Decision Support System Feasibility of Tourism Resort in Poso District used 360 Degree Method

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Abstract

As one of the areas with beautiful natural attractions and unique culture, Poso district has much potential to be developed. However, this attraction fails to gain visitors. The absence of tourism resort feasibility standard used by the government might be the reason behind this failure. Information and technology have been proved to be a very useful tool to solve some real life problems in various sectors including in tourism. Hence, technology interference is importantly needed to design a resort feasibility standard involving the entire stakeholders, so that a more objective and maximum development can be achieved. By using sustainable tourism methods, interview, and the 360 degree method, an assessment to determine the resort's feasibility, to its strengths and weaknesses to improve the present condition of the area's tourism development can be designed. As the result, a decision support system on resort's feasibility can be utilized to develop tourism information system to support a new standard in tourism decision making. Furthermore, this new system could also add other factors related to further improvement.

Keywords: Decision Support System, Feasibility Tourism, 360 Degree Method, Tourism

1. Introduction

As an individual or organizational supporting media, Technology and Information grow vastly in order to improve effectivity and eficiency. Often , technology could help human tasks. For example, in making a decision, an organization and individual can use decision support system. This technology is designed based on the knowledge of decision making, asessment and analytical process which could produce a specific decision. This signifies the importance of decision support system in achieving individual or organizational success in many sectors[1].

Based on the previous understanding, the use of decision support system cannot be separated from decision making for tourism development. The development requires technological support so that every decision taken meets with its need. This is the foundation for colaboration between technology and tourism information in order to develop technology based tourism(e-tourism).

Technology has been proved to bring good impact on promotion, marketing, as well as tourism sales. These are achieved through internet usage which mark the radical transformation in tourism industry since nowadays society is looking for tourism destination through internet. Based on a case study in Africa, tourism marketing and renewal are performed in international context which is measured by services from developed country's providers. Thus, selling transaction could be increased and greater amount of benefits(85%) could be earned. This could also happen in Caribia(80%), or Asia, such as in Thailand(70%) and India(40%), [2].

Therefore, as one of influencing sectors in Indonesia's economy, tourism industry is a very potential sector to be improved. Should it be organized well, this sector could produce more income for the country. The country's income could be increased by offering its nature and culture to the domestic and international tourists without damaging or endagering the natural inhabitants living in the area. This could be achieved by developing e-tourism where information transfer will be easier for the tourists who use the internet as a media to access information.

As a district with potential tourism resorts, Poso is worth visited. Unfortunately, those tourism resorts have not been able to attract visitors. This may be caused by the lack

of rational foundations used in developing the tourism resorts. Recently, tourism development process is performed in subjective structure, based on government's intention without taking into account the resort's real condition. Nowadays, tourism resort's feasibility is only determined by tourism department because there has not been any decision supporting system. Therefore, this research is dedicated to develop a decision support system for feasibility determination based on 360 degree method. The feasibility asessment is done by involving all stakeholders such as visitors, government, community representative, as well as the local community.

Moreover, some researches were also used to compare and support this research. A research entitled "The Design and Implementation of Decision Support System for Tourism Development Feasibility using AHP Method (A Case Study:Tourism Department in Sumba Barat Daya District"), discussed a system to help government in determining tourism resort feasibility using AHP method.

In the research, the output is in the form of prioritized region which will be developed with an assessment according to the head of tourism department. Problems are solved by elaborating some assessment elements such as criteria and alternatives, which later will be organized into a hierarchy structure. Criteria and alternatives will be assessed by *matrix of pairwise comparison* where expert decision maker decides the value of the interest *relative* among the assessment's elements. Criteria concerned are uniqueness, distance, facilities and infrastructure[3].

In addition, another research about the employee's performance assessment using 360 degree method has been conducted. In the research the assessment criteria have been decided by the company. Involving all groups of employees, this assessment is carried out using decision support system application. So, the assessment was easier because the employee would not have to fill in the questionnaires manually [4].

