

A Hybrid Legal Expert System

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Except where otherwise indicated, this thesis is my own original work.

Thomas Alexander O'Callaghan
14 February 2003

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Introduction

Legal expert systems are the nexus of Artificial Intelligence and the law. A legal expert system is “a system capable of performing at a level expected of a lawyer” [Pople 1996, page 3]. Legal expert systems may be designed for use by legally trained people or for use by the general public (“lay-people”).

Legal expert systems designed for use by legally trained people aim to provide a method of speeding-up the provision, and improving the accuracy, of legal research undertaken with the aim of advising the client. Designed for use by legally trained people, these systems may assume general legal knowledge. Consequently the questions asked by the system and the reports returned may be stated at a level appropriate for legally trained people.

The primary benefit of this category of legal expert system is the reduction of internal cost of legal research. The flow-on benefits for clients reductions in the cost of legal services and consequently improved access to quality representation, and reduction of the time taken to resolve a legal question.

Legal expert systems designed for use by lay-people aim to provide greater access to the law. This category of legal expert system is more difficult to create because no legal knowledge by the user can be assumed. The discovery of the facts of the case becomes problematic [Susskind 2001]. More research is required in the area of fact elicitation before such systems become viable. Once they are viable, access to the law should be dramatically improved. A consequential benefit may be a reduction in litigation, as potential litigants could settle their dispute by reference to the advice of a legal expert system. However, such a system would raise an important ethical question — the creators of such a system may be usurping the role of the courts in that the public may come to rely on the statements by the system as “what the law is”.

SHYSTER-MYCIN is the legal expert system created for and discussed in this thesis. SHYSTER-MYCIN combines rule-based reasoning with case-based reasoning. The system is designed as the first category of legal expert systems described above: a legal expert system to be consulted by legally trained people. This hybrid system enables the case-based reasoner to determine open-textured concepts when required by the rule-based reasoner, MYCIN.

The system operates on a reduced version of the *Copyright Act 1968*, including cases that define the term “authorization” (see Chapter 2). The Act is reasoned by a system of rules. Whereas cases are reasoned by analogy. This approach is supported

by jurisprudential discussions on legal reasoning (see Chapter 3).

The system was created in three progressive versions (Chapter 5). The focus of the creation of the system was the reporting of reasons for conclusions. The second and third versions were tested against three criteria: validity, conciseness and correctness (see Chapter 6). The system performed well (see Chapter 7) against those criteria, indicating that the approach taken is appropriate: that is, it is appropriate to use rules to reason with statutes and analogy to reason with cases.

The Legal System

I now provide a legal framework upon which my expert system is constructed. This enables the expert system to be aligned with an expert's reasoning, producing a rational and justifiable expert system. To this end I present the sources of law and the methods of arguing about that law.

2.1 The Structure of Government in Australia

The structure of government in Australia is based upon the doctrine of the separation of powers, and is consequently similar to that of England. The separation of powers doctrine (as proposed by Montesquieu [1748]) was based upon an idealised, rather than an accurate account of the government of England. The doctrine claims that "good" government is achieved by separating the legislative, executive and judicial arms of government. The pure form of the doctrine requires that no one person or body should control more than one arm of government. The purest form of the doctrine can be found in the United States of America [Carvan 2002], with a more relaxed approach taken in Australia and England.

The legislative arm of government holds the power to make laws. In Australia this power is exercised by various parliaments. The parliaments may only operate within the limits of their constitutions. The parliaments may also delegate, to other bodies or people, their power to make laws.

The executive arm of government executes and administers the laws created by the legislative arm and exercises some powers of its own. The executive consists of ministers of the Crown, who are also members of parliament. It is here that the doctrine of the separation of powers is not strictly followed in Australia.

The judicial arm of government has the power to determine the meaning of, and enforce the application of, laws both created by the legislative arm, and those developed within the courts. The judicial arm consists of a hierarchy of courts, with the judiciary appointed by the executive. In Australia the judicial arm also has the power to examine the constitutionality of laws created by the legislative arm. This has led some to view the High Court as the peak of government in Australia. For example, in the Boyer Lectures in 2000 Chief Justice of the High Court, Murray Gleeson, used Alfred Deakin's description of the High Court as "the keystone of the federal arch"

[McGuinness 2000]. McGuinness claims that Chief Justice Gleeson is “one of those who is making appointments to the court the most glittering prize of the political contest.”

In Australia, the government is further divided between the federal government and state and territory governments. The Constitution sets out the powers that the Commonwealth Government has, with the states having the residual power. The legislatures in the territories exercise power delegated by the Commonwealth parliament, which retains the power to override territory legislation.

The bodies that control each of the three arms of government are present at both the Commonwealth level and in each state and territory. Although they appear replicated, there is no redundancy, as the arms of government at different levels concern themselves with different subject matter.

The Queen is represented at both the federal and state levels of government. At the State level the Queen is represented by Governors, and at the Federal level by the Governor-General. Theoretically, Governors and the Governor-General take their place above each of the three arms. The powers Governors and the Governor-General hold are far reaching, but by constitutional convention, only nominal. By convention, Governors and the Governor-General must act only on the advice of their Ministers. These Ministers are selected from the party or grouping that holds a majority in the lower house of Parliament.

2.1.1 The Structure of the Courts

The judiciary within the states, territories, and at the federal level operate within courts that exist in a hierarchy. This hierarchy is useful in determining how influential a previous decision of the, or another, court is to the present case. The hierarchy is also used to specialise the subject matter of some courts, and to provide maximum claim limits. This hierarchy is displayed¹ in Figure 2.1.

2.1.1.1 The State/Territory Judicial Hierarchy

As seen in Figure 2.1, the court hierarchies in the states and territories are similar. However, the states have two extra levels in their hierarchies. These are the State Tribunals and the Intermediate Courts (the County or District Courts). The latter of these sits between the Minor Courts and the Supreme Court.

The territories and states also differ on where appeals from their Supreme Court Court of Appeals are heard. In the states, appeals are made to the High Court, whereas the appeals from the Supreme Court Court of Appeals in the territories are heard by the Full Court of the Federal Court, and then appeals from there are made to the High Court.

Previously appeals could be made from the State Supreme Courts to the Privy Council (the highest court in Great Britain), however, since the *Australia Act 1986* (Cth), appeals to the Privy Council have been abolished.

¹Taken from Aitken and Orr [2002].

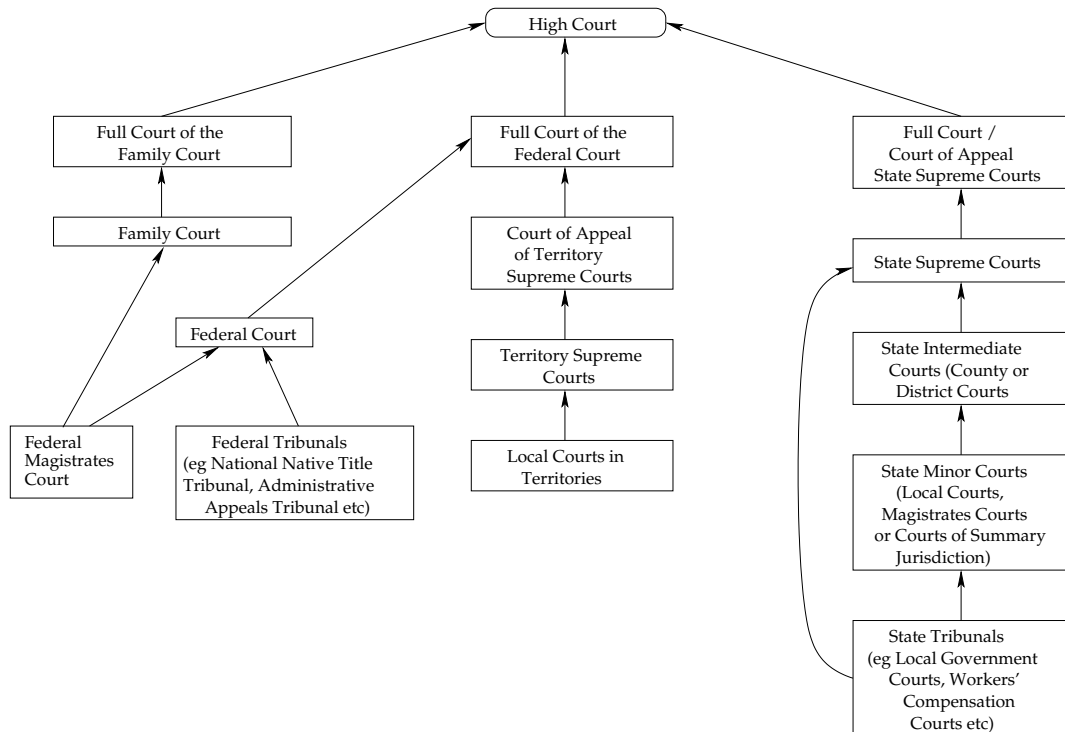


Figure 2.1: Summary of the Australian Court System

2.1.1.2 The Federal Judicial Hierarchy

The federal judiciary is divided into two main areas: family law, and other matters of Commonwealth law (eg bankruptcy, copyright, patents, trade marks, breaches of the *Trade Practices Act* and some industrial matters [Carvan 2002]).

In the area of family law, the lowest court is the “Federal Magistrates Court”. Whilst not previously part of the federal judiciary, this court has been given jurisdiction over most family law matters except for divorces. The reason for the inclusion of the Federal Magistrates Court is to provide greater geographic and timely access to the Family Court, which sits above the this court. Appeals from the Family Court of Australia are heard by the Full Court of the Family Court, and from there by the High Court of Australia.

For the other areas of Commonwealth law, the Federal Court of Australia is typically the first court. However, some matters may begin in a tribunal, and have an appeal brought to the Federal Court. Appeals from the Federal Court are heard by the Full Court of the Federal Court, and from there to the High Court of Australia.

The High Court of Australia is therefore the highest court in both the Federal and State or Territory systems of government.

2.2 Legal Disputes

Legal disputes only arise when parties that have in some way interacted with one-another disagree about the meaning of the law that applies to them, or perhaps even whether that law does apply to them. If they agreed on the applicability of the law and its meaning, there would obviously be no dispute.

The reasons for disagreements about meaning and applicability may be numerous. However, one, and perhaps the ultimate, reason for disagreement is that natural languages are inherently imprecise. Hart [1994] terms this imprecision the “open-texture” of language:

[U]ncertainty at the borderline is the price to be paid for the use of general classifying terms in any form of communication concerning matters of fact. Natural languages like English are when so used irreducibly open-textured.

When attempting to determine the law, its meaning and its application in relation to a particular dispute, there are three methods of reasoning that may be employed. These three methods are: deduction, analogy and induction.

Deduction involves taking a rule and applying it to the given facts to determine what the conclusion or outcome should be. Take for example the rule “no vehicles in the park, penalty \$100”. If it is established that the given object is a vehicle, and it is determined who was responsible for placing it in the park, then they can be given the penalty of a \$100 fine. Deduction is therefore used whenever applying statute-based law. It is also used once generalisations are created through the process of induction. The “rules” induced are applied to the present case.

Deduction requires the careful definition of each term in the rule, and the careful application of that construction to the facts of the case. Thus with rules, the process of construction allows the rules to take on a variety of meanings. The court must decide which construction of the meaning of a rule is the true or correct construction.

Analogy is the comparison of one case with another case or group of cases. The process of analogy involves attempting to liken the facts of one case to the facts of a previously decided case or cases. If the present case is considered to be sufficiently similar to a previously decided case, then the outcome of the previous case should be the outcome of the present case.

Analogy can provide conflicting possible results. Take for example the rule that was used to explain deduction above. Now suppose that there have been two cases of a car owner and truck owner who both drove through the park and were fined the \$100, and there has been a case of a bicyclist who did not have to pay the fine for riding her bike through the park. Suppose that the present case involves a motorbike being ridden through the park. By analogy the motorbike can be likened to the car and the truck as it has a combustion engine and is capable of high speed. This would mean the rider was liable to pay the \$100 fine. However, the facts of the present case could be said to be analogous with that of the bicyclist, in that the motorbike is two-wheeled, light weight and nimble. This would result in the rider not being liable for

the fine.

Induction is the process of creating a general statement or rule that can explain the outcome of a case or a number of cases. The process of induction may either be undertaken to create a rule for use in determining the outcome in a case under consideration, or it may be undertaken in an attempt to create a rule to give certainty to the outcome in possible future cases. That is, whilst the process is the same, the claims about the usefulness of the result vary. In the first circumstance, the result of the induction is applicable to the case presently under consideration, as this was the goal of the induction. The more bold claim is to assert the possession of an ability to state a rule that would apply to all future cases.

The process of induction is now explained using the example by Calleros [1994, page 120ff]. Suppose a court is asked the question of whether a warrant is required to search a motor home that parked on the street in a residential neighbourhood. Supposing that there were four previous cases that permitted warrantless searches of the following vehicles: a car on a highway, a delivery truck in a private driveway, a family van in a shopping centre parking lot, and a four-wheel drive truck on unpaved desert. A general or common reason for the decisions in these cases may have been that because each vehicle was mobile and subject to administrative regulation a warrantless search was permitted. Therefore, in the case before the court (the motor home), the court would apply the rule induced from the previous cases to hold that, since the motor home is a vehicle that was mobile and subject to administrative regulation, a warrantless search is permitted.

However, Calleros demonstrates that another line of authority may exist, permitting a logically valid contrary rule to be induced. Supposing that there were four previous cases that did not permit warrantless searches of the following dwellings: an unattached house on its own lot, a rented unit of an apartment complex, a weekend cabin in the mountains, and a natural cave on private land used as a dwelling. A generalisation that may arise from these cases is that warrants were required because of the expectations of privacy within a dwelling is so high. This rule which has been generalised or induced is contrary to the one induced from the other group of cases, and would have the opposite outcome for the case presently before the court.

With both the processes of analogy and induction contrary outcomes may both seem logically possible. To handle conflicting lines of legal authority, the judiciary adheres to the principle of precedent which guides the court as to which cases should have more authority. A detailed discussion and comparison of the processes of legal reasoning can be found in Chapter 3.

2.2.1 The doctrine of precedent

From the brief outline of the three forms of legal reasoning, it can be seen that a variety of conflicting outcomes for a case may all be arrived at logically. To select an appropriate line of authority, the courts use the “doctrine of precedent”. At a practical level, the doctrine provides a method of deciding how binding or applicable a previously decided case is, based upon which court decided that case. At a policy level, the

doctrine provides certainty, equality, efficiency, and the appearance of justice (in the sense that the law is seen to be consistently done).

The hierarchy of the courts is important to the doctrine of precedent. Where in the hierarchy a decision is made governs how much precedential value it has for the present case in the court in which it is being heard.

Cook, Creyke, Geddes, and Holloway [2001] have summarised the general rules of precedent:

- each court is bound by decisions of courts higher in its hierarchy;
- a decision of a court in a different hierarchy may be of considerable weight but will not be binding;
- only the *ratio decidendi* (the judge's decision on the material facts) of a case is binding;
- any relevant decisions, although not binding, may be considered and followed; and,
- precedents are not necessarily abrogated by lapse of time.

The doctrine of precedent developed because of the ideal that like cases are decided alike. The Full Court of the Federal Court in *Telstra Corporation v Treloar* [2000] FCA 1171 at para 23 describe the policy reasons for following the doctrine of precedent (or *stare decisis*):

The doctrine of *stare decisis* takes its name from the Latin phrase '*stare decisis et non quieta movere*' which translates as 'stand by the thing decided and do not disturb the calm'. It is a doctrine based on policy. The rationale for the doctrine can be grouped into four categories: certainty, equality, efficiency and the appearance of justice. *Stare decisis* promotes certainty because the law is then able to furnish a clear guide for the conduct of individuals. Citizens are able to arrange their affairs with confidence knowing that the law that will be applied to them in the future will be the same as is currently applied. The doctrine achieves equality by treating like cases alike. *Stare decisis* promotes efficiency. Once a court has determined an issue, subsequent courts need not expend the time and resources to reconsider it. Finally, *stare decisis* promotes the appearance of justice by creating impartial rules of law not dependent upon the personal views or biases of a particular judge. It achieves this result by impersonal and reasoned judgments.

Wasserstrom [1961, page 61] contends that whilst the doctrine of precedent is good, it does not provide certainty. Wasserstrom states that "predictability, rather than certainty, is the characteristic alluded to ... the antecedent possibility of *predicting* judicial decisions is the virtue most often attributed to a precedential decision process".

Wigmore [1920, page 79] claims that certainty is not the product of the doctrine of precedent: “Our judicial law is as uncertain as any law could well be. We possess all the detriment of uncertainty, which *stare decisis* was supposed to avoid, and also all the detriment of ancient law-lumber, which *stare decisis* concededly involves — the government of the living by the dead, as Herbert Spencer has called it.”

Aside from issues of whether the doctrine of precedent provides what it claims, it is a doctrine that is followed by the judiciary of Australia and a number of other countries. The importance of the doctrine of precedent to the present work is that it is used as a method of selecting the line of authority to be used to predict the outcome of a case.

2.3 Copyright Law in Australia

As with most of the law in Australia, copyright law finds its origins in England. In England prior to 1709 the Stationers’ Company (a guild of illuminators, bookbinders and booksellers) held a monopoly over the printing of books. The first protection that existed was the simple right to prevent unauthorized copying of books. Only members of the guild were able to register and receive a copyright (which was perpetual). These rights could also be traded. This right was extended to the prevention of importation of books. The prevention of importation provided economic benefit to the Stationers’ Company ensuring its monopoly. The Tudor and Stuart monarchs were able to use the prevention of importation of books as a method of censorship.

In 1709, the Statute of Anne changed the nature of copyright to protect the interests of authors; however, publishers still stood to benefit the most from copyright protection. The Statute of Anne was entitled an “Act for the Encouragement of Learning and for securing the Property of Copies of Books to the Rightful Owners Thereof”, and provided the author of a published book with the right to prevent unauthorized copying for up to 28 years. Authors could assign this right to a publisher, therefore copyrights could be traded.

In reaction to the Statute of Anne, the Stationers’ Company attempted to claim that the members of the guild still held a perpetual copyright at common law². The House of Lords held that if there had been a common law copyright, the Statute of Anne now governed the law of copyright (*Donaldson v Beckett* (1744) 4 Burr 2408; 98 ER 257). This marks the establishment of copyright as only subsisting by virtue of statute (continued by s8 of the *Copyright Act 1968 (Cth)*).

Until 1911, 15 different statutes extended the protection of copyright to include material other than books, such as musical, artistic and dramatic works. The *Copyright Act 1911 (UK)* was enacted to repeal the Statute of Anne and subsequent legislation, and to provide a single statute from which copyright was created.

²Whilst an act of Parliament may confer rights, it does not necessarily remove rights that previously existed in the Common Law. That is, rights at common law are those that are observed to be protected by previously decided cases.

In Australia initially the colonies enacted copyright statutes. When Australia was federated, the Commonwealth Parliament was given the power to make laws in respect of copyrights under s51(xviii) of the Constitution. The colonial statutes were thus subsumed by the *Copyright Act 1905 (Cth)* and again by the *Copyright Act 1912 (Cth)*, which simply declared that the *Copyright Act 1911 (UK)* was in force in Australia. Currently the *Copyright Act 1968 (Cth)* governs the law of copyright in Australia. The Act continues to be amended to reflect changes in technology, affecting the definitions of works or other subject matter in which copyright can subsist.

