

# Cloud Computing Implementation Strategy for Information Dissemination on Meteorology, Climatology, Air Quality, and Geophysics (MKKuG)

*Sardjoeni Moedjiono, Budi Luhur University, Jakarta, Indonesia*

*Ali Mas'at, Agency of Meteorology, Meteorological, Climatology, and Geophysics (BMKG),  
Indonesia*

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## ABSTRACT

*Cloud computing technology utilizing virtual server facility of the Internet services in order to maintain or process the data and applications, will revolutionize the way of how the information systems work in organization due to the simplification of the information technology (IT) management and services by working remotely. The Indonesian Agency of Meteorology, Climatology, and Geophysics (BMKG) as a government institution has the responsibility to disseminate the information of Meteorology, Climatology, Air Quality, and Geophysics through its technical implementation unit (UPT) throughout Indonesian region. An integrated cloud computing technology implementation strategy for MKKuG dissemination information system is needed for BMKG dissemination systems best service, cutting edge technology, and sustainable to its users. This research will use the Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis and the Analytic Network Process (ANP) with Super Decision Software as a tool to determine the need. A cloud computing technology implementation strategy is achieved and presented with four best alternatives, namely the development of a web centre, implementation of virtual hosting concept, procurement of network infrastructure, and ICT development program.*

*Keywords: Analytic Network Process (ANP), Cloud Computing Technology, Infrastructure-as-a-Service (IaaS), Meteorology-Climatology-Air Quality-and Geophysics Dissemination Systems (MKKuG Dissemination Systems), Platform-as-a-Service (PaaS), Software-as-a-Service (SaaS), Strengths-Weaknesses-Opportunities and Threats Analysis (SWOT Analysis)*

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## 1. INTRODUCTION

In order to prepare the IT strategy and policy development plan based on its vision and mission, BMKG is looking deeply for equity factor where using the IT to improve quality of public services. To achieve the IT effective implementation target, BMKG needs to improve the computerization, human resources capacity, education and training at the same time. The reason for this is if the users have the technology knowledge concerning the IT services, it is believed that the optimal IT implementation will be achieved.

BMKG as a government institution has the responsibility to disseminate information of Meteorology, Climatology, Air Quality and Geophysics. Furthermore, BMKG has the task to make the data and information available and disseminate to institution interfaces and public concerning the early warning caused by weather, climate, air pollution and earthquake factors.

Due to the frequent occurrences of natural disasters in Indonesia, people realize the importance of MKKuG information. People becoming more critical demanding to obtain MKKuG information fast, precise, accurate, understandable and comprehensively be able to reach anyone in Indonesia. The presentation of weather and earthquake information on websites as one of the dissemination modes will facilitate the rapidness of dissemination of weather, climate and earthquake information.

BMKG website containing MKKuG information, as one of the service tools and dissemination modes meant to reach worldwide users through the Internet. Currently, there are many websites available at BMKG Headquarters and its technical implementation unit (UPT) which are working as sub-units. The internet-based website facility is expected to ease the public to acquire BMKG information. However, many websites and dissemination servers generate a lack of coordination among websites in BMKG working environment. Another obstacle is each the technical implementation unit (UPT)'s website is different in terms of design, domain, and contents. Based on this working environment,

BMKG has to facilitate the hosting websites for purposes of each UPT. The purpose of this paper is to find the alternatives and concepts of the implementation strategy of cloud computing technology at BMKG dissemination system, so that in the future BMKG can provide the best service at cutting-edge technology and sustainable to its users.

## 2. CLOUD COMPUTING TECHNOLOGY

Cloud computing technology utilizes Internet connection using a virtual server centre in order to maintain or process data and applications <sup>[1]</sup>. The cloud computing technology will revolutionize the way of how the systems work in organization's information technology. It is due to the concept of cloud computing that able to significantly reduce the cost of information technology implementation by simplifying the management of IT services by working remotely. Simplifying the management of IT services is available and can be accessed from the Internet and the physical location of the servers which can be reached anywhere, not necessarily on-premise or at each data centre. Nowadays, there are several organizations that provide various types of cloud computing services and physical computing resources located in their data centres.

### 2.1. Cloud Computing Service Models

Service models provided by cloud computing can be divided into three main categories (Spinola, 2009) namely (Figure 1):

- a. Software-as-a-Service (SaaS).

Software-as-a-Service is the first most cloud computing popular service. This service is a further evolution of the application service provider (ASP) concept. According to its name, SaaS makes users easier to utilize the software resources by subscription method. It doesn't

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