LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING

Judul Karya Ilmiah	:	Hardware design of queuing free environmental friendly automatic toll gate using RFID		
Jumlah Penulis	:	3 orang (**Wahyul Amien Syafei**, Listyono, A.F., Darjat)		
Status Pengusul	:	Penulis Utama		
Identitas Prosiding	:	a. Judul Prosiding	:	The 4th International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE) 2017
		b. ISBN/ISSN	:	978-1-5090-1434-7
		c. Thn Terbit, Tempat Pelaks.	:	2017, Semarang - Indonesia
		d. Penerbit/Organiser	:	IEEE Xplore Digital Library
		e. Alamat Repository/Web	:	https://ieeexplore.ieee.org/document/8257692/
		Alamat Artikel	:	https://doc-pak.undip.ac.id/7988/1/syafei2017.pdf
		f. Terindeks di (jika ada)	:	Scopus

Kategori Publikasi Makalah (beri ✓pada kategori yang tepat) : [√] *Prosiding* Forum Ilmiah Internasional
[ ] *Prosiding* Forum Ilmiah Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi prosiding (10%)	2,50	2,50	2,50
b. Ruang lingkup dan kedalaman pembahasan (30%)	7,00	7,00	7,00
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	7,00	7,00	7,00
d. Kelengkapan unsur dan kualitas terbitan/prosiding(30%)	7,50	7,00	7,25
Total = (100%)	**24,00**	**23,50**	**23,75**
Nilai Pengusul = (60% x 23,75) = 14,25			

Semarang,

Reviewer 2

Dr. Wahyudi, S.T., M.T.
NIP. 196906121994031001
Unit Kerja: Teknik Elektro Fakultas Teknik
Universitas Diponegoro

Reviewer 1

Dr. Iwan Setiawan, ST., MT.
NIP. 197309262000121001
Unit Kerja: Teknik Elektro Fakultas Teknik
Universitas Diponegoro

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING

Judul Karya Ilmiah	:	Hardware design of queuing free environmental friendly automatic toll gate using RFID		
Jumlah Penulis	:	3 orang (**Wahyul Amien Syafei**, Listyono, A.F., Darjat)		
Status Pengusul	:	Penulis Utama		
Identitas Prosiding	:	a. Judul Prosiding	:	The 4th International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE) 2017
		b. ISBN/ISSN	:	978-1-5090-1434-7
		c. Thn Terbit, Tempat Pelaks.	:	2017, Semarang - Indonesia
		d. Penerbit/Organiser	:	IEEE Xplore Digital Library
		e. Alamat Repository/Web	:	https://ieeexplore.ieee.org/document/8257692/
		Alamat Artikel	:	https://doc-pak.undip.ac.id/7988/1/syafei2017.pdf
		f. Terindeks di (jika ada)	:	Scopus

Kategori Publikasi Makalah (beri ✓pada kategori yang tepat) : [√] *Prosiding* Forum Ilmiah Internasional
[ ] *Prosiding* Forum Ilmiah Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional [25]	Nasional [ ]	
a. Kelengkapan unsur isi prosiding (10%)	2,50		2,50
b. Ruang lingkup dan kedalaman pembahasan (30%)	7,50		7,00
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	7,50		7,00
d. Kelengkapan unsur dan kualitas terbitan/prosiding(30%)	7,50		7,50
Total = (100%)	**25,00**		**24,00**
Nilai Pengusul = (60% x 24,00) = 14,40			

Catatan Penilaian Paper oleh Reviewer :

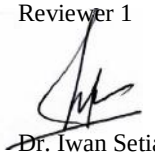
1. **Kesesuaian dan kelengkapan unsur isi paper:** Paper ditulis dengan lengkap dan sesuai kaidah karya tulis ilmiah, memuat judul, abstrak, pendahuluan, perancangan, hasil, kesimpulan, dan referensi. (Nilai 2,5).

