
REINVENTING LEGISLATION

**An Integrated Approach to Developing
and Administering Legislation**

File Name: RuleBurst Paper - Reinventing Legislation.doc
8 August 2016

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Reinventing Legislation

Overview

Legislation lies at the heart of most government agencies. Whether they are responsible for policy development, transaction processing or industry regulation, the activities of most agencies are framed by their current or proposed legislation.

This paper argues that it is possible to improve the quality of many functions in government by changing the way in which legislation is used. It proposes that the current passive, paper version of legislation, supplemented by the intellectual models of agency staff, can be significantly enhanced.

The means of this enhancement are rulebases: dynamic electronic models of legislation that represent it in a consistent, rigorous format, and that can be tested, investigated and used by staff and clients.

The key argument in the paper is that this opportunity for improvement will be profoundly enhanced by taking a holistic approach to the use of this technology across several key functions: policy development, legislative drafting, service design and service delivery.

An integrated approach to the use of legislation in these four functions can have a remarkable and sustained impact on the quality of policy, of legislation, of administrative accuracy and efficiency, and of client service.

The paper argues for this approach in four sections:

- Administrative Objectives – this describes a ubiquitous set of aspirations that government agencies have to improve the quality of their work;
- An Integrated Model – this describes how an integrated approach to improving the four key functions has an accelerating effect, far exceeding the benefits of piecemeal improvements in discrete functions;
- Elements of the Model – this describes how rulebase technology, capturing an agency's legislation in a dynamic format, is a key enabler of improvement for many functions in this integrated model;
- Conclusion – this identifies the strategic investment that is required to implement this integrated model: the translation of current legislation to a rulebase format, the use of this approach with new legislation, and the maintenance of those rulebases once created.

Administrative Objectives

Within government agencies responsible for administering legislation, there tend to be several common aspirations for quality improvement.

These aspirations may reflect existing problems, or simply a desire to do things better. They can be summarised as a desire for:

- better policy formulation and advice;
- better legislation, that gives precise and accurate effect to policy objectives, ideally in a way that is coherent to the staff and constituents of the agency;
- reduced time for implementation of new policy or new legislation;
- increased accuracy and consistency in the administration of legislation;
- an enhanced array of options for delivering the agency's services, whether to improve services to clients or to reduce costs;
- a greater focus on clients' needs in their interactions with the agency (rather than on agency processes, structures and convenience) in all of the work of the agency;
- tighter integration of policy and service delivery functions, so as to help to achieve some of these objectives.

All of these objectives focus on the heart of an agency's business: its policy and legislation. These give the agency its character and shape. This core knowledge informs almost every aspect of the agency's work.

Naturally, policy and legislation are the immediate subject matter of policy development and legislative drafting. But they are also central to service delivery: in most government agencies, the services that clients seek are determinations or advice on the application of legislation to their circumstances. It is the legislation that defines clients' rights, entitlements and obligations.

Initiatives to meet these objectives can easily be seen as separate, unconnected activities, each relating to a discrete part of an agency's business. Increasingly however, agencies are focusing on the last objective – tighter integration of policy and service delivery functions – because it has become apparent that these functions and all of the listed objectives are critically interrelated.

This paper proposes a way of addressing all of these objectives within an integrated model.

An Integrated Model

There are four key functions in the administration of legislation:

- the development of policy;
- the drafting and enactment of legislation;
- the design of service delivery structures and methods to administer the legislation;
- the delivery of services based on the legislation.

This paper proposes an integrated model for these functions. However, in order to do this, it will describe the model not simply in terms of those four key activities, but in a more refined set of sub-activities.

The following elements of this model, can be seen as forming a circle of activities, with successive cycles of *policy development* → *legislation* → *implementation* → *evaluation*.

Key steps in this cycle are illustrated in the diagram below, which also emphasises the primacy of the legislation and policy rules in this cycle of activity.

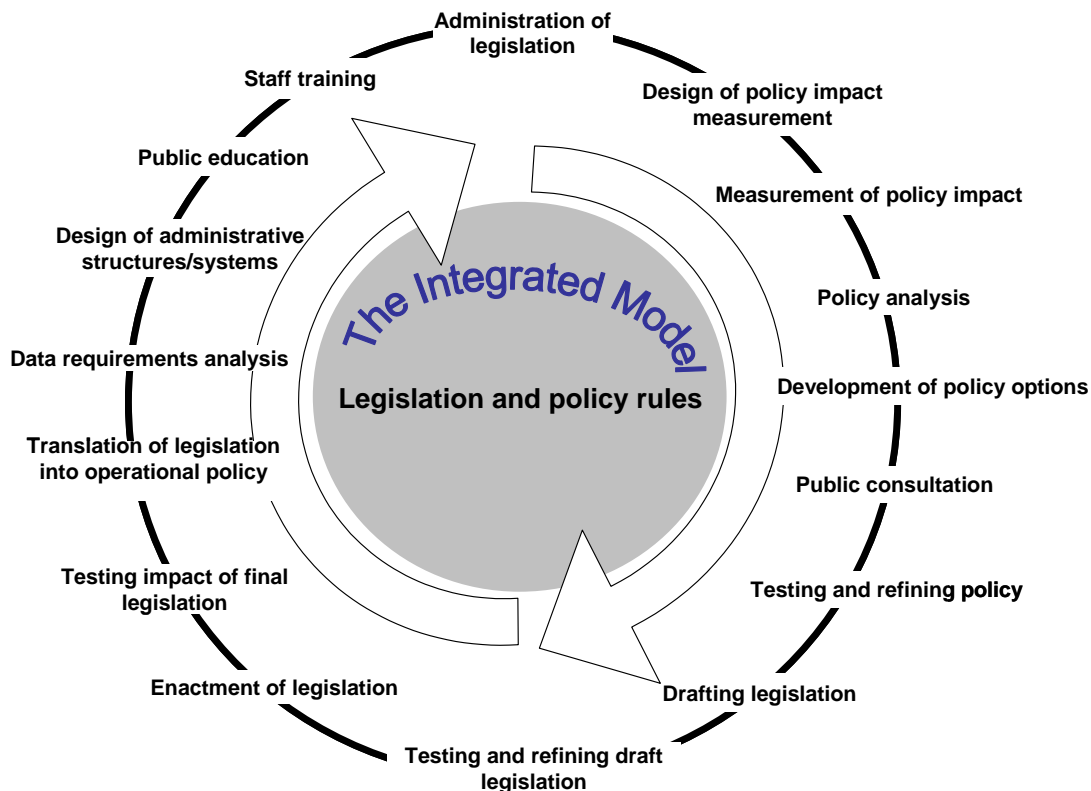


Diagram: Policy development, legislation, service design, service delivery

The diagram above emphasises that these activities are interrelated. In practice, many of the activities frequently take place out of sequence. The interactions between different functions are more varied and complex than the simple cycle suggests. However, the fact that activities take place out of sequence doesn't detract from the proposed approach. Rather, the interreliance of the elements highlights the value of a consistent shared foundation.

