

# THE DESIGN OF SPACE WEATHER INFORMATION SYSTEM APPLICATIONS FOR ANDROID OPERATING SYSTEM

Rizal Suryana  
National Institute of Aeronautics and Space (LAPAN)  
[rizal@bdg.lapan.go.id](mailto:rizal@bdg.lapan.go.id)

## ABSTRACT

At this time the development of information and communication technology is very rapidly, an information delivery through all media such as internet, television, newspaper, radio, short message service, and mobile phone without unobstructed distance and time. Space weather information is very important, delivery of an information requires a media that easy can be access, very past without unobstructed distance and time. Information and communication technology are a media most effective, because almost everyone has been a communication mobile device such as a mobile phone or smartphone. The communication mobile device needed software to be able to access of space weather information, where the software will be development to running mobile phone or smartphone that use android operating system. The software will always be connected to the Internet for getting space weather information, an information are available on the server <http://foss.dirgantara-lapan.or.id>. Space weather information can be accessed consist of solar activity, geomagnetic and ionosphere. This application will allow users smart phones that use an android operating system in accessing of space weather informations.

**Keywords:** android, information system, space weather

## 1. INTRODUCTION

An information system is any combination of information technology and people's activities using that technology to support operations, management (Robert J, 2003) in a very broad sense, the term information system is frequently used to refer to the interaction between people, algorithmic processes, data and technology. In this sense, the term is used to refer not only to the information and communication technology (ICT) an organization uses, but also to the way in which people interact with this technology in support of business processes (Kroenke, 2008). Some make a clear distinction between information systems, and computer systems ICT, and business processes. Information systems are distinct from information technology in that an information system is typically seen as having an ICT component. It is mainly concerned with the purposeful utilization of information technology. Information systems are also different from business

processes. Information systems help to control the performance of business processes (O'Brien, 2003).

Space weather describes the condition in space that effect Earth and its technological systems. Our space weather is as a consequence of the behavior of the sun, the nature of Earth's magnetic field and atmosphere and our location in the solar system (Committee, 1997). Effect of space weather can occur on space system and ground systems. Effect of space weather on space system such as spacecraft anomalies, spacecraft orbit changes and effect of radiation on humans in space. Effect of space weather on ground system such as disruption of GPS and other spacecraft signals, disruption of long distance radio signals, effect of radiation on humans at and near ground level, electrical transmission, geophysical exploration, hydrocarbon production and terrestrial weather. Effect of space weather the performance and reliability of

technological systems in space and ground based. Physical phenomena variations related with of space weather such as geomagnetic storms and sub-storms, the energy to Van Allen belts to be able to cause aurora, Geomagnetic induce current in the earth's surface, as well as changes condition in ionosphere that can cause disorders communication and navigation.

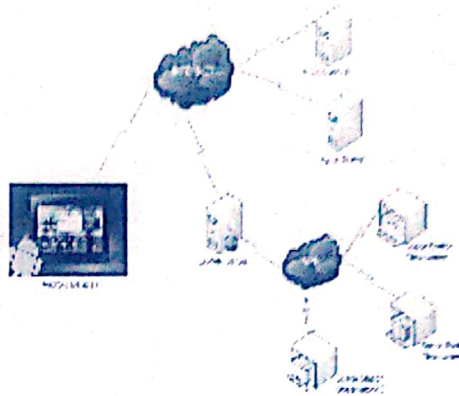
Deployment of an information can be provide to newspapers, magazines, TV, radio, journal, proceedings, short message service (SMS) and Internet. Internet is an application information and communication technology, where growth rapidly. World internet usage until march 31 2011 are 2.095.006.005 (Internet world stats) and in Indonesia is 39.6 millions of users, Hand phone or mobile phone usage in Indonesia until 2007 is 69 millions of users, with show the data internet usage so provide an information to internet is very effective. An information of space weather is very important for provide to people's because effect of space weather can be losses economic and social human. A hand phone or smart phone accessed information necessary a software application. Software application is junction between users and server for get information.

This paper porpuse to make the design application information system of space weather, its application will be running on an hand phone or smart phone using android operating system. Android is very famous an operating system for mobile device such as smart phones and tablet computers, it is developed by the open handset alliance led by Google (Google, 2011). The reason an application information system of space weather will develop on an android are for easily users accessed information without a limited time, distance, communication devices and make your hands information.

## 2. DATA AND METHOD

An information space weather will given an information such as Solar activity,

Geomagnetic field, Ionosphere. An information provided about the solar activity consist of solar X-ray flux, proton flux, electron flux and sunspot number. An information provided about the geomagnetic field consist of KP index, Dst



Index and Magnetometer. An information provide about the Ionosphere consist of the foF2, Spread-F and E layer Sporadic. All the data provide in information system source from NOAA, Kyoto and station observation space at LAPAN.