Different from the previous studies, this research aimed at developing available research using 360 degree method for feasibility determination in developing tourism of Poso District. Ledoh's research(2009) did interviews with authorized government without including community representative in decision making. On the other hand, this research stresses more on the use of 360 degree method and questionnaires as data collection instruments. The writers did several studies and concluded findings from previous research as foundation for assessment's criteria. Therefore, using 360 degree methods, the feasibility was assessed by various elements such as government, community representatives, tourists, and even the local community. This method is believed to represent an objective assessment process for tourism development. The decision support system is expected to objectively help the government in determining potential tourism resorts to be developed and also facilities that needs improvement..

2. RESEARCH METHOD

2.1 The Application of 360 Degree Method

360 degree method is a feedback process which is usually applied in employee performance assessment. The assessment uses standardized questionnaire through which employee's achievement could be perceived thoroughly including supervisor(s), peers, and direct reports, in order to create a full circle feedback. Each individual would fill up the questionnaires in their own perspective. Later on, the company would create a feedback concluding the data resulted from the questionnaires. Finally, the report will be sent confidentially to every individual. The 360 degree system could be examined at the figure 1.

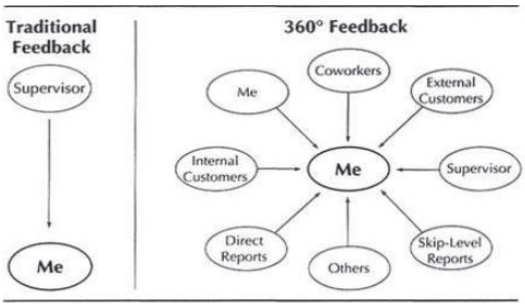

Fig.1 360 Degree Method [5]

Based on the chart above, the assessment is only performed one way which is from senior employee to junior employee. Thus, it is hardly objective because the evaluation is only done by the senior staff without involving peers, junior staffs, or others involved in the job. However, 360 degree method enables a thoroughly assessment since it is performed not only by

senior employee but also peers and junior staff. Therefore, research on tourism resort feasibility must be undertaken thoroughly involving government, local community, community representative, along with the visitors. The major difference between this method and other methods lays on the focus point on the feedback rather than evaluation by acquiring information from groups or elements related to the resort.

360 degree performance assessment consisted of five steps which are: performance construction, execution, measurement, review, renewal and also employee's contract. The research will indicate resort's potential. Not only that, it could also produce suggestions for the resort improvement in order to achieve the purpose of development that has been planned [6].

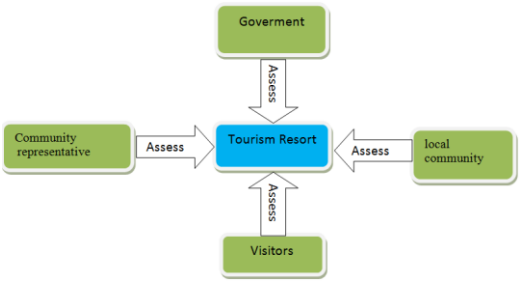

Fig. 2 Implementation of 360 Degree method in the System

The Assessment of 360 degrees method implemention in figure 2 is done by involving the stakeholders such as local community, tourists, community representative, and the government, based on the theory of developing sustainable tourism management, a strategy which demands the society to fulfill their needs without jeopardizing the future generation's chance from gaining a similar prosperity and good life (MacGregor, 1993).

Community involvement is critical to the success of sustainable tourism development (Jan van der Straaten, 2000). Thus, similar to the local community believe, it is appropriate that they manage the tourism so that the business and tourism activity are developed and managed by them and by their own agreement. The concept of community-based sustainable tourism (CBST) was developed to minimize negative tourism impact in rural or small areas. It was also developed to form a self-sustaining tourism where the community has the right to make decision, increase their income, and local capability to share their culture in order to maintain the natural and cultural resources. Holding on to their common law, every village in Poso is led by a traditional leader and a village chief. Traditional leader determines the law so that based on this research understanding tourist, local community, community representative and government have the right to participate in developing sustainable tourism.

