# CHINATAX: Exploring Isomorphism with Chinese Law

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## INTRODUCTION

The CHINATAX system was developed using DataLex Legal Workstation software (DataLex) (1) as a means of exploring some of the possibilities opened up by the integration of Hypertext, Free Text Retrieval and Rule Based Inferencing in this software package. Overall the CHINATAX system was conceived as a research and study resource rather than the ultimate decision maker.

Planning required a notional user whose needs were to be met by the developed system. The notional user would have some legal training or experience, but no particular expertise or understanding of the particular topic which is the core of the system.

To service the user the CHINATAX system had a number of separate but overlapping aims:

(i)    To assist in formulating answers to problems posed by particular legal facts situations accurately and expeditiously.

(ii) To ensure that the user was aware of all relevant provisions in the legislation modelled, and where possible, indicate when further research was necessary.

(iii) To provide background information and commentary in a structured way, but permit users to apply their own legal expertise to the interpretation of written material in the system, and permit free access to all materials with minimum instruction of the user.

(iv) To be totally transparent to the user so that any information provided (including the rule base itself) could be compared with internal or external information for validation.

(v)  To be able to run on a less-than-state-of-the-art PC.

I am interested in the Commercial law of the Peoples Republic of China and building a system around a development in Chinese tax law provided an opportunity to meet these notional requirements. It also provided many challenges, some of which are not yet completely overcome.

## THE SOFTWARE

The DataLex software is convenient for a lawyer with limited knowledge of computers to use as all material used to build a system is created as ASCII text files. "Markers" for the Free text Retrieval and Hypertext facilities are also in ASCII text embedded in the source material. The Rule Base uses a simple and conventional syntax, readily learned, and is also in ASCII text.

The use of ASCII text files is one of the great strengths of the DataLex package. A user or developer needs no knowledge of a computer language to validate the material provided in a system, whether general information or the rulebase itself. Integration of Hypertext, Free Text Retrieval and Rule Based Inferencing is the other great strength.

## THE LAW

The People's Republic of China began opening its economy to Western concepts and development in 1979 and has rapidly incorporated many aspects of the market economy since then. The legal system has also changed, attempting to mirror economic development.

In April 1991, (2) the *Income Tax Law of the Peoples Republic of China Concerning Foreign Investment Enterprises and Foreign Enterprises* (The Law) was adopted with effect from July 1 1991 and soon after the Detailed Implementing Regulations were also promulgated. (The Implementing Regulations) (3)    The

Law consists of 30 articles and had annexed to it one article from Criminal Code. The Implementing Regulations provide detail to assist in implementing the Law itself and frequently provide detailed definitions for concepts referred to only briefly in the Law itself.

The introduction of the Law was a sign of the increasing maturity of China's commercial law. It consolidated a number of tax laws into one statutory provision, preserved incentives granted under previous law, addressed issues of tax avoidance directly, and incorporated some treaty provisions into general tax law.

The Law, because of its direct relevance to foreign investment, was the subject of commentary in journals and was generally well received.

## AN OVERVIEW OF THE CHINATAX SYSTEM

The CHINATAX system contains the following:

1. Background material on China and its legal and economic structures (4)

2. Four journal articles commenting on the Law and/or the Implementing Regulations (5)

3. The Law (in English translation) (6)

4. The Law (in Chinese) (7)

5. Implementing Regulations (in English translation) (8 )

6. The rule base which models key provisions of the Law, including relevant Implementing Regulations.

This is the core of the CHINATAX system and, with the exception of the Law in Chinese, is contained in a single text file which a user can read from beginning to end without restriction. However, all text materials are also indexed and linked using hypertext and may be searched using free text retrieval.

Even without the rule base, the system is a powerful resource, linking commentary with specific sections of the Law and the Implementing Regulations and vice versa.

The tax law in Chinese is contained in a series of TIF files which can be displayed as required from the main menu or from hypertext links from within the text. A map of China is also provided as a TIF file and can be similarly displayed.

The rule base is selected from the menu when required. It models the operation of The Law and is fully integrated into the system. Completing a question and answer session

permits liability under The Law to be determined for a specific facts situation. All relevant statutory provisions are considered, and detailed reasons for the conclusions reached are provided. Assistance to the user is provided in the form of Hypertext links from defined terms in the rulebase to relevant statutory and commentary material.

## CHALLENGES IN DEVELOPING CHINATAX

## TRANSLATION

Chinese law and associated materials are most readily available in the original Chinese. Inevitably, translation is the Achilles heel of an expert system modelling Chinese law in English. Isomorphism is something of a contradiction in terms when it is applied to a rule base which models an English translation of the original Chinese. The quality of the translation ultimately determines the quality of the whole system.