2.3.1 Subsistence of Copyright

Copyright protects the expression of ideas, rather than the ideas themselves. Copyright in Australia only subsists by virtue of the *Copyright Act 1968 (Cth)*, s8. The Act only protects “certain types of subject matter in a material form that has been created by a qualified person (as defined by the Act) or published in Australia” [McKeough et al. 2002, page 45]. The Act only requires that these criteria be met for the owner of the copyright to obtain certain exclusive rights (for a limited time). There is no registration process.

The types of subject matter that the Act protects are divided into “works” and “subject matter other than works”. “Works” are “literary, dramatic, musical or artistic works” (s10). “Subject matter other than works” are “sound recordings” (s85), “cinematograph films” (s86), “television broadcasts and sound broadcasts” (s87), and “published editions of works” (s88).

Copyright will only protect an expression once it is reduced to material form. Section 22 states that a work is “made” once it is “reduced to writing or some other material form”. How subject matter other than works is made is also covered in s22. In s10 the Act defines “material form” to be “any form (whether visible or not) of storage from which the work ... can be reproduced”. For example when someone says something they cannot claim copyright in relation to that expression. If however, the person writes down what they were to say, they would be able to protect that expression under the *Copyright Act*. Alternatively if the person recorded what they said, they would have copyright to the (invisible) recording of their speech and to the content of that speech.

Works must be created by a qualified person for copyright to subsist (s32(1) and (2)). A “qualified person” means “an Australian citizen, an Australian protected person or a person resident in Australia” (s32(4)).

A “qualified person” in relation to subject matter other than works means (s84):

- (a) an Australian citizen, an Australian protected person or a person (other than a body corporate) resident in Australia; or
- (b) a body corporate incorporated under a law of the Commonwealth or of a State.

Subject matter other than works can either be created by a qualified person or published. Sound recordings, films or broadcasts must be either made by a qualified

person (ss89(1), 90(1) and 91(1) respectively), or the recording, film or broadcast be made in Australia (ss89(2), 90(2) and 91(2) respectively), or the first publication of the recording, film or broadcast was made in Australia (ss89(3), 90(3) and 91(3) respectively). In the case of published editions of works, copyright subsists where the first publication of the work takes place in Australia, or where “the publisher of the edition was a qualified person at the date of the first publication of the edition” (s91(1)).

2.3.2 Exploitation of Copyright

By virtue of the *Copyright Act* certain exclusive rights may be protected in relation to particular subject matter for finite lengths of time. The rights in relation to works are as described in Table 2.1 (taken from McKeough, Bowery, and Griffith [2002, pages 45–46]).

Literary, dramatic and musical works	Artistic works
s31(1)(a)(i) to reproduce the work in material form	s31(1)(b)(i) to reproduce the work in material form
s31(1)(a)(ii) to publish the work	s31(1)(b)(ii) to publish the work
s31(1)(a)(iii) to perform the work	—
s31(1)(a)(iv) to communicate the work to the public	s 31(1)(b)(iii) to communicate the work to the public
s31(1)(a)(vi) to make an adaptation of the work	—
s31(1)(a)(vii) to do in relation to an adaptation any of the acts mentioned in (i) to (iv)	—
s31(1)(c) (where the work is other than a computer program) to enter into a commercial rental arrangement in respect of the work reproduced in a sound recording	—
s31(1)(d) in the case of a computer program, to enter into a commercial rental arrangement in respect of the program	—

Table 2.1: Rights in Respect of Works

In relation to subject matter other than works, the exclusive rights as described in Table 2.2 are protected (again, taken from McKeough, Bowery, and Griffith [2002, pages 46]).

The duration of most of these exclusive rights is for a period up to 50 years from the end of the calendar year in which the author died; for the others, it is 50 years from the end of the calendar year in which publication occurred.

Sound Recordings	Cinematograph films	Television and sound broadcasts	Published editions
s85(1)(a) to make a copy of the sound recording	s86(a) to make a copy of the film	s87(a) in the case of a television broadcast, in so far as it consists of visual images – to make a film of the broadcast, or a copy of the film	s88 to make a facsimile copy of the edition
s85(1)(b) to cause the recording to be heard in public	s86(b) to cause the film, in so far as it consists of visual images, to be seen in public, or in so far as it consists of sounds, to be heard in public	s87(b) in the case of a sound broadcast, in so far as it consists of sounds – to make a sound recording of the broadcast, or a copy of the sound recording	–
s85(1)(c) to communicate the recording to the public	s86(c) to communicate the film to the public	s87(c) to rebroadcast it or communicate it to the public other than by broadcasting it	–
s85(1)(d) to enter into a commercial agreement in respect of the recording	–	–	–

Table 2.2: Rights in Respect of Subject-Matter Other Than Works

The rights as listed above may be traded by the owner(s) of the subject matter. The owner is able to sell a licence to all or part of any of the rights that protect the use of the work. The money received by the owner from such a licence is called a royalty. The owner is also able to completely transfer ownership of a single or multiple rights to another person.

2.3.3 Infringement of Copyright

Infringement of the copyright occurs when a person exercises a right they do not own. The copyright subsisting in a work or other subject matter may be infringed by the use of it in its entirety, or by the use of a substantial part of it (s14(1)(a)), in the process of exercising an associated exclusive right. Infringement of the copyright in a work or other subject matter may either be direct or indirect.

Direct infringement means the doing of any of the acts (listed above), without a licence, that the owner is exclusively entitled to enjoy. Direct infringements do not require knowledge of the copyright, or intention to commit the wrongdoing (see for example *Andritz Srout-Bauer Australia Pty Ltd v Rowland Engineering Sales Pty Ltd* (1993) 28 IPR 29).

On the other hand, “certain other ‘indirect’ infringements do require actual or constructive knowledge of wrongdoing” [McKeough and Stewart 1997, page 190]. Forms of indirect infringement are: importing infringing articles into Australia for trade (ss37 and 102), when such articles are sold or otherwise traded (ss38 and 103), or when an infringing public performance of a work is allowed to be performed in a place of public entertainment (s39(1)).

Section 13(2) establishes that the exclusive right to perform any of the acts in relation to a work or other subject matter includes the right to authorize such acts. Therefore to authorize an infringement of the copyright is an infringement itself. Sections 36(1) and 101(1) confirm that the authorization of an act without ownership or licence is an infringement. The topic of authorization forms the case-based content of the knowledge-base for SHYSTER-MYCIN.

The term “authorization” is undefined in the *Copyright Act*. Consequently a number of cases have been before the courts seeking answers as to what conduct amounts to authorization. The main contexts in which the issue has arisen are: “home taping of recorded materials, photocopying in educational institutions and performing works in public” [McKeough et al. 2002, page 198].

Attempts have been made to hold the makers and suppliers of copying equipment and blank media liable for authorization of infringements of copyright. These attempts have, so far, been unsuccessful. The reason for the makers and suppliers of the copying equipment and blank media not being held liable is the lack of control that they can exercise over the use of their equipment and/or media once it is sold. The attempts to hold the makers and suppliers liable have come from the entertainment industry. Whilst the entertainment industry may believe their interests are in conflict with the electronic equipment industry, they are really in an interdependent relationship, as described by Lord Templeman in *CBS Songs Ltd v Amstrad Consumer Electronics Plc* (1988) 11 IPR 1 at 3:

Without the public demand for entertainment, the electronic industry would not be able to sell its machines to the public. Without the facilities provided by the electronic equipment industry the entertainment industry could not provide entertainment in the home, and could not, for example, maintain orchestras which fill the air with 20th century cacophony or make gratifying profit from a recording of a group without a voice singing a song without a tune.

University of New South Wales v Moorhouse (1975) 133 CLR 1 is the leading Australian case on the topic of authorization, and dealt specifically with the issue of photocopying in educational institutions. The university was held to be liable for authorizing infringements of copyrights by providing [at page 22] “an unqualified supply

of books and photocopying machines". It was held that the provision of the books and photocopying machines was [at page 22] "an invitation to users of the library to make such use of the machines by photocopying of the books or substantial portions thereof as they saw fit." It was further held that whilst the university provided these machines, they made no attempts to prevent infringements from occurring by supervising the use of the machines. As a result of *Moorhouse*, s39A was introduced into the *Copyright Act 1968* to excuse a library from being liable for authorizing infringements, so long as a notice is near the machine bringing the relevant provisions of the Act to the attention of the user.

Clubs and other venues may be held directly liable for infringements of copyright when the infringer is an employee (as the actions of the employee are vicariously the actions of the employer). However, the venues may also be liable for authorization of that infringement (whether the infringer is an employee or independent contractor). In *Australasian Performing Right Association Ltd v Jain* (1990) 18 IPR 663, the Federal Court held the venue where infringements had occurred to be liable for authorizing the infringements. Sheppard, Foster and Hill JJ held [at para 29] that "[i]t was within [the venue manager's] power to control what was occurring but he did nothing at all" and that because of this inaction, he was liable for authorizing the breach. Also, in *Australian Performing Right Association Ltd v Canterbury-Bankstown League Club Ltd* (1964) 5 FLR 415, it was held that a venue's management having, but not exercising, control over the works performed was sufficient to find that venue liable for authorizing the infringement.

Another issue that arose in recent years was that of authorization by Internet Service Providers. The *Copyright Amendment (Digital Agenda) Act 2000* (Digital Agenda Act) has now introduced sections to aid in the definition of "authorization" and establishes that the provision of internet services does not amount to authorization. The Digital Agenda Act "adopts the international consensus that communication carriers and internet service providers should not be liable for breaches of the transmission right when they are acting as providers of infrastructure. The person 'making' the transmission is to be the person responsible for its content" [McKeough et al. 2002, page 198]. Section 39B covers the transmission of works and s112E covers the transmission of other subject matter and both establish that simply the provision of a means of transmission is not an authorization of transmission.

Sections 36(1A) and 101(1A) provide guidance when determining if an act can be said to be an authorization of an infringement of an exclusive right. These new sections essentially codify the principles drawn from the leading Australian case, *University of New South Wales v Moorhouse* (1975) 133 CLR 1, as explained in the Explanatory Memorandum to the Copyright Amendment (Digital Agenda) Bill 2000. The facts to be considered in determining if there was authorization should include:

- (a) the extent (if any) of the person's power to prevent the doing of the act concerned;
- (b) the nature of any relationship existing between the person and the person who did the act concerned;

(c) whether the person took any other reasonable steps to prevent or avoid the doing of the act, including whether the person complied with any relevant industry codes of practice.

2.4 SHYSTER-MYCIN's Domain

For the purpose of testing SHYSTER-MYCIN the system will be given a knowledge-base that reflects the state of the law on authorization prior to the introduction of ss36(1A), 39A, 39B, 101(1A) and 112E. That is, as far as SHYSTER-MYCIN “knows”, there are no statutory guidelines for defining “authorization”; the definition of “authorization” can only be determined by reference to decided cases.

The reason for selecting the *Copyright Act* and the term “authorization” as the area of law for SHYSTER-MYCIN was because SHYSTER already “knew” about “authorization”. One of the four case areas that was written for SHYSTER is that of authorization (see Section 4.2.2). The reason for using the Act without the sections providing guidelines on the definition of “authorization” is that the case law specification that was written for SHYSTER was written prior to their introduction.

Furthermore, the case-base that the SHYSTER part operates on is limited to the law as at 1983 [Popple 1996, page 181]. The reason for this limitation in the new system SHYSTER-MYCIN is that the focus is on the construction of the MYCIN part, not the SHYSTER part. Consequently the extension of SHYSTER was beyond the scope of this thesis. The original reason for the limitation was stated by Popple [1996, page 181]: “[t]hree important authorization cases have been decided since then [1983], and they are used to test SHYSTER”.

Legal Reasoning

Susskind [2001, page 194] has criticised all developers of legal expert systems as failing to consider jurisprudence¹ in their construction. At best some attempted justification of their method after the construction of the system. Susskind suggests that jurisprudence should be the starting point for a legal expert system rather than merely a point of discussion after construction.

Whilst this may be a valid point, the works that Susskind suggests (Hart, Dworkin, Finnis or Raz) as starting points are not, at least immediately, useful. Jurisprudence almost solely deals with general questions such as “what is law?” and “what is good law”. The jurists have rarely studied the question of “how do we argue with law” or “how does a lawyer reason?” The answers or discussion on these questions must surely provide a more sturdy ground to begin the construction of a legal expert system than a theory of “what law is”. Chandler [1974] states that “[m]ore must be known about the mental operations a lawyer performs when engaging in case law research before the computer can be programmed to aid him to the full extent of its capacity”. Bing [1990] is in agreement: “[a] computer program for legal reasoning cannot be created without first characterising the task to be performed and the means by which the reasoning agent performs it”.

Although there is, by comparison with the entire field of jurisprudence, little discussion on the topic of legal reasoning, there is some that directly addresses it, and models of legal reasoning can be inferred in other works of jurisprudence. A number of these works are now discussed.

¹“The subject matter of jurisprudence, whether the discipline be classified as an art or science, is the nature of law and its working” [McCoubrey and White 1999, page 1]. Chinhengo [2000, page 2] notes the etymology of the word “jurisprudence” from its Latin roots — *juris* “of the law” and *prudens* “skilled” — and indicates this vague definition of the term has meant that over the years the term has taken on a number of different meanings. Chinhengo [2000, page 2] states that “jurisprudence may be said to involve the study of a wide range of social phenomena, with the specific aim of understanding the nature, place and role of law within society”. The two chief divisions of jurisprudential enquiry were defined by Austin [1832] as analytical and normative, addressing general questions of “what is law?” and “what is good law?” respectively.

3.1 Hart

Hart [1994]² paints a picture of a legal system that is heavily rule based. He claims that rules can be extracted from all cases, and that these are “as determinate as any statutory rule” [Hart 1994, page 135]. However, just prior to this statement, he concedes that this is “no authoritative or uniquely correct formulation of any rule to be extracted from cases” [Hart 1994, page 134]. It seems odd that two such contrary statements should be made one after another. Hart attempts to appease their differences by claiming that whilst “no authoritative or uniquely correct” rule exists, there is “very general agreement” [Hart 1994, page 134]; yet it still seems a leap of faith to then claim the “rule” as equivalent with those found in acts of a parliament. If the “general agreement” is such that the rule is so well defined and understood by all, then why is there litigation? In Hart’s world, in every dispute one party must already know they will lose.

Hart’s position is this: the law (both statute and cases) is entirely a body of rules. The rules are generally agreed upon yet not authoritatively correct. Hart believes rule-based reasoning to be appropriate for any source of law.

3.2 Wasserstrom

Wasserstrom [1961, chapter 2] characterises decisions as either being arrived at by a logical process or as arbitrary. For Wasserstrom, the only method of “logically” arriving at a decision is by deduction. Therefore, as the system claims to not be arbitrary, deduction is the method of reasoning with the law. Wasserstrom wishes that if the system is not logical, that it is made to be on utilitarian grounds.

By assuming deduction to be the only method of reasoning in law, Wasserstrom agrees with the eliciting of rules from cases.

3.3 Wahlgren

Wahlgren [1992] only considers the positivists and realists as the commentators on legal reasoning. That is, either law is a complete body of rules, or that decisions are only justified by rules, not made as a consequence of them. Wahlgren noticeably omits the possibility of reasoning by analogy or example.

Wahlgren does not provide his own conclusion about legal reasoning. Rather he only presents a survey of some work in the field. His conclusion may, however, be inferred by his citing [at page 273], without criticism, the work of Kowalski and Sergot [1985] in creating a rule-based legal expert system to operate on the British Nationality Act.³

²First published in 1961.

³This system made the bold claim that rules were sufficient to capture the meaning of the Act as the Act was newly enacted and therefore (according to Kowalski and Sergot [1985]), no cases affected the interpreting of any sections of the Act.

Thus it is assumed that Wahlgren views the law from the positivist standpoint. That is, rules can be elicited from cases.

3.4 Aarnio

Aarnio puts forward a view of legal reasoning in which induction is allowable, but it only provides prediction, not certainty. Aarnio contrasts law with nature, declaring that in nature there are “regularities, instances of invariability” which permit generalisation, whereas law is “volative, a result of human will” [Aarnio 1977, page 79] and consequently generalisations can never hold.

Aarnio explains [at page 79] the inability to generalise in law by an example of the localisation of any “rule”: “If a person, then, has checked cases *a*, *b*, *c* and *d* and has stated that legal principle N_i is expressed in all of them, this does not yet entitle him to claim that the principle is *general* in nature.”

Whilst Aarnio rejects the idea of declaring a rule “general in nature”, he believes that prediction is possible. When there are several cases all of which express the same rule, then the “possibility to draw up a plausible prediction *increases*” [page 256]. He does, however, deny the possibility of making a prediction or rule from a single case.

Although more cases give a better chance of defining a rule, Aarnio warns of Dray’s paradox [page 73]. Dray’s paradox is that “a law providing a historical explanation may be sufficiently comprehensive only when it contains such a large number of restrictive conditions that in the end it only concerns the individual case that should be explained.” As the certainty of a prediction increases with the addition of more cases from which the prediction is inducted, the generality of the prediction decreases.

Aarnio cautiously concedes that inducting a rule may be possible from cases. However, this concession is made with such a limitation for it to almost be a denial of the appropriateness of inducting a rule.

3.5 Calleros

Calleros [1994] describes legal reasoning as involving two types of reasoning - induction and deduction. Calleros describes deduction as a “broad framework” [at page 123], and views it as the general method of reasoning that is present in some form at all stages of reach a conclusion to a legal problem. Induction is essentially a means for producing the rules that are then used in the broad framework of deduction.

Induction is broken down into two variations, “analogy” and “generalization”. Calleros describes “generalization” as “construct[ing] a general proposition from specific cases” [at page 121]. He describes “analogy” as the process of “predict[ing] the outcome of a specific case by comparing it to other cases”.

Both forms of induction are described as being applicable to predicting the finding of a court based upon previously decided cases. Thus Calleros implies that in addition

to providing the “broad framework”, deduction is the only method of reasoning for arguing about statutes.

In discussing “generalization”, Calleros admits that the rule(s) generated are not necessarily generally correct. He claims that “you could reasonably induce [*sic*] a general rule” “[a]lthough the rule would not necessarily follow from the cases” [at page 122]. Perhaps in recognition of the uncertainty of “induced” rules, Calleros does not suggest that rules should be constructed without a new case to apply them to. In other words, the “induced” rules are temporary, only good enough guesses to predict the outcome of the current case, and then to be discarded or reformulated when a new case on that topic appears.

Calleros believes forms of inductive reasoning (both creating rules and as comparison) are appropriate for reasoning with cases; deductive, rule-based, reasoning is appropriate for reasoning with statutes.

3.6 Allen

In the Second Edition of his work Allen [1930] separates legal reasoning into two categories which are neatly separated by the line between case-law and statute-law. Allen states [at page 248]: “Whereas precedent is inductive, enactment clearly imposes the necessity of deduction upon the Courts. It is general and comprehensive in form, precedent particular and limited. A decision, whatever implications may be read into it by subsequent comparison and interpretation, exists primarily for the settling of a particular dispute: a statute purports to lay down a universal rule.”

