

# INTERNATIONAL CONFERENCE



The Second International Conference on  
Engineering and Technology Development

# 2<sup>nd</sup> ICETD 2013

27, 28, 29 August 2013, Bandar Lampung, Indonesia



**PROCEEDINGS**



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Hosted by :

Faculty of Engineering and Faculty of Computer Science,  
Bandar Lampung University (UBL), Indonesia

# 2<sup>nd</sup> ICETD 2013

THE SECOND INTERNATIONAL CONFERENCE  
ON ENGINEERING AND TECHNOLOGY DEVELOPMENT

28 -30 January 2013  
Bandar Lampung University (UBL)  
Lampung, Indonesia

## PROCEEDINGS

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## PREFACE

The Activities of the International Conference is in line and very appropriate with the vision and mission of Bandar Lampung University (UBL) to promote training and education as well as research in these areas.

On behalf of the Second International Conference on Engineering and Technology Development ( 2<sup>nd</sup> ICETD 2013) organizing committee, we are very pleased with the very good response especially from the keynote speaker and from the participans. It is noteworthy to point out that about 80 technical papers were received for this conference.

The participants of the conference come from many well known universities, among others : University Kebangsaan Malaysia – Malaysia, APTIKOM – Indonesia, Institut Teknologi sepuluh November – Indonesia, Surya Institute – Indonesia, International Islamic University – Malaysia, STMIK Mitra Lampung – lampung, Bandung Institut of Technology – Bandung, Lecture of The Malahayati University, B2TP – BPPT Researcher – lampung, Starch Technology Center – Lampung, Universitas Islam Indonesia – Indonesia, Politeknik Negeri Malang – Malang, University of Kitakyushu – Japan, Gadjah Mada University – Indonesia, Universitas Malahayati – Lampung, Lampung University – lampung, Starch Technology Center – Lampung, Universitas Riau – Riau, Hasanuddin University – Indonesia, Diponegoro University – Indonesia, King Abdulaziz University – Saudi Arabia, Parahyangan Catholic University – Indonesia , National Taiwan University– Taiwan, Surakarta Christian University – Indonesia, Sugijapranata Catholic University – Indonesia, Semarang University – Indonesia, University of Brawijaya – Indonesia, PPKIA Tarakanita Rahmawati – Indonesia, Kyushu University, Fukuoka – Japan, Science and Technology Beijing – China, Institut Teknologi Sepuluh Nopember – Surabaya, Researcher of Starch Technology Center, Universitas Muhammadiyah Metro – Metro, National University of Malaysia – Malaysia.

I would like to express my deepest gratitude to the International Advisory Board members, sponsor and also to all keynote speakers and all participants. I am also gratefull to all organizing committee and all of the reviewers who contribute to the high standard of the conference. Also I would like to express my deepest gratitude to the Rector of Bandar Lampung University (UBL) who give us endless support to these activities, so that the conference can be administrated on time

Bandar Lampung, 29 August 2013-08-26

Mustofa Usman, Ph.D  
2<sup>nd</sup> ICETD Chairman

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## Table Of Content

Organizing Committee .....	i
Table Of Content.....	v
Keynote Speaker	
1. Recent Advances in Biofuel Cell and Emerging Hybrid System <b>Abdul Aziz Ahmad and Raihan Othman</b> .....	1
2. Waste Utilization Study Tailing Gold Mine in Way Linggo-Lampung, as Fine Aggregate Materials for Producing Mortar Materials based on concept of Green Technology <b>Lilies Widodojoko &amp; Susilawati</b> .....	8
3. Infrastructure Health Monitoring System (SHM) Development, a Necessity for Maintance and Investigation <b>Prof. Dr. Priyo Suprobo, Faimun, Arie Febry</b> .....	17
4. Four Phases Quality Function Deployment (Qfd) By Considering Kano Concept, Time And Manufacturing Cost <b>Prof. Dr. Moses L Singgih, Dyah L. Trenggonowati, Putu D. Karningsih</b> ....	22



Speaker

1. Comparative Analysis for The Multi Period Degree Minimum Spanning Tree Problem  
**Wamiliana, Amanto, and Mustofa Usman**..... 39
2. Choosing The Right Software In Supporting The Successful of Enterprise ERP Implementation  
**Yodhie Yuniarthe, Idris Asmuni**..... 44
3. Climate Adaptive Technology In Maintaining Vernacularism Of Urban Kampong Case study: Kampung Adat (Indiginous) Mahmud, Bandung District, West Java  
**Marcus Gartiwa**..... 50
4. The Prospect Of Diesohol In Facing Fossil Fuel Crissis  
**M.C. Tri Atmodjo**..... 63
5. The Potential Of Agriculture And Forestry Biomass Wastes As Source Of Bioenergy  
**Hardoyo**..... 66
6. The Importance of Education Facility as Sustainable Urban Generation Tool  
**Fritz Akhmad Nuzir, Haris Murwadi and Bart Julien Dewancker** ..... 71
7. The implementation of Secton Method for Solving Systems of Non Linear Equations  
**Nur Rokhman** ..... 80
8. Quality Control Analysis Into Decrease The Level Defects On Coffee Product  
**Heri Wibowo, Sulastri and Emy Khikmawati** ..... 85
9. Public Transpotion Crisis In Bandar Lampung  
**Ida Bagus Ilham Malik** ..... 89
10. Geospatial Analysis of Land Use Change in Way Kuripan Watershed, Bandar Lampung City  
**Candra Hakim Van Rafi'1., Dyah Indriana Kusumastuti2., Dwi Jokowinarno**..... 99
11. Material Utilization Technology Of Agriculture And Forestry Waste  
**Hardoyo**..... 105
12. The Supply Chain System Of Cassava On The Tapioca Industry  
**Hardoyo**..... 108
13. Glass Technology In Natural Light Glasses On Aperture Element In The Architecture World  
**Muhammad Rija & MT Pedia Aldy** ..... 113