Each of the elements in this cycle is discussed in the next section of this paper.

The centre of this cycle of activity is the legislation. It represents the core knowledge. All of these activities focus on the legislation – the representation of the core knowledge of the administrative field.

At present, this core knowledge is held in two media, but in a multitude of versions. The two media are text (whether paper or electronic) and the memories and intellects of staff (or agents) of the agency. There can be multiple versions of the text, which can present problems. There are certainly multiple intellectual models among the agency staff who use this knowledge. Each person who “knows” the legislation will have developed their own model, from the domain specialist in the legal or policy area to the front-line staff-member who directly administers the legislation.

Both these media are flawed. The paper medium is incomplete: it must be complemented by intellectual effort for the effect of the legislation to be coherent. The intellectual models are flawed because they rely for their accuracy on the talent, memory and continuity of staff (or the capacities of clients or agents).

If this core knowledge is instead held in a complete, authoritative, dynamic, electronic format, all of the functions listed above can be radically improved. They have a consistent, shared point of reference which is currently lacking. They have a shared, accessible model that they can each rely on and contribute to. And the electronic model is capable of all sorts of functions that the current media don't provide.

The creation of such a model – a legislative rulebase – enables an agency to integrate these functions in a way that previously has been unimaginable. The scale of improvement possible in each function exceeds what is currently possible. But the overall improvement, and the capacity for an evolving spiral of improvement, is far greater than the individual improvement, because each function can interact and contribute far more effectively than before.

What this paper suggests is the creation of a universal, dynamic format for representing and using legislation (at least within an agency). The use of programmatic, electronic rule-based media is appropriate for government agencies that increasingly view themselves as electronic businesses, and who recognise that they use IT systems to develop, capture and maintain substantial intellectual property.

The creation of a universal format can create enormous benefits. Standards create opportunity. For example, the acceptance of HTML as a standard enabled the

growth of the World Wide Web – a universal protocol for representing information enabled a creative explosion.

Without creating a dynamic, shared model of the core knowledge, an agency can't truly implement an integrated approach to improvement. Once an agency has created that model, it needs to understand and address how each of these functions can and should contribute to the cycle of improvement.

The creation of a rulebase does not completely satisfy the objectives listed early in this paper. The separate functions within an agency will still remain separate, and discrete strategies for improvement will still be required. But a dynamic, shared model of the core knowledge is an essential foundation element for an integrated approach to improvement. The integrated approach offers faster and greater improvements in every function.

The following section explains each of the elements in the model above, and how the use of a rulebase contributes to each.¹

Scope of the Integrated Model

The proposed integrated approach does not apply to all legislation, but it applies to all of the legislation that we suggest is important.

Much legislation is machinery: broad, empowering legislation, provisions that set up agencies, provisions that stipulate requirements for annual reports or that set up tribunals. This machinery legislation is seldom controversial once enacted, is not frequently consulted and seldom contains any significant logical structure.

The key legislation for the purposes of this paper is *determinative legislation*: provisions that stipulate people's rights, entitlements or obligations. These are the provisions that people are concerned about, provisions that determine transactions or that businesses must comply with.

These determinative provisions frequently form intricate logical webs – central provisions call on whole schemes of definitions, exceptions, qualifications and transitional provisions. These provisions are usually used in relation to a specific person's situation. In order to work out how these provisions apply to a particular case, it is currently necessary to have knowledge of the breadth and detail of those provisions, and to have a developed intellectual model of how the provisions interact.

It is these webs of determinative provisions that this paper is concerned with – their creation and their administration.

¹ This paper presupposes an understanding of what a rulebase is and how it works. RuleBurst can provide a brief explanation of what a rulebase is, if requested. Further explanation, examples and demonstration of a rulebase will enhance this understanding.

Elements of the Model

This section of the paper elaborates on each of the functions listed in the previous section. It presupposes that an agency has developed a rulebase that models the agency's legislation. It explains, for each function, how the use of a rulebase leads to improvements in that function, and how that use either relies on or contributes to the improvement of other functions. Finally, it provides an example for the function.

It can be legitimate to start this discussion at several points in the cycle illustrated above. We will start at the policy analysis stage.

Policy analysis

A rulebase can be used for service delivery. This is its conventional use. By modelling the agency's legislation fully into a rulebase, it is possible to ensure that staff making primary decisions follow the legislation.

In a service delivery context, the rulebase performs two functions relevant to policy analysis.

First, it collects detailed data about clients, in precisely the terms of the legislation. This is different from conventional data collection techniques, which rely on generic forms, that bear no direct relationship to the legislative requirements and that very seldom comprehensively collect the information required to apply the legislation.

There are constraints on the volume of data that agencies can currently collect about clients. The paper-based forms must be reasonably generic to be remotely manageable. The data collected must be geared to the scope of the agency's existing client database, or there is little point in collecting it. So, agencies collect an amount of client data suited to these media, and rely on their staff to fill in the gaps.

The data collected by a rulebase is both complete in terms of the items required by the legislation for a determination in that case, and framed in the terms of the legislative requirements. We term this *primary data*.

Secondly, the rulebase infers very precise conclusion about which sub-paragraphs, paragraphs, subsections and sections of the legislation apply to a particular client, and can store that information. This *secondary data* provides a complete picture of how the legislation applied (positively or negatively) to each client.

