A Tourist Tracking Model by Tourist Bureau

A Tourist Tracking Model by Tourist Bureau

Jack Febrian Rusdi[1]; Sazilah Salam[2]; Nur Azman Abu[2]; Budi Sunaryo[3]; Muchammad Naseer[1]; Awan Setiawan[4]; Mohammad Kchouri[5]; Rohmat Taufiq[6]; Rella Dwi Respati[7]; Sitti Nur Alam[8]; Siti Sarah[9]; Arlinda Rusmartiana[9]; Sri Rahmawati[10].

[1] Informatics Engineering, Sekolah Tinggi Teknologi Bandung, Bandung, Indonesia
[2] Faculty of Information and Communication Technology, Universiti Teknikal Malaysia Melaka, Melaka, Malaysia.
[3] Department of Electrical Engineering, Andalas University, Padang, Indonesia.
[4] Department of Informatics Engineering, Universitas Langlangbuana, Bandung, Indonesia.
[5] Islamic University of Lebanon, Beirut, Lebanon.
[6] Department of Informatics Engineering, Engineering Faculty, University Muhammadiyah of Tangerang, Tangerang, Indonesia.
[7] Department of Tourism, Faculty of Tourism and Creative Industries, Universitas Muhammadiyah of Tangerang, Tangerang, Indonesia.
[8] Department of Information System, Faculty of Engineering and Information System, Universitas Yapis Papua, Papua, Indonesia.
[9] Department of Psychology, Faculty of Psychology, Universitas Nasional Pasim, Bandung, Indonesia.
[10] Indonesia Tourism Journalist Association (ITJA), Indonesia.

Corresponding Author's: inijack@gmail.com; jack@sttbandung.ac.id

Abstract. Tour guides are the critical services for the Travel Bureau. Especially for the services, they provide to tourists. So, a realtime system is needed to be able to interact between the two parties, especially regarding service records in the field and information processing for the Bureau. Based on ScienceDirect library, unfortunately, until there was no reporting system facilitate both parties and recorded in realtime. This study discusses software development solutions that receive various field notes by workers and can be directly viewed online for employers. This research is in the form of a reporting model, which is a solution for the Travel Bureau to have data and be stored electronically on the server. The system was built using a platform that is on a smartphone, so the tour guide reporting system becomes a solution for the Travel Bureau and the Tour Guide to document the trips carried out.

1. Introduction

Tourism is the economic backbone of many countries and is their highest source of income [1]. This sector provides an influence on the welfare of an area, including for residents, and can employ a lot of human resources in various fields, both directly and indirectly [2], [3].

Tourism success is strongly related to the presence of various Travel Agents and Tour Operators who provide different types of tour packages that they pack in multiple forms of service [4], [5]. One of the

keys to their services is to provide various services to tourists [6]. Both before the trip, during the journey, and after the trip [7], [8].

Services in the field when the trip is part of which is served by Tour Guides [9]. Tour guides in their daily lives are always with tourists since the service starts until the service ends. So, various vital records need to documented and reported during the service [4], [9], [10].

Unfortunately, until now, based on the study of researchers through various research libraries, as Science Direct, no system has been found that processes this tour guide reporting online [11]. So from the field review, it was found that the reporting of tour guides to the Travel Bureau carried out manually. Meanwhile, the use of a smartphone in tourism is a daily style of life.

For this reason, this study examines the development of a Tour Guide Reporting System, starting with a model of a system. This system is a solution in the world of tourism, especially between Tour Guides and employers, primarily through the Travel Bureau.

The method studied is the feasibility of a system built on a software platform. An application installed on a smartphone. So that field data can be directly reported and stored on the server.

2. Material

The role of higher education is very influential in the development of science and research [12], [13]. Likewise, with research in the field of tourism development in the era of open information in all areas [14], [15].

Tourism considered a significant contributor to the economy, and its growth has increased sharply over time [2], [16]. The tourism sector is the highest source of income for many of the worlds, such as America, China, Germany, Japan, UK, France, Mexico, Italy, Spain and Brazil [17], including in Indonesia [18].

