&T. These factors are: the tourism environment, tourism and the labour market, tourism in the community, tourism and education and human resource development in the tourism industry. Vanessa A. Amoah and Tom Baum (1997) developed a framework which advocates the importance of education for T&T policy and ensure that they work in synergy. Aslihan Aykac (2010) opined that the integrated policy approach combined tourism policy, education policy and labour policy to form a common denominator that would enhance tourism employment, hence tourism industry across the board. Micro businesses in tourism might influence the process of tourism policy formation and change in urban settings (Rhodri Thomas and Huw Thomas, 2006). A research by Peter U.C. Dieke (2003) highlighted on the issue of clear tourism development objectives and integration of these into national plans. He advocated for local involvement and control, regional co-operation and integration and promoting tourism entrepreneurship. Qiu Hanqin et al. (2002) observed that tourism policy implementation in China was a 'top-down' and 'trial and error-correcting' model. The strong influence of the socio-cultural environment on the politics driving sustainable tourism inhibits its effective implementation in Cyprus (Anna Farmaki et al, 2015). Some research was conducted on policies with the help of the advocacy coalition framework and network analysis (Edieser Dela Santa, 2013). The study was based in Philippines and it showed that individual policy beliefs might lead to implementation networks, but the degree of network integration determined progress in policy execution. It was found that four factors namely: institutional arrangements; economic and social macro-environment; inter-organizational relations (IOR) and inter-organizational co-ordination structures (IOC); and interest groups were influential in the implementation of tourism policy in China (Dan Wang and John Ap, 2013).

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METHODOLOGY

There are various models for prioritising factors in research. The significant models are multiple criteria decision making (MCDM) models such as analytic hierarchy process (AHP), technique for order preference by similarity to ideal solution (TOPSIS) etc. In this paper, Fuzzy TOPSIS model is applied, introduced by Chen (1997) for prioritising the enablers for T&T industry in India. The research framework is presented in Figure I.

Figure 1 Resaerch framework
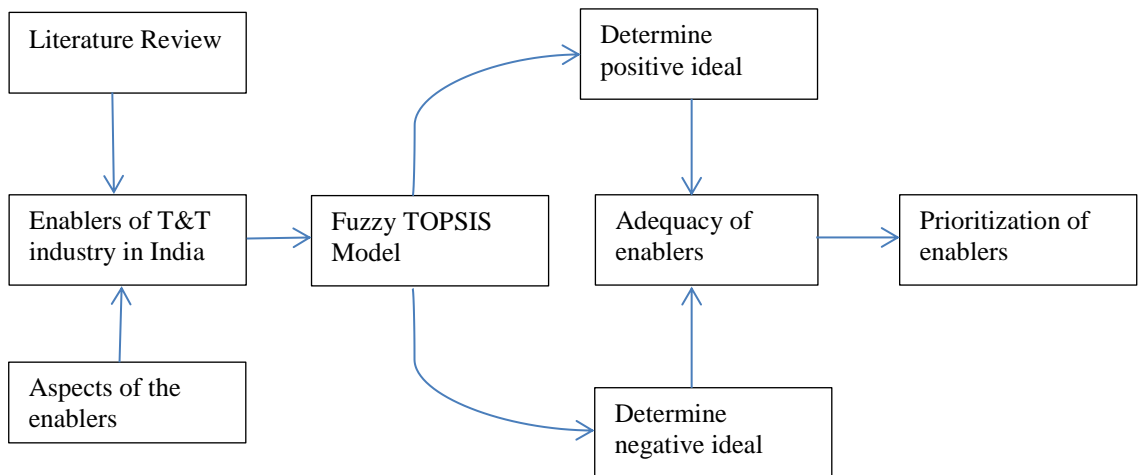
To facilitate the service delivery for improving customer satisfaction, TOPSIS offers an important operational design. The inability to deliver on required service standards can be highlighted through the loss function in TOPSIS thus making it an effective tool for service design (Mukherjee and Nath, 2005). In TOPSIS, a multi-attribute decision-making problem is viewed as a geometric system with m points in the n-dimensional space. The idea is the chosen alternative should have the shortest distance from the positive-ideal solution and the longest distance from the negative-ideal solution. The ambiguity and vagueness of human judgements can be captured by fuzzy sets (Kahraman et al., 2007). Fuzzy TOPSIS is a methodology that is an extension of TOPSIS allowing the flexibility to deal with ambiguity and vagueness of human judgement.

