

GUIDANCE NOTE

Achieving Success With Electronic Services—The Importance of Having a Sound Business Architecture

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Approved by

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CENTRE FOR TAX POLICY AND ADMINISTRATION

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ABOUT THIS DOCUMENT

Purpose

The purpose of this guidance note is to encourage revenue authorities in member countries to establish and maintain a high level and comprehensive set of business directions or principles—referred to in the note as a ‘business architecture’—to guide the development of modern electronic services (e.g. for information provision and electronic filing, payment, and correspondence).

Background

Sharing knowledge within and beyond the OECD

With globalisation comes the increasing need for revenue authorities around the world to cooperate to help each country administer their revenue system. The work of the Organisation for Economic Cooperation and Development (OECD) and other international organisations aims to find ways to ensure the correct tax is paid in the correct jurisdiction. OECD members need to continue to explore ways of sharing experience and contributing to ongoing research.

Focus on issues of taxpayer services

Recent years have witnessed major reforms in public sector administration as governments strive to improve the efficiency and effectiveness of their operations. Central to these reforms has been the establishment of sound corporate governance practices, including the application of new technology in delivering information and transaction services to taxpayers. During meetings of the CFA’s Forum on Strategic Management in early 2002, it was agreed that further work should be carried out by country tax officials to share experiences and to provide more comprehensive guidance on the provision of electronic services to taxpayers.

The Forum on Tax Administration Taxpayer Services Sub-group

In October 2002, tax officials from a number of OECD countries convened in Paris as the Forum on Tax Administration’s (FTA) e-Services Sub-group (subsequently renamed the Taxpayer Services Sub-group). The Sub-group’s mandate is to 1) periodically monitor and report on trends in taxpayer service delivery, with a particular focus on the development and deployment of electronic services (hereafter referred to as ‘e-services’) by revenue authorities; 2) examine ways to promote the uptake and use of e-services by revenue authorities; 3) examine options for cross-border administrative simplification and consistency; and 4) assist, as appropriate, other groups of the Committee of Fiscal Affairs (CFA) in their work on taxation.

At a meeting of the Subgroup in Toronto in 2003 a number of subjects were identified for consideration and research. This included the issue of a revenue authority’s ‘business

architecture' and the role it played in guiding the development of modern e-services for taxpayer service delivery. Resulting from discussions among Sub-group members, it was decided to provide a short guidance note on this topic, as part of the work programme of the Taxpayer Services Sub-group.

Caveat

Each revenue authority faces a varied environment within which they administer their taxation system. Jurisdictions differ in respect of their policy and legislative environment and their administrative practices and culture. As such, a standard approach to tax administration may be neither practical nor desirable in a particular instance.

The documents forming the OECD tax guidance series need to be interpreted with this in mind. Care should always be taken when considering a country's practices to fully appreciate the complex factors that have shaped a particular approach.

Inquiries and further information

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SUMMARY

The growth of e-services is presenting many opportunities and challenges to revenue authorities. The initial response by many revenue authorities has centred on the provision of e-filing solutions for the various tax types administered. However, increasingly, both customers and Governments expect more comprehensive e-services that match the best of the commercial sector. Providing e-services that are joined-up, customer-centric and drive down costs involves much more than deploying e-filing solutions which simply mimic paper transactions. Achieving those goals demands a wider reappraisal of business activity that is more fundamental than that traditionally undertaken for information technology investments, and one that often raises core questions about processes developed for, and used in, paper, face-to-face, and/or telephone interactions. This makes it necessary for revenue authorities to have a coherent business architecture to guide developments and investments in people, processes, organisation and information technology (IT).

This paper is intended to help and stimulate the thinking of business people in revenue authorities (particularly those which are at a relatively early stage in their adoption of e-services) about the role that a coherent business architecture can play in shaping and improving future business activities. It does this by:

- explaining what a business architecture is and why it is important;
- exploring what a future generic business architecture might look like;
- outlining the relationship with a technical architecture; and
- examining in more detail (see annexes 1 to 4) some aspects of particular concern to revenue authorities.

The guidance note has been derived from a review of the practices of national revenue authorities in OECD countries. Inevitably, it is pitched at a high level to bring out the generic issues. In doing so, it is designed to provide an overall framework within which the different circumstances of different tax administrations can be accommodated.

The note concludes with the following guidance:

- Revenue authorities should ensure that they develop a business architecture before they start building their e-service capabilities. If they have already started building such services without a comprehensive business architecture, they need to develop one as soon as possible.

Failure to do so is likely to: 1) drive up long-term investment costs because unforeseen issues can drive the need to revisit earlier investments; 2) inhibit development of a full range of integrated e-services because component parts will not have been built with a future business architecture to guide them; 3) reduce the take-up rates of e-services otherwise achievable because customers will not get a consistent, high quality experience; and 4) limit the efficiencies which could be gained from understanding and bringing together future staff and customer requirements.

INTRODUCTION

- 1 The growth of e-services is presenting many opportunities and challenges to revenue authorities. The initial response by revenue authorities has centred on the provision of e-filing solutions for the various tax types administered. Some were Internet-based; others used electronic data interchange (EDI) or floppy disks. However, increasingly, both customers and Governments expect more comprehensive e-services which match the best of the commercial sector. Providing e-services that are joined-up, customer-centric and drive down costs involves much more than deploying e-filing solutions which simply mimic paper transactions. Achieving those goals demands a wider reappraisal of business activity that is more fundamental than that traditionally undertaken for information technology investments, and one that often raises core questions about processes developed for and used in paper, face-to-face, and/or telephone interactions with customers. This makes it necessary for revenue authorities to have a coherent business architecture to guide developments and investments in people, processes, organisation and IT.
- 2 The FTA's Taxpayer Services Sub-group concluded that it would be helpful to officials in revenue authorities who are not specialists in business architecture or the associated technology to produce a brief guidance note on the subject. This note is intended to help and stimulate the thinking of business officials in revenue authorities (particularly those which are at a relatively early stage in their adoption of e-services) about the role that a coherent business architecture can play in shaping and improving future business activities. It aims to do this by:
 - explaining what a business architecture is and why it is important;
 - exploring what a future generic business architecture might look like;
 - outlining the relationship with a technical architecture; and
 - examining in more detail (see annexes 1 to 4) some aspects of particular concern to revenue authorities.
- 3 The paper is intended to be neither a comprehensive nor a theoretical statement about business architecture. It is not aimed at business architecture experts or technologists. Rather, it tries to provide practical guidance for business officials on the issues which most concern revenue authorities, based on the experiences of member countries. Inevitably, it is pitched at a high level to bring out the generic issues. In doing so, it is designed to provide an overall framework within which the different circumstances of different revenue authorities can be accommodated.
- 4 It is important to note from the outset that there is a basic question about who "owns" the business architecture within a revenue authority. The answer may seem very obvious—surely it is the business arm of the revenue body. And it should be. But that raises two issues which must be answered. Firstly, who in the business should own it? That should be a relatively easy question to answer and is very much a matter for each individual country depending on its organisational structure. What is clear on this point is that the ownership should be at the corporate level, bringing the business vision of individual business units within the revenue authority into a coherent whole. The second issue, though, can be more difficult. In many revenue authorities there is much greater clarity about the technical architecture that is supposed to support the business architecture than

