Figure 1:- The model is derived from experience in participating conferences including field trips abroad and literature review. It is related to 3 stakeholders and can be classified into 7 main groups. The AHP is applied to prioritize the importance level of 7 main factors in order to create a model of organizing marathon running events. The researcher adopted the model to the actual events to test whether the model from research can be used in practice or not.

To study the satisfaction factors towards marathon running events in terms of the importance on factors, satisfaction of factors, and creating "satisfaction index" for current marathon running events;

1. To study the hierarchy of satisfaction factors which affects organizing marathon running events and creating a model of marathon running system, by means of the "Application of Analytical Hierarchy Process for Investigating Satisfaction Factors in Organizing a Marathon Running Event" on the basis of satisfaction factors collected from organizers, athletes, and sponsors; and

2. To evaluate the results of using the created model, by applying the analytical hierarchy process (AHP) in organizing three marathon running events, so as to be spatial data for the research.

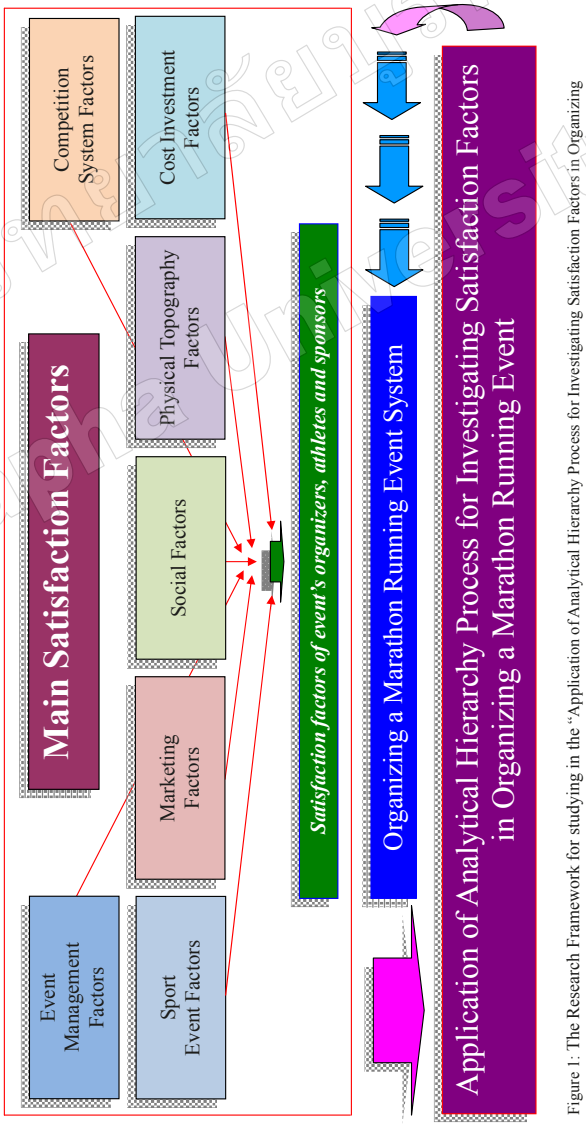

Figure 1: The Research Framework for studying in the "Application of Analytical Hierarchy Process for Investigating Satisfaction Factors in Organizing a Marathon Running Event"

Literature Review

Apart from the satisfaction factors towards organizing a marathon running event derived from data collection in the venues of marathon events by using questionnaire to interview a sample group of 2,632 persons and in-depth interview to a sample group of 65 persons (3 stakeholders: 30 athletes, 20 event organizers, and 15 sponsors), the researcher applied the data collected from numerous sources, especially in literature review as the following.