The study sample was randomly selected from the tourists in the state of Uttarakhand, India. Uttarakhand is a state in North Indian region of Himalayas. The state is crossed by Himalayas and popularly known as Devbhumi (land of Gods) due to the presence of numerous Hindu pilgrimage sites. It also attracts a lot of foreign tourists because of the beautiful mountains of Himalayas and the Yoga centre in the town of Rishikesh in the banks of holy river Ganga. Thus the state provided a proper representation of the tourists in India and the result can be generalized for the entire nation. Questionnaires were administered among a sample size of 160 tourists, among which 132 were proper for use. The locations selected for the study were Nainital in Kumayun region and Haridwar, Rishikesh in Garhwal region of Uttarakhand. Table 1 shows the characteristics of the sample.

Table 1	Sample characteristics	
Factor	**Frequency**	**Percentage**
Age(years)		
20-30	24	18.5
30-40	35	26.5
40-50	28	21
50-60	27	20
More than 60	18	14
Indian	82	62
Foreign	50	38
Previous no. of visits		
None	48	36.5
1	36	27
2	26	20
3	14	10.5
More than 3	08	06

Questionnaire development, validity and reliability

In order to prioritise the T&T enablers in an Indian context, the enabling factors were driven from extensive literature survey. The data was collected in the form of a questionnaire by asking the respondents to choose the importance of the mentioned enablers based on Likert scale, with rankings of: 1 very low; 2 low; 3 relatively low; 4 fair; 5 relatively high; 6 high; and 7 very high. Prioritising the factors was done using the Fuzzy TOPSIS. For each linguistic term used in the questionnaire, the numerical value is determined using fuzzy approach as shown in TableII (Lin et al., 2005). Because of the imprecise nature of linguistic attributes related to the T&T enablers, inconsistencies in assessment are likely to be there. To deal with these inconsistencies, a fuzzy based approach is needed to convert the linguistic attributes associated into fuzzy numbers. In TableII, the seven scale linguistic terms are transformed into equal fuzzy intervals. This research uses the questionnaire already used in previous studies (Nel et al., 1997; Sultan and Simpson, 2000). So its validity is confirmed. To test the reliability of the questionnaire, Cronbach's alpha was found to be 0.79, which indicated that the questionnaire has high internal reliability.

Table 2	Fuzzy range and numbers
Linguistic Term	**Fuzzy Number**
1	(0,0.05,0.15)
2	(0.1,0.2,0.3)
3	(0.2,0.35,0.5)
4	(0.3,0.5,0.7)
5	(0.5,0.65,0.8)
6	(0.7,0.8,0.9)
7	(0.85,0.95,1)

Measurement with fuzzy set

The measurement of human perception related to the area of Travel and Tourism is an area of imprecision. The quantitative assessment models based on the objective assessment of various factors is not beyond criticism. The most fundamental assumption in all these models

is that the factors can be precisely defined and unambiguous terms are questionable. Therefore the evaluation of the factors and their importance can be better judged by subjective judgments. Zimmer (1983) has suggested that human are comparatively efficient in qualitative forecasting than quantitative prediction. People will be less biased when asked to give subjective estimates. It is quite clear from the discussion that for assessment, quantification may be better based on probability-possibility instead of pure statistical probability. Fuzzy decision making process fits well in such situations, as it is possible to study the complex and ill defined systems and concepts where uncertainty is due to fuzziness or degree of vagueness. Hence our effort will be in exploring the possibility of carrying out the assessment based on fuzzy decision making process. To reflect the subjectivity and imprecision in the survey, the assessment made by the respondents can be represented as fuzzy sets. Fuzzy logic could quantify imprecise data as shown by Kosko (1993) through approximate linguistic expressions – high, good, bad etc. Thus fuzzy logic allows decision-making with estimated values under incomplete or uncertain information.

For this reason fuzzy logic has been combined and used along with TOPSIS, and has resulted in a Fuzzy TOPSIS methodology for reviewing the enablers of T&T industry in India. The following seven steps, based on the technique introduced by Chen (1997), are used for this research purpose in ranking the enablers.

