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FOREWORD

We welcome you to the First International Conference on Information Technology Applications and Systems (ICITAS) held February 3, 2018 in Surabaya, East Java, Indonesia. ICITAS 2018 provides a highly competitive forum for global exploration of the latest developments in Information Technology and their direct impact on the economic sustainability. Therefore, we carefully chose and embraced the theme of this conference as "Managing Digital Development for Sustainable Economy".

We are pleased to present the proceedings of the conference as its published record. In overall, the technical committee has selected 40 papers to be published, which comprises authors from various countries and regions. The topics may include, but not limited to the following: Information and Communication Technology, Business and Economics Applications, and Applications of Digital Media Technology in Arts Design.

We want to express our gratitude to the members of the Program Committee and the Technical Committee, as well as the external reviewers for their hard work in reviewing all the submission papers. We also thank the three invited speakers, Prof Nai-Wei Lo (National Taiwan University of Science and Technology), Prof. Kamarul Hawari bin Ghazali (Universiti Malaysia Pahang), and Mr. Kresnayana Yahya, for sharing their insights with us. Finally, the conference would not be possible without the excellent papers contributed by authors. We thank to all the authors for their contributions and their participation in ICITAS 2018! We hope that this program will further stimulate research in Information Technology systems and their applications in the present time and in the future, and provide practitioners with better techniques, algorithms, and tools for deployment.

Dr. Jusak

General Chair of the ICITAS 2018

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KEYNOTE SPEAKER

Keynote Speaker 1

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• Feb 2014 till present:
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FIELD OF SPECIALIZATION

• Machine Vision System, Image Processing, Signal Processing, Intelligent System, Vison Control, Computer Control System, Thermal Imaging Analysis (in all related applications - Electrical, Medical, Environment) and Computer Engineering.

THERMAL IMAGING APPLICATION: THERMAL - VISIBLE FUSION FOR HUMAN DETECTION

Abstract - An increased interest in detecting human beings in video surveillance system has emerged in recent years. Multisensory image fusion deserves more research attention due to the capability to improve the visual interpretability of an image. This study proposed fusion techniques for human detection based on multiscale transform using grayscale visual light and infrared images. The samples for this study were taken from online dataset. Both images captured by the two sensors were decomposed into high and low frequency coefficients using Stationary Wavelet Transform (SWT). Hence, the appropriate fusion rule was used to merge. The coefficients and finally, the final fused image was obtained by using inverse SWT. From the qualitative and quantitative results, the proposed method is more superior than the two other methods in terms of enhancement of the target region and preservation of details information of the image.

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Keynote Speaker 2

Dr. Nai-Wei Lo got his Ph.D. degree in Electrical Engineering from State University of New York at Stony Brook, USA, in 1998. He worked as research assistant at TNT Information Systems Inc. in 1997 to 1998. From 1998 to 2000, he worked at H&L Technique Inc. as a software consultant for AT& T Business and Global Services. From 2000 to 2002, he worked at Lucent Technologies as member of technical staff.

Dr. Nai-Wei Lo joined the Department of Information Management in National Taiwan University of Science and Technology in 2003, and he has become professor from 2015. In addition, he has been the director of Taiwan Information Security Center, National Taiwan University of Science and Technology (TWISC@NTUST) since 2014. His research interests include smart grid security, IoT/IoV security, web technology, and cloud security.

Keynote Speech Title: Indoor Positioning-based Mobile Payment System Using BLE Technology

Abstract – The development of information technology has paved the way for faster and convenient payment process flows and new methodology of design and implementation for next generation payment system. The usage growth of smartphones in nowadays has fostered a new and popular mobile payment environment. Most of the current generation smartphones support BLE technology to communicate with nearby BLE-enabled devices. It is plausible to construct an Over-the-Air BLE-based mobile payment system as one of the payment methods for people living in modern societies. In order to secure the BLE-based mobile payment system, a secure indoor positioning-based mobile payment authentication protocol and corresponding mobile payment system is designed. The authentication protocol consists of three phases: initialization phase, session key construction phase, and authentication phase. A prototype is implemented to assess the performance of the designed mobile payment system.