Schofied (1983); Hensen and Gautheir (1989); Zhang, Pease, Hui, & Michaud (1995) mentioned about factors in attending sports events such as economic factors, demographic factors, game attractiveness factors, and residual preference factors which correspond to Wells, Southall, and Peng (2000). They also added about social psychological factors. Ferreira and Armstrong (2004) additionally talked about other factors which are overall popularity of sports, free offerings and promotion, pre-game and in-game entertainment, convenience and accessibility, labels physical contact, facility, and ticket price. Furthermore, Lee and Bang (2003) proposed that the factors include team performance, weather, competition, fan identification, social interaction, entertainment, new stadium, and quality of food services. Hall, O'Mahony, and Vieceli (2009) provided their opinions that the factors consist of emotion, true fan, front room, back room, media alternative, and family and friend. In terms of intention to attend and participate sports-related activities, Zeithaml, Berry & Parasuraman (1996); Cronin, Brady & Hult (2000); Ajzen (2005), Carroll (2009), Dolmont (2009), Menefee (2009), and Yoshida (2010) give similar opinions that the factors comprise of game revisit, recommendation, positive word of mouth, persuasion, purchase of souvenirs, loyalty to company or service,

higher spending (the customers are willing to pay more for better goods or services) based on the importance and attraction of games or activities. Hensen and Gautheir (1989); Yoshida and James (2010) identified about the related factors i.e. competition in special occasions, number of reputational sportsman, and atmosphere of games. In this regard, Smith (2008: 36-39) specified that the attractions of activity are psychological, social and cultural, and personal. Wann (1995); Funk (2000); Funk & Pastore (2000); Trail, Anderson & Fink (2000); Wann, Royalty & Rochelle (2002); Shank (2009) added and supported that the activities which can attract spectators and participants must have excitement, enjoyment, and entertainment value which can build or boost up pride of individual or community motivated by sports. Meanwhile, the athletes can build up alliance, sociability, relaxation, representation of success, source of knowledge, artistic value, economic value, family relationship, necessity for alliances sharing similar quality of expression, and physical and qualitative characteristics of participants who want to escape the monotony of everyday life.

Therefore, in order to organize marathon running events and create games carrying the above-mentioned factors completely, Masteralexis, Barr & Hums (2005) and Westerbeek, Smith, Turner, Emery, Green & Van (2007) mentioned about event management that it must comprise main functions which are financial and budget management (for the success of overall competition), risk management (which is loss management such as asset, equipment, image, market share), organizing competition (i.e. framework of event, equipment, necessary facility, schedule of activity, considering important supporter, making agreements of signs to be placed, venue, food and beverage, sale of souvenir, marketing promotion activity, transportation, communication, responsibility, authority line, security, policy, and mass controlling), registration management, voluntary management, and marketing management. Funk (2008) gave his opinion that organizing sports competitions needs to consider facility service, communication tool, food and beverage, geographical relation of venues, accommodation, sign and decoration, language service, maintenance of infrastructure, medical treatment and first aid, transportation, and safety and security.

According to the above-mentioned data of satisfaction factors of organizing marathon running events which was gathered from numerous sources, a total of 85 factors were classified into 7 main factors as the following.

(1) Event Management Factors (EMF)
(2) Sport Event Factors (SEF)
(3) Marketing Factors (MKF),
(4) Social Factors (SOF)
(5) Physical Topography Factors (PTF),
(6) Cost Investment Factors (CIF)
(7) Competition System Factors (CSF)

Methodology

The research on the "Application of Analytical Hierarchy Process for Investigating Satisfaction Factors in Organizing a Marathon Running Event" is combined by using both qualitative and quantitative methods. The researcher gathered information from literature review and survey by using questionnaires to interview sample groups for data in marathon running venues, through multistage random samplings. The methods are blended from cluster sampling, stratified sampling, and simple random sampling from 2,632 contestants, 55 venues, 38 provinces, and 6 regions in total. The researcher also collected data from in-depth interviews on the ground using the purposive sampling method from 30 athletes, 20 event organizers, and 15 sponsors, with a total of 65 persons. In addition, 3 test venues were designed to evaluate the results obtained from applying AHP, aiming for geographical data as case studies which were "Hua-Hin Mini and Super Half Marathon 2013 (Mountain, Sea, Beach)", "Chaiyaphum International Marathon 2013" and "Angthong Super-Mini Half Marathon 2013 (Green Field)". The AHP process is then applied repeatedly to analyze the suitability and correspondence of the importance factors and satisfaction factors regarding 3 stakeholders. The data applied for the analysis is derived from experience in the venue of marathon events of researcher, inquiry, advice and instruction from knowledgeable people in marathon running business, domestic and offshore experts. It is also from studying related documents and research papers.