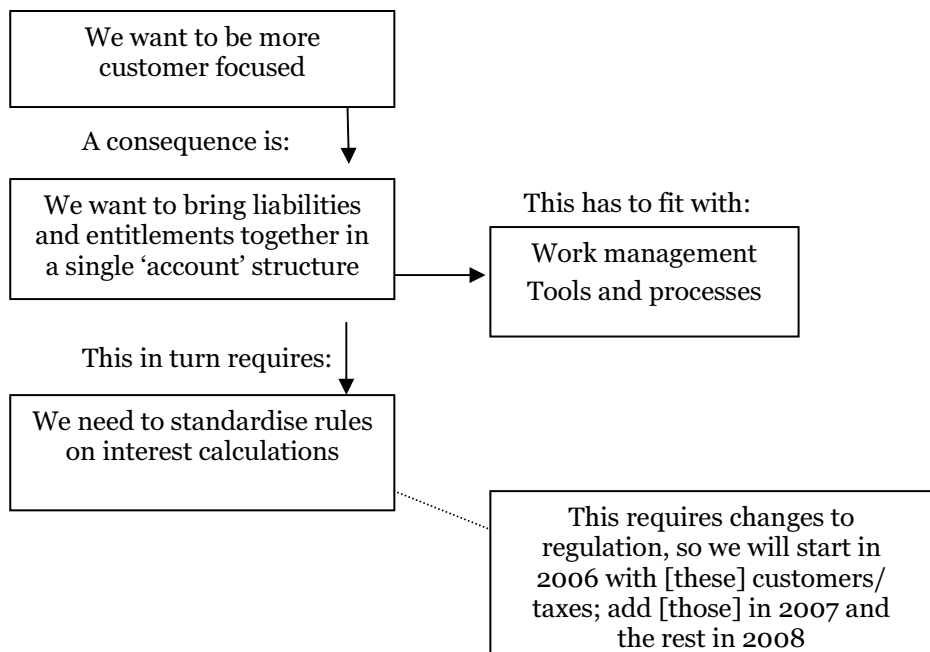
there is about the business architecture itself. Experience from many countries suggests that business people are not necessarily clear about what a business architecture is and why it matters. If those business people are to constructively “own” the business architecture they need to understand the issues which this paper explores.

What is a business architecture?

- 5 A business architecture is simply a way of representing the main elements of the desired future shape of a business. It essentially does three things:
- It provides a bridge between very high level, abstract, statements of business direction (e.g. “we want to be customer-focussed”) and the specific pieces of work which will contribute to being customer-focussed. It does so by setting out logical models of how the requirement will be satisfied which provide guidance to designers of information or operational systems (e.g. “ this is the logical view of how we will provide an overall view of all of a customers records”)
 - It helps define the relationship between different aspects of the future state and forces out questions about the overall coherence of the big picture (e.g. “is our ‘whole of customer’ approach consistent with the way we design jobs for our staff?”)
 - It supports the development of a time-based view of how the organisation will progress from where it is now to where it wants to be (e.g. “our ultimate goal is to have a single account for each customer; but we will need to get there through the following incremental steps”).

In essence, it makes critical connections between ideas and action in three dimensions: top-down (linking strategy to the real world); horizontally (linking different parts of the business together) and out over time.

- 6 A simple representation of these different types of thinking might be:



Even a short piece of work on just one aspect of an organisation's vision will quickly generate a level of complexity and a number of dependencies which will need formal, persistent and consistent control if something coherent is to be delivered over time by a number of different projects.

Why is business architecture important?

- 7 Revenue authorities in OECD countries typically carry out wide-ranging and diverse lines of business. Their most common responsibilities are administration of direct taxes on personal income (including withholding taxes for employers) and company profits and some forms of indirect sales tax (e.g. value added taxes, excise). However, many are also responsible for welfare-related matters (e.g. paying tax credits), collecting non-tax debts (e.g. student loans), collecting transport-related taxes and managing special taxes on waste or travel and so on. This diversity of business lines is reflected in their customer base which can range from single parents dependent on the regular payment of benefits to collecting taxes from the largest multinationals.
- 8 Organisationally, revenue authorities are very different. Some have extensive local office networks while others have little or no such network. Some are structured principally around customer groupings, others around functions or product (i.e. tax) lines. And some are the unique taxing arm of central Government while others work in tandem with regional or state taxing authorities.
- 9 This diversity of organizational models means there will be different aspects of business architecture which are most important in any particular context. For instance, depending on the nature of the tax regime, and the priorities of the time the emphasis might be on the particular characteristics of withholding tax structures and the support needed for external relationships; or on the more internal need to construct robust risk profiles to underpin a compliance regime.
- 10 The diversity of product, customer and channels within each revenue authority and the fact that systems typically have to live through a number of changes in priority (and organisation), mean that the creation and maintenance of a business architecture is essential if the opportunities of an e-enabled business are to be taken. There are four principal reasons why some form of business architecture is so important to the future. Taking the earlier point about how it can guide development, this translates directly into:
 - ensuring that projects are scoped properly and managed effectively;
 - prioritising work on an informed basis and across the whole organisation;
 - making it more likely that there will be a return on investment (and not just in IT); accommodation and staff skills, for example, are just as relevant); and
 - understanding and managing the impact of change.

Each of these requirements is described more fully in the following paragraphs.

CONTROLLING PROJECTS AND PROGRAMMES

- 11 In most revenue authorities, change is delivered through a large number of separate initiatives or projects, no single one of which delivers a self-contained, fully-formed component of the desired end-state. Without some intermediate expression of what corporate strategy statements mean at a practical 'delivery' level, individual projects will necessarily come up with their own interpretations. And these will differ both from what was intended and from each other. An effective architecture provides a means of giving clear guidance to projects at the outset about what is required and how they are expected to contribute to strategic aims. It also serves as a means of testing, during the life of the project, whether the detailed work is remaining faithful to the original intention.
- 12 In addition, some issues are too large or wide-ranging to be resolved by individual projects, and need the wider context of a business architecture if difficult policy problems (e.g. defining acceptable standards of personal identification or handling client association and representation (discussed further in Annex 1)) are to be handled effectively.

