

THE DEVELOPMENT OF E-PROFILING
WEBSITE IN SUPPORTING SOCIO-LITERACY
FOR AN ORGANIZATION BY USING CASE
BASED REASONING

NUR HIDAYAH BINTI BAHARIM

BACHELOR OF COMPUTER SCIENCE
(SOFTWARE ENGINEERING)

UNIVERSITI MALAYSIA PAHANG



SUPERVISOR'S DECLARATION

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Bachelor of Computer Science (Software Engineering)

(Supervisor's Signature)

Full Name : DR. AWANIS BINTI ROMLI

Position :

Date :

(Co-supervisor's Signature)

Full Name :

Position :

Date :



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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

(Student's Signature)

Full Name : NUR HIDAYAH BINTI BAHARIM

ID Number : CB15115

Date : MAY 2019

THE DEVELOPMENT OF E-PROFILING WEBSITE IN SUPPORTING SOCIO-
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NUR HIDAYAH BINTI BAHARIM

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ABSTRAK

Manusia memegang ciri-ciri keperibadian yang berlainan yang bertindak secara berbeza. Menurut Ernest Tupes dan Raymond Christal, terdapat lima (5) model keperibadian yang dipanggil OCEAN yang mewakili Keterbukaan, Kesedaran, Sosial, Ketulusan dan Neuroticism. Setiap personaliti mempunyai kriteria yang berbeza dan penjelasan khusus terhadap tingkah laku mereka. Oleh itu, keperibadian yang berbeza ini membina kepelbagaian yang luar biasa dalam organisasi. Kebelakangan ini, terdapat beberapa isu yang timbul dalam organisasi misalnya, miskomunikasi di kalangan rakan sekerja, salah tanggapan, diskriminasi, pengurangan produktiviti kerja dan kurang kepuasan kerja berlaku kerana mempunyai norma personaliti yang berbeza dan pilihan laluan kerjaya yang tidak menepati kriteria. Oleh itu, tujuan penyelidikan ini adalah untuk membangunkan laman web e-profil mudah alih dalam menyokong sosio-literasi untuk sebuah organisasi yang berdasarkan kepada premis bahawa jika pengalaman daripada keperibadian pengguna dapat ditangkap dalam beberapa bentuk yang berguna, alat ini dapat mencadangkan penyelesaian dalam mempunyai interaksi yang baik di dalam organisasi. Oleh itu, penyelidikan ini akan melaksanakan teknik CBR yang dapat memberikan penyelesaian untuk meningkatkan hubungan antara rakan sekerja dan membimbing kakitangan untuk memoles, memantau dan meningkatkan kekuatan setiap individu secara khusus dan organisasi secara holistik. Pendekatan ini akan membantu pembuat keputusan organisasi dengan mencadangkan penyelesaian dalam menggunakan semula atau menyemak semula penyelesaian dari kes yang serupa dan dari pengalaman masa lalu mereka.

ABSTRACT

Human hold a different kind of personality type that act diversely. According to Ernest Tupes and Raymond Christal, there are big five (5) personality model called OCEAN which represents Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism. Each personality owned a different criteria and specific explanation towards their behavior. Thus, this different personality build a tremendous diversity in an organization. Recently, there are some issues arises in an organization for instance, miscommunication among colleague, misperception, discrimination, mitigation in work productivity and less job satisfaction occur due to have a different norm of personality and wrong choices of career path. Therefore, the aim of this research is to develop a e-profiling website in supporting socio-literacy for an organization which is based on the premise that if experiences from the user personality can be captured in some useful form, the tool will able to propose the solution in having good interaction inside the organization. Hence, this research will implement the Case Based Reasoning (CBR) technique that able to give a solution to improve the relationship between the colleagues and guide the staff to polish, monitor and improve the strength of each individual specifically and organization holistically. This approach will assist the decision-makers of the organization by propose the solutions in reusing or revising the solutions from similar cases and from their past experiences.

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LIST OF ABBREVIATIONS

AHP	Analytic Hierarchy Process
AI	Artificial Intelligent
CBR	Case Based Reasoning
DFD	Data Flow Diagram
ERD	Entity Relationship Diagram
KYPT	Know Your Personality Type
LAN	Local Area
PHP	Hypertext Preprocessor

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Social issue is a major problem that happens among society that can be described as a group of people that share the same geographical state or territory that evolve an interaction, behaviour, traditions, education and the same political authority. Meanwhile proficiency itself illustrate a person's ability, skills, expertise or the quality inside him/her. Therefore, Socio-proficiency here means an organisation or community that possess any skills or particular ability that can sharpen their quality and competency. This quality and competency can be measure through an individual personality that describe what type of person according to some behaviour. Psychologist theorized that people create and choose experiences or situations to satisfy their individual needs, thus it is often related to their personalities (Qiu, Chen, Ramsay, & Lu, 2019). Personality can be seen as a motors that drives an individual behaviour in order to given out feedback towards the other people and to deal with the situation (Bailey, 2014), for example in a workstation.

