A Decision Support System Of
Tea Beverages Outlet Franchise Selection In Indonesia

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Abstract - **The popular Food and Beverages (F&B) franchises in Tea products are recently Teh Poci, Good Tea, Teh MU. This research used an online selected decision support system of tea franchise outlet which may be feasible for franchisee. The study used an AHP method. Online application is made on PHP programming language, and have been uploaded publicly on the website namely www.waralabateh.com. This uploaded application has been tested by 97 respondent who are already the partners of 3 tea franchises, namely : Teh Poci, Good Tea, Teh MU, and 10 would-be partners. This system incorporates 4 criteria including initial franchise fee, continuing franchisee fee, franchisor size, and franchisor reputation. The options are Teh Poci, Good Tea, and Teh MU. The results indicated the results benchmarked from partners wew as follows the first choice was Teh Poci 47.9%, the second choice was Teh MU 29.81%, and the third choice wass Good Tea 22.3%. The results of would-be partners can be summed as follows the first choice was Teh Poci 43.31%, the second choice Good Tea was 29.21%, and the third choice was Teh MU 27.56%.**

Keywords : decision support system, AHP, tea franchise selection

I. FOREWORD

There are many ways to do business, one of them is franchising which becomes trend nowadays. It is also an effective distribution channel to bring the product closer to consumer through the franchisee (Info Franchise magazine 2009 : 17).

One of the franchise in F&B (Food and Beverages) is tea beverages. In Indonesia, tea has witnessed the most creative business evolution, we know bottled tea and then we have interesting phenomen with instant tea in an outlet (booth) in many franchise brands like Teh Poci, Good Tea, Teh Men United (MU), Teh Saring, Honest Tea, Es Tea, Mr Tea, Happy Tea. Brands with no unique differentiation and added value will fade away.

According to Castrigiovani and Justis (2002) , there are seven factors which will affect franchise network growth, namely : franchise start-up cost, initial franchise fee, franchise growth orientation, industry growth, franchisor age, franchisor size dan franchisor reputation.

Researchers only take 4 indicators : initial franchise fee, continuing franchisee fee, franchisor size, and franchisor reputation. According to Wibowo (2007) about analysis of factors that affect the franchise network growth, these 4 indicators are adequate for franchise network growth rate.

AHP method is applied in the website design so that the would-b franchisee are at ease in finding out and choosing the tea beverage outlet franchise in Indonesia. This is what www.waralabateh.com is based on.

II. DECISION SUPPORT SYSTEM

Suryadi and Ramdhani (2002: 5) said that the objective of Decision Support System (DSS) is to help the decision maker choosing decision alternatives which are result of processing available information using decision making methods. Basically, DSS is an improved Computerized Management Information System designed to be user-interactive.

III. ANALYTICAL HIRARCHI PROCESS (AHP)

AHP is a method developed by Thomas L. Saaty, a mathematician. This method can solve complex problems with many ascpects or criteria.

According to Kadarsah S. and Ali Ramdhani (2002 : 13), the steps in AHP are as follows :
1. Defining problem and the desired solution
2. Making hierarchical structure started with general goal/objective, then sub-objectives, criteria, and then possible alternatives at the lowest level criteria.
3. Making pairwise comparison matrix that describes each element's relative contribution or effect toward each objctive or criteria above them. Comparison is done based on judgement from the decision maker by weighing each element compared to the others
4. Doing the pairwise comparison so it will result in a total of n x [(n-1//2] judgements, where n is the number of element in comparison.

5. Calculating the eigen value and test the consistency, data gathering should be done all over again in a case of inconsistency.
6. Repeat step 3,4, and 5 for the entire hierarchy level
7. Calculating Eigen Vector (EV) of each pairwise comparison matrix. EV value is the weight of each element. This step is done to synthesize judgement to prioritze elements from lowest level of hierarchy to the goal/objective.
8. Checking the hierarchy's consistency. If the value is more than 10% then judgement data valuation should be adjusted.

