Integrated Performance Appraisal System with Management by Objective Method

Publisher: IEEE

Fitri dwi Kartikasari ; Susana Limanto ; Nandya cahya Puspita **All Authors**

Abstract

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I. Introduction

II. Methods

III. Result and Discussions

IV. Conclusion

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Abstract: Higher education institutions generally have two types of employees, Lecturers and Non-Lecturers, both of which are managed by the Directorate of Human Resources (HR). On... **View more**

Metadata

Abstract:

Higher education institutions generally have two types of employees, Lecturers and Non-Lecturers, both of which are managed by the Directorate of Human Resources (HR). One of the tasks of the HR Directorate is to provide Non-Lecturer employee performance appraisal services. Scoring systems that are often used are generally behavior-based (Behaviorally Anchored Rating Scales techniques). This technique assesses all employees with the same assessment indicators. This raises the problem of not being able to show actual work results because it only evaluates behavior without assessing the successful completion of the employee's main work or tasks. Based on these problems a performance appraisal-based performance target system (Management By Objective) was developed. This system can provide assessment results that reflect the actual performance of employees and can set assessment indicators based on the duties of each employee. Evaluations show that the system is function properly and successfully helps the implementation of performance appraisal system development because it is able to facilitate the evaluation of subordinates' performance, evaluate their own performance, be able to help provide assessment results that reflect actual employee performance, and be able to help regulate assessment indicators based on the duties and responsibilities of each employee.

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In an organization it is very important to be able to maintain

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Published: 2021

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existence and be able to continue to develop its potential. This is inseparable from the role of competent human resources in their fields. Based on this, a performance appraisal system is very necessary to support the improvement of the quality of human resources [1].

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Conference Proceedings

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Yogyakarta, Indonesia

5 – 7 October 2022

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Universitas Sultan Ageng Tirtayasa

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Welcome Message

Salam. Dear ICIEE participants,

Welcome to the ICIEE 2022!

On behalf of the Organizing Committee of the 2022 International Conference on Informatics Electrical and Electronics, it is our great pleasure to welcome you to our hybrid event in Yogyakarta. The aim of this event is to provide an opportunity to present and share the most current research in electrical engineering and informatics. We cordially ask you to join fellow researchers, academicians, scientists, and engineers on a full day occasion.

The ICIEE is a biennial conference, organized by the Department of Electrical Engineering, Universitas Sultan Ageng Tirtayasa (and partners), with previous successful events held in 2018 and 2020. Technically co-sponsored by IEEE Indonesia Section, this year the conference's theme is "Smart Technology Towards Smart Energy." The topics include but are not limited to: Power System, Control Electronics, Circuits, and Systems, Information Technology, and Telecommunication.

We will kick off our conference with keynote lectures from distinguished profiles: Professor Chii-Wann Lin from National Taiwan University, Professor Josaphat Tetuko Sri Sumantyo from Chiba University and Professor Hadi Suyono from Universitas Brawijaya. We thank them sincerely for dedicating their valuable time to give exciting talks to the conference audience. Then, technical sessions will follow and be presented in parallel. Most presentations will be given virtually, so in-person participation here does not necessarily reflect the actual scale of this conference.

Our conference this year received a total of 74 submissions, of which 47 will be presented during the conference. All contributed papers went through an independent peer-review process. Finally accepted and presented papers published in the Conference Proceedings will be submitted for possible inclusion into IEEE Xplore. Submissions were from academia (87.8%), research facilities and government laboratories (9.5%), and industry (2.7%). Those papers came from IEEE Region 8 (Africa, Europe, Middle East) and Region 10 (Asia Pacific).

Special mention should be addressed to Rector of Untirta Professor Fatah Sulaiman and Dean of Engineering Faculty Untirta Professor Asep Ridwan for their institutional backing. In addition, we are honoured to have support from Universitas Lampung, Universitas Tidar, Universitas Mataram, as well as FORTEI, APTIKOM and sponsors. It goes without saying that this event is made possible by efforts from hard-working committees and also our student volunteers. Of course, appreciation also goes to external reviewers whose major contribution in the peer-reviewing process is at the very core of scientific dissemination.

We hope you will find the conference experience both technically and socially informative. Moreover, our purpose is also to facilitate collaborations and connections. We look forward to your feedback on this event and we hope to see you in the future ICIEE 2024!

General Chair : Dr. Romi Wiryadinata

Technical Program Chair : Imamul Muttakin, Ph.D.

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Welcome Message

Assalamualaykum warohmatullahi wabarakatuh.

Distinguished keynote speakers and speakers, guests, ladies and gentlemen,

It is our great pleasure to join and to welcome all participants of the 2022 International Conference on Informatics Electrical and Electronics (ICIEE) in hybrid. I am happy to see this great work of the Department of Electrical Engineering on organizing this international event.

On this occasion, I would like to congratulate all participants for their scientific involvement and willingness to share their findings in this conference. I believe that this conference can play an important role to encourage and embrace cooperative, collaborative, and interdisciplinary research among the engineers and scientists. And as a leading state university in Banten Province and fast-growing university in Indonesia, through this international seminar, Untirta consistently serves a medium for the development of knowledge particularly in area of Electrical engineering.

I do expect that this kind of similar event will be held in the future by other department within Untirta as part of activities in education research and social responsibilities of universities, research institutions, and industries internationally. My heartful gratitude is dedicated to Organizing Committee members and the students of Department of Electrical Engineering for their generous effort and contribution toward the success of the ICIEE 2022.

And on behalf of Universitas Sultan Ageng Tirtayasa, by reciting basmalah, “Bismillahirrohmanirrohim” I officially declare to open the 2022 International Conference on Informatics Electrical and Electronics.

Thank you.

Wassalamualaykum warohmatullahi wabarakatuh.

Prof. Dr. H. Fatah Sulaiman, ST., MT.

Rector of Universitas Sultan Ageng Tirtayasa

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Keynote Speaker

"Enabling Precision Health with Biomedical Electronics"

Chii-Wann Lin, Ph.D., *Professor, Department of Biomedical Engineering, National Taiwan University*

Biomedical electronics has been the corner stone of the healthcare with numerous innovative medical devices. Advances in miniaturization, heterogeneous integration, and hard/software co-development have enabled digital transformation of modern healthcare system. Artificial intelligence, big data analytics, cloud computing, low latency communications, and immersive interactions, all these emerging technologies will help to facilitate novel service models in healthcare for better clinical outcomes and in preventive care toward precision health. I will share a few current statuses of research projects from my laboratory, e.g. complex phase space differential (CPSD) for arrythmia detection, automation of surface plasmon resonance (SPR) biosensing system, reinforcement learning (RL) algorithm for closed-loop stimulator.

Chii-Wann Lin received the B.S. degree from the Department of Electrical Engineering, National Cheng Kung University, Tainan City, Taiwan, the M.S. degree from the Graduate Institute of Biomedical Engineering, National Yang Ming University, Taipei, Taiwan, and the Ph.D. degree from Case Western Reserve University, Cleveland, OH, in 1984, 1986, and 1993, respectively. He was with the Center for Biomedical Engineering, College of Medicine, National Taiwan University, Taipei, from September 1993 until August 1998. He is now a Professor in the Graduate Institute of Biomedical Engineering and holds joint appointments in the Department of Electrical Engineering and Institute of Applied Mechanics, National Taiwan University. His research interests include biomedical micro sensors, optical biochip, surface plasmon resonance, bioplasmonics, nanomedicine, and personal e-health system. Dr. Lin is a member of the IEEE Engineering in Medicine and Biology Society, the International Federation for Medical and Biological Engineering, and the Chinese Biomedical Engineering Society. He was the President of the Taiwan Association of Chemical Sensors from 2008–2010.