By the time of his Seventh Edition, Allen states that, whilst the method of arguing with cases is usually termed induction, that what really happens is argument by analogy. Allen regards analogy as the best and most common form of argument - “a close analogy is more convincing than a far-fetched illustration” [Allen 1964, page 286]. “Every *ratio* is an *interpretation* of authorities in the light of the facts of the instant case. . . . The ratio is thus in a constant state of flux . . . it is not susceptible of any precise and comprehensive definition” [page 60]. When interpreting the *ratio* of a case in light of the instant case, analogy is necessarily involved. Thus there is a blurring in the four step process typically taught to law students of “Issue-Rule-Application-Conclusion” (see for example [Calleros 1994, page 58–60]), that is, the rule and its application should be considered as one question — how the rule is to be applied to the facts of the instant case dictate how the rule will be formed.

This method of reasoning appears to be heading the way of the rule skeptics. The rule skeptics see reference to legal rules as a *ex post facto* justification of the decision in a case rather than the sources upon which to reach the decision. Llewellyn, a rule skeptic, will be discussed in the following section.

Allen proposes that analogy is the best method of reasoning with cases.

3.7 Llewellyn

The work of the rule skeptics is a criticism of the claim that legal decisions are made as a consequence of a system of rules. The work of the rule skeptics is not necessarily concerned with the appropriateness of eliciting rules from cases. However, Llewellyn [1960] does make the claim relevant to the current discussion. According to Llewellyn, the *ratio* of a prior case is particular to that case and it cannot be used as a general rule in future cases with different facts.

Llewellyn thus rejects any use of a previous case in the process of reaching a decision. However, previous cases may be used to justify the decision.

3.8 Levi

Levi explicitly states that the process of “Issue-Rule-Application-Conclusion” is not just blurred, but in fact is reversed (at least in the middle). Levi believes that the use of analogy is *the* method of arguing with cases in law — “the finding of similarity or difference is the key step in the legal process” [Levi 1961, page 2]. By arguing with cases using the method of analogy, “the rules arise out of a process which, while comparing fact situations, creates rules and then applies them” [Levi 1961, page 4].

Levi admits that such a description of the process of legal reasoning will not sit well with lawyers and judges, as it “runs contrary to the pretense of the system” [Levi 1961, page 9]. However, he sees it as much more dangerous to continue in the belief of a system of rules being established from cases: “[t]he rule will be useless. It will operate on a level where it has no meaning . . . The statement of the rule is roughly analogous to the appeal to the meaning of a statute or of a constitution, but it has less of a function to perform. It is window dressing. Yet it can be very misleading” [Levi 1961, page 9].

3.9 Bush

Although Vannevar Bush is not a jurisprudent, his paper “As We May Think” [Bush 1945] discusses the processes of thought and how machines may assist in these processes. Bush [1945, part 3] states that “[f]or mature thought there is no mechanical substitute. But creative thought and essentially repetitive thought are very different things. For the later there are, and may be, powerful mechanical aids.”

In creating these aids Bush believes that then methods of organising information were artificial, and hence the methods of retrieval were artificial as well. Bush does not believe that the human mind organises information in an alphabetical order, such as would be found in a library. Rather, “[t]he human mind . . . operates by association. With one item in its grasp, it snaps instantly to the next that is suggested by the association of thoughts, in accordance with some intricate web of trails carried by the cells of the brain.” [Bush 1945, part 6].

The thought process that Bush favours, association, when considered in the context of argument (legal reasoning) would be that of analogy. A lawyer (adhering to Bush's view of thought), would attempt to find the cases useful as precedents by arriving at them from association (or analogy) with the present case.

3.10 Leith

Leith [1986] begins his discussion of the "AI Man's View of Law" with the following observation: "it is almost as though when God made computer scientists, he made them all think of law in the same way — as a system of rules."

Leith views the law as being more than simply a system of rules. He states [at page 511] that: "it seems to me to be all very well to draw up a collection of rules from legislation; but, as lawyers all know intimately, a piece of legislation is but one thing in the legal world." Leith does not explicitly state that rules are an inappropriate way or reasoning with cases, but it is an obvious conclusion to make based on this statement.

Leith therefore presents the view that more than rule-based reasoning is required to reason in "the legal world". Leith states that rule-based reasoning is appropriate for statutes, but that it is not appropriate for the rest of the law (for example cases).

3.11 Rissland

Rissland [1985] states that both rules and cases are required to fully understand an area of law. She states [at page 1256] that "[e]ven if one believes that the law can be captured in rules — which many, particularly the legal realists, do not — one needs cases to flesh out the meaning and intent of the rules." Rissland agrees with the Gardner [1984] that to create a legal expert system, one should use "a rule-based approach for the 'easy' or black-and-white questions and a case-based approach for the 'hard' or gray-area [*sic*] questions." However, Rissland does not state which sources of law are "easy" and which are "hard" — she does not directly address the question of whether all cases are in the "gray-area [*sic*]".

The method of reasoning that Rissland envisages is for the rule-based reasoner to call upon the case-based one when required and vice-versa.

3.12 Schauer

Schauer [1991, page 177] states that whilst we speak of rules in the common law, they are "so malleable so as not to even be rules". Schauer appears to be of the view that rules in the proper sense cannot be elicited from previous cases: "[precedent] cannot serve to provide the rule-like constraint" [page 184].

Schauer states that there is an ambiguity in the word "rule". This ambiguity causes some jurisprudents to believe that the "rule of law" means that the law consists of rules. Schauer explains [at page 167] the use of the word "rule": "[i]n the sense that we have *rulers* who *rule* their subjects, 'rule' bears its closest affinity with 'reign' or

control', and has only the remotest relationship with a form of decision-making characterized either by generality or by the entrenchment of generalizations."

At page 177, Schauer explains that whilst "rules" may claim to be applied, their application is not by way of interpretation. Rather "rules" are used as guidelines:

[a]lthough lawyers and judges can describe any number of common-law rules, and although both opinions and textbooks can state them in 'black letter' fashion, the rules have no single authoritative formulation, and accordingly the process of applying them does not involve an interpretation of the *text* of the rule. . . . it appears that common-law 'rules' are indeed descriptive rather than prescriptive, functioning merely as temporary guides.

Schauer [at page 178] agrees with the rule skeptics, as discussed in Section 3.6, in that "[t]he common law appears . . . to be decision according to justification rather than decision according to rule."

Schauer identifies that there is a problem with claiming to find "rules" in cases. The problem that Schauer identifies [at page 183] is that at the outset of constructing a rule, the predicate (the facts of the case) must be stated. These facts cannot be easily stated:

What distinguishes reasoning from precedent from reasoning from rule, however, is the necessity in precedential reasoning of *constructing* the generalization/factual predicate that already exists in the case of a rule. As we have seen, the factual predicate of a rule, a generalization necessarily encompassing a multiplicity of events, is part of the rule's canonical form. But where there is only a previous decision and no rule-formulation, the source of the factual predicate is obscure, and consequently the manner in which the previous decision constrains becomes problematic.

For Schauer, the concept of precedent is to ensure the same result on the same facts. He notes [at 183]: "[n]o two events are exactly alike, but the idea of precedential constraint presupposes that a prior decision will control a subsequent set of facts that are *like* the first." Here the word "like" describes a definite association. That is, one case is "like" another. Cases are therefore compared by analogy.

To create a rule from a case would be to alter the use of "like" to describe indefinite, possible association. Schauer does not agree with the creation of rules from cases, and consequently would not condone the extension to the meaning of the word "like" as described.

The comments that Schauer has made as to the problems with constructing "rules" are restricted to the common law. That is, Schauer does not agree with the proposition that cases can be argued with by use of rule-based reasoning. The method of reasoning Schauer seems to advocate is that of analogy.

3.13 Conclusion

Susskind's suggestion to use jurisprudence in the design of a legal expert system seems sound. However, he suggested the wrong starting points. The starting points he suggested offer general, all-encompassing studies of law. They do not offer answers, that may seem to some jurists fore-granted, to questions of how do lawyers think?

The discussion above has provided an overview of the contrary positions that have been taken in the debate over whether "rules" can be extracted from cases. All seem to agree that deduction plays a role in the process of legal reasoning. It would seem uncontroversial to state that deduction is *the* method for reasoning with statutes. The controversy begins with the appropriate method for handling case law knowledge.

Some of those that support the idea of extracting rules from cases admit their shortcomings. The rules are seen as local, not general, temporal rather than permanent, and subjectively considered correct rather than universally.

Given these limitations, it hardly seems appropriate to refer to whatever is extracted from a case as a "rule". It is a guide that is extracted or a principle. The use of the word rule (in legal circles) is not designed to convey the same strictness as a rule say in mathematics — something that cannot be broken.

The use of analogy to compare cases seems to fit well with the concept of precedent (as discussed in Section 2.2.1). Such a method of reasoning has support from some of the above-mentioned jurists. The idea of analogy is to show how one thing is like another. The doctrine of precedent purports to treat like cases alike.

For the reasons discussed here it seems appropriate to use a case-based reasoner that selects cases by analogy. SHYSTER is such a system, and will be linked to a MYCIN based reasoner, to provide answers to questions that are answered by cases.

A Survey of Legal Expert Systems

This chapter provides an outline of some legal expert systems that have previously been developed. The expert systems can be classified into three main groups: the rule-based reasoning (“RBR”), case-based reasoning (“CBR”) and hybrid systems (using a mixture of RBR and CBR).

4.1 Rule-Based Reasoning

Jackson [1986, page 31] states that rule-based reasoning uses “empirical associations between patterns of data presented to the system [to determine the] actions that the system should perform as a consequence”. Systems using rule-based reasoning are referred to as “production systems”.

Production systems have at least three main components. The first is the rule set. This first component is the representation of the knowledge of an expert in the knowledge domain. The second component is an interpreter. A rule interpreter decides which rules apply, and how and when to apply them. The interpreter determines the outcome for the facts given to the system. These facts are represented in the third component of the system — the “working memory” (“WM”). The working memory may hold data (facts about the problem), goals (the ends that the system is attempting to achieve), and intermediate results.

The rule set that represents the experts’ knowledge contains rules in the form of “premise-action pairs”. Rules are described in the form of:

$$\text{if } P_1 \& \dots \& P_n, \text{ then } Q_1 \& \dots \& Q_m.$$

The rule above would be translated as: “if each of the premises P_1 and ... and P_n are true, then conclude Q_1 and ... and Q_m ”. The premise(s) (P_i) are usually termed the conditions of the rule, and the action(s) (Q_j) are usually termed the conclusions of the rule. The reason for this is that most rule-based reasoning systems are used to draw conclusions about a problem scenario.

Information about the problem is stored in the working memory. This information is usually stored in triples that consist of object-attribute-value.

The interpreter performs its function in the “recognize-act cycle”. This cycle is described by Jackson [1986] as:

1. Match the calling patterns of rules against elements in working memory.
2. If there is more than one rule that could fire¹, then decide which one to apply; this is called 'conflict resolution'.
3. Apply the rule, perhaps adding a new item to WM or deleting an old one, and then go to step (1).

4.1.1 A famous and classic approach: MYCIN

MYCIN² was created at Stanford as a Medical Expert System. Allen Newell has said of MYCIN that "this is not just any old expert system, but the granddaddy of them all — the one that launched the field"³ and that it is the embodiment of "all the clichés of what expert systems are"⁴. The construction of this expert system began in 1972 as "a collaboration between the medical and AI communities at Stanford" [Jackson 1986, page 95]. MYCIN is designed to provide expert advice on the diagnosis and treatment of blood infections to a physician who is not an expert in the field of antibiotics. The system uses a "backward-chaining"⁵ rule-based reasoner. Rules are stored in the form "if ... then ...".

When facts are entered they may have a "certainty factor" attached to them. All the conclusions that are drawn have "certainty factors". The "certainty factor" is a number between -1 and 1 that gives the system an idea of how strong the evidence is that the fact relies upon. When reporting the conclusions, a "certainty factor" is translated into an English phrase, conveying the strength of each conclusion.

MYCIN was evaluated by comparing its recommendations with those made by experts and non-expert physicians. Eight independent experts were asked to mark the recommendations made on ten real cases. These experts marked the recommendations made by MYCIN in addition to those made by the Stanford physicians (expert and non-expert in the field). The marking took place without the markers being made aware of who made the recommendations. MYCIN's final score was 52 out of a possible 80; this was the highest overall score. The highest ranked Stanford experts received a total score of 50. The result demonstrated that MYCIN performed as well as the experts in the field, and better than the non-experts.

Although MYCIN is an obvious success in the field of expert system, at the time of Jackson [1986], it was not used in practice. The reasons given for this were: the

¹When a rule "fires" it is activated. That is, the premise are all found to be true, and the consequence is to reach the prescribed conclusion, or perform the required action.

²The version of MYCIN that was used for this thesis was one created by Norvig [1992] (and available at <http://www.norvig.com/paip.html>). Consequently, comments about the system are comments about the Norvig version of MYCIN, not necessarily the original system itself. For an account of the original system, see [Buchanan and Shortliffe 1985].

³See <http://www.ida.liu.se/~HKGBB0/studentpapper-01/Kristin-Lundgren.doc>

⁴See <http://www.cs.wpi.edu/~dcb/courses/CS538/documents/MYCIN-slides.pdf>

⁵"Backward-chaining" is the method of reasoning by starting with a conclusion that is to be proved. The conditions that are necessary for this condition to be true must then be seen to be supported by the facts. Conversely, "forward-chaining" is the process of establishing the facts, and seeing which conclusions are supported. See [Jackson 1986, pages 35–37].

incompleteness of its knowledge-base and the then cost of computing power to run the system.

4.1.2 The generalisation of MYCIN: EMYCIN

EMYCIN is known as “Empty” MYCIN or “Essential” MYCIN — the MYCIN expert medical system, without the medical knowledge, making it domain-independent. EMYCIN is a goal-direct backward-chaining RBR, as was MYCIN. When faced with a problem, EMYCIN retrieves the list of rules whose conclusions affect the goal. For each of these rules, the premise is evaluated and conclusions drawn when true.

In addition to the creation of an abstracted version of MYCIN, a number of tools have been added to the system to assist expert system architects build and debug. One of these tools is the abbreviated rule language (ARL). This language is an ALGOL-like notation, rather than LISP (the language MYCIN and EMYCIN are written in) or “Doctorese” (the subset of English used by MYCIN). ARL is apparently easier to read than LISP and more concise than Doctorese. ARL is claimed to allow new rules to be included more easily than was previously possible with MYCIN.

When a rule is entered, there is a syntactic check of the rule. This tool is designed so that the expert can concentrate on logical errors and omissions. There is also a limited semantic check. This compares the new or changed rule with existing rules that conclude about the same parameter, to ensure there are no contradictions or duplicate rules.

Another tool that is included is a rule compiler. This tool transforms the rules of the system into a decision tree, which the compiler can compile into machine code. This eliminates the need for a rule interpreter.

4.1.3 A very similar approach to MYCIN in the legal domain: JUDITH

The JUDITH system was created by Popp and Schlink [1975] at Stanford, where MYCIN had been developed. JUDITH was developed prior to the creation of EMYCIN by van Melle [1980], and was consequently unable to be used to test the hypothesis that later developed regarding the generality of the reasoning in MYCIN.⁶ However, the similarity between MYCIN and JUDITH was claimed by the authors stating that “it seems feasible to create a legal knowledge base for MYCIN, and, vice versa, to create a therapeutical knowledge base for JUDITH, without more than some slight modification” [Popp and Schlink 1975].

The JUDITH system was designed for use by a lawyer, and provides two methods of interaction. The first is the “case option”. This is used when a comprehensive analysis of a factual scenario is required. The second is the “specific term option”. This option is used to research the meaning of one or more specific legal terms or concepts.

⁶JUDITH whilst developed at Stanford and prior to EMYCIN was developed without building directly upon the work of the “MYCIN gang”. The authors of JUDITH claim that it was developed separately to the MYCIN project, yet ended up being similar.

Popp and Schlink [1975] claim that the most powerful use of JUDITH is to be found in the “specify option”. This option is entered when a question is put to the lawyer and the lawyer believes that more questioning is required to determine the appropriate response to the initial question. This option would therefore be entered when encountering an open-textured concept.

When entered, the specify option causes JUDITH to begin a line of questioning directed at answering the primary question. This line of questioning uses rule-based reasoning to determine the appropriate value for the “primary question”. This approach of using rule-based reasoning to define open-textured concepts is now generally regarded as inadequate as discussed in Chapter 3.

Another feature of JUDITH is the automatic generation of keywords. This list is generated so that if the system “runs out”, and the lawyer is left at an “open end of the data structure”, the lawyer is referred to an information retrieval system to view relevant cases or articles. Popp and Schlink [1975] claim that the query produced from the keywords generated by JUDITH is “likely to be more on point than one set up by the lawyer.” This is an interesting claim that is not further supported.

4.1.4 TAXMAN

The TAXMAN system created by McCarty focuses on the taxation of corporate restructuring as legislated in subchapter C of chapter I of the Internal Revenue Code of 1954 in the United States of America. McCarty chose to focus on this area of law because of the “artificial and formal systems” of corporate law resulting in it being “well structured”

This “well structured” nature is illustrated when McCarty gives an example of a legal definition of what is required to have a controlling stake in a corporation (Internal Revenue Code s368(c)). He uses this definition as an example of one that is easily described in the TAXMAN system. The reason he gives for this is that it “has an algebraic formula at its core” [McCarty 1977, page 871].

For less clear legal concepts McCarty states [at page 840] that describing them in TAXMAN “requires a degree of explicitness about the structure of these concepts that has never previously been attempted.” TAXMAN requires the user to describe legal concepts with a “strong dose of precision and rigor”. McCarty does, unlike some others, concede that “when we describe concepts in this way, we implicitly articulate theories about them”.

McCarty claims that by describing legal concepts in a fashion that is readable by a computer, and consequently describing legal theory to the computer, the computer is able to quickly and thoroughly test the extrapolation of the legal theories implicit in the description of the legal concepts. He equates the attempting of describing law in a computer-readable form with methods used in linguistics and cognitive psychology. Both of these disciplines use computational-based models to describe the real world. This allows these models to be easily fed into a computer, which can perform a great number of tests on the model in a very short time. This gives the researchers in these fields a powerful tool to evaluate the correctness of their models. McCarty sees a link

between the subject matter of linguistics and cognitive psychology and the subject matter of the law. By equating the subject matter, McCarty believes similar modeling techniques would also be appropriate. It seems that this is McCarty's justification for attempting to model legal concepts in a computer-readable form.

The TAXMAN system is rule-based, with the information for the rules coming from the Internal Revenue Code. It does not contain a case-based reasoner to argue about previously decided cases.