2.2 Designing Feasibility Tourism Resort System

Designing an application to measure tourism resort feasibility using prototyping or modelling method is a technique to collect certain information about user's need precisely. Through this model, user could preview the application system model created and being involved directly from the beginning of application development. Users could also give inputs about application made for them through discussion, exploration, experiment, and continuous improvement. The prototyping method could be seen on figure 3.

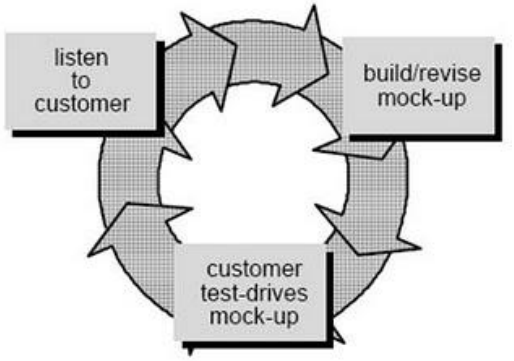

Fig. 3 *Prototyping* Method [7]

Stages used in this application design are: Consumer input. At this stage system developer discussed with Amir Kiat as the head of Tourism & Cultural Department in Poso District on deciding criteria for the resort feasibility which would be used as an assessment aspect. In order to strengthen aspects used in the assessment, researcher reviewed some literature that could support the resort feasibility and the discussion. Some criteria used were : cultural value that consists of 8 questions to measure how much cultural asset can attract tourist to come and deserve preservation, physical value consists of 7 questions to measure accessiblility of the site, legally and physicaly can be renovated without changing the original value, and can attract tourists, tourism product value consists of 8 questions to measure that site is big enough to

keep tourist staying longer, worth to be visited and have another point of interest near the area, experience value consists of 5 question to measure that site can potentially give a new experience, entertaining and satisfying tourists and give different experience from the other place, accommodation value consists of 3 questions to measure the accommodation around the area like place to stay, souvenir shop and restaurant. This discussion also determined four respondents groups consist of government, community representative, local community, and visitors who would assess the resort's feasibility. The point of the assessments were :visitors as consumers or target market for the resort development was given the biggest point which is 40%, 20 % for the Government, 20% for the community representative and the community. Verification standard is also decided 60% of the total maximum point which is 0.15. Tourist resort which scored more than 0.15 is feasible to be developed.

The second stage was developing and improving a prototype. At this stage, a tentative design was constructed based on consumer input. Therefore, the construction was performed using UML (Unified Modeling language [8].

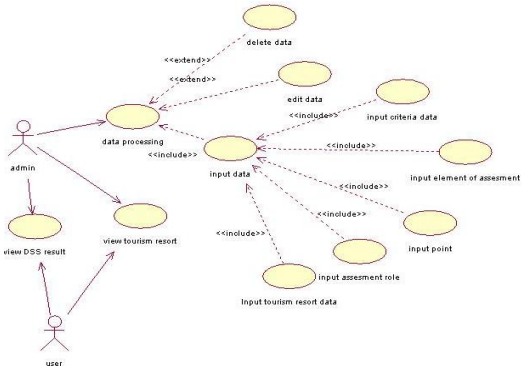

Fig. 4 Use Case Diagram

From the figure 4, administrator had access to input data into the system, including input assessment criteria, element assessment s input, and values from local community assessment input, visitors, government, community representative, and even tourism department staff. Administrator also had access to input rules for the value such as rules for assessing the points for each criterion, counting process, as well as inputting resort data. Besides, he was also able to process data – assessment data, and verify the assessment's result. Administrator and user had similar access to gain information about the resort and its feasibility based on the result using DSS.

The next stage took place when customer tested the prototype. The prototype constructed was evaluated by users. After that, users gave feedbacks which would be used as data in designing a system to improve the intended system. This cycle was repeated over and over again until the users were satisfied and the system's requirement was fulfilled based on the users' intention**.**

3 Implementation and Evaluation

During this stage, the system would be built using Java programming. Program was processed using JDBC technology in order to make data processing easier through *query statement* [9].