If this primary and secondary data is stored, the policy analysis capabilities of the agency are profoundly increased from the current norm. The agency will have a great deal more primary data, giving them more precise profiles of the characteristics of their client population. The agency will also have a rich mine of secondary data, identifying which provisions of the legislation are used by which clients in which circumstances.

If this data is stored and properly examined, it becomes possible to measure the exact impact of existing or new policy. It is possible to know precisely which clients have benefited from or been affected by new legislative provisions. This doesn't require any assumptions or extrapolation – the data is comprehensive.

This capacity to store and analyse legislative data relies on a rulebase being used for the delivery of services, and provides a powerful research base for policy development.

Example

A tax agency administering tax credits may process the claims for those credits.

A legislative rulebase is used to determine those claims, applying the legislative requirements to each case. This means that, for every case, the agency can identify which provisions have been relied on.

The Minister receives a question, asking how many people have been affected by recent legislative changes. At present, the agency might have to analyse a limited set of data, interpret from that data the likely impact of the changes, make allowances for low take-up or non-compliance and provide a cautious approximation of the impact.

In the future, the agency should be able not only to answer the question immediately, but also to provide lower level information on the impact of particular portions of the new policy, and the demographic profile of people affected by the new legislation. This information should be comprehensive and authoritative.

Development of targeted policy options

With the policy analysis capability outlined above, it is possible to provide better advice on the impact of policy, and on potential policy options. It allows the impact of those options to be very accurately tested. This ability to test options is explained further in the next section of this paper.

However, the use of a rulebase by staff delivering services to clients (or by clients themselves) does open a critical opportunity for policy developers to *target* policy far more precisely than has previously been possible.

When a person uses a rulebase in an operational environment, the system will guide them through an intelligent data collection process. It continually makes decisions, drawing inferences about how the legislation will or will not apply in this person's case, and fashioning the data collection to suit the situation of the client.

This means that a rulebase provides a very efficient, intelligent way of traversing a vast body of legislation, and determining its impact. For example, the application of over 800 pages of Australian social security legislation will often require only about 60 items of data to be collected.

The rulebase *absorbs* and *hides* the complexity of the legislation from the user. The user has an experience of relative simplicity. This means that the complexity of the underlying legislation or policy is not daunting for either the client or the staff member using the system.

This creates an opportunity for policy makers. It is possible to develop increasingly complex, refined policy, targeting specific categories of clients more precisely than before. High risk categories, high cost cases, those with high sensitivity or low risk, high volume cases: all these can be handled according to specially fashioned rules.

The Australian Department of Veterans' Affairs has done this using rulebase technology. Claims for disability pension are now processed in accordance with special rules fashioned for each of their top 250 medical conditions. Instead of a single, inconsistently-exercised discretion requiring senior staff attention, more junior staff consistently apply very precise rules for each medical condition.

This capacity to increase the targeting and sensitivity of policy also provides the opportunity for richer data collection. This in turn feeds the policy analysis function, so that the agency can address the needs or issues of specific client categories with increasing precision.

Example

It becomes clear to a tax agency that a broadly targeted set of provisions has led to exploitation within ten identified industry sectors. Specific legislation would be required to address this problem.

However, the Minister is currently receiving unwelcome criticism about the growing complexity of the tax legislation and the inconsistent advice from the tax agency's staff that results from this complexity.

Specific legislation, covering the situation and problems of each of the ten industry sectors can be enacted. These can be accompanied by the provision of intelligent rulebase applications to the agency's staff, with on-line versions available to the industry sectors. These intelligent applications stream users quickly to the correct legislative module, and then walk the user through an investigation of that module, prompting them to answer the questions relevant to the industry-specific legislative issues. The system automatically determines the correct application of the legislation in the specific case.

In this way, the agency's revenue-protection responsibilities are met while it can simultaneously claim to be improving the consistency of advice and to be providing clients with tools that remove the problems of complexity.

Testing, refinement and decisions on policy options

If an agency's legislation is modelled in a rulebase, it is possible to quickly create and test models of proposed policy initiatives.

The Australian Department of Family and Community Services (FaCS) is currently using a rulebase in this way. It has a rulebase model of the social security legislation for which it is responsible. It is able to change numeric parameters (ages, dates, threshold income or assets levels, payment rates etc) quickly. It is also possible to change the rules governing eligibility for and rates of payments, in either simple or profound ways. Whole new sets of provisions can be formulated and tested.

FaCS can then run a weighted, representative sample of cases quickly against a policy model, see the outcomes in each case, and identify any differences between that model or any other model (including the baseline of current policy).

This has a number of effects.

- First, it is possible to test whether a proposed legislative change will have the legislative impact that is sought.
- Secondly, it is possible to see whether it has any unintended consequences, in terms of affecting other parts of the legislation adversely.
- Thirdly, it is possible to link the output of this policy-modelling system to demographic and financial models, to identify the fiscal impact of a change very precisely.
- Finally, if the agency uses a rulebase in service delivery, and has the policy analysis capability identified earlier, it is possible to test a proposed legislative change against the current client population, and measure the impact on them.

This approach has particular value in catching unintended consequences. Policy makers who are expert in and focused on a particular program, may not see some subtle interactions between that program and another. Or, because of their focus, they may simply forget about an interaction. Complex legislation frequently does have such interactions. The capacity to test the legislative implications of a policy change quickly and accurately can eliminate these mistakes.

Example

The government wishes to change the way in which small capital gains are taxed for certain types of business. The government is firm in its position that the legislative changes must lead to precisely the result that it blithely promised during the election campaign.

Achieving this outcome for the different types of business requires quite intricate changes to the tax legislation, as several of these industry sectors are already subject to exceptional treatment.

The tax agency staff responsible for these changes do not have expertise across all of these industry sectors.

If the agency's legislation is modelled in a rulebase, these staff can propose changes to the legislation, model these changes in the rulebase, and test the effect of the changes against either an existing test database or one created for the purpose. Specialists in each of the industry sectors can simply specify which outcomes should be changed and which unchanged if the government's wishes are to be met.