Keynote Speaker

"Development of Airborne Microwave Remoted Sensor and The Applications"

Josaphat Tetuko Sri Sumantyo, Ph.D., *Professor, Center for Environmental Remote Sensing, Chiba University*

Our laboratory developed airborne circularly polarized synthetic aperture radar (SAR) for disaster and environment observation. This lecture explains the experience to develop this sensor, investigation of scattering characteristics of circular polarization in the ground test, and flight test of circularly polarized SAR in the Hinotori-C2 mission onboard CN235MPA aircraft in March 2018 at Makassar, Indonesia. This lecture also explains the applications of SAR image analysis using differential interferometric SAR and permanent scatterer interferometric SAR to observe disaster and environmental change. Finally, the tips of how to to be researcher will be explain in the end of this lecture.

Josaphat Tetuko Sri Sumantyo was born in Bandung, Indonesia in June 1970. He received the B.Eng. and M.Eng. degrees in electrical and computer engineering (subsurface radar systems) from Kanazawa University, Japan, in 1995 and 1997, respectively, and a Ph.D. degree in artificial system sciences (applied radio wave and radar systems) from Chiba University, Japan, in 2002. From 2002 to 2005, he was a Lecturer (Post-doctoral Fellowship Researcher) with the Center for Frontier Electronics and Photonics, Chiba University, Japan. From 2005 to 2013, he was an Associate Professor (permanent staff) with the Center for Environmental Remote Sensing, Chiba University, where he is currently a Full Professor (permanent staff). He is Head Department of Environmental Remote Sensing and Head Division of Earth and Environmental Sciences, Graduate School of Integrated Science and Technology, Chiba University in 2019-2020. He is also Full Professor in the Department of Electrical Engineering, Faculty of Engineering, Universitas Sebelas Maret (UNS), Indonesia since 2020. Now he is Head Division of Disaster Data Analysis, Research Institute of Disaster Medicine, Faculty of Medicine, Chiba University since October 2021. His research interest is theoretically scattering microwave analysis and its applications in the microwave (radar) remote sensing, especially synthetic aperture radar, quantum radar, noise radar, and subsurface radar (VLF), including InSAR, DInSAR, and PS-InSAR, analysis and design of antennas for mobile satellite communications and microwave sensors, development of microwave sensors, including synthetic aperture radar for UAV, aircraft, high altitude platform system (HAPS), and microsatellite. He published about 900 journal and conference papers, invited talks, and 15 book-related wave analyses, UAV, SAR, space antenna, and a small antenna. He is General Chair of the 7th and the 8th Asia-Pacific Conference on Synthetic Aperture Radar (APSAR 2021), and more than 260 Invited Talks and Lectures. He is Chair of Technical Committee of Working Group on Remote Sensing Instrumentation and Technologies for UAV of IEEE-GRSS, Technical Committee on Instrumentation, and Future Technologies (IFT-TC), and Associate Editor of IEEE Geoscience and Remote Sensing Letter (GRSL).

Keynote Speaker

"Enhancement of Power Grid Resilience using Artificial Intelligence"

Ir. Hadi Suyono, Ph.D., IPU., ASEAN.Eng., *Professor, Department of Electrical Engineering, Universitas Brawijaya*

.

Prof. Ir. Hadi Suyono, S.T., M.T., Ph.D., IPU., ASEAN Eng. received his B.Eng. from Universitas Brawijaya, Malang-Indonesia in 1996; M.Eng. from Universitas Gadjah Mada, Yogyakarta-Indonesia in 2000 and Ph.D from Universiti Malaya, Kuala Lumpur-Malaysia in 2006. He is currently a Professor at the Department of Electrical Engineering, Faculty of Engineering, Universitas Brawijaya (UB), Malang, Indonesia.

He serves as the Head of the Department of Electrical Engineering, from 2017 up to 2021, and as the Dean of Faculty of Engineering, Brawijaya University, from 2021 up to now. He is also the Head of Power System Engineering and Energy Management Research Group (PSeeMRG), Universitas Brawijaya, since 2015 - now. In year 2013-2017, he served as the Vice Head of Department of Electrical Engineering, Faculty of Engineering, Universitas Brawijaya. In year 2010-2014 he served as Vice Head of the Master and Doctoral Program in the Faculty of Engineering, Universitas Brawijaya. He has been appointed as interviewer and reviewer of Indonesia Endowment Fund for Education, the Secretariat General of the Ministry of Finance of the Republic of Indonesia, since 2015-now. He holds professional engineer certificate from the Engineer Association of Indonesia since 2016-now. He has been appointed as the Auditor of the Quality Assurance Centre, Universitas Brawijaya since 2013-now.

He is a member of IEEE, IEEE Power and Energy (PES), IEEE Computational Intelligence Society (CIS), IEEE Dielectrics and Electrical Insulation Society (DEIS), International Association of Engineers (IAENG), Indonesian Renewable Energy Society (IRES), International Association of Computer Science and Information Technology (IACSIT). He is elected as vice head (2018-2020) and Head (2020-now) of Association of Higher Education in Electrical Engineering Indonesia (FORTEI). He is active as a reviewer of several international journals and conferences. He also serves actively as a senior consultant in industries, private companies and government institutions. His research interests cover the power system engineering, artificial intelligence, energy efficiency, embedded generation system, renewable energy, power system stability, power system planning and operation, and reliability studies in a deregulated power system.

Program

2022 International Conference on Informatics Electrical and Electronics (ICIEE)

Wednesday, 5 October 2022
Eastparc Hotel, Yogyakarta – Indonesia

08:00 – 08:30	Registration			
08:30 – 09:30	Opening			
09:30 – 10:00	Coffee break			
10:00 – 12:00	Keynote lecture			
12:00 – 13:00	Lunch and prayer break			
13:00 – 15:00	Parallel session			
	Power system I	Control, electronics, circuits, and systems I	Information technology I	Telecommunication I
15:00 – 15:30	Coffee and prayer break			
15:30 – 16:45	Parallel session			
	Power system II	Control, electronics, circuits, and systems II	Information technology II	Information technology III
16:45 – 17:00	Closing			

