Open Learning Optimization Based on Cloud Technology: Case Study Implementation in Personalization E-learning

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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 an 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. This research through several phases of research including analysis, design, implementation, testing and evaluation. The design of the proposed architecture consists of six layers: (1) Infrastructure, (2) Platform, (3) Application, (4) Service, (5) Access, (6) User. As results 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 personalization e-learning in cloud environment successed when 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 an increase in benefits (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 an increase in benefits (NPV) of 109.55%.

Keyword— **E-Learning, Indonesia Open Educational Resources, Open learning, Cloud Computing**

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