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APPLICATION OF BILLING POS (POINT OF SALES) ON CLOUD COMPUTING FOR RESTAURANT BY USING IoT (INTERNET OF THINGS) DEVICE WITH DATA SYNCHRONIZED METHOD IN THE REPORTING PROCESS

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ABSTRACT

In this study POS (Point Of Sales) Billing System was designed and built with more affordable prices on Restaurant Taxpayers using IoT (Internet Of Thing) devices by utilizing Cloud Computing technology that can sending sales report data in realtime to the server owned by the Probolinggo Regency Financial and Asset Agency. The input from this study is data that is sent in realtime from a billing machine, from a series of tests that have been carried out that can run smoothly, that is proven by measuring data transmission with speed in accessing article data an average of 0.7833 seconds / data transactions compared manually. So that through this application, estimates of regional revenue targets can be monitored directly

Keywords: *Cloud Computing, Point Of Sales (POS), Internet Of Thing*

1. INTRODUCTION

Probolinggo Regency is an area in East Java which is about 13 km to the east of the Surabaya Capital City of East Java Province, probolinggo district has an area of 1,696.17 km^2. The district government center is in Kraksaan. Probolinggo Regency is one of the districts located in Tapal Kuda, East Java. The district is surrounded by the mountains of Tengger, Mount Semeru, and Mount Argopuro. The location of the strategic position of Probolinggo Regency and the conditions of natural conditions that are very fertile, very beneficial for local governments in increasing their local revenue.

Figure.1 Map Location Probolinggo Regency, East Java

Some restaurants in Probolinggo are usually visited by guests or tourists who will travel to the Bali island, Kab. Situbondo, Kab. Banyuwangi, Kab. Bondowoso and etc. Based on the data we obtained in the field, there are a lot of restaurants that are very crowded, among them are Rawon Nguling restaurants, Tongas Asri restaurants, Bromo Asri restaurants and so on. Of course, based on observations of random data testing, it is estimated that the monthly turnover achieved by this restaurant reaches Hundreds of Million Rupiah. It is very unfortunate that the amount of deposits received by regional governments for food and restaurant taxes is less than the expected value [1].

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Figure.2 One of Restaurants in Kab. Probolinggo

The lack of tax deposits from restaurant entrepreneurs for food and beverages is caused by the lack of an appropriate supervision system in conducting billing transactions in restaurants, this can happen, among others:

1. The extent of the region of Probolinggo Regency
2. The lack of utilization of technology.
3. So expensive Billing Software/Hardware devices for the restaurant business.
4. Billing logging model restaurant which is still manual bookkeeping condition, causing a restaurant/Diner is very difficult to monitor its revenues.

Along with the development of technology and the Progress of human civilization that was already growing rapidly in all fields of life. Science and technology nowadays become an integral part of the life of modern society. By leveraging the technology based on the internet (Online), a system of reporting someone thinking with regard to the daily income of a taxpayer (WP) for hotels, the current can be monitored in realtime. [2]. Devices IoT (Internet of Thing), is a modern invention in the field of ICT (Internet Communication Technology) in the era of digital communications, using the IoT, various devices can be developed that are able to be controlled via the medium of the Internet. [3].

Billing application system P.O. 's (Point Of Sales) that will be used in this research, is a Billing sis-tem P.O. standard for transaction S Restaurant or Brasserie, by doing software engineering and device IoT (Internet of Thing) Rasp-berry Model Pi 3, we try to provide solutions in the process of sending data to the dispenda based on the technology of cloud computing (Cloud Computing). [4]