Deviation from consistency is stated in Consistency Index (CI) with equation :

$$CI = \frac{\lambda_{maks} - n}{n - 1} \qquad \text{Where } \lambda_{maks} = \text{eigenvalue maksimum} \\ n = \text{ukuran matriks}$$

Ratio between CI and RI for a matrix is defined as Consistency Ratio (CR).

$$CR = CI / RI \qquad \text{Where } CR = \text{Consistency Ratio} \\ CI = \text{Consistency Index} \\ RI = \text{Random Index}$$

If CR ≤ 10% then the matrix is consistent

TABLE 3.1 RANDOM INDEX (RI) VALUE

N	1	2	3	4	5	6	7	8	9	10	11
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51

Source : Suryadi dan Ramdhani (2002:138)

TABLE 3.2. VALUATION SCALE OF PAIRWISE COMPARISON FOR A CRITERIA

Intensity of Importance	Definition	Explanation
1	Equal importance	Two elements contribute equally to the objective
3	Moderate importance	Experience and judgement slightly favour one element over another
5	Strong importance	Experience and judgement strongly favour one element over anothe
7	Very strong or demonstrated importance	An element is favoured very strongly over another; its dominance demonstrated in practice
9	Extreme importance	The evidence favouring one activity over another is of the highest possible order of affirmation
2, 4, 6, 8	In between above values	Used when there are compromises between two of above values
Reciprocals of above	If activity i has one of the above non-zero numbers assigned to it when compared with activity j, then j has the reciprocal value when compared with i	

Source : Suryadi dan Ramdhani (2002:132)

TABLE 3.3. VALUATION SCALE OF PAIRWISE COMPARISON FOR OPTIONS

Intensity of Importance	Definition	Explanation
1	Equal price/size/reputation	Two elements contribute equally to the objective
3	Moderate difference in price/size/reputation	Experience and judgement slightly favour one element over another
5	Strong difference in price/size/reputation	Experience and judgement strongly favour one element over another
7	Very strong or demonstrated difference in price/size/reputation	An element is favoured very strongly over another; its dominance demonstrated in practice
9	Extreme difference in price/size/reputation	The evidence favouring one activity over another is of the highest possible order of affirmation
2, 4, 6, 8	Equal price/size/reputation	Used when there are compromises between two of above values
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Source : Suryadi dan Ramdhani (2002:132) / Processed Data (2011)

IV. SYSTEM DESIGN

System design will explain the overall system development, relationship between user/admin, website and the database.

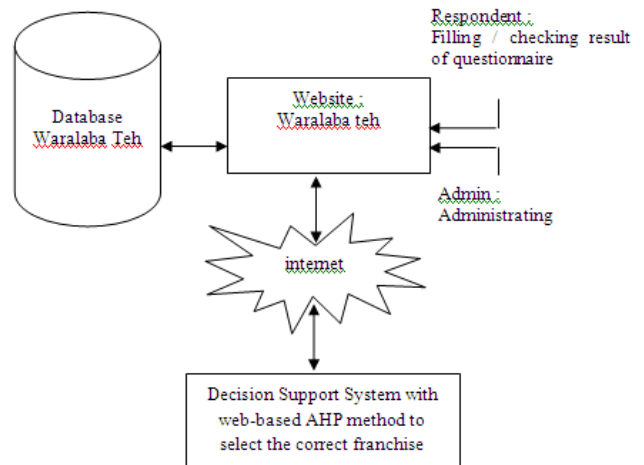The system architecture that were built was as depicted in the picture below.

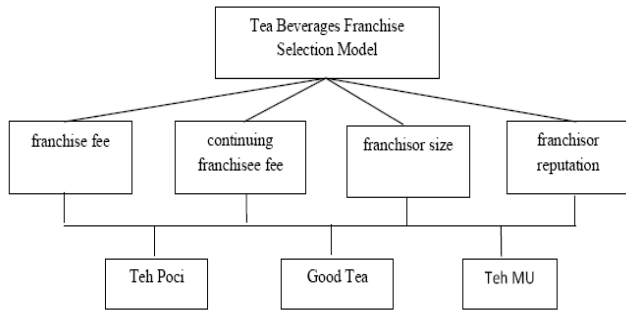FIGURE 1. SYSTEM ARCHITECTURE

Proposed research model :

FIGURE 2. PROPOSED RESEARCH MODEL

V. RESEARCH RESULT

Research data is collected by filling out online questionnaire which is separated into 2 parts that is Partner Result Benchmark from 97 respondent and Would-be Partner Result Recapitulation from 10 respondent. The result of the questionnaire depends on the respondents' answers and the number of respondents in a system that is design to accept any number of respondents who fill out the questionnaires.