PRIORITISATION OF WORK

- 13 There will always be many different factors affecting the relative priority of pieces of work. Often, these can be clearly expressed (e.g. political commitments). Being able to see the contribution which projects, or components of projects, make to the wider development plan for the organisation is a harder but essential part of effective prioritisation and resource allocation. An architecture makes these dependencies visible, easier to discuss and more manageable.

MANAGING INVESTMENT EXPENDITURE

- 14 One of the objectives of producing an architecture is to identify areas of business activity where a generic approach would be beneficial and efficient (e.g. a standard approach to the handling of payments). Identifying these upfront and encouraging projects to take a common approach avoids any "reinvention of wheels" and the associated waste of time and money. There are other, more profound, implications: if functions are seen to be truly generic, it allows the business to question whether it wishes to invest in them at all, or whether they might be sourced as a commodity service. Current technological tools such as web services using service-oriented systems design make greater efficiencies possible but revenue authorities will only obtain the full benefits through a comprehensive business architecture.

MANAGING THE IMPACT OF CHANGE

- 15 Resistance to the idea of investing in an architecture is often based on a view that, in a fast-changing world, any attempt to second-guess the future is doomed to failure. This view misses the point. It is the very pace and complexity of change which makes it important to have some documented view of where the organisation is heading, so that changes can be seen against the assumptions on which the architecture was based, and plans modified accordingly in a consistent and controlled manner.

Why does it matter now?

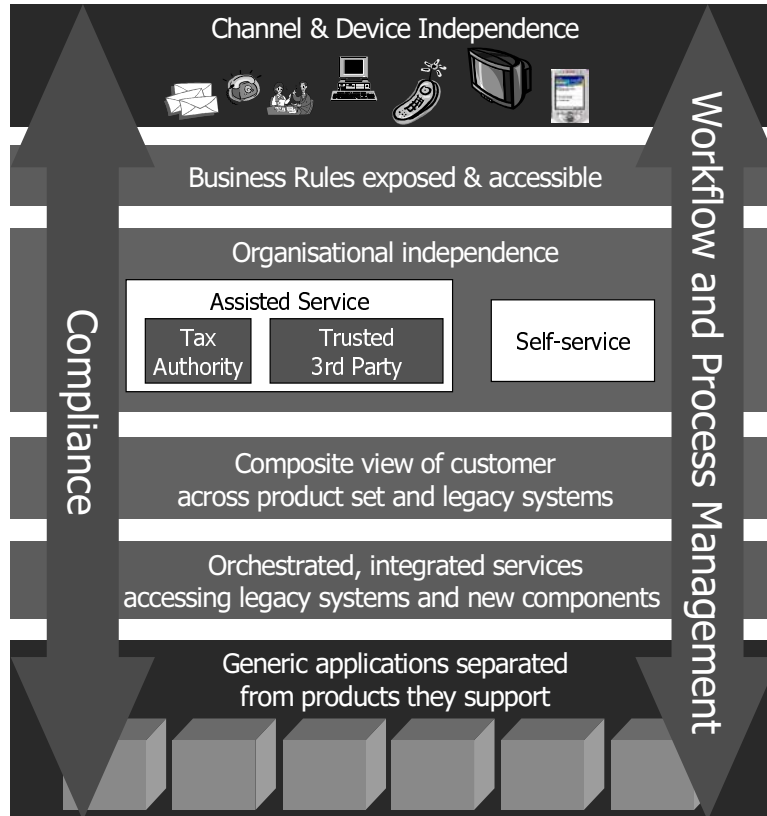
- 16 The big driver, as suggested in paragraph 15 above, is change: change on a scale and at a rate which brings many business processes into question and which existing control mechanisms struggle to cope with. Every revenue authority will have its own set of challenges involving the introduction of new policies and working within tight financial constraints. But in particular all face a set of demands and expectations which flow from the e-agenda.
- 17 “E” makes it possible to redesign existing processes from first principles and to identify wholly new ways of linking information and services together. And there is a growing set of expectations that, having invested in a good deal of learning and experimentation, revenue authorities are now able to deliver these sorts of new services. The public expects it because they see these sorts of benefits coming from commercial service providers. Governments expect it because the pressure for more responsive and customer-centred service is high on the political agenda alongside the pressure to reduce costs. Effective adoption of the “e” channel holds the potential to fundamentally alter how taxpayers view their government, presenting a government that offers the services they need, when they need them, through a channel that is always available.
- 18 The growing range and sophistication of IT capabilities has also made possible breakthroughs in areas such as consistent channel management and knowledge management. But full exploitation of those capabilities and gaining real benefit from them is probably ultimately dependent on more robust business architectures being available to provide the framework within which that exploitation is possible, than on purely technical solutions.
- 19 There is growing evidence that simply e-enabling individual transactions without taking account of the bigger picture of where services are heading will lead to lower than expected benefits and a failure to open up more flexible ways of working. To make future investments pay off, they need to be anchored in a coherent business picture that is tied to a credible and stable technical architecture. That level of control requires thinking through the implications of these changes so as to;
 - identify those trends which are likely to be persistent and therefore need to be properly and actively supported in any long term planning; and
 - construct an integrated picture of how all the elements of change interact with each other, which is Manageable and can be communicated in an understandable way.

The role of business architecture is to help provide that control.

A generic business architecture

20 Figure 1 below shows an illustrative high-level generic business architecture.

Figure 1. Illustrative high level generic business architecture



21 The key characteristics of this architecture are as follows:

- It provides a consistent face to customers irrespective of the channel they use (described more fully in Annex 2.) and implies that the customer view and the employee view of the customer data will derive from the same sources and be very similar if not always identical (described more fully in Annex 3).
- Data capture is separated from subsequent processing. This allows the design of back end transaction systems to assume the availability of validated data in electronic form, regardless of its source.
- The rules which determine how processing works (e.g. for calculating entitlements or liabilities) are also separated from the actual processing (described more fully in Annex 1).
- The current organisation model is not hard-coded into the architecture, so any work items which need clerical handling are distributed via a workflow process which is flexible and responsive to organisational change.

- Generic components are identified and separated out from product-specific services. This is particularly important in the case of customer data which may be common to a number of different products or services; but it also applies to generic applications (such as output handling; payments etc). These components have a potentially high 'asset' value and need to be managed so that they can be reused in delivering different services (thus cutting the cost and elapsed time required to implement new initiatives).
- Legacy systems are an explicit part of the architecture, since there is often neither the time nor the money to replace them completely. They are therefore regarded as components in their own right. The wider architecture defines the future plans for these legacy systems (such as to progressively pull out from them bits of information or processing which properly belong in generic components).
- The architecture is based on the ability to make connections between things- even between things which are not owned by the administration. So it permits 'whole customer' information to be brought together across different parts of Government, or even across Government and private sector (e.g. in constructing an aggregate view of pension entitlements).