Step one

For a fuzzy decision matrix of respondents' ideas, where i stands for the number of factors (enablers) and j stands for the number of respondents. $\tilde{X}_{ij}$ stands for the score assigned by respondent number i for factor j. On the other hand, Wij is the importance (weight) of each respondent's ideas. It must be added that, because all the respondents are considered to have the same weight, $\tilde{W}_{ij}$ will be defined:

as $\tilde{W}_{j} = (1,1,1) \, \forall j \in n$;

$$\tilde{D} = \begin{bmatrix} \tilde{X}_{11} & \tilde{X}_{12} & \dots & \tilde{X}_{1n} \\ \tilde{X}_{21} & \tilde{X}_{22} & \dots & \tilde{X}_{2n} \\ \dots & \dots & \dots & \dots \\ \tilde{X}_{m1} & \tilde{X}_{m2} & \dots & \tilde{X}_{mn} \end{bmatrix}$$

$$\tilde{X} = (a_{ij}, \, b_{ij}, \, c_{ij})$$

$$\tilde{W} = \left[\tilde{w}_{1}, \tilde{w}_{2}, \dots, \tilde{w}_{n} \right]$$

Step two

This involves neutralizing the weight of decision matrix and generating fuzzy unweighted matrix($\tilde{R}$). To generate $\tilde{R}$, either of the relations can be applied.

Relation 1

$$\tilde{R} = \left[\tilde{r}_{ij} \right]_{mxn} \quad \tilde{r}_{ij} = \left(\frac{a_{ij}}{c_j^*}, \frac{b_{ij}}{c_j^*}, \frac{c_{ij}}{c_j^*} \right)$$

where:

$$c_j^* = \max c$$

Relation 2

$$\tilde{r}_{ij} = \left(\frac{a_j^-}{c_{ij}}, \frac{a_j^-}{b_{ij}}, \frac{ca_j^-}{c_{ij}} \right)$$

where:

$$a_j^- = \min a_{ij}$$

Step three

This step includes generating fuzzy unweighted matrix ($\tilde{V}$), while having $\tilde{W}_{ij}$ as an input for the algorithm:

$$\tilde{V} = \left[\tilde{v}_{ij} \right]_{mxn} \quad i = 1, 2 .... m, \ j = 1, 2, ... n$$

$$\tilde{v}_{ij} = \tilde{r}_{ij} \cdot \tilde{w}_j$$

Step four

Determine positive ideals ((FPIS, A$^+$)) and negative ideals ((FPIS, A$^-$))for the factors:

$$A^+ = \left(\tilde{v}_1^*, \tilde{v}_2^*, ..., \tilde{v}_n^* \right)$$

$$A^- = \left(\tilde{v}_1^-, \tilde{v}_2^-, ..., \tilde{v}_n^- \right)$$

The positive and negative ideas introduced by Chen (1997) are used in this research. Therefore:

$$\tilde{v}_j^* = (1, 1, 1)$$

$$\tilde{v}_j^- = (0, 0, 0)$$

Step five

The sum of distances from positive and negative ideas for each factor is calculated in this step. For fuzzy numbers such as A and B, the difference between A and B shown as D(A,B). is determined using the following formula:

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$$\tilde{A} = (a_1, b_1, c_1) \quad \tilde{B} = (a_2, b_2, c_2)$$

$$D(A, B) = \sqrt{1/3\left[(a_2 - a_1)^2 + (b_2 - b_1)^2 + (c_2 - c_1)^2\right]}$$

The difference of each factor from positive and negative ideas is calculated

$$d_i^* = \frac{\sum_{j=1}^{n} d\left(\tilde{v}_{ij} - \tilde{v}_j^*\right)}{n} \quad i = 1, 2, ..., m$$

$$d_i^- = \frac{\sum_{j=1}^{n} d\left(\tilde{v}_{ij} - \tilde{v}_j^-\right)}{n} \quad i = 1, 2, ..., m$$

Step six

The adequacy of each factor to positive ideal is calculated as the following:

$$CC_i = \frac{d_i^-}{d_i^* + d_i^-} \quad i = 1, 2....., m$$

Step seven

This is the final step where in terms of descending order of CC_i factors are ranked. Therefore the higher CC_i go to top.

FINDINGS

The findings of this research shows that "Safety and security", "Price" and "Transport" are considered the most important enabling factors for T&T industry in Indian context. The "Safety and security" factor gets a value of 0.705 which is the ratio between distance from negative ideal upon total distance from negative and positive ideal. Its d^* value being 0.199 indicates that it is closest to the postive ideal among all the factors. Similarly the d_i^- value of 0.592 is farthest to the negative ideal. This may be attributed to the fact that recent terrorist activities worldwide have made "Safety and Security" one of the biggest concern. This has been corroborated by frequent alert by the respective governments from western world to their citizens regarding travel to contries like India. There are a lot of price conscious visitors visiting India making price as one of the prime enabler. The same view was expressed by the domestic visitors as well. The general concern among tourists were the transport and related infrastructure. Interestingly "Human Resources" and "ICT" are considered as least important factors. This may be attributed to the fact that general hospitality of Indians was considered satisfactory by the respondents. India being a considerable force in ICT industry, the penetration has been there in T&T industry as well. The entire result is shown in Table 3.

