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### **SALES CONTRACTOR: A system to support the production of sale of goods contracts**

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Abstract: This paper describes the prototype version of Sales Contractor, a computer system which produces standard or variable contracts for the sale of goods. Although built using an expert system shell, Sales Contractor operates as a decision support system, advising the user about which clauses to include in the contract, but leaving the final choice to him/her. Sales Contractor represents the first computer-based realisation of work on structuring the Law of Contract in a systematic and logical way which one of the authors has been carrying out for more than ten years. This work turned out to lend itself very easily to representation in a standard expert system shell.

#### **Introduction**

The work described here represents a collaboration between two authors from different backgrounds, the "legal expert" and the "knowledge engineer" respectively. Accordingly, the paper is divided into two parts. The first, mainly written by the legal expert, sets out a philosophy about structuring the Law of Contract which he has been developed. His original objective was to develop the application of business law by managers or their legal advisers. A secondary objective was to develop computer-assisted learning for students of management or legal studies. The second part, mainly written by the knowledge engineer, describes the development of a computer system based on this philosophy; Sales Contractor, which supports decisions about contracts for the sale of goods. There is a slight overlap between the two parts, especially regarding the basic nature of Sales Contractor, where some aspects are described twice, once from each perspective. This overlap has, however, been deliberately retained in order to help illustrate the gradual convergence of the views of the two authors.

#### **The problem**

The substantive content of contractual terms and conditions of trade requires discharge of legal and evidentiary burdens of proof divided amongst three elements:

1. In a few instances, contracts may arise entirely by operation of law, whether under statute or

judicially implied (*Companies Act 1985 S 14; Rayfield v Hands* [1960] Ch 1). Moreover, contracts in general are heavily and increasingly supplemented by both statutory and judicial authority. Although the Law Commission has declined any attempt to codify the law of contract, a vast range of relatively specific statutes increasingly seeks to provide for the terms on which contracts are made, particularly in such fields as employment and commercial contracting (*Employment Protection (Consolidation) Act 1978; Consumer Credit Act 1974*).

2. Whilst, in theory, contractual terms may not arise entirely out of trade usage, some examples have been so heavily dependent on it as almost to have done (*James Nelson & Sons Ltd v Nelson Line (Liverpool) Ltd* [1908] AC 108).

Such usage may be specifically given effect under statute or may be judicially noticed as part of the law merchant. Other trade usages may be judicially "acknowledged" as impliedly adopted by the parties to the extent that they are legal (*Cointat v Myham & Sons* (1914) 30 TLR 282), reasonable (*North & South Trust Co v Berkeley Co* [1971] All ER 980; [1971] 1 WLR 470), certain (*Re Walkers, Winsor Hamrn & Shaw & Son & Co* [1904] 2 KB 152) and notorious (*James Nelson & Sons Ltd v Nelson Line (Liverpool) Ltd* [1908] AC 108). Legality and reasonableness fall within the legal burden of proof, certainty and notoriety within the evidenciary burden. The normal rules of contractual interpretation apply with specific effect to such trade usages. Consequently, it is a primary principle that a usage may only affect the content of an agreement if it is not repugnant to the clearly expressed intention of the contracting parties.

But the practical, day to day value of trade usage is as a conveniently identifiable body of developed practice, susceptible of succinct adoption expressly by the parties themselves (the '*Rolimpe*' case [1978] 1 All ER 81 CA).

3. Nevertheless, in accordance with the parties' residuary autonomy, the existence and character of their relationship is still primarily determined in accordance with their common contractual intention (see per Lord Reid in *McCutcheon v David Macrayne Ltd* [1964] 1 WLR 125, 128). Clearly, the Victorian apogee of *laissez faire*, celebrated by Sir Henry Maine (Maine, 1861) as progression from status to contract, is now well into reverse.

But the myriad difficulties of discharging an evidenciary burden defined by the scope of party autonomy are compounded by the need for a legally conscious creativity which, it seems, can be fully realised by neither business managers nor their legal advisers alone.