3.1 Tourism Resort Feasibility Assessment Implementation

In implementing application's initial appearance, *user* must have a *username* and *password* before logging into the system. *Login* was done with an *account* that had been saved before. *Account* with *administrator* name was given access as *admin*istrator. If *user name* and *password* was as saved then system would access *admin's* main *form* as shown at figure 5, and *user's* main *form* as shown at figure 6.

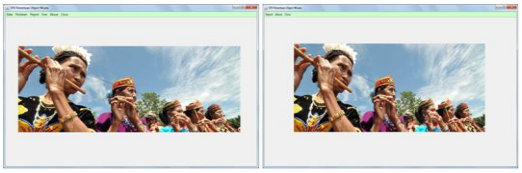

Fig. 5 Admin's Main Form Fig. 6 User's main Form

Figure 5 in *admin's* main *form* is the main page to access all menus or functions in this application. Those menus were categorized according to their types so it would be easier for the user to access all the functions performed by the admin. Figure 6 in user's main *form* is the main page to access all menus or functions such as *report*, *about*, and *close*. *User* could only see the result of DSS on tourism resort feasibility and could not assess the resort or input resort data or add *user account*. *User's* main *form* and *admin's* main *form* have similar appearance.

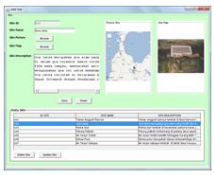

Fig. 7 Add Site Form

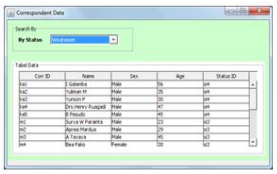

Fig. 8 Correspondent's Data

Figure 7 is *Add Site Form*. Functions in this form are to add, change, and delete tourims resort data. When admin save or change tourims resort data , data on the table below will automatically change based on the data inputted by the *admin*. All resort data saved can be changed. However, *site_id is* given protection so that it cannot be changed since it is the *primary key site* table and and is carried out with *answer* tabel contained resort assessment data. Corresponding data is shown in *Form Correspondent Data.*

Figure 8 is respondent's data, arranged based on respondent assessor group. When administrator chooses a visitor, data shown in the table will be respondent data of visitor group.

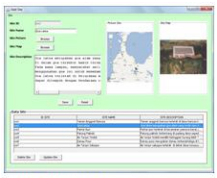

Fig. 9 Question Form

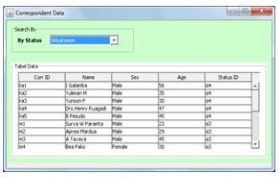

Fig. 10 Criteria Form

Figure 9 is *Form Question* to add and change questions based on the criteria. Admin could pick questions which will be added to certain criteria and input *positive question* and *negative question* including positive and negative questions from assessment point so that it is easier for the respondent to do the assessment

Figure 10 *Form Criteria* is to add, change and delete criteria data of resort assessment. Each criterion has different points of assessment, but the total points should be =1 so that the resort feasibility assessment result is valid. Furthermore, picture 9 also consists of a table showing criteria data which has been saved. Changed data could be seen automatically on table containing criteria. *Criteria id* cannot be changed because it is the *primary key* of criteria table. Thus, it is given protection.

Fig. 11 Resort Assessment's Form

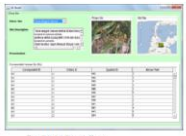

Fig. 12 All Result Form

Fig. 13 Final Result Form

Figure 11 is the resort assessment's form. Before assessment, respondent data must be inputted first. After that, assessment could be performed. Respondent assessment ranges from number 1-5, 5 means strongly agree, with positive statement and 1 means strongly disagree with negative statement. After that the next question will appear.