This sector is the backbone of the economies of many countries. The advancement of tourism in an area has a positive impact on various sectors, such as the business environment, education, labour, industry, and public welfare. The growth of world tourism also does not increase significantly from time to time [2].

The role of information technology has contributed to the development of tourism and holds a significant history of the presence of a worldwide network [19], [20]. Researchers have developed various applications to support this tourism sector in different forms and scales [21]. One of the developments made is how technology can bridge the needs of stakeholders to understand tourist behaviour [22], [23]. Tourist behaviour is the key to tourism success [24].

A variety of scientific article libraries available online. Such as Google Scholar, Science Direct, and Garuda. It found that several systems developed related to this tour guide service. However, the research tendency that many writers find is the replacement of tour guide positions that are not served by humans but through machines, such as tour guide platforms through virtual machines [25], as traveller systems [26], and the use of augmented reality as tour guides [27].

Based on the article search in the database of Science Direct, we did not find a system that handles the reporting of tour guides, primarily used the smartphone. It also found based on observations of researchers in Bandung. There is no online reporting system available. Meanwhile, the reporting system with smartphone-based already implemented in several fields [10]. So, reporting still do with manually. The Tour Guide Reporting System can be said to be a necessity in the world of tourism, especially with the odd behaviour of tourists served [28].

The presence of technology that provides long-distance interaction with real-time, with the use of smartphones can be a solution in the development of reporting systems, including the presence of cameras and GPS which is becoming common at this time [10], [20].

This system developed with the basic structure of the architect of system development, which involves several layers, including perception layer, network layer, middleware layer, and application layer [10], [29]. So that reporting can be sent directly from a smartphone, stored on a server, and obtained the report through a computer that is in the Travel Bureau [10].

The provision of tourism infrastructure is essential. Especially seeing the development of tourism is considered necessary. This sector can exert influence on revenue both regionally and nationally. The impact also affects the economy of the community, including opening up employment opportunities [2], [3].

3. Method

The method used in developing the model of the ICT-based tourist reporting system consists of four stages. Namely, Defining problems and objectives, the study of literature, requirements analysis, and model design.

The four stages look like in Figure 1.

Figure 1: Method Stages

4. Findings and Discussion

4.1. Tourist Guide and Smartphone

Some research has been done previously related to this tour guide and smartphone. Some research developments, as shown in Table 1.

Table 1: Previous Research for Tourist Guide and Smartphone

Researchers	Country	Description
Tarantino et al. (2019) [30]	Italy	Interactive guide as a tourist planning guide
Rusdi et al. (2019) [20]	Indonesia	Provision of internet access for tourists and travel management for tour guides
Kirova and Thanh (2019) [31]	France	The role of contactual factors smartphone usage in a theme park.
Yee Kuen Yi et al. (2019) [8]	Spain	Integral application in mobile application
Huei-Ming Chiao (2018) [25]	Taiwan	Online virtual tour-guiding
Yang and Hsu (2016) [32]	Taiwan	Tour guiding location-based service
Guha et al. (2012) [33]	India	Smartphone apps with the location-privacy platform
B. Seo et al. (2010) [34]	Korea	On-site tour guide based on Augmented Reality

Source: Authors (2019)

Figure 2: Tourist Tracking Concept. Source: Authors (2019)

4.2. Tracking Concept

The initial concept starts from tourists who travel to several tourist attractions. Every moment recorded by a smartphone in the form of a photo or video will be a series of travel histories that stored during his life. Travel data stored on a smartphone is expected to be able to be depicted in the form of a digital map (Figure 2).

4.3. Tracking Tourist System

The tracking system starts when tourists open the photo or video recorder form. Automatically, the coordinates of the tourist location detected via the GPS device on the smartphone. The coordinate parameters of the recorded location are latitude and longitude coordinates.

When tourists are in locations that have internet access, then the data will be stored in an SQLite database (smartphone) and sent directly to the MySQL database server. When in a location that does not have internet access, the data is stored in SQLite first. When tourists are near the BTS, or there is an internet network (move position), then automatically the data stored in SQLite will be sent to the MySQL database server with a database synchronisation process (Figure 3).