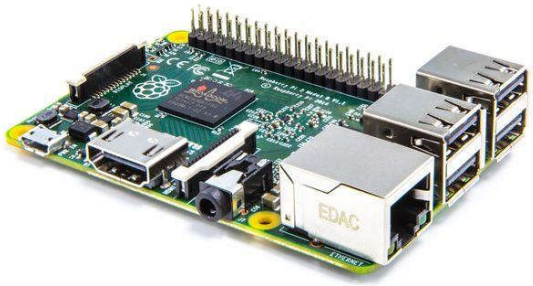

Figure 3 Device IoT Raspberry Pi 3

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Synchronization is a process of setting the course of multiple processes at the same time to equate time and data so that doesn't happen incon-sitensi (an inconsistent state) data due to concurrent data access so that the result is good and in accordance with what is expected. Here the data required for the synchronization, including call remains consistent. Shared memory is the solution to the problem of bounded-butter that allows at most n-1 material in a buffer at the same time. A solution, if all N buffer used is not simple. Dimisalkan we modify the producer-consumer code with added that-even a counter variable, starting from 0 and each additional time of one new item is given a kepa-da buffer. Synchronization is the "issue" is important in the design/implementation of OS (shared resources, data, and multitasking)[5]

The development of internet-based computing technology is currently more on the point on the system easy application without requiring a lot of time and effort. In the presence of cloud computing in the digital age now have actually felt in the middle of a day in the life of society today such as the use of email and social media is also.[6]

2. RESEARCH METHODS

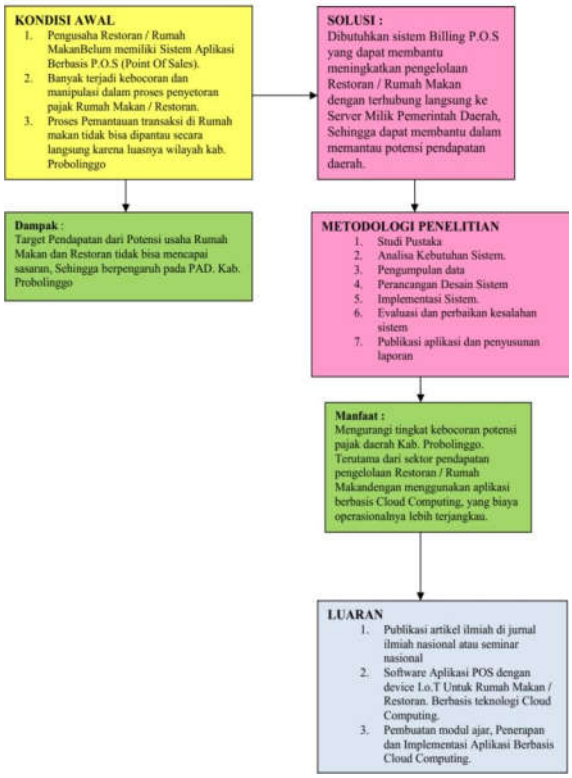

Figure 4. Research Methods

Based on figure 4, the process is starting from initial conditions, namely: (1) in this case The Taxpayer restaurant/Diner a lot that is not yet using the Billing System Based P.O. 's (Point Of Sales), (2) Many happen to-leakage and manipulation in process remittance tax Ru restaurant-mah, based on initial conditions is this research needs to be done by making the application Billing P.O. S restaurant/Home Makanberbasis technology Cloud Compu-ting device by utilizing the I.o. T to help the synchronization process to the Server.

3. RESEARCH PHASE

This research uses a software development method that consists of stages as follows:

1. Conduct studies Library: this stage is the stage of the collection of study literature, i.e., by studying some of the research associated with the development of Cloud Computing-based application system.
2. Needs Analysis System: this Phase is the initial phase in designing a system that will be applied.
3. Data collection: this stage is the stage to collect the data in field.

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4. Designing system: at this stage will do the design of the system for implementing the use of cloud computing architecture models, resulting in the application of this system can be obtained maximum results.
5. System implementation: this Phase is a phase to implement the results of the draft shortly-so the software (Software) and Hardware (Hardware).
6. Evaluation and repair errors: testing phase and then relied upon to make an evaluation of the necessary improvements to make the system as expected.
7. Publications and the preparation of the report: this stage will give you results and reports from research.