Results and Discussions

According to the research on the "Application of Analytical Hierarchy Process for Investigating Satisfaction Factors in Organizing a Marathon Running Event", the researcher can summarize and provide opinions in the results of research as the following.

The data analysis on marathon running events implying 85 factors involved with qualitative satisfaction, while only 7 factors are the most important which can be used for collecting the data by verbal questionnaires, whose quality of survey had received approval from the experts. (Experts :- They are basically categorized into 4 groups with a total of 35 persons. These are (1) organizers of marathon running events of 20 persons, (2) Thai and foreign scholars who possess the knowledge of mass sports (marathon) of 9 persons, (3) the committee members of Thai Health Promotion Foundation of 3 persons, and (4) the companies organizing the running events with 15-30 years of experience of three companies.) The aims of survey are to study and analyze the importance factors, satisfaction factors, satisfaction index, and hierarchy of satisfaction factors, and evaluation on organizing marathon running in actual venues by adopting the model of competition system which is built up from AHP based on the above-mentioned qualitative data of organizing marathon running. The results of data analysis can be explained by issues as the following.

1. The confirmatory analysis on importance factors:

In determining importance factors, 7 main factors in which some of them correspond with previous integration of some authors. They are (1) event management factors (EMF) [Masteralexis, Barr & Hums (2005); Westerbeek, Smith, Turner, Emery, Green & Van Leeuwen (2007); Lee and Bang (2003)], (2) sport event factors (SEF) [Schofied (1983); Hensen and Gautheir (1989); Zhang et al. (1995); Wells, Southall, and Peng (2000); Ferreira and Armstrong (2004)], (3) marketing factors (MKF) [Zeithaml, Barry, and Parasuraman (1996); Cronin, Brady, and Hult (2000); Ajzen (2005);

Carroll (2009); Dolmont (2009); Menefee (2009); Yoshida and James (2010)], (4) social factors (SOF) [Hensen and Gautheir (1989); Yoshida and James (2010); Smith (2008); Wann (1995); Funk and Pastore (2000); Trail , Anderson & Fink (2000); Wann, Royalty & Rochelle (2002); Shank (2009); Hall, O'Mahony, & Vieceli, (2009)], (5) physical topography factors (PTF), (6) cost investment factors (CIF) [Masteralexis, Barr & Hums (2005); Westerbeek, Smith, Turner, Emery, Green & Van Leeuwen (2007)] and (7) competition system factors (CSF) [AIMS : Association of International Marathon and Distance Races (2012)]. The study results contain the following information.

When considering an analysis table of correlation coefficient among observable variables, it was found that most of variable correlation is 0.335 – 0.730, and standard deviation is 6.977 – 34.180 from the total of 2,632 samples in this study. After considering, Kaiser-Meyer-Oklin Measure of Sampling Adequacy (KMO) and Barlett's Test, KMO, a number measuring the random adequacy which is supposed to be close to 1 or its minimum should be 0.5, its actual value is 0.892. While Barlett's Test of Sphericity Approx. Chi-Square provides 11547.971, df 21, and Sig. .000; it is a value testing the relation of variables. In this regard, p-value is close to zero which is less than 0.05, or a significant level. This number represents that each variable used in this analysis has suitable relation. Therefore, each variable can be used for a method of factor analysis.

