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This Dissertation Is Submitted In Partial Fulfillment Of Requirements For The Degree Of Msc In Computer Science.

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## Synopsis

Expert systems as a topic in Artificial Intelligence (AI) is faced with a lot of unrealistic expectations in technology development today. AI is basically an attempt to build computer software that perform intelligently, with the purpose of emulating human intelligence. An expert system is precisely a computer program that represents and reasons with the knowledge of some specialist subject with a view to solving a problem or giving advice. The focus of expert systems is on knowledge rather than search techniques and computational logic which were the original AI concepts of problem solving. Expert systems (ES) or knowledge systems have attained a permanent and secure role in industry. Specifically, ES are increasingly being deployed in the following roles: assistants to human operators; autonomous decision-making components of complex systems; generators, critics, and evaluators of configured information structures such as designs, plans, and schedules; and finally, provision of advisory services.

This study provides an overview of expert systems: the theory underlying expert systems design, like the acquisition and representation of knowledge and inference mechanisms, the uses of expert systems, some case studies of some expert systems in use: their successes and failures, general problems and limitations of expert systems, and the study ends with a design of the prototype version of an expert system for the design of an electrical power distribution system. Chapter 1 is an introduction to the theory underlying expert systems design. Chapter 2 presents a review of some existing expert systems, their applications, successes, problems and limitations. Chapter 3 deals with the design of the prototype version of the electrical power distribution system, using an expert system shell called VP-expert. Chapter 4 is the conclusions to the study and also states some problems and limitations encountered, and recommendations for future development of this system.