Keynote Speaker 3

Krenayana Yahya is a Director of Enciety Business Consult and also aLecturer at Department of Statistics ITS. Not only served as Director of Enciety Business Consult, this Jakarta-born man is also listed as a Commissioner of PT Petrokimia Gresik. In addition he is also a Board of Trustees LEAD Indonesia (one of the program The Foundation of Sustainable Development or Foundation for Sustainable Development of the UK). Not only that, a number of important positions in several organizations such as the Chairman of the Association of Indonesia Manager Surabaya Branch, President of the Association of Indonesian Marketing area of East Java, and various other important positions in the field of statistics, environment, marketing to democracy. Mr. Yahya who holds a master's degree at the University of Wisconsin, USA is known to actively fill interactive dialogue in various mass media such as Suara Surabaya and JTV radio. His writing was often appeared in print media Java Post and Kompas Daily.

Keynote Speech Title : Digital development for sustainable economy

Abstract - The development issues today is strongly related to the developments of Technology. Technology introduction to a society is mainly a choice and related to the readiness to accept and utilized for the good of the improvement of welfare. Digitalization becomes a mean and a purpose to achieve sustainable development. Educating the young and bridging the digital divide becomes the most important aspect before to decide what and which technology should be implemented in a society, in a public sector and overall for business development. Disruptions will come and replacing, renewing, through innovation and developing application to reduce time, increasing speed and integrating most activities that reduce the impact on the degradation of the earth.

The role of development should define and prioritize the steps toward improving quality of life through managing the digital policy in the stages of development. Consideration the impact and the negative side of the use of IT should be anticipated through

policy developments. Technology by itself is neutral, but preparing the infrastructure to used, to be used by whom and for what purposes will the main cause to regulate. The digital divide should be considered as a real concern not to widen the welfare gaps and the increase of economic disparity.

Currently in Indonesia the IT Index of developments showed that Jakarta has the most advanced IT usage, Infrastructure and supported for business, while most villages and outer Island like Papua has very poor access for internet

Indonesian archipelago has its problems in disparity of level support for mostly several infrastructure. Better and more justice in prioritizing is on the way to make it even and more welfare instruments will cover.

On the other hand better access for communication and improving connectivity will improve the chances to integrate IT with most public sectors like transportation, online courses, retail, and public utility access. The future of IT will certainly a great help for human development in general. The improvement of policy development will be a real support for most development instrument. Specifically policy development for digitalization will be most valuable through the better understanding and the right implementation of sustainable development

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III. BUSINESS AND ECONOMICS APPLICATIONS

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Implementation Text Mining for Recommendation Follow Up Customer

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***Abstract*—Customer is one of the biggest assets in a company. The cost of acquiring new customers is greater than the cost of maintaining customer relationships today. The company's follow-up should be appropriate to support customer retention. This study aims to produce applications as a tool to generate recommendations about customer conditions. In this article explained that used a combination of the concept of Mining Text and naïve bayes clasiffier algorithm to process the status of customers from social media, in this study using Facebook. After going through the testing phase, the application can generate recommendation data for follow-up on the customer.**

Keywords—Data Mining, Customer Retention, Naïve Bayes Classifier, te

I. INTRODUCTION

In today's increasingly competitive era, organizations have been widely demanded to pay attention to quality (products or services) to their customers. Top leaders and managers are challenged to create and maintain systems and controls to ensure that quality-focused strategies will continue to be implemented and developed [1]. Therefore, an effective organization will give result a good service quality and customer satisfaction.

There are two customer satisfaction strategies: Offensive Strategy and Different Strategy [2]. The offensive strategy is primarily aimed at reaching and acquiring new customers. While difensif strategy includes efforts to reduce the possibility of customer exit and switching customers to other marketers. The purpose of this defensive strategy is to minimize customer turnover and maximize customer retention by protecting its products and markets from competitors' market attacks [2]. If the company is concerned only with offensive strategies and ignoring the strategy difensif, then its survival will be threatened at any time. Because establishing long-term relationships with existing customers will be more effective for corporate growth and increased profitability [3]. Requirements to be met by a company to be successful in the competition is trying to reach the goal of creating and retaining customers [2].