The staff can run the new model of the legislation against the test database, and identify all unforeseen or undesirable consequences of their changes. In this way, they can identify either how they must draft their legislation, or consequential amendments that will be necessary in other parts of the legislation in order to achieve the desired effect.

This reduces the reliance on the industry specialists, and may therefore reduce the time taken to introduce the new measures, as well as avoiding unforeseen consequences.

Public consultation

The use of rulebase technology to represent legislation makes it easy for people to use the legislation.

A rulebase application, representing proposed legislative changes, can be made available to people likely to be interested in or affected by those changes: industry lobby groups, peak industry bodies, social policy groups, commentators and client advocates.

This means that these groups can quickly and reliably test the way in which the proposed legislation will affect their constituency, and comment on those effects.

This enhances the capacity of government agencies to consult effectively with the community on proposed policy changes, and to provide preliminary education on the changes.

Case Study

The Australian Department of Family and Community Services (FaCS) is responsible for developing policy on social security payments for the Australian Government. The social security service delivery agency is Centrelink.

FaCS and Centrelink are developing legislative rulebase applications for the administration of the social security legislation. The primary use will be for service delivery by Centrelink staff and clients.

However, FaCS have also made the rulebase application available to the social policy community: researchers, commentators and interest groups concerned about social policy and outcomes.

FaCS see this as a way of improving consultation, and ultimately of improving both the quality of social security policy and the community's understanding of that policy.

Legislative drafting

The business of most government agencies is determined by legislation, yet they frequently have no control over the final content of legislation, which is ultimately the province of Parliament.

Legislation is usually drafted by Parliamentary counsel, and then amended directly by the Parliament. The resulting legislation is often significantly different from the initial policy, which the agency will have substantially shaped, and the original Bill, which will have been developed by counsel working with agency policy-makers.

There are several improvements that can be secured by aligning legislative drafting with the development and use of a rulebase:

- the communication of policy requirements to a legislative draftsman will be enhanced if they share a logical model of the existing legislation and the desired effect of the new policy;
- the time taken to draft amendments to legislation could be reduced;
- the time to implement new legislation can be radically reduced, if the legislation is drafted in a way that facilitates the rapid creation or updating of a rulebase.

Drafting style involves two elements. One is the selection of words to precisely and accurately communicate ideas. The second is the selection of a framework in which the logical interactions between requirements will be represented.

The first, the precise use of language, is not relevant here. The second is completely relevant.

The logic of a set of policy requirements can be represented in a range of different ways, in accordance with the style of a particular drafter. Many different logical structures, and the use of many different words to express logical connections, can be used while still accurately representing the logical effect of the policy.

However, there are some structures and techniques that make it very easy to build a rulebase from the legislation (and even to substantially automate that construction), while others make it relatively difficult. The *consistent* use of logical operators is particularly helpful when converting legislation to a rulebase.

A rulebase uses a very rigorous set of conventions for the representation of logic. Parliamentary drafters tend to use quite individual styles and conventions. There are many ways of representing *not* accurately with no difference in effect, and many ways of representing *or*, again with no difference in effect.

If it were possible to align drafting conventions for the representation of logic in a consistent way with those used by a rulebase, this would have an immediate impact on the speed and ease of rulebase construction. It is always possible to create a rulebase from legislation, but consistent logical frameworks makes it easy.

This is not simply a plea for co-operation. If a drafter were to comply with an agreed set of conventions for logical structures, it would become possible to create a rulebase extremely quickly and very reliably from the subject legislation. It would be possible to substantially automate the construction of the rulebase. This would make the creation of rulebases an almost immediate by-product of legislative drafting.

It is possible to identify roughly 30 drafting principles which, if consistently adhered to, would align the logical model of a piece of legislation very closely with a rulebase model². None of these principles are unconventional – it is possible to identify examples of all these principles in current well-drafted Australian Federal legislation. In many ways, each of the principles represents good practice. It is the cumulative effect of their rigorous and consistent use that would revolutionise this stage.

In many ways, this is a lynchpin in this proposed integrated model. The legislation lies at the heart of the functions listed early in this paper. This stage is the creation of that legislation. If this stage is conducted with the needs of the other functions directly in mind, in a manner not only consistent with the policy

² These principles are outlined in a separate paper.

medium that they share, but also directly creating that medium, the capacity for improvement is profoundly accelerated.

Example

Parliamentary counsel responsible for drafting tax legislation have been responsible for developing a set of conventions for the consistent representation of logical constructs in their legislation. They apply these conventions in any legislation that they draft.

A new tax initiative requires a new Part to be added to the tax legislation. This is drafted in accordance with the conventions. Validation software parses the draft to check on conformance with the conventions. This validation software also identifies duplicate provisions, incorrect cross-references and similar drafting errors.

This legislation is scanned, and its translation into a rulebase is largely automated. Any requirement for manual modelling is identified and quickly carried out. Within days of the legislation having been drafted, a legislative rulebase has been created.

This dramatically reduces the time, effort and cost required to make all of the subsequent stages possible. It therefore increases the likelihood that they will take place.

Testing and correction of legislation

Testing legislative quality

The rigorous process of creating a rulebase from legislation inevitably identifies drafting errors (incorrect cross-references, absurd and unintended consequences) as well as ambiguities that require clarification. Automated validation checks find a range of other errors (loops, unused provisions, logical holes).

This has been RuleBurst's experience in virtually every project it has worked on. This is not surprising: the errors are usually minor and reflect the very complex logic of much legislation.

So, while developing a rulebase an agency is likely to immediately identify problems or areas for improvement in their current legislation.

It is also possible to automatically identify where all provisions are used, and the provisions that will be affected by any change. Because the rulebase holds a model of the legislation capable of being explored and executed by a computer, with all logical connections encapsulated within it, it is possible to automatically identify any of these connections, no matter how remote or convoluted they might be.

The alignment of rulebase creation with legislative drafting can provide an agency with an efficient and effective means of ensuring the drafting quality of the legislation. Otherwise, these errors are found too late.

Testing policy outcomes

Once the legislation has been modelled into a rulebase, it is possible to run the same sorts of tests as were suggested in the policy testing phase. The new legislation can be run against large case samples, to check that it has had the intended policy effect, and has not had unintended consequences. The agency can test the quality of the legislation in terms of its achievement of policy outcomes.

