

**ANALYSIS ON THE BEHAVIOR OF WIRELESS SENSOR NODE
THROUGH TEST-BED IMPLEMENTATION**



**RESEARCH MANAGEMENT INSTITUTE (RMI)
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR
MALAYSIA**

BY :

**YUSNANI MOHD YUSSOFF
HUSNA ZAINOL ABIDIN
RUHANI AB RAHMAN
FAEIZA HANUM YAHAYA**

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BAHAGIAN G : ABSTRAK PENYELIDIKAN – Tidak Melebihi 200 patah perkataan

Wireless Sensor Networks (WSN) has fundamentally different architecture than normal wired data networks. They are highly constrained in resources, have multi-hop wireless connectivity and form Ad hoc networks with random deployment in possibly unmanned terrain. The sensor nodes are usually scattered in a sensor field. Each of the sensor nodes has the capabilities to collect data and route the data back through a multi-hop hybrid wireless communication. The design of sensor network is influenced by many factors including scalability, operating system, fault tolerance, sensor network topology, hardware constraints, transmission media and power consumption. The assessment of performance in wireless sensor network is generally difficult since mathematical models are based on assumptions and simplifications. In order to develop an appropriate protocol for a given application, appropriate network conditions must be used and metrics of the intended WSN application must be taken into consideration. Network (wireless and wired) currently fully depend on infrastructure to enable the communication. An alternative method for these issues is wireless sensor network that utilize Ad hoc network communication characteristics. Test bed implementation is a must before studies or applications development in wireless sensor network can be initiated. This project will concentrate on setting up a working wireless sensor network test bed that will have the capabilities to transfer data and communicate with each other and with a central server.

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5.3 Introduction

Wireless Sensor Network (WSN) are a trend of the last few years due to the advances made in the wireless communication, information technologies and electronics field [1]. The developments of low-cost, low-powered, multifunctional sensors have received increasing attention from various industries [2]. WSN is a wireless network composed of autonomous and compact devices called sensor nodes or motes. A sensor network is designed to detect desired phenomena, then collect, process the data and transmit this information to users. Sensor nodes or *motes* in WSNs are small sized and are capable of sensing, gathering and processing data while communicating with other connected nodes in the network, via radio frequency (RF) channel. The sensor nodes scattered in a sensor field where each sensor nodes collects data and route the data back through a multi-hop hybrid wireless communications. The design of the sensor network is influenced by factors including scalability, operating system, fault tolerance, sensor network topology, hardware constrains, transmission media, and power consumption [3]. Fig. 1 shows the topology of Wireless Sensor Networks.

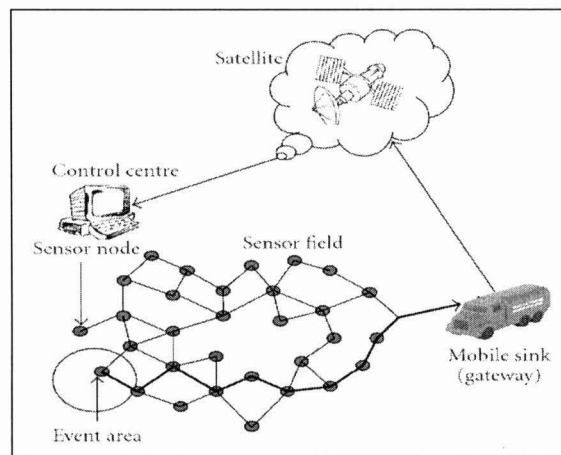


Figure 1 Wireless Sensor Networks

Exists currently two kinds of sensor used in the network. One is the normal sensor node deployed to sense the phenomena. The other is a gateway node that interfaces sensor networks to the external world. Sensor such as magnetometer, accelerometer, light and temperature are among the types of sensor being used depending on the application. As presented in Fig.2, the system architecture of a sensor node consists of