The results of analysis by means of linear structural relationship model (LISREL Model) found that the importance on factors (expectation on factors) in organizing a marathon running event model is consistent with empirical data. These can be considered from $\chi^2 = 4.0$, df 5, p 0.87, GFI 1.00, AGFI 1.00, RMR 0.0020, RMSEA 0.000, and $\chi^2 / df = 0.806$. The p value amounting to 0.87 which is more than 0.05 showed the acceptance of null hypothesis which specifies the model used for measuring factors correlated to importance on factors in organizing marathon running event and empirical data model has no difference. The result of analysis on GFI and AGFI found that is close to 1. Moreover, RMR and RMSEA which are close to 0 and under 0.005 represent the alignment of theoretical model and empirical data.

2. The confirmatory analysis on satisfaction of the 7 main importance factors:

The confirmatory analysis on satisfaction in 7 main factors consisting of (1) event management factors (EMF) [Masteralexis, Barr & Hums (2005); Westerbeek, Smith, Turner, Emery, Green & Van Leeuwen (2007); Lee and Bang (2003)], (2) sport event factors (SEF) [Schofied (1983); Hensen and Gautheir (1989); Zhang et al. (1995); Wells, Southall, and Peng (2000); Ferreira and Armstrong (2004)], (3) marketing factors (MKF) [Zeithaml, Barry, and Parasuraman (1996); Cronin, Brady, and Hult (2000); Ajzen (2005); Carroll (2009); Dolmont (2009); Menefee (2009); Yoshida and James (2010)], (4) social factors (SOF) [Hensen and Gautheir (1989); Yoshida and James (2010); Smith (2008); Wann (1995); Funk & Pastore (2000); Trail , Anderson & Fink (2000); Wann, Royalty & Rochelle (2002); Shank (2009); Hall, O'Mahony, & Vieceli, (2009)], (5) physical topography factors (PTF), (6) cost investment factors (CIF) [Masteralexis, Barr & Hums (2005); Westerbeek, Smith, Turner, Emery, Green & Van Leeuwen (2007)] and (7) competition system factors (CSF) [AIMS : Association of International Marathon and Distance Races (2012)] provided the results as below.

When considering an analysis table of correlation coefficient among observable variables, it was found that most of variable correlation is 0.555 – 0.789, and standard deviation is 6.977 – 39.098 from the total of 2,632 samples in this study. After considering Kaiser-Meyer-Oklin Measure of Sampling Adequacy (KMO) and Barlett's Test, KMO, a number measuring the random adequacy which is supposed to be close to 1 or its minimum should be 0.5, its number is 0.921. While Barlett's Test of Sphericity Approx. Chi-Square provides 15007.102, df 21, and Sig. .000; it is a value testing the relation of variables. In this regard, p-value is close to zero which is less than 0.05 or a significant level. This number represents that each variable used in this analysis has suitable correlation. Therefore, each variable can be used for a method of factor analysis.

The analysis on confirmatory component by Lisrel program found that satisfaction model in organizing a marathon running event is in consistent with empirical data. It can be considered by , df 5, p 0.544, GFI 1.00, AGFI 1.00, RMR 0.0025, RMSEA 0.0000, and . The p which is beyond 0.052 means the acceptance of null hypothesis which specifies the model used for measuring factors correlated to satisfaction in organizing marathon running event and empirical data model has no difference. The result of analysis on GFI and AGFI found that is close to 1. Moreover, RMR and RMSEA which are close to 0 and under 0.005 represent the alignment of theoretical model and empirical data.

3. Satisfaction index towards organizing marathon running events:

The calculation on satisfaction index towards organizing marathon running events can be conducted from the result of data analysis in terms of the importance on factors and satisfaction of factors of organizing marathon running events, based on participation in the events in previous year. The researcher can summarize overall current picture of importance on factors averaged 7.395 and satisfaction of factors averaged 6.901. The satisfaction index towards quality of organizing marathon running event amounted to 69.44%. The results of study are the following.