4. SYSTEM OF DESIGN

4.1 Context Diagram

Context diagram is a diagram that describes the system as a whole. Context diagram consists of two elements, namely Entrepreneurs restaurant/Bistro and Office of Government Revenue. Proboliggo, East Java. Restaurant entrepreneur was competent parties in the reporting obligations of the daily income of a restaurant/Diner. Before using this system, taxpayers must first register. In accordance with Figure 5

Figure 5 Context Diagram

4.2 Use Case Diagram POS Transactions

Use Case Diagrams in research poured in Figure 6. Where actors in research consist of two actors i.e. cashier and the customer, the transaction will be made in the next research journal recapitulation. A later proceeds recapitulation of data will be sent through the data synchronization.

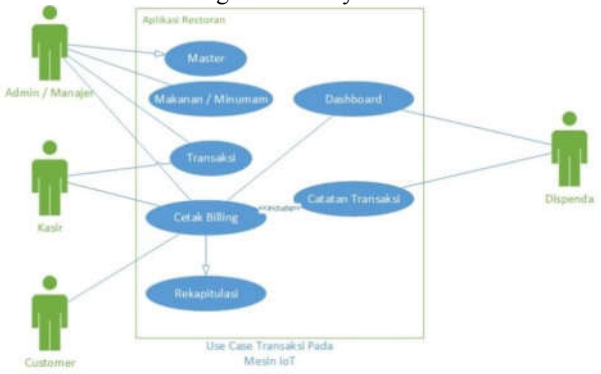

Figure 6 Use Case Diagram POS Restoran

4.3 System Architecture

In general the architectural design for the device used in the study is a Client Server data access by leveraging the Internet, but in this study, a Client that is associated with the server in the form of a device IoT (Internet of Things Device) Figure 6. For servers we utilize Google's Cloud Computing resources.

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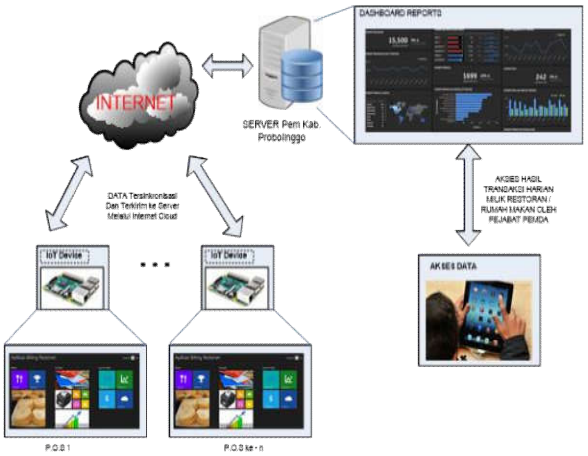

Figure 7 Design Research

To process transactions P.O. is in the client (restaurant/diner), where the client will send a transaction process in the restaurant/Brasserie automatically with the help of device IoT, in this study we used Raspberry products 3. The data sent to the server (Figure 7), then it will be processed into the form of a dashboard report, with the display in the form of graphs. Further data on the results of the report can also be accessed through Mobile devices-me/Tab from anywhere and when-else if required by the regional Government officials. Probolinggo. For an overview of the above system design, the number of clients not limit, subject to a minimum internet bandwidth available is sufficient to serve the client transaction server.

5. IMPLEMENTATION

5.1 Selected Cloud Platform

The first step before applying the system, the need to be prepared in determining Cloud Computing platform that will be used.

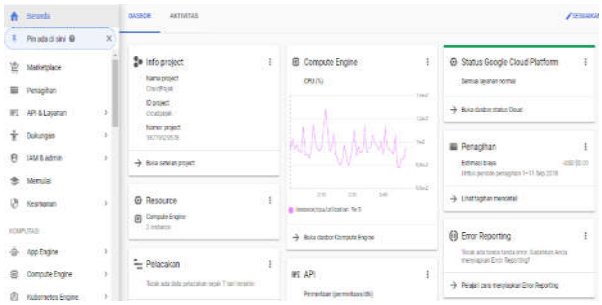

Figure 8 Dashboard Cloud Google's Platform.