The method that McCarty uses to test the validity of the TAXMAN system is to use a previously decided case. McCarty uses the case *United States v. Phellis* as the test case. This case was decided under a different statute, and so McCarty claims that the output of TAXMAN would not replicate the original decision [at page 877]. It seems odd that the test case chosen was not one which had been decided under the Internal Revenue Code. If this had been done, then the result given by TAXMAN could be compared directly with the original decision. When testing the *Phellis* case, TAXMAN manages to make partial and multiple matches between the transactions in the case and the types reorganization in the Internal Revenue Code. McCarty claims that this is a "potentially a very powerful feature of the TAXMAN system" [at page 881]. However, there is no legal commentary, expert or otherwise, as to whether these partial and multiple matches are in any sense correct. In essence, McCarty's "testing" of TAXMAN demonstrates nothing concrete — it is a demonstration of the system, rather than an evaluation of its correctness.

4.2 Case-Based Reasoning

Case-based reasoning is the process of predicting an outcome based upon a comparison between the present case and the cases in the case-base. Case-based reasoners store their knowledge of cases by some form of abstraction of the facts of the case, the result, and possibly the reasons for reaching that result. The case-based reasoners discussed here are: FINDER and SHYSTER.

4.2.1 FINDER

FINDER was created by Tyree, Greenleaf, and Mowbray [1988]⁷. The domain in which FINDER is expert is that of the law of trover. The law of trover is an entirely common law based area of law on the rights of finders of lost chattels.

FINDER stores its knowledge of each of the leading cases on the law of trover in a "vector of attribute values" [Popple 1996, page 41]. The attributes are "yes" or "no" response to questions about facts that were determined to be legally significant in the leading cases.

FINDER reports a likely result (whether or not the finder should be allowed to keep the chattel). FINDER reports an argument based upon the nearest case (using nearest neighbour analysis) and the nearest case with the opposite result.

⁷See also [Tyree et al. 1989], [Tyree 1985], [Tyree 1986] and [Tyree et al. 1989].

Popple [1996] built upon the approach taken in constructing FINDER. The FINDER system is simulated in SHYSTER.

4.2.2 Pragmatic Case Based Reasoning: SHYSTER

Popple [1996] created SHYSTER as part of his PhD at the Australian National University, and “represents the state of the art in statistical legal reasoning” [Pannu 1995, page 183]. SHYSTER was intended to be a hybrid system, using rule-based reasoning for Acts of Parliament and case-based reasoning for decided cases. However, in its present form, SHYSTER is purely a case-based reasoner.

SHYSTER stores knowledge of cases in fact-vectors. Each fact is represented by a “yes”, “no” or “unknown” value in the vector. When the user interacts with SHYSTER, it asks questions to establish the values for each fact in the vector. At the conclusion of the questioning, SHYSTER then compares the fact-vector for the present case (entered by the user) with the decided cases that are in its case-base. This comparison is done by way of a nearest-neighbour analysis in the n -dimensional space that the fact vectors sit in. This means that the method of legal reasoning used by SHYSTER is that known as “analogy”.

Once the closest cases are determined, a report is generated. This report explains why particular cases are used to reach the conclusion, and what the result of the application of those cases would be.

SHYSTER currently has four separate case-bases. One is on the meaning of “authorization” in the *Copyright Act*, another on the classification of a worker as either an employee or an independent contractor, a third is on the implication of the duty to observe natural justice, and the fourth is a simulation of FINDER.

4.3 Hybrid Systems

A hybrid expert legal system is one which combines more than one method of reasoning in order to attempt to answer a legal problem. Hybrid systems typically combine the two major forms of reasoning: rule-based reasoning (RBR) and case-based reasoning (CBR).

There are two popular methods of combining RBR and CBR. The first is what is known as “blackboard architecture”. This method has a number of knowledge modules that collaborate with each other by using a shared database (the “blackboard”). There is a control mechanism (sometimes called a “scheduler”) that decides which knowledge module is most appropriate at each step of the reasoning process. Two examples of the blackboard system are CABARET and PROLEXS (both discussed below).

The other method of combining RBR and CBR is distributed artificial intelligence. This method allows different AI systems to run at the same time over their own knowledge-bases, and to ask each other questions and respond to them. This approach has been used in the IKBALS project (discussed below). The developers of IKBALS used distributed AI because they believe that blackboard architectures are too

constraining in a domain which will inevitably involve linking heterogeneous cases, rules and databases using parallel architectures. Another reason to support the use of distributed AI is that blackboard systems provide serial processing and answers to parallel problems⁸. Distributed AI systems could be running simultaneously on parallel processors and pass each other questions and answers, providing faster solutions to problems.

From the descriptions below, it can be seen that typically the RBR parts of the hybrid system are used to capture knowledge not only about statutes, but also the common law. CABARET and GREBE use a RBR to capture both types of knowledge. PROLEXS perhaps is a little against the trend and uses a RBR for the capturing of knowledge about the statute, and a CBR for the case-base, however for its other knowledge “other types of (mostly rule-based) reasoning” were used [van Opdorp et al. 1991, page 280]. The problem with these approaches is that, from a lawyer’s perspective, the only information that can be accurately captured and argued by a RBR is that found in statutes. No matter how clear a case may seem, it cannot be captured by a rule, because a rule would attempt to define how that case should apply to all possible future legal problems (see Chapter 3. Due to the complexity of human interaction, this is simply not possible.

4.3.1 CABARET

CABARET [Rissland and Skalak 1989a]⁹ is an expert system that deals with (US) income tax law relating to the deduction for expenses relating to a home office. The area is covered primarily by s280A of the Internal Revenue Code, and the authors have focused upon s280A(c)(1). To determine the meaning of the section, CABARET has a case knowledge base of 23 litigated and six hypothetical cases. In addition to this it has an index knowledge base of 14 dimensions that is based on precedents, scholarly legal analysis and commercial taxation materials. It also has a rule base consisting of ten home office deduction rules (derived from the section of the Act), together with some production rules from reading cases and tax service treatises.

Whilst the meaning of a section is determined using a case-based reasoner, some other case law knowledge is stored in rules. These rules would come from so-called “clear” cases. As discussed above in Section 4.3 and in Chapter 3, these “rules” are not truly rules when using the word precisely. In the precise use of the word “rule”, it is a logical structure designed not to be broken; perhaps the best way to describe the observed “rule” is as a “principle”, rather than a rule.

⁸For example: in areas of law in which rights are derived both from cases (common law) and statute, the overall problem of establishing these rights is parallel, whilst the establishing of rights from one source (either common law or statute) is serial in nature.

⁹See also [Rissland and Skalak 1989b; Skalak 1989; Skalak and Rissland 1991; Skalak and Rissland 1992; Rissland 1990]

4.3.2 GREBE

Branting [1989, 1991], in creating GREBE, took an approach that combines both the blackboard architecture and distributed AI methods for creating hybrid systems. Unlike the pure blackboard systems, GREBE does not have a scheduling agent. Instead, the choice between the arguments created by the reasoners is made after they have constructed their arguments. This means that both RBR and CBR are attempted at the same time — they run concurrently (the distributed AI aspect of the system) — with the ultimate report being the “best” of the two reports produced (one by RBR and one by CBR).

The domain for GREBE is Texas’ workers’ compensation law. The rule-base for GREBE has 47 rules including statutory, common law, and “common-sense” rules. The case-base has 25 precedent cases, including 21 hypothetical cases.

Again there is the mixing of methods of representing and reasoning with cases. In GREBE, cases are represented both in rules and in a case-base.¹⁰ As proposed previously in Section 4.3 and in Chapter 3, the representing of cases by way of rules is inappropriate.

4.3.3 PROLEXS

PROLEXS is a Dutch expert legal system, focused on the domain of landlord-tenant law. The authors [van Opdorp et al. 1991] of the project believe that all knowledge should be represented only once; meta-level knowledge is used to state the importance and priority of a piece of knowledge. The four knowledge groups that were used in PROLEXS were: legislation, legal doctrine, expert knowledge and case law.

The reasoning used on each of the four areas differs. A RBR is used for the legislation knowledge, a CBR for the case law knowledge, and a blackboard is used for the other areas of knowledge. The RBR for the legislation is both forward and backward chaining.

PROLEXS employs reasoners as proposed to be appropriate in Section 4.3 and in Chapter 3. That is, in PROLEXS, cases are reasoned with case-based reasoning; statutes are reasoned with rule-based reasoning. The approach taken here generally fits with that taken in the creation of SHYSTER-MYCIN (see Section 5.1).

4.3.4 IKBALS

The IKBALS project uses a distributed artificial intelligence approach. IKBALS operates in the area of credit law. Vossos et al. [1991] argue that this is a better approach as the questions asked of expert legal systems are of a parallel nature, and are consequently better answered by a parallel system rather than a serial one. Because the CBR and RBR are completely independent agents, they could theoretically be run at

¹⁰Note that different cases are represented in rules and in the case-base. That is, the same case is not described in both methods of storage.

the same time on parallel processors, waiting upon messages from each other. However, the authors of IKBALS decided to model the process of IKBALS on that taken by a lawyer when asked a question: first the RBR is used, then the CBR.

This last point describes the same method by which SHYSTER-MYCIN operates (see Sections 5.3 and 5.4). The reason for taking this approach in SHYSTER-MYCIN is that in copyright law, the rights only exist by virtue of the Act (see Section 2.3), with the cases being used to defined the meaning of the Act. It therefore seems sensible to start the overall reasoning with the reasoner that handles the Act (an RBR), then move onto the reasoner (a CBR) that handles cases (if required).

4.4 Conclusion

From the above examples of some legal expert systems, it can be seen that there has been a tendency to create and use “rules” from cases. The concept of a rule fits very neatly into computer science, as “if ... then ...” statements have been a part of computing since its inception. However, the ease of handling such representations should not be the motivation for modelling the real-world system in that way. Whilst in the real-world system there may be talk of “rules” from cases, there is good support for the proposition that law is a “rule guided activity” [Skalak and Rissland 1991], or that there are no rules to be extracted from cases (see Chapter 3).

The law provides quite a different domain of knowledge compared to other expert system areas such as medicine. McCarty [1983] addresses the question of why rule-based systems such as MYCIN are so successful in the medical field, yet have “seriously” limited use in the legal field. Rissland [1985, page 1258] states that: “McCarty’s answer to this paradox lies in the differences of the nature of the rules involved. In medicine, the rules are empirical, associative, probabilistic rules of thumb, which are used cumulatively and which do not reflect any deep causal models, say of bacterial disease.”

Even if those who use RBR for reasoning with cases are right in doing so, then they have only produced systems that apply rules. Once you are given the rules, creating a program to use “if ... then ...” statements can be fairly simplistic. The interesting issue to focus on for these systems would be the creation or discovery of those “rules” from cases. This would attack the bottleneck that is experienced in eliciting an expert’s knowledge. Using the rules is the easy part — creating them is where it gets hard.

The System SHYSTER-MYCIN

Central to this thesis is the creation of a legal expert system which combines MYCIN with SHYSTER. This system was appropriately named SHYSTER-MYCIN. The system was produced in three different versions.

The first version was very basic, and was used to make a preliminary assessment of the appropriateness of coupling a rule-based and a case-based system to reason with sections and cases, respectively. The second version of the system had a greatly increased rule-base, and alterations were made to the reporting of results so that reasons for a conclusion, rather just the conclusion, would be reported. The third version of the system produced more concise reports, by limiting the conclusions that would be reported.

5.1 The origins of SHYSTER-MYCIN

SHYSTER-MYCIN finds its origins in MYCIN and SHYSTER, two previous expert systems. MYCIN is a medical expert system, which was adapted for use in SHYSTER-MYCIN. Whilst SHYSTER was originally created as a legal expert system, and used without alteration.

The original MYCIN system is discussed in Section 4.1.1. In SHYSTER-MYCIN, the “certainty factor” used in MYCIN is not used.¹ The reason for this is the difficulty in scientifically establishing how certain a fact is in a legal domain. In medicine, the “certainty factor” can be established by calculating the error in measurement, or statistically measured certainties of test results. In the law the vast majority of conclusions cannot be established by scientific methods, and therefore a “certainty” cannot be attached to them. For example the speed of a motor vehicle can be established and a “certainty factor” given; however, how certain the conclusion is that the driver was driving at an excessive speed in all the circumstances² cannot be determined by way

¹Or, more precisely, all the certainty factors are set at 1.

²For example perhaps the driver was traveling faster than the posted speed limit, but was doing so because she was transporting to hospital a person who had just suffered a heart attack. Objectively she is “speeding” as she is traveling at a speed greater than the posted limit. Supposing that there is provision to be excused from a fine for speeding if the speeding was “necessary or not excessive in the circumstances”, the case described in this note would fit the “necessary or not excessive in the

of a formula.³

The SHYSTER part of SHYSTER-MYCIN has been left untouched, and is only called upon for questions relating to its knowledge on the definition of “authorization”. In this way the SHYSTER part is like an expert that the MYCIN part calls upon when it cannot answer a question.

In SHYSTER-MYCIN, the MYCIN part is used to reason with the sections of an Act of Parliament only. The MYCIN part is not used to reason with so-called rules from decided cases. Similarly, SHYSTER does not reason with the sections of an Act — its domain is purely decided cases.

5.2 The intended use of SHYSTER-MYCIN

SHYSTER-MYCIN is created as a tool for use by lawyers or para-legals. It is designed as a system that would fall into the bottom-right quadrant of the “Legal Grid” as described by Susskind [2001, page 9] and displayed in Figure 5.1.

That is, the system is designed to speed up internal processes of handling a matter. With an improved method of fact elicitation and classification, the system could be moved into the top-right quadrant, “online legal services”. This improvement would require the system to “get the facts right” when questioning a lay-person.

5.3 The versions of SHYSTER-MYCIN

I now describe the three versions of SHYSTER-MYCIN.

5.3.1 Version 1

The first version of SHYSTER-MYCIN (“SM-v1”) was created to provide a preliminary assessment of the approach that would be undertaken with the later versions of SHYSTER-MYCIN. That approach was: to provide the MYCIN based part with a rule-base drawn from sections of the *Copyright Act 1968*, and to have SHYSTER be able to be called upon when an “open textured” term⁴ was encountered.

When an “open textured” term was encountered, the user was notified that it was a term that might be best answered by consulting the SHYSTER part. The user had

circumstances” test, as she was speeding in the hope of saving a persons life. The objective fact can be described with noting the margin of error in making the measurement of the car’s speed. This can be expressed using a “certainty factor”. The subjective fact is a unique, subjective weighting of a multitude of secondary facts. As the weighting of the secondary facts is also subjective, a “certainty factor” cannot be attributed to the primary subjective fact.

³A statistician may claim that with a sufficient number of cases, a certainty factor could be established. Taking the example in the previous note, the number of “valid excuse” cases could be compared with the total number of speeding cases, resulting in a “certainty factor”. This would give the probability that the accused *may* have a valid excuse. Importantly it says nothing about the actual validity of the excuse. Consequently a “certainty factor”, so determined, is useless.

⁴Specifically for this system the term “authorization”.

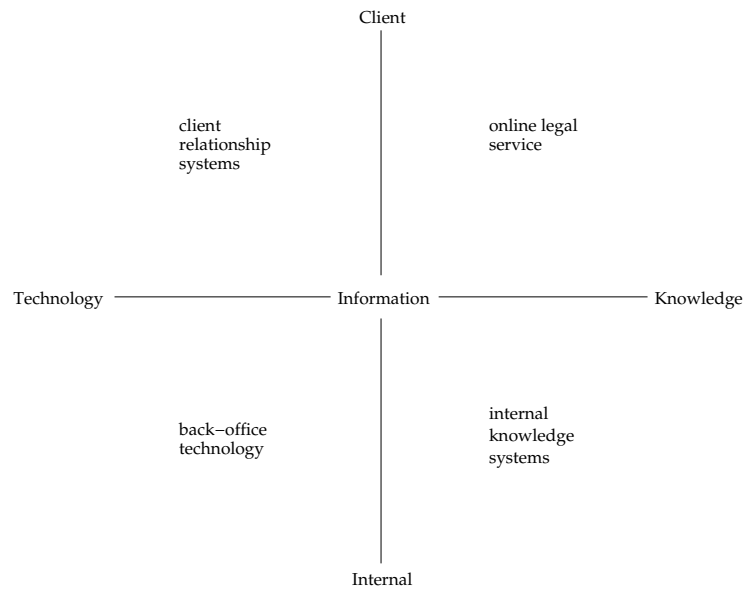


Figure 5.1: Susskind's "Legal Grid"

a choice at this stage to answer the question on their own knowledge, or to consult SHYSTER. If SHYSTER was consulted, the user answered SHYSTER's questions, and, at the end of the consultation, was given the likely result. The user then gave this answer to the MYCIN part. This allowed the user to "over-rule" the SHYSTER part if they so wished.

SM-v1 has a rule-base of 16 rules, it draws conclusions based on the values of 9 parameters. The rules are used to represent sub-sections 13(2), 36(1), and 101(1) of the *Copyright Act 1968*. These are the three provisions in which the term "authorization" is used. As stated in Section 2.3.3 this term, whilst used in the Act, remains undefined. Amendments were made in 2002 to the Act to include guidelines on defining the term. Additionally SHYSTER-MYCIN (in all its versions) operates upon the Act as it was before the statutory guidelines for defining "authorization" were introduced (as stated in Section 2.4).

The parameters for SM-v1 are the facts that are asked of the user or that are determined by applying rules to the facts obtained from the user. The parameters that SM-v1 uses are:

1. The name of the material
2. The type of the material
3. Whether the accused was the owner of the material
4. Whether the accused had a licence to use the material
5. Whether the accused had authorized someone else to use the material

6. If the use of the material occurred in Australia
7. Whether the accused had infringed the owner's rights under s13(2)
8. Whether the accused had infringed the owner's rights under s36(1)
9. Whether the accused had infringed the owner's rights under s101(1)

The last three parameters are the "goal" parameters. These are the facts that SM-v1 attempts to establish by applying the rules it knows to the facts asked of the user in relation to parameters 1–6.

Interactions with SM-v1 indicated that the approach proposed in this thesis would be valid, and worth continuing further. The MYCIN part of SM-v1 was able to work logically through the sections in the Act that were provided to it as rules. However, SM-v1 only "knew" of three sub-sections of the Act. This meant that the answers to questions asked by SM-v1 relied upon the user being familiar with the remainder of the Act. For example, the user had to make assessments on "ownership" of copyrights — something covered by other sections of the Act⁵. Also, that the copyright material was used by the accused, and that that use was the exercising of one of the exclusive rights⁶ for that material, were facts assumed by the system.

In advancing from SM-v1, more sections of the Act had to be added to the system, and better reporting had to be implemented.

5.3.2 Version 2

SM-v2 uses the same approach as SM-v1 in that the MYCIN part reasons with sections of the Act and the SHYSTER part reasons with decided cases. Version 2 differed from version 1 in three areas: the size of the rule-base, the debugging of the MYCIN part, and the reporting of conclusions.

The rule-base that the MYCIN part was working from was greatly expanded in version 2 as compared with version 1. The sections of the Act that the MYCIN part knew were increased, making the system more realistic. This meant that most of the terms or concepts encountered in sections 13(2), 36(1) and 101(1) were determined in surrounding sections. For example: to determine whether the accused was the owner of the copyright, rules representing s35(2) were added to explain that a person who authored a work owned the copyright. In this version the sections that the MYCIN part knows are:

- s13(2) — the right to authorize acts
- s31 — the acts the owner has an exclusive right to (for works)
- s35 — determining the owner of a copyright (for works)
- s36 — how copyright is infringed (for works)

⁵Sections 35 and 97–100 of the Act.