14. An Eksperimental Permeable Asphalt Pavement Using Local Material Domato Stone On Quality Of Porous Asphalt  
**Firdaus Chairuddin, Wihardi Tjaronge, Muhammad Ramli, Johannes Patanduk** ..... 117
15. Coordination Of Architectural Concepts And Construction Systems  
**Eddy Hermanto.** ..... 129
16. Seismic Assessment of RC Building Using Pushover Analysis  
**Riza Ainul Hakim.**..... 136
17. Viscosity and Liquidity Index Relation for Elucidating Mudflow Behavior  
**Budijanto Widjaja and Shannon Hsien-Heng Lee.**..... 143
18. The Use of Pozzolanic Material for Improving Quality of Strontium Liquid Waste Cementation in Saline Environment during Nuclear Waste Immobilization Process  
**Muhammad Yusuf, HayuTyasUtami, Tri SulistiyoHariNugroho, SusetyoHarioPutero** ..... 148
19. Geospatial Analysis Of Land Use And Land Cover Changes For Discharge At Way Kualagaruntang Watershed In Bandar Lampung  
**Fieni Yuniarti, Dyah Indriana K, Dwi Joko Winarno.**..... 153
20. Wifi Network Design For High Performance  
**Heru Nurwarsito, KasyfulAmron,BektiWidyaningsih** ..... 161
21. Studi on The Efficiency Using Nature Materials in The Structural Elements of Reinforced Concrete Beam  
**Yasser, Herman Parung, M. Wihardi Tjaronge, Rudy Djamaluddin.**..... 167
22. The Research Of Slow Release Nitrogen Fertilizer Applied In Sugarcane (Saccharum Officinarum) For Green Energy Bioethanol  
**M.C. Tri Atmodjo, Agus Eko T. Nurul Rusdi, Sigit Setiadi, and Rina.**..... 179
23. Energy Utilization Technology Of Agriculture And Forestry Waste  
**Hardoyo.**..... 185
24. Implementation Of Fuzzy Inference System With Tsukamoto Method For Study Programme Selection  
**Fenty Ariani and Robby Yuli Endra.** ..... 189
25. The Analysis of Video Conference With ITU Standarization (International Telecommunication Union) That Joining in Inherent At Bandar Lampung University  
**Maria Shusanti F, Happy Reksa** ..... 201

26. The E-internal audit iso 9001:2008 based on accreditation form assessment matrix in study program for effectiveness of monitoring accreditation  
**Marzuki, Maria Shusanti F.** ..... 207
27. The Developing Of e-Consultations For Effectiveness of Mentoring Academy  
**Ahmad Cucus, Endang K** ..... 214
28. The Evaluation of information system performance in higher education case study with EUCS model at bandar lampung university  
**Reni Nursyanti, Erlangga.** ..... 221
29. The Analysis Of History Collection System Based On AndroidSmartphone With Qr Code Using Qr CodeCase Study: Museum Lampung  
**Usman Rizal, Wiwin Susanty, Sutrisno.**..... 230
30. Application of Complaint Handling by Approach Model of ISO 10002 : 2004 to Increase Complaint Services  
**Agus Sukoco and Yuthsi Aprilinda.** ..... 235
31. Towards Indonesian Cloud Campus  
**Taqwan Thamrin, Iing Lukman, Dina Ika Wahyuningsih** ..... 252
32. Bridging Router to ADSL Modem for Stability Network Connection  
**Arnes Yuli Vandika and Ruri Koesliandana.**..... 257
33. The Effect of Use Styrofoam for Flexural Characteristics of Reinforced Concrete Beams  
**Yasser , Herman Parung, M. Wihardi Tjaronge, Rudy Djamaluddin** ..... 261
34. The Estimation Of Bioethanol Yield From Some Cassava Variety  
**M.C. Tri Atmodjo**..... 273
35. Effect of Superficial Velocity of Pressure Difference on The Separation of Oil And Water by Using The T-Pipe Junctionl  
**Kms. Ridhuan and Indarto.**..... 277
36. The use of CRM for Customer Management at Cellular Telecommunications Industry  
**Ayu Kartika Puspa.**..... 293
37. Indonesian Puslit (Centre Of IT Solution) Website Analysis Using Webqual For Measuring Website Quality  
**Maria Shusanti Febrianti and Nurhayati.** ..... 297
38. The E-internal audit iso 9001:2008 based on accreditation form assessment matrix in study program for effectiveness of monitoring accreditation  
**Marzuki, Maria Shusanti F.** ..... 307

39. Enhancing Quality Software Through CMMI-ISO 9001:2008 and ISO 9126 <b>Agus Sukoco</b> .....	320
40. Value Analysis Of Passenger Car Equivalent Motorcycle (Case Study Kartini Road Bandar Lampung) <b>Juniardi, Aflah Efendi</b> .....	337
41. Alternative Analysis Of Flood Control Downstream Of Way Sekampung River <b>Sugito, Maulana Febramsyah.</b> .....	347
42. Analysis Of Fitness Facilities And Effective Use Of Crossing Road <b>Juniardi, Edi Haryanto.</b> .....	353
43. Study On Regional Development Work Environment Panjang Port Lands In Support Bandar Lampung City As A Service And Trade <b>Ir. A. Karim Iksan, MT, Yohn Ferry.</b> .....	359
44. Analytical And Experimental Study Bamboo Beam Concrete <b>Hery Riyanto, Sugito, Juli</b> .....	370
45. Comparative Analysis Of Load Factor Method Static And Dynamic Method (Case Study Akdp Bus Route Rajabasa - Bakauheni) <b>A. Ikhsan Karim, MT., Ahmad Zulkily.</b> .....	378
46. Optimization Utilization Of Water Resources dam Batutegei Using Method Of Linear Program <b>Aprizal, Hery Fitriyansyah</b> .....	386
47. Characteristics Generation Traffic Patterns And Movement In Residential Area (Case Study Way Kandis Residential Bandar Lampung) <b>Fery Hendi Jaya, Juniardi,</b> .....	392
48. Use Study On Slight Beam Reinforced Concrete Floor Plate in Lieu Of Secondary Beam <b>Hery Riyanto, Sugito, Lilies Widodjoko, Sjamsu Iskandar</b> .....	399
49. Observation Of The Effect Of Static Magnetic Field 0.1 Mt On A-Amylase Activity In Legume Germination <b>Rochmah Agustrina, Tundjung T. Handayani, and Sumardi.</b> .....	405
50. Effectiveness Analysis Of Applications Netsupport School 10 Based Iso / Iec 9126-4 Metrics Effectiveness <b>Ahmad Cucus, Nelcy Novelia</b> .....	413
51. Comparative Performance Analysis Of Banking For Implementing Internet Banking <b>Reza Kurniawan</b> .....	418