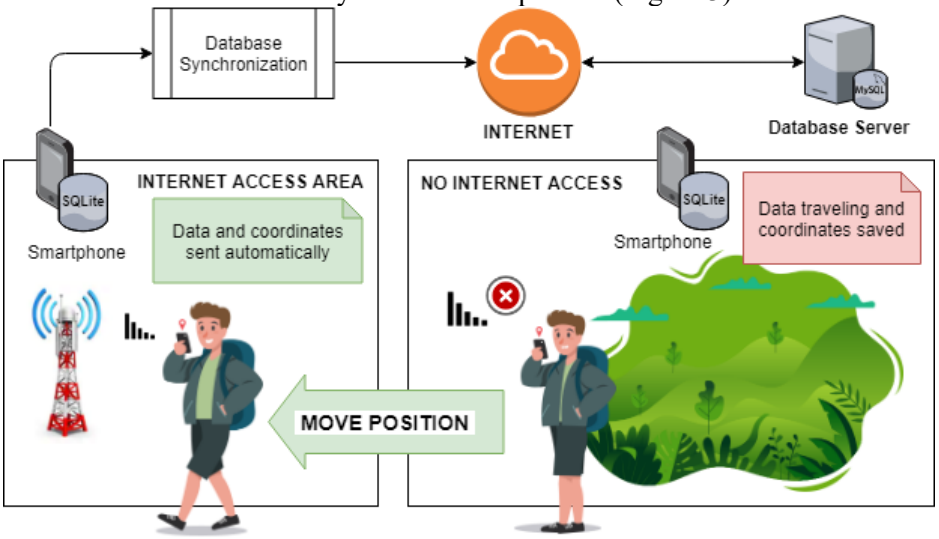

Figure 3: Tracking Tourist System. Source: Authors (2019)

4.4. Database Synchronization

Database synchronization occurs when the SQLite and MySQL databases connected through an internet network intermediary. Either through BTS or WiFi networks. The system on the smartphone will check the network. The component parameter in the SQLite database in the system is a status field with a value of 0 or 1 (Figure 4)

When a tourist is in a location that has internet access, data sent to the MySQL database server, then the value of the status field in SQLite will be changed to 1. If the status field has a value of 1, then the data does not need to be sent to the MySQL database server (ignore).

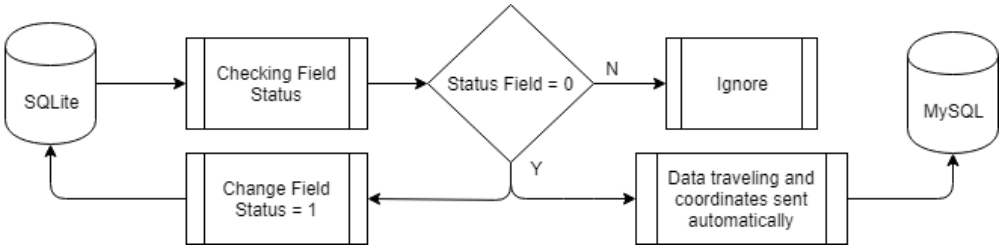

Figure 4: Database Synchronization. Source: Authors (2019)

5. Conclusion

The tourist tracking system model is advantageous in displaying historical travel data. Location-based data with photos or videos are a recommendation for other tourists who will travel to the same place. Database synchronisation is instrumental in storing location coordinates when tourists store their data in an SQLite database. The data based on storage time, not when the data sent to the MySQL database server.

Acknowledgements

This research conducted by the Pervasive Computing & Educational Technology Research Group. C-ACT, Universiti Teknikal Malaysia Melaka (UTeM). The Indonesia Tourism Journalist Association (ITJA) which has provided access to various parties related to this research. Sekolah Tinggi Teknologi Bandung and PT Jackwisata (jacktour.com) which has provided research materials related to technology and tourism.