⁶Sections 31 and 85–88 of the Act.

-
- ss85–88 — the acts the owner has an exclusive right to (for subject matter other than works)
 - ss97–100 — determining the owner of a copyright (for subject matter other than works)
 - s101 — how copyright is infringed (for subject matter other than works)

The rules that represent these sections of the Act total 273. Also, the number of parameters used by these rules increased from 9 to 56. The case-base used by the SHYSTER part was again left untouched.

In the process of expanding the rule-base and altering the reporting (discussed below), it became apparent that a method of viewing how the MYCIN part stepped through its rules would be useful. To achieve this, the MYCIN reasoner was altered so that when each question was asked, information about the rule currently under consideration was recorded in a file. This record was called a “stream of consciousness”, as it detailed why the MYCIN part was asking each question — it provided information as to how the system arrived at its conclusions.

This record was useful in debugging the rule-base. The file provided a step-by-step record, which assisted in checking that the rules were entered in the way that they were meant to be entered, in order to accurately represent the sections of the Act. This record of the stream of consciousness was also the first attempt to improve the reporting. However it was immediately obvious that the record was far too long. All rules that came under considerations were recorded. This meant many non-firing rules were included in the file. Thus the bulk of the file contained no useful information.

The reporting of conclusions was improved in SM-v2 to make the MYCIN part fit with the generally accepted definition of a expert system. That is, an expert system should report on reasons for reaching conclusions, rather than simply return the conclusions.

Prior to altering the MYCIN part, the reporting was very limited. When a conclusion was reached, only the conclusion would be reported at the end of the consultation. Importantly, no reasons supporting the conclusion were reported.

The improvement to the reporting was made such that, when the reasoner was concluding a rule, the “report-why” function would be called upon. This function writes to a file the facts that were known, the rule that was applied to these facts, and the conclusion that was consequently made. The report is made using L^AT_EX tags, so that the report from the MYCIN part can be combined with the output from the SHYSTER part, to produce a more cohesive report. It is important to note that SM-v2 reported upon every conclusion drawn. This approach was slightly altered in SM-v3.

5.3.3 Version 3

SM-v3 operated on the same rule-base that SM-v2 did, however, the reporting of conclusions was altered. The reporting done by the MYCIN part was restricted to only

reporting on conclusions that were made by relying on more than one fact. This was the only change made between versions 2 and 3.

5.4 An interaction with SHYSTER-MYCIN

A sample interaction with SHYSTER-MYCIN can be viewed in Appendix A. The interaction is taken from when I used the system to obtain reports on questions raised in Question 3 of the testing pack (see Section B.3).

First, the system asks for the name of the accused. This is not required for the process of reasoning with the rules, but rather it is requested so that the questioning and reporting can be made to seem more natural. This means that questions such as “Did Quentin make a copy of the material in Australia?” can be asked.

The system then establishes what type of material the accused is said to have used. This instantly allows the system to ignore a large number of its rules based on the answer to this question. This is because about half the sections in the Act that SHYSTER-MYCIN uses are about works, and the other half about subject-matter other than works.

Questions about the direct use of the material are asked. The answers here are used in establishing whether the accused infringed the copyright. Questions about indirect use — use of the work by someone else are also asked. This, when combined with other answers, allows the system to establish whether the use of the work was authorized by the accused.

On the question of “authorization”, the system indicates to the user that SHYSTER can be called upon to answer this question. If the user knows the answer to the question based upon their own expertise, they are not required to consult SHYSTER. If, however, SHYSTER is consulted, the user is then asked a series of questions by SHYSTER. The user then tells the MYCIN part the result that SHYSTER advised them would be likely. The reporting by SHYSTER is made to a \LaTeX file that is able to be input into the user’s overall report. An example using SHYSTER is demonstrated in Section A.2.

At the end of the questioning, MYCIN reports a summary of the findings for each of the goals that it was directed to. The reasons for reaching these conclusions is recorded in a \LaTeX file in the reports directory for the user to include in their overall report.

Evaluating SHYSTER-MYCIN

The evaluation of SHYSTER-MYCIN was done with a focus upon the reporting by the MYCIN-part. The first two areas of testing are solely focused upon evaluating the alterations made to the reporting done by the MYCIN-part. The third area of testing evaluates how the system works overall. That is, whether the hybrid system created by joining SHYSTER and a MYCIN-based reasoner provides good answers.

6.1 Testing Methodology

To determine the appropriateness of the approach taken in SHYSTER-MYCIN, the reporting that it makes is assessed. To do this I compare the system's report with reports made by legal experts. The test group consisted of three legal experts: a graduate of the University of New South Wales Law School currently attending the College of Law, a practising solicitor with five years experience and one with 30 years experience.

The test group was given a series of short questions to answer (see Appendix B). The group was instructed to answer these questions using a short version of the *Copyright Act* (see Appendix C) and case summaries (see Appendix D). The version of the Act was the same set of sections that SHYSTER-MYCIN knew of (except for a few preliminary sections, ss1-10). The case summaries were a human readable form of the summaries from which SHYSTER would operate in the area of "authorization". The case summaries provided the test group with: the name of the case, the facts of the case (limited to the eight facts in the fact vector), and some commentary on the case. The test group answered the questions, each person decided to use point-form to write their answers. The answers can be viewed in Appendix E.

SHYSTER-MYCIN was used to answer the same set of questions that the test group answered. I operated SHYSTER-MYCIN, answering its questions, using the factual scenarios (in Appendix B) and s10 of the Act (the definitions section). Both versions 2 and 3 were used to answer the questions from the test pack. The selected reports generated by SHYSTER-MYCIN to answer these questions can be viewed in Appendix F.

6.2 The aims of the testing

The over-arching aim of the testing was of course to determine if the approach taken in creating SHYSTER-MYCIN was appropriate. That is, should the domain of rule-based reasoning be purely the Acts of Parliament and that cases should be reasoned with other methods of reasoning, in this instance, an analogical case-based reasoner?

To assess the appropriateness of the approach taken in SHYSTER-MYCIN three areas of testing were determined. The report generated by SHYSTER-MYCIN was to be tested on: validity, conciseness and “correctness”.

6.2.1 Testing the Validity

The validity of the report is established by seeing if the report references the “right” sections of the Act. The report for each answer to the testing questions was checked to see on which sections of the Act conclusions were made. If a section of the Act was referenced in the consequence-part of a conclusion, then that section was said to be referenced for the purposes of this test. Conversely, if a section of the Act was referenced in the description of the facts that the conclusion was based upon, then this was not sufficient for the section to be considered “referenced”.

The sections that the test group referenced were also recorded. Again, only those sections that were mentioned in the process of stating a consequence were counted as being “referenced”. On occasion the section that a member of the test group was referring to had to be inferred, as they would quote words from a section yet not reference it explicitly. The answers given by the test group, as displayed in Appendix E, have been amended to explicitly state the sections of the Act that they were implicitly referring to.

I recorded the sections referenced in each report in a series of tables (see Tables G.1–G.7 in Appendix G). Multiple references to sections were only recorded once. That is the test is to see which sections are referenced, not how many times they are referenced.

Thus a report by the system may either be classified as valid or not. There is no concept of one report being “more valid” than another. The system would pass this test if it referenced the same sections that the test group referenced.

6.2.2 Testing the Conciseness

The conciseness of the report is determined by the number of conclusions that are reported. The number of conclusions reported was easily determinable when checking the number that SHYSTER-MYCIN reported. When SHYSTER-MYCIN reports, each conclusion is made a separate sub-section in the \LaTeX file. The total number of these conclusions made by the MYCIN-part were recorded for each report for each question.

The number of conclusions that the test group made for each answer was also recorded. The answers provided by the test group were in point-form which made

counting the number of conclusions easier. However, some points were simply quotes from the Act, and so were not counted as conclusions.

By counting the number of conclusions, it is hoped that a comparison can be made between the length of the reports given by the test group and by SHYSTER-MYCIN. A direct comparison of the length of the reports (that is, how many lines or words they are) would not be appropriate, as it is the conciseness of the report rather than the conciseness of the expression of concepts within the report. The reports are therefore assessed on the number of conclusions that they make, ignoring how concisely each conclusion is made.

“Conciseness” is thus a comparative measure. Additionally, one report can be said to be better than another by being more concise. However, conciseness should not come at the expense of validity. The reporting made by the system can be said to be improved if version 3 of the system produces more concise reports.

6.2.3 Testing the “Correctness”

The “correctness” of the report is assessed by seeing if the “right” result is returned as an answer to the question raised by the factual scenario. The “right” result is not a scientifically observable fact — in the legal domain, several answers may be logically correct. That is the answer is a logical conclusion that results from the application of Acts of Parliament and the Common Law to the facts of the present case (see Section 2.2). Therefore, to assess the “correctness” of the results reported by SHYSTER-MYCIN, there must be some method of determining the “right” result for each question.

To this end, the results given by the test group were taken to be representative of the “right” result. As there were three members of the test group, the “right” result would be the result returned by a majority of the group. In this way the test group was akin to a panel of three judges hearing a case. Whilst this does not provide a good statistical basis upon which to project what the legal communities results on average would be to the questions, it does provide the view of more decision-makers than most cases receive¹. It is therefore assumed that the results of the test group are indicative of a good answer and, when taking the majority view, a “right” answer.

So a “correct” system will provide answers that are the same as the majority of the legal experts in the test group.

¹Most cases are heard by a single judge or decision-maker [McMillan 2002, page 19].

The Results

This chapter details the results of the testing carried out on SHYSTER-MYCIN as described in Chapter 6. First how SHYSTER-MYCIN fared against the three areas of interest is detailed. The second part of this chapter discusses the conclusions that may be made, in light of these results, about the alterations to the MYCIN part and the model of legal reasoning upon which the hybrid system was based.

7.1 The Performance of SHYSTER-MYCIN

I now discuss the performance of SHYSTER-MYCIN. Both versions 2 and 3 are assessed in relation to the test areas: validity and conciseness. The system is assessed on the third test area of correctness. This is because versions 2 and 3 provide the same results; they differ in reporting how they reached those results.

7.1.1 The Validity

Both SM-v2 and SM-v3 provided “valid” reports,¹ as defined in Section 6.2.1. Both versions referred to the same sections that the test group did. However both versions referred to more sections than the test group saw necessary to refer to. SM-v2 would refer to every section that it knew about. These were:

- s13(2)
- s31(1)(a)
- s31(1)(b)
- s35(2)
- s36(1)
- ss85–88

¹Based upon the sections that they knew. Notably in response to questions one and two, the test group referred to s10 of the the Act, the definitions section. SHYSTER-MYCIN was not “aware” of s10, as no rules relating to that section were in its rule-base.

- ss97–100
- s101(1)

This would always ensure that SM-v2 referenced the correct sections, by taking a lazy or verbose approach. SM-v3 on the other hand would make more precise references to the Act. By limiting the reporting of SM-v3 to conclusions made on more than one fact, SM-v3 would reference the sections that the test group would reference and usually only 2–3 extra sections. SM-v2 would make approximately 11 excess references, as compared with the test group.

In response to question four², SM-v3 did not reference the same sections as person 3 did. However, when comparing the report of SM-v3 with the majority of the references, the report is valid. Person 3 referenced ss85 and 97 as shown in Table G.5. The reason for SM-v3 not referencing these sections is that in this question there was a difference of opinion about whether the material was a musical work. Persons 1 and 2 believed the musical performance to be a musical work. When I used both versions of SHYSTER-MYCIN, I entered details based upon the live performance being a musical work. Person 3 stated that the recording of the performance was a sound recording. This conflict over the facts could have been resolved by the inclusion of s22 of the Act in both the test pack materials and the rules in SHYSTER-MYCIN. Section 22 would have allowed both myself (by operation of the system) and the test group to decide with certainty that the performance was not in fact a musical work, as it had not been reduced to material form. If I had classified the facts in the same way person 3 had, then both SM-v2 and SM-v3 would have referenced the same sections that person 3 did.

7.1.2 The Conciseness

An initial comparison of the length of the answers given by the test group and those given by SHYSTER-MYCIN gives the impression that SHYSTER-MYCIN is very verbose in either versions 2 or 3. However, as detailed in Section 6.2.2, the test for conciseness would be based upon the number of conclusions reported, rather than the conciseness of the conclusions themselves.

Even when the conciseness of a report is assessed in this way, both versions are still more verbose than the test group. However, there is a definite, significant improvement that version 3 has over version 2. The number of conclusions reported on by SM-v2, SM-v3 and the average number reported by the test group can be seen in Figure 7.1 for each of the questions posed in the testing.

On average, SM-v3 reported only 24% of the conclusions that SM-v2 reported. Just on this comparison, version 3 seems to have an advantage over version 2. According to SM-v3, most of the conclusions (approximately 3/4 of them) are uninteresting. The criterion that SM-v3 uses to eliminate the uninteresting conclusions is to not report the conclusions made by applying a rule to a solitary fact (see Section 5.3.3). This criterion

²See Section B.4.

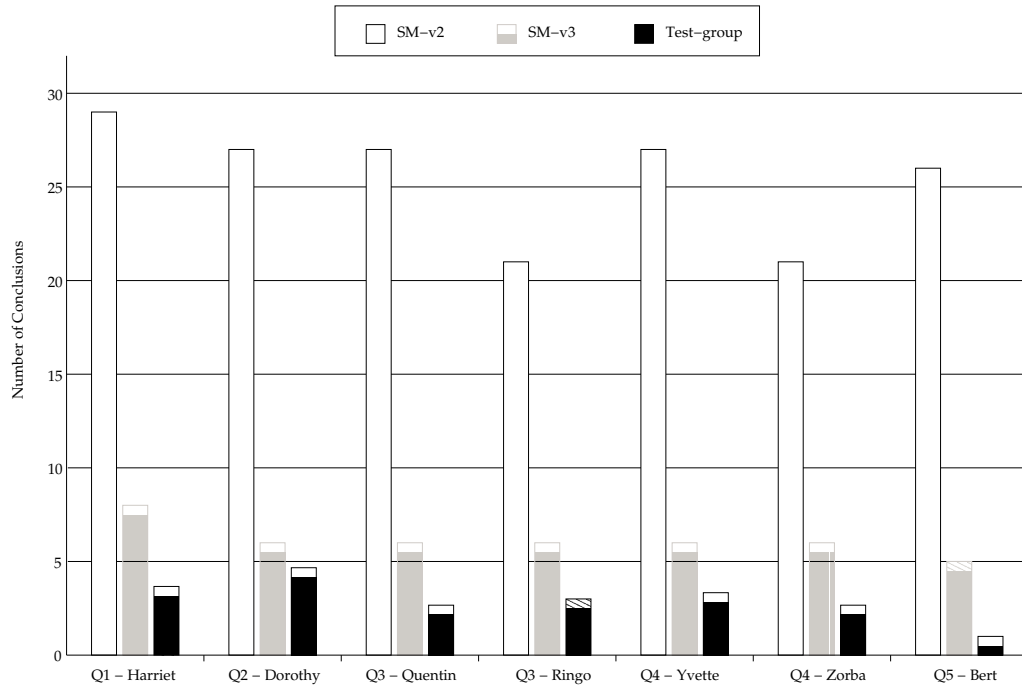


Figure 7.1: The Number of Conclusions Reported for each Question

is based upon the idea that conclusions based on a single fact are simply one-to-one mappings between one fact and another and do not give the user any real information. At best the information that the user provided is regurgitated to them with a slightly different wording. Conversely, a fact (conclusion) is interesting if it is arrived at by combining several facts.

When comparing SM-v3 with the test group, it can be seen that SM-v3 does compare much better than SM-v2, yet there is still room for improvement. On average the test group reported 12% of the conclusions that SM-v2 did, or about half as many as SM-v3 did. In answering Question 2, SM-v3 and the test group were fairly equal in the number of conclusions reported. SM-v3 reported on 6 conclusions, with the test group averaging just under 5. The greatest difference was observed in answers to Question 5: SM-v3 reported on 5 conclusions, each member of the test group reported on only one. It is guessed that by the time of Question 5, the test group decided to rely heavily upon their earlier answers and, as a consequence, only had a single conclusion each to report.

7.1.3 The Correctness

SM-v2 and SM-v3 operate on the same rule base and use the same methods for accessing and concluding rules. Their difference is only in the reporting. Therefore, because the rules that they use and their use of them is the same, they will always return the

same result for the same set of answers to their questions. This means that when assessing the correctness of the system, the system generally (versions 2 and 3) will be referred to.

The test group agreed on the result for each question except for two questions. In response to question two³, persons 1 and 2 reported a result that the accused had not infringed; person 3 reported that she had.⁴ There was a 2:1 decision that the accused did not infringe.

In response to question four⁵, persons 1 and 2 classified the musical performance as a musical work, person 3 did not. Person 3 classified the recording of the performance as a sound recording.⁶ This difference in fact classification meant that the results would be different. If s22 had been provided, this difference of opinion on the facts could have been resolved. However, without s22, the correct answer to the question would again be a majority holding. That is a 2:1 decision that the first accused did infringe.

The system agrees with the experts for each answer to the questions. When opinion is divided amongst the experts, the system agrees with the majority view. When slightly different facts (as classified by the minority review) are entered, the result given by the minority is returned. I can therefore say that the system provides correct answers (as defined in Section 6.2.3). However, the facts must be classified “correctly”. How this is done raises many questions (see Section 8.3, and is beyond the scope of this thesis).

These results prove that both SHYSTER-MYCIN and each of its component parts provide correct answers. The reports on questions of “authorization” further support the claims of the correctness of SHYSTER made by Popple [1996, pages 173–190, 246–7].

7.2 The Consequences of the Results

The performance of the system against the three criteria as reported above permits two broad conclusions to be made. The first is that the reporting by the MYCIN part is an improvement, both as compared with the original version of MYCIN and between SM-v3 and SM-v2. The second conclusion is that the model of legal reasoning

³See Section B.2.

⁴The conflict of opinion here can be based upon a differing classification of facts. The opinion of person 3 indicates that perhaps the facts described in the question were not precise enough. The facts do not explicitly state that the alleged infringing material was not an exact copy of Emma’s work. Persons 1 and 2 read the facts to be that the stories were similar, but not exact copies. Person 3 read the same facts to be that Dorothy’s story was an exact copy of Emma’s story.

⁵See Section B.4.

⁶Persons 1 and 2 stated that “musical work” was not defined in the Act, and relied upon a natural or everyday meaning of the phrase. Section 22 of the Act states that something must be “reduced to a material form” before it becomes a work. This would mean that persons 1 and 2 were in error (as the musical performance was not reduced to a material form) in reality — but because they were not provided with the section they were not. Person 3 classified the facts correctly, in reality; but again, in the tests, s22 was not provided. As s22 was not provided, both classifications could be valid.

is appropriate.

7.2.1 The reporting by the MYCIN-part

The results reported above indicate that the reporting now done by SHYSTER-MYCIN is an improvement over the reporting that was done by MYCIN. The original MYCIN system reported only conclusions. Both versions 2 and 3 report the conclusions and the reasons for reaching those conclusions. This is an improvement, as the MYCIN part of the system now explains its reasoning, and thus is able to meet that criteria of being an expert system.

