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Intelligence in the Era of Big Data

ICSIIT 2015

Rolly Intan
Chi-Hung Chi
Henry N. Palit
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Communications in Computer and Information Science 516

# Intelligence in the Era of Big Data

4th International Conference on Soft Computing, Intelligent Systems and Information Technology, ICSIIT 2015 Bali, Indonesia, March 11–14, 2015, Proceedings

Springer

Rolly Intan · Chi-Hung Chi
Henry N. Palit · Leo W. Santoso (Eds.)

# Intelligence in the Era of Big Data

4th International Conference
on Soft Computing, Intelligent Systems
and Information Technology, ICSIIT 2015
Bali, Indonesia, March 11–14, 2015
Proceedings

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# Preface

This proceedings volume contains papers presented at the fourth International Conference on Soft Computing, Intelligent System and Information Technology (the 4th ICSIIT) held in Bali, Indonesia, 11-14 March 2015. Main theme of this international conference is "**Intelligence in the Era of Big Data**", and it was organized and hosted by Informatics Engineering Department, Petra Christian University, Surabaya, Indonesia.

The Program Committee received 90 submissions for the conference from across Indonesia and around the world. After peer-review process by at least two reviewers per paper, 53 papers were accepted and included in the proceedings. The papers were divided into fourteen groups: fuzzy logic and control system, genetic algorithm and heuristic approaches, artificial intelligence and machine learning, similarity based models, classification and clustering techniques, intelligent data processing, feature extraction, image recognition, visualization technique, intelligent network, cloud and parallel computing, strategic planning, intelligent applications, and intelligent systems for enterprise government and society.

We would like to thank all Program Committee members for their effort in providing high-quality reviews in a timely manner. We thank all the authors of submitted papers and the authors of selected papers for their collaboration in preparation of the final copy.

Compared to the previous ICSIIT conferences, the number of participants of the 4th ICSIIT 2015 is not only increasing, but also the research papers presented at the conference are improved both in quantity and quality. On behalf of the organizing committee, once again, we would like to thank all participants of this conference, who contributed enormously to the success of the conference.

We hope all of you enjoy reading this volume and that you will find it inspiring and stimulating for your research and future work.

February 2015

Rolly Intan
Chi-Hung Chi
Henry N. Palit
Leo W. Santoso

# Organization

The International Conference on Soft Computing, Intelligent System and Information Technology (ICSIIT) 2015 (http://icsiit.petra.ac.id) took place in Bali, Indonesia, March 11-14, 2015, hosted by Informatics Department, Petra Christian University.

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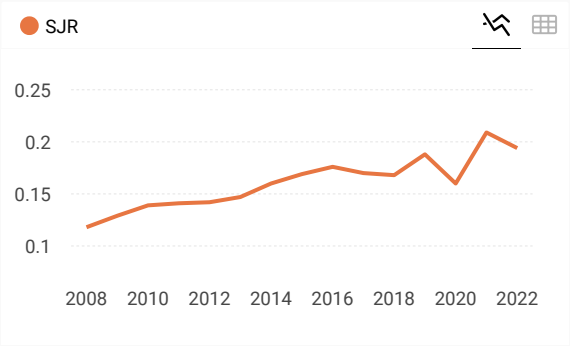