Each company must have its own way in providing services to its customers. Always conduct an evaluation for activities that have been done and always make improvements to the next activity. A wide range of facilities are provided for the convenience of its customers. The belief in the quality of service earned can be a recommendation for new customers or for old customers for subsequent use of services. Providing information on services, facilities, promos and discounts is done on an ongoing basis in an effort to increase the number of subscribers. Customer retention is an important thing for most companies because the cost of acquiring new customers is greater than the cost of maintaining customer relationships today [4]. The contribution of this research is to apply the concept of text mining and combined with Naïve Bayes Classifier (NB) algorithm to classify customers and know the potential of customer retention in order to follow up.

II. IMPLEMENTATION OF TEXT MINING

Text Mining is automatic or semi-automatic processing involving text structures and extracting relevant information on text [5]. Text Mining relates to words that are transcribed and stored in electronic files, representing raw data for analysis. The stages in text mining are as shown in Figure 1.

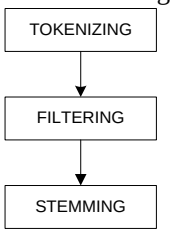

Fig 1. Stage of Text Mining (Miller, 2005)

Text Mining is a process that uses a word approach in conducting its analysis. Text Mining analyzes data in the form of text obtained from sources in the form of documents and the goal is to find words that can represent the contents of the

document so that it can be done linkage analysis between documents. The stages are:

a. Tokenizing stage is the cutting stage of the input string based on each word that compiles it. This process is done to make it easier when done matcing with key words related to the analysis to be done.
b. Filtering is the stage of taking important words from tokenizing process. This process only identifies each incoming word from tokenizing results. The word obtained will be done directly matching process and raised the value of matching results.
c. Stemming Stage is the root searching stage of each word filtering result. In this process the word sorting becomes a basic word without any word affixation.

Customer data used is status data that exist in social media up. Then the data is processed matching with words that come from Bag of Traveling is a set of words related to the term tourism or tourism when doing a trip for recreation or vacation, and also preparations made for activities during traveling (50 miles) from his home with the purpose of recreation, because the term traveling is a definition agreed by the World Tourism Organization [6].

III. USE OF NAÏVE BAYES CLASSIFIER ALGORITHM

Naive Bayes Classifier (NBC) is a statistical classifier that can be used to predict the probability of membership of a class. Naive Bayes is based on the Bayes theorem that has similar classification capabilities to the decision tree and neural network. Naive Bayes proved to have high accuracy and speed when applied into databases with large data [7]. Bayes's prediction is based on Bayes's theorem formulas with the following general formula:

$$P(H|X) = \frac{P(X|H)P(H)}{P(X)} \quad (1)$$

The NBC algorithm is applied when calculating the probabilities of stage 2 (filtering) and 3 (stemming) in the text mining stages. NBC performs matching with the status data training so as to produce a probability decision value that the customer data taken included in the category of traveling or spam as in Figure 2.

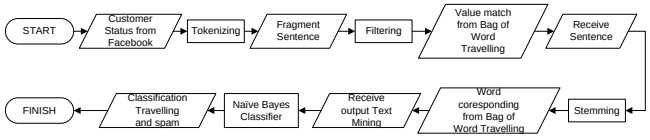

Fig 2. NBC Flowchart in the Text Mining Process

IV. IMPLEMENTATION OF TEXT MINING AND NAÏVE BAYES CLASSIFIER

There are 2 actors in this system, namely Customer and Marketing Staff. The system retrieves status data created by customers in Facebook's social media. Then the data will be processed by marketing staff. Text mining process is done on the customer's status data by applying the NBC algorithm. Figure 3 describes the functionality of the two actors.