## Application of Complaint Handling by Approach Model of ISO 10002 : 2004 to Increase Complaint Services

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**Abstract:** *This study describes the components of available forage in Vahregan watershed, Central Iran and highlight issues relating to forage endowment and environmental dynamics. In this study, proper use factor and palatability models and their components use to develop the model of available forage and measure it. The components climatic, topography, land systems, vegetation, land use and grass and shrub species composition changes were analyzed using GIS. In this study source of information are herders, land and livestock owners, research institution and personal field inspections. Responses to the questionnaires were obtained from local government offices and research on rangelands and analyzed in parallel with the results of detailed interviews with pastoralists. The results of the completed overall model of available forage showed that of the 18346.2 hectares in the range area only 8.36% of the rangeland is in good condition and the rest are in fair (13.8%), poor and very poor (77.82%). About 16812.85 ha (91.64%) of the rangeland area shows a downward trend, only 1533.35 ha (8.36%) upward trend. About half of the rangeland is not favorable for domestic livestock grazing. The range condition situation and its trend in consideration of soil and slope properties in this study indicates that the rangeland in Vahregan is a fragile production system, sensitive to soil erosion and rangeland degradation, so for a long time sustainable exploitation should be goes to minimize land degradation in the future, proper management and sustainable exploitation should be implemented in the future*

**Key words:** Available forage model, Palatability, Proper use, GIS, Central rangeland, Iran.

### Introduction

A services in a public mangement services on a government instution or even on private institution has became an impotant thing (1). The most important thing on principal services is mass fundamental requirements concern on education, sanity and Indonesia housing also has worst record on services, according to WIR survey Indonesia ranks 138 from 140 countries. And according to Jakarta LBH and YAPPIKA (incorporated in mass service public care 2011, complaining on education is 16 %. According to Mega (2013), needed a complaint management to solve the problem in order the complaint is monitored, so we can take the fastest respond to solve the problem.

The satisfy of customer becomes one of company object, especially on handling customer complaint services is one of an important aspect (2),The system of complaint handling that handled manually causing time delay on

complaining relay from front liner to the backroom, it increases the length to solve the complaint, that also causing on lowering the faith of customer on that institution. (2). One the other side the availability performance is needed and controlling compensations concern on service level, those are not the problem that can be solved easily. Because the existing system doesn't support yet the availability report fast and accurate. The one example is handling complaint that needed by every company the many of problem retardation in complaining problem process that can combine the competence, technic skill and skill of giving comprehensive and versatile solution(3).

Information technology and communication applying that has touched many activities in humanity lives, it can give a big hopes, especially in increasing customer services. Thus be able to close the gap between the provider and be provided (4), on the preparing of global

era, we are charged to increase the availability optimally and professionally so be hoped it can give professional service [2], along with more complicated and critic demand for services.

For easing the complaint process is needed a system of complaint handling which based on ISO 10002 : 2004, which taken from skill of capability, knowledge and the system that runs automatically. On building the system of complaint handling is needed strategically and systematic steps where the system of complaint handling placed, because the system of complaint handling must be completed by reservation, the user interface that can be known easily, includes have best service quality (5).

From system of complaint handling which based ISO 10002 : 2004 it is necessary entry data from user and skilled that based from the problem and patched solution will become based knowledge that will be used as problem solution that faced by the user of handling complaint system (6).

One of the references that used to solve complaint satisfaction of customer is ISO : 2004, because there are some clausal that concerns with complaint services (7), on building handling complaint system is needed a systematic and strategic steps.

## I. Literature Review

### 1.1. Complaint

Communication between providers and customer that causing customers become dissatisfaction are service, facility or product it can be categorized as complaints (8), one of important things from complaint handling is a raw data which used as a base step to collect the valuable information. The activity on complaining process generally called complaining service, though the complaint has to check again, whether it is included to the rights thing that can become a complaint form or not (8), first step on receiving complaints is sorting back on the complaint so that complaint have the things that can be formed as

information to increase the information become a better one.

Complaint as: "A complaint is an expression of dissatisfaction, about the standard of service, actions or lack of action..... affecting an individual customer or group of customers.

complaint management is really important, observation that related on complaints are increasing every years. Some of observations concern to complaints those are about voidity of customer complaint, approach models related on complaint handling, monitoring of complaint, so the complaint is handled effectively. So the complaint is prioritized handling and rank of complaint is grouped well.

Moreover, according on increasing the services, the view point of customer is ultimately important because of their direct involvement. In this perspective, web based system of support decision for management of business process employs customers complaints is proposed to handle customers complaints as one of repairing analytically. Moreover [13] will be presented a new model based on Service Oriented Architecture to increase the communication between mass and government. By using the existing model, the dissatisfaction of customers can be minimalized and encourage them to take participation in increasing services, moreover the new approach is provided use mining data tools to manage customer complaint. This approach is used to figure out the relationship between various groups of mass and several of compliant by using mining data technic.

The established organization encourages the customer to express their complaint. They seek on changing complaining customer become a satisfy customer.

The organization is getting to know about the weakness on giving services on customer, as a self-introspection tool of organization to be responsive and always wanting to hearing the sound and customer choice, ease the organization to find the way out to

increase quality service, if promptly handled, customer feel that their hope and interest is thoughtfulness, it can increase faith and loyalty of the customer to services organization, the great and success complaint handling can increase the satisfy of customer.

The fundamental of handling complaint process well is depending on the framework's power. The effective complaint application is also developed as pointed on standard framework. Because of that, research that related with framework of handling job is getting increase with the aim to increase the process of handling complaint. The findings suggest implanting the adaptive approach to dodge the error of attention allocation, energy, another research. Beside of that, handling system of complaint must be easily accessed by customer and responsible, staff can manage the complaint directly. Framework of job which presented allows customer to carry opinion efficiently by the process of new product developed and plan the center of online customer for grouping and analyze the useful information.