References

[1] Aam, "2018 , Tahun Keemasan," *Koran Sindo*, (2017).
[2] UNWTO, *Tourism Highlights 2018 Edition*. UNWTO, 2018.
[3] O. Sukmana, "Strategi Percepatan Pertumbuhan Lapangan Kerja Dan Pengentasan Kemiskinan Melalui Kebijakan Pengembangan Pariwisata," *Sosio Informa*, vol. 4, no. 3, pp. 488–500, (2018), doi: 10.33007/inf.v4i3.1570.
[4] P. Richards and X. Font, "Sustainability in the tour operator–ground agent supply chain," *Journal of Sustainable Tourism*, vol. 27, no. 3, pp. 277–291, (2019), doi: 10.1080/09669582.2018.1560451.
[5] A. Noor, M. Suryana, S. Amalia, and I. B. Putera, "An Analysis Of E-Business Process At The Tour And Travel Companies In Bandung," *Tourism Scientific Journal*, vol. 4, no. 2, pp. 126–148, (2019).
[6] J. F. Rusdi, S. Salam, N. A. Abu, B. Sunaryo, R. Taufiq, L. S. Muchlis, T. Septiana, K. Hamdi, Arianto, B. Ilman, Desfitriady, F. R. Kodong, and A. V. Vitianingsih, "Dataset Smartphone Usage of International Tourist Behavior," *Data in Brief*, p. 104610, Oct. (2019), doi: 10.1016/j.dib.2019.104610.
[7] Z. Chen, "A qualitative pilot study exploring tourists' pre- and post-trip perceptions on the destination image of Macau," *Journal of Travel and Tourism Marketing*, vol. 36, no. 3, pp. 330–344, (2019), doi: 10.1080/10548408.2018.1541777.
[8] yee K. Yi, G. martínez del Vas, and A. Muñoz, "An integral mobile application for pre- travel , on-site and post-travel stages," *International Journal of Information Systems and Tourism*, vol. 4, no. 1, pp. 7–17, (2019).
[9] B. Supriadi, "Kompetensi Pendampingan Pemandu Wisata Lokal Sebagai Developers of People," *Jurnal Pariwisata Pesona*, vol. 1, no. 2, pp. 72–86, (2016), doi: 10.26905/jpp.v1i2.517.
[10] B. Sunaryo, M. I. Rusydi, J. F. Rusdi, R. Suriani, and S. Daus, "Sistem Pelacakan Lokasi Pelaporan Petugas Lapangan Irigasi Provinsi," *Jurnal RESTI*, vol. x, no. x, pp. 1–11, (2019).
[11] J. F. Rusdi, "Tourist Guide and Smartphone," *Mendeley Data, V1.*, (2019), doi: 10.17632/ghc889vfv9.1.
[12] J. Febrian, "Buku Saku Tentang Pendidikan Tinggi di Indonesia," *Penerbit Informatika*, (2000).
[13] J. F. Rusdi, S. Salam, N. A. Abu, T. G. Baktina, R. G. Hadiningrat, B. Sunaryo, A. Rusmartiana, W. Nashihuddin, P. Fannya, F. Laurenty, N. Shanono, and R. Hardi, "ICT Research in Indonesia," *SciTech Framework*, vol. 1, pp. 1–23, (2019).
[14] J. Febrian, "Menjelajah Dunia dengan Google," *Penerbit Informatika*, (2008).
[15] J. Febrian, "Google & Yahoo Secrets!," *Penerbit Informatika*, (2007).
[16] UNWTO-UNDP, *Tourism and the Sustainable Development Goals – Journey to 2030*. 2017.