In *Humfrey v Dale* (1858) 7 E & B 266, Lord Campbell CJ stated at pp 278-9:

The minds of lawyers are under a different influence from that which, in spite of them, will always influence the practices of traders. The former desire certainty, and would have a written contract express all its terms, and desire that no parol evidence beyond it should be receivable. But merchants and traders, with a multiplicity of transactions pressing on them, and moving in a narrow circle, and meeting each other daily, desire to write little, and leave unwritten what they take for granted in every contract. In spite of the lamentations of judges, they will continue to do so.... It is the business of Courts reasonably so to shape their rules of evidence as to make them suitable to the habits of mankind, and such as are not likely to exclude the actual facts of the dealings between parties when they are to determine on the controversies which grow out of them.

(See also The Law Commission Working Paper no.70 on the *Parol Evidence Rule*, Parts III 24,25 & IV; further, the report *Small Print*, National Consumer Council and Plain English Campaign, 1982.)

Thus, for example, the facts of *Butler Machine Tool Co Ltd v Ex-Cell-O Corp (Eng) Ltd* [1979] 1 WLR 401 CA (and see per Lord Denning MR at p405E) - a battle of standard forms - are well-

known. What is less familiar is the eventual outcome. Butler (the sellers) did in fact revise their standard terms of trade. The conclusive point against them, however, had been their failure to provide a detachable acceptance slip at the end thereof, and to compound the omission by returning that of the buyer, along the following lines:-

Acknowledgement: Please sign and return to...[i.e. offeror].  
We accept your contractual offer of...[i.e.date]...[i.e. reference number] on the terms stated therein.  
Signed on behalf of... [i.e. offeree]  
Position...

Nevertheless, despite all the trouble and cost of a failure in the Court of Appeal, the combined efforts of Butler's managerial staff and their legal advisers failed to draw the obvious conclusion and to provide a tear off slip at the foot of their revised terms.

This is by no means an isolated example. Unlike accountancy, the law has not been seen traditionally as closely related to business. Few U.K. business managers at all levels have any knowledge of the law, in stark contrast to those in Japan or Germany. Even the knowledge of those who do is likely to be confined to substantive law, leaving them totally ignorant of procedure and proof.

Legal materials provided for business, with the notable exception of Clive Schmitthoff's *Export Trade* (Schmitthoff, 1990) which follows the ancient tradition of Malyne's *Lex Mercatoria* (Malyne, 1622), are nothing more than textbooks for lawyers writ small. As a result, small and medium businesses are notoriously unwilling to take legal advice prior to their development of appropriate terms and conditions of trade. All too often the result, in times of recession especially, is likely to be bad debts, legal actions and complaints against legal advisers brought in too late on a poor scenario, leading in some cases as far as the insolvency process.

Nor do the legal professions escape criticism unscathed. The movement to bring legal services more closely within the realms of business is neither without its attendant dangers nor by any means certain of achieving its objective.

Business law can be loosely defined as that which is dependent on an autonomous relationship freely created between two or more parties (usually a contract). The legal adviser to a business client, or business lawyer, therefore, is a strategic negotiator whose central role is to assist in "contributive" negotiation of such relationships and, only where necessary, to take charge of any "distributive" negotiations over the resolution of any attendant disputes. The long title of Malyne's book refers to lawyers, inter alia, as negotiators. Unfortunately, lawyers are trained reactively as crisis managers, rather than pro-actively as negotiators, a traditional misperception which the current "legal skills" debate does not seem likely to rectify. The conventional textbook on contract law, for example, omits much that is of the essence to a proper understanding of the transaction. Infants' capacity is a well established "contractual" topic which is invariably treated in isolation from such other legal factors in the negotiating structure of natural or corporate parties as their personality, capacity, liability and authority.