### 1.2. System of Complaint Management

A wonderful conclusion from customer satisfaction is in every compliant, have scale and complaint prioritize, this thing will be related on top of all to overcome the complaint in order to provide satisfy to the customers (9) efficiently and preventing the loop of complaint. So that needed the system of CRM and also needed strategy through e-business in order to getting more profits, such as: a). aiming to increase satisfies of customer b). Ensuring the reach of promotion and communication to customer, c) decrease negative feedback about customer, d) Increasing loyalty between both of sides, and e)The Increases of work ethics has become one of motivation.

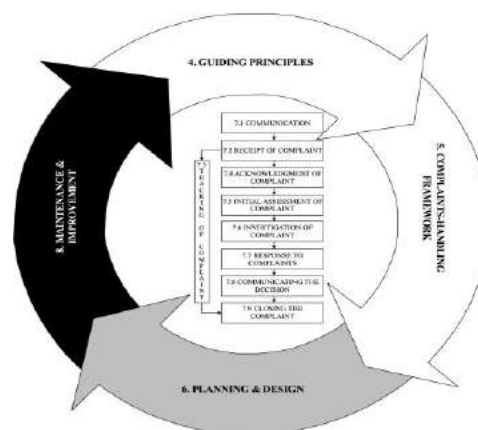
Using complaint management system, the company must be adequate to

control complaint and presenting fast answer.

### 1.3. Management system based on ISO 10002 : 2004

In an organization that will be implanted standard of ISO 10002 : 2004 about handling system of complaint, has two mainly aims such as handling the complaint well so that will give satisfaction either internally or externally, the handled complaint is be able to increase the service performance, the indicator of care and satisfy of customer is by giving complaint.

In ISO 10002 : 2004 there is a model in handling the complaint it is such as explained below



Complaints Handling Framework  
Planning and Design Maintenance and Improvement

Four of those parts define nine principles to help the organization and guarantee system of complaint handling can work effective.

#### SPK Principles

Contain principles that must be exist on complaint handling

#### Visibility

Information about "how" and where the complaint must be publicized to the customer or related parties.

#### Accessibility

The process of handling complaint must be easily presented by customer to an institution. The formed information must be existed detail about how to overcome that complaint it is also supported by information that easily understood.

#### Responsiveness

Handling of complaint must be as soon as possible responded and overcome fast, the existing complaint must be overcome fast and lead the complaint to accurate place directly. After led to the authorized due to their complaints, so the next step is the existing complaint has to be monitored and be responded back to customer.

#### Objective

The coming complaint from customer, must be received well and fairly, and must be objective and unusually on handling.

#### Charge

There is no money tax on complaint handling.

#### Secret

The person who gives the complaint has to be saved the secret, so the received complaint can be more effective especially related on the given information.

#### Focus on customer

The given information is the appearance of care in focusing the customer satisfaction.

#### SPK framework

Fifth part from ISO 10002 : 2004 standard was giving SPK framework, knowing the hoped or what will be taken from complaint handling effective, with

existing framework of complaint handling.

Sixth part of ISO 10002 : 2004 placed the related thing of framework in implanting SPK :

#### Commitment of organization

The strong commitment on handling of system complaint is first step of smooth establishment of handling complaint system effectively, thus the strong commitment from all relations become an obligation.

#### Policy

The peak of management must settle handling system complaint as a policy, that policy is not only must be known by all organization but it is also must become cultured policy, the policies that related to SPK must pay attention on something like:

It must be relevant with the requirement of regulation and applicable law.

The financial aspect must be operational and the requirement comes from organizations.

The inputs come from customer either personal or relation.

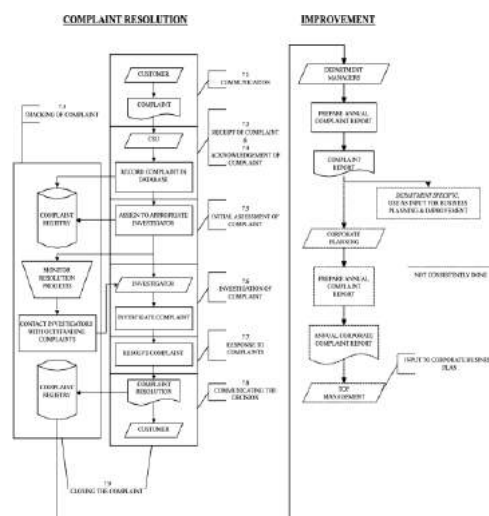
Sixth part of ISO 10002: 2004 placed guidance for the planning and designing. It's very interesting to be recorded that article 6.1 claims that "organization must have planning on effective design and the efficiency of process complaint handling in order to increase the loyalty and satisfaction of customer, and it is also to increase the existing product quality. Essentially, this statement is aiming to indicate complaint handling, complaint resolution and repairing. In order to reach main purpose, the standard points that functional purpose has been determined according to performed work and existing-needs source.



From the section of planning, top management must set the target that related to complain of customer, for each position level, the planned interval target is measured by the standard is achievement and performance. Things that have to be prepared on the planning are:

a) Communication of *handling complaint system*(HCS)

In the application of HCS, the form filling has to be easily accessed by the relation, and HCS gives the guarantee for each complaint is saved and can be processed again.



Standard complaint form supposed who, the reporting complaints address, how is the complaint, complaint time, information of complaint monitoring process, how the process of handing complaint, how the information state of handling complaint.

- Receiving process of complaint in HCS
- On receiving complaint, it is better for HCS to give unique code of complaint handling automatically, so ease to search. So that in HCS the supports of the information effectively is:
  - Description about a complaint and the supporting data.
  - Requesting about un-responded complaint in HCS.
  - Tempo or time limitation of complaint.

- Receiver complaint data, is contained about “who is the receiver”, the department.
- The fast complaint responds.

b) Complaint Browsing

The complaint must be able to be searched from the first time it’s received, from the process until the compliant feels satisfy or the handling of complaint is solved. The fresh state must be always exist on each asks or in some interval.

c) Complaint Verification

In HCS receiving complaint through web, after receive the complaint, it is better to verify again about the truth of complaint to the compliant, using email or telephone.

d) The start of classify of complaint estimator

After received on HCS, the complaint has to be valued from the start with such of kind criteria, it is like problem complexity, impact, the needs of fast respond.

e) Complaint investigation

Some of complaints usually must be investigated to know the causes, investigation mechanic must be done by information and condition of complaint. The level of investigation is based on seriousness levels of reports that can be known from the reports, the incident frequency and level of importance of a complaint in HCS.

f) Complaint Respond

After done the investigation, team must give fast respond, in HCS is better to respond the complaint with technology of warning system.

g) Communication on taking the conclusion.