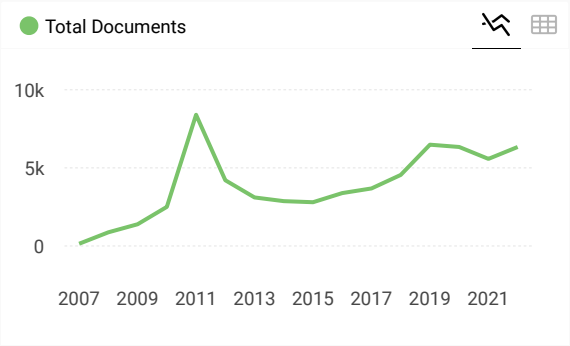


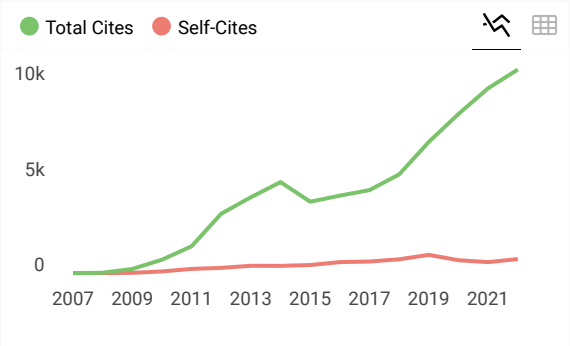


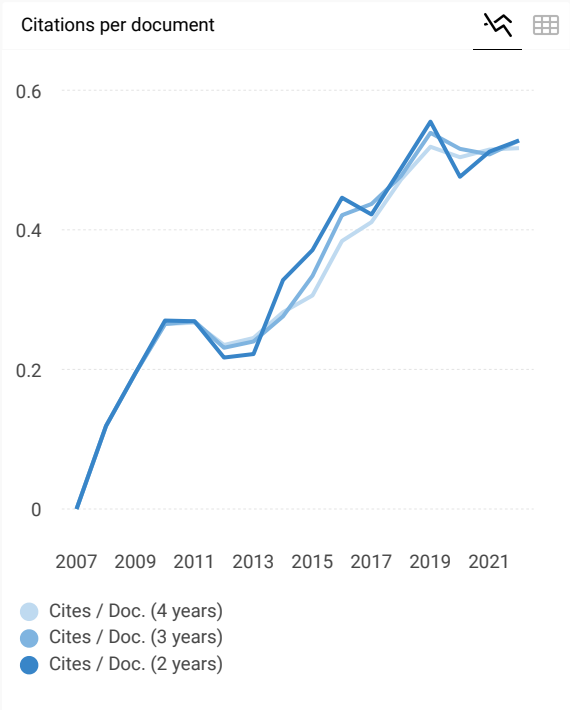


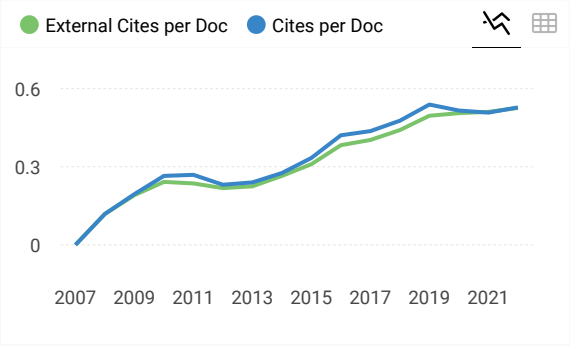


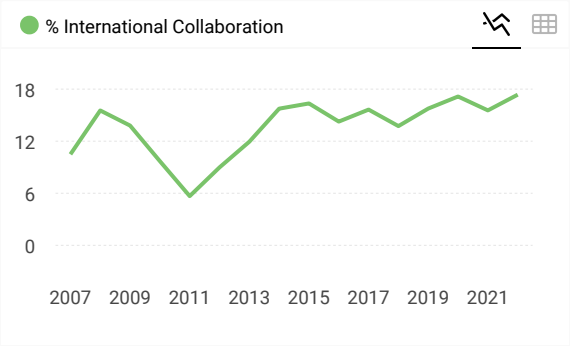


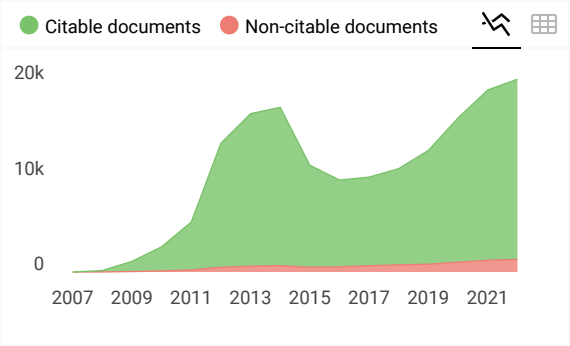


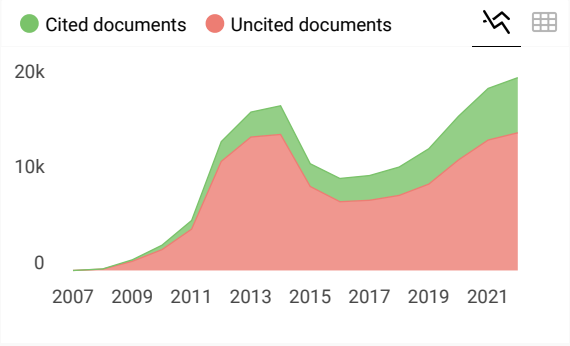

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# Public Transport Information System Using Android

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**Abstract.** Traffic jams are getting higher, making people surabaya thinking of switching from private to public transport vehicles. But the problem that arises is the lack of information about public transportation in Surabaya, so it is quite difficult for people who want to use public transport for transportation.