The CHINATAX rule base attempts to be as isomorphic as possible to the translation, because of the difficulties inherent in any other approach. (9)

## DISPLAY OF GRAPHICS

The graphics capabilities of the PC are used in the CHINATAX system to display the 30 articles of the Law in the original Chinese. This allows a user with reading ability in Chinese to compare the translation with the original, and to verify the accuracy of the rule base.

Graphics files are inefficient for storing and retrieving information but they are a readily available means to store and retrieve non-text information. Their use in CHINATAX was essential if the need for system transparency was to be met.

## STRUCTURE OF THE STATUTES

Lawyers have become accustomed to statutes which follow drafting conventions such as the use of definition sections, identified chapters of related provisions, numbered sections, sub-sections and the like. We find them a familiar path into the provisions of a statute.

Chinese legal drafting often does not follow the conventions with which we are familiar and this adds to the difficulty in modelling the provisions of a statute in a rule base.

For example, Article 8 of the Income Tax Law reads as follows:

*ARTICLE 8. Any enterprise with foreign investments of a production nature scheduled to operate for a period of not less than ten years shall, upon examination and verification by the tax authorities of an application filed by the enterprise, from the first profit-making tax year, be exempted from income tax in the first and second years and allowed a fifty percent reduction in the third to fifth years. However, the income tax on enterprises with foreign investments engaged in the exploitation of resources such as petroleum, natural gas, rare metals, and precious metals shall be regulated separately by the State Council. Enterprises with foreign investments which have actually operated for a period of less than ten years, shall repay the amount of income tax exempted or reduced already.*

*The relevant regulations, promulgated by the State Council before the entry into force of this Law, which provide preferential treatment of exemption from or reduction of income tax on enterprises engaged in energy, transportation, harbour, wharf and other major projects of a production nature for a period longer than that specified in the preceding paragraph, or provide preferential treatment of exemption from or reduction of income tax on enterprises engaged in major projects of a non-production nature, shall remain applicable after this Law enters into force.*

*Any enterprise with foreign investments which is engaged in agriculture, forestry or animal husbandry and any other enterprise with foreign investments which is located in remote underdeveloped areas may, upon approval by the competent department for tax affairs under the State Council of an application filed by the enterprise, be allowed a fifteen to thirty percent reduction of the amount of income tax payable for a period of another ten years following the expiration of the period for tax exemption or reduction as provided for in the preceding two paragraphs.*

*After this Law enters into force, any modification to the provisions on the exemption or reduction of income tax on enterprises of the preceding three paragraphs of this Article shall be submitted by the State Council to the Standing Committee of the National People's Congress for decision.*

This one article contains provisions which we would usually expect to see in the form of numbered sections and sub-sections, containing references to a definition section, other sections and other statutes. It also contains material which is more accurately considered as policy.

## ISOMORPHISM AND THE LAW

Quite unremarkable legislation can tax the ingenuity of a system builder attempting an isomorphic rulebase, even with a "user friendly" shell.

Developing CHINATAX required deviation from the purely isomorphic path. Articles modelled in the rulebase were structured with a Head rule and subordinate rules. De-facto sections were introduced to break an article up into its constituent parts in order to model it. Once this step had been taken it seemed obvious to use section numbers to identify the components of the article and place a familiar statutory template over the Chinese law.

This would have been effective but a source of confusion for the user. The use of numbers and letters to indicate sections or subsections implies that they exist in the original material, making validation more cumbersome for the user.

Ultimately I decided to use labels consisting of a short name identifying the operation of the relevant part, for example *Article 8 (Petroleum etc)*. These could be readily referred to the relevant part of the statutory provision modelled to determine the accuracy of the rule without the confusion engendered by pseudo-official numbering, and the label gives some idea of the nature of the provision.

The result is rules which can be readily verified against the source material in English and Chinese, and follow the wording of the Statute closely. In my view if practicality and isomorphism conflict then practicality must prevail, while remaining as close as possible to the source material to ensure accuracy and permit maintenance.

Part of the rule base for Article 8 is included here and illustrates the solution used.