Technical Schedule

13:00 - 15:00	
Power System I	
Session Chair:	Alimuddin
Room:	A

957 (in person)	Thermoelectric Generator for Micropower Application Using Household Waste Munnik Haryanti, Wahyu Saputro and Bekti Yulianti
2072 (in person)	Thermal Monitoring System Phase Change Material Batteries Using Fuzzy Logic Hartono Hartono and Khen Nuhfus Sanjaya
5596 (in person)	Dynamic Stability Simulation Multimachine Power Generating System Sapto Nisworo, Deria Pravitasari and Zulfikar Aji Kusworo
6851 (in person)	Shaded Cell Random Model of Solar Cell Module on Energy Harvesting A.N. Afandi, Sujito Sujito, Mahmudin Yunus, Langlang Gumilar, Ana Nuril Achadiyah and Goro Fujita
9323 (in person)	Dynamic Thermal Line Rating Considering Cooling Impact on Conductor's Heating of Transmission Power Loss A.N. Afandi, Aji Prasetya Wibawa, Yuni Rahmawati, Sunaryono Sunaryono and Makiko Kobayashi
7457 (in person)	Acceleration of Rooftop Solar Power Plant Development as a Support of the Reduction of Greenhouse Effect Ibrahim Nawawi, Andriyatna Agung Kurniawan and Deria Pravitasari

15:30 - 17:00	
Power System II	
Session Chair:	Hartono
Room:	A

7591 (in person)	Study of Electrical Power System onTransmission and Distribution in PT Krakatau Daya Listrik (KDL) Alimuddin Alimuddin, Amil Mukrod, Irma Saraswati, Cakra Adipura Wicaksana, Heri Hariyanto and Ria Arafiyah
6671 (virtual)	Role of type-2 fuzzy algorithm to improve response of rectifier in HVDC-model I Made Ginarsa, I Made Ari Nrartha, Agung Budi Muljono, Ni Made Seniari and Osea Zebua
9341 (virtual)	A Development of a Low Cost Solar Irradiance Meter Using Mini Solar Cells Ferdian Ronilaya, Putra Fahri Ramadhani, Moh. Noor Hidayat, Sapto Wibowo, Irwan Heryanto Eryk and Stevanus Septian Vicky Putra Pratama

13:00 - 15:00	
Control, electronics, circuits, and systems I	
Session Chair:	Irma Saraswati
Room:	B

1954 (in person)	Determine of the Time Constant of Capacitance Applied to Electrical Capacitance Tomography Arba'I Yusuf, Wahyu Widada and Warsito Purwo Taruno
2750 (in person)	Active Front End with simple control for Improved Power Quality Asep Andang, Oriza Sativa and Abdul Chobir
3761 (in person)	Analysis of the Influence of Sun Intensity on Power on Coastal and High Lands using Solar Tracker based on Arduino Microcontroller Isra Nuur Darmawan, Kholistianingsih Kholistianingsih, Burhan Alnovda Azaria and Priyono Yulianto
5220 (in person)	Implementation of AHRS (Attitude Heading and Reference Systems) With Madgwick Filter as Hexapods Robot Navigation Ri Munarto, Romi Wiryadinata and Donny Prakarsa Utama
8746 (virtual)	The role of post-annealing treatment on ZnO:Co structure and magnetic transition grown by sputtering deposition Agusutrisno Marlis Nurut, Naoto Yamashita, Kunihiro Kamataki, Kazunori Koga, Naho Itagaki and Masaharu Shiratani
1530 (virtual)	Control of DC Motor Speed on Smart Gate System Using Fuzzy Logic Controller Wahyudi Wahyudi, Muhammad Rohman and M Arfan
2270 (virtual)	Dual Axis Solar Tracker With Fuzzy Logic Method Yustinus Bagus Arisotya, A. Bayu Primawan and Djoko Untoro Suwarno

15:30 - 17:00	
Control, electronics, circuits, and systems II	
Session Chair:	Ceri Ahendyarti
Room:	B

3057 (virtual)	Prototype of a Monitoring System for Temperature, Humidity, and Location of Reefer Container based on IoT Abdi Pratama Putra, Muhammad Yusro and Aodah Diamah
3772 (virtual)	Monitoring System Temperature and Humidity of Oyster Mushroom House Based On The Internet Of Things Irma Saraswati, Adhitya Rahma Putra, Masjudin Masjudin and Alimuddin Alimuddin
6252 (virtual)	A Real-time Performance Monitoring of IoT-based on Lithium-Ion Battery Pack Murie Dwiyaniti, Sri Lestari Kusumastuti, Luthfi Rahman Nova Kusuma, Achmad Rais Wiguna, Silawardono Silawardono and Tohazen Tohazen
6950 (virtual)	Internet of Things-based PDAM Water Usage and Quality Monitoring System using ESP32 Bramantyo Regowo, Muhammad Yusro and Jusuf Bintoro
6576 (in person)	Low-cost Impedance Measurement System for Determination of Condition and Oil Content in Wood Material Rocky Alfanz, Muhamad Fauzi, Imamul Muttakin, Rian Fahrizal and Yofei Okazaki

13:00 - 15:00
Information technology I
Session Chair: Muhammad Iman Santoso
Room: C

1310 (in person)	Energy Potential Estimation System Model To Produce Alternative Energy Briquettes Norbertus Tri Suswanto Saptadi, Ansar Suyuti, Amil Ahmad Ilham and Ingrid Nurtanio
7949 (in person)	Analysing Temporal Hotspot Occurance over Sumatera and Kalimantan Arie Vatresia, Ferzha Putra Utama, Aji Novriadi, Hendri Gunawan, Rendra Rais and Yudi Setiawan
388 (virtual)	Integrated Performance Appraisal System with Management by Objective Method Fitri Dwi Kartikasari, Susana Limanto and Nandya Cahya Puspita
3764 (virtual)	Graph-based Process Mining for Measuring Quality of Business Process Model Kelly Rossa Sungkono, Riyanarto Sarno, Fara Dinda Mutia Kinanggit, Irsyadhani Dwi Shubhi and Khofifah Nurlaela
4644 (virtual)	Role of Internet of Things in Aviation Industry: Applications, Challenges, and Possible Solutions Md Shaikh Rahman, Selvakumar Manickam and Shafiq Ul Rehman
6858 (virtual)	Modelling Flood Prone Area in North America with Geomorphic Flood Index Method Hanni Yolina, Edy Irwansyah and Rojali Rojali
7787 (virtual)	Mapping Graph-Based Process Model Into Discrete Event Simulation (DES) Riza Dwi Andhika, Kelly Rossa Sungkono and Riyanarto Sarno

15:30 - 17:00
Information technology II
Session Chair: Rian Fahrizal
Room: C

5548 (in person)	Performance Evaluation for Infrared Face Recognition using Convolutional Neural Network Muhammad Eka Setio Aji, Annisa Syakhira, Supriyanto Praptodiyono and Rocky Alfanz
8577 (In person)	Fake News Classifier with Deep Learning Abba Suganda Girsang
490 (in person)	Twitter Sentiment Analysis in Indonesian Language with Python using Naive Bayes Classification Method Cakra Adipura Wicaksana, Mohammad Fatkhurrokhman, Rinanda Febriani, Rifaldi Tryawan, Alimuddin Alimuddin and Hafiyyan Putra Pratama
673 (virtual)	Investigating the Influence of Layers Towards Speed and Accuracy of Neural Networks Kevin Bennett Haryono, Hizkia Christian Purnomo, Ryne Ferdinand, Henry Lucky and Derwin Suhartono
5935 (virtual)	Implementation of Feature Selection to Reduce the Number of Features in Determining the Initial Centroid of K-Means Algorithm Vincentius Riandaru Prasetyo, Fania Alya Miranti and Susana Limanto
6488 (virtual)	Clustering of Customer Lifetime Value With Length Recency Frequency and Monetary Model Using Fuzzy C-Means Algorithm Mirdatul Husnah and Rice Novita