2. **Ruang lingkup dan kedalaman pembahasan:** Pembahasan dalam paper ini relatif mendalam, mulai dari perancangan sampai perwujudan dan pengujian perangkat keras di lapangan, dilengkapi juga dengan foto. (Nilai 7).

3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:** Metode yang dipakai cukup efektif untuk mendeteksi dan scara otomatis memotong saldo dan mengirimkan notifikasi ke pelanggan. Pengujian berhasil, sesuai dengan rencana.(Nilai 7).

4. **Kelengkapan unsur dan kualitas terbitan:** Prosiding sangat lengkap dengan kualitas terbitan yang berstandar Internasional dan terindeks Scopus. Paper dicek dengan Turnitin tidak ada unsur plagiasi dan sesuai dengan bidang ilmu pengusul. (Nilai 7,5).

Semarang,
Reviewer 1



Dr. Iwan Setiawan, ST., MT.
NIP. 197309262000121001
Unit Kerja: Teknik Elektro Fakultas Teknik
Universitas Diponegoro

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING

Judul Karya Ilmiah	:	Hardware design of queuing free environmental friendly automatic toll gate using RFID		
Jumlah Penulis	:	3 orang (**Wahyul Amien Syafei**, Listyono, A.F., Darjat)		
Status Pengusul	:	Penulis Utama		
Identitas Prosiding	:	a. Judul Prosiding	:	The 4th International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE) 2017
		b. ISBN/ISSN	:	978-1-5090-1434-7
		c. Thn Terbit, Tempat Pelaks.	:	2017, Semarang - Indonesia
		d. Penerbit/Organiser	:	IEEE Xplore Digital Library
		e. Alamat Repository/Web	:	https://ieeexplore.ieee.org/document/8257692/
		Alamat Artikel	:	https://doc-pak.undip.ac.id/7988/1/syafei2017.pdf
		f. Terindeks di (jika ada)	:	Scopus

Kategori Publikasi Makalah (beri ✓pada kategori yang tepat) : [√] *Prosiding* Forum Ilmiah Internasional
[ ] *Prosiding* Forum Ilmiah Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Prosiding		Nilai Akhir Yang Diperoleh
	Internasional [25]	Nasional [ ]	
a. Kelengkapan unsur isi prosiding (10%)	2,50		2,50
b. Ruang lingkup dan kedalaman pembahasan (30%)	7,50		7,00
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	7,50		7,00
d. Kelengkapan unsur dan kualitas terbitan/prosiding(30%)	7,50		7,00
Total = (100%)	**25,00**		**23,50**
Nilai Pengusul = (60% x 23,50) = 14,10			

Catatan Penilaian Paper oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi paper:** Isi paper lengkap. Semua unsur sebuah paper telah terpenuhi, judul, abstrak, pendahuluan, desain, hasil, kesimpulan dan referensi semua lengkap. (Nilai 2,5).

2. **Ruang lingkup dan kedalaman pembahasan:** Pembahasan dalam paper ini relatif mendalam, mulai dari perancangan sampai perwujudan dan pengujian perangkat keras di lapangan, dilengkapi juga dengan foto. (Nilai 7).

3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:** Metode yang dipakai cukup efektif untuk mendeteksi dan scara otomatis memotong saldo dan mengirimkan notifikasi ke pelanggan. Pengujian berhasil, sesuai dengan rencana.(Nilai 7).

4. **Kelengkapan unsur dan kualitas terbitan:** Unsur prosiding sangat lengkap dan memiliki kualitas terbitan yang baik dengan format yang konsisten dari tahun ke tahun. Terindeks di Scopus. Tidak ada unsur plaigiasi. Paper linier dengan bidang ilmu pengusul. (Nilai 7).