Communication in team must be clear on the personal that related and the taker of conclusion to take the respond of complaint solving. In HCS must be explained about the accessed form by the individual who will overcome the complaint according to problem and first receiving.

h) Closing the Complaint

If the receiver of complaint receives conclusion proposal or repairs complaint, must be done and recorded. In HCS the electronic archiving must be provided easily and provided to be accessed.

If the complaint cannot be received on the perform time, the complaint is in processing state and becomes alternative correction. In HCS should provide developing monitor perform and correcting all of the process so it satisfy all parties.

### 2.2.2.1. Maintenance and Continuous Improvement

#### 1. Data collection

The coming data of handling complaint system (HCS) must be archived so it becomes a group of information that can be used again on handling the same complaint. Board of HCS must create and implement a mechanism for filing complaints procedures and response and use the complaints system, including protecting any information, and ensure the confidentiality of the reporter, the things that must be considered by the HCS:

- a) Setting action steps to identify, collect, classify, store and distribute / dispose archive.
- b) Archive storage complaints and maintain records, in the form of electronic files, and data backup.
- c) Keep archive through training and work instructions especially with involved person.

#### 2. Analysis and evaluation of complaints

In HCS systems should be classified, finalists, identified, issues, trends and classify the causes of grievance complaints.

#### 3. Measuring of complaint handling satisfaction

There should be in the HCS action complaints were dealt assessment.

#### 4. Monitoring of complaint process

Periodically there are complaints monitoring process, both in terms of reporting and level up.

#### 5. Audit system of Handling Complaint

Periodically and regularly have to perform an audit to evaluate the performance of the handling of complaints.

#### 6. Management review

Upper management should conduct management review periodically to guarantee the continuous of handling complaint effectively and efficiently.

#### 7. Continuous of increasing

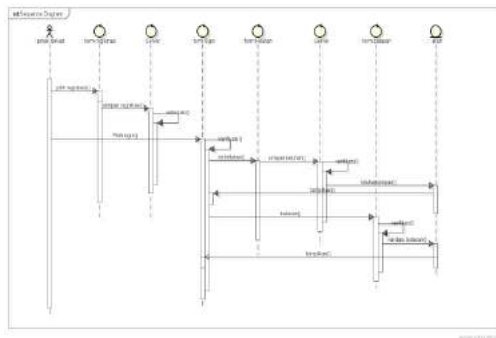
HCS must be increased and developed continuously so it is getting effective and efficient.

### 2.3. e-Complain

Electronic Customer Relationship Management (e-CRM) especially e-Complaint is helping that has used e-business especially to increase and add customer loyalty (10), e-Complaint is customer feedback where placed from marketing system based *web-enabled*, so e-complaint needs reflection from customer correction. The success of management which have been standardized so be able to consist and focus on a goal that to increase continuously. The using of technology of information that based on web is increasing this time on, to measure the handling of performance especially for *online* business that able to be higher in place than traditional business (10).

### 3. Frame Work

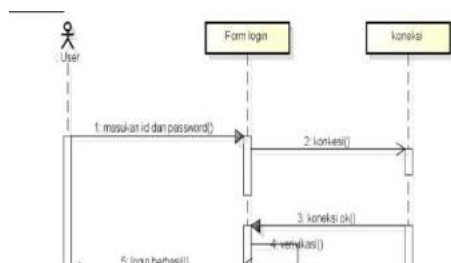




Picture 3.14 Class Diagram

The picture above is a diagram that shows classes which exist on a system of handling complaint.

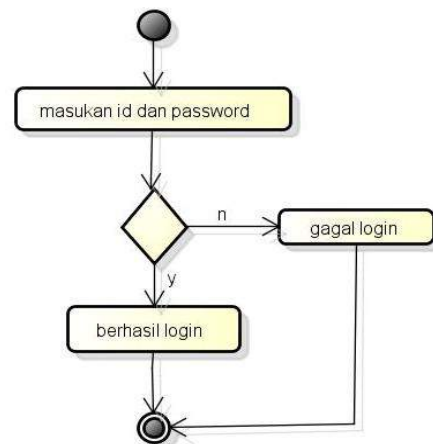
c. Sequence of Diagram Login



Name Field	Type	Size	explanation
Username	Varchar	50	Id Dean
Name	Varchar	50	Namedean
address	Varchar	50	addressdean
Telephone	Varchar	50	Telephonedean
Email	Varchar	50	Email dean
Password	Varchar	50	Password dean

Diagram Activity

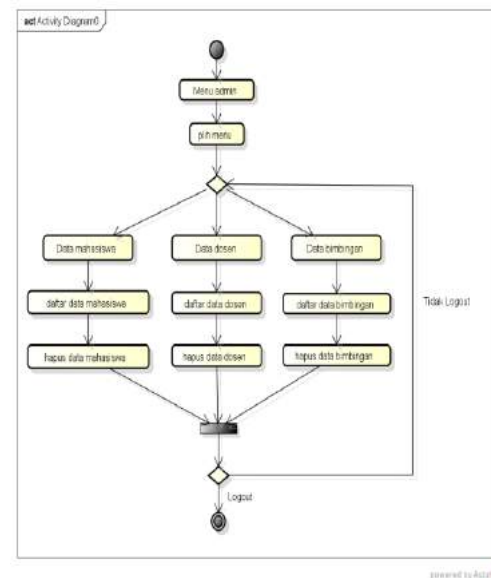
a. Activity of login diagram



Picture 3.15 activity of diagram login

Activity diagram above describes about the plot in system of complaint handling which is being worked and the picture above also describe about login activity.

Activity of diagram admin menu



Picture 3.16 activity of diagram menu admin

Activity of diagram above describes of activity plots in the system of complaint handling which is planned and also the picture above describes the plot of admin activity.

