Foundations of the Digital State

Working Papers Volume II

An independent report for Scottish Government

Gordon Guthrie

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List of Working Papers

These are the collected working papers referred to in *Foundations of the Digital State* – an independent report for Scottish Government.

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WP X *The heart of the beast*
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WP 1.2 *Data and the rule of law*
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The appendix to WP 9 is available on request from the author.

These were written when the author was an Research Fellow at Scottish Government under the First Minister's Digital Fellowship programme.

The views in these papers do not represent the views of Scottish Government.

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Working Paper 6 – A solera for data cleansing

Version 1.0

The promised land is a journey not a destination

Introduction

What is a solera and why do we need one?

A solera is a stack of barrels that are used to mature sherry. Each year a new batch of raw wine is made. The same amount of sherry is drawn from the bottom barrel in the stack and bottled. That barrel is topped up from the barrel directly above it, and up and up until there is space at the topmost barrel – which the new wine goes in. The wine is blended and gradually matured is it is taken down the stack.

The way in which the state specifies data and the powers to hold and share data is primitive and in bad need of reform. Individual data sets are unsharable at the moment by reason of law, of data quality, of lack of metadata, of lack of technical data sharing implementations, or a mixture of these reasons.

The state has a small amount of high quality, mature data and the challenge is find a way to take our raw data and slowly step-wise mature it. This document proposes a solera to do that. The top barrel contains raw (or dirty) data which might be useful for certain purposes but brings risk and contamination. This document proposes a set of intermediate steps, barrels in the solera, in which the data can be matured. Each step requires the dataset to have been fixed in part legally, for quality, metadata and technical implementation. And as certain steps are taken the data set moves down the solera until finally it is <drinkable>.

Fixing data is at the heart of joined up government. And the fixing of it will have to be incremental because of the scale of the problem with all its entanglements. Without an incremental strategy for moving data sets up the maturity curve/down the solera, whilst still using them, joined up government will fail.

Who are you?

This is quite a technical paper, so you are a technical or data specialist with an interest in open data or a parliamentary drafter interested in data law reform[1].

Why should you read this?

The improvement of state data will require a complex implementation plan – this is not that plan, but it outlines an architecture for that plan, a path of attack on a difficult problem.

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1 see Working Paper 5 – Law reform for data

A target data pipeline

Overview

This paper focuses on non-person data – primarily place data. At its core is a desire to link up data based on geographical tags (Unique Property Reference Numbers – UPRNs[2] – These provide higher resolution of property data than postcode/housenumbers). Data about people – the other major category of critical data for joined up government requires different treatment and is considered more directly in Working Paper No 5 – *Law reform for data*.

Everyone who have used Google Maps once is already familiar with joined up geographical data. The Scottish Government produces lots of geographical data – but the task of coding it and joining it up is left to the citizen, private or 3rd sector. This imposes a time tax which inhibits use of the rich data we have.

Making that data pre-joined up would lower the entry costs for many commercial sectors dramatically, make geographical statistical data available to public and private sector alike at a more fine-grained resolution. This would lead to better decision making and be a significant contribution to creating a unified market in geographical information.

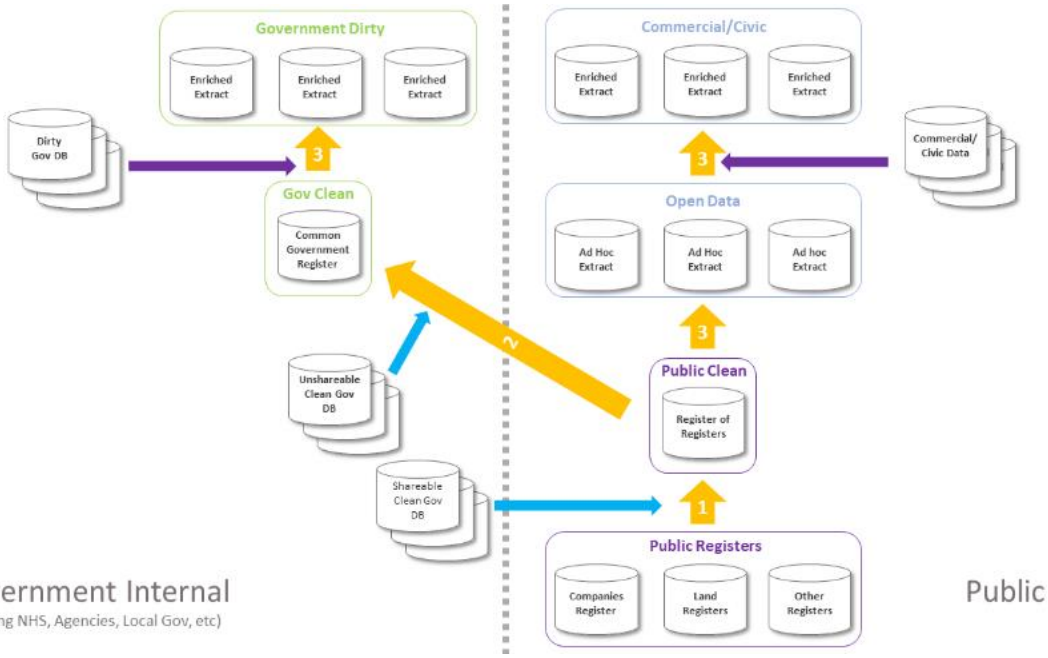
I have sketched out a data pipeline to provide context.

Sherry is aged in a system called the solera. There is a stack of barrels. Sherry is always bottled from the bottom of the stack. Each bottle extracted leaves capacity for a top-up, and each barrel is topped up with sherry from the barrel above. This capacity travels backwards up the solera and the new year's wine can be added into the top most barrel.

This pipeline is designed as a data solera – a system that keeps dirty data from clean and decouples the work of maturing datasets. Individual datasets can be matured and promoted independently. Maturation covers data cleanliness, proper time handling, technical implementation, legal permissions and so on. Different data systems will have different time schedules based on legislative slots, software upgrade cycles, clashing delivery schedules and so on.