The relationship to technical architecture

- 22 As more and more business processes have become more and more IT-dependent the line between business and technical architectures has itself become more blurred. The e-agenda, in which IT largely is the business process, has intensified that blurring.
- 23 It is evident that the business architecture cannot be considered without a close understanding of the technical capabilities which make it possible. Moreover, there are some technologies which critically underpin this picture of the business. Typically, these are technologies which allow aspects of the architecture to be formally (and physically) separated from each other but connectable in a much more flexible ("loosely coupled") way.
- 24 Detailed consideration of technical architectures needs to be the subject of a separate paper, but capability in the following areas is necessary if a business architecture is to be properly supported in the e-world:
 - *Standard interface protocols* : The adoption of standard (e.g. XML) communication protocols.
 - *Routing*: The ability to capture information from a variety of channels in a single logical manner, validate it and then present it to whatever back end processes require it. Annex 2 has more detailed commentary on this subject.
 - *Rules*: The ability to separate business rules from the internal back-end transaction-processing systems and make them available to the external world. This is discussed further at Annex 4.
 - *Access to data in legacy systems*: An early response to the need for joined-up information was to contemplate building new 'integrated' databases and systems; but for a number of reasons this is often impractical. Even if cost and the elapsed time involved in replacing legacy systems are discounted, the very nature of the e- environment is that connections need to be made to sources of data which cannot be assumed to be within the revenue authority. So technologies which

allow information to be extracted from existing systems, combined with other data, and presented to a varied audience are an essential feature of the landscape.

Issues and constraints: If it's all so good why is it so hard to do in practice?

- 25 At one level, it is not particularly difficult to draw the simplified architectural diagrams; but most architectures seem to work better in PowerPoint than they do in reality.
- 26 Some problems relate to the nature of business architectures, and include the following issues:
 - *Semantics*: It can be hard to find the right language to describe business architectures beyond a high abstract level.
 - *Levelling*: There are problems in determining the appropriate level of detail to go to in describing a business architecture. Too little detail, and the picture is vulnerable to the charge that it is insufficiently real or complete; too much detail and it becomes unapproachable—difficult to comprehend and overly prescriptive.
 - *Decision-making*: Architectures tend to force out questions of direction and seek clarity. Revenue authorities find it hard to commit to this level of clarity in an uncertain political environment.
- 27 There is also an issue relating to the gap between the technology views of the world and the business views. The e-agenda has forced a wholesale reappraisal of technical assumptions and products. As a consequence, it is generally the case that technical architectures in an organisation tend to be well established. Although similarly significant changes to business structures (and their silos) are implied, there has often been less necessity to address them (partly because “e” has been re-automating existing business processes). So technical thinking is often more advanced than the business thinking it purports to reflect.
- 28 The generation of business users who had come to terms with the technologies of legacy may not yet have got to grips with the newer technologies. The risk is of a business/ technology divide as business people may see technical solutions in search of a business requirement and may feel pushed rather than supported by technology. A better understanding of the overall business architecture helps business people to see the potential of newer technologies. On the other hand, business leaders in revenue authorities may also come under the spell of the “wow” factor of new technologies, particularly if they have observed the sales pitch of a technology vendor and want “one of those”. In these instances, a better understanding of the overall business architecture helps business people see where the newer technology might or might not logically fit.
- 29 The third broad area of difficulty is that, even where architectures do exist, it is not necessarily straightforward to tie them into formal governance processes. The control processes which maintain architectures are often immature and lack authority compared to the projects which put them into practice which generally have a much narrower scope. A more collaborative and matrix-based governance than the strong ownership-based project structures which exist in most organisations is required. These cultural hurdles are often the hardest ones of all to overcome.

Conclusion

- 30 As stated in the introduction, the goal of this paper was to outline the case for revenue authorities to build business architectures with a long-term view as a foundation for “e” services development efforts. Completing the work to build the business architecture within each revenue authority will not be easy work. There are difficult issues to be addressed. While the goal of this guidance note was not to provide an in-depth guide to these efforts, four annexes are included which address four important issues each revenue authority will need to address as part of its e-agenda, why the issue is important, and an example of how one country tackled the issue. A piece of work related to this paper - an analysis of the technical components to deliver the e-vision based upon current member country experience - is under development as part of the Subgroup’s 2005-06 work programme. If dictated by feedback to this note and new developments, further more detailed work will be undertaken.

Recommendations

- 31 There is a very simple recommendation which flows from the arguments in this paper.

- Revenue authorities should ensure that they develop a business architecture before they start building their e-service capabilities. If they have already started building such services without a comprehensive business architecture, they need to develop one as soon as possible.

Failure to do so is likely to: 1) drive up long term investment costs because unforeseen issues can drive the need to revisit earlier investments; 2) inhibit development of a full range of integrated e-services because component parts will not have been built with a future business architecture to guide them; 3) reduce the take-up rates of e-services otherwise achievable because customers will not get a consistent, high quality experience; and 4) limit the efficiencies which could be gained from understanding and bringing together future staff and customer requirements.

ANNEX 1 - CLIENT ASSOCIATION AND REPRESENTATION

- 32 A fundamental issue to be addressed in the architecture for successful e-enablement of tax administration is the management of agents' authorized access to client data and/or to act on behalf of the client. While processes and exact rules may vary, it seems that every country has representation requirements. It is important to note that the issues in this realm apply not just to third party representatives such as certified practising accountants (CPA's) and payroll service providers, but also to those who act as agents for a company, but are in fact employees of the company.
- 33 While some, or in many countries all, client representatives may be registered in some fashion in the paper environment, additional registration processes apply in the e-environment. This is necessary to establish the authentication regimen—generally a login and password—for determining that the on-line presence accessing the revenue authority's e-site is in fact the representative with authorization to access the taxpayer's account.
- 34 After the representative has been registered and can be e-authenticated, there needs to be a "permission" file that controls what accounts the representative can access and the nature of the authorities that exist for each account. The design of this "permission" file is critical to programme success and can be somewhat complex depending upon the rules under which the representatives must operate. Two examples will illustrate the potential complexity:
- For some countries, CPA's and other tax professional authorization are made to the office in which they work while others, such as a power of attorney is made to the individual(s) within the office. In these instances, the individual representative must be associated with the office that grants them the right to use the office level authorities, as well as with the authorities they are granted as an individual tax professional.
 - In large and mid-sized companies, there are likely to be a number of employees, sometimes in different departments, that may work on different components of a company's tax account. Companies generally want to restrict components of the account that specific employees can access. For example, most employees with some access might not have access to those tax records reflecting salaries and taxes withheld for all company employees. Some employees might have 'read-only' access, while a smaller number might have authority to file documents or make payments for the company. The "permission" file, as well as the on-line services themselves, must be structured to accommodate this.
- 35 Revenue authorities in the early stages of developing their on-line services must take the long term view when designing this component of the architecture so that all local complexities are considered in the design, not just those related to the initial e-services. This will avoid the necessity for later redesign, and added cost, to accommodate the authority's ultimate vision.

