Chapter 8 - Conclusions and final remarks

The hypothesis of this study was set as:
"It is possible to provide an interface to a knowledge base where domain experts can develop and maintain their knowledge that serves as an input to the expert or intelligent component of an Intelligent Decision Support System."

The objectives were partially met:

1. An Intelligent Decision Support System (IDDS) or Knowledge-Based Decision Support System (KB-DSS) was prototyped using ILOG JRules that has the following features or capabilities:
   - The **expert is able to maintain** his knowledge in the knowledge base. ILOG JRules have different builder launchers displaying rules in different modes as interfaces to the knowledge base. Depending on the skill of the rule administrator or course domain expert, the modes will be suitable to specify and maintain the expert's knowledge. A programmer/builder is needed to create the objects shared by the application and the rules of the knowledge base as well as the user or decision-maker's interface.
   - The knowledge is kept as objects and **decentralised** rules. The rules can be developed independently of other experts, in a decentralised way, and is stored in a separate rule set that is not dependant on the rule sets of other experts, to be invoked when needed. A specific **DSS simulation model** was created to assist the decision-makers: the students, to reach a well-informed decision.
   - The KB-DSS can run as an applet on the **web** and provides the decision-maker with multiple **alternatives** to choose from, presenting explanations and suggestions. This contributes to the **effectiveness** of the DSS by constantly **explaining** its actions.
   - A **data component** can extract details from the university's database supplying information to the DSS intelligent component.
2. Maintenance of the knowledge in the knowledge base will not cause a new release of the IDDS application and thus ensures productivity, providing changes to the rules did not involve structural changes to the objects used in the rules. Once a new update has been done, a new student will invoke the latest updated file.

Domain experts can maintain their knowledge in a knowledge base, providing that the objects and attributes used in the rule base were specified by a builder/programmer. Having the expert maintain his own rule sets, decentralised from the other experts and separately from production, places the responsibility of the rules where it belongs: with the expert. At the same time, the expert is alleviated from numerous identical queries to focus on situations where his expertise is really needed. As the expert captures his knowledge by additional rules in the knowledge base, he will find more and more

time to focus on the non-routine tasks that requires his expertise , and when he leaves the company, the knowledge will remain, resulting in a win-win situation.

Decision Support and Expert Systems are matured fields of study with limited developments. Some developments were discussed in Paragraph 1.1 (p1). The advice system could possibly be developed as an intelligent agent supplying recommendations to other systems used by the university where selection of new courses for the current semester is appropriate. A learning component can adjust the advice system's knowledge base by comparing its suggestions with the final confirmed decision of the decision worker. A business object model (BOM) can be developed to be used with the builder interfaces provided with ILOG JRules to specify an even simpler business action language linked with the objects used in the environment. Specifying this BOM could result in a simpler, more natural way of expressing the rules that would allow the rule administrator as a course-skilled domain expert to develop his own rules without the assistance of the builder/programmer.

As technologies develop, Decision Support and Expert Systems or Intelligent Systems can be revisited to improve the decision-making processes by including these newer technologies.