In an organisation or a company, there will be a large number of people with a numerous kind of personality, behaving diversely, think and feel differently. Besides, the role of personality in the workplace somehow, important since different personality illustrate an individual different character that bound a different skill and ability (Psych Tests AIM Inc, 2012). It is important for the employer to observe and record the level of proficiency of the employee through their personality type so that during the recruitment or training session they can be sorted into a specific job scope or department that suits them. Thus, in this study has proposed e-profiling for an organisation to observe and record the personality of the employee and how different personality going to communicate and cooperate with each other effectively and efficiently. Communication

style is denote by the way an individual attempt to involve in the communication, how the way they tend to relate with one another and how the message are typically interpreted because different personality types generates and communicate information differently (Humanmetrics, 2018). Therefore, the aims of this study to develop an e-profiling website that provides society a guide line about their personality type to sharpen their skills, strengthen their career path and improve the relationship among society through communication strategies.

The mobile web refers to the use of the internet through handheld mobile devices such as smartphone (e.g. iPhone, Android and Blackberry). Generally, mobile application has made life hassle free where human can access any information at anywhere and anytime without needing of difficulties. Besides, mobile application is growing fast with no sign of slowing down (Rakestraw, 2013). The growth of mobile application has begun tremendously as it is clearly can give a vengeance of modernisation in the world nowadays where everything can be reach through a single touch that widen the prosperous of knowledge and human civilisation. Furthermore, mobile application can drive the society towards the implementation of the Smart Society 5.0, where human, technology and values are connected.

There is numerous existing application related to personality type test for instance, 'PersonalityMatch'. This application is designed to help people to discover their personality type and know better their personal relationship between partner and friends based on each personality type. Next example is 16Personalities. 16Personalities is a mobile-website platform that provide a personality test for the user to know their personality type. Besides, inspired by a modern psychological and social research dominant model, Big Five Personality Traits, this website defined the personality type by combining five personality aspect which are Mind, Energy, Nature, Tactics and Identity as technique to calculate and measure human personality traits and what kind of profession that suits the personality.

This study is aim to learn and analyse the type of human and how different type can interact effectively. Thus, a mobile application technology is proposed to help in enhancing socio-proficiency e-profiling. To analyse this human type, it can be solved by the Case-Based Reasoning (CBR) technique. CBR is an artificial intelligent (AI)

techniques that try to model or imitate human reasoning (decision making) and thinking with respectful cycles, which are retrieve, reuse, revise and retain.

1.2 PROBLEM STATEMENT

Steve Case once said, in a team, to get along with people it is important to understand that different people have a different strength, perspective and personality (Dibra, 2014). Despite Malaysia's first-class employment standards, many suffer from workplace discrimination in the public and private sectors (Lokman & Atikah, 2018). According to the head of Psychiatry Department at Universiti Kebangsaan Malaysia Medical Centre, Prof. Dr. Marhani Midin, bullying at the workplace involved victimisation or discrimination either physically or mentally that can harm the state of an employee (Baqiah, 2016). Bullying come in the forms of assigning the task which is out of the employee capability, belittling the capability of an employee or colleague, and else discriminate the workers until it is psychologically affected (Baqiah, 2016). This situation will mitigate the individual intense towards the work environment due to feel predispose from a victimisation. Thus, adversely affecting the productivity and the quality of work.

Recently, some issues such as discrimination, workplace bullying, mental and physical abuse, working-time arrangement, role's conflict and poor psychosocial job has become a factors of poor work quality performance (Bubonya, Cobb-clark, & Wooden, 2017). Therefore, this scenario has leads to a propagation of counterproductive behaviour such as lateness, reduce personal productivity and absence in a workplace. Absenteeism is the failure of self-report towards the scheduled work which is costly to the employers in the terms of lost productivity in the organisation (Bubonya et al., 2017). Many factors that influenced the absenteeism in a workplace such as illness, feel predispose from a victimisation, lack of job motivation, low intense towards the working atmosphere and undesired towards overflowed the job satisfaction. Stability of absenteeism over time across the changing atmosphere may be the part of due to its enduring personality based determinants (Ones, Viswesvaran, & Schmidt, 2003). Thus, it causes a mitigation of work productivity that affect the operating system in an organisation.

