Jurnal Mantik, 5 (2) (2021) 855-859

Published by:Institute of Computer Science (IOCS)

Jurnal Mantik

Journal homepage: www.iocscience.org/ejournal/index.php/mantik/index

Mysql Database Syncronization Using Restful Webservice Api PT. Minori

Felix Wuryo Handono[1], Sumarna[2], Hafis Nurdin[3], Fernando B Siahaan[4], Hary Sugiarto[5], Indra Chaidir[6]

[1,4,5,6,] Information Systems, Universitas Bina Sarana Informatika, Jakarta, 13630, Indonesia
[2,3,] Technical Information, Universitas Nusa Mandiri, Jakarta,10450, Indonesia

E-mail: felix@bsi.ac.id

A R T I C L E I N F O

Article history:
Received: 01/06/2021
Revised: 10/06/2021
Accepted: 30/06/2021

Keywords:
Minori, education, database synchronization, restful API

A B S T R A C T

PT. Minori is an apprentice delivery company to Japan located in Cikarang Bekasi. The apprentices to be sent to Japan must first follow the selection and education process. Even after arriving in Japan, the apprentices must take part in lessons too so they will not forget the educational material and move up to a higher level. The learning method during education is by accessing the Education server in LAN (Local Area Network) and accessing the cloud server during internship. The difference in location and network causes problems, the data that is on the local network server with the public network server, how to synchronize the data without changing the existing network infrastructure. Database synchronization in PT Minori is done by restful API from both servers to synchronize data.

1. Introduction

PT. Minori is a private company in Cikarang, Bekasi which is engaged in sending apprentices and workers to Japan. The apprentices and workers who are sent must have the requirements needed by companies in Japan, one of which is the ability is to speak Japanese.

For this reason, PT. Minori provides Japanese Language Education to prospective apprentices for six months and education is carried out in the building or dormitory of PT. Minori. Language Education is not only provided directly by the sensei, but also uses LAN network access to the Education server to access E-learning and Quiz.

The advantage of learning and testing carried out on a LAN is that learning can be accessed at a good access speed without having to pay for large bandwidth purchases through an Internet Service Provider (ISP). Apprentices who leave for Japan are still following the learning activities so that their Japanese language skills will continue to improve, by access learning through the public network to the Minori VPS Server. The problem that occurs is how the data on this local server can be synchronized with the data on the VPS (Virtual Private Server) Cloud so that the learning history remains carried over when accessing VPS Cloud and vice versa. Data synchronization is the process of building data consistency from source to target data storage and rather (Jindal, 2016). So it is necessary to do a database syncronization on the source database for User Data, namely Jimusho database, then send the data to the destination database, namely Quiz-room, and vice versa for User Report Data.

For this purpose, a communication method that connects the two databases on a different server is required to be synchronized. One method that can be used is known as Representational State Transfer (REST). REST is an application of a web-based communication architecture model (Manuaba & Rudiastini, 2018). REST runs the process of reading web pages containing content to be presented in XML or JSON form (Firdaus et al., 2019). With this method, both databases that will be synchronize can be carried out, but many database owners are worried about data security, the database is entered directly for the purpose of the database, so some developers use a connecting server to check the data called REST-Server.

REST itself is a separate architecture with a light communication load according to needs and generally runs via the HTTP protocol. In addition to REST, the API needs to carry out instructions made to provide data and also an API that will retrieve the data for saving to the destination server. API is an Application Programming Interface that is accessed by the public by application developers (Rakhmawati et al., 2019).

Several references with similar case studies were also used in this research, including the implementation of Database Synchronization Based on RESTful Web Services in the Attendance Application, the study was conducted to answer attendance needs in locations that cannot be reached by the internet network, so attendance must be done offline and then the presence of the data is synchronized with the database server after it is online (Pamuji et al., 2020). Another research about web service design with the REST API Method for Integrating Mobile Applications and Websites at the Waste Bank where this method is used to integrate the waste bank savings transaction information system, namely customer data by providing direct information access to customers via mobile applications. The Rest method is considering more effective in developing Web Service (Fakhrun & Gumilang, 2018). In the postal research journal and Informatics vol 9 No. 2 of 2019 with Indonesia's Public Application Programming Interface (API) title, there are Indonesian several e-commerce companies that provide open APIs to develop innovative third-party computing, for example is Bukalapak. The Bukalapak API uses REST technology for Bukalapak server communication with clients using the JSON format (Rakhmawati et al., 2019).

2. Research Methods

This study uses an application design model, namely a waterfall where the model uses a sequential path. The waterfall model is the most widely model used in research (Putri & Anggraeni, 2019). The model that was first proposed by Winston W. Royce, which until now is part of the model can still be applied (Fatkharrofiqi et al., 2020).