Clearly, an on-going need exists which might potentially be serviced by suitable information technology developments, in preference to traditional lawyers' hard copy materials, the major requirement being that it should be a pro-active sequential system defined by reference to the transaction rather than to conventional legal categories.

The choice between an expert system, which would attempt to take the problem out of the user's hands completely, leaving their own expertise both unused and unimproved, or a decision support approach which would support the user's ability to make an appropriate contractual decision as well as educating his/her perceptions of:

- detailed linkages between legal and evidenciary proof;
- as distributed amongst the three significant elements; and
- over a coherent contractual field;

was eventually resolved in favour of the latter. Of the many reasons for this decision, one in particular, i.e. usability over a wide potential market range, needs to be examined.

The system had to be effective for the very wide spectrum of executive user functions concerned with the drafting or amendment of terms of trade, from the owners of small businesses to marketing executives, contracting managers and legal advisers. Such executive user functions require widely varying levels of commercial and legal expertise, and exercise commensurately differing ranges of discretion. Nevertheless, the range of choices for an optimum printed contractual outcome must be the same for all. Hence, it was essential that not only should any commercial/legal concepts be congruent with each other, but also with the systemic approach, whilst at the same time allowing for differences of commercial and legal insight amongst users in situations to which it might be applied. It was considered that this might most elegantly be catered for by a decision support approach, which avoided the pitfall of apparent certainty in uncertain situations by reserving the ultimate discretion to the user. It was accepted that a level of individual customising might nevertheless be necessary. As a result, moreover, the system should also be eminently suitable for computer-aided learning of these functions at all levels.

## **The Actual System**

Clearly, however, the whole problem could not be tackled at one attempt. It was decided that the most effective approach would be to attempt to solve the whole problem in two major phases:-

A. The easier phase of developing a system capable of evidencing the parties' relationship according to substantive legal constraints on it.

B. The far more difficult phase conceptually of building a system capable of supporting the creation of such a relationship according to substantive legal constraints on the process, and of resolving any disputes arising from it according to relevant procedure.

This paper is concerned exclusively with the search for a solution to phase (A).

The field chosen for the development of the experimental prototype system was the sale of goods, for the following reasons:

1. Sale of goods represents the foundation of trade, having common elements throughout the Common Law and Civil Law world. Its scope is partially definitive of various dependent transactions, for the carriage of goods, payments, marine insurance, arbitration as well, where appropriate, as supply of associated products, installation and maintenance.
2. The field is a highly coherent one definable in accordance with the nature of a wide range of trade transactions without loss of legal accuracy.
3. The law and practice is well settled, not being liable to great or sudden change and hence capable of long-term use given an appropriate technological realisation.

Accordingly, successful development of such a system would open the way towards systems in such other areas as the law of employment, or even the licensing of intellectual property by identifying a successful approach to party autonomy in contract generally capable of transposition to any contractual field.

The system was designed to take the user deductively from a basis of legal authorities towards the production of printed terms and conditions of trade appropriate to the specific needs of any given

transaction or group of transactions by means of a series of information-supported questions.

Such information reflects a careful balance between the three elements of law, usage and contractual intention. The law itself is limited to a brief summary of relevant principle together with a selection of authorities designed to reflect its range of uncertainty where appropriate. Trade usages derived from such ICC publications as *INCOTERMS*, *Uniform Rules for Collections* and *Uniform Customs and Practice for Documentary Credits* are given greater prominence than conventional legal reference materials. The contractual intention is most carefully catered for by a range of suggested standard terms identified after careful analysis of a wide variety of sales contracts reflecting the whole spectrum of trade from small and medium business to international commodities transactions.

