the effect of doping which conform to theory. Thus, for circuit miniaturization purposes, PNZT is preferred due to the higher permittivity. Transmission lines of length of 100 mm and width 5 mm were constructed on these films in microstrip and co-planar waveguide forms. For this purpose, short-open-load-thru (SOLT) calibration technique was implemented prior to insertion loss measurement. The results indicate that the performance of microstrip and co-planar waveguide were dependent on both the structure and the films used. Specifically, PZT-based coplanar waveguide showed slightly higher insertion loss than microstrip. On the contrary, PNZT-based co-planar waveguide and microstrip show comparable performances. This was probably due to the higher crystallinity showed by PNZT. Detailed analysis of the test structures using electromagnetic simulations reveal the loss was mostly caused by the impedance mismatch between the transmission line and the wafer probes. Extensive characterization at microwave frequencies carried on these films show that they are good candidates for use in MMIC. These appeared to be direct correlation between film property and high frequency behavior. The films exhibited considerable loss at high frequencies as expected of ceramic films.

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Wireless Sensor Networks (WSNs) have shown great promise as the emerging technology for data gathering from unattended or hostile environment. The advancement in micro-electro-mechanical sensor technology, wireless communication technology and the recent scavenging energy have gradually expanding the acceptance of WSN related applications. The design of sensors that are small, low cost, low power and combined with its unattended nature has made it more viable and indirectly promotes its popularity for future solutions in various real-life challenges. One of the most challenging yet important security issues in Wireless Sensor Network is in establishing trusted and secured communication between sensor node and base station. While the term trusted has been widely used referring to valid nodes in the group, this thesis refer the term trusted based on Trusted Computing Group (TCG) specifications. With limitations in the present solutions such as late discovery of invalid nodes such in Trust Management System and high energy consumption with external security chip due to the used of Trusted Platform Module chip; a Framework of a Trusted Wireless Sensor Node is presented. The framework incorporates ideas from TCG and Identity-based cryptosystem by Boneh Franklin to ensure trusted and secured communications between sender and receiver which might be between sensor node and base station or between sensor nodes in the network. The research aim to come out with a credential based trusted sensor network to verify the authenticity of sensor nodes in the network. Finally the proposed trusted framework is evaluated for the potential application in resource constraint devices by quantifying their power consumption on selected major processes. The result proved the proposed scheme can establish trust in WSN with less computation and communication and most importantly eliminating the need for neighbouring evaluation such in Trust Management System or relying on external security chip. Finally, proposed works benefit in eliminating clone or duplicated nodes in the WSN thus reduced the number of false and unwanted messages in the Wireless Sensor Network.

This thesis proposes a new power tracing technique using computational intelligence approach for non discriminatory losses charge allocation and voltage stability improvement. Contrary to conventional techniques which mainly rely on matrix operation, the proposed algorithm implements optimization technique as an alternative for performing the tracing process. At first, in producing a good optimization algorithm, a hybridization technique was proposed for adopting the finest features of two different algorithms; namely the Genetic Algorithm (GA) and continuous domain Ant Colony Optimization (ACOR). The hybrid algorithm is termed as the Blended Crossover Continuous Ant Colony Optimization (BX-CACO). It was found that performing power tracing via BX-CACO produced...
reliable tracing results as it is free from assumption like proportional sharing principle (PSP). Without treating the power system to be lossless, the tracing results are based on actual system condition; which means that they are consistent. Despite BX-CACO required computation time during optimization process, it is still within tolerable range. In addition, the proposed technique was able to promote fair losses charge allocation by involving imaginary consumers other than generation companies (GENCOs) and distribution companies (DISCOs); where, not all conventional tracing techniques include such consideration in their pricing scheme. Subsequently, the developed tracing algorithm was modified in the context of stability index tracing. At this stage, the limited application of power tracing in the field of power system economics was enhanced for the purpose of voltage stability improvement. By utilizing the Fast Voltage Stability Index (FVSI) as the index to be traced, the proposed stability index tracing is called \textit{FVSI}-Tracing (FVSI-T); which consists of two schemes namely \textit{FVSI}-Generation Tracing (FVSI-GT) and \textit{FVSI}-Load Tracing (FVSI-LT). From both schemes of FVSI-T, a ranking list indicating the priority of buses to be performed any countermeasures against voltage instability was derived. Contrary to conventional techniques such as sensitivity analysis and stability index approach, the derived ranking list consists of two types of locations ranked based on their priority; which are bus and line. In addition, the ranking list derived from BX-CACO-based-FVSI-T is available at any system conditions and includes all possible sources and sinks that also participate in the system. This highlights its merit over conventional ranking techniques. After experiment and comparative studies, it was justified that the derived ranking list gave reliable signal for satisfactory and consistent voltage stability improvement in the problem of generation power dispatch, placement of compensating devices, and load shedding. Regardless of the change in system condition, the derived ranking list from FVSI-T resulted in steady trend of voltage magnitude and consistent losses reduction as compared to conventional methods. Eventually, in providing an effective load shedding scheme with reliable amount of load power to be shed, an intuitive Fuzzy Inference System (FIS) was designed using FVSI as the criterion when designing its membership functions and rules. Through experiment, the proposed method resulted in the most consistent voltage stability improvement over other methods as both FIS and the derived ranking list are based on FVSI.

Existing content delivery strategies by incumbent service providers in Malaysia suppress new innovative value-added services as it eliminates opportunities for open partnership between network operators and third-party service providers. This creates a high barrier of entry of delivering new services that will substantially address the demand pull for high quality contents by TV and broadband subscribers in Malaysia. Process innovation in the content delivery strategies impacting current business model of high speed broadband service delivery in Malaysia will be analyzed. This involves exploring contributing factors that affect the broadband and broadcast service providers’ Quality of Service (QoS) and the subscriber Quality of User Viewing Experience (QoE). This research analyzes the quality of the existing service delivery, reviewing the various content delivery methods and analyzing the Open Access network policies that advocates the participation of multiple service providers. This research also reviews the different types of multi-play services to subscribers which liberate them from proprietary contents and services. The cross section, ex post facto, formal empirical study involved interviewing 232 respondents whom are subscribers of the present broadband and broadcast service providers in the Klang Valley. The statistical analysis includes factor analysis, descriptive statistics, and frequencies, Cronbach Alpha Coefficient, Eigen values, Pearson’s correlation, t-test and One-way ANOVA tests and multiple regression using enter method. The main findings of the study are: Implementing Fiber to the Home network with Open Access Policy will substantially improve the subscribers Quality of viewing experience and the service providers’ quality of service delivery; successful Implementation of Open Access Policy in a high speed broadband environment in Malaysia requires incorporating a set of effective content delivery strategies and improving existing services by introducing elements of subscriber preference properties; these delivery strategies include incorporation of value-added services, content management and personalization and integrating current services into the open system environment and quality of existing services includes incorporating subscriber preference level of current services. The research study is concluded by listing known limitations and recommending future research.

**Title**

Effective Content Management And Delivery Methods Using Open Access Strategy

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