Why test legislation?

In these ways, the quality of legislation that is proposed to Parliament can be more assured.

This has particular relevance to legislation that is likely to have significant revenue consequences. The agency, the drafter and the Parliament all know that an army of lawyers and accountants may quickly assemble to find loopholes, unintended consequences, ambiguities and the consequent opportunities for their clients.

For many agencies, the quality of its legislation has a very direct impact on revenue collection or expenditure. While rulebases offer a means to reduce administrative costs (discussed under a later heading) it is often the savings in program expenditure or in revenue collection that will be most important.

Agencies therefore have an interest in assuring the quality their legislation as far as possible, to protect revenue and to ensure that the Government's policy is correctly implemented. New methods of improving this quality are valuable, particularly if those methods also lead to substantial improvements in other agency functions.

Example

Following from the last example, a rulebase has been created, based on some new tax legislation.

As soon as this is created, automatic processes are run to find any loops, any provisions that can't be used (because of the interaction of exceptions), any duplicate definitions, and similar errors.

The legislative rulebase is then run against the same database of test cases used during the policy development phase. The final results of the policy development phase have been saved, so the desired set of outcomes is known.

The legislative rulebase produces different results for a small number of client profiles. This might indicate either a problem with the policy, or a drafting error. It may indicate an anomalous effect for some members of the community that hadn't been contemplated. But it can be addressed by discussion between the Minister, the agency and Parliamentary counsel, so that the outcomes of the Bill for the full range of client groups will be known and consistent with the government's wishes.

Enactment of legislation

While it may currently be unthinkable to many, it is possible that one day, Parliament may enact some legislation (important pieces of determinative legislation) in a form other than paper – in a dynamic format that unambiguously captures the intended logical effect of the provisions. At least, Parliament may sanction such a dynamic form in addition to enacting a paper version.

By doing this, Parliament could avoid some of the later (and costly) arguments about the intent of the legislation, by removing the capacity for ambiguity about the intended logical interaction between provisions. The intended impact of the legislation on a broad range of client groups could be tested and verified.

In some ways, this is merely an extension of modern drafting practices that include tables, method statements, examples and procedural instructions. It is a format that implements these drafting devices, which are practical and sensible departures from the traditional slavish use of convoluted sentences to explain logical interactions.

This type of step would only sensibly apply to determinative legislation: provisions that specify detailed requirements for a right, entitlement or obligation.

Example

As part of the passage of tax legislation through Parliament, it must be scrutinised in detail by a committee. Several members of this committee request information about the impact of certain changes which they believe would be beneficial.

The agency models the requested changes, and identifies the impact that they will have on the range of clients contemplated by the committee members, but also the impact on other client groups.

Through a process of requests, modelling, testing and refinement, the draft legislation is altered before it is presented to Parliament.

The Explanatory Memorandum accompanying the legislation includes a provision that the outcomes determined by an identified rulebase correctly illustrate the intended logical effect of the provisions for all clients whose circumstances are covered by the accompanying suite of test cases.

Testing the effect of legislation

A further testing step is possible after legislation has been passed. The impact of the final legislation will often be different from that contemplated at either the initial policy development stage, or the drafting stage. Parliament will have made amendments, some drafted at the eleventh hour.

An agency responsible for the implementation of legislation can use a rulebase to determine the actual effect that the final Act it will have on the client population. Once again, running the legislative rulebase against a large sample of cases will identify any unforeseen consequences. It may be too late to change the legislation if those consequences were not intended by the legislature, but at least the executive agency will be prepared.

Example

Parliament sits overnight, debating the controversial provisions of some proposed changes to tax legislation. Deals are done, compromises made, and amendments hastily drafted and agreed.

The final Act that passes the Parliament is materially different in several respects from the Bill that had been tested and put to Parliament.

The tax agency quickly changes their rulebase model to reflect the legislation as it was ultimately passed. They run this against their test case database. This highlights that the Parliamentary changes will lead to unexpected windfalls for certain high-income families.

The agency notifies the Minister of this, so that she can take action – before it becomes front page news.

Translation of legislation to operational policy

In many agencies, the front line staff charged with making primary decisions do not use the legislation directly. Instead, the agency drafts operational guidelines or instructions that explain and elaborate on the legislation, often mixing this with an explanation of the procedures that must be followed when implementing the legislation. This translation is sometimes done by policy staff, but it is often people responsible for managing the service delivery area that prepare these guidelines.

The use of a rulebase substantially removes the requirement for this stage. The rulebase captures and implements the effect of the legislation, and it is directly useable by staff. It will usually need to be supplemented by explanatory material, describing how to exercise judgement on specific legislative issues. But the scope, logic and effect of the legislative requirements does not need to be translated.

This means that there is a very direct integration between the policy area and the staff delivering services. The policy staff are likely to be the people who create the rulebase and any associated elaborative policy.

This provides policy areas with greater control over the manner in which the legislation is administered and the quality of that administration. It enhances their function, requiring them to combine their knowledge of legislation and policy with practical considerations of implementation.

This addresses one of the common tensions within this type of government agency: a perception that policy-makers are removed in ivory towers, lacking contact with or concern for front line staff. The use of rulebase technology provides an opportunity (and even a requirement) for policy staff to play a role in the design of service delivery methods, because they design the rulebase that controls primary decision-making.

This also means that what is applied by service delivery staff, clients or advisors is the legislation itself. It is not a paraphrasing of the legislation, a common subset of rules, the confused memory of a staff member or a jumble of office folklore. It is the precise detail of the legislation.

This is the way in which the Australian Department of Veterans' Affairs administers a large and complex body of delegated legislation, dealing with entitlement to disability pension. The policy changes frequently, as it is under constant review by a specialist medico-legal panel. The staff are not trained in these changes. No explanatory bulletins, instructions or manuals are written and distributed.

Instead, the rulebase-driven system used by the staff implements the policy changes in a timely way, consistently across Australia. The staff simply address the issues as prompted by the system. They apply precisely the requirements specified in the delegated legislation. They concentrate on exercising their judgement, and considering evidence, using supporting tools provided by the system.

