Development of Emotourist as a tourist face that reflects emotional response

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Abstract. The quality of tourism influences tourist visits. The government must improve the quality of tourism by overseeing the emotional experience of tourists. This study aims to develop an Emotourist software application. Emotourist is short for the emotional experience of tourists. Research methods include the formulation of an emotional experience index, as well as black-box testing using emotional experience data from three tourist destination locations. The computer randomly chooses emotional experiences for each tourist destination, and Emotourist records it as input data. The Emotourist uses the input data to determine its emotional experience index. The Emotourist successfully displays tourists’ faces according to the emotional experience index for each tourist destination location or tourist area. Emotion icons, including joy, love, and positive surprise, represent the tourist’s face. The government can use the emotional experience index and tourists’ faces as an indicator of improving the quality of tourism.

1. Introduction
Garut is one of the tourist destinations in Indonesia with the potential for nature tourism, which includes mountains, forests, sea, beaches, and rivers. Garut Central Statistics Agency reports the number of tourist visits to Garut, which continues to increase every year [1]. But in reality, foreign tourists’ visits have decreased, as shown in table 1. The government can improve it by increasing the quality of tourism, which can affect tourist satisfaction, and indirectly affect tourist loyalty by reducing tourist complaints [2].

| Year | Target | Realization | Foreign Tourist | Local Tourist |
|------|--------|-------------|----------------|--------------|
| 2012 | 1.954.663 | 2.014.766 | 6.020 | 2.008.746 |
| 2013 | 2.119.663 | 2.254.281 | 6.344 | 2.247.937 |
| 2014 | 2.323.801 | 2.425.146 | 6.444 | 2.418.702 |
| 2015 | 2.400.000 | 2.448.967 | 6.820 | 2.442.147 |
| 2016 | 2.500.000 | 2.489.527 | 6.004 | 2.483.523 |
| 2017 | 2.600.000 | 2.517.232 | 5.014 | 2.512.218 |
| 2018 | 2.700.000 | 2.756.478 | 3.113 | 2.753.365 |

The government needs to monitor tourist experiences as part of improving the quality of tourism to get political benefits, such as public trust [3]. Among the characteristics of experience is emotion [4], which is an essential factor in communication [5]. Emotional experiences at tourist destinations such as joy,
love, and positive-surprise are related to tourist satisfaction [6]. Tourists can express it with their faces. Facial expressions are the way humans communicate their emotions [7].

Within the TIGER-society framework, the application of information technology in the fields of tourism is to improve the quality of tourism, which has an impact on tourist satisfaction [8]. The research team has conducted research related to the application of information technology in the field of tourism in the district of Garut. The results of the study include a tourist information sub-system that presents tourist destination locations and profiles [9-11], a reservation sub-system for tourism and travel [12,13], as well as the question and answer sub-system that bridges tourist communication with travel information providers [14]. The research has not yet touched on the development of information technology to monitor the facial expressions of tourists.

This study aims to develop an Emotourist (Emotional experience of Tourists) application software that displays emotion-icons as a tourist face on the maps based on the emotional experience data. Through this application, the government can see the faces of tourists in specific tourist destinations or tourist areas. This technology development is essential, considering that technology and innovation can influence the success of an organization [15], which in this case, is the government.

2. Methods
The Emotourist development framework, as shown in Figure 1. The literature review phase includes determining the gap and the contribution of research, as well as formulating an emotional experience index that uses as a basis for selecting emotion icon markers for tourist destination locations on the map. The development phase includes analysis and design activities using Unified Modeling Language; implementation activities that produce mobile applications; and testing activities using a black-box technique, where the validation of the system's reaction to inputs is following program specifications [16]. In the testing activity, computers act as testers who provide random data input. The research will utilize Google Maps API (Application Programming Interface) to fulfill the map features on Emotourist.

![Figure 1. Research framework.](image)

3. Results and discussion
The Emotourist application interacts with three actors, which include system administrators, tourists, and government. Users play their actors when interacting with the system [17]. The interaction of actors with Emotourist, as shown in figure 2.
Figure 2. Use case diagram.

The role of the system administrator/admin is as an actor who manages the data of profile and coordinates of tourist destination locations. Tourists act as actors who provide input data to the Emotourist in the form of emotional experiences on a scale of 0-7. The government sees the results of data processing in the form of an emotion icon that represents the face of tourists, as shown on the right side of figure 3.

Figure 3. Emotourist interface.

Each tourist destination location appears on the map in the form of an emotion icon. Emotourist applies three types of emotion icons (joy, love, positive surprise), adopted from the Destination Emotion Scale Hosany and Gilbert’s [6]. The GPS (Global Positioning System) makes it easy for tourists to find the location of the tourist destination they are visiting on the Emotourist map. This research utilizes the floating window of the Google Maps API [18] to display information related to the emotional experience
of tourists. The window appears when tourists choose one of the icons that appear on the map, as shown in figure 2.