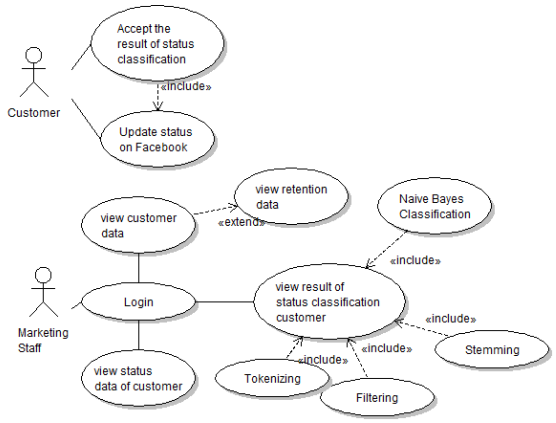

Fig 3. Use Case System Travelling Classification

The collection of customer facebook status is done directly through the application linked to the url of the customer's account. It is seen in Figure 4 that the customer status data will be stored in the database for subsequent processing.

Fig 4. Customer Status from Facebook

The status that has been obtained will be continued to the classification process by using tokenizing, filtering, stemming process in which using NBC algorithm. The result of calculation by using NBC generate weight value whether the customer's status included in the category of traveling or spam. The value of the given treshold is 0.5, meaning that if the weighted value of the NBC calculation exceeds that value it will be categorized as the traveling status. Figure 5 shows weighted results from one customer status. Status is included in the category Traveling.

The classification results are then stored as training data for the system. The more training data the system will run smarter and faster in issuing the results.

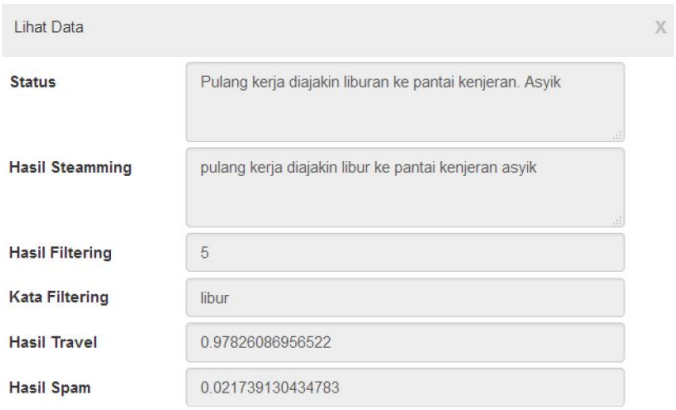

Fig 5 Point of Status Classification

Figure 6 shows the results of customer classification with the status of traveling. The data is presented by sorting by the highest potential retention value. This data can be used by marketing staff to determine which customers should be given follow-up to the use of company services.

Classification of Travelling Categories Customer

Potential Retention Customer : 6 person

No.	Name	URL Facebook	Potential Point
1	Ainur Kholis Rizkiyanto	https://web.facebook.com/rizkykholis	0.99999988305183
2	Rena Anggraini	https://web.facebook.com/renaanggraeini	0.99999970399979
3	Caroline Patricia	https://web.facebook.com/carolinepatricia	0.8
4	Teghar Firmansyah	https://web.facebook.com/teghar	0.75
5	Tri Septianto	https://www.facebook.com/tri.septianto	0.75
6	Agil Rijal Quaresma	https://www.facebook.com/agil.quaresma	0.64285714285714

Fig 6. Classification of Travelling Categories Customer

V. CONCLUSSION

This research implements a text mining process that has tokenizing, filtering and stemming stages. In the process is also combined with Naïve Bayes Classifier algorithm to provide probability value on the classification of customer status data. The results of the process have been done two kinds of tests, namely using unit testing is also integration and system testing. Unit testing has been performed and the results show that the functionality of tokenizing, filtering, stemming and NBC algorithm usage is in accordance with expected conditions. That means the system to classify customer status is applicable. Integration and system testing tested the status classification process and attempted applications on a number of users.

Based on the research conducted, has produced an application that implements the concept of text mining. Using the app can be used to manage customer status data taken from social media. Management of customer status data as a recommendation material to determine the customer who will follow-up

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