Figure 1. The concept connection an Application to Server

LAPAN Server (Server information system) collected the data space weather form NOAA server, Kyoto server through internet connection and virtual private network (VPN) for connected to server station observation space. After collected the data, server information system doing the data processing, it perform to determine current condition of space weather, data update and data management. Android device can be doing connection to server information system at LAPAN through Internet, where the server will reply any request with sending information to user according to demand. The connection between android device with the server information system using Port 80 in Transmission Control Protocol and the Internet Protocol (TCP/IP), Port 80 call the Hypertext Transfer Protocol (HTTP). The Hypertext Transfer Protocol (HTTP) is a networking

protocol for distributed, collaborative, hypermedia information systems (fielding, 1999). HTTP is the foundation of data communication for the World Wide Web. The standards development of HTTP has been coordinated by the Internet Engineering Task Force (IETF) and the World Wide Web Consortium (W3C), culminating in the publication of a series of Requests for Comments 2616 (RFCs), which defines HTTP/1.1, the version of HTTP in common use.

### 3. RESULTS AND DISCUSSION

An information is four modules such main module, solar activity module, geomagnetic field modules and ionosphere module. The main module contains the solar activity monitoring, which display the current condition space weather today and description of space weather and indicator condition space weather.

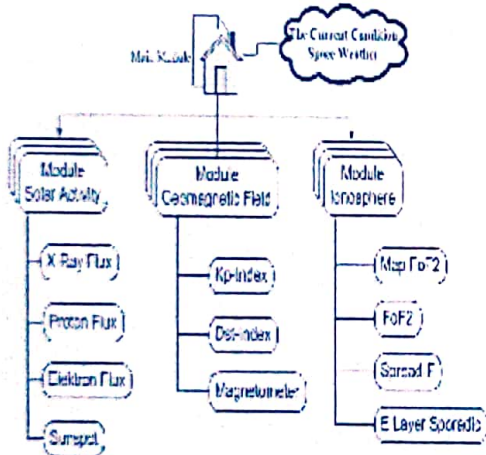
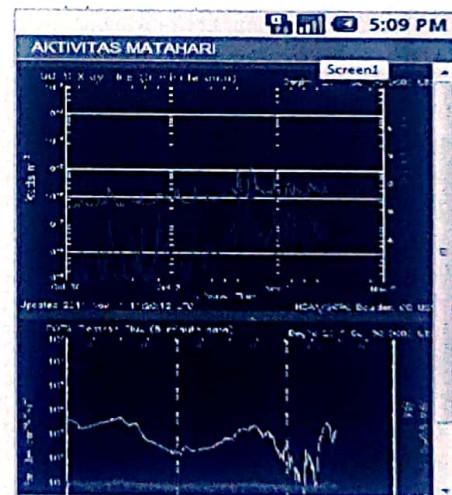
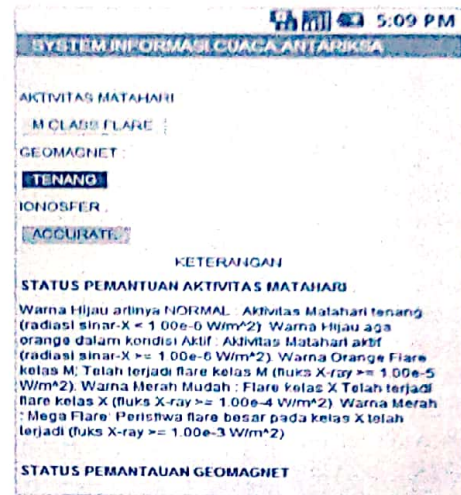


Figure 2. Design Information System

Each module contains the data of Space Weather, the data that contained in each modules is the results plotting. Each condition of space weather to give symbol color, for solar activity green color is normal, yellow is active, orange is M class flare, red is X class flare and red and text yellow is Mega flare. Symbol color for the geomagnetic field is black color is quiet, orange is active or unsettled and red is storm. Symbol color of the Ionosphere is

green color is accurate value, yellow is A-blanketing by Es, B-absorption; D-upper limit of frequency range, E-lower limit of frequency range, F-spread echoes, G-too small ionization density, S-interference, X-deduced from the x-component and red is C-operational problem.



(a)  
(b)

Figure 3. 3a is The Main Module, 3b is The Module Solar Activity

When an Android device is execute the application information system of space weather, then the application will request to the server <http://foss.dirgantara-lapan.or.id>, then the server responds to the

request and sending the data according to demand. The data send to android device is the current condition of status space weather as seen in figure 3a. User can see detail data related to solar activity, geomagnetic field and ionosphere by click on the button status and the results as shown in figure 3b.

#### 4. CONCLUSION

Development information and communication technology is specially mobile phone can be easy in dissemination of information to all level of society. Dissemination of information space weather can be accessed wherever, whenever, whoever and no limited on computer device. Peoples can determine the condition of space weather at any time, so the information in your hand. The data contained in the information system is always updated every 5 minutes, so an information contained its real time the condition of space weather.

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