Available online at www.sciencedirect.com
SCIENCE DIRECT®
Decision Support Systems 41 (2006) 532–541
Decision Support Systems
www.elsevier.com/locate/dsw

IPManager: a microcomputer-based DSS for intellectual property management

Chuda Basnet[a,*], L.R. Foulds[a], Warren Parker[b]

[a]Department of Management Systems, University of Waikato, Private Bag 3105, Hamilton, New Zealand
[b]AgResearch, Ruakura Research Centre, Hamilton, New Zealand

Received 1 April 2003; accepted 1 May 2004
Available online 27 September 2004

Abstract

We describe a decision support system (DSS) that was developed for the management of the costs associated with the payment of fees to protect the intellectual property (IP) of organizations involved in research and development. IPManager is a decision support system that the authors developed to aid managers of IP in creating or improving IP registration and maintenance strategies and to enable them to use their experience and preferences. The system is currently in use at AgResearch, which is a New Zealand-based institute conducting research into agriculture. A case study is reported discussing the decision environment that motivated the development of the system.

Keywords: Intellectual property management; Decision support; Prototyping

1. Introduction

As the largest Crown Research Institute in New Zealand, AgResearch provides knowledge and best practice technology to pastoral agricultural industries. A strong focus on biotechnology and ecotechnology seeks to provide integrated life science solutions that create value for stakeholders and customers, wealth for New Zealand, and better health for all. At the beginning of 2000, 835 permanent staff operated from the Ruakura (Hamilton), Grasslands (Palmerston North), Wallaceville (Upper Hutt), Lincoln (Christchurch), and Invermay (Dunedin) campuses of AgResearch. Revenue for the year to June 2000 was $106 million. While contract research and development remains the cornerstone of AgResearch's business, a major imperative is to evolve into a life sciences company providing value-added high margin products and subsequent greater returns to New Zealand. This is to be achieved by increasing revenue through the acquisition or development and delivery of new products and technologies.

This strategy necessitates the creation of new agricultural products whose related intellectual property (IP) ownership by AgResearch must be protected

* Corresponding author.
E-mail address: chuda@waikato.ac.nz (C. Basnet).

0167-9236/$ - see front matter © 2004 Elsevier B.V. All rights reserved.
doi:10.1016/j.dss.2004.05.014

by patents, trademarks (TMs), and plant variety rights (PVRs).

AgResearch (Ruakura) required a decision support system that would improve the organization's management of the costs it periodically incurs in maintaining its IP rights. We describe here the decision environment involved and also the development and use of the DSS, called IPManager, that was constructed for this purpose. A literature review of current research into the management of intellectual property is provided in the next section. In Section 3, we discuss the use of the DSS as an operations research (OR) tool. In Sections 4 and 5, we discuss the decision environment at AgResearch and IPManager. In Section 6, a description of the development process and a discussion of the impact of the DSS is presented. We end the paper with some overall conclusions and a summary in Section 7.

2. Literature on intellectual property management research

Recently the World Intellectual Property Organization agreed to decrease patent registration fees [12]. The decreases were approved unanimously by all 171 member countries. Zarocostas [12] provides details on the amount the fees were decreased, including information on discounts for electronic applications. On a worldwide basis this news, along with the growing privatisation of research and development, has been a factor in the increasing number of patent registration applications. As research into the IP registration process is scarce, we provide only a brief overview of current research in this area. Beggs [2] explains the use of royalty payments, rather than fixed fees, in the licensing of patents in the presence of asymmetric information. Bousquet et al. [4] made the first formal study of risk sharing as a major rationale for the financial arrangements between a patentee and a licensee. The authors examine a particular, but empirically meaningful, class of license contracts consisting of a fixed fee, a per unit royalty, and an ad valorem royalty. The analysis proceeds by simulation in order to characterize the optimal license contracts. Lanjouw [9] has derived empirical estimates of the private value of patent protection for four technologies: computers, textiles, combustion engines, and pharmaceuticals; using new patent data for Germany. It is assumed that patent-owners must pay renewal fees to keep their patents in force, as well as legal expenses in order to enforce them. We now go on to discuss the DSS approach to management issues, of which IP fee management is an example.

3. The decision support system as an aid to OR practice

The decision support system (DSS) has emerged as a computer-based approach to assisting decision makers to address semi-structured problems by allowing them to access and use data and analytic models [11]. DSSs are interactive computer-based systems aimed at semi-structured problems, utilising models with internal and external databases, and emphasising flexibility, effectiveness, and adaptability. These characteristics have guided much of the research in the DSS area, but the potential benefits of the DSS in the business environment are yet to be fully realized. Nevertheless, many successful DSS applications have been reported in the literature [1,5,10] Most of these applications are either large-scale systems built to facilitate well-defined and repetitive decision tasks, or else they are small PC-based systems offering quick and economic routines to support one-time decision making [7]. Although the definition of the DSS concept has been elusive [3,6], the field has flourished with the development of computer technology. Keen [8] reviewed a decade of DSS development and concluded that there is a need for a balance between each of the three DSS elements: decision, support, and systems. He felt that more research effort on the decision component was required to restore this balance, as the technology for the system component was no longer a bottleneck. To achieve "the mission of the DSS- to help people to make better decisions", Keen stressed the need for an active supporting role for "decisions that really matter". We now focus on the decision component of the DSS.

Many DSSs have the basic structure that is illustrated in Fig. 1. The model and solution technique bases are included to incorporate mathematical programming (MP) techniques. Clearly, they could include all appropriate models and their companion solution techniques that may be useful in order to gain