Removing or reducing this translation step is not only more efficient, it is more correct. It means that clients' rights, entitlements or obligations are being determined according to the law.

Example

The Government introduces a wide-ranging set of changes to the tax system. This renders a lot of current staff knowledge redundant (and, in fact, dangerous), and requires the application of a set of entirely new rules.

Instead of embarking on a large-scale training and quality control exercise – a nightmare for both management and staff – the agency implements the new legislation through a rulebase system. This will ensure that staff are consistently guided through the right issues for any case, and will automatically determine the logical result of their judgement on these issues.

The agency takes the opportunity to change its business processes. Instead of simply training staff in the use of this system within their old silo structure, they integrate the work of the old division with that of another division that already uses rulebase technology. The tools are the same, and staff are now capable of operating across both programs.

This breakdown of old structures services the agency's clients better, breaks down some entrenched dynamics within the agency, and provides the opportunity to meet the agency's efficiency targets.

Data collection and system data requirements

Replacing form design with intelligent data collection processes

It is essential to collect data in order to administer legislation. Whether the agency collects the data and makes determinations, or whether businesses operating under a regulatory regime gather their own data, it is necessary to frame a set of data requirements in terms of the information required to properly apply the legislation.

Traditionally, this has been done in a generic way prescribed by the available media: paper forms. Forms can usually only collect a subset of common data. To collect all of the information genuinely required to apply legislation correctly in all cases would require forms of unwieldy size and complexity.

A rulebase provides an intelligent data collection process: only data that is essential is collected, and the required data is dynamically determined as the peculiar characteristics of each case unfold.

The first benefit of this is that it is possible to eliminate paper forms for many or all clients.

In addition, it is possible to collect more and better data. The intelligent navigational process means that it is possible to collect more detailed information from each client: precisely the detail of the data required by the legislation for that person's case, rather than a fixed, generic set of data.

Automatic identification of system data requirements

A rulebase can automatically identify the base data required to satisfy any single legislative goal. It is possible to instantly identify the full scope of data requirements for any transaction, and to filter these to exclude branches of the legislation that will be handled in special ways.

This provides several benefits:

- It is possible to quickly identify similar data elements from a complete list, and therefore to identify where rationalisation is possible and sensible. By synchronising the language of different legislation provisions, it can be possible to eliminate collection of similar data items: the data analysis can inform sensible amendments to simplify the legislation and make it consistent.
- As long as paper forms remain practically necessary, it is possible to quickly and reliably identify the data that will be required to satisfy the legislation. This can help in form design, even if it is not practically possible to collect all data items. This can also help in the design of a transition from paper-based forms to intelligent online data collection processes.
- The legislation ultimately specifies the data requirements that an agency's information storage systems must accommodate. This automatic feature allows an agency to quickly assess the impact of legislative change on its existing IT systems, and the data requirements for new systems.

Example

The Government wishes to introduce a new tax credit for students. This will require new administrative and IT systems.

Because the tax agency models its legislation in a rulebase, it can immediately identify the data requirements for both the collection of information from clients and the storage of information for payment and analysis purposes.

The agency takes a bold step. Paper forms will be avoided as far as possible. Virtually all data collection will be online. For students who don't have access to the Internet at home, the tax agency will provide facilities at tertiary institutions.

This means that the agency can achieve 100% data entry by the students. There is no such thing as an incomplete form: the system requires students to provide the necessary information, with substantial explanatory assistance for each data item.

It also means that all assessments can be automated and instantaneous. Because of their data matching capability, the tax agency doesn't require production of evidence in all cases, but can manage the risk of fraud adequately through targeted audit.

The new scheme is implemented in an unprecedentedly short time, with very low administrative costs from the outset. Students know their entitlements without delay, and the management information system that has been created to analyse the client data is unusually rich, allowing high quality analysis and evaluation of the new credit's impact.

Design of service delivery structures and systems

The existence of a rulebase has enormous implications for the design of service delivery structures, methods and support. It provides a means by which an agency can genuinely re-engineer its processes, and can enhance its methods of delivering services.

The use of a rulebase removes the need for staff to have specialised knowledge of the core knowledge – the legislation and policy. They will often require a broad understanding of that policy, and an understanding of the business of the organisation. But, using an application developed from a rulebase, more generally skilled staff will have the capability of operating effectively across a far broader range of subject areas: across different pieces of legislation, different programs and even different portfolios.

This is a critical step in enabling processes to be designed around client's needs. In order to be a client-focused agency, it is essential to equip staff to be genuinely competent across a range of service areas. Staff specialisation seldom services clients well.

The full implications of using rulebase technology for service delivery are beyond the scope of this paper. Instead, the paper assumes that this is the method used to support staff responsible for primary decision-making. But because the use of this technique enables radically different service delivery methods (such as single-point processing, self-service, contracted services and one-stop shops), it is essential that new delivery processes are developed for the support of these options.

Example

The new student tax credit has been implemented from the outset as an electronic service (as in the previous example).

Instead of creating a new claim processing section, as for the other tax credits, the agency creates a small, specialised team. The first role of this team is to develop and maintain the rulebase application that the students will use. The second role is to design and conduct a targeted audit program, to ensure compliance. The third role is to monitor the implementation of the scheme, and the output of the management information system, to suggest policy and application improvements.

The new scheme is implemented at 20% of the administrative costs per claim of other tax credit schemes, because the students do virtually all of the processing work.

Staff training

The existence of a dynamic model of the agency's core knowledge makes an immediate and substantial contribution towards meeting staff knowledge requirements.

The use of rulebase technology removes the need for staff to learn and retain the detail of new legislation or policy. The rulebase system prompts them to address individual issues, requiring them to exercise general skills in judgement, discretion and consideration of evidence. They no longer have the pressure of memorising the minutiae of legislation or policy.

This means that training can focus more on the development of general skills required for client contact, and less on technical knowledge. This also means that the profile of recruits and the skills sought from new recruits can change to suit more client-focused administrative arrangements.

Example

The tax agency implements new tax credit legislation. Rather than creating a new branch to administer this new credit, it simply extends the rulebase processing system used by staff who administer another tax credit.