The US IRS Example

- 36 As context, it is important to note that in the USA thousands of paid tax professionals provide a variety of tax services, such as preparing paper tax returns for taxpayers, with little oversight from the IRS. All paid professional return preparers must, in most instances, sign the returns they prepare, along with the taxpayer, and provide their social security number or a special tax professional ID number that IRS will provide upon request. But there is no registration, training requirements or tax knowledge testing conducted to screen these individuals—if you can convince someone to pay you, you can be a professional return preparer. However, persons wishing to represent clients before the IRS, for example, in an audit, must meet a higher standard. They must be an attorney or CPA in good standing, or pass the IRS-enrolled agent examination and become an enrolled agent. This set of representatives does have special regulations that apply to them and for infractions they can be suspended from their right to represent taxpayers with the IRS.
- 37 As for most revenue authorities, the first IRS electronic service was for e-filing of tax returns which began in 1986. For all IRS services for e-filing of tax returns, offices registered, and were issued logins and passwords, after the responsible officials in the office applied and had passed criminal history and tax compliance checks. All individuals working in the office could then file returns under the office registration. Rule infractions by anyone in the office could lead to the office being suspended from the programme. This process worked fine until recently, when other e-services were offered which required authorization at the individual rather than office level. Instances requiring specific written taxpayer authorization, such as a power of attorney, are a case in point. This required a complete reassessment of the process.
- 38 The decision was made to move to an architectural component called the ‘Third Party Data Store (TRDB)’. When developed to the final state, it will include all third party registration and authorization data for use not only for providing e-services, but also internally for confirming authorizations in the telephone, paper and face-to-face environments.
- 39 For the TRDB, the IRS made the decision to retain the office level authorization for the e-filing of documents. Once the principal official(s) had registered and become approved for e-services access they can set up delegations to individuals working in the office. These individuals can then apply for their own login and password to access the specific services for which they are authorized. If the individual wants to access or address account information of a client, the appropriate authorization must also be in the IRS database (as a result of a paper filing of the authorization) or the individual representative must use first use the e-service application through which they certify that they have the written taxpayer authorization in their files and available for IRS inspection if necessary.
- 40 For businesses who use their own staff for filing returns and managing accounts, the responsible officials in the business can designate those who can act on their behalf for specific types of returns (corporate, employment, partnership, etc.). The IRS does not currently offer any further limitations within each category. It is important to note that the IRS has experienced at least one situation in which an employee of a company attempted to defraud the company of funds through tax accounts because the company did not maintain adequate controls on those with access to company bank and tax accounts. Businesses must be regularly reminded of the necessity for vigilance in managing these accesses.
- 41 The IRS currently does not offer account access or management for individual taxpayers, pending development of a workable authentication mechanism.

ANNEX 2 - MULTI-CHANNEL COMPONENT

Introduction

- 42 Most revenue authorities are large and operationally-diverse organisations whose business processes are heavily IT dependent. But those processes often reflect the fact that different lines of business were developed at different times using the technology available at that time. That can lead to processes being in “silos” which then limit the potential of “e” to drive business process change.
- 43 It has not been uncommon for revenue authorities to create “frameworks” of common data outside of these silos but the processes each one supports have often been largely operated independently of one another, with process integration, where appropriate, at a human level.
- 44 This not only limits “e” driven business process change; it can also make the introduction of “e” unnecessarily expensive because it becomes yet another channel or IT system which has to interface with other IT systems. Among other things, this has meant that back-office systems still need to maintain multiple interfaces with different architectural components that are fundamentally performing the same tasks (e.g. processing inputs or generating output, with consequent impacts on the ongoing business and IT costs associated with each process.
- 45 The pressure to maintain business as usual and to minimise risk to major tax administration systems will always be a factor and will tend to mean that line of business silos will remain for some time. But, at the same time, the pressure to implement ambitious channel strategies, in which migrating customers to “e” is a key driver, is growing.
- 46 The challenge therefore will be how to design a business architecture and implement supporting technologies that can rationalise common activities across channels and IT systems to gain processing efficiencies and allow the integration of business processes leading to greater flexibility and a reduction of operational costs.

An expert view

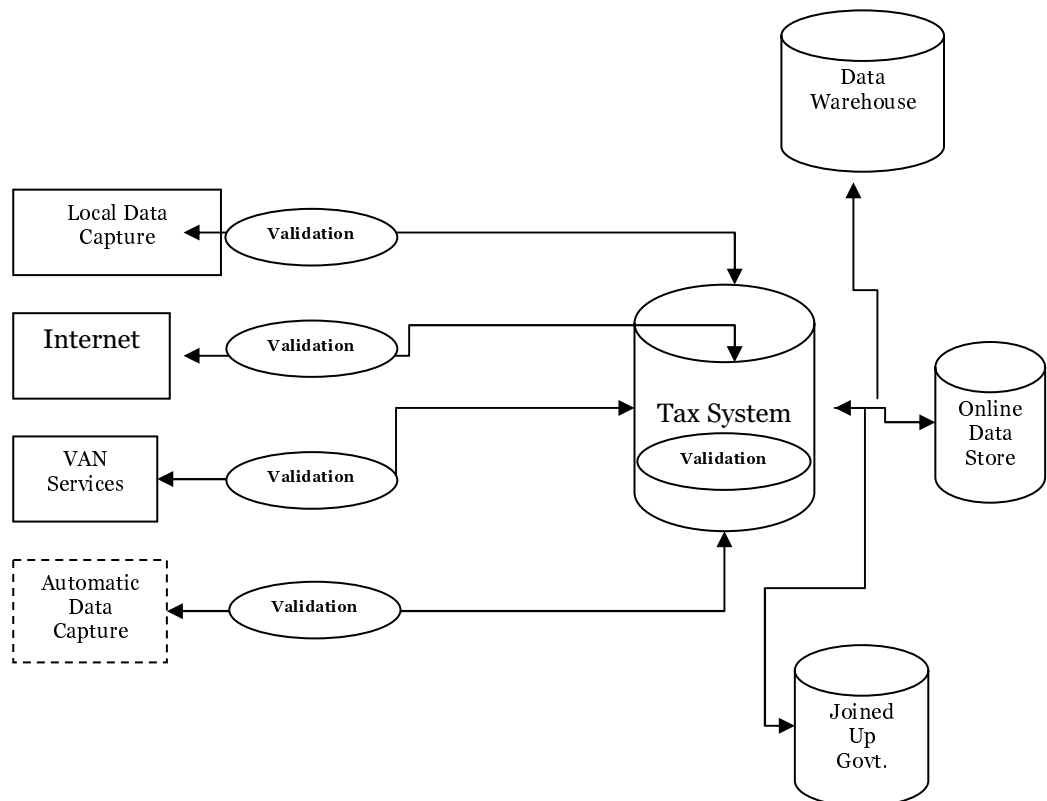
- 47 Gartner has been stressing the need for what it describes as an “Enterprise Nervous System” for some 3 years now. Their technical description of it is set out below:
- “An application-level network that provides unifying connectivity among people, application systems and devices in different locations and different business units”
- “An ENS network is intelligent and incorporates intermediating logical engines such as integration brokers, business process management services and, cross application resources such as operational data stores and message warehouses” But in business speak that is essentially a technical solution to the issues described in the introduction to this paper.”