This improved reporting can also be seen to improve from version 2 to version 3. Version 3 produces a dramatically more concise report. Version 3 achieves this without losing the validity that version 2 has.

7.2.2 The Model of Legal Reasoning

The results discussed in Section 7.1.3 indicate that the system provides “correct” answers. The fact that the answers provided by the system agree with those given by the experts suggests that the approach taken in constructing the system is appropriate. That is, the representing of knowledge about a statute in rules, and the representing of cases in a case-base is appropriate.

Conclusion

I now conclude this thesis by: providing an overview of the construction and testing of SHYSTER-MYCIN, stating the implications of the results of the testing, and finally by identifying areas of future research.

8.1 The construction and testing of SHYSTER-MYCIN

SHYSTER-MYCIN is the combination of a rule-based reasoner and a case-based reasoner. The creation of this system was chiefly focused upon the MYCIN, or rule-based, part of the system. The SHYSTER part was only called upon from within MYCIN when it was needed.

In creating the MYCIN part, two major tasks were completed. First, a rule base was created to reflect the relevant provisions of the *Copyright Act 1968*. This rule base eventually consisted of some 273 rules. Second, the reporting made by MYCIN was altered to report not just conclusions, but also reasons for those conclusions. To this end some of the existing LISP functions in MYCIN were altered, others were added.

The system was created in three versions. The first as an elementary test to see if the remainder of the development was feasible. The second version contained the large rule base and improved reporting procedures. This reporting was further improved in the third version of the system. The reporting was improved in its conciseness by limiting conclusions reported to those made relying on more than one fact. The third version goes close to providing reports similar to the legal experts in terms of validity, conciseness and correctness.

The system was tested by way of comparison with reports made by a group of three legal experts. The results of these tests show that the system produces valid and correct reports, although the conciseness of the reports could be further improved. However, there is a trend from version two to version three that the conciseness is improving.

8.2 Implications of the results

The results of testing SHYSTER-MYCIN show that the approach taken in constructing the system is appropriate. That is, it is appropriate to use rule-based reasoning when

dealing with statutes, and that it is appropriate to use case-based reasoning when dealing with cases.

The results suggest that if the entire *Copyright Act 1968* and associated cases were represented within SHYSTER-MYCIN (that is, with the whole Act represented in the MYCIN part, and all of the open-textured concepts resolvable by reference to an enhanced case-base in the SHYSTER part), the system would be expert in the entire body of copyright law.

8.3 Future research

Given sufficient time and resources, the entire *Copyright Act 1968* and associated cases could be represented in SHYSTER-MYCIN. This would then allow for a definitive statement as to the ability of the system to become expert in an area of law.

To translate the entire Act into rules for the MYCIN part, some sort of rule management system should be created. This is because, in creating SHYSTER-MYCIN, it was observed that a great number of rules are required to represent only a small number of provisions in the Act. Without a rule management system, the rule-base is “fragile”, that is, changing it would most likely result in error.

The system could be further improved in the conciseness of the reporting by the MYCIN part. By defining a “positive conclusion”, the reporting could be further restricted to only report conclusions made on more than one fact which was concluded positively. A “positive conclusion” would have the effect of assigning a direction to a fact. A positive answer would be one that brings the system a step closer to a goal.¹

Although left untouched in the construction of SHYSTER-MYCIN, the reasoning performed by SHYSTER could be altered. Methods of analogy other than nearest neighbour could be employed by SHYSTER to select cases.²

The facts collected by the MYCIN and SHYSTER parts should be shared between the two expert systems. At present they each store their own set of facts, and do not pass information between each other. If the facts were stored commonly, then the potential for a user to be asked the same question twice is eliminated. This has two benefits: the user does not become annoyed or frustrated by double-questioning, and conflicting answers are not provided³.

SHYSTER-MYCIN could be tested by comparing the results given by the system when used by lay-people with the answers given by experts. This would test whether SHYSTER-MYCIN can accurately gather facts by questioning a person. Fact elicitation/classification is one of the areas that Susskind [2001] identifies as requiring

¹The answer “false” could be “positive” under this system. That is because whether an answer is positive or not depends on whether it takes the system a step closer to a goal — which an answer of “false” might do.

²As suggested by Popple [1996, page 251].

³If a user was asked essentially the same question twice, their second answer has the potential to conflict with the first. This could mean that the SHYSTER part and the MYCIN part were working on different facts. As discussed in Section 7.1.3, if the facts used are different, the result will most likely be different.

greater research. A system capable of getting the facts right by questioning a lay-person would be an “online legal service” and in the top-right quadrant of Susskind’s “Legal Grid”⁴. Such a system would be of great use both commercially and for society.

⁴See Figure 5.1.

An Interaction with SHYSTER-MYCIN

Here follows an interaction with SHYSTER-MYCIN. The factual scenario that the user was working from was the one described in the third of the testing pack questions, in Section B.3. The answers provided by the user are presented in a bold, sans serif font, the output of the MYCIN-part in the standard serif font used in the majority of this thesis, and the output of the SHYSTER-part is displayed in a typewriter style font.

A.1 In Relation to Quentin

CL-USER(3): (**shyster-mycin**)

— ACCUSED-1 —

What is the name of the accused? **Quentin**

The material in question is a: **cinematograph-film**

Did Quentin make a copy of the the material in Australia? **yes**

Did Quentin communicate the material to the public? **no**

Did Quentin cause the material to heard in public in Australia? **no**

Did Quentin cause the material to seen in public in Australia? **no**

Did Quentin authorize the use of the material?

Please note that SHYSTER can assist you in answering this question.

To ask SHYSTER, please type "ask-shyster" **no**

Was a copy of the the material made in Australia (by someone else)? **no**

Was the material caused to be seen in public in Australia (by someone else)? **no**

Was the material caused to be heard in public in Australia (by someone else)? **no**

Was the material communicated to the public in Australia (by someone else)? **no**

Did Quentin have a licence to use the material, in the manner in which it was used? **no**

Did Quentin make the cinematograph film? **no**

Findings for Quentin:

EX-S31.1.A: NO (1.000)

EX-S31.1.B: NO (1.000)

EX-S85: NO (1.000)

EX-S86: YES (1.000)

EX-S87: NO (1.000)

EX-S88: NO (1.000)

EX-S31.1.A-AUTH: NO (1.000)

EX-S31.1.B-AUTH: NO (1.000)

EX-S85-AUTH: NO (1.000)

EX-S86-AUTH: NO (1.000)

EX-S87-AUTH: NO (1.000)

EX-S88-AUTH: NO (1.000)

INFRINGING-COPYRIGHT-S13.2: NO (1.000)

INFRINGING-COPYRIGHT-S36.1: NO (1.000)

INFRINGING-COPYRIGHT-S101.1: YES (1.000)

A.2 In Relation to Ringo

What is the name of the accused? **Ringo**

The material in question is a: **cinematograph-film**

Did Ringo make a copy of the the material in Australia? **no**

Did Ringo cause the material to seen in public in Australia? **no**

Did Ringo cause the material to heard in public in Australia? **no**

Did Ringo communicate the material to the public? **no**

Did Ringo authorize the use of the material?

Please note that SHYSTER can assist you in answering this question.

To ask SHYSTER, please type "ask-shyster" **ask-shyster**

SHYSTER version 1.0

Copyright James Popple 1993

Reading case law specification from
"/home/u3175294/shyster/Authorization.cls" ...

7 courts in the hierarchy.

Authorization area:

3 results
7 attributes
9 cases
3 ideal points

WARNING (Parser): C2 and C4 in Authorization area have
identical attribute values (except for unknowns).

WARNING (Parser): C2 and C9 in Authorization area have
identical attribute values (except for unknowns) and
different results.

Case law specification is valid.

WARNING (Scales): A5 in Authorization area has infinite
weight.

Case law area identifier: Authorization
Case-based system called with area identifier "Authorization".

Area is Authorization.

Writing report to
"/home/u3175294/ai/report/shyster-conclusions-Authorization.tex".

Was the infringer an employee of the accused (YNUHQ)? **y**
Was the infringer an independent contractor to the accused
(YNUHQ)? **n**

Did the accused sell or hire the infringer the means of
infringing (YNUQ)? **u**

Did the accused have the power to prevent the infringement

(YNUHQ)? **y**

Did the accused take reasonable steps to avoid the infringement (YNUHQ)? **n**

Did the accused know, or have reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done (YNUHQ)? **y**

Was the specific infringement causally related to an incitement to infringe on the part of the accused (YNUHQ)? **u**

Fact vector is (YNUYNYU).

Nearest neighbours:

 Liable:

 C9 APRA v. Miles

Nearest others:

 Auth:

 C1 UNSW v. Moorhouse

 C3 Winstone v. Wurlitzer

 Not-Auth:

 C6 RCA v. Fairfax

 C8 A & M v. Audio Magnetics

Safeguards:

 Distance measures:

 * C2 APRA v. Canterbury-Bankstown (Auth)

 Association coefficients:

 * C2 APRA v. Canterbury-Bankstown (Auth)

 Correlation coefficients:

 * C2 APRA v. Canterbury-Bankstown (Auth)

 Weighted correlation coefficients:

 * C2 APRA v. Canterbury-Bankstown (Auth)

WARNING (Reporter): one or both of the weighted safeguard metrics suggest that a case (or cases) with a different result should be the nearest neighbour (or neighbours).

Nearest result for the instant case is Liable.

Instantiation 1 is (YNY[^]YNY[^]Y).

Nearest neighbours:

Liable:

C9 APRA v. Miles

Nearest others:

Auth:

C3 Winstone v. Wurlitzer

Not-Auth:

C8 A & M v. Audio Magnetics

Safeguards:

Distance measures:

* C2 APRA v. Canterbury-Bankstown (Auth)

* C3 Winstone v. Wurlitzer (Auth)

Association coefficients:

* C3 Winstone v. Wurlitzer (Auth)

Correlation coefficients:

* C3 Winstone v. Wurlitzer (Auth)

Nearest result for instantiation 1 is Liable.

Instantiation 2 is (YNY[^]YNY[^]N).

Nearest neighbours:

Liable:

C9 APRA v. Miles

Nearest others:

Auth:

C1 UNSW v. Moorhouse

Not-Auth:

C8 A & M v. Audio Magnetics

Safeguards:

Distance measures:

* C1 UNSW v. Moorhouse (Auth)
- C9 APRA v. Miles

Association coefficients:

* C1 UNSW v. Moorhouse (Auth)
- C9 APRA v. Miles

Correlation coefficients:

* C1 UNSW v. Moorhouse (Auth)
- C9 APRA v. Miles

Ideal point directions:

Not-Auth

Centroid directions:

Not-Auth

Nearest result for instantiation 2 is Liable.

Instantiation 3 is (YNNYNY).
 ^ ^

Nearest neighbours:

Liable:

C9 APRA v. Miles (identical)

Nearest others:

Auth:

C3 Winstone v. Wurlitzer

Not-Auth:

C6 RCA v. Fairfax

Safeguards:

Distance measures:

* C2 APRA v. Canterbury-Bankstown (Auth)

Association coefficients:

* C2 APRA v. Canterbury-Bankstown (Auth)

Correlation coefficients:

* C2 APRA v. Canterbury-Bankstown (Auth)

Weighted correlation coefficients:

* C2 APRA v. Canterbury-Bankstown (Auth)

WARNING (Reporter): one or both of the weighted safeguard metrics suggest that a case (or cases) with a different result should be the nearest neighbour (or neighbours).

Nearest result for instantiation 3 is Liable.

Instantiation 4 is (YNNYNYN).

Nearest neighbours:

Liable:

C9 APRA v. Miles

Nearest others:

Auth:

C1 UNSW v. Moorhouse

Not-Auth:

C6 RCA v. Fairfax

Safeguards:

Distance measures:

* C2 APRA v. Canterbury-Bankstown (Auth)

Ideal point directions:

Not-Auth

Centroid directions:

Not-Auth

Nearest result for instantiation 4 is Liable.

All 4 instantiations have the same nearest result as does the instant case.

No hypotheticals.

Case-based system returned result identifier "Liable".

Finished.

Did Ringo authorize the use of the material?

Please note that SHYSTER can assist you in answering this question.

To ask SHYSTER, please type "ask-shyster" **yes**

Was a copy of the the material made in Australia (by someone else)? **yes**

Was the material communicated to the public in Australia (by someone else)? **no**

Was the material caused to be heard in public in Australia (by someone else)? **no**

Was the material caused to be seen in public in Australia (by someone else)? **no**

Did Ringo have a licence to use the material, in the manner in which it was used? **no**

Did Ringo make the cinematograph film? **no**

Findings for Ringo:

EX-S31.1.A: NO (1.000)

EX-S31.1.B: NO (1.000)

EX-S85: NO (1.000)

EX-S86: NO (1.000)

EX-S87: NO (1.000)

EX-S88: NO (1.000)

EX-S31.1.A-AUTH: NO (1.000)

EX-S31.1.B-AUTH: NO (1.000)

EX-S85-AUTH: NO (1.000)

EX-S86-AUTH: YES (1.000)

EX-S87-AUTH: NO (1.000)

EX-S88-AUTH: NO (1.000)

INFRINGING-COPYRIGHT-S13.2: YES (1.000)

INFRINGING-COPYRIGHT-S36.1: NO (1.000)

INFRINGING-COPYRIGHT-S101.1: YES (1.000)

The Testing Pack — Questions

The following are the questions that were given to both SHYSTER-MYCIN and the testing group to answer.

B.1 Question One

Glen has written a number of poems over the last few years. Using his desktop-publishing skills and his computer he produces a collection of his poems as a small book. Glen donates a copy of the book to his local library.

Harriet borrows the book, and after reading Glen's poetry discovers that she likes his poetry a great deal and feels that more people should have the chance to read the poems. Harriet achieves her aim by typing each of the poems into her computer and then produces a series of webpages that are accessible by anyone on the internet.

Glen comes to you and first asks if Harriet has infringed his copyright in the poetry.

B.2 Question Two

Upon seeing an advertisement for a creative writing competition, Emma decides to enter. After she has begun writing her entry, she tells her friend Dorothy about the competition. As the closing date for entries has not yet past, Dorothy thinks to herself that she might enter the competition as well. Emma goes on to tell Dorothy the plot of the story that she is writing.

Once the competition was decided, it happened that Dorothy won the competition. The winning entry and some others were published in the local paper. Emma noticed that Dorothy's story had the same plot as her story. Emma became quiet upset with Dorothy and the friendship ended.

Emma now asks for your advice about whether Dorothy has infringed her rights relating to the story she wrote.

B.3 Question Three

Quentin loves watching movies, and considers himself a bit of a “movie-buff”. Because of this he decided that a really good way to watch a lot of movies cheaply would be to work in a video store. He hoped that watching a lot of movies will help him in his dream to be a director.

Whilst working for Pulp Video, Quentin enjoyed watching the movies. Ringo owned the store and Quentin was his only employee. Whenever Quentin was working, Ringo was also in the store. Ringo didn’t like it when he played the same movie repeatedly over the in-store TVs. Quentin stopped playing the movies repeatedly, yet he wished he could keep some of the videos for his collection, so he could watch them again. Quentin then remembered that there was another VCR and cables in the store room. He connected this VCR to the one for playing the movies in-store so that he could copy the movies whilst they were being played on the in-store TVs. Quentin used a large number of blank video cassettes that were in the store room to record the movies he wanted to add to his collection.

One day the local Sony-Time-Warner-Disney (“STWD”) representative, Peta, comes into the store and notices the VCRs that are set up to copy videos. Peta notices that at the time she walked into the store, Quentin was copying “Bambi II – Judgement Day”, a movie of which STWD owns the copyright. Peta asks you to assess whether Quentin has infringed the copyrights that STWD owns, and, if so, whether Ringo has authorised the infringement.

B.4 Question Four

“X” is an electronic music group who create their music live at each performance. Consequently they make each performance unique with different music performed each time.

Yvette attends a performance at her local pub. As Yvette enters the bouncer notices she has a dictaphone with her, and initially refuses her entry. The bar manager, Zorba, sees this. Yvette asks Zorba if she can come in with the dictaphone. Zorba says that she can enter and that she can bring the dictaphone with her.

Yvette makes a recording of X’s performance, at the time X are unaware that this is taking place. A few weeks later X return to the bar and notice an advertisement placed there by Yvette, offering for sale recordings of their last performance at the bar.

X is annoyed by this and seeks your advice as to whether Yvette is infringing their copyright, and whether Zorba has authorised that infringement.

B.5 Question Five

Bert owns and operates a music shop. Bert has contracted with “CleanCleaners” to have the shop cleaned each night. CleanCleaners employ Carl among others to clean

the shops for which they having cleaning contracts. The shifts are randomly allocated so the one cleaner does not always clean the same building.

After cleaning Bert's music shop a few times, Carl thinks up a plan to start copying the music and then selling the copies. When Carl knows when he will be cleaning Bert's music shop, he gives his friend Danny a call to inform him. Danny then meets Carl and picks up a bunch of CDs that he then takes home and copies whilst Carl continues to clean the shop. By the time Carl has finished the cleaning, Danny returns and they put the CDs back exactly where they found them. The cleaning always takes place in the early hours of the morning, a time during which Bert always prefers to sleep instead of checking-up on the cleaners.

Using some sophisticated software, the local Sony-Time-Warner-Disney ("STWD") representative, Anna, discovers the counterfeit CDs that she found Danny was selling had originated from shipments they had made to Bert's store. STWD has already successfully sued Danny for a breach of copyright, and now Anna asks you to determine if Bert authorised the infringement.

The Testing Pack — *Copyright Act 1968*

The Act that the rules for SHYSTER MYCIN came from, and that the test group were given, was a cut-down version of the *Copyright Act 1968*¹. The text of some of the sections was also changed to remove references to other provisions in the original Act which were not included in the cut-down version.

The cut-down version of the Act contained the following sections only:

- Sections 1–9
- Selected definitions from s10
- Section 13(2)
- Section 31 — subsections (1) and (2)
- Section 35(2)
- Section 36(1)
- Section 85(1)
- Sections 86–88
- Section 97(2)
- Section 98(2)
- Sections 99 and 100
- Section 101(1)

¹Available online at http://www.austlii.edu.au/au/legis/cth/consol_act/ca1968133/

The Testing Pack — Case Summaries

D.1 *Performing Right Society Ltd v. Cyril Theatrical Syndicate Ltd* [1924] 1 KB 1

Facts:

1. The infringer was not an employee of the accused.
2. The infringer was an independent contractor to the accused.
3. The accused did not sell or hire the infringer the means of infringing.
4. The accused had the power to prevent the infringement.
5. The accused did not take reasonable steps to avoid the infringement.
6. The accused did not know, and had no reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.
7. The specific infringement was not causally related to an incitement to infringe on the part of the accused.

Commentary:

The syndicate was the lessee of a theatre. The managing-director of the syndicate produced a play at that theatre, and engaged a band to perform at the theatre under the direction of a bandmaster. In the absence of the managing-director, and without his knowledge, the band performed works the copyright in which was owned by the Performing Right Society.

Bankes, Scrutton and Atkin LJJ held that the managing-director had not authorized the infringing performances, within the meaning of s. 1(2) of the Copyright Act 1911 (UK), because the infringement occurred without his knowledge and he had no reason to anticipate or suspect that the band was likely to give performances which would breach copyright.