13:00 - 15:00 Telecommunication I Session Chair: Teguh Firmansyah Room: D	
4898 (in person)	5G Coverage Evaluation: A Systematic Literature Review Bayu Devanda Putra, Rizal Munadi, Syahrial Syahrial, Ramzi Adriman, Teuku Yuliar Arif and Melinda Melinda
9615 (in person)	Multi-Antenna Combination Visibility Analysis for Rocket Application using SDR Sri Kliwati, Romi Wiryadinata, Afrido Prayogi, Rustamaji Rustamaji and Wahyu Widada
1330 (virtual)	Design of Fiber-to-the-Home Network Deployment at the Ministerial Residential of IKN Nusantara Jeremy Baskoro, Fasya Tiarani, Naufal Alfarabay, Bintang Giani, Nurmuthia Oktovioletha and Catur Apriono
1510 (virtual)	Dual-Band Microstrip Antenna Array Design for Low Power Energy at Frequencies 900 MHz and 1800 MHz Priyo Wibowo, R. Harry Arjadi and Nur Adi Siswandari
1653 (virtual)	FPGA Implementation of OFDM-based Visible Light Communication System Rahmayati Alindra, Purnomo Sidi Priambodo and Kalamullah Ramli
1801 (virtual)	Techno-Economic Analysis of 5G Implementation at Frequency 2.3 GHz for Bandung City Merlyn Inova Christie Latukolan, Nachwan Mufti Adriansyah and Ahmad Tri Hanuranto
8995 (virtual)	Predicting Channel Gain Threshold for V2V Communications with Varying Doppler Shift Using Machine Learning Nazmia Kurniawati, Aisyah Novfitri, Rifqi Fuadi Hasani and Arti Suryaning Tyas

15:30 - 17:00 Information technology III Session Chair: Suhendar Room: D	
5473 (virtual)	Effect of Visual Augmented Reality in the Transportation Sector I Putu Ronny Eka Wicaksana, Bertrand Bertrand, Jason Christian, Said Achmad and Rhio Sutoyo
5981 (virtual)	How is Smartphone Technology Changing Healthcare Azella Gania Mutyara, Brian Abiyyu Farras, Liauren Permata Sari, Said Achmad and Rhio Sutoyo
7301 (virtual)	Detecting Phishing Websites with Non-Parametric Machine Learning Bianca Chelsea Putri Nugroho, Josephine Florencia Chan, Valencia Vananda, Henry Lucky and Derwin Suhartono
8343 (virtual)	Important Security Factors for Implementing Internet of Things in Smart Home Systems Daniel Widjaja, Derrick Derrick, Muhammad Fathariq Dimas Octaviandra, Said Achmad and Rhio Sutoyo
8776 (in person)	Comparative Analysis of Radial Basis Method with Backpropagation for Signature Identification Siswo Wardoyo, Adi Nugroho and Suhendar Suhendar
8931 (virtual)	The Utilization of Content Based Filtering for Spotify Music Recommendation Jonas Theon Anthony, Gerard Ezra Christian, Vincent Evanlim, Henry Lucky and Derwin Suhartono

Room

Agenda	Venue	Zoom
Keynote Lecture	Main Venue “Garden Room”	Meeting ID: 927 2371 0736 Passcode: 438329
Parallel Session A	Breakout I “Orchid Room”	Meeting ID: 959 6751 2980 Passcode: 1234
Parallel Session B	Breakout II “Magnolia Room”	Meeting ID: 832 2435 0072 Passcode: 537443
Parallel Session C	Breakout III “Carnation Room”	Meeting ID: 883 9976 2136 Passcode: 544854
Parallel Session D	Breakout IV “Lotus Room”	Meeting ID: 921 5958 9210 Passcode: 887272

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Integrated Performance Appraisal System with Management by Objective Method

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***Abstract*— Higher education institutions generally have two types of employees, Lecturers and Non-Lecturers, both of which are managed by the Directorate of Human Resources (HR). One of the tasks of the HR Directorate is to provide Non-Lecturer employee performance appraisal services. Scoring systems that are often used are generally behavior-based (Behaviorally Anchored Rating Scales techniques). This technique assesses all employees with the same assessment indicators. This raises the problem of not being able to show actual work results because it only evaluates behavior without assessing the successful completion of the employee's main work or tasks. Based on these problems a performance appraisal-based performance target system (Management By Objective) was developed. This system can provide assessment results that reflect the actual performance of employees and can set assessment indicators based on the duties of each employee. Evaluations show that the system is function properly and successfully helps the implementation of performance appraisal system development because it is able to facilitate the evaluation of subordinates' performance, evaluate their own performance, be able to help provide assessment results that reflect actual employee performance, and be able to help regulate assessment indicators based on the duties and responsibilities of each employee.**

Keywords*— *performance appraisal system, non – lecturer employee, management by objective

I. INTRODUCTION

In an organization it is very important to be able to maintain existence and be able to continue to develop its potential. This is inseparable from the role of competent human resources in their fields. Based on this, a performance appraisal system is very necessary to support the improvement of the quality of human resources [1].

Various employee performance appraisal techniques have been developed and applied in various institutions. Generally, every institution will avoid the element of subjectivity in evaluating the performance of its employees. For example, an institution engaged in finance uses employee performance appraisal techniques by incorporating different assessment components for each group, judged to be less effective because of the high subjectivity element [2]. The Industrial Engineering Department of a tire factory located in Tangerang applies the Balanced Score Card method to establish clear Key Performance Indicators items for each of its employees. The method is expected to eliminate the subjectivity of the assessment that comes from the person who leads the department [3].

A higher education institution has two types of employees, lecturers and non-lecturers. The performance evaluation of lecturers has been regulated in various laws and regulations regarding higher education in Indonesia [4]. While the performance evaluation of non-lecturer employees for private universities is carried out with the regulations of each institution. This research was applied at a private university that previously assessed the performance of non-lecturer employees based on behavior using the Behaviourally Anchored Rating Scales (BARS) technique. The BARS technique evaluates employees based on their behavior with the same indicators for all employees. This creates a problem because it cannot show the actual work. This is because if an employee is assessed to be well behaved then the result of the employee's performance appraisal is good and if the employee is assessed to have bad behavior then the result of his performance appraisal is bad. Even though employees with bad behavior do not necessarily have bad work results and vice versa. To overcome these problems, a new integrated assessment system was developed by adopting Management by Objective (MBO) techniques based on work targets [5]. This method has been widely used in various fields and has been assessed several times [6-8].

MBO is a technique of performance appraisal based on the success of each member of the team in completing their work targets [5, 9-11]. So, MBO provides a unique assessment for each employee. While BARS technique focuses on evaluating employee's behavior with the same indicators for all employees. Reference [12] states that the MBO technique is an effective tool to improve employee performance in order to encourage organizational productivity. Meanwhile, [13] states that MBO improves employee performance so that organizations can compete in the world of globalization. However, many researchers try to combine both techniques to get the most effective performance appraisal [9-11].