Semarang,
Reviewer 2

Dr. Wahyudi, S.T., M.T.
NIP. 196906121994031001
Unit Kerja: Teknik Elektro Fakultas Teknik
Universitas Diponegoro

ICITACEE 2017

THE 4th INTERNATIONAL CONFERENCE ON INFORMATION TECHNOLOGY, COMPUTER, AND ELECTRICAL ENGINEERING

Green TECHNOLOGY for the Better Future in Information Technology, Electrical, and COMPUTER ENGINEERING Implementation

IEEE

Certificate

Awarded to

WAHYUL AMIEN SYAFEI

as

PRESENTER

THE 4th INTERNATIONAL CONFERENCE ON INFORMATION TECHNOLOGY, COMPUTER, AND ELECTRICAL ENGINEERING

(ICITACEE 2017)

Department of Computer Engineering, Diponegoro University

Semarang, 18 - 19 October 2017

Ir. M. Agung Wibowo, M.M., M.Sc., Ph.D

Dean of Faculty Engineering, Diponegoro University

ICITACEE 2017

Department of Computer Engineering

Agung Budi Prasetijo, S.T., M.IT., Ph.D.)

General Chair

NOMOR 716/UN7.P/HK/2017.

Document type
Conference Paper

Source type
Conference Proceedings

ISBN
978-153863946-7

DOI
10.1109/ICITACEE.2017.8257692

View more

Proceedings - 2017 4th International Conference on Information Technology, Computer, and Electrical Engineering, ICITACEE 2017 • Volume 2018-January, Pages 142 - 146 • 1 July 2017 • 4th International Conference on Information Technology, Computer, and Electrical Engineering, ICITACEE 2017, Semarang, 18 October 2017 - 19 October 2017, 134244

Hardware design of queuing free environmental friendly automatic toll gate using RFID

Syafei W.A. , Listyono A.F., Darjat

Save all to author list

Electrical Engineering Department, Diponegoro University, Semarang, Indonesia

Abstract

The main problem of Indonesian's highway is the long queue at the toll gates due to toll fee payment transaction. This occurs when arriving rate of the vehicles is much higher than servicing rate of the toll gates . Instead of cash payment at manual toll gates , automatic toll gates (GTO) use debit cards to do payment faster. Regardless the gates are manual or automatic , every vehicle should stop for a while to finish the transaction. The more vehicles come, the longer queue be. The longer queue, the more wasting fuel consumption and the higher air pollution be. Further, the conventional

THE 2017 4th INTERNATIONAL CONFERENCE
ON INFORMATION TECHNOLOGY, COMPUTER, AND ELECTRICAL ENGINEERING

ICITACEE 2017

OCTOBER 18 -19, 2017

The Wujil Resort and Conventions
Semarang, October 18 - 19, 2017

DEPARTMENT OF COMPUTER ENGINEERING
FACULTY OF ENGINEERING
DIPONEGORO UNIVERSITY

IEEE

The 2017 4th International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE)

Conference Committee

General Chair : Agung Budi Prasetijo (Universitas Diponegoro)
Co-Chair : Aghus Sofwan (Universitas Diponegoro)
Secretary : Dania Eridani

Organizing Committee:

Munawar Agus Riyadi
R. Rizal Isnanto
Risma Septiana
Andi Widiasmoro
Melati Mawas Titi
Eko Didik Widianto
Yudi Eko Windarto
Kurniawan Teguh Martono
Adnan Fauzi

Steering Commitee:

Hiroshi Ochi (Kyushu Institute of Technology, Jepang)
Hiroshi Furukawa (Kyushu University, Jepang)
Kuncoro Wastuwibowo (IEEE Indonesia Section)
Trio Adiono (IEEE Solid State Circuits Indonesia Chapter)
Mauridhi Hery Purnomo (Sepuluh Nopember Institute of Technology)
Razali Ismail (University Teknologi Malaysia)
Taufik (California Polytechnic State, USA)

Technical Program Committee:

Mochammad Facta (Diponegoro University, Indonesia)
Masayuki Kurosaki (Kyushu University, Japan)
Trio Adiono (Bandung Institute of Technology, Indonesia)
P. Insap Santosa (Gadjah Mada University, Indonesia)
Hermawan (Diponegoro University, Indonesia)
Mauridhi Hery Purnomo (Sepuluh Nopember Institute of Technology, Indonesia)
Khoirul Anwar (Japan Advanced Institute of Science and Technology, Japan)
Wahyudi (Diponegoro University, Indonesia)
Tole Sutikno (Ahmad Dahlan University, Indonesia)
Wahyul Amien Syafei (Diponegoro University, Indonesia)
Munawar Agus Riyadi (Diponegoro University, Indonesia)
Sidiq Syamsul Hidayat (Semarang State Polytechnics, Indonesia)
Supari (Semarang University, Indonesia)
Slamet Riyadi (Soegijapranoto Katholic University, Indonesia)
M. Haddin (Sultan Agung Islamic University, Indonesia)

Onil Nazra Persada (CIRELA, France)
Zolkafle Buntat (Universiti Teknologi Malaysia)
Taufik (California Polytechnic State University, USA)
Hashim Uledi Iddi (University of Dar es Salaam, Tanzania)
Aris Triwiyatno (Diponegoro University, Indonesia)
Pandu Sandi Pratama (Pusan National University, South Korea)
Razali Ismail (Universiti Teknologi Malaysia, Malaysia)
Ismail Saad (University Malaysia Sabah, Malaysia)
Oky Dwi Nurhayati (Diponegoro University, Indonesia)

TABLE OF CONTENTS

Electronics, Robotics and Instrumentation

Image and Signal Processing

Information Technology

Wireless and Telecommunication

Hardware Design of Queuing Free Environmental Friendly Automatic Toll Gate Using RFID

W. A. Syafei, A. F. Listyono, and Darjat
Electrical Engineering Department
Diponegoro University
Semarang, Indonesia
wasyafei@live.undip.ac.id

***Abstract*—The main problem of Indonesian's highway is the long queue at the toll gates due to toll fee payment transaction. This occurs when arriving rate of the vehicles is much higher than servicing rate of the toll gates. Instead of cash payment at manual toll gates, automatic toll gates (GTO) use debit cards to do payment faster. Regardless the gates are manual or automatic, every vehicle should stop for a while to finish the transaction. The more vehicles come, the longer queue be. The longer queue, the more wasting fuel consumption and the higher air pollution be. Further, the conventional payment method at the toll gates makes this situation even worse. Toll gates officers or automatic printers will give a small piece of paper as successful payment notification. These notification papers, however, are not really cared by the drivers and further become trashes around the toll gates. This research aims to improve the quality of service of the toll gates by developing a queuing free environmental friendly automatic toll gates. Instead of debit card to identify the toll customers and do the payment, the proposed system uses a non-contact technology that commonly referred as Radio Frequency Identification. The vehicle is identified by the systems just as it is passing through the toll gate. This method eliminates the queue at the toll gate since the payment is done in fly. Next, a payment notification is sent to the driver's hand phone via short message service. It replaces the need of paper and ink and eliminates paper trashes around the toll gates. This paper presents the hardware development of the proposed system.**

Keywords— Automatic toll gate, RFID, SMS, environmental friendly, green technology

I. INTRODUCTION

Highways or Toll Roads are provided to enhance the traffic, improve the distribution of goods and services, and increase mobility and accessibility of people. [1]

The main problem that occurs recently on the Indonesian highway is the long queue. This queue occurs because the arriving rate of vehicles to toll gates is much higher than the servicing rate. The congestion is caused by some factors, such as the cessation of vehicles at toll gates to do payment of toll fee, less number of toll gates, and volume of vehicles exceeds the capacity. This congestion will lead to wasting time for wait, incendiary fuel combustion, and air pollution caused by vehicle exhaust. Sooner or later these problems will cause health problems.

Utilization of electronic toll collection (ETC) offers some advantages. It improves the service at the toll gates, save fuel, reduce vehicle gas emissions, and save time queue. Another advantage of this system is that it eliminates traffic jam and increases control over traffic flow through administrative control centers. ETC has been widely employed by various countries. This system in America known as EZ-Pass, in Australia known as City-link, while in Asia known as D-Link. All have the same meaning the toll gate serves by employing ETC system. [2, 3].

