

Enhancing the Implementation of Cloud-Based Open Learning with E-Learning Personalization

Nungki Selviandro^{1,2}, Mira Suryani², Zainal A. Hasibuan²

¹Faculty of Informatics Telkom University, Indonesia

²Faculty of Computer Science University of Indonesia, Indonesia

nselviandro@telkomniversity.ac.id, mira.suryani@ui.ac.id, zhasibua@cs.ui.ac.id

Abstract — Indonesia is a developing country that began to utilize information technology in education. A form of its implementation is the use of e-learning. However, in practice there are still some obstacles, such as learning resources are not evenly distributed, limited access to services provided, qualified educators resources are concentrated in specific areas. This led to the emergence of disparities educational process, and technology gap due to differences in ICT infrastructure owned by any educational institution.

Therefore this study proposes architecture of cloud-based open learning to solve these problems. The term open learning is used in order to encouraging the development of the concept of Indonesia Open Educational Resources (IOER) and as well as the adoption of concept of cloud computing. There are several phase that we conducted in this research such as analysis, design, implementation, testing, and evaluation phase. The design of the proposed architecture consists of six layers: (1) Infrastructure, (2) Platform, (3) Application, (4) Service, (5) Access, (6) User. As a result of the implementation from this architecture is a prototype of Indonesia - Virtual Open Learning System (iVOLS).

In experiment, personalization e-learning runs as a service that need large storage and other shared facilities to conduct the program so the system can delivered different learning materials to different learners. The e-learning personalization in cloud environment classified successful if the learners got the best performance on learning and it shown by their evaluation score. Based on the test results and evaluation showed that the availability on Cloud-Based Open Learning further meet user needs. This is indicated by the presence of a simple infrastructure services, application services with just one stage and the availability of a wider range of data and the resource sharing. In accessibility, Cloud-Based Open Learning provides easy access to the user. By economically, the result of evaluation showed that Cloud-Based Open Learning has an investment of 35.61% efficiency, increase Return On Investment (ROI) of 60.95% and Net Present Value (NPV) of 81.97% from the user's perspective. While from the provider's perspective, Cloud-Based Open Learning has an investment of 200% efficiency, increase Return On Investment (ROI) of 220.4% and Net Present Value (NPV) of 109.55%.

Keyword—Cloud Computing, E-Learning, Indonesia Open Educational Resources, Personalization.



Nungki Selviandro was born in Curup, Indonesia in 1988. He received bachelor's degree in Computer Science from University of Indonesia, Indonesia, 2011, and master's degree also in computer science from University of Indonesia, Indonesia, 2013. Currently, he is a lecturer at Faculty of Informatics Telkom University. His research interests include cloud computing, e-Learning, information system, and software engineering.



Mira Suryani was born in Bandung, Indonesia in 1989. She received bachelor degree in Computer Science Education from Education University of Indonesia, Indonesia, 2011, and master's degree in Computer Science from University of Indonesia, Indonesia, 2014. Currently, she is a research assistant in research laboratory at Faculty of Computer Science, University of Indonesia. Her research interests include digital library, e-learning, information system, information retrieval, and software engineering.



Prof. Zainal A. Hasibuan, Ph.D. was born in Pekanbaru, Indonesia in 1959. He received BSc. degree in Statistic from Bogor Institute of Agriculture, Indonesia, 1986, MSc. and PhD in Information Science, Indiana University, in 1989 and 1995 respectively. Currently, he is a lecturer and PhD supervisor at Faculty of Computer Science, University of Indonesia. He is also the Head of Digital Library and Distance Learning. His research interests include e-Learning, Digital Library, Information Retrieval, Information System, and Software Engineering.