In the study, used Google's Platform, the dashbaordnya shown into Figure 8. As an alternative there are a lot of Cloud Platform Vendors that we can choose [7] e.g. IBM, Miscrosoft, Oracle etc, with a very sophisticated infrastructure considerations and fürstenhof in research it was decided to use the Google Cloud Platform.

5.2 Server Settings On Cloud Platforms

For the selection of the server used in the study, selected the Debian Linux operating system 9.x, Linux system settings in the way Google Cloud is very easy, in the research created instance with the name ' CloudPajak ', then performed the allocation of Capacity 10 GB Of hard drive, and the election of 1 Processor with the capabilities of server access using port 80 (http) corresponds to (Figure 9). The next step is to enter into the server system by

Resource Google Cloud Platform Bisa Diakses Melalui Halaman "https://cloud.google.com/"

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creating a SSH KEY using port 22 (ssh-keygen), this way is easier to use than having to access the server using a password, to the encryption method used is the RSA [8], then made access to the server by using command "ssh-keygen-t rsa", code Keygen, generate results from subsequent copied into the folder/.ssh/authorized_keys. Then the next file transfer process in conducting data synchronization can be done without entering the password first. By utilizing this method then the server is able to receive data from the client using the IoT Devices.

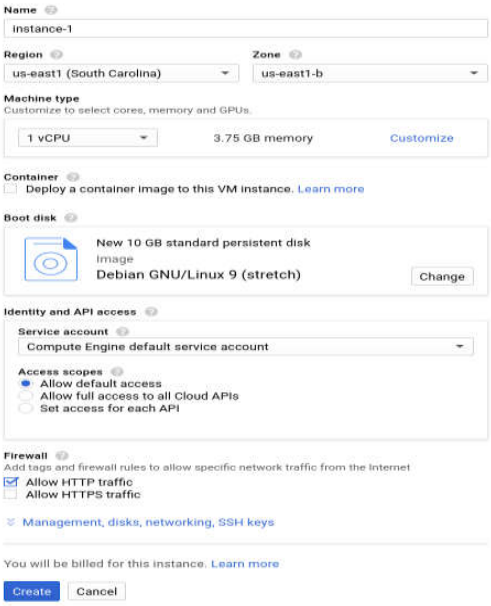

Figure 9 Setting the OS Cloud Server Documentation

5.3 Setting IoT Devices

For the implementation of IoT, Devices in the study used the device of Raspberry Pi 3 B, with the specifications Of the Internal 1 GB memmory, and koneksifitas capabilities of Bluetooth, Wifi and Ethernet Network (Figure 10). In the study, the IoT used should not be run using an internet connection for 24 hours, for that data synchronization process is done based on time Schedule.

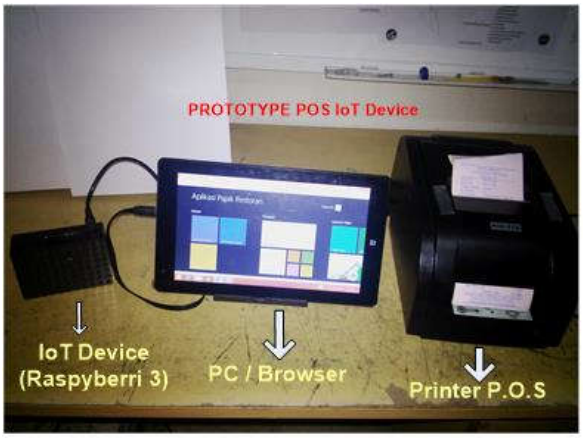

Figure 10 Installation Device IoT

5.4 The Menu of Restaurant Transactions

To POST transactions Menu used in research is the Standard Retail Sales Transaction menu of Food/Beverages at a restaurant, with standard transactions in the order process begins from filling the menu, selection of Master data, transaction, Print Billing and Income Recap.