The toll gates in Indonesia have been utilizing ETC, under the name of Automatic Toll Gate (GTO). This system improves the quality of toll gate services and toll road customer satisfaction [4]. Existing GTO uses debit card for identification and payment process which requires the driver to contact the debit card to the card reader. GTO prints successful payment transaction on a small piece of paper then let the driver to take it. In fact, this payment proof is not really cared by the drivers and becomes trash around toll road or at toll gate. The time consumed by this process (from taping the debit card until taking the payment proof paper) is just a few seconds different to the time consumed by manual toll gate. Therefore, vehicle queue is also common seen in GTO. GTO is not a solution to overcome queueing problem at toll gates and is not environmental friendly either.

Researches have been conducted to improve the quality of service of the toll gates. Two of them have proposed using a non-contact technology that commonly referred as Radio Frequency Identification (RFID) [5] and GSM module which are controlled by ARM7 LPC2148 in [6]. The system used RFID passive tag, which should be placed less than 10 cm to be detected by RFID reader. To increase the detection distance RF transceiver is implemented in [7]. However, this system is costly because it employed ARM7 LPC2129 and many other modules.

With the same goal, this research has developed a queueing free environmental friendly automatic toll gates (Queen ATG). Instead of debit card to identify the toll customers and do the payment, the proposed system uses RFID active tag. The detector is designed better because the vehicle is identified just as it is passing through the toll gate. This method eliminates the queue at the toll gate since the payment is done on the fly. Next, a payment notification is sent to the driver's hand phone

A Multiple Classifiers Broadcast Protocol for VANET

Sami S. Alwakeel, Hesham A. Altwaijry
Department of Computer Engineering
CCIS – King Saud University
Riyadh, Kingdom of Saudi Arabia
{swakeel, twaijry}@ksu.edu.sa

Agung B. Prasetijo
Department of Computer Engineering
Faculty of Engineering – Diponegoro University
Semarang, Indonesia
agungprasetijo@ce.undip.ac.id

***Abstract*—Many types of artificial intelligent machines have been used for decision making purposes. In VANET broadcast protocols, vehicles must decide the received messages are to be rebroadcast or not. Several attributes such as sender-to-receiver distance, sender-receiver speed difference, number of neighboring vehicles, as well as vehicle's movement direction are important measures to take the broadcast decision. As the relationships of attributes to the broadcast decision cannot be mathematically defined, the use of a classifier-based artificial intelligence may approximately predict the relationships of all the incorporated attributes to such a decision. As the decision is based on prediction, the use of multiple classifiers in decision making may increase accuracy. Therefore, this research employs a combined-classifiers at an abstract level to provide firmer broadcast decisions on VANET. Our research results justify that the performance of our combined multiple-classifiers outperformed a single-classifier scheme. The multi-classifiers scheme contributes to an average increase of 2.5% in reachability compared to that of the efficient counter–based scheme (ECS). The combined multi-classifiers scheme also improves the saving in rebroadcast tries by 38.9%.**

***Keywords*—Broadcast-storm, classifier, VANET, vehicular attribute.**

I. Introduction

An efficient broadcast has always been a hot issue in broadcast protocol area. Several schemes have been available, from heuristic (e.g. probability-based, counter-based broadcast) to topology-based broadcast (e.g. distance-based broadcast). However, most of the solutions have used mostly only a few attributes (whether local or global), such as the use of sender-to-receiver distance, number of message duplicates received, or even only employing probability to reduce the number of nodes/vehicles that rebroadcast messages to mitigate the broadcast-storm problem (the massive message redundancy, contention and collision) [1, 2, 3, 4].

In reality, considering many attributes in the broadcast decision mechanism may lead to a more efficient broadcast scheme. For example, a vehicle having a greater distance from the sender vehicle is more potential to rebroadcast messages than that of having a smaller distance. Likewise, a vehicle that has a higher speed differential to the sender is considered to be a better broadcast candidate as it will go out from the sender's radio coverage fast. The number of neighboring vehicles can also be used to select the rebroadcast candidates. The denser the neighbors, the smaller the probability for a vehicle to rebroadcast. Therefore, a multiple-attributes scheme are more probable to outperform a single-attribute scheme if such attributes are properly treated.