- 48 The Gartner view is that the emergence of an ENS is subtle, arriving in piecemeal fashion, with individual projects implementing components that could be viewed as part of a wider homogenous ENS, but which may only benefit/impact 5% or less of the wider business.
- 49 Gartner goes on to suggest that most people within a business are not really aware of this emergence and so it is not recognised explicitly in business architecture and the associated technical architecture. This lack of an organised central approach to ENS will mean that many organisations will find themselves with a multitude of redundant and partially complete ENS services because of independent adoption among various projects.
- 50 Lack of centralised design and management will inhibit business process change and drive up costs. On the other hand the explicit inclusion of the ENS concept in a business architecture can enable business process change, drive down costs and increase flexibility.

The UK Inland Revenue Approach

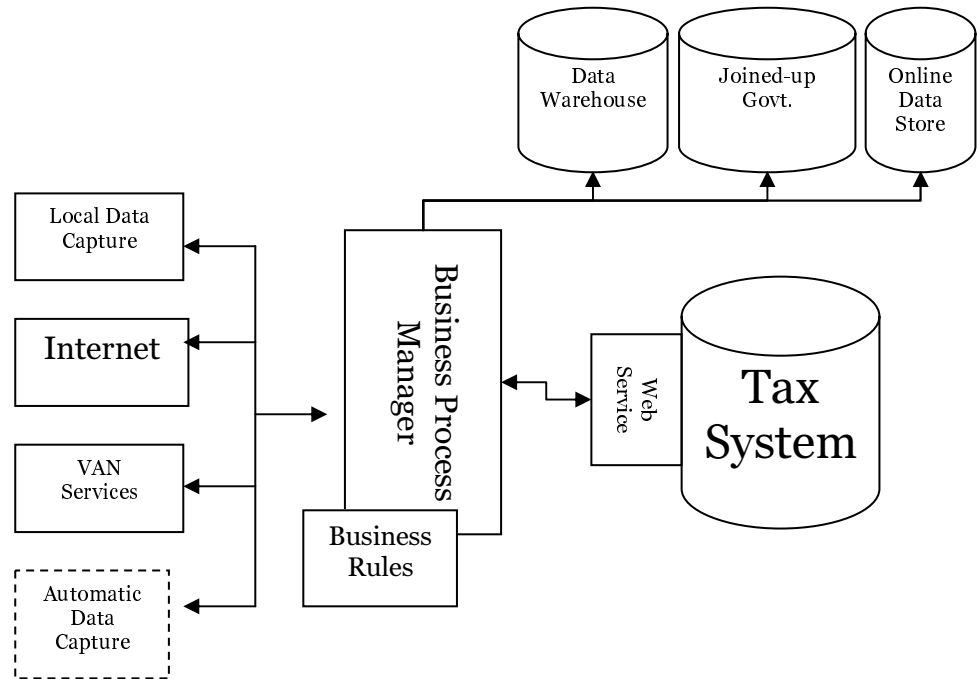
- 51 IR has a large and diverse set of back-end IT systems. The growing range of business lines and of e-services highlighted the constraints and inefficiencies of building and maintaining the traditional direct interfaces between back end systems and the various channels they received input from or outputted to.
- 52 Figure 2 below illustrates the issue by showing a back end system supporting 4 separate incoming data interfaces each with their own validation components, as well as at least 3 data dissemination interfaces to other corporate systems.

Figure 2. UK IR approach—front-end and back-end interfaces



- 53 What was needed was a set of components which could facilitate the business architecture vision around business process change and flexibility. These were labelled the External Routing Interface Component or ERIC for convenience. But the label is largely irrelevant and the precise set of capabilities will vary depending on the circumstances of each Tax Administration.
- 54 In the IR case the key capability being sought was the unified receipt, validation and transformation of all incoming transactions and outgoing responses and messages. The aim is that, over time, all line of business systems will use a common component to replace their current reliance on multiple interfaces to support each input and output channel (e.g. Paper, Internet, EDI etc).
- 55 Figure 3 below illustrates how the complexity and constraints in the previous diagram can be redesigned into a single web service based interface

Figure 3. UK IR approach redesigned



- 56 Another key benefit is ease of new service integration. New IT systems development, to enhance and support existing lines of business, will need to be brought into service within tight time and cost constraints, with ever increasing levels of sophistication and integration. Additionally, and very importantly, IR will increasingly be expected to integrate responsible for integrating silo systems from other UK government departments.
- 57 This planning landscape means that it is more important than ever to rationalise business architecture that supports basic input/output operations and provide explicit routing and validation components that future services can easily intercept without significant IT development or growth in ongoing IT costs.

ANNEX 3 - STAFF AND CUSTOMER VIEWS

Introduction

- 58 Historically, the information available to revenue authority staff and their customers has been very different. From the customers' perspective, they received information in a "push" style mainly within notices and letters that were sent as a result of the completion or, in some cases, the non-completion of a business event. These events may have been the filing of an income tax return, the payment of a debt or, conversely, the failure to file a return or pay taxes due on time. The forms and notices that contained this information were technically cleared and deemed to be appropriate to all clients.
- 59 Staff, on the other hand, had information on their computer screens generated by IT systems which presented a different view of the customer. That information may have represented the same facts and circumstances but in a different way and usually to different levels of detail. Resolution of phone enquiries, in particular, was usually made more difficult by the lack of a shared presentation of information.
- 60 The advent of e-services, especially the deployment of "view account" services (via the Internet) to customers, potentially offers a way to resolve this problem by having staff and customers viewing the same screens. However, experience has shown that this is not as easy to achieve as it may appear at first sight.