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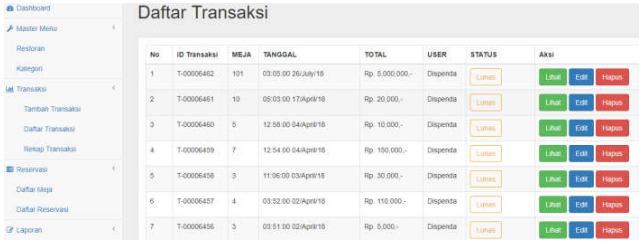

Figure 11 Menu POS Restoran

5.5 Menu Dashboard Manajemen Pada Server

* tekan F5 Untuk Me-refresh

No.	Nama Wajib Pajak	Terakhir Sinkronisasi	
		Tanggal	Waktu
1.	Hotel Bromo View	Sep 12 - 2018	12:16
2.	Cafe Celsius	Data tdk tersinkronisasi : - 2018	Data tdk tersinkronisasi :
3.	Cafe J Bing	Data tdk tersinkronisasi : - 2018	Data tdk tersinkronisasi :
4.	Karaoke Pop City	Sep 12 - 2018	00:31
5.	RM Sumber Hidup	Sep 12 - 2018	14:43

Figure 12 Dashboard Data Synchronization

Lihat Statistik | Export ke Excel | Export ke PDF

REKAPITULASI SPTPD DATA RESTORAN
TAHUN 2018

NO.	NAMA OBYEK PAJAK	ALAMAT	REALISASI												
			Januari	Februari	Maret	April	Mei	Juni	Juli	Agustus	September	Oktober	November	Desember	Jumlah
1	jbing cafe dan resto	JL. Basuki Rahmad No 9 Kota Probolinggo	Rp. 0	Rp. 0	Rp. 2,167,000	Rp. 15,646,000	Rp. 0	Rp. 0	Rp. 1,244,500	Rp. 4,565,400	Rp. 3,132,500	Rp. 0	Rp. 0	Rp. 0	Rp. 26,755,400
2	Cafe Celsius	Jl. KH. Mansyur no. 58	Rp. 0	Rp. 0	Rp. 0	Rp. 0	Rp. 0	Rp. 0	Rp. 390,696	Rp. 186,644	Rp. 0	Rp. 0	Rp. 0	Rp. 0	Rp. 577,340
3	RM Sumber Hidup	Jl Dr Moch Saleh 02. Kota Probolinggo	Rp. 0	Rp. 2,220,000	Rp. 0	Rp. 0	Rp. 0	Rp. 0	Rp. 0	Rp. 5,249,050	Rp. 2,559,450	Rp. 0	Rp. 0	Rp. 0	Rp. 10,028,500
			Rp. 0	Rp. 2,220,000	Rp. 2,167,000	Rp. 15,646,000	Rp. 0	Rp. 0	Rp. 1,635,196	Rp. 10,001,094	Rp. 5,691,950	Rp. 0	Rp. 0	Rp. 0	Rp. 37,361,240

Figure 13 Dashboard recapitulation of Data

5.6 Result and Analysis

The test aims to find out the time it takes in in the process of sending data, where for sending data from client devices to server machines in the Cloud System obtained the following data: Based on the test results, it was concluded that in the research application development for cloud computing-based P.O. S system, has a speed of accessing the data average article 0.7833 seconds/transaction data, with the memory load pages average is 2.0 MB, with articles in the transactions show random or uncertain, following the input that the user do on the transactions column.

6. CONCLUSION AND SUGGESTIONS

With the presence of cloud computing technology and device IoT (Internet Of Thing), the type of transactions in a retail objects such as a restaurant/diner which is usually a transaction using Software P.O. 's (Point Of Sales), currently with our easy-to-monitor transactions in realtime. Of course this is very helpful for an area Government yield estimates in terms of taxes. Data results have been obtained with techniques, methods of classification can be obtained pengelempokkan mandatory based on the level of allegiance [9], in the research trial results in field application of a system that has been built very effective and faster in submitting data reporting.

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