### 3.4. Database Structure

a. Structure of admin database

Table name : Admin

Length of 1 record : 150

Field Name	Type	Size	explanation
Username	Varchar	50	Id Admin
Name	Varchar	50	Admin's Name
Password	Varchar	50	Admin's Password

b. Dean Database Structure

Table name : Dean

Length of 1 record : 300

c. Lecturer Database Structure

Table name : Lecturer

Length of 1 record : 350

Name Field	Type	Size	explanation
Username	Varchar	50	Id dozen
Name	Varchar	50	Namelecture
address	Varchar	50	addresslecture
Telephone	Varchar	50	Telephonelectur
Email	Varchar	50	Email lecture
Password	Varchar	50	Password lecture
Status User	Varchar	50	Status complain

### 4.1 Analysis of Software Quality ISO 1002 : 2004

After the spreading of questioner obtained respond from user of Fik

Complaint website, this questioner consists of 7 questions that contained Visibility characteristic, Accessibility, Responsiveness, Objectivity, Confidentially, and customer focused approach. Inside the questioner there are 1-9 scales which has been analyzed, that scale has been translated to 3 levels, those are *Low*, *Medium* and *High* (L) is a scale between 1-3, *Medium* (M) is a scale between 4-6 and *High* is scale between 7-9 that existed inside the questioner. Number of responds above explains that :

- High* if respondent number reach *high* so the respondent showing that how much the interests of the respondent on Fik Complaint *website* and shows that respondent give good responds to Fik Complaint *website*.
- Medium* if numbers of respondent results *Medium* so the respondent shows how much the interest to Fik Complaint *website* and shows that respondent gives a good enough respond.
- Low* if numbers of respondent reach how much the interest of respondent to Fik Complaint *website*
- and shows that respondent gives a bad respond to website.



Result of questioner data according to table 4.1, consist of number of user respond as the exist questions in the questioner and the results is according to the much level.

No.	Question	Respond Number User			Results Level	Characteristic
		Low (L)	Med (M)	High (H)		
1	Is there any component or feature of the website that doesn't give complaint handling well when you want to see the state or your complaint of answer?	-	5	15	H	Visibility
2	Is there any component or feature of the website complaint handling that is not understood easily and useless?	-	6	14	H	Accessibility
3	Is the existed website of handling the complaint promptly dealt according to their urgency?	1	3	16	H	Responsiveness
4	Are your complaint handled properly and fairly?	4	13	3	H	Objectivity
5	Does the website provide access to complaint handling	-	3	17	H	Charges

#### User Interface

The picture below is the appearance of user interface to interact with system.

#### 4.5. Black Box Testing

##### Index Page

No	Tested Object	Result
1	Link Login Action : Click Result : Appearing of Login Page	Success
2	Link Register Action : Click Result : Appearing of Scholar Page Register	Success
3	Link Register Action : Click Result : Appears register lecture page	Success
4	Link Register Party Authorities Action : Click Result : Manful page register party Authorities	Success

5	Login Button Action : Click Result : Appears page login	Success
---	---	---------

**Table 4.2 black box testing of index page**

This black box of index page is used to test things that related to internal logic and code structure. On this testing is used formula such as:

$$\text{Cyclomatic Complexity } V(G) = E - N + 2$$

Where ; E = Path

N = Node

Here are the tests of white box on :

Flow graph picture is plot of system process on admin web page.

##### a. Set Path Linier

1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10

1 - 2 - 3 - 11 - 12 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10

1 - 2 - 3 - 11 - 12 - 13 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10

1 - 2 - 3 - 4 - 5 - 14 - 4 - 5 - 6 - 7 - 8 - 9 - 10

1 - 2 - 3 - 4 - 5 - 6 - 7 - 15 - 16 - 7 - 8 - 9 - 10

1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 17 - 18 - 8 - 9 - 10

1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 4 - 5 - 6 - 7 - 8 - 9 - 10

##### b. Cyclomatic complexity

$$V(G) = E - N + 2$$

$$V(G) = 22 - 18 + 2$$

$$V(G) = 6$$

Conclusion

After analyzing result of questioner, that result compared to the needed level in the standard of ISO 10002 : 2004

Analysis Kualitas Produk			
Karakteristik	Hasil	Level yang dibutuhkan	Hasil Penelitian Aktual
Visibility	H	H	Sesuai
Accessibility	H	H	Sesuai
Responsiveness	H	H	Sesuai
Objectivity	M	M	Sesuai
Charges	H	H	Sesuai
Confidentiality	H	H	Sesuai
customer focused approach	M	M	Sesuai

Table 5.1 Research Result Website FIK Complaint based on ISO 10002 : 2004

Based on overall studies produced some important findings that can be formulated in the following conclusion below :

1. Characteristic of visibility in the research produces high level, and the needed level is High so the result of research declared that Website FIK Complaint is characterize visibility is relevant with standard ISO 10002 : 2004.
2. Characteristic of accessibility in the research produces high level, and the needed level is high. So the result of research declares that FIK website UBL Complaint on characteristic of Accessibility is relevance with ISO 10002 : 2004.
3. Characteristic of responsive in research produces High level, whereas the required level is High. Results declared so Fik website UBL on the characteristic of responsive is not relevance with ISO 10002 : 2004
4. Characteristic of Objectivity in the research produces high level, while needed is medium, so the results declare that Website FIK Compliant UBL on Objectivity Characteristic is relevance with standard ISO 10002 : 2004.

5. Characteristic of charges in the research produces high level, but the needed level is High so the result of research declares that website of FIK complaint UBL on charges characteristic is relevance with ISO 10002 : 2004.
6. Characteristic of confidentiality in the research produces high level, but the needed level is high so the results of research declare that website FIK Complaint UB in Charges Characteristic is relevance with ISO 10002 : 2004.
7. Characteristic of customer focus approach in the research produces medium level, but the needed level is medium so the result of research declares that website FIK Complaint on characteristic of customer focus approach is relevance with ISO 10002:2004.