Table 3   Ranking the enablers for T&T industry

Rank	Factor	d_i^*	d_i^-	Ci
1	Safety and Security	0.199	0.592	0.755
2	Price	0.205	0.590	0.744
3	Transport (Air, Road, Railways and port) Infrastructure	0.207	0.582	0.738
4	Tourism infrastructure	0.208	0.575	0.735
5	Health and hygiene	0.211	0.572	0.730
6	Environment	0.216	0.570	0.726
7	Policy rules and regulations	0.221	0.566	0.720
8	Natural and Cultural resources	0.237	0.556	0.711
9	Human resource	0.245	0.551	0.706
10	Information and Communication technology (ICT)	0.248	0.550	0.701

DISCUSSION

There is a need to project India as a **safe and secure** tourist destination. The country may step up its incredible India campaign— showcase of different aspects of Indian culture and history—globally to help counter balance some of the adverse conceptions about tourism, especially the safety of women tourists. Crime against foreign visitors has tarnished India's image globally and adversely affected its tourism industry. There is an urgent need to ensure the safety of the tourists and improving the brand image. These protection measures include creating massive awareness campaigns for demonstrating good behaviour with visitors and deploying civil police along with helping visitors with tourist helpline numbers. In addition, it is also important that the private hotels and restaurants and the tour operators are registered with the state authorities, so that they function according to the formal rules.

Price takes the second rank in our findings. It is imperative to introduce proper regulatory policy to increase international tourist inflow. One of the important measures should be to ensure that the tourists are not cheated and overpriced. The customised tour packages with competitive pricing may be developed keeping in mind the profile of visitors, budget and travel requirements.

Although India provides an array of tourism destinations, still there is need for development of new tourist destinations for offering innovative tourism products or experiences specially related to natural and cultural tourism. This can be ensured by developing integrated tourism circuits across states based on attributes, tourism potential, current and future connectivity and synergy within destinations. This should be supported by seamless travel across integrated circuits through linkages between various public **transportation** modes. The T&T sector needs investment and that can be ensured from private sector through provision of fiscal and non-fiscal incentives for boosting **infrastructure** development. There are currently many challenges in terms of improving the destination experience: better airports, bus stations, railway connectivity, public transport, sanitation, power, roads, the approach to monuments and maintenance – these are all areas with substantial scope for improvement. There is urgent need for improvement in highway infrastructure such as petrol pumps, clean drinking water kiosks and sanitation facilities, road signage's etc.

Health and Hygiene has been always a concern for tourists in India. A focus on sustainable tourism at the centre of the development agenda can be helpful so that rural tourism and

cultural tourism can thrive. A recent initiative by Government called *Swatch Bharat* (cleaner India) can be a great boost to improve the sanitation. Involvement of local community can ensure hygiene and safety issues.

Our findings accentuate the need for more reliable tourism development **policy rules and regulations** to be executed by the Government of India to take full advantage of the potential of tourism for promoting economic growth. The onus lies with the government to direct their policy focus towards extending very warm hospitality to inbound tourists, enhancing tourism infrastructure and generating more visitor trust in the worldwide tourism market.The presence of many world heritage sites has played a crucial factor in increasing foreign tourist arrivals in different states of India. It is necessary that the Government of India should take additional measures for the preservation and protection of the **cultural** heritage sites.

To promote the T&T industry, **marketing** process needs to be strengthened. There has to be proper usage of publicity material like brochures, print creative, audio video presentations, short films, radio jingles, online creatives and advertisements over media channels. In the present world it is important to use innovative marketing techniques over social media channels for promoting tourism. To promote T&T industry in India and attract foreign tourists, the effort has to go beyond the geographical boundary. There should be increased participation in international events.

T&T sector in India is in continuous need for trained **human resources.** The training and skill development programmes may be introduced in order to manage the supply of adequately skilled manpower. It is also important to involve local community through awareness programmes and workshops for sustainable development and maintenance of tourism in the country. To achieve the desired growth in this sector the country needs to execute policies that advance enthusiastic and prudent talent management, particularly in human capital development. The hospitality education should be more "hands on" in order to ensure that students are better prepared and more employable. In order to accomplish this transition, an active university-industry interface is needed.

As **Information and Communication technology** becomes the main medium for accessing and retrieving information, an online presence needs to be managed so as to create desired business outcomes. Online marketing has become an important medium for hospitality firms. Indian T&T industry has to gain the pace in this respect and web sites of various parties involved need to add this capability so that they can capitalize on the market opportunities that exist around the world.

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