With the development of technology, especially in the smartphone, which is almost used by most people, the idea emerged to develop an application that can provide information related to public transport service based on mobile technology. Android platform chosen for the current smartphones starting from the lowest price to the highest price is dominated by the Android operating system. Applications developed to help people to be able to choose the transport used while traveling from one place to a particular destination with as little effort as possible. The application is able to assist the selection of an appropriate route, either directly or indirectly.

**Keywords:** Android, Information System Transportation, Mobile Device.

## 1 Background

Android-based smart phone technology is increasingly being used by the community. Various types and brands of smart phones that both local and global enliven the smart phone market.

The development of technology and prices are getting cheaper, smart phone with cheap price also is equipped with GPS (Global Positioning System) [1], a technology that can help to find a location from anywhere. This is very helpful in providing information about a location.

Surabaya as the second largest city in Indonesia, have problems in the public transport system. Many people began to leave the public transport as the main option in meeting the transportation needs because quite difficult to get information about the route of public transport [2].

So many public transportation but very little information is available either through the mass media and the Internet. For those reasons, by utilizing the Android technology, where this technology is quite cheap and more people are using it, then this is a pretty interesting idea to be able to develop applications that can help to provide information about public transport service in the city of Surabaya [3].

If the system is developed successfully, it will be easily adopted to be implemented in other areas, so as to help the government to further improve public transport facilities for the people of Indonesia in general.

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Applications developed will be able to help people in Surabaya to maximally utilize public transportation, and even not only the indigenous people of Surabaya but also newcomers can take advantage of public transportation in Surabaya [3].

## 2 Theory

### 2.1 Public Transport

Transportation system plays an important role in economic development in an area. The better the transportation system of a region, it will have a positive impact on the economic development of the region [4].

Surabaya, the capital of East Java province, is the second largest city in Indonesia after Jakarta. Surabaya city has grown rapidly in terms of trade and population growth. This leads to the need of transportation have increased significantly. The number of private vehicles, according to data of East Java Police has reached more than 4 million units [5].

With the number of private vehicles is large enough, then Surabaya experiencing traffic congestion problems. To overcome traffic congestion, then the people of Surabaya should be encouraged to switch to public transport. For those reasons, the level of comfort and reliability of the public transport system of choice for workers, students and the community at large.

The main problem in Surabaya is information about public transport. People in Surabaya have difficulty in accessing information about public transportation route, so there is a tendency to use private vehicles.

### 2.2 Public Transport Profile

Public Transportation in Surabaya consist of: City Bus, Public Passenger Cars (MPU), trains and ships. However, the focus of this research is on Passenger Cars (MPU). Each route has a specific code that is set by Organda (Organisation of National Transport Vehicle On Road). List of routes MPU in Surabaya is in Table 1 [6].

**Table 1.**

| Code | Route |
|---|---|
| C | Pasar Loak - Sedayu - Karang Menjangan PP |
| D | Joyoboyo - Pasar Turi - Sidorame PP |
| E | Petojo - Tanjungsari - Balongsari PP |
| F | Joyoboyo - Pegirian - Endrosono PP |
| G | Joyoboyo - Karang Menjangan / Lakarsantri / Karang Pilang PP |
| H2 | Pasar Wonokromo - Pagesangan PP |
| H2P | Pasar Wonokromo - Terminal Menanggal PP |
| I | Kupang - Benowo PP |
| K | Ujung Baru - Kalimas Barat / Pasar Loak PP |
| L2 | Ujung Baru - Sasak - Petojo PP |
| M | Joyoboyo - Dinoyo - Kayun - Kalimas Barat PP |
| N | Kalimas Barat - Menur - Bratang PP |