The staff do not require detailed training in the new tax legislation, because they don't need to have a detailed knowledge of it. They are familiar with the rulebase technology, and the guided approach to administering legislation.

They are trained in half-day sessions to use the new rulebase modules, which integrate with their existing case management system. The processes are the same, it is just the content of the rulebase investigations that is different.

Staff throughout the country are quickly able to take on the additional program, without any specialised knowledge of it.

Public education

Most Government agencies have an interest in educating their client communities about changes to legislation or new policy initiatives. Effective public education leads to greater acceptance of change, higher compliance and ultimately lower administrative costs. Public education is also a specific responsibility of most agencies.

The use of rulebase technology provides these agencies with the capacity to give their client communities a new and very effective means of public education. It is possible to create intelligent, targeted tools that help clients to quickly and accurately assess the impact of proposed or recent policy changes to their situation. These facilities can be made available to both staff and clients online.

These intelligent tools are usually more useful to clients than any number of pamphlets, booklets, paper kits or television campaigns. This is because they can quickly answer the clients' precise questions, rather than simply providing generic information.

A secondary problem in conventional public education is the provision of inconsistent advice by agency staff. At times of new policy initiatives, large numbers of clients will want answers to specific questions. They will ring agency staff or those on hotlines set up to cope with this peak demand period.

Rulebase tools help these staff to deal with quite complex issues accurately and consistently.

Rulebases created from the legislation can be used to answer very precise questions. While a rulebase can model a large volume of legislation, it is not necessary to investigate all of the legislation. Multiple entry points can easily be created to query any discrete part of the legislation, or to answer predictable, high-volume questions.

The introduction of new programs, and particularly complex programs, requires effective public education. The success of the initiative will often depend upon public acceptance. The provision of effective tools that clients can access directly provides a targeted, effective and relatively cheap way of addressing the public's needs.

If an agency holds its core legislation in this format, providing these intelligent tools during the public education phase is relatively straightforward. It can become a standard by-product of the creation of the legislation.

Example

The government passes new capital gains tax legislation. This affects large numbers of businesses and citizens. It has a high political and press profile.

The tax agency has developed rulebases to model the new policy at each stage of the passage from final government policy to legislation. At each stage, it has made these publicly available, providing explanatory textual support for each requirement to help the public to understand the requirements.

The public have been able to access these rulebase tools directly over the Internet, through call centres, in mobile booths set up during public education seminars, and at the tax agency's offices.

People are invited to assess how the new policy will apply to them. They are able to run and print the results from different scenarios, testing how changes in their circumstances will affect them.

If members of the public believe that they are affected unfairly or in an anomalous way, there is a mechanism for them to identify this to the tax agency. In this way, genuine anomalies and likely political problems can be picked up and corrected.

Alternatively, the tax agency may prefer to wait until the new policy is law before making these tools available to the public. The period around commencement of the new regime will be the most hectic, with agency staff being called on to advise on a host of situations.

By developing these intelligent tools, as an adjunct to the legislative drafting process, the agency is well-placed to provide detailed, consistent, accurate advice to clients in an efficient way from the commencement of the scheme.

Delivery of services

The use of rulebase technology dramatically improves the accuracy and consistency of primary decision-making. It virtually entirely removes the following sources of error:

- staff relying on their original training, and their memory of the content of that training;
- staff relying on their faulty memory of more recent legislative or policy updates, bulletins or instructions;
- staff relying on their knowledge of a common subset of the legislation;
- staff relying on an office expert, whose own knowledge is flawed;
- staff having insufficient time to properly research unusual situations or complex questions;

- staff failing to consult interpretative material, because of the pressure of work;
- staff continuing to enforce repealed legislation or superseded policy;
- staff misinterpreting the logic of intricate legislative requirements;
- staff in different offices developing differing standard interpretations of intricate or ambiguous legislative requirements;
- staff failing to keep up-to-date with changes in the legislation or policy;
- staff failing to remember or implement guidelines on the exercise of discretion or evidentiary requirements.

A rulebase forces a decision-maker to consider all relevant issues in any case, and only those issues that are relevant, and then it automatically infers the correct conclusion, implementing the logic of the legislation. It does this consistently throughout a large, dispersed staff base. And if the rulebase is up-to-date, then all staff will be administering current policy.

The staff must still address each relevant issue, and exercise judgement where required. But by automatically navigating broad, intricate legislation, and reliably executing the logic of that legislation, a rulebase addresses the causes of the majority of errors.

Accuracy is not only important because of accountability and equity considerations. It also has a very direct impact on program expenditure or revenue collection. Correct primary decision-making is a prerequisite for proper control of a program budget.

As previously noted, rulebase technology largely removes the need for specialist knowledge, which in turn opens up new options for the delivery of services. Self-service becomes a credible option in otherwise impossible transactions. One-stop shops, external service delivery agents and single-officer processing all become viable in more than cosmetic ways. In each case, it is possible for a transaction to be completed, even though it may require a decision on the application of very complex legislation.

While the use of a rulebase in the other functions will improve the quality of overall administration, this is probably the major source of cost savings, particularly savings of administrative costs.

Example 1

A tax agency employs thousands of staff to apply tax legislation, when advising clients and when determining tax liability.

The agency has been receiving very bad press because of an audit of the consistency and correctness of its decisions in one program area. That audit has identified that clients in the same circumstances are likely to get different answers from different offices, that there is an initially surprising correlation between staff experience and error levels, that most staff do not look at legislation but instead rely on the advice of colleagues, and that many staff still administer repealed legislation two years later.

The agency has modelled its legislation into a rulebase. It makes it compulsory for staff to use the rulebase when answering questions about how legislation applies to a client's circumstances. It links the rulebase to the tax return processing system, so that staff must use it to determine liability.

Error rates immediately go down, and identical cases are demonstrably handled consistently from office to office. Staff no longer rely on office folklore or the advice of colleagues to deal with difficult issues, but rely on the system. Audit of the quality of decisions is easy and reliable.