The Emotourist database contains emotional experience data for each tourist destination location. This research limits its location to three places, namely Cangkuang Lake, Bagendit Lake, and Sabda Alam Water Park. In testing activities, the computer acts as a tourist who provides random input data for these three locations. For each place, the computer selects one emotional experience and scores on a scale of 1 to 7. If the random result is joy, then the others (love and positive surprise) will be 0. Table 2 shows that the tourist’s face for each location is love for Cangkuang Lake, love for Bagendit Lake, and positive surprise for Sabda Alam Water Park. Emotional Experience Index (EmEx-Index) that determines the tourist’s face is the maximum average emotional experience. Emotourist displays all tourists’ faces by emotion icon on the map, as shown in figure 2.

Table 2. Emotional experience of tourist destination locations.

| Record Number | Choice of Emotion Experience | Cangkuang Lake | Bagendit Lake | Sabda Alam Water Park |
|---------------|------------------------------|----------------|---------------|-----------------------|
|               |                              | Joy | Love | Positive Surprise | Joy | Love | Positive Surprise | Joy | Love | Positive Surprise |
| 1             | 1                            | 6   | 0    | 0               | 7   | 0    | 0               | 4   | 0    | 0               |
| 2             | 3                            | 0   | 0    | 2               | 0   | 0    | 1               | 0   | 0    | 6               |
| 3             | 1                            | 5   | 0    | 0               | 6   | 0    | 0               | 3   | 0    | 0               |
| 4             | 1                            | 0   | 0    | 0               | 3   | 0    | 0               | 1   | 0    | 0               |
| 5             | 2                            | 0   | 7    | 0               | 0   | 7    | 0               | 0   | 5    | 0               |
| ...           | ...                          | ... | ...  | ...             | ... | ...  | ...             | ... | ...  | ...             |
| 296           | 1                            | 5   | 0    | 0               | 7   | 0    | 0               | 5   | 0    | 0               |
| 297           | 1                            | 2   | 0    | 0               | 2   | 0    | 0               | 0   | 0    | 0               |
| 298           | 1                            | 7   | 0    | 0               | 4   | 0    | 0               | 1   | 0    | 0               |
| 299           | 2                            | 0   | 2    | 0               | 0   | 5    | 0               | 0   | 0    | 0               |
| 300           | 2                            | 0   | 1    | 0               | 0   | 5    | 0               | 0   | 2    | 0               |
| Average       |                              | 1.15| 1.31 | 1.18            | 1.15| 1.27 | 1.15            | 0.94| 1.15 | 1.29            |
| Tourist's Face|                              | Love| Love | Positive Surprise| Love| Love | Positive Surprise| Love| Love | Positive Surprise|

The three tourist destination locations are in the district of Garut. Emotourist determines the tourist’s face in Garut through two steps: first, determining the average for each emotional experience of the three tourist destination locations; and second, set the largest as Garut EmEx-Index and a tourist's face. By taking these steps, Emotourist displays the emotion icon of Love (18%), as shown in table 3 and figure 2. The tourism industry must improve the quality of tourism so that the cumulative emotional experience rises and approaches 100%. Among the ways to improve it is to practice co-creation experiences that invite tourists to participate in tourism activities organized by tourism industry actors [19].

Table 3. Emotional experience index of Garut.

| Emotional Experience       | Joy | Love | Positive Surprise |
|----------------------------|-----|------|-------------------|
| Cangkuang Lake             | 1.15| 1.31 | 1.18              |
| Bagendit Lake              | 1.15| 1.27 | 1.15              |
| Sabda Alam Water Park      | 0.94| 1.15 | 1.29              |
| Average                    | 1.08| 1.24 | 1.21              |
| Garut EmEx-Index           | 1.24|
| Compared to the maximum score (7) | 18% |
| Garut Tourist’s Face       | Love|
In the same way, Emotourist determines the tourists’ faces within the scope of one sub-district. The appearance of the Emotourist changed from the map page to the tourists’ faces page in the sub-district scope when the smartphone is moving from the tourist destination location. GPS sends district location data to Emotourist. If none of the tourist destination locations in the sub-district, the Emotourist will display the faces of tourists within the scope of the district.

4. Conclusion
The research successfully developed an Emotourist application that can display the faces of tourists for specific tourist destination locations or tourist areas. The government can use Emotourist to oversee the emotional experience of tourists to improve the quality of tourism in the area. The EmEx-Index can be one indicator of tourism quality used in strategic tourism plans. This research does not yet provide monthly or annual EmEx-Index charts for executives. Future research can prove the effectiveness of the EmEx-Index on improving the quality of tourism. Emotourist in the future can provide more detailed emotional experience choices for tourists, such as joy, which include cheerful, delight, enthusiasm, joy, and pleasure [20]. It may be necessary to add other emotional experience choices such as anger and sadness [21].

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