3.1 The analysis in relation to the importance on factors towards satisfaction factors of quality for organizing marathon running events in various aspects found that the 7 main important factors were ranged 7.191 – 7.897. These contained social factor (7.897), event management factor (7.539), sports event factor (7.537), competition system factor (7.512), physical topography factor (7.475), cost investment factor (7.212), and marketing factor (7.191) as a minimum respectively.

3.2 The satisfaction analysis on 7 main satisfaction factors in association with quality of organizing suitable marathon running events in various aspects revealed that the satisfaction value was ranged 6.561-7.598. They contained social factor (7.598), sports event factor (7.155), competition system factor (7.154), physical topography factor (7.065), event management factor (6.938), marketing factor (6.662), and cost investment factor (6.561) as a minimum respectively.

3.3 The analysis on satisfaction index towards 7 main satisfaction factors of organizing suitable marathon running events in various aspects showed the satisfaction index ranged 66.889 – 76.049%. They comprised social factor (76.049%), sports event factor (71.766%), competition system factor (70.828%), event management factor (69.529%), physical topography factor (68.703%), marketing factor (66.959%), and cost investment factor (66.889%) as a minimum respectively.

4. Determining of factor hierarchy based on AHP :

In search of factor hierarchy, the analysis on this matter found that event sponsors and organizers gave the first ranking to “cost investment factor” of 0.32 and 0.25 respectively, from the 7 main satisfaction factors regarding quality of organizing marathon running events. The athletes focused on “competition system factor” as their topmost ranking of 0.23. The first ranking of overall 3 stakeholders went to “competition system factor” of 0.25. However, the second and third rankings of overall 3 stakeholders were “cost investment factor” and “event management factor” of 0.22 and 0.13 respectively.

In terms of analysis on hierarchy of satisfaction factors towards quality of organizing current marathon running event, there are minor factors which are under main factors involved with competition system factor as the following.

The analysis on “competition system factor” found the hierarchy of minor factor which are under the main factor. The sponsors gave the importance to “mini marathon with 10.550 – 15.0 kilometer” as the first rank of 0.301, while the organizers gave the highest rank to “marathon with 42.195 kilometer” of 0.342. However, athletes and overall 3 stakeholders both placed their foremost rank on “half marathon with 21.1-32.0 kilometer” of 0.332 and 0.285 respectively. Nevertheless, the minor factors holding lower hierarchy as the second, third, and fourth were “mini marathon with 10.550-15.0

kilometer", "marathon with 42.195 kilometer", and "fun run with 3.0-7.5 kilometer". The overall 3 stakeholders gave the number of 0.281, 0.263, and 0.171 respectively.

5. Ranking values of marathon competition system:

The ranking analysis of marathon competition system revealed the following results.

In consistent with application of analytical hierarchy process (AHP) and importance on factor, satisfaction of factor, and satisfaction index of organizing marathon running event at present, on the ground of satisfaction from the 3 stakeholders for quality of events, the analysis found that the best competition systems gave the highest importance on factor (7.512), satisfaction of factor (7.154), and satisfaction index (70.83%). These are marathon systems with a distance of 21.1-32.0 kilometer (0.285), 10.550-15.00 kilometer (0.281), 42.195 kilometer (0.263), and 5.00-7.5 kilometer (0.171) respectively. (figure 2 and 3)

	Competition System
Fun Run 3.0-7.5 Km.	0.171
Mini Marathon 10.550-15.0 Km.	0.281
Half Marathon 21.1-32.0 Km.	0.285
Marathon 42.195 Km.	0.263

Figure 2: Ranking of marathon running systems

After considering the result of analysis on ranked marathon running systems as shown in table 8, together with other ranked satisfaction factors towards event management factor and cost investment factor, it was found that the rank of marathon running system at that time is significantly changed. This result led to tests of marathon running system so as to gather fundamental geographic data set which is study cases of 3 venues. The results of study revealed the increase in all satisfaction factors relating to marathon running events in the actual 1-3 venues to reach 3-7% in venue 1, 14-26% in venue 2, and 7-15% in venue 3. Therefore, the "satisfaction index" of 3 venues approximately rose by 10-12%.