[17] Echi, "Peta Pendapatan Negara di Sektor Pariwisata, Indonesia Sukses Kalahkan Malaysia dan Singapura," *Phinemo*, vol. 8, no. 5, p. 55, (2019).
[18] B. Tantowi, Akhmad and E. Suryani, "Neraca Satelit Pariwisata Nasional 2017," *Kemenpar RI*, p. 100, (2017), doi: 10.1016/S0040-6090(03)00029-4.
[19] H. Werthner, C. Koo, U. Gretzel, and C. Lamsfus, "Special issue on Smart Tourism Systems: Convergence of information technologies, business models, and experiences," *Computers in Human Behavior*, vol. 50, pp. 556–557, Sep. (2015), doi: 10.1016/j.chb.2015.03.042.
[20] J. F. Rusdi, S. Salam, N. A. Abu, S. Sahib, M. Naseer, and A. A. Abdullah, "Drone Tracking Modelling Ontology for Tourist Behavior," *Journal of Physics: Conference Series*, vol. 1201, no. 1, p. 012032, May (2019), doi: 10.1088/1742-6596/1201/1/012032.
[21] N. Shoval and R. Ahas, "The use of tracking technologies in tourism research: the first decade," *Tourism Geographies*, vol. 18, no. 5, pp. 587–606, (2016), doi: 10.1080/14616688.2016.1214977.
[22] M. Kozak and N. Kozak, *Tourist Behavior, An Experiential Perspective*. Springer International Publishing AG, 2018.
[23] A. Nikjoo and H. Bakhshi, "The presence of tourists and residents in shared travel photos," *Tourism Management*, vol. 70, pp. 89–98, Feb. (2019), doi: 10.1016/j.tourman.2018.08.005.
[24] W. Zheng, R. Zhou, Z. Zhang, Y. Zhong, S. Wang, Z. Wei, and H. Ji, "Understanding the tourist mobility using GPS: How similar are the tourists?," *Tourism Management*, vol. 71, no. September 2018, pp. 54–66, (2019), doi: 10.1016/j.tourman.2018.09.019.
[25] H. M. Chiao, Y. L. Chen, and W. H. Huang, "Examining the usability of an online virtual tour-guiding platform for cultural tourism education," *Journal of Hospitality, Leisure, Sport and Tourism Education*, vol. 23, no. May, pp. 29–38, (2018), doi: 10.1016/j.jhlste.2018.05.002.
[26] S. Renjith, A. Sreekumar, and M. Jathavedan, "An extensive study on the evolution of context-aware personalized travel recommender systems," *Information Processing and Management*, no. January, p. 102078, (2019), doi: 10.1016/j.ipm.2019.102078.
[27] J. M. Harley, S. P. Lajoie, T. Tressel, and A. Jarrell, "Fostering positive emotions and history knowledge with location-based augmented reality and tour-guide prompts," *Learning and Instruction*, no. August, pp. 1–16, (2018), doi: 10.1016/j.learninstruc.2018.09.001.
[28] J. F. Rusdi, "Smartphone usage and International Tourist Behaviour," *Mendeley Data, V1.*, (2019), doi: 10.17632/zwzb8hzc9j.1.
[29] F. Bhatti, M. A. Shah, C. Maple, and S. Ul Islam, "A novel internet of things-enabled accident detection and reporting system for smart city environments," *Sensors (Switzerland)*, vol. 19, no. 9, pp. 1–29, (2019), doi: 10.3390/s19092071.
[30] E. Tarantino, I. De Falco, and U. Scafuri, "A mobile personalized tourist guide and its user evaluation," *Information Technology & Tourism*, pp. 1–43, Jul. (2019), doi: 10.1007/s40558-019-00150-5.
[31] V. Kirova and T. Vo Thanh, "Smartphone use during the leisure theme park visit experience: The role of contextual factors," *Information & Management*, vol. 56, no. 5, pp. 742–753, Jul. (2019), doi: 10.1016/j.im.2018.11.008.
[32] S.-Y. Yang and C.-L. Hsu, "A location-based services and Google maps-based information master system for tour guiding," *Computers & Electrical Engineering*, vol. 54, pp. 87–105, Aug. (2016), doi: 10.1016/J.COMPELECENG.2015.11.020.
[33] Saikat Guha, Mudit Jain, and Venkata N. Padmanabhan, "Koi: a location-privacy platform for smartphone apps," in *NSDI'12 Proceedings of the 9th USENIX conference on Networked Systems Design and Implementation*, 2012, pp. 14–14.
[34] B.-K. Seo, K. Kim, and J.-I. Park, "Augmented Reality-Based On-Site Tour Guide: A Study in Gyeongbokgung," in *Computer Vision – ACCV 2010 Workshops.*, R. Koch and F. Huang, Eds. Berlin: Springer, Berlin, Heidelberg, 2010, pp. 276–285.