Finally, the structure of the system necessarily reflects both the statutory definition of a sales contract in terms of 'A contract by which the seller transfers, or agrees to transfer the property in goods to the buyer for a money consideration, called the price' (*Sale of Goods Act 1979*, s2(1); see *Young & Martin Ltd v McManus Childs Ltd* [1969] 1 AC 454; [1968] 2 All ER 1169 HL; *Gloucestershire County Council v Richardson* [1969] 1 AC 480; [1968] 2 All ER 1181 HL; *G.J.Dawson (Clapham) Ltd v Duffield* [1936] 2 All ER 232; but note the *Supply of Goods and Services Act 1982*.) and the use of party autonomy to agree on terms dealing, inter alia, with:-

the fact of sale; the goods, their sampling, weighing, analysis and testing; type and time of shipment, appropriation to the contract and notification of shipment; the passing of property and/or risk in the goods; defective and damaged goods; prevention of shipment, deviation or detention of the ship, loss of the ship; average, the price, its method of calculation, charges, division of duties, taxes, levies, dues, etc.; variations in the price, method and terms for payment; shipping documents, certificates of origin, import licences; effect of adverse government orders, regulations or enactments.

Amongst more marginal miscellaneous and related matters commonly provided for are the provision of such ancillary matters as installation, servicing and even operation of certain types of manufactured goods. The agreement may further seek to provide for resale, supplies, pricing, and supportive information or services, together with such matters as third party performance guarantees, confirmation of documentary letters of credit, and indemnities against third party liability for infringement of industrial property rights, or in negligence.

Accordingly, the core of the system can be conceived as a matrix defined on one axis by the reciprocal considerations of buyer and seller, and on the other axis by a transactional progression from stage to stage. Accordingly, the seller's undertakings are grouped according to the goods themselves, their delivery and transfer of property in them. The buyer's corresponding undertakings relate to the price, its payment and acceptance of goods and documents. Each section deals fully with all elements and is autonomous.

### **Feasibility of an expert system; the knowledge engineer's perspective**

Much research has been done into the use of expert systems in legal domains, for example (Sharpe, 1985) and (Capper and Susskind, 1988). For the most part, it can be grouped into one of two categories: interpretation, either of the law or of codes of practice relating to it, such as the above examples and ICL's Welfare Benefits Adviser; and advice on process, such as the sentencing advisers for judges described in (Bainbridge, 1990). None of these systems, as far as we are aware, actually aims to produce legally valid documents. Thus the attraction of sales contracts as an area is that it represents a new type of legal application.

However, the form of the required output - essentially a customised document - is not substantially different in appearance from that of advisory reports produced by expert systems in other domains such as financial analysis (Koch, Krehl and Mertens, 1991) and business strategy (Krallmann,

Woltering and Müller-Wunsch, 1991). Thus the production of such a system appeared technically feasible, and with relatively inexpensive tools such as one of the better PC-based expert system shells.

However, once a decision had been made to concentrate on the sale of goods as the first sub-domain within the general field of contracting, further consideration by the knowledge engineer and the legal expert of the precise nature of the support required suggested that the classic picture of an expert system proper would not be the best solution. There were two principal reasons for this. The first was the need for a system to be accepted by its intended users. Drawing up a contract involves choices as to which special clauses are required to cover either actual or potential circumstances relevant to the particular sale. If the system were to make these choices on behalf of the user, then there would be a danger that it would be seen as "de-skilling" the task, removing the user's discretion and turning the task of contract production into one of mere data entry. The intended "market" for the sale of goods system consisted of those running small businesses, marketing managers and contracts managers in larger organizations, and clerical staff in lawyers' offices. Given this target market, there might well be a barrier to the acceptance of such a system. The second, and more important point was the sheer magnitude of the work involved in building such a system. It is no doubt possible to construct a system with the expertise required to make good decisions about a contract, but it would be by no means easy. For any given contract, the decisions would involve not only knowledge about the goods to be sold, but also about the seller, the buyer, the relationship between them, the state of the relevant sector of the world economy and so on. There would thus be no absolute correct decision about, for example, the wording of a clause relating to the quality of the goods; it would, literally, depend on the preferences of the person drawing up the contract. It would thus be correspondingly difficult to produce a system which covered such a wide range of possibilities, and yet was easy to use without specialised computer hardware or considerable training.