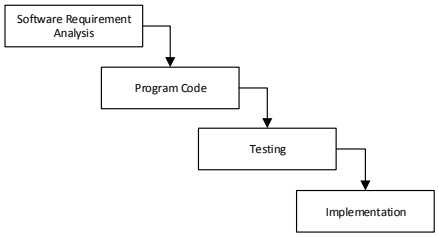

Fig 1. Waterfall design model.

a. Software Requirements Analysis
   Schema diagrams and database synchronization flowcharts are made to analyze the needs in making applications.
b. Program Code
   The programming language used in making this application uses the PHP programming language
c. Testing
   Black-box testing is used to test codes that have been made. Black box testing is used to validate (Nidhra, 2012)between input and output.
d. Implementation
   Implement coding program.

3. Results and Discussion

3.1. Stages of Analysis

This stage is carried out to analyze the needs of PT. Minori in integrating the Jimusho Application with the Quiz-room Application, and the following are the results of the analysis:

1) Admin inputs users in the Jimusho Application. Users in the Jimusho application are prospective apprentices who have passed the selection process so they get an identity number. The data inputted in the user input normally is user personal data and the company data where the user will intern.
2) User data is stored in the Jimusho database.
3) Jimusho sends the User Data that was inputted directly into the Quiz-room database
4) Users access the Quiz-room application with user data previously inputted by the Admin through the Jimusho application.

Accredited "Rank 4"(Sinta 4), DIKTI, No. 36/E/KPT/2019, December 13th 2019.

5) Quiz results performed by users through the Quiz-room application are sent to the Jimusho database.
6) Admin can see the Quiz results through the Jimusho application

a. Schema Diagram

The following is the diagram scheme submitted to PT. Minori:

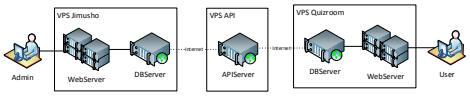

Fig 2. Schematic diagram for PT Minori Internal Information System communication with external parties, namely Quiz-room.

b. Database Synchronization Flowchart

The following is a Database Synchronization flowchart created for synchronizing the Jimusho database with Quizroom :

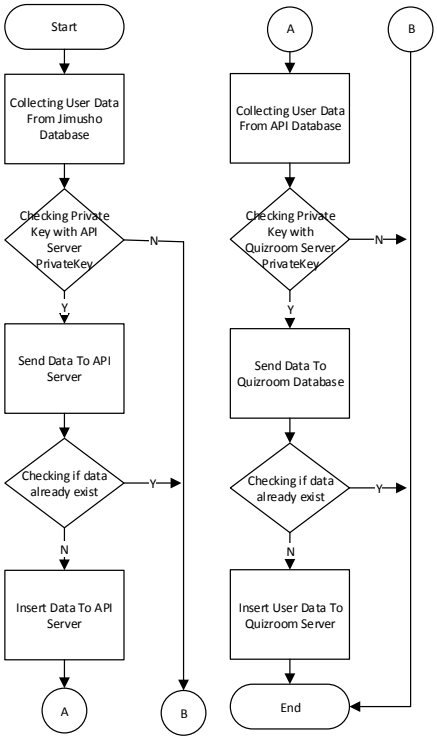

Fig 3. Synchronizing User Data from Jimusho Database to Quizroom

Accredited "Rank 4"(Sinta 4), DIKTI, No. 36/E/KPT/2019, December 13th 2019.

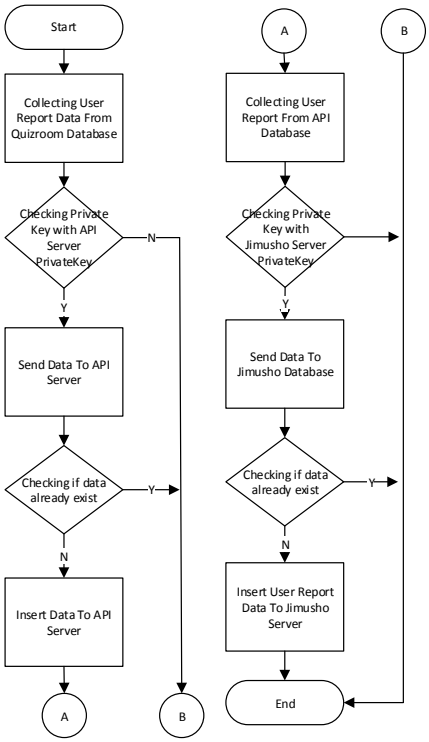

Fig 4. Synchronization of User Report Data from Database Quizroom to Jimusho

3.2. Implementation

a. User Input Database display

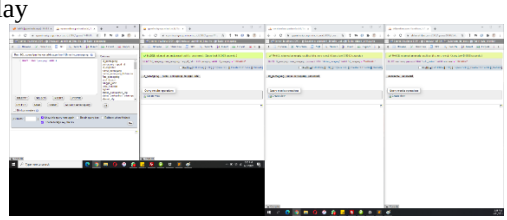

Fig 5. Display of Query Data Results on the API database and Quiz-room database before Input or Insert in the Jimusho database.