The performance appraisal system that was developed can manage the assessment indicators based on the works and responsibilities of each employee in each unit. Unit leaders will set a rating scale not only based on employee work behavior but also the standard of achievement that must be achieved by each employee. This standard will be a reference for leaders to be able to carry out an evaluation. The system is built integrated with various existing systems so as to facilitate the unification of data.

II. METHODS

This research can be classified as applied research because the developed system can be used as a practical solution to a problem. The object of this research is a private university in East Java. The study was developed using the prototyping methodology as seen in Fig 1. It starts with a system analysis to understand the current employee performance appraisal system with various existing problems and defines the system requirements. System analysis is carried out through semi-structured interviews with related

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parties, evaluating the current employee performance appraisal system and looking at related documents. Interviews were conducted with the Director of Human Resources (HR), the Manager of Empowerment of Human Resources (PSDM), and the Manager of Management Information Systems (MIS).

The next step is to create a system design based on a predefined needs analysis. The design created includes data design, process design, and user interface design. Data design is based on the analysis of the relationship between data so that it can be well integrated in the system. The design process shows the workflow of the new employee performance appraisal system and the roles of the parties involved. While the user interface design shows the appearance of the system when used by the user.

The design of the data is confirmed with the SIM director to ensure that employee performance appraisal data can be integrated with other data. While the user interface design will be used to develop a prototype system. The design process and prototype were discussed with the HR director to ensure that changes were made to the new system and to test the ease of use. The results of discussions with the HR director are used to improve the existing design. The approved design will be implemented in the form of a web-based program. The program is designed web-based so it can be accessed directly by many users from various departments in the institution. Data implementation is done using Postgre SQL software. While the program implementation is done using the PHP programming language: Hypertext Preprocessor based on the PHP framework template developed by the SIM Directorate.

As a final step, a program testing was conducted which included the verification and validation stages. Verification is carried out to ensure that the program runs according to the design previously made and validation is carried out to ensure that the program output is in line with user requirements. Verification is done using the black box testing method, by testing various input scenarios then evaluating the results. If the results are not suitable, repairs and re-verification will be carried out. Validation is done by demonstrating the program, simulating by the user, and evaluating the program by the user. Evaluation is done by filling out the questionnaire and giving a brief explanation related to the answers to the questionnaire. The simulation was conducted by three HR employees as administrators who were responsible for carrying out employee performance appraisal at the university which was the object of research, 9 employees who had positions as unit leaders who gave assignments and assessed the performance of subordinates, and 19 employees as subordinates to be assessed as well as assessing themself and evaluating coworkers. Respondents who act as administrators are selected from the HR directorate given their duties as the ones responsible for carrying out employee performance appraisals. While other respondents were selected using the cluster sampling method combined with the simple random sampling method. The existing cluster is divided into 2, namely academic support units and academic units. Respondents from each cluster were taken randomly using the simple random sampling method. The results of the questionnaire and interview will be used to improve the program.

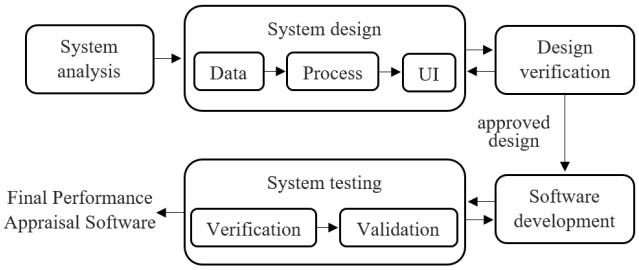

Fig. 1. Research methodology

III. Result and Discussions

Employee performance appraisal techniques currently used are Behaviourally Anchored Ratting Scales (BARS). The assessment carried out only assesses the achievement of agreed targets and applies equally to all employees. The target set is a general target, employee behavior in serving customers is not the result of performance. So the results of the assessment do not indicate the ability of employees to complete their work in accordance with their respective duties and responsibilities. To overcome the existing problems, this research develops an employee performance appraisal software based on the work targets that have been set for each employee. The performance appraisal technique used is Management by Objective.

The system that is built begins with an analysis of the old system to find out the current conditions and the problems they are experiencing. Based on the results of the analysis, it was found that the obstacle that had occurred with the existing performance appraisal system was that the results of the assessment could not show the actual work results because what was assessed was only behavior without assessing the work so that it did not reflect the ability of employees to carry out their work in accordance with their duties and responsibilities. each employee. Based on the results of this analysis, a system design is made which includes the design of data, processes, and user interfaces.

Data is an important part of a system. In the system built, the data is described in the form of an Entity Relationship Diagram (ERD) [14]. This ERD will describe the relationship between the entities involved in the Integrated Performance Appraisal System with the Management by Objective Method. Part of ERD can be seen in Fig. 2.

Broadly speaking, the design of the workflow process of the performance appraisal system developed in this study is divided into five stages of assessment. The process design of each stage of the employee performance appraisal system is described using the Business Process Model and Notation (BPMN) [15]. The first stage, which is the preparation phase involves the Directorate of Human Resources and unit leaders to set work targets, periods, coordinator of work units, types of appraisers, indicators and weighting of assessments for each type of appraiser, as well as limits on Cumulative Increase in Position. The work target for each employee is determined by the respective unit leader for each assessment period. While the evaluation period, type of appraiser and access rights respectively, coordinator of the work unit, indicators and weight of the appraisal for each type of appraiser, as well as the cumulative number limit for obtaining a promotion (AKKJ) are determined by the Directorate of Human Resources. BPMN from the system setting stage can be seen in Fig. 3.

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The second stage begins after the selected unit coordinator receives notification of the assessment schedule. At this stage a prospective employee appraiser is determined for each type of appraiser. BPMN from the second stage, namely the determination of prospective assessors can be seen in Fig. 4. Next, the third stage is the assessment stage. At this stage the leaders and employees will receive notifications to make an assessment. Employees will receive notifications to assess their own performance as well as to assess colleagues that have been determined by the unit coordinator. While the unit leader assesses all employees in the unit they lead. BPMN from the third stage, namely the assessment can be seen in Fig. 5. The fourth stage is the stage of calculating the value of performance and forming a report. This stage is carried out entirely by the system by taking assessment data that has been done by all types of assessors. The result of the forth stage is the report on the performance appraisal (report cards). The last stage is validation of report cards by the HR Directorate.

BPMN from the validation stage can be seen in Fig. 6. Validated report cards can then be seen by interested parties. The flow of the employee performance appraisal process can be seen in Fig. 7.

The User interface design is implemented in the form of a web-based Performance Appraisal software. This software provides various features which are divided into five major parts, i.e. data management, assessment processes, monitoring, validation, and reports. The monitoring feature is used to check the assessment process. The validation feature is used to check the completeness of the assessment results. If all assessment results are complete, validation can be carried out on the results of the assessment and close the assessment process. Employee Performance Assessment users are divided into five types, i.e. administrators, coordinators, appraisal employees, unit leaders, and assessed employees. Each user has different access rights to the features in the system, for example features that can be accessed by the administrator can be seen in Fig. 8. Fig. 8 shows that the administrator has the right to manage data through the Settings menu, monitor the course of the assessment process through the Monitoring menu, and at the end the assessment period validates the assessment results through the Validation menu. Administrators can also view reports in the form of performance report cards from each employee through the Report Card menu.