Taking these considerations into account, it was clear that the better option would be to construct a decision support system, so that discretion and the final responsibility remained with the user, but to use expert system tools to build it. One of the authors has speculated elsewhere (Edwards, 1992) that there is much less difference between decision support and expert systems than is often assumed. In this case, the system would be using its expertise to indicate which choices had to be made, and to advise on the merits of the different choices. It would not actually be taking the final decision, and therefore less expertise (in some sense) would need to be captured in the system. Not only would this simplify the task of knowledge engineering, it would also bring the system within the scope of the most commonly available expert system tools, i.e. a PC-based expert system shell. The most common knowledge representation format available, production rules, now appeared feasible for the task, which it might not have been for the more advanced system, and the use of a shell offered two main benefits. One was that it is designed to work primarily with text for both input and output, thus matching the task of Sales Contractor; the other was that an inferencing structure of backward and forward chaining was highly suitable for guiding the sequential process of constructing the contract. The specific shell chosen was Xi Plus Release 3, mainly for the pragmatic reasons that it was readily available, and the one which the knowledge engineer knew best!

## **Building the System - Knowledge Engineering**

Knowledge engineering essentially consists of three tasks, namely knowledge acquisition, knowledge representation and system execution. The "first pass" at each of these tasks takes place in that order, but a considerable amount of backtracking and cycling follows, so that to a great extent all three may be carried out simultaneously. The intention from the outset had been to take advantage, if possible, of the textbook on contracting for the sale of goods written by one of the authors (Ackroyd, 1984).

It has often been asserted that the knowledge which needs to be captured in an expert system about

any domain is precisely that which is not written down in books about that domain. However, the domain of contracting for the sale of goods was not the normal situation; here the book had been written as part of a specific attempt to structure and set out the relevant knowledge in a logical manner. The question was: would this actually prove more helpful to the knowledge engineer?

The detailed knowledge acquisition process followed was one which had been used before by the knowledge engineer and/or his co-workers (Edwards, 1991):

- preliminary discussions to give some idea of the scope of the problem and the boundaries of the domain;
- the use of books and other written material, mainly to educate the knowledge engineer in the domain's vocabulary;
- protocol analysis and semi-structured interviews to "map out the territory" of the domain and structure the knowledge-base;
- more highly structured interviews to fill in the detail, with an increasing use of the developing system as a vehicle for discussion.

Where the book proved extremely valuable to the knowledge engineer was in the third of the above steps. The major part of the structuring of the knowledge had already been done by the expert in producing the structure of the book, which is shown in Figure 1. It proved feasible to use the book's structure as the basis for that of the system's knowledge-base, because of the way in which it had been set out. Note however that, in our opinion, this would not be true of a conventional textbook,

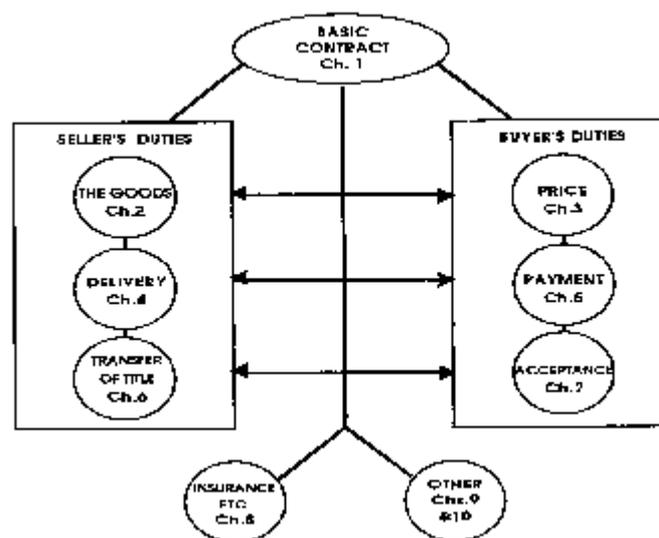


Figure 1: Proposed system structure and relationship to Dr. Akroyd's book chapters

whatever the domain.