Figure 12 is *Form All Result* showing all respondents' assessment results along with resort's information. The results could be arranged based on the assessed resort. Figure 13 *Form Final Result* is to show resort's feasibility result using DSS. According to that understanding, data will show resorts worth visited which has been determined by verification standard 60% from maximum value. The score can be seen on code 1.

```
(1)   public List<FinalResultEntiitas> getFinalResult() {
(2)       List<FinalResultEntiitas> ls = new
      ArrayList<FinalResultEntiitas>();
(3)       try {
(4)PreparedStatement ps =con.prepareStatement("select
      a.site_id,st.site_label,"
(5)+ " sum(question_answer)/ (count(question_answer)* 5) *
      s.status_weight  "
(6)+"*c.criteria_weight  from tb_answer a,tb_criteria  c,tb_status
      s,tb_site st  "
(7)+ "where a.criteria_id = c.criteria_id  and s.status_id =
      a.status_id "
(8)+"and st.site_id = a.site_id group by site_id, s.status_id,
      c.criteria_id (9)order by site_id");
(10)          ResultSet rs = ps.executeQuery();
 (11)           while (rs.next()) {
(12)              FinalResultEntiitas  s = new FinalResultEntiitas();
(13)              a.setSite_id(rs.getString(1));
(14)              a.setSite_label(rs.getString(2));
(15)              a.setHasil(rs.getFloat(3));
(16)              ls.add(a);
(17)           }
(18)       } catch (Exception e) {
(19)       }
(20)       return ls;
 (21)    }
(22)  }
```

Code 1 Command to Process *User's* assessment data

Code 1 is used to implement resort feasibility score by applying 360 method using JDBC technology where every assessment criterion and respondent have different weight. Criteria's weight is saved in tb_criteria while respondent's weight is saved in tb_status. Meanwhile, assessment data is saved in database. Line (4) until (8) is SQL *statement query* to process data saved in the database. Assessment point in tb_answer is added and timed with respondent's value based on his status. Then it is timed again with every resort's value criterion based on its *criteria weight*. Finally the result is arranged according to resort with higher points. In line (2) ls is declared as

array list object which occupies execution result on line (4) until line (8) where ls value will be returned in get Result method.

Assessment point will be categorized with question criteria. Every criterion has different weight. The assessment score could be obtained with this formula:

TA=(Tcv/Mcv)x15%+(Tpv/Mpv)x15%+(Ttp/Mtp)x15%+(Tev/Mev)*40%+(Ta/Mav)*15%

TA= Total All	Mcv=Maximum culture value
Tcv= Total culture value	Mpv=Maximum physical value
Tpv= Total physical value	Mtp=Maximum tourism product
Ttp= Total tourism product	Mev=Maximum experience value
Tev= Total experience value	Ma=Maximum accomodation value
Ta= Total Accomodation	

After obtaining assessment result, all assessment score is added based on respondent group then timed according to respondent group's weight decided which are 20% for the local community, government, community representative, and 40% for the visitors. Later on the result is divided according to respondent number to gain average value. Final calculation formula:

Final Result= (Community point x 20%)+(Government Point x 20%) +(Community Representative Point x 20%)+(Visitor Point x 40%)/Total Respondent

Respondent's assessment data is manually performed to 7 tourism resort in Poso according to the previous formula as in figure 14.

Tourism Resort	Total Point
Taman anggrek bancea	0,177725
Goa latea	0,179779643
Pantai siuri	0,195080357
Patung palindo	0,181889286
Air terjun tindoli	0,164471071
Danau poso	0,207092143
Air terjun saluopa	0,197990357

Fig. 14 Final Result Using Formula manually

Site Name	Result
Taman Anggrek Bancea	0.17772502
Goa Latea	0.17977966
Pantai Siuri	0.19508035
Patung Palindo	0.18188931
Air Terjun Tindoli	0.16447107
Danau Poso	0.20709214
Air Terjun Saluopa	0.19799036

Fig. 15 Final Result Using DSS

Based on assessment result on figure 14, resort with highest point is Poso lake with assessment score 0.207092143. Resort with the lowest score is Tindoli waterfall which is 0,164471071. All resorts assessed are feasible to be developed because they exceed verification standard which is 60% from assessment maximal score as 0.15.

Calculation result is compared between using formula manually and using DSS application for resort's feasibility.