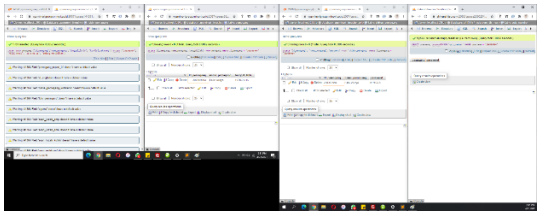

Fig 6. Display of Query Data Results in the API database and Quizroom database after inputting or inserting user data in the Jimusho database within 1 minute.

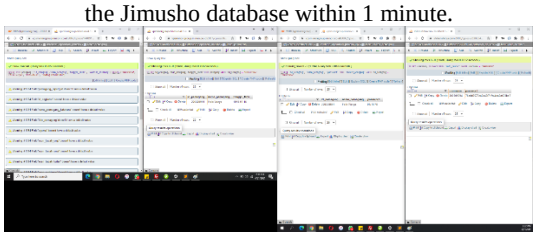

Fig 7. Display of Query Data Results in the API database and Quizroom database After input or insert in the Jimusho database within 2 minutes.

Accredited "Rank 4"(Sinta 4), DIKTI, No. 36/E/KPT/2019, December 13th 2019.

b. User Report display

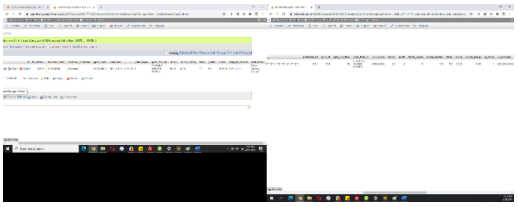

Fig 8. Example of Report Quiz Results sent from the Quiz-room database to Jimusho.

4. Conclusion

The Blackbox test result shown that the process of sending data from the Jimusho database to the API database and then to the Quiz-room database was succeed, and vice versa, the test results carried out in Quiz-room are sent to Jimusho, but there is a little lag time required for data to be sent from source database to the destination database for about one minute.

5. References

[1] Fakhrun, M. W. R., & Gumilang, S. F. S. (2018). Rancangan Web Service Dengan Metode Rest Api Untuk Integrasi Aplikasi Mobile Dan Website Pada Bank Sampah. Konferensi Nasional Sistem Informasi, 214–219.

[2] Fatkharrofiqi, A., Kuswanto, H., Rahman, T., Sumarna, Handono, F. W., & Nurdin, H. (2020). Employee attendance application using location based service (lbs) method based on android. Journal of Physics: Conference Series, 1641(1). https://doi.org/10.1088/1742-6596/1641/1/012044

[3] Firdaus, A., Widodo, S., Sutrisman, A., Nasution, S. G. F., & Mardiana, R. (2019). Rancang Bangun Sistem Informasi Perpustakaan Menggunakan Web Service Pada Jurusan Teknik Komputer Polsri. Jurnal Informatika, 5(2407–1730), 83.

[4] Jindal, R. (2016). Review Paper on Database Synchronization Between Local and. International Journal of Engineering Sciences and Research Technology, 5(7), 1396–1400.

[5] Nidhra, S. (2012). Black Box and White Box Testing Techniques - A Literature Review. International Journal of Embedded Systems and Applications, 2(2), 29–50. https://doi.org/10.5121/ijesa.2012.2204

[6] Pamuji, D. K., Yunus, M., & Widarti, D. W. (2020). Implementasi Sinkronisasi Database Berbasis RESTful Web Services pada Aplikasi Presensi. JOINTECS (Journal of Information Technology and Computer Science), 5(1), 1. https://doi.org/10.31328/jointecs.v5i1.1190

[7] Putri, S. A., & Anggraeni, S. (2019). Perancangan Sistem Catatan Jentik Berbasis Android Dengan Metode Certainty Factor Untuk Pengendalian Endemik Dbd. Jurnal Techno Nusa Mandiri, 16(2), 147–154. https://doi.org/10.33480/techno.v16i2.788

[8] Rakhmawati, N. A., Suryawan, S. H., Furqon, M. A., & Hermansyah, D. (2019). Indonesia's Public Application Programming Interface (API). Jurnal Penelitian Pos Dan Informatika, 9(2), 85. https://doi.org/10.17933/jppi.2019.090201