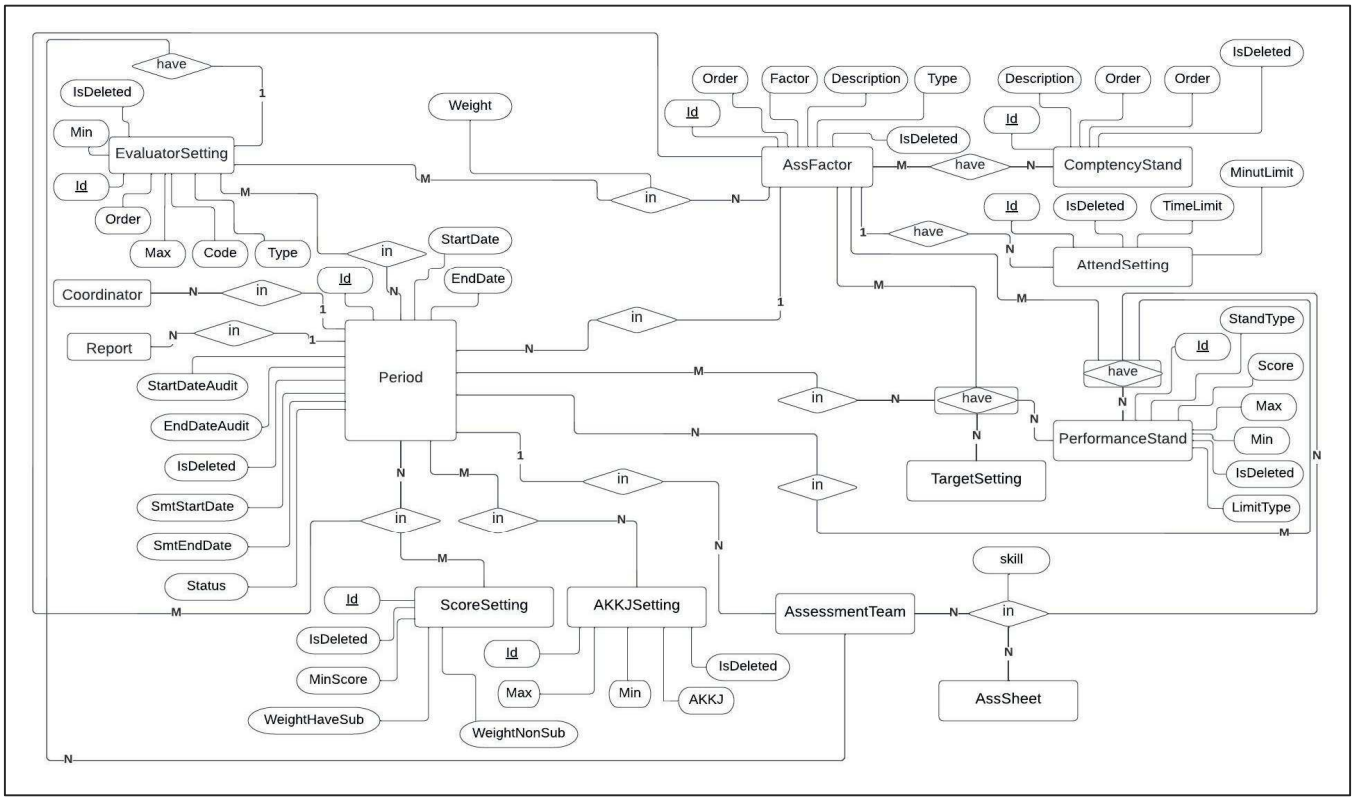

Fig. 2. ERD of Integrated Performance Appraisal System

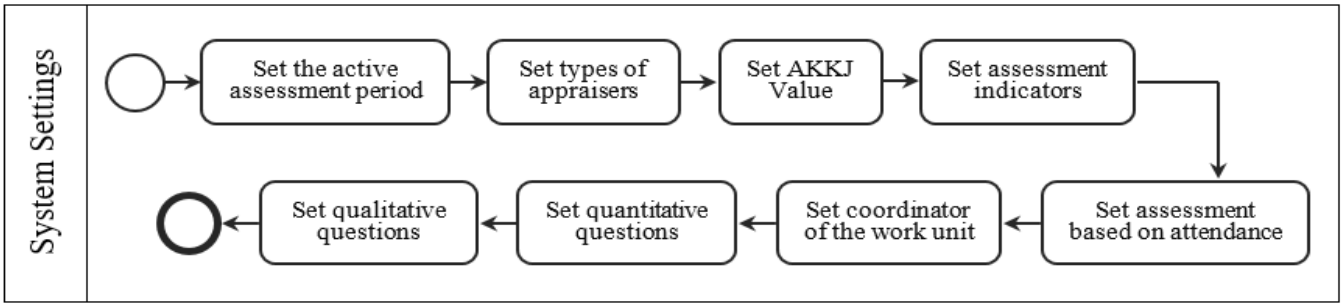

Fig. 3. BPMN of the first stage (system setting)

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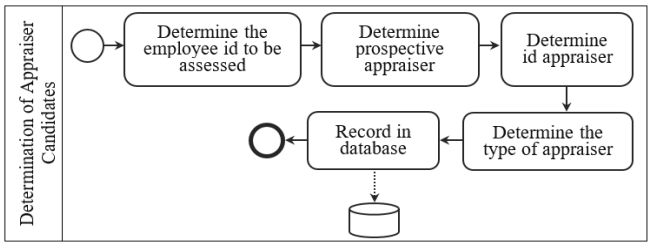

Fig. 4. BPMN of the second stage (determination of appraiser candidates)

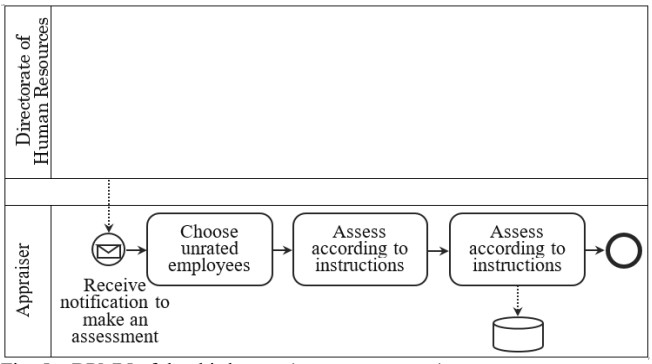

Fig. 5. BPMN of the third stage (assessment stage)

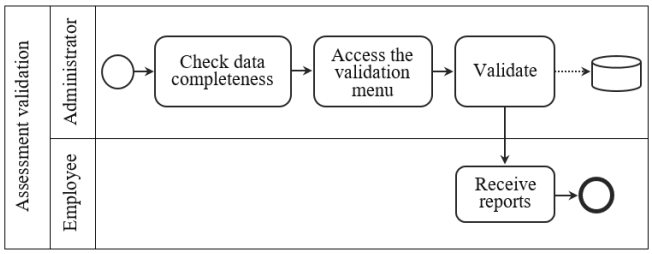

Fig. 6. BPMN of the fifth stage (validation stage)