To properly handle the attributes, a classification algorithm (known as a classifier or an expert) can be used to examine all the possible situations of the attributes dealing with current vehicular network situation. For example, a greater distance threshold should be applied for vehicles deserved rebroadcast in a dense network. However, a smaller threshold is required to maintain high network reachability. A classifier is able to recognize the input conditions of the attributes and to make decisions based on the knowledge obtained from prior training (called as model). Our work employs the following attributes: sender-to-receiver distance, number of message copies, vehicular density, as well as speed differential and movement direction.

Discussion of the research are presented in what follows. Research in broadcast protocols are presented in section 2. Sections 3 and 4 discuss how our experiments are set up and experimented. Results of the study are presented and discussed in section 5 and conclusions can be found in section 6.

II. The Broadcast-Storm Mitigation Schemes

One simple method to reduce the broadcast-storm is to use a probabilistic approach. The probabilistic based scheme uses probability mechanism for node selection rather than using a threshold mechanism (such as in distance-based threshold) for determining rebroadcast nodes. Basic broadcast techniques in VANETs follow either a *1*-persistence or a *p*-persistence scheme. The *1*-persistence scheme has the advantages of low complexity and high penetration rate, but creates massive redundancy. The *p*-persistence scheme may reduce message redundancy but may increase in total latency and degraded penetration rate. For example, literature [5] proposed three schemes: weighted *p*-persistence, slotted *1*-persistence, and slotted *p*-persistence broadcast schemes, whilst literature [6] proposed an adaptive probabilistic based scheme that senses idle channel time to represent the broadcast probability.

978-1-5386-3947-4/17/$31.00 ©2017 IEEE

Assessing Information Security Culture: The Case of Malaysia Public Organization

Mohamad Noorman Masrek
Faculty of Information Management MARA
Universiti Teknologi MARA
Shah Alam Selangor, Malaysia
mnoorman@salam.uitm.edu.my

Abstract

In line with the growing number of reported cases of information security breaches, there is also a growing interest among researchers to study information security culture. To this effect, researchers have developed various models and frameworks for assessing and developing information security culture. However, most of these models or frameworks are not a silver bullet which can be easily applied to all organizational settings. The requirements and the characteristics of information security culture differ from one organization to other organization. On the basis of this background, this study was conducted with the aim of identifying the dimensions of information security culture in the context of Malaysian public organizations. The framework for assessing the information security culture was developed through extensive literature review and verified through experts' interviews. The framework consists of six components, namely, management support, policy and procedures, compliance, awareness, budget and technology. A corresponding scale was also developed to assess the information security culture and administered to Malaysian public organizations of the federal ministries. The respondents were requested to indicate the aspects that are considered crucial and important in developing an information security culture. A total of 293 IT directors responded to the survey. The results showed that all of the aforementioned components were indeed crucial and significant in developing information security culture. The contribution of the study can be described in three-folds, namely theoretical, practical and empirical. From a theoretical standpoint, it has developed an empirical based framework for assessing information security culture. From a practical standpoint, the scale or instrument developed in the study can be used to gauge the level of information security culture and finally from the empirical standpoint, it has provided additional empirical evidence on the status of information security culture in the Malaysian context.