REFERENCE

- 16Personalities. (2018). personality test. Retrieved from <https://www.16personalities.com/>
- Aamodt, A., & Enric Plaza. (1994). Case-Based Reasoning: Foundational Issues, Methodological Variations, and System Approaches, 7, 39–59.
- Adil, T., Izhar, T., Torabi, T., & Bhatti, M. I. (2017). Using Ontology to Incorporate Social Media Data and Organizational Data for Efficient Decision - Making, (February).
- Aziz, A., Ahmed, S., & Khan, F. I. (2019). An ontology-based methodology for hazard identification and causation analysis. *Process Safety and Environmental Protection*, 123, 87–98. <https://doi.org/10.1016/j.psep.2018.12.008>
- Bailey, S. (2014). Can Personality Predict Performance ? *Forbes*. Retrieved from <https://www.forbes.com/sites/sebastianbailey/2014/07/08/can-personality-predict-performance/#1ad4e1245499>
- Baqiah, S. (2016). ‘I am bullied at my workplace.’ *The Star Online*. Retrieved from <https://www.thestar.com.my/news/nation/2016/05/05/i-am-bullied-at-my-workplace/>
- Bubonya, M., Cobb-clark, D. A., & Wooden, M. (2017). Mental health and productivity at work : Does what you do matter ? *Labour Economics*, 46(September 2016), 150–165. <https://doi.org/10.1016/j.labeco.2017.05.001>
- Chen, S., Yi, J., Jiang, H., & Zhu, X. (2016). Ontology and CBR based automated decision-making method for the disassembly of mechanical products. *Advanced Engineering Informatics*, 30(3), 564–584. <https://doi.org/10.1016/j.aei.2016.06.005>
- Dibra, S. (2014). Understanding Different Personality Types: Communicating Effectively in the Workplace. Retrieved from <https://blog.worldcampus.psu.edu/2014/07/understanding-different-personality-types-communicating-effectively-in-the-workplace/>
- Humanmetrics. (2018). Communication Strategies for Different Personality Types. Retrieved from <http://www.humanmetrics.com/personality/communication-strategies-for-different-types>
- Lokman, T., & Atikah, Q. (2018). Workplace woes: Worplace discrimination is common in Malaysia. *New Straits Times*. Retrieved from <https://www.nst.com.my/news/exclusive/2018/01/329441/workplace-woes-workplace-discrimination-common-malaysia>
- Nag, A. (2016). 16 Factors that Lead to Poor Performance at the Workplace. Retrieved from <https://blog.commlabindia.com/elearning-design/negative-performance-factors>

- Ones, D. S., Viswesvaran, C., & Schmidt, F. L. (2003). Personality and Absenteeism: A Meta-Analysis of Integrity Tests. *European Journal of Personality, 17*(SPEC. 1).
<https://doi.org/10.1002/per.487>
- Pantic, M. (2014). Syllabus Case-Based Reasoning, (course 395).
- PersonalityPerfect. (2018). Personality Match. Retrieved from
<https://app.personalityperfect.com/#>
- Psych Tests AIM Inc. (2012). Hiring : Risk-taking , Charismatic and Goal-oriented Leader – Why Understanding Personality in the Workplace is Important. *Arch Profile*.
- Qiu, L., Chen, J., Ramsay, J., & Lu, J. (2019). Personality predicts words in favorite songs. *Journal of Research in Personality, 78*, 25–35. <https://doi.org/10.1016/j.jrp.2018.11.004>
- Rajasekar, S., & Philominathan, P. (2006). Research methodology, 1–53.
- Rakestraw, T. (2013). The mobile apps industry: A case study. *Journal of Business Cases and Applications, 9*, 26.
- Roepe, L. R. (2017). Why People go Job-Hopping. Retrieved from
<https://www.ozy.com/acumen/why-people-go-job-hopping/82328>
- Simmons, B. L. (2010). Employee Withdrawal: A big reasons you need to care about Job Satisfaction. Retrieved from <http://www.bretlsimmons.com/2010-09/employee-withdrawal-a-big-reason-you-need-to-care-about-job-satisfaction/>
- Soto, C. J. (2018). Big Five personality traits, (March).
- Wilt, J., & Revelle, W. (2019). The Big Five, everyday contexts and activities, and affective experience. *Personality and Individual Differences, 136*(December 2017), 140–147.
<https://doi.org/10.1016/j.paid.2017.12.032>
- Zia, S. S., Akhtar, P., Hussain, R., & Mala, I. (2014). CBR: Cycle, framework and applications. *World Applied Sciences Journal, 32*(7), 1349–1355.
<https://doi.org/10.5829/idosi.wasj.2014.32.07.489>