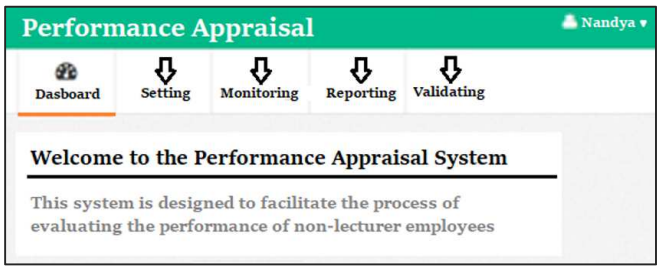

Fig. 8. Administrator main menu

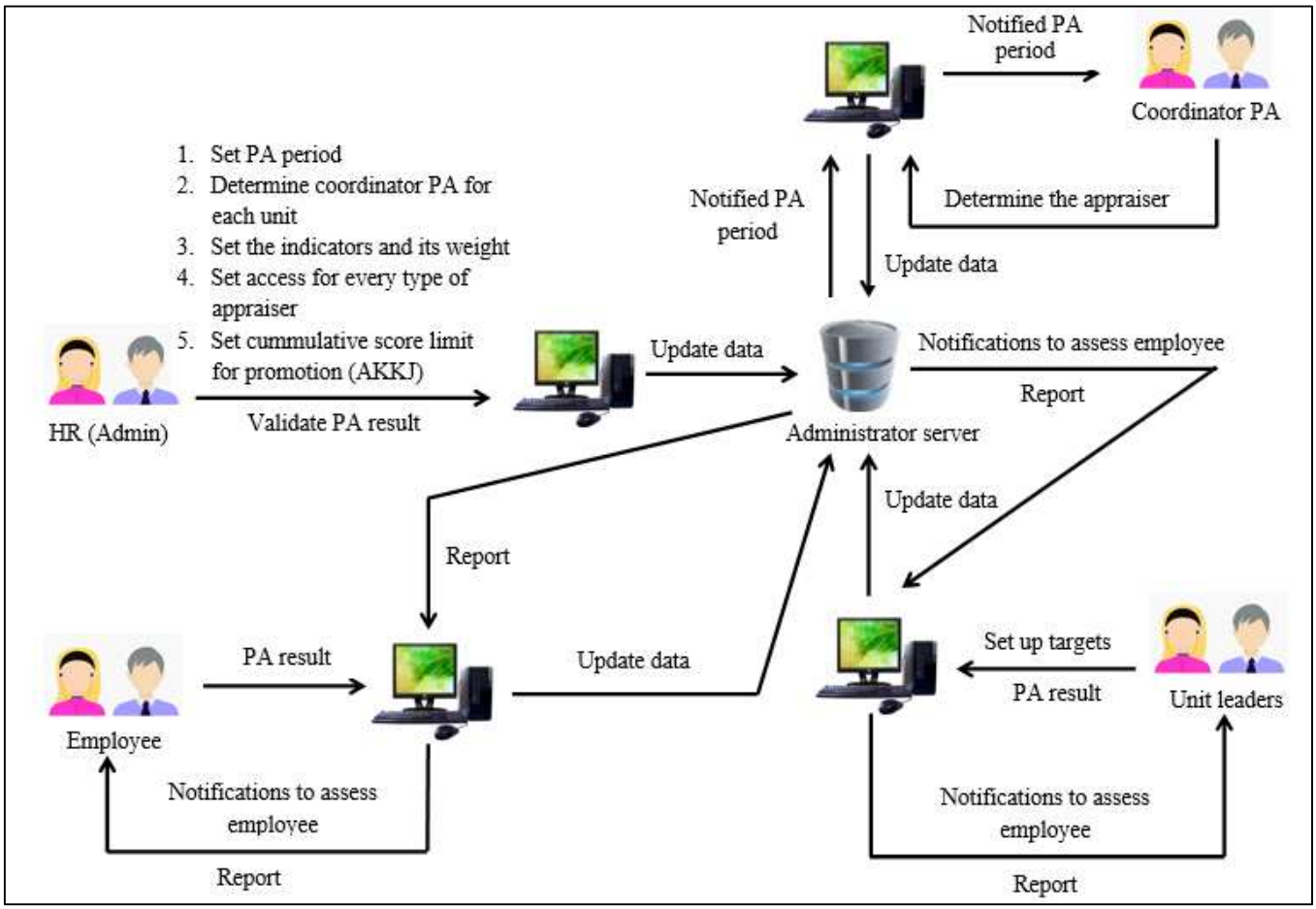

Fig. 7. Appraisal system process

The appraiser can provide the results of the appraisal on a predetermined schedule period in accordance with the given role (as oneself, supervisor, coworkers, subordinates, or customers). Examples of assessment pages can be seen in Fig. 9. Fig. 9 shows that there are two types of assessment factors, i.e. quantitative and qualitative factors. Qualitative factor assessments are displayed in the form of multiple choices in which the assessor can choose more than one answer choice. Each assessment factor can be divided into several sub-assessment factors. The factors assessed are adjusted to the work targets that have been determined by the unit leader.

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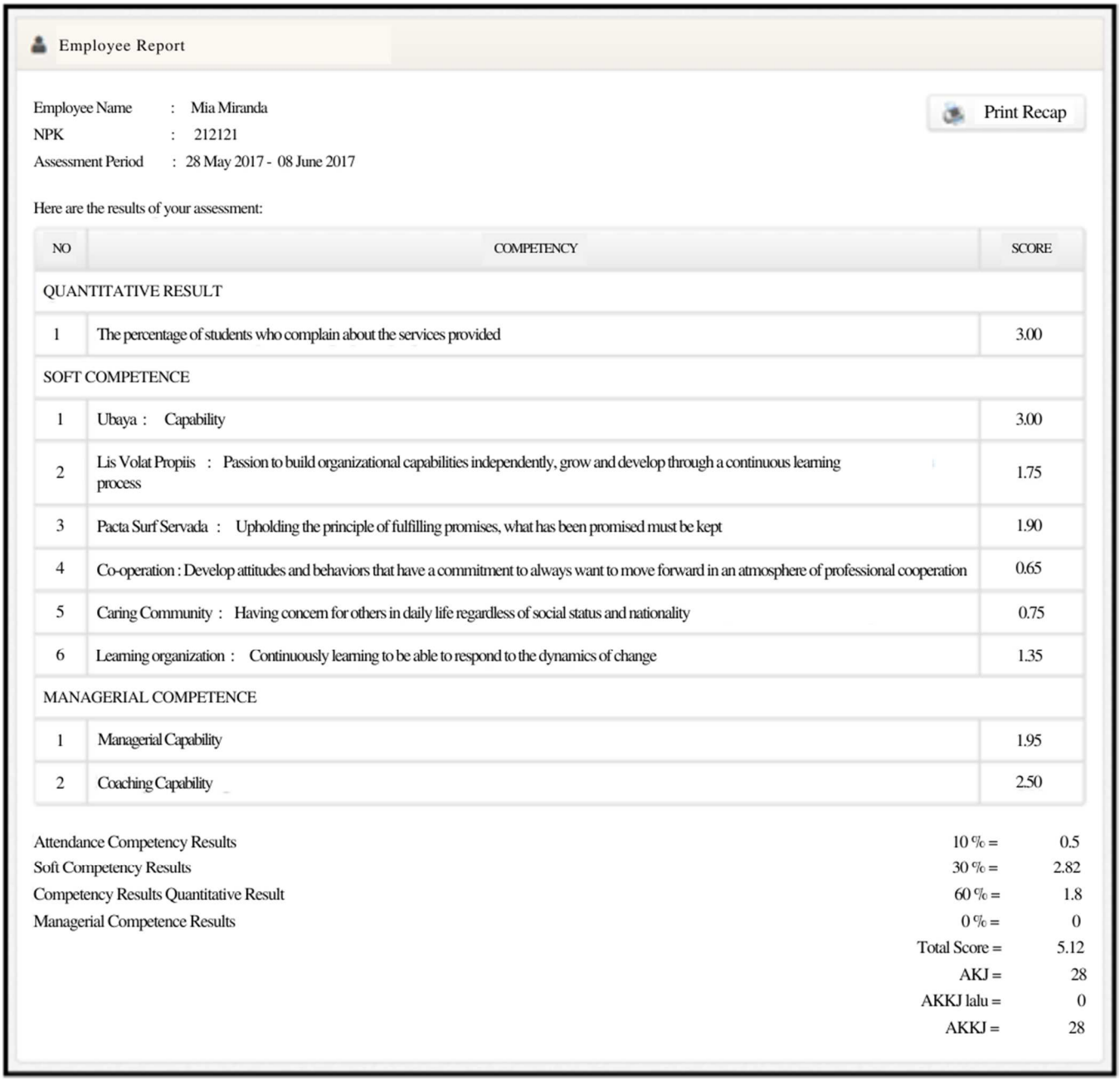