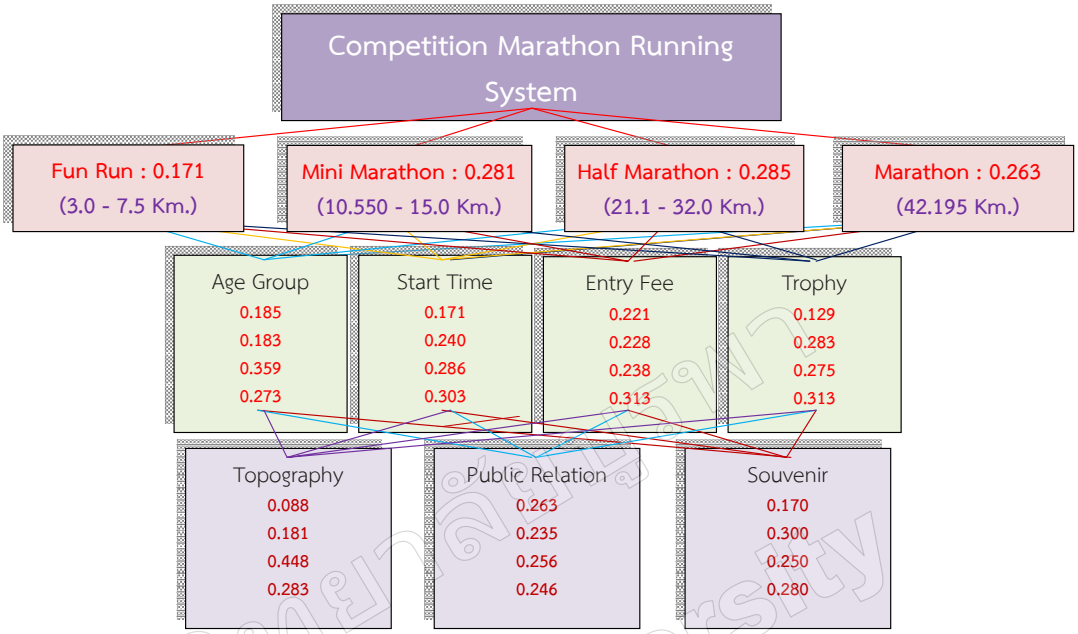

Figure 3: The system of marathon running management holding good ranking :- *It is the best system of organizing marathon running events which was derived from applying AHP. The system is tested in organizing actual three marathon running events. Other minor satisfaction factors are considered such as age classification, starting time, application fee, type of trophy, advertisement, public relations, souvenir, and topography of venues.*

Conclusion

According to the result from integrated analysis of entire data, the researcher can find various interesting points as below.

1. The findings reveal that the importance of these factors is 7.395; the factor satisfaction was 6.901, resulting in 69.44 percent of the satisfaction index of the marathon race at present.

2. Marketing-wise, Half Marathon Competition System [21.1-32.0 Km.], Mini Marathon competition system [10.550-15.0 Km.], Marathon competition system [42.195 Km.] are ranked with 0.285, 0.281, and 0.263 respectively following by Fun Run competition system [3.0-7.5 Km.] with 0.171.

3. Correlation between Marathon event in the past and the subjects (three chosen events) based on satisfaction factors to the three stakeholders is found positively in every dimension that the values of the satisfaction factors and indexes considerably increased.

4. Application of this research can improve both efficiency and effectiveness of the Marathon Running Event Management. Events with different objectives can be managed differently. Among others, these 7 satisfaction factors would benefit to all three stakeholders of Marathon events—organizers, athletes, and sponsors.

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