**Table 1.** (*Continued*)

| | |
|---|---|
| O | Tambak Wedi - Petojo - Keputih PP |
| O1 | Kalimas Barat - Keputih PP |
| O2 (WK) | Tambak Oso Wilangun (Depan SPBU) - Petojo PP / Tambak Wedi - Keputih - Bratang PP |
| P | Joyoboyo - Gebang Putih - Kenjeran / Petojo - Ketintang / Joyoboyo - Karang Menjangan - Kenjeran PP |
| Q | Kalimas Barat - Bratang PP |
| R | Kalimas Barat - Kapasan - Kenjeran PP |
| S | Joyoboyo - Bratang - Kenjeran PP |
| T1 | Margorejo - Joyoboyo - Sawahan - Pasar Loak PP |
| T2 | Joyoboyo - Mulyosari - Kenjeran PP |
| U | Joyoboyo - Rungkut - Wonorejo / Joyobekti PP |
| V | Joyoboyo - Tambakrejo PP |
| W | Dukuh Kupang - Kapas Krampung - Kenjeran PP |
| Y | Joyoboyo - Demak PP |
| Z | Kalimas Barat - Benowo PP |
| TV | Joyoboyo - Citra Raya / Manukan Kulon / Banjar Sugihan |
| DP | Kalimas Barat / Petekan - Manukan Kulon PP |
| Z1 | Benowo - Ujung Baru PP |
| J | Joyoboyo - Kalianak PP |
| BK | Bangkingan - Karang Pilang PP |
| DA | Kalimas Barat - Citra Raya |
| JTK | Joyoboyo - Tambak Klanggri PP |
| JTK2 | Joyoboyo - Medokan Ayu PP |
| R1 | Kalimas Barat - Nambangan - Kenjeran PP |
| WLD | Wonoarum - Pasar Loak - Dukuh Kupang PP |
| WLD2 | Bulak Banteng - Dukuh Kupang PP |
| RT | Rungkut - Pasar Turi PP |
| LMJ | Lakarsantri - Manukan Kulon - Kalimas Barat PP |
| BM | Bratang - Perumnas Menanggal PP |
| JBMN | Joyoboyo - Gunung Anyar PP |
| LK | Manukan Kulon - Pasar Loak - Kenjeran PP |
| GL | Pasar Loak - Gadung PP |
| JK | Joyoboyo - Kalijudan - Kenjeran PP |
| IM | Benowo – Simokerto |
| WB | Wonosari - Bratang PP |
| DKM | Dukuh Kupang - Menanggal PP |
| DKB | Dukuh Kupang - Benowo PP |
| BJ | Benowo - Kalimas Barat PP |
| RDK | Dukuh Kupang - Benowo PP |
| UBB | Ujung Baru - Bratang PP |
| UBK | Ujung Baru - Kenjeran PP |
| JMK | Kenjeran - Kalimas Barat PP |
| KIP1 | Kutisari Indah - Petojo PP (Lewat Tengah) PP |
| KIP2 | Kutisari Indah - Petojo PP (Lewat Timur) PP |
| GS | Gunung Anyar - Sidorame PP |
| RBK | Rungkut Barata - Kenjeran PP |
| DWM | Balongsari - Pangkalan Karah PP |

### 2.3 Android

Android is a software for smartphones that includes an operating system, middleware and key applications that are released by Google [7].

To make it easier to develop applications on the Android platform requires Adroid SDK, Tools API (Application Programming Interface) using the Java programming language.

Android Development Tools (ADT) is a plugin that is designed for the Eclipse IDE that make it easier to develop Android applications. By using ADT for Eclipse, it will be easier to create applications Android project, create a GUI application, and add other components. In addition, it can build Android package (.apk) that are used to distribute Android applications.

### 2.4 Google MAPS

Google Maps is an online map application service provided by Google for free. Google Maps officially accessible through the site http://maps.google.com. Service is very interactive google maps, maps in the slide according to user needs and the level of zoom can be adjusted [8].

Google Maps has many features that can be used eg location search based on certain keywords, such as a name, city, or road, and able to perform the calculation of the travel route from the starting location to the destination.

## 3 Design System

### 3.1 System Architecture

Referring to the public transport route as in Table 1, the transport information system developed using google maps to perform routes calculations, and data is saved to the server that can be accessed via the Internet.

There are two functions in the system: administrator and user. The administrator in charge to enter all the data into routes server, while the user is only able to request to the server on a particular routes, and the server provides the results to the user.

System architecture diagram can be seen in Figure 1.

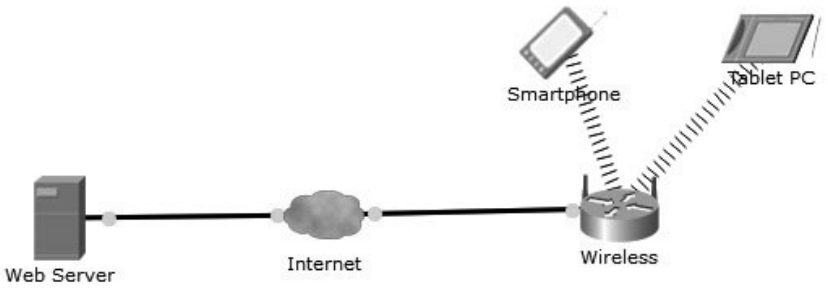


**Fig. 1.** System Architecture Diagram

### 3.2 Design Flowchart

Design Flowchart of Administrator Function can be seen in Figure 2.