1. Partner Result Benchmark

Result from the 97 respondent is as follows :

TABLE 1. CRITERIA AND PARTNER'S OPTIONS

Criteria / Option		Poci	Good	MU
Franchisor Reputation	29.81 %	68.1 %	15.9 %	15.8 %
Continuing Franchisee Fee	29.62 %	25.4 %	19.7 %	55.1 %
Franchisor Size	23.64 %	69.5 %	15.3 %	15.1 %
Franchise Fee	16.93 %	18.1 %	51.1 %	30.9 %

From table 1 we have conclusions that : Franchisor Reputation 29.81% as the criteria most partners choose in selecting tea franchise. And next comes Continuing Franchisee Fee 29.62%, Franchisor Size 23.64% and Franchise Fee 16.93%.

TABLE 2. PARTNER'S TEA FRANCHISE PRIORITY

Tea Franchise Priority from AHP	
Franchise	Percentage
Teh Poci	47.9 %
Teh MU	29.81 %
Good Tea	22.3 %

From Table 2 conclusions can be drawn that : Teh Poci with 47.91 score is the tea franchise which is chosen by most partners, followed by Teh MU with 29.81% and Good Tea with 22.3%.

2. Would-Be Partner Result Recapitulation

Result from the 10 respondent filling out the questionnaire is as follows :

TABLE 3. CRITERIA AND WOULD-BE PARTNER'S OPTIONS

Criteria / Option		Poci	Good	MU
Franchisor Reputation	28.13 %	61 %	21.7 %	17.3 %
Franchise Fee	25.19 %	18.8 %	56.9 %	24.3 %
Continuing Franchisee Fee	23.36 %	28.5 %	19.1 %	52.6 %
Franchisor Size	23.31 %	55.7 %	26.7 %	17.7 %

From table 3 we have conclusions that : Franchisor Reputation 28.13% as the criteria most would-be partners choose in selecting tea franchise. And next comes Franchise Fee 25.19%, Continuing Franchisee Fee 23.36% and Franchisor Size 23.31%.

TABLE 4. WOULD PARTNER'S TEA FRANCHISE PRIORITY

Tea Franchise Priority from AHP	
Franchise	Percentage
Teh Poci	43.31%
Teh MU	29.21%
Good Tea	27.56%

From Table 4 conclusions can be drawn that : Teh Poci with 43.31% score is the tea franchise which is chosen by most would-bepartners, followed by Good Tea with 29.21% and Teh MU with 27.56%.

VI. CONCLUSION

From the data analysis and explanation on previous chapters, it can be concluded as follows:

1. Application is made for 4 criteria as follows : initial franchise fee, continuing franchisee fee, franchisor size, and franchisor reputation with 3 options : Teh Poci, Good Tea, Teh MU. This application can accommodate additional criteria and options, also additional question (in the questionnaire).

2. Application has been tested on 97 respondents who are already partners as benchmark, and 10 respondents would-be partners. This application produce decision alternatives in percentage. This application is designed to take questionnaire with any number of respondents.

3. From the test, the outputs are as follows : Partner result benchmark from 97 respondents : First choice for criteria is Franchisor Reputation (29.81%), second choice Continuing Franchisee Fee (29.62%), third, Franchisor Size (23,64), and fourth Franchise Fee (16.93%). First choice for options is Teh Poci (47.9%), second choice Teh MU (29.81%), and third Good Tea (22.3%). From 10 would-be partners respondents : First choice for criteria is Franchisor Reputation (28.31%), second choice Franchise Fee (25.19%), third, Continuing Franchisee Fee (23,36%), and fourth Franchisor Size (23.31%). First choice for options is Teh Poci (43.31%), second choice Good Tea (29.21%), and third Teh MU (27.56%).

Further research can be conduted by adding location criterion because strategic location factor directly relates with demand to seize the market. Location Theory from August Losch stated that seller's location will very much affect the number of consumers he can serve. The farther away from the seller, consumer will be more reluctant to buy because transportation cost will be higher. Losch tends to recommend that production location be in the market or near the market.

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