Issues

- 61 Information sent on paper to customers can be incomplete, incorrect or the customer may not understand the message (what to do next – or why have I got this?) or the customer may want information about their obligations. As "view account" services are made available they tend to be (and should be) designed to provide a lot of information but to do so in user-friendly ways.
- 62 This may mean they present the information very differently from services used by staff which may be older and/or designed on the assumption they are used by trained people in a controlled environment. In addition, the combined information presented to the customer may actually be made up from information accessible to staff only through a number of separate services. In either event, there is a risk of perpetuating the problems and misunderstandings which existed in the paper world when customer expectations are understandably much higher. There are a number of ways to overcome this problem.
- 63 First, the service used by external customers can be made available to staff. This is a simple but limited solution. If it is in addition to the service staff already have for that line of business, it is inefficient from a staff perspective and they may not use it when dealing with the customer. It is particularly problematic in a call centre environment.
- 64 A more fundamental approach would be to redesign the applications which support both staff and customers so that they are basically the same but with the staff application having added functionality. This is a more complex, expensive and disruptive approach but offers longer term gains.

- 65 There is a further approach which builds on the above. The capabilities to both view and amend data could be built as “web services”, to be called upon by anyone with the necessary authentication clearance. What people (i.e. staff and customers) can do is then determined by permissions appropriate to their role at the time. This may not be a feasible solution currently but its possible future use needs to be borne in mind in current designs because of its potential to support the principles detailed elsewhere in this paper.

The ATO Experience

- 66 Until recently (i.e. 2003) the information available to ATO customers was very different to that available to the ATO staff. The vast majority of the ATO’s calls between 2000 and 2003 reflected that our customers needed information that was not included in the forms and letters sent to them, but was in fact contained in taxpayers’ accounts or the customer register.
- 67 During this same period, much of the ATO’s interpretative information became available on-line. This provided views of information about the then “New Tax System” geared towards helping our customers understand and comply with new law and policy. Once again, while there was much information available externally, it was perceived that the ATO staff (particularly in call centres) had access to a far superior source of information.
- 68 What was evident is that even though staff and customers had access to the same base information, they had different views of that information and their search facilities were different. Because the ATO had staff using an intranet and customers using its public internet facilities, it was possible (likely) that searches on the same topic could result in different references being found. Call centre staff had trouble talking to customers who were looking at the reference material on-line and seeking clarification – when they were unable to “get on the same page”. While they were effectively looking at two different sets of reference material, reaching a conclusion was often difficult.
- 69 It became evident that for customer and staff interactions, it is an imperative to provide them with the same view and information. It also became evident that many of the ATO’s calls were simply seeking information that was held in ATO systems. ATO staff were effectively acting as a web browser for customers. Allowing access to that information by our customers would take away a large proportion of call centre workloads.
- 70 Providing self-managed/self-service access to this information through our “Tax Agent” and “Business” portals introduced in 2003 and 2004 has seen a dramatic decrease in call centre traffic, a reduction in complaints, a change in the nature of enquiries (now more complex) and an increase in taxpayer (and agent) satisfaction.
- 71 Using web based technologies, the views of client information can be tailored to meet their expectations. For example, the ATO has many accounts for its business clients. As an on-line service, these can be combined to provide a virtual “single account” something which could not be done on paper. This again met with a high degree of client satisfaction.
- 72 But now the customer had a “single account” view while the ATO’s staff still had to access many ATO accounts to develop an overall perspective of the customer’s accounts. So the view that was now available for the ATO’s customers was once again different from that which could be seen by its staff. (In fact, staff could see the same view as a customer by “logging on” as that customer but the effort to

navigate away from their internal systems to the external view has severe productivity impacts.)

- 73 The “external” view clearly needs to be available to staff from within their day-to-day systems in which they operate. In the absence of this capability, communication was again beginning to be strained by the fact that conversations and enquiries (generally by phone) could not get the clients and the ATO to see the same view of information.
- 74 It is worth noting that the ATO experimented with identical internal and external user interfaces in its Australian Business Register (ABR) application in 2001. Although users of this application did not suffer the same issues as described above, internal users were constrained by the simplicity of the actioning interface – it was simple enough for a customer to use, but could not cater for the throughput needs of “power user” skilled staff.
- 75 At this point the ATO has at least one delivery project (scheduled for completion in December 2004) to deliver a “single view of account” for ATO staff. This will be equivalent to the view that has been provided to its clients on the Tax Agent and Business portals.
- 76 More generally, the ATO is currently embarking on a change programme, and through the planning and strategy phase, we have adopted some key principles. One of these relates to the client and staff view. The high level outcome reads – “ATO staff will have access to the same information in the same view that is accessible by our clients”.
- 77 Learning from its ABR experience, this does not preclude the ATO from providing more efficient accesses for its staff where a different view is more efficient. However, it does ensure a level of availability of different views for staff. It is also important to note that while ATO staff will have access to the same information as clients, they will also have access to more than the clients, such as risk profiles and case information. But they will not, in the future be in a position where customers have information that staff cannot access or see in the same context.

ANNEX 4 - THE IMPORTANCE OF BUSINESS RULES

Introduction

78 Business rules represent the knowledge assets of a business. They are statements about how a business is governed (for example legislation, policy, contractual obligations) and how a business operates (for example procedures, processes, customer service standards, decision points).

79 Business rules can be expressed:

- informally through experience and “know how” about a business,
- semi-formally through policy statements and directives, or
- formally through precise statements that relate directly to the practices of a business.

The main sources of business rules for a revenue authority are government policy and legislation, which are operationalised as a set of rules and guidance for use by staff and computer systems.

80 Business rules that can be defined as precise statements can be automated within computer systems. Perhaps the most recognisable form of business rule is validation of data such as checking that the answer to $a + b$ is correct but there are many other forms. Traditionally, these automated rules have often been written deep within application code or database integrity constraints. This has led to the risk of duplication and inconsistency of rules and a lack of visibility of which rules are used within which business processes.

81 In the past, business rules were mainly private to the revenue authority. They were not generally shared with customers or other groups either because there was not seen to be a need or because of a conscious decision that they should remain private. The latter reason may well have been invoked because business rules tend to cover both business process and risk assessment. Even if the revenue authority was willing to share its process rules, it was unlikely to be willing to share risk assessment rules (though even that is changing).

82 Three major developments have greatly increased the importance of business rules and challenged the way in which they are used by revenue authorities:

- The development of rules engines which can provide consistency, reuse and visibility of business rules to allow them to be monitored, managed and maintained more effectively and more efficiently.
- The advent of e-services (and, in the future, the increasing deployment of web services) which has opened up new opportunities to use the sharing of business rules to improve business efficiency and customer service: and
- The increasing involvement of the private sector as intermediaries or software providers to customers of revenue authorities.