Figure 15 shows final calculation. The tourism system shows that Poso lake has the highest value which is 0,20709214 while Tindoli waterfall has the lowest value which is 0,16447107. The results using manual calculation and system similarly indicate that all resorts assessed are feasible to be developed.

Assessment Results on resort's strengths and weaknesses is shown in figure 16.

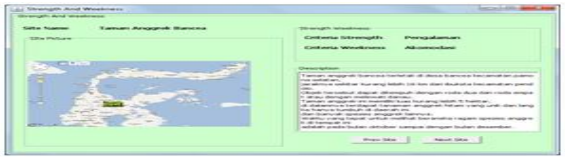

Fig. 16 *Strength and Weakness*

Figure 16 Form Strength and Weakness is to show resort's strengths and weaknesses based on respondent assessment in order to help Tourism resort department in developing the resorts. The calculation could be seen on Code 2.

```
(1)public List<SWEntitas> getSW(String site_id) {
(2)List<SWEntitas> ls = new ArrayList<SWEntitas>();
(3)try {
(4)PreparedStatement ps = con.prepareStatement("select a.site_id,ts.site_label,"
(5)+ " c.criteria_label, ts.site_picture, ts.site_description, sum(a.question_answer)"
(6)+ " * c.criteria_weight * s.status_weight / (count(a.criteria_id) * 5)"
(7)+ " from tb_answer a, tb_criteria c, tb_status s , tb_site ts "
(8)+ "where a.site_id = ts.site_id and a.criteria_id = c.criteria_id,"
(9)+ "and s.status_id = a.status_id and a.site_id = '" + site_id + "' "
(10)+ "group by site_id, a.criteria_id order by sum(a.question_answer)"
(11)+ " * c.criteria_weight * s.status_weight / (count(a.criteria_id) * 5) desc");
(12)        ResultSet rs = ps.executeQuery();
(13)        while (rs.next()) {
(14)            SWEntitas a = new SWEntitas();
(15)            a.setSite_id(rs.getString(1));
(16)            a.setSite_label(rs.getString(2));
(17)            a.setCriteria_label(rs.getString(3));
(18)            a.setSite_picture(rs.getString(4));
(19)            a.setDescription(rs.getString(5));
(20)            a.setHasil(rs.getString(6));
(21)            ls.add(a);
(22)        }
(23)    } catch (Exception e) {
(24)    }
(25)    return ls;
(26)  }
```

Code 2 Command to Assess Resort's Strengths and Weaknesses

Code 2 is a program's code to determine strengths and weaknesses of a resort based on respondent assessment score. Line (4) until line (11) is the final calculation application formula *query*. Total calculation, all respondent's assessment point is added and timed based on criteria weight and divided with assessment criteria's maximum value and then timed again with respondent's status weight. The result of each criterion is compared with other criteria. Criterion with the highest assessment point is the resort's strengths while the lowest point is the weakness.

4. Results and Analysis

User's assessment is performed by Tourism Department staff based on menus available in the *form user*. The result of the assessment indicated that Decision Support System of Tourism Resort Feasibility for all users of all functions could perform well without any error on the application. Users

could also see the result of the final assessment as well as the resort's strengths and weaknesses.

Admin assessment is performed by Poso Tourism Department Staff on Tourism Construction & Development. They assessed the Decision Support System for Tourism Resort's Feasibility according to the main *form.* Similar to the previous assessment, the result also showed that all functions could perform well without any error on the application.

5. Conclusion

Designing and implementing Decision Support System using 360 degree method was constructed based on the need analysis of Tourism Department in Poso District. Elements related to assessing the tourism resort's feasibility such as government, community representative, local communities, and visitors were involved as well.

Decision Support System for Tourism Resort feasibility could provide all the needs of Tourism Department in Poso District. Furthermore, it could decrease subjectivity that make objective assessment of resort feasibility could be obtained.

As a system developed based on 360 degree and prototyped in its nature, this system is believed to be able to provide the need of feasibility in developing a tourism resort. Hence, the feasibility determination for developing a tourism resort could be very useful. It has a bigger chance and competitive value.

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