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# The Analysis Of History Collection System Based On Android Smartphone With Qr Code Using Qr Code Case Study: Museum Lampung

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**Abstract-***This scientific writing is to describe and explain the activities that related with using quick respon (QR) qode on collection history so it can be known as the advantages and disadvantages that exist in the system History Collection. The purpose of this analysis is to evaluate the advantages and disadvantages of the use of Quick Response (QR) Code for Collection System History at the museum Lampung as well as to study the QR Code.*

**Keyword-***Collection History, QR Code, Android SmartPhone*

## 1. Introduction

Lampung Museum is one of the government institutions that located in Bandar Lampung and the function is to provide information and knowledge of history to visitors. The Representatives of schools and educational facilities often make this Lampung Museum as one of the resorts to make their children can learn the history and see the Lampung relics of prehistoric man in Lampung. By coming to the museum, visitors are not only traveled, but also can learn about the collections through the collection that available information contained beside of glass containers in the collection at the Museum of Lampung. Such information is called History Collection.

Based on the questionnaire that author was handed out to visitors, 72% of respondents answered that the information can be given only limited to the contents of the History Collection to write a history of a collection so that visitors can not obtain the maximum information about the collection at that museum. Collection history system with Base Paper can not support all thevisitors there to see if the conditions are in the crowded museum visitors.

Quick Response (QR) Code is a two barcode dimensional that has the ability to store data or more information than the one- barcode dimensional(Revelation, 2012). QR code is a type of matrix code or two-dimensional was developed by Denso Wave, a division of Denso

Corporation which is a Japanese company and published in 1994 with the main functionality that can be easily read by the scanner. Unlike the bar code, which only stores information horizontally, QR codes are capable of storing information horizontally and vertically, and therefore automatically QR codes can hold much more information than a barcode. QR codes have gained international standardization and standardization of the Japanese form of ISO/IEC18004 and JIS-X-0510.

Android is an operating system on smartphones that use an open platform makes it easy to develop applications developers, because Android is open has a good free apps, trial. Additionally developer applications developed can be used for all devices that use the Android OS (Tresnani, 2012).

## 2. Basic Theory

The authors gives limit of the issues to be addressed in this study is only on systems analysis History Collection using Quick Response (QR) Code without changing the existing system.

### 2.1 collection history

Information to the base paper containing material information about the collection and the complete background and can be a source of research and publicity materials. Every Collection History records only a single object or a small entity group. (Directorate of Museums, MANAGING MUSEUM COLLECTION, 2007: 11)

## 2.2 QR Code

QR Code (Quick Response) is a form of evolution of one barcode-dimensional into two-dimensional (2D). The use of QR codes has been very prevalent in Japan This is because the ability to store data that is larger than the bar code so as to encode information in Japanese kanji because it can accommodate the kanji letter. QR codes were first developed by Denso Wave, which is a Japanese company. Barcode difference with QR Code QR Code capability that is capable of storing information horizontally and vertically so that the QR Code can store more information than with Barcode.

QR Code function, such as:

1. Saving the address or identity
2. Storing URL
3. Saving a Phone Number
4. Storing Text

The presence of this code allows the audience to interact with the mixed media through mobile phones effectively and efficiently. Users can also generate and print their own QR codes for others to visit one of several encyclopedias QR code. QR codes can be used on phones that have a QR code reader application and have internet access GPRS or Wi-Fi or 3G to connect the phone to the destination site via the QR code. Customers, which in this case is to enable mobile users only need a QR code reader program, pointing the camera at a QR code, QR code readers next program will automatically scan the data that has been embedded in the QR code. If the QR code contains the website address, so customers can directly access the site without having to type the address of the first destination site.

Characteristics	Subcharacteristics	Definitions
Functionality	Suitability	This is the essential Functionality characteristic and refers to the appropriateness (to specification) of the functions of the software.
	Accurateness	This refers to the correctness of the functions, an ATM may provide a cash dispensing function but is the amount correct?
	Interoperability	A given software component or system does not typically function in isolation. This subcharacteristic concerns the ability of a software component to interact with other components or systems.
	Compliance	Where appropriate certain industry (or government) laws and guidelines need to be complied with, i.e. SOX. This subcharacteristic addresses the compliant capability of software.
	Security	This subcharacteristic relates to unauthorized access to the software functions.
Reliability	Maturity	This subcharacteristic concerns frequency of failure of the software.
	Fault tolerance	The ability of software to withstand (and recover) from component, or environmental, failure.
	Recoverability	Ability to bring back a failed system to full operation, including data and network connections.
Usability	Understandability	Determines the ease of which the systems functions can be understood, relates to user mental models in Human Computer Interaction methods.

Picture 2.3 QR Code

QR code is a type of matrix code or two barcode-dimensional bar code that was developed by Denso Wave, a division of Denso Corporation which is a Japanese company and published in 1994 with the main functional that can be easily read by the scanner. An only the bar code, which only stores information horizontally, QR codes are capable of storing information horizontally and vertically, therefore automatically QR codes can hold much more information than a barcode. QR codes have gained international standardization and standardization of the Japanese form of ISO/IEC18004 and JIS-X-0510.

QR Code has several advantages than types of barcodes. Advantages possessed by QR Code is as follows:

1. Large capacity.
2. Easy to read.
3. Ability to save kanji letter.
4. Can be read from a variety of directions.
5. Small size.
6. Resistant to dirty and broken.
7. Can be divided.

QR Code is a matrix symbol that shaped like cell structures arranged in a box shape. QR Code structure can be seen in Figure 2.3 Here is an explanation of the structure of QR Code:

1. Finder Pattern: three identical structures located at each corner of QR Code except the bottom right corner of a 3x3 matrix of black modules are

surrounded by white module module then black again to detect the position of the QR Code.

2. Alignment Pattern: The pattern for correcting distortion of the QR Code.

3. Timing Pattern: a pattern to identify the central coordinates of each cell in the QR Code with black and white patterns are arranged alternately.

4. Quiet Zone: Space required to read QR Code. Quiet zone is easier detected symbol of an image using a CCD sensor.

5. Data Area: Data from QR Code will be stored or encoded in the data area. QR Code on a black cell represents a binary "1" and the white cell

#### Android 2.3

According to Nazruddin (2011, p. 1) Android is a mobile device that includes an operating system, middleware and Linux-based applications. Android is a software-based computer codes that can be distributed openly (open source) so that developers can create their own applications that can be used for a variety of Android-based smartphones. Android was initially developed by a company called Android Inc, And in 2005 the company is in acquisition by Google Inc. Android smartphones include in kernel based on, user interface glass, end-user applications, application frameworks, multimedia support, and many more. User application was built based on the Java programming language. Moreover applications that are built are also based on Java.