Result:

- The accused did not authorize the infringement.

D.2 *Falcon v. Famous Players Film Co.* [1926] 2 KB 474

Facts:

1. The infringer was not an employee of the accused.
2. The infringer was not an independent contractor to the accused.
3. The accused sold or hired the infringer the means of infringing.
4. The accused did not have the power to prevent the infringement.
5. The accused did not take reasonable steps to avoid the infringement.
6. The accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.
7. The specific infringement was causally related to an incitement to infringe on the part of the accused.

Commentary:

the author of a play assigned to Falcon the sole right to perform the play in the United Kingdom and, twenty-one years later, sold to Famous Players the film rights to the play throughout the world. Famous Players made a film of the play in America, imported it to England, and purported to let the right to exhibit it to the proprietor of a cinema. Falcon brought an action to restrain Famous Players from infringing his performing right. Famous Players denied that Falcon had such an exclusive right and claimed that, even if he had, they had not infringed it.

The Court of Appeal held that Falcon did have an exclusive right to perform the play in the UK, and that Famous Players had infringed it.

Scrutton LJ referred to the hiring agreement that impliedly stipulated that the cinema proprietor should exhibit. “They have imposed an obligation upon him that he shall perform, and in my view persons who do that perform themselves.”¹ Hence Scrutton LJ found no need to consider whether Famous Players had authorized the cinema proprietor to infringe.

Bankes and Atkin LJ held that Famous Players had authorized the infringement within the meaning of s. 1(2) of the Copyright Act 1911 (UK).

¹At 495.

Bankes LJ's view (quoted above) that the word "authorize" should be understood in its ordinary dictionary sense of "sanction, approve, and countenance" has been adopted by most subsequent courts in the UK and in Australia.

Result:

- The accused authorized the infringement.

D.3 *Mellor v. Australian Broadcasting Commission* [1940] AC 491

Facts:

1. The infringer was not an employee of the accused.
2. The infringer was an independent contractor to the accused.
3. The accused did not sell or hire the infringer the means of infringing.
4. The accused had the power to prevent the infringement.
5. The accused did not take reasonable steps to avoid the infringement.
6. The accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.
7. The specific infringement was causally related to an incitement to infringe on the part of the accused.

Commentary:

Mellor and others held the sole right to perform in public in Australia musical works arranged for performance by brass and military bands. They published and distributed advertising pamphlets which included a statement that all of their sheet music was "'Free for Public Performance' anywhere ... We have paid for the performing rights of every piece we issue."² The ABC engaged bands to play some of this music, and broadcast the bands' performances on radio.

The Privy Council held that the ABC had authorized the bands to perform the musical works within the meaning of s. 1(2) of the Copyright Act 1911 (UK) which was in force in Australia by virtue of the *Copyright Act 1912* (Cth). However, the ABC had not infringed the plaintiffs' sole right to authorize public performance because the statements made in the pamphlets amounted to consent.

Result:

- The accused authorized the infringement.

²At 498–9.

D.4 *Winstone v. Wurlitzer Automatic Phonograph Co. of Australia Pty Ltd* [1946] VLR 338

Facts:

1. The infringer was not an employee of the accused.
2. The infringer was not an independent contractor to the accused.
3. The accused sold or hired the infringer the means of infringing.
4. The accused had the power to prevent the infringement.
5. The accused did not take reasonable steps to avoid the infringement.
6. The accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.
7. The specific infringement was causally related to an incitement to infringe on the part of the accused.

Commentary:

Wurlitzer installed a juke-box in a shop and had an agreement with the shop's proprietor by which Wurlitzer maintained and repaired the machine, and supplied it with records which Wurlitzer selected. The juke-box played a musical work, the copyright in which was owned by Winstone.

Herring CJ held that the proprietor of the shop had publicly performed the musical work and — because of nature of the agreement between Wurlitzer and the shop's proprietor, and because Wurlitzer selected the records — Wurlitzer had authorized that infringing performance within the meaning of s. 1(2) of the Copyright Act 1911 (UK) which was in force in Australia by virtue of the *Copyright Act 1912* (Cth).

Result:

- The accused authorized the infringement.

D.5 *Australasian Performing Right Association Ltd v. Miles* [1962] NSW 405

Facts:

1. The infringer was an employee of the accused.
2. The infringer was not an independent contractor to the accused.
3. The accused did not sell or hire the infringer the means of infringing.

4. The accused had the power to prevent the infringement.
5. The accused did not take reasonable steps to avoid the infringement.
6. The accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.
7. The specific infringement was causally related to an incitement to infringe on the part of the accused.

Commentary:

The Dee Why RSL Club engaged a band to play at a dance held at the club. During the dance the band played *I've Got a Lovely Bunch of Coconuts*, the copyright in which was owned by the Australasian Performing Right Association.

Jacobs J held that the members of the band were servants of the club, because "the club through its officers was exercising a control over the work performed in such a way as to show that there was an authority to command the orchestra in its performance."³ So the members of the club, through the band, performed the musical work and infringed the copyright under s. 2(1) of the Copyright Act 1911 (UK) which was in force in Australia by virtue of the *Copyright Act 1912* (Cth).

Result:

- The accused is liable (directly or vicariously) for the infringement.

D.6 *APRA v. Canterbury-Bankstown League Club Ltd* [1964–65] NSW 138

Facts:

1. Unknown
2. Unknown
3. The accused did not sell or hire the infringer the means of infringing.
4. The accused had the power to prevent the infringement.
5. The accused did not take reasonable steps to avoid the infringement.
6. The accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.

³At 407.

7. The specific infringement was causally related to an incitement to infringe on the part of the accused.

Commentary:

The club engaged a dance band to play music for dances that it held at its premises. The choice of the music to be played was left to the band leader.

Herron CJ, Ferguson and Asprey JJ held that whether the bandleader was an employee or an independent contractor was immaterial. “He was authorized to play and was allowed a discretion to select whatever music he liked. He was thus given a general authority to play whatever music he liked irrespective of copyright.”⁴ So (if he was an employee) the club was vicariously liable for — or (if he was an independent contractor) the club was liable for the authorization of — the bandleader’s breach of the *Copyright Act 1912* (Cth).

Result:

- The accused authorized the infringement.

D.7 *University of New South Wales v. Moorhouse* (1975) 133 CLR 1

Facts:

1. The infringer was not an employee of the accused.
2. The infringer was not an independent contractor to the accused.
3. The accused sold or hired the infringer the means of infringing.
4. The accused had the power to prevent the infringement.
5. The accused did not take reasonable steps to avoid the infringement.
6. The accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.
7. The specific infringement was not causally related to an incitement to infringe on the part of the accused.

Commentary:

⁴At 140 per Ferguson J.

A graduate of the University used a photocopy machine in the University library to make two copies of a story from a library copy of a book of short stories.

McTiernan ACJ, Gibbs and Jacobs JJ held that the University had authorized the infringement within the meaning of s. 36(1) of the *Copyright Act 1968* (Cth); it had the power to prevent infringements, but had not taken reasonable steps to prevent them.⁵ Gibbs J's statement about what constitutes authorization of an infringement is quoted above.

Result:

- The accused authorized the infringement.

D.8 *A & M Records Inc. v. Audio Magnetics Inc. (UK) Ltd [1979] FSR 1*

Facts:

1. The infringer was not an employee of the accused.
2. The infringer was not an independent contractor to the accused.
3. The accused sold or hired the infringer the means of infringing.
4. The accused did not have the power to prevent the infringement.
5. The accused did not take reasonable steps to avoid the infringement.
6. The accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.
7. The specific infringement was not causally related to an incitement to infringe on the part of the accused.

Commentary:

A&M Records and twenty-three others alleged that Audio Magnetics was inciting the public to infringe their copyright in sound recording by advertising blank cassette tapes.

Foster J held that there was no "particular specific authorisation";⁶ there was not sufficient causal relationship between the alleged authorization and the actual breach. "It was not sufficient to allege authorisation at large. Authorisation meant sanctioning, express approval or countenancing of an actual breach of copyright by some act directly related to that breach."⁷

⁵The *Copyright Act* was amended in 1980 to ameliorate the effect of *UNSW v. Moorhouse* as far as photocopying in educational institutions is concerned.

⁶At 10.

⁷At 2.

Result:

- The accused did not authorize the infringement.

D.9 *RCA Corporation v. John Fairfax and Sons Ltd* [1981] 1 NSWLR 251

Facts:

1. The infringer was not an employee of the accused.
2. The infringer was not an independent contractor to the accused.
3. The accused did not sell or hire the infringer the means of infringing.
4. The accused did not have the power to prevent the infringement.
5. The accused did not take reasonable steps to avoid the infringement.
6. The accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.
7. The specific infringement was not causally related to an incitement to infringe on the part of the accused.

Commentary:

the Fairfax newspaper the *Sun-Herald* carried an article which pointed out that, using cassette tapes and good quality taping equipment, the same album can be taped by many people. It also discussed how the advent of FM radio had made it easy for people to tape new album and single releases without buying the discs: “Why spend nearly \$10 on the new David Bowie album when you can tape it from 2JJJ?”⁸

Kearney J held that “authorization involves some element of causation — and hence the necessity for some relationship creating a link or connection however tenuous between the authorizer and the infringer.”⁹ There was no such link, so Fairfax had not authorized any infringement within the meaning of s. 13(2) of the *Copyright Act 1968* (Cth).

Result:

- The accused did not authorize the infringement.

⁸At 252.

⁹At 259.

D.10 **Ideal Case One**

Facts:

1. The infringer was not an employee of the accused.
2. The infringer was an independent contractor to the accused.
3. The accused sold or hired the infringer the means of infringing.
4. The accused had the power to prevent the infringement.
5. The accused did not take reasonable steps to avoid the infringement.
6. The accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.
7. The specific infringement was causally related to an incitement to infringe on the part of the accused.

Result:

- The accused authorized the infringement.

D.11 **Ideal Case Two**

Facts:

1. The infringer was not an employee of the accused.
2. The infringer was not an independent contractor to the accused.
3. The accused did not sell or hire the infringer the means of infringing.
4. The accused did not have the power to prevent the infringement.
5. The accused took reasonable steps to avoid the infringement.
6. The accused did not know, and had no reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.
7. The specific infringement was not causally related to an incitement to infringe on the part of the accused.

Result:

- The accused did not authorize the infringement.

D.12 Ideal Case Three

Facts:

1. The infringer was an employee of the accused.
2. The infringer was not an independent contractor to the accused.
3. Unknown
4. The accused had the power to prevent the infringement.
5. The accused did not take reasonable steps to avoid the infringement.
6. The accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.
7. Unknown

Result:

- The accused is liable (directly or vicariously) for the infringement.

Test Results — Answers to Questions

E.1 Answers to Question One

E.1.1 Person One

- The book is a “literary” work
- Section 31(1): copyright is the exclusive right to do certain things
- Section 35(2): “author” = owner = Glen
- Section 36(1): Harriet infringes by “doing an act” in Australia (being an act comprised in the copyright), namely the act described in s 36(1)(a)(i) and (ii).

E.1.2 Person Two

- Glen, as the author of the book, is the owner of the copyright in it (s35)
- Glen’s book is a “literary work”
- By s36(1), Harriet infringes Glen’s copyright in the book if Harriet does any of the acts in the sub-section (s31(1)(a)) in Australia
- Harriet has done the acts in s31(1)(a)(i), (ii), and (iv)
- The fact that the internet disseminates material globally does not mean that Harriet has not done the act in Australia
- Therefore Harriet has infringed Glen’s copyright in the book

E.1.3 Person Three

- Harriet has infringed the copyright in the poetry
- Glen owns the copyright as he is the author of a literary/artistic work — s35

- He has the exclusive right to — communicate the work to the public — s31(a)(iv)
- Communicate is defined in s10 to include “make available online”
- There has been an infringement as Harriet has done an act “comprised in the copyright” — s36

E.2 Answers to Question Two

E.2.1 Person One

- Emma’s entry is a “literary work”
- Section 31(1): the copyright in it is Emma’s
- Section 35(2): “author” = “owner” = Emma (in Emma’s work)
- Section 36(1) — did Dorothy “infringe”?
- Section 31(1)(a):
 - (i) — no
 - (ii) — no
 - (iii) — no
 - (iv) — is it an “adaptation”? no (see s10)
- Therefore Dorothy has not infringed Emma’s rights.

E.2.2 Person Two

- As the “author”, Emma is the “owner” of the copyright in the work (s35(2))
- Emma’s entry is a “literary work”
- Emma has the copyright (s31(1))
- Dorothy will have infringed Emma’s copyright if Dorothy has committed one of the acts in s31(1)(a)(i)–(v)
- Dorothy has not done so
- Dorothy’s entry is clearly not an “adaptation” (s10) of Emma’s work

E.2.3 Person Three

- Dorothy has infringed the rights relating to the story
- Emma owns the copyright as she is the author of the literary work — s35
- “Literary work” is defined as a compilation expressed in words (“words” not equivalent to “writing” which is defined differently in the Act) — s10
- She has the exclusive right to reproduce the work in material form — s31(a)(i)
- She has the exclusive right to publish the work — s31(a)(ii)
- There has been an infringement as Dorothy has done an act “comprised in the copyright” — s36

E.3 Answers to Question Three

E.3.1 Person One

- The movie is a “cinematograph film”
- Section 86: copyright is the exclusive right to — “(a) make a copy of the film”
- Section 98(2): STWD, being the maker of the cinematograph film is the “owner”
- Section 101: Quentin, not being the “owner” infringes by making a copy of the film
- Section 101: has Ringo “authorized” the doing by Quentin of the infringing act of making the copy?
- “Authorize” = “sanction, approve or countenance” (*Famous Players*) but Ringo had not taken reasonable steps to prevent the infringement (*Moorhouse*).
- Therefore Ringo “authorized” the infringement (he was always there)

E.3.2 Person Two

- STWD is the owner of the copyright in the cinematograph film (s98(2))
- By s86, copyright includes the exclusive right to make copies of the film
- Quentin — who is not the “owner” of the copyright — infringes by making a copy
- Ringo contravenes s101 if he “authorizes” Quentin’s actions
- Ringo has taken no steps at all to prevent Quentin from making the copies (*Moorhouse*)
- Therefore, Ringo has “authorized”

E.3.3 Person Three

- Assume from question that STWD owns the copyright
- Quentin:
 - Quentin has infringed the copyrights that STWD own
 - STWD has the exclusive right to make a copy of the film — s86(a)
 - There has been an infringement as Quentin has done an act “comprised in the copyright” — s101
- Ringo:
 - Ringo has infringed the copyrights that STWD own
 - The Act:
 - * STWD has the exclusive right to make a copy of the film — s86(a)
 - * There has been an infringement as Quentin has done an act “comprised in the copyright” — s101
 - Cases:
 - * *Australian Performing Right Association v Miles* — Ringo fits the facts of this case and is liable directly or vicariously for the infringement as he has “authorised” the doing of an act comprised in the coyright

E.4 Answers to Question Four

E.4.1 Person One

- X’s performance is a “musical work”
- X is the “owner” of the copyright, being the “author” (s 35(2))
- Section 31(1)(a) confers on X the exclusive right — “(i) to reproduce the work in a material form”
- Section 36(1): a person who is not the owner, infringes by doing the act described in s 31(1)(a)(i)
- Therefore Yvette infringes
- A person also infringes if the person “authorizes” the doing of the act . . .
- Zorba has “authorized” by “countenancing” (*Famous Players*) and by failing to take obvious measures to restrain Yvette

E.4.2 Person Two

- Although the expression “musical work” is not defined in the Act, V’s performance is plainly a “musical work” according to the common meaning of that expression
- X is the owner, as it is the author (s35(2))
- By section 31, X has the exclusive right to “reproduce the work in a material form”
- Therefore for anyone else to make a copy is an infringement
- Therefore, Yvette has infringed (s36(1))
- Has Zorba authorized Yvette’s infringement?
- Zorba has actively encouraged Yvette — by overruling the bouncer’s decision to refuse her admittance with the recorder (*Famous Players* — and on any of the test of “authorization”, has authorized the infringement, and so contravened s36(1))

E.4.3 Person Three

- Yvette:
 - Yvette has not infringed the copyrights that X own
 - Yvette owns the copyright of the sounds recording because she is the maker of the sound recording — s97(2)
 - Yvette has the exclusive right to make a copy of the sound recording — s85(1)(a)
- Zorba
 - Zorba has infringed the copyright that X own
 - Cases
 - * Closest could find was *Australian Performing Right Association v Canterbury* - but wasn’t really that close

E.5 Answers to Question Five

E.5.1 Person One

- Whether Bert “authorized” the infringement, which has been proven
- It is not unreasonable for Bert to sleep at night and the CD’s were always put back in their right place

- Bert has not “sanctioned approved or countenanced” (*Famous Players*) the infringement; nor has he failed to take reasonable precautions
- Therefore no infringement through authorizing

E.5.2 Person Two

- The question, whether Danny (who has been successfully been sued for infringement) in fact infringed the copyright, may be considered again in these proceedings (*A & M Records*). However, on the stated facts, it is plain that Danny has been correctly convicted
- Has Bert “authorized” Danny’s infringement?
- Bert sleeps when most of the world sleeps; he has no reason to suspect anything is wrong; he is entitled to rely on the cleaners to do their job honestly
- Therefore, under none of the authorities has Bert infringed STWD’s copyright

E.5.3 Person Three

- Bert has not authorised the infringement
- Cases:
 - Closest could find was the second “Ideal Case” — but the accused (Bert) did not take reasonable steps to avoid the infringement as Bert always preferred to sleep in the early hours of the morning instead of checking-up on the cleaners.

Test Results — Selected Answers to Questions by SHYSTER-MYCIN

This appendix contains two samples of the reports generated by SHYSTER-MYCIN version 3 when consulted by a user. Both reports are answers to Question 3 from the test pack (see Section B.3). The first report is an answer to the issue of Quentin’s infringement; the second an answer to Ringo’s authorization.

The reports are usually created as stand-alone L^AT_EX files. The title page, abstract and contents that normally accompany these reports have been removed.

F.1 Quentin’s Infringement

F.1.1 MYCIN

F.1.1.1

I have been told or previously deduced that:

- the material is a CINEMATOGRAPH-FILM
- the accused did publish the material in Australia

By applying a rule¹ to the above facts, I am concluding that:

- the accused did exercise an exclusive right under s86

F.1.1.2

I have been told or previously deduced that:

- the material is a CINEMATOGRAPH-FILM
- a copy of the the material was not made in Australia (by someone else)
- the material was not caused to be seen in public in Australia (by someone else)

¹represented internally to me as rule 86.A.