Types of Business Rules

- 83 There are many different categorisations of business rules. But one can start with four basic rule types (as shown below with simple examples)
- *Fact* – “the basic rate of income tax is 22%” or “customer x is a charity”
 - *Constraint* – “a household is not eligible for tax credits if the total income is greater than £n”
 - *Control* – “if repayment amount is greater than £m make a repayment otherwise offset against tax code”
 - *Derivation* – “if number of employees is greater than x and annual PAYE return less than y then apply a risk score of z”
- 84 These basic rule types can be combined into a more functional categorisation of the type of business rules applicable to a revenue authority. For example, the uses of business rules shown below are applicable to the operation of the core business:
- *Validation* – is received information syntactically valid, does it make sense as a whole, and is it valid in relation to other information stored within the IT system databases?
 - *Assessment* – does the information known about this customer meet the eligibility criteria for the benefit; has the tax liability been met by the amount of tax paid?
 - *Calculation* – what is the tax liability for this customer based on the information supplied; how much benefit is this customer entitled to?
 - *Work Flow* – if a household is eligible for tax credits and there are dependent children calculate child tax credit amount due; if the employer for this new starter cannot be identified raise a work item.
 - *Work Management* – send complex child benefit assessment work to the work lists of people with this role; change the mix of work list types handled by a particular office.
 - *Event Triggers* – if an individual moves from England to Scotland re-calculate their tax code; when this type of return is 30 days overdue raise a penalty.
- 85 Other types of business rules are also used in areas such as compliance, customer support and business analysis. Examples of this could be rules for decision support, analytical analysis, risk assessment, customisation, personalisation, and search and guided help. There are also IT-focussed rules used in areas such as data transformation and integrity, message routing and screen sequencing.

Benefits of Automation

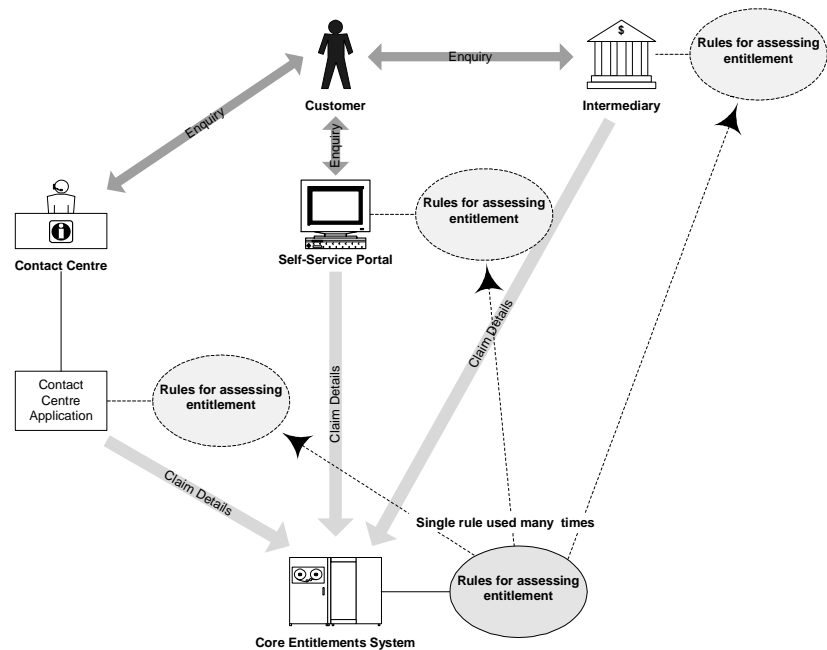
- 86 The benefits of automating business rules accrue from providing software support such that:
- Rules are reusable - the same implementation of the same rule is used wherever the rule is required. This includes the use of rules externally or internally for externally defined rules. The benefits of this approach include consistency of rules leading to greater consistency of customer advice which in turn leads to improved customer service and reduced exceptions. It should also reduce implementation and maintenance costs by avoiding duplication of work.

- Rules are visible - visibility of which rules are used in which processes; frequency of use; typical outcomes; volume of use; benefits include improved operational statistics and management information.
- Rules are flexible - changes to rules can be applied quickly with easier impacting, and changes are audited; benefits include faster, risk managed response to change and reduced maintenance costs.
- Rules are generic - they can be parameterised and reused, but can have variants based on local conditions or over time; benefits include increased reuse and responsiveness to local requirements.

Re-use of Business Rules

87 Business rules may be used in more than one place in the IT system architecture and also in multiple applications. For example, assessment of eligibility for entitlement could be used through a customer facing portal to provide an indication of benefits entitlement and also within the core entitlements system to assess actual eligibility. The difference between the two is not in the rules applied, but in the source, quality and timeliness of the data used in the assessment. Figure 4 illustrates multiple re-use of the same business rules.

Figure 4. Multiple re-use of business rules



88 Reusable business rules can be implemented as components that can be used in multiple applications (“write once, use everywhere”) or services that can be accessed from multiple applications (“write once, access from anywhere”). The component implementation approach also relies on reuse of the same rules engine to execute the rules. This condition will remain until standards are agreed for business rules definition and implementation.

UK IR Experience

- 89 When IR introduced its first Internet filing service in 2000, the decision was taken to use XML from the outset. This was driven mainly by a desire to make it easier for private sector companies to produce filing products or, more importantly, to integrate filing capability into their existing business products such as payroll or accounting packages.
- 90 That decision made it vital to provide the relevant business rules to the private sector or risk significant failure rates bringing added cost to both IR and the companies concerned. The most obvious rules to make available were validation ones. This should have ensured that the validation within those products was the same as that used by IR so that returns did not fail validation checks by at the point of receipt.
- 91 In reality, some failures did occur because there was no compulsion to use all the business rules within the products. So long as they passed a range of tests (which cannot cover every combination of business rules) products could be used with IR's filing service. Failing returns at the point of receipt like this incurs costs for customers and IR and damages the credibility of the service.
- 92 This illustrates the fact that making business rules available outside the revenue authority is a necessary step but not the whole story. As mentioned earlier, the full benefit can only be gained when the same set of rules is consistently used internally and externally. The still developing concept of "web services" may offer a realistic way of achieving that goal.
- 93 Making business rules generally available does not ensure their consistent use because they have to be interpreted to integrate them into products. And problems may arise from the continued use of versions which have been superseded. Offering business rules as a web service which can be called on to validate a form or return at the time of completion can overcome both of these problems. And there is no intrinsic reason why that same web service should not perform internal validation as well. Indeed, it needs to if the goal of having only one version of each set of rules is to be achieved.