Example 2

A tax agency previously employed advisors to provide rulings on the complex interaction of tax provisions. These advisors dealt with specific requests for interpretation of the law, researching the provisions that affect the client, and preparing an official response on the way in which the provisions interact. If a particular case raised new questions, they consulted with senior policy or legal staff on the correct or desirable interpretation.

This process has been expedited since the creation of the rulebase model of the agency's legislation.

The interaction between all provisions is now known. During the development of the rulebase, decisions were made by senior policy staff to resolve difficult or ambiguous logical interactions.

The advisors now work in a two-step process. Initially, they simply consult the rulebase application, feeding the client's situation into the model and identifying the conclusion. The system automatically generates a letter to the client, advising on the outcome of the investigation. The letter also states that if the client is not satisfied with this, they can request a second reconsideration. This reconsideration by senior policy staff, if it led to a different conclusion, would require a re-examination of the previous resolution on the issue that the rulebase had implemented.

As a next step, the agency makes the rulebase application available to clients. It commits that, if the client holds output of this system, with a full audit trail of the decision and a signed declaration as to the accuracy of the inputs, this will have the status of official advice from the tax agency. Within two years, the number of rulings has quadrupled, while the number of rulings handled by staff has halved.

Design of impact measures

Before implementing new legislation, it is sensible for an agency to identify the ways in which it wishes to measure its impact.

Where legislation is administered using a rulebase, the impact of the new legislation can be very precisely measured. The rulebase collects detailed primary data, framed comprehensively in the terms of the legislation. There is a direct correlation between each item of data and the relevant provisions of the legislation. In addition, the rulebase infers secondary data: which provisions of the legislation have been satisfied by each client, and how.

It makes sense for an agency to be more ambitious in designing their measurement of policy impact, when a rulebase is used. In pilots, in samples and in full production systems, it is possible to extract comprehensive information about the take-up of the new measures, the profile of clients affected and any negative impacts.

Example

A tax agency implements a new method for assessing tax on superannuation. This requires all people claiming a concession to determine their entitlement to the concession and assess the level of concession through an online facility.

The online facility includes a rulebase model of the legislation. Before the introduction of the scheme, the agency designs the way in which it will measure the impact of the new concession.

It decides that it will save all the primary data elements that determine entitlement and level of concession. From this data, it can automatically recreate all assessments and query all legislative conclusions. After 6 and 12 months, it will report on precisely which categories of client have taken up the concession, the level of reliance on different grounds for entitlement, the number of clients at each concession level, and the major categories of people who tested their entitlement but were disqualified.

All of this can be automated.

Measurement of policy impact

The last step in this process is to measure the impact of policy, whether current or new. This has been explained in previous sections: the rulebase provides a capability to measure the impact in far more detail and more comprehensively than ever before.

This in turn feeds into better policy analysis, better policy development and therefore better legislation.

Example

The tax agency has implemented its student tax credit and its capital gains tax concession using rulebase technology.

All of the data from these is saved into a management information database. The agency has developed a standard set of reports that will be generated from this database: profile of successful claimants, profile of unsuccessful claimants, an analysis of the different grounds of entitlement, measurement of actual impact against predicted impact. These reports are easily generated, because the data reflects the legislative provisions and criteria.

This also enables the demographic weightings applied to each profile in the test case database to be tuned, so that the likely fiscal impact of policy options can be more precisely forecast.

This information is provided to the policy analysts, who determine whether any tuning of the legislation or administration is required.

Conclusion

Rulebase technology has been used by a number of government agencies to administer legislation – to deliver services. The benefits are significant and demonstrable.

However, this technology also offers the opportunity for an integrated approach to quality improvement. It is possible to develop an integrated approach to policy development, legislative drafting and service delivery, in which each directly enhances the quality of the others.

The scale of benefits that can be derived increases dramatically if the holistic approach suggested in this paper is adopted. If the circle is broken, the overall benefits will be reduced.

For example, if policy-makers and those responsible for service delivery make use of the technology, but those responsible for drafting legislation do not help them, this will reduce the overall benefit. It will not mean that proceeding down this path is not worthwhile. But a holistic approach will have profound consequences for an agency, genuinely locating a shared view of the core knowledge at the centre of the agency's activities.

In this paper, the process of policy development, legislative drafting and enactment, and service design and delivery are represented in a circle. This is obviously simplistic, but it illustrates the inter-reliance of these activities. In fact, these different functions interact in more various and complicated ways.

These interactions only reinforce the benefits of having a common, accessible and powerful reference point. Each will be able to communicate more coherently, precisely and efficiently with the others about problems with the legislation that drives the agency's activities. Each can become more knowledgeable about, more sympathetic to, and more responsible for the agency's overall administration of its legislation.

This approach requires all relevant legislation administered by an agency to be implemented in rulebases (whether one rulebase or many). The drafting of new legislation obviously provides a great opportunity to start this process in one program area.

Whether this approach is taken when legislation is new or rewritten, or whether existing legislation is translated to a rulebase, this should be viewed as a strategic capital investment. The benefits will accrue relatively quickly, but will also endure. In fact, if the holistic approach recommended in this paper is adopted, the benefits will multiply as the agency's different functions become increasingly tightly integrated, and increasingly refined in their quality.

In an early section of this paper, a number of aspirations for improvement were listed. These were:

- better policy formulation and advice;

- better legislation, that gives precise and accurate effect to policy objectives, ideally in a way that is coherent to the staff and constituents of the agency;
- reduced time for implementation of new policy or new legislation;
- increased accuracy and consistency in the administration of legislation;
- an enhanced array of options for delivering the agency's services, whether to improve services to clients or to reduce costs;
- a greater focus on clients' needs in their interactions with the agency (rather than on agency processes, structures and convenience) in all of the work of the agency;
- a tighter integration of policy and service delivery functions, so as to help to achieve some of these objectives.

This paper has argued for an integrated, holistic approach to meeting these objectives. A piecemeal approach will secure benefits, but not on the same scale as an integrated approach.

By creating a shared, enhanced and accessible version of an agency's core knowledge, its legislation, it is possible to take such an integrated approach to quality improvement.

By reinventing the way in which legislation is conceived and how it works, it is possible to reinvent the ways in which it is used. This means that it is possible to reinvent the way that many Government agencies do their work.