#### 3. Walking systems

1. Lampung museum create a team of procurement collection

2. Curator collect prospective collection of objects commonly called the Culture things

3. From every culture thing are held collection documentation (collection of written information, sound recordings, video recordings relating to the background of objects of cultural heritage)

4. After the documentation phase of the survey team conducted the research methods conducting collection museology

approach to get at the cultural aspects of the region

5. Results surveying team will continue to examine every collection with data collection and analysis activities with a particular method on a particular type of collection

6. Research any collection activities will be continued with the procurement team doing research manuscript into a book published by the museum

7. The next phase of the conservation objectives for collection care, rescue, repair, and protect the collection from damage, either by natural or human Data

#### Flow of Document

Analysis and Testing Authors make use case flow of QR Code to describe the process flow of a Collection history QR Code that can be used by visitors. This use case flow tells how a Collection history can be used QR Code to be accessed by visitors Lampung Museum.

#### a. Team Museum:

Museum team can perform many activities, such as:

1. Creating curator team
2. Surveying the cultural heritage objects
3. Documentation and submission of manuscripts
4. Maintenance History Collection

#### b. Visitor:

Visitors can perform some activities, such as:

1. Scanning the QR Code
2. Storing the necessary data

#### c. Admin:

Admin can perform the following activities:

1. Saving History Collection to server
2. Collection history process into a QR Code

#### 3. Maintenance QR Code

#### Visitor Questionnaire

Authors tested the QR Code to find the resistance of a QR Code to scan. This testing needs to be done, Because QR Code to find the resistance in order to

obtain the advantages and disadvantages of the QR Code.

#### 4. Conclusion

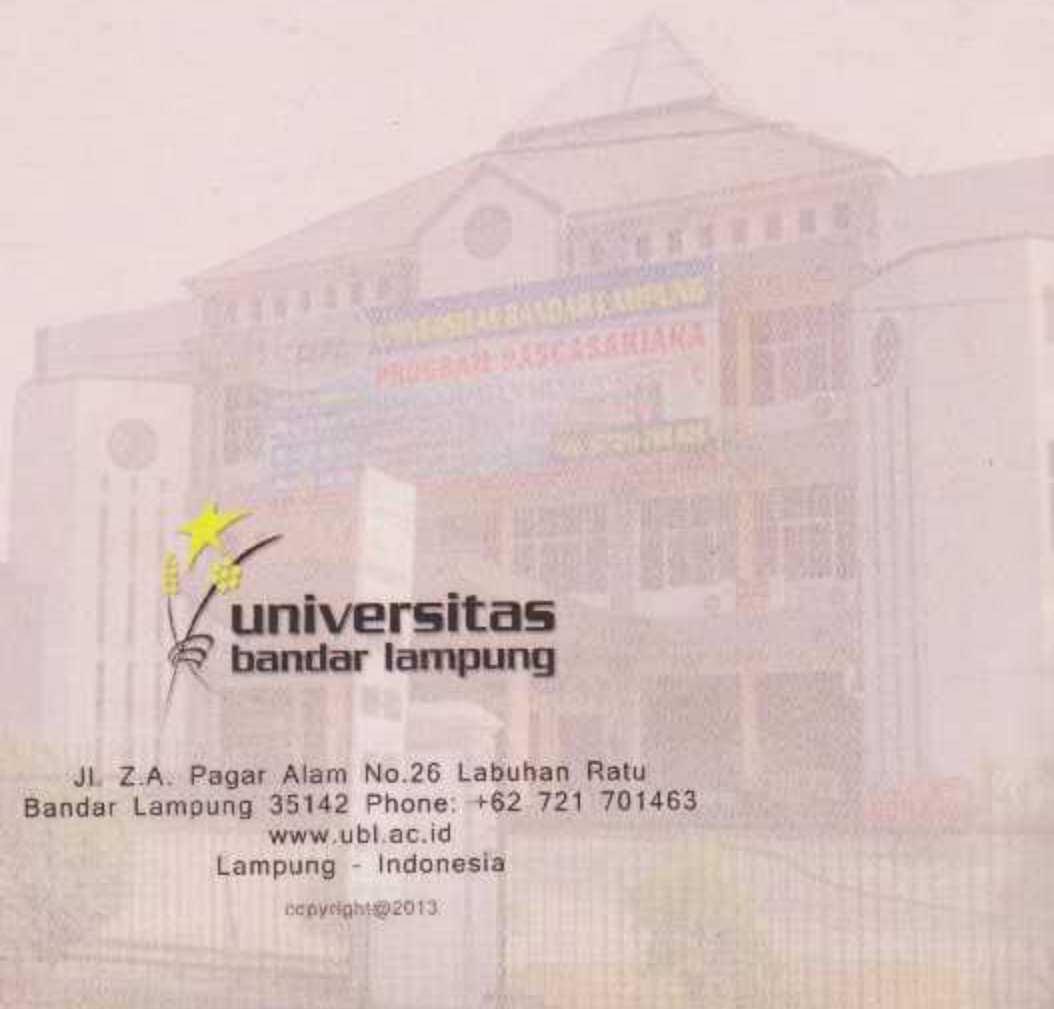
After the authors performed an analysis of the system that running on a particular of system collection History Lampung museum, the authors take a decision that the use of QR Code can improve system performance at the Collection history. The following table shows the ratio that can improve the performance of the History Collection.

Variable Percentage (%) Ease lvl  
18 Able to provide more complete information  
19 User number  
10 Resilience QR Code  
21 Total 68 Most visitors Lampung Museum said that they get the information from the paper collection of information while the other also argue that the information provided was really minimal. Visitors also expect the collection of information is presented in digital form so that can make it easier to be got by anyone and the paper must be has more complete information. The authors take a decision on the use of QR Code History Collection can provide more complete information and also easy of access without having to record again. QR Code also has other advantages that can be accessed horizontally and vertically.  
moreoveer, the authors found that there is a weakness in the QR Code, which the QR Code was partially destroyed or damaged most of the QR Code can not be accessed.

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