Employee Report

Employee Name : Mia Miranda
NPK : 212121
Assessment Period : 28 May 2017 - 08 June 2017

Print Recap

Here are the results of your assessment:

NO	COMPETENCY	SCORE
QUANTITATIVE RESULT		
1	The percentage of students who complain about the services provided	3.00
SOFT COMPETENCE		
1	Ubaya : Capability	3.00
2	Lis Volat Propiis : Passion to build organizational capabilities independently, grow and develop through a continuous learning process	1.75
3	Pacta Surf Servada : Upholding the principle of fulfilling promises, what has been promised must be kept	1.90
4	Co-operation : Develop attitudes and behaviors that have a commitment to always want to move forward in an atmosphere of professional cooperation	0.65
5	Caring Community : Having concern for others in daily life regardless of social status and nationality	0.75
6	Learning organization : Continuously learning to be able to respond to the dynamics of change	1.35
MANAGERIAL COMPETENCE		
1	Managerial Capability	1.95
2	Coaching Capability	2.50

Attendance Competency Results	10 % =	0.5
Soft Competency Results	30 % =	2.82
Competency Results Quantitative Result	60 % =	1.8
Managerial Competence Results	0 % =	0
	Total Score =	5.12
	AKJ =	28
	AKKJ lalu =	0
	AKKJ =	28

Fig. 9. Performance appraisal form

After the assessment period ends and the administrator has validated, the system will automatically carry out a calculation process to produce report cards from each employee. An example of an employee's report card can be seen in Fig. 10. Employee performance report cards contain detailed assessment results and a summary of final grades. The assessment results are calculated from all types of assessors and the weights of each assessment factor. If needed, report cards can be printed.

Testing was carried out to ensure that the program created was suitable to use. There were two kinds of tests carried out, namely verification and validation. Verification was carried out in the form of functional testing using the black box testing method. After several tests and revisions have been made, the program can be ascertained that it was running according to the design made.

Validation began with demonstrating the available features and how to use the program. After that, it was continued by asking the user to do a simulation accompanied by the researcher. Finally, the users were asked to provide feedback on the program that was created as a solution to the problems that were previously encountered. The results of the evaluation by administrators can be seen in Table 1, the results of the evaluation by unit leaders can be seen in Table 2, and the results of the evaluation by subordinates can be seen in Table 3.

Based on the results of the questionnaire for administrators, it can be seen that 100% of respondents agree that the developed system helped the actual employee performance appraisal process with easy settings and operations and also provided reports as needed. On the other hand, there were some suggestions from respondent, namely adding an import feature (from Excel file) to make the process of adding large amounts of question data easier, feature to conduct assessment after deadline, and assessment complaint feature.

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Fig. 10. Report card

TABLE I. The results of the evaluation by administrators

Questions	1	2	3	4	5
The developed system helps provide assessment results that reflect the actual performance of employees	67 %	33 %			
The developed system helps to set assessment indicators based on the jobs and responsibilities of each employee	100 %				
The developed system makes it easier to share access rights	67 %	33 %			
The software features provided for administrators are easy to understand		100 %			
It is easy to operate the Performance Appraisal software	67 %	33 %			
The reports provided are as needed	33 %	67 %			

1 = strongly agree, 5 = strongly disagree

Table II shows that 100% of respondents agree that the developed system facilitates the process of evaluating the performance of subordinates and the reports provided are in accordance with the needs. All respondents agreed that the features provided were easy to understand, but only 78% agree that the Performance Appraisal software was easy to operate. Confirmation results with 22% of respondents who were doubtful about the ease of using PA software, respondents stated that the assessment by choosing the appropriate statement was quite difficult to do when compared to giving a rating like the previous system. This was because the time required to read each statement was quite a lot. But on the other hand, respondents stated that the assessment by choosing the appropriate statement was able to provide more accurate assessment results.

TABLE II. The results of the evaluation by unit leaders

Questions	1	2	3	4	5
The system developed makes it easier to evaluate the performance of subordinates	56 %	44 %			
The software features provided for unit leaders are easy to understand	44 %	56 %			
It is easy to operate the Performance Appraisal software	56 %	22 %	22 %		
The reports provided are as needed	33 %	67 %			

1 = strongly agree, 5 = strongly disagree

At least 84% of respondents as subordinates stated that the developed system helped employees performance appraisal process with easy operations and provided reports as needed. The reason for 15.8% of respondents who were doubtful about the ease of using PA software was the same as that of 22% of respondents as unit leaders who were doubtful about the same question.

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TABLE III. The results of the evaluation by subordinates

Questions	1	2	3	4	5
The system developed makes it easier to evaluate your own performance	21%	79%			
The software features provided for employee as subordinates are easy to understand	42%	58%			
It is easy to operate the Performance Appraisal software	31.6 %	52.6 %	15.8 %		
The reports provided are as needed	5%	95%			

1 = strongly agree, 5 = strongly disagree

Based on the test results, it can be concluded that the employee performance appraisal system developed is feasible to use. In the future, the system will be developed by adding features suggested by respondents.

IV. CONCLUSION

After being tested, it is proven that the system developed can provide assessment results that reflect the actual performance of employees by arranging assessment indicators based on the duties and responsibilities of each employee. The system also simplifies the process of evaluating performance for oneself and subordinates. So as a whole the system developed makes it easier to carry out performance appraisals in accordance with the characteristics of the duties of each employee. In the framework of system development, respondents provide suggestions to add complaints to the results of the assessment.

Ease of customizing the program without depending on the programmer is very important. Therefore, a configurable performance appraisal system will be our future research.

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