Keywords—information security; security culture assessment; security culture framework; survey; questionnaire

A Bi-directional Boost Converter-Based Non-Isolated DC-DC Transformer with Modular Solid-State Switches for Medium-/High-Voltage DC Grids

Ahmed Elserougi[1,2], Ahmed Massoud[1], and Shehab Ahmed[3]
[1]Electrical Dept., Qatar University, Doha, Qatar
[2]Electrical Dept., Alexandria University, Alexandria, Egypt
[3]Electrical Dept., Texas A&M University at Qatar, Doha, Qatar

***Abstract*— In this paper, a bi-directional non-isolated dc-dc transformer is proposed, which can be used for connecting different dc voltage levels in medium-/high-voltage dc grids. The proposed dc-dc transformer is based on the conventional bi-directional boost converter, but with modular solid-state switches to avoid the complexity of employing series-connected Insulated Gate Bipolar Transistors (IGBTs) to meet the high-voltage requirement. The modular solid-state switch consists of cascaded modules, where each module consists of Half-Bridge Sub-Module (HB-SM) along with clamping IGBT. Small module capacitance is required in the proposed architecture as it is used typically to clamp the module voltage, not to store the energy to be delivered to the load. This affects positively the lifetime of the dc-dc transformer. On the other hand, clamping IGBTs ensure a successful operation with balanced capacitors' voltages without the need for voltage or current measurements. A detailed illustration for the proposed architecture is presented along with its operational modes and controller. Simulation results for a 2MW 10 kV/25 kV dc-dc transformer are presented to show the viability of the proposed architecture.**

Keywords*— *Bi-directional converter; dc-dc transformer; modular solid-state switch.

I. INTRODUCTION

The dc-dc transformer is an essential component in medium-/high-voltage dc grids for connecting two different dc voltage levels [1]. The dc-dc transformer can be classified into isolated [2-5] and non-isolated [6-10]. In the isolated type, an isolation transformer is employed to isolate between the high- and low-voltage sides.

The conventional non-isolated dc-dc boost converters are not normally used for applications requiring high voltage gains because of the difficulties with the main switch stresses [1], as the employed switches are rated at the higher voltage level. To meet the required high-voltage rating of the switch, series-connection of IGBTs [11], or multi-module dc-dc transformer configurations [9] can be used. In case of series connection of IGBTs, there are some challenges related to static and dynamic voltage sharing among the involved IGBTs. Active gate control can be deployed, yet with increasing system complexity [11].

While in case of multi-module converters, there are two possible connections [9]: cascaded converters and series converters. In cascaded converters [9], the first converter has intermediate voltage stresses and high current stresses, while the second converter has high voltage stresses and low current stresses. In addition, there is a difficulty in the control due to the interaction between converters. In case of series converters with one dc input [9], each converter processes only half of the input power, which enhances the system efficiency, and the employed switches are rated at half of the total voltage stress, which is still high for one IGBT. To reduce the voltage rating of employed switches, multi-module (generally, *n* modules) can be employed by connecting their output in series, but their inputs should be isolated which necessitates isolating transformers.

In order to meet the required high-voltage rating of switches in medium-/high-voltage applications without employing series-connection of switches nor multi-module converters, multi-module-cascaded high-voltage composite switch can be employed which enables recruiting low-voltage IGBTs in high-voltage applications.

In [12], a high-voltage composite switch, which is based on Modular Multilevel Converter (MMC), is proposed. This composite switch entails cascaded modules, where each module consists of a dc capacitor, a resistor, and four IGBTs (i.e. a Full-Bridge Sub-Module (FB-SM)). The voltage balancing is guaranteed automatically during the conduction modes of this configuration. The main drawback is that the number of required gate drivers is four times that with the series-connected IGBTs.

In this paper, a modular high-voltage switch with a reduced number of IGBTs is proposed for a bi-directional boost converter-based dc-dc transformer. The proposed modular switch entails cascaded modules, where each module consists of Half-Bridge SM (HB-SM) (each SM has two IGBTs and a small dc capacitor) along with clamping IGBT. The capacitance of the HB-SM is small, as the dc capacitor is used as a snubber circuit to clamp the voltage of the HB-SM not to store the energy to be delivered to the load. While clamping IGBTs are employed to ensure balanced capacitors' voltages during the operation without the need for voltage or current measurement. The modular switch's modules are operated with Marx concept, i.e. basic cell for Marx [13] is employed, where the capacitors are connected in parallel during the bypass mode (turn-on) of the modular switch, and are connected in series during the turn-off period of the modular switch. The HB-SMs' capacitances should be selected small enough to ensure insignificant effect on the boost converter operation and to limit the inrush current emanated from the repetitive switching of modules' capacitors during the operation. Detailed illustration and design for the proposed architecture are presented in the following sections.