There were nevertheless instances where the commonly reported inadequacies of "book knowledge" did still occur in this case. The basic format of Sales Contractor is one of having essential elements which appear in every contract, together with a choice of additional special provisions relating to specific aspects such as the quality of the goods, the method of payment or the place of delivery. In most cases, the book not only listed examples of, but also discussed the legal authority for, the more "sophisticated" clauses, yet gave no example at all of what the essential simple form of that element of the contract might be. Thus "in the small", the book did not avoid knowledge engineering problems, but "in the large" it certainly did.

A further benefit from being able to use a book as a knowledge source to such a great extent was that it was possible to scan the text of the book onto disk to form the basis of Sales Contractor's advice screens, thus avoiding a considerable amount of manual keyboarding.

## The Prototype System

The intermediate representation of the knowledge was based on an expansion of Figure 1 into further, more detailed diagrams for each element of the contract/knowledge-base. Each element consisted of a basic part (for example every written sale of goods contract is likely to specify a description of the goods, for example by quantity and/or quality and/or location, etc.), together with the possible types of special provisions relating to that element, and the alternative clauses for each type of special provision. The detailed wording of clauses or advice was produced by reference to appropriate sections of the book wherever possible.

System execution using Xi Plus presented few additional problems, since the combination of the use of "input forms" (an input form is a screen display which may contain multiple questions) and Sales Contractor's "decision support" function made it possible to represent the structure of essential clauses plus optional provisions in a natural way, and one which was the same for each of the different elements of the contract. Thus more of the rules in the knowledge-base related to controlling the process of selecting special provision clauses than to the deeper expertise about contracts, much of the latter being built into the forms.

One unexpected technical issue did arise, in that it proved much more straightforward in Xi Plus to build up two separate versions of the contract in parallel; one for screen display and the other for printing. The principal reason for this was that the output forms used by Xi Plus would have blank areas corresponding to elements where no special provisions were required at all. This is a virtue on the screen, to help the user to check that he/she is happy with the contract, but a printed contract with large blank spaces in it would be distinctly undesirable. Controlling this parallel building-up of the contracts also made it preferable not to have a highly modular knowledge-base, again because of problems arising if one element was not required at all in a particular contract. So far this lack of modularisation has not given rise to any noticeable performance problems.

As yet untested in the prototype is the question of customisation for a given user. Initial user testing with Aston Business School undergraduates studying Commercial Law and Marketing is only capable of shedding a limited amount of light on this aspect. It will clearly be advantageous to tailor the standard clauses of a contract to the forms of words to which a particular user or organisation is accustomed. There appear to be three options for doing this:

- provide an interface for the user to tailor the wording him/herself;
- provide an interface which the developers would use to tailor the wording in collaboration with the user;
- tailor the wording using the standard Xi Plus editing facilities after collaboration with the user.

The first option seems infeasible, because it would require legal knowledge which the user may not possess; for example, there is no guarantee that a company's current standard terms and conditions of trade are legally valid. Both of the remaining two options remain open at present. Clearly either would require that Sales Contractor be offered, not simply as an "off the shelf" package, but as a combination of package and consultancy. This does not seem unreasonable, since it is a method which is becoming more common, both in the field of knowledge-based systems, and in the information systems field as a whole.

## Conclusions

This paper has described the development of Sales Contractor, a decision support system for the production of sale of goods contracts which has been built using expert system tools. It is the first computer-based realisation of an approach to structuring the Law of Contract which has been developed over many years, and which considerably simplified the development of the system. Its technological feasibility has been demonstrated; trials to determine its practical usefulness will take

place in the near future. If successful, it will be relatively straightforward to transpose the structure to other types of contract. The system could also serve as a basis for the development of a truly expert system with much deeper expertise relating to the process of contracting itself.

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