GOAL RULE
(Rule) Article 8 of the Income Tax Law PROVIDES IF
Article 8 (Exemptions) of the Income Tax Law applies
THEN from the first profit making year the enterprise is exempted from income tax for the first and second years and allowed a fifty percent reduction in the third to fifth years

IF
Article 8 (Petroleum etc) of the Income Tax Law applies
THEN inquiries must be made regarding the special provisions relating to these matters

IF
Article 8 (Exemptions) of the Income Tax Law applies
AND Article 8 (Repayment of benefits) of the Income Tax Law applies

THEN the enterprise shall repay the amount of income tax already reduced or exempted

IF
Article 8 (Agriculture, remote etc) of the Income Tax Law applies AND Article 8 (Exemptions) of the Income Tax Law applies
THEN
the enterprise shall be allowed a further fifteen to thirty percent reduction of the amount of income tax payable for a period of another ten years following the expiration of the period for tax exemption or reduction previously referred to in Article 8 of the Income Tax Law

IF
Article 8 (Former regulations) of the Income Tax Law applies
THEN The relevant regulations, promulgated by the State Council before the entry into force of the Income Tax Law which provide preferential treatment of reduction of or exemption from income tax shall remain applicable after the Income Tax Law enters into force
ELSE IF
Article 8 (Exemptions) of the Income Tax Law does not apply
AND Article 8 (Petroleum etc) of the Income Tax Law does not apply
AND Article 8 (Repayment of benefits) of the Income Tax Law does not apply
AND Article 8 (Agriculture, remote etc) of the Income Tax Law does not apply
AND Article 8 (Former regulations) of the Income Tax Law does not apply
THEN Article 8 of the Income Tax Law does not apply

Etc etc

The rule model used is not as elegant as I originally hoped for, but it does meet the immediate need of function.


## THE IMPORTANCE OF HYPERTEXT

Hypertext plays an important role in the overall operation of the CHINATAX System by linking relevant parts of the general text in a way which assists and guides the user to relevant background information, commentary or statutory provision. In my experience Hypertext makes the material contained in the system more readily available to the user than the same material in its originally published form.

The legal and technical expertise of the system builder is an integral part of the construction; the legal expertise of the user is utilised in determining the approach taken to the materials contained in it. The user may randomly browse, research a particular term, or read an entire journal article. Screen dumps permit a permanent record for later use of information retrieved.

Hypertext is also used to simplify the construction and use of one aspect of the rulebase.

Chinese law has established special zones, areas and government agencies. For example, Special Economic Zones (SEZ) permit special privileges to be granted to those who invest in the zone. Other areas have been designated to attract particular types of investment, and again benefits attach.

Investment in special zones receive benefits under the Law which requires the zones to be included, in some way, in the rule base.

An approach which modelled the law for each zone directly from the relevant statute would provide definitive legal advice to a user without legal training or experience, but would greatly increase the size of the CHINATAX system and make it more cumbersome in use.

Another approach would be to create heuristic rules which model the relevant legislation in a much more rudimentary form. If invoked at the option of the user, this would be an effective way of achieving the desired result but involves building a large heuristic rule base with the consequent difficulties in ongoing maintenance.

CHINATAX uses Hypertext to incorporate the legal training and experience of the user into the operation of the rule base.

When a term such as "special economic zone" is referred to in the rule base, it is connected by Hypertext links to relevant background and commentary information which would assist the user to determine whether the term is properly applicable to the area being researched.

This approach relies on the legal training of the user to make the best use of the information provided. It also relies on the user to recognise when inadequate information is provided in a particular circumstance.


## CONCLUSIONS

Deviation from isomorphism is not without danger, but does not preclude the creation of practical tools for use by professionals. If the limitations of a particular approach are recognized, systems can be built by an individual which are convenient and accurate to use.

There is comparatively little information available in any language other than Chinese about Chinese commercial law. Frequently the first translations of a new Chinese law

are published in Hong Kong based newspapers. The difficulty of obtaining any depth of information enhances the role of a simple system such as CHINATAX which, although small, contains much of the information in English published to date on the topic.

The CHINATAX system is not, and is not intended to be, the ultimate oracle on the Law. Much of China's taxation law is administered by way of administrative circular and local interpretations which are not generally known outside China, and may vary in practice, if not in theory, from province to province. Inevitably the practitioner with access to this constantly changing information who takes the trouble to continually update his knowledge will be the ultimate expert in the Law. This level of expertise is unlikely to be found outside China or Hong Kong. Equally, this is an expertise which CHINATAX could not legitimately emulate unless developed and maintained in the region.

For a practitioner in law or accountancy with an interest in China, or a need to obtain reasonably sophisticated background information before briefing overseas counsel, or as a teaching resource, the CHINATAX system, I suggest, is an example of a very efficient way of providing access to available material and a practical use of the DataLex Legal Workstation.

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