978-1-5386-3947-4/17/$31.00 ©2017 IEEE

Regulatory Framework Creation Analysis to Reduce Security Risks The Use of Social Media in Companies

Oktavianus Teguh Prayitno[1], Ofelia Cizela da Costa Tavares[2], Amaya Andri Damaini[3], and Djoko Budiyanto Setyohadi[4]
[1,2,3,4]Magister Teknik Informatika, Universitas Atma Jaya Yogyakarta, Yogyakarta, Indonesia
[1]Departement of Port Management, Akademi Maritim Nusantara Cilacap, Cilacap, Indonesia
[2]Department of Computer Science Faculty of Engineering and Science, Institute of Technology Dili, Dili, Timor Leste
otegoohp@gmail.com, ofelia_tavares@yahoo.com, amayaandridamaini@gmail.com, djoko.bdy@gmail.com

***Abstract*— Companies, agencies and individuals currently use social media as a means of communication and business facilities, because through social media the staffs can connect globally in expressing ideas, feelings or emotions. However, social media users need to be aware of the security risk to their organization. In this paper, we present a perception of the risks, benefits, and strategies of social media applications developed from societies that use social media in the company by discussing existing regulations and how they apply to the use of social media by companies/institutions also to overcome this challenge. From this research, a solution is made for companies whose security rules are being used by the public. This regulatory framework can serve as a basis for establishing company internal policies for the use of social media by its employees. With the creation of policies that are the result of this study, companies that have the maximum ability in the field of information technology.**
Keywords*— *Social media, security risk, privacy, Security policy

I. INTRODUCTION

Social media are common today. Social media is used for communication, from sending messages to sharing many things with the community and the people closest. The popularity of social media in the internet world has been widely used to build a network of friends to business networks, this forces businesses to adapt marketing strategies and involve social media as a marketing tool[1]. Some companies today are even actively creating specialized corporate social media communities such as corporate Twitter channels, YouTube channels, or Facebook fan pages. Social media are generally used for communication facilities in the company or as a media campaign and marketing[2].

The popularity of social media cannot be separated from the security risks that threaten users. The threat of this risk certainly affects the companies that are actively involved in social media and not alert[3]. Mistakes in using social media can lead to customer attacks, negative publicity and reputation damage to the company[4].

In addition to this, organizations are also facing threats from their own employees who often post on social media on behalf of the organization either through their personal accounts or company accounts. Other risks received can include phishing, information leakage, malware to hacking.

Social media policies are seen as an important part of the organization[5]. The regulatory framework is an important aspect of controlling the use of social media within corporations[6]. In this paper, we find the risks of using social media to develop more effective strategies to decrease the security threat by social media to companies through the establishment of a regulatory framework.

II. SOCIAL MEDIA SECURITY RISKS

The development of an increasingly modern era encourages the change of the system, either directly or indirectly, as in a company. Technological advances, especially the internet make the limitations of distance, time and cost can be easily overcome. Implementation of technology, in this case, to improve business, sales and buy of products is to use electronic commerce[7]. Company policies that are made for enterprise information security from social media are often only accepted for that purpose without being read and understood by users. The implications are privacy and security[8].

Through good communication, a company will feel comfortable and cut the perception of corporate risk, and ultimately can influence consumers in determining decisions in a company through social media. In accordance with research conducted by Khailil Leonil (2015) which states that perceived risk perception of consumers have a significant impact on online decisions, and related to the existence of online fraud, the company always pay attention to the quality of service in terms of risk perception, this is due to perception Risk contains uncertainty of a risk situation in a company that is product risk, transaction risk and psychological risk[9].

Understanding the perception of risk is needed[10]. Every person within a company has different perceptions of risk. A member of the IT department will see viruses or malware as a risk that could impact data loss on the company,