- the material was not caused to be heard in public in Australia (by someone else)
- the material was not communicated to the public in Australia (by someone else)

By applying a rule² to the above facts, I am concluding that:

- the accused did not authorize an exclusive right under s86 to be exercised

F.1.1.3

I have been told or previously deduced that:

- the accused did not authorize an exclusive right under s31(1)(b) to be exercised
- the accused did not authorize an exclusive right under s85 to be exercised
- the accused did not authorize an exclusive right under s86 to be exercised
- the accused did not authorize an exclusive right under s87 to be exercised
- the accused did not authorize an exclusive right under s88 to be exercised

By applying a rule³ to the above facts, I am concluding that:

- the use of the material was not an infringement of the right to authorize the use copyright material subsisting by virtue of s13(2)

F.1.1.4

I have been told or previously deduced that:

- the material is a CINEMATOGRAPH-FILM
- the accused did not make the cinematograph film

By applying a rule⁴ to the above facts, I am concluding that:

- the accused was not the owner of the material (s98)

F.1.1.5

I have been told or previously deduced that:

- the accused did not exercise an exclusive right under s31(1)(a)
- the accused did not authorize an exclusive right under s31(1)(a) to be exercised
- the accused did not exercise an exclusive right under s31(1)(b)

²represented internally to me as rule 86-NO-AUTH.

³represented internally to me as rule 13.2-NO.

⁴represented internally to me as rule 98-NO.

- the accused did not authorize an exclusive right under s31(1)(b) to be exercised

By applying a rule⁵ to the above facts, I am concluding that:

- the use of the material was not an infringement of the copyright subsisting by virtue of s36(1)

F.1.1.6

I have been told or previously deduced that:

- the accused was not the owner of the material (s98)
- the accused did not have a licence to use the material in the manner described
- the accused did exercise an exclusive right under s86

By applying a rule⁶ to the above facts, I am concluding that:

- the use of the material was an infringement of the copyright subsisting by virtue of s101(1)

F.1.2 SHYSTER

Shyster was not consulted on these facts.

F.2 Ringo's Authorization

F.2.1 MYCIN

F.2.1.1

I have been told or previously deduced that:

- the material is a CINEMATOGRAPH-FILM
- the accused did not publish the material in Australia
- the accused did not cause the material to be seen in public in Australia
- the accused did not cause the material to be heard in public in Australia
- the accused did not communicate the material to the public

By applying a rule⁷ to the above facts, I am concluding that:

- the accused did not exercise an exclusive right under s86

⁵represented internally to me as rule 36.1-NO-C.

⁶represented internally to me as rule 101.1-YES-86.

⁷represented internally to me as rule 86-NO.

F.2.1.2

I have been told or previously deduced that:

- the material is a CINEMATOGRAPH-FILM
- a copy of the the material was made in Australia (by someone else)
- the accused did authorise the use of the material

By applying a rule⁸ to the above facts, I am concluding that:

- the accused did authorize an exclusive right under s86 to be exercised

F.2.1.3

I have been told or previously deduced that:

- the material is a CINEMATOGRAPH-FILM
- the accused did not make the cinematograph film

By applying a rule⁹ to the above facts, I am concluding that:

- the accused was not the owner of the material (s98)

F.2.1.4

I have been told or previously deduced that:

- the accused was not the owner of the material (s98)
- the accused did not have a licence to use the material in the manner described
- the accused did authorize an exclusive right under s86 to be exercised

By applying a rule¹⁰ to the above facts, I am concluding that:

- the use of the material was an infringement of the right to authorize the use copy-right material subsisting by virtue of s13(2)

⁸represented internally to me as rule 86.A-AUTH.

⁹represented internally to me as rule 98-NO.

¹⁰represented internally to me as rule 13.2-FILM.

F.2.1.5

I have been told or previously deduced that:

- the accused did not exercise an exclusive right under s31(1)(a)
- the accused did not authorize an exclusive right under s31(1)(a) to be exercised
- the accused did not exercise an exclusive right under s31(1)(b)
- the accused did not authorize an exclusive right under s31(1)(b) to be exercised

By applying a rule¹¹ to the above facts, I am concluding that:

- the use of the material was not an infringement of the copyright subsisting by virtue of s36(1)

F.2.1.6

I have been told or previously deduced that:

- the accused was not the owner of the material (s98)
- the accused did not have a licence to use the material in the manner described
- the accused did authorize an exclusive right under s86 to be exercised

By applying a rule¹² to the above facts, I am concluding that:

- the use of the material was an infringement of the copyright subsisting by virtue of s101(1)

F.2.2 SHYSTER

Authorization area

Instant case

The notion of authorization extends beyond the authority given to an agent. The word "authorize" should be "understood in its ordinary dictionary sense of 'sanction, approve, and countenance.'"¹³

"[A] person who has under his control the means by which an infringement of copyright may be committed . . . and who makes it available to other persons, knowing, or having reason to suspect, that it is likely to be used for the purpose of committing an infringement, and omitting to take reasonable steps to limit its use to legitimate purposes, would authorize any infringement that resulted from its use."¹⁴

¹¹represented internally to me as rule 36.1-NO-C.

¹²represented internally to me as rule 101.1-YES-AUTH-86.

¹³*Falcon v. Famous Players Film Co.* [1926] 2 KB 474 at 491 per Bankes LJ.

¹⁴*University of New South Wales v. Moorhouse* (1975) 133 CLR 1 at 13 per Gibbs J.

In the instant case, the infringer was an employee of the accused; the infringer was not an independent contractor to the accused; it is not known whether the accused sold or hired the infringer the means of infringing; the accused had the power to prevent the infringement; the accused did not take reasonable steps to avoid the infringement; the accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done; and it is not known whether the specific infringement was causally related to an incitement to infringe on the part of the accused.

In my opinion—following *Australasian Performing Right Association Ltd v. Miles*—the accused is liable (directly or vicariously) for the infringement.

In *Australasian Performing Right Association Ltd v. Miles*,¹⁵ a 1961 decision of the Supreme Court of New South Wales, the Dee Why RSL Club engaged a band to play at a dance held at the club. During the dance the band played *I've Got a Lovely Bunch of Coconuts*, the copyright in which was owned by the Australasian Performing Right Association.

Jacobs J held that the members of the band were servants of the club, because “the club through its officers was exercising a control over the work performed in such a way as to show that there was an authority to command the orchestra in its performance.”¹⁶ So the members of the club, through the band, performed the musical work and infringed the copyright under s. 2(1) of the Copyright Act 1911 (UK) which was in force in Australia by virtue of the *Copyright Act 1912* (Cth).

The instant case *may* be on all fours with *APRA v. Miles*—but

Nevertheless, I believe that *APRA v. Miles* should be followed.

If *University of New South Wales v. Moorhouse* or *Winstone v. Wurlitzer Automatic Phonograph Co. of Australia Pty Ltd* are followed then the accused authorized the infringement.

In *University of New South Wales v. Moorhouse*,¹⁷ a 1975 decision of three judges of the High Court of Australia, a graduate of the University used a photocopy machine in the University library to make two copies of a story from a library copy of a book of short stories.

McTiernan ACJ, Gibbs and Jacobs JJ held that the University had authorized the infringement within the meaning of s. 36(1) of the *Copyright Act 1968* (Cth); it had the power to prevent infringements, but had not taken reasonable steps to prevent them.¹⁸ Gibbs J's statement about what constitutes authorization of an infringement is quoted above.

There are several similarities between the instant case and *UNSW v. Moorhouse*: the infringer was not an independent contractor to the accused; the accused had the power to prevent the infringement; the accused did not take reasonable steps to avoid

¹⁵[1962] NSW 405.

¹⁶*ibid.* at 407.

¹⁷(1975) 133 CLR 1.

¹⁸The *Copyright Act* was amended in 1980 to ameliorate the effect of *UNSW v. Moorhouse* as far as photocopying in educational institutions is concerned.

the infringement; and the accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.

However, there are several significant differences between the instant case and *UNSW v. Moorhouse*. In that case the infringer was not an employee of the accused; the accused sold or hired the infringer the means of infringing; and the specific infringement was not causally related to an incitement to infringe on the part of the accused.

Despite the fact that *UNSW v. Moorhouse* is a decision of three judges of the High Court of Australia (and better authority than a case decided by the Supreme Court of New South Wales—like *APRA v. Miles*), there is nothing in *UNSW v. Moorhouse* to warrant any change in my conclusion.

In 1946, *Winstone v. Wurlitzer Automatic Phonograph Co. of Australia Pty Ltd*¹⁹ was decided by the Supreme Court of Victoria. (A case decided by the Supreme Court of Victoria is not as good authority as a case decided by three judges of the High Court of Australia—like *UNSW v. Moorhouse*; furthermore *Winstone v. Wurlitzer* is 29 years older than *UNSW v. Moorhouse*.)

In *Winstone v. Wurlitzer*, Wurlitzer installed a juke-box in a shop and had an agreement with the shop's proprietor by which Wurlitzer maintained and repaired the machine, and supplied it with records which Wurlitzer selected. The juke-box played a musical work, the copyright in which was owned by Winstone.

Herring CJ held that the proprietor of the shop had publicly performed the musical work and—because of nature of the agreement between Wurlitzer and the shop's proprietor, and because Wurlitzer selected the records—Wurlitzer had authorized that infringing performance within the meaning of s. 1(2) of the Copyright Act 1911 (UK) which was in force in Australia by virtue of the *Copyright Act 1912* (Cth).

There are several similarities between the instant case and *Winstone v. Wurlitzer*: the infringer was not an independent contractor to the accused; the accused had the power to prevent the infringement; the accused did not take reasonable steps to avoid the infringement; and the accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.

However, there are several significant differences between the instant case and *Winstone v. Wurlitzer*. In that case the infringer was not an employee of the accused; the accused sold or hired the infringer the means of infringing; and the specific infringement was causally related to an incitement to infringe on the part of the accused.

Despite the fact that *Winstone v. Wurlitzer* is a decision of the Supreme Court of Victoria (and as good authority as a case decided by the Supreme Court of New South Wales—like *APRA v. Miles*), there is nothing in *Winstone v. Wurlitzer* to warrant any change in my conclusion.

If *RCA Corporation v. John Fairfax and Sons Ltd* or *A & M Records Inc. v. Audio Magnetics Inc. (UK) Ltd* are followed then the accused did not authorize the infringement.

¹⁹[1946] VLR 338.

In *RCA Corporation v. John Fairfax and Sons Ltd*,²⁰ a 1981 decision of the Supreme Court of New South Wales, the Fairfax newspaper the *Sun-Herald* carried an article which pointed out that, using cassette tapes and good quality taping equipment, the same album can be taped by many people. It also discussed how the advent of FM radio had made it easy for people to tape new album and single releases without buying the discs: “Why spend nearly \$10 on the new David Bowie album when you can tape it from 2JJJ?”²¹

Kearney J held that “authorization involves some element of causation—and hence the necessity for some relationship creating a link or connection however tenuous between the authorizer and the infringer.”²² There was no such link, so Fairfax had not authorized any infringement within the meaning of s. 13(2) of the *Copyright Act 1968* (Cth).

There are several similarities between the instant case and *RCA v. Fairfax*: the infringer was not an independent contractor to the accused; the accused did not take reasonable steps to avoid the infringement; and the accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.

However, there are several significant differences between the instant case and *RCA v. Fairfax*. In that case the infringer was not an employee of the accused; the accused did not sell or hire the infringer the means of infringing; the accused did not have the power to prevent the infringement; and the specific infringement was not causally related to an incitement to infringe on the part of the accused.

Despite the fact that *RCA v. Fairfax* and *APRA v. Miles* are both decisions of the Supreme Court of New South Wales, there is nothing in *RCA v. Fairfax* to warrant any change in my conclusion.

In 1978, *A & M Records Inc. v. Audio Magnetics Inc. (UK) Ltd*²³ was decided by the Chancery Division of the English High Court. (A case decided by the Chancery Division of the English High Court is not as good authority as a case decided by the Supreme Court of New South Wales—like *RCA v. Fairfax*; furthermore *A & M v. Audio Magnetics* is three years older than *RCA v. Fairfax*.)

In *A & M v. Audio Magnetics*, A&M Records and twenty-three others alleged that Audio Magnetics was inciting the public to infringe their copyright in sound recording by advertising blank cassette tapes.

Foster J held that there was no “particular specific authorisation”;²⁴ there was not sufficient causal relationship between the alleged authorization and the actual breach. “It was not sufficient to allege authorisation at large. Authorisation meant sanctioning, express approval or countenancing of an actual breach of copyright by some act directly related to that breach.”²⁵

²⁰[1981] 1 NSWLR 251.

²¹*ibid.* at 252.

²²*ibid.* at 259.

²³[1979] FSR 1.

²⁴*ibid.* at 10.

²⁵*ibid.* at 2.

There are several similarities between the instant case and *A & M v. Audio Magnetics*: the infringer was not an independent contractor to the accused; the accused did not take reasonable steps to avoid the infringement; and the accused knew, or had reason to anticipate or suspect, that the infringing act was to be, or was likely to be, done.

However, there are several significant differences between the instant case and *A & M v. Audio Magnetics*. In that case the infringer was not an employee of the accused; the accused sold or hired the infringer the means of infringing; the accused did not have the power to prevent the infringement; and the specific infringement was not causally related to an incitement to infringe on the part of the accused. Note also that *A & M v. Audio Magnetics* is only a decision of the Chancery Division of the English High Court and not as good authority as a case decided by the Supreme Court of New South Wales—like *APRA v. Miles*.

Consequently, there is nothing in *A & M v. Audio Magnetics* to warrant any change in my conclusion.

Data from Testing on Validity

Tables G.1–G.7 show the sections that were referenced by versions 1 and 2 of SHYSTER-MYCIN and the three legal experts. A “•” indicates that the section was referenced; a “×” indicates that the section was not referenced.

Section	SM-v2	SM-v3	Person 1	Person 2	Person 3
10	×	×	×	×	•
s13(2)	•	•	×	×	×
s31(1)(a)	•	•	•	•	•
s31(1)(b)	•	×	×	×	×
s35(2)	•	•	•	•	•
s36(1)	•	•	•	•	•
s85	•	×	×	×	×
s86	•	×	×	×	×
s87	•	×	×	×	×
s88	•	×	×	×	×
s97	•	×	×	×	×
s98	•	×	×	×	×
s99	•	×	×	×	×
s100	•	×	×	×	×
s101(1)	•	•	×	×	×

Table G.1: Data for the Validity Test for Question One

Section	SM-v2	SM-v3	Person 1	Person 2	Person 3
10	×	×	•	•	•
s13(2)	•	•	×	×	×
s31(1)(a)	•	•	•	•	•
s31(1)(b)	•	×	×	×	×
s35(2)	•	•	•	•	•
s36(1)	•	•	•	×	•
s85	•	×	×	×	×
s86	•	×	×	×	×
s87	•	×	×	×	×
s88	•	×	×	×	×
s97	•	×	×	×	×
s98	•	×	×	×	×
s99	•	×	×	×	×
s100	•	×	×	×	×
s101(1)	•	•	×	×	×

Table G.2: Data for the Validity Test for Question Two

Section	SM-v2	SM-v3	Person 1	Person 2	Person 3
10	×	×	×	×	×
s13(2)	•	•	×	×	×
s31(1)(a)	•	×	×	×	×
s31(1)(b)	•	×	×	×	×
s35(2)	•	×	×	×	×
s36(1)	•	•	×	×	×
s85	•	×	×	×	×
s86	•	•	•	•	•
s87	•	×	×	×	×
s88	•	×	×	×	×
s97	•	×	×	×	×
s98	•	•	•	•	×
s99	•	×	×	×	×
s100	•	×	×	×	×
s101(1)	•	•	•	•	•

Table G.3: Data for the Validity Test for Question Three (Quentin)

Section	SM-v2	SM-v3	Person 1	Person 2	Person 3
10	×	×	×	×	×
s13(2)	•	•	×	×	×
s31(1)(a)	•	×	×	×	×
s31(1)(b)	•	×	×	×	×
s35(2)	•	×	×	×	×
s36(1)	•	•	×	×	×
s85	•	×	×	×	×
s86	•	•	•	•	•
s87	•	×	×	×	×
s88	•	×	×	×	×
s97	•	×	×	×	×
s98	•	•	•	•	×
s99	•	×	×	×	×
s100	•	×	×	×	×
s101(1)	•	•	•	•	•

Table G.4: Data for the Validity Test for Question Three (Ringo)

Section	SM-v2	SM-v3	Person 1	Person 2	Person 3
10	×	×	×	×	×
s13(2)	•	•	×	×	×
s31(1)(a)	•	•	•	•	×
s31(1)(b)	•	×	×	×	×
s35(2)	•	•	•	•	×
s36(1)	•	•	•	•	×
s85	•	×	×	×	•
s86	•	×	×	×	×
s87	•	×	×	×	×
s88	•	×	×	×	×
s97	•	×	×	×	•
s98	•	×	×	×	×
s99	•	×	×	×	×
s100	•	×	×	×	×
s101(1)	•	•	×	×	×

Table G.5: Data for the Validity Test for Question Four (Yvette)

Section	SM-v2	SM-v3	Person 1	Person 2	Person 3
10	×	×	×	×	×
s13(2)	•	•	×	×	×
s31(1)(a)	•	•	•	•	×
s31(1)(b)	•	×	×	×	×
s35(2)	•	•	•	•	×
s36(1)	•	•	•	•	×
s85	•	×	×	×	×
s86	•	×	×	×	×
s87	•	×	×	×	×
s88	•	×	×	×	×
s97	•	×	×	×	×
s98	•	×	×	×	×
s99	•	×	×	×	×
s100	•	×	×	×	×
s101(1)	•	•	×	×	×

Table G.6: Data for the Validity Test for Question Four (Zorba)

Section	SM-v2	SM-v3	Person 1	Person 2	Person 3
10	×	×	×	×	×
s13(2)	•	•	×	×	×
s31(1)(a)	•	×	×	×	×
s31(1)(b)	•	×	×	×	×
s35(2)	•	×	×	×	×
s36(1)	•	•	×	×	×
s85	•	•	×	×	×
s86	•	×	×	×	×
s87	•	×	×	×	×
s88	•	×	×	×	×
s97	•	•	×	×	×
s98	•	×	×	×	×
s99	•	×	×	×	×
s100	•	×	×	×	×
s101(1)	•	•	×	×	×

Table G.7: Data for the Validity Test for Question Five

Data from Testing on Conciseness

Table H.1 displays the number of conclusions reported in answering each of the questions.

Question	SM-v2	SM-v3	Person 1	Person 2	Person 3
One	29	8	3	4	4
Two	27	6	5	5	4
Three — Quentin	27	6	4	2	2
Three — Ringo	21	6	5	2	2
Four — Yvette	27	6	4	3	3
Four — Zorba	21	6	4	3	1
Five	26	5	1	1	1

Table H.1: Data for the Conciseness Test

Data from Testing on “Correctness”

Table I.1 displays the ultimate conclusion made in answering the questions. The results are either “infringed” or “did not infringe”, or “authorized” or “did not authorize”.

Question	SM-v2	SM-v3	Person 1	Person 2	Person 3
One	infringed	infringed	infringed	infringed	infringed
Two	did not infringe	did not infringe	did not infringe	did not infringe	infringed
Three — Quentin	infringed	infringed	infringed	infringed	infringed
Three — Ringo	authorized	authorized	authorized	authorized	authorized
Four — Yvette	infringed	infringed	infringed	infringed	did not infringe
Four — Zorba	authorized	authorized	authorized	authorized	authorized
Five	did not authorize	did not authorize	did not authorize	did not authorize	did not authorize

Table I.1: Data for the “Correctness” Test

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