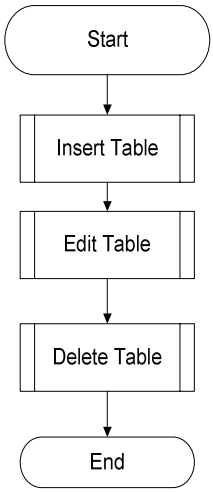


**Fig. 2.** Flowchart of Administrator Function

### 3.3 System on Android

Android system begins with the way the user make a selection starting location and destination.

At the destination, the user has three options: choose a destination by street name, place name, or select from the map.

Next the system will process and deliver the results to the user. When user presses the button MAP, then the user will be taken to a page that displays the position of each path traversed by public transport.

## 4 Implementation

### 4.1 Web Administrator

On the Web Administrator, there is a page to add street code and name of the street. When Insert button is pressed, the new data will be entered into the database.

At the bottom there is a function to add the location. This function is in the form of ID location that serves to explain the location of a street, street ID based on the code of the street that has been defined at the top.

Latitude and Longitude are used to store data based on the existing location on the map. The function of the web administrator can be seen in Figure 3.

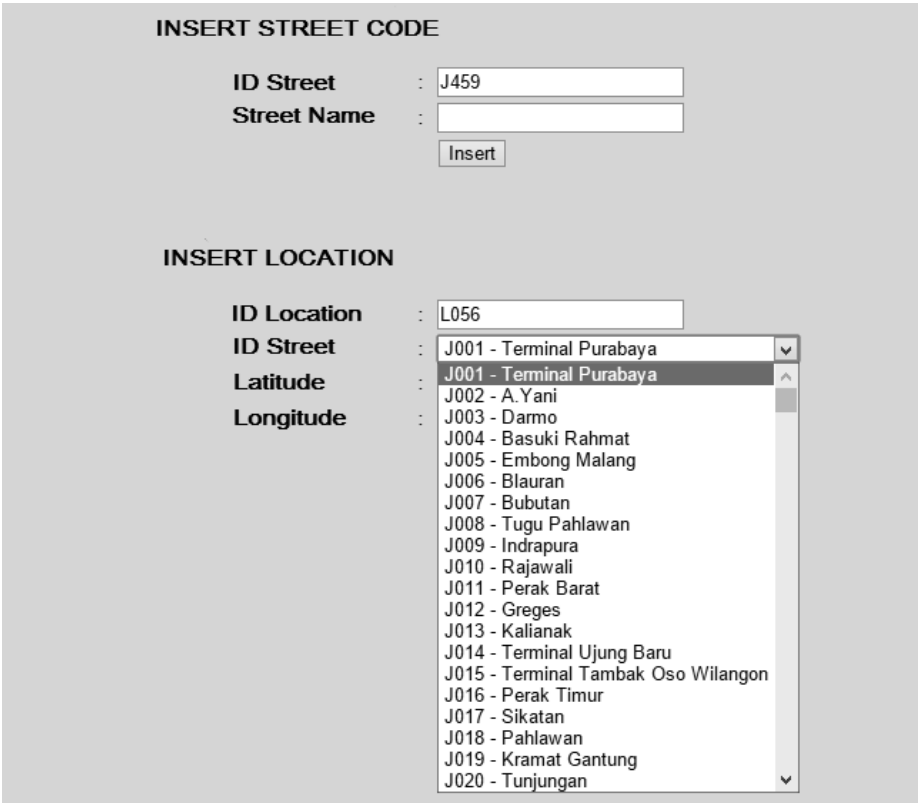


**Fig. 3.** Web Administrator

### 4.2 Implementation on Android

Implementation of Transport Information System in the form of Android-based applications. The main page of the application can be seen in Figure 4. There is an input to enter the starting location (Lokasi Awal), or take a position on the map (Ambil Posisi).

For the location of Interest, there are two options, namely by street or by location. If the user selects a street, by entering the name of the destination street. If the user selects a location, by entering a name in the text box. Process of the user to determine the location of the destination by street or location can be seen in Figure 5.

**Fig. 4.** Main Page of Application

**Fig. 5.** User selection of Destination

Search results based on the location of the start and destination can be seen in Figure 6.

**Fig. 6.** Search Result

## 5 Conclusion

Based on testing performed, the application is able to perform these searches, either directly or indirectly. However, to search for a location, can not be precise because of the limitations of existing public transport. Advice that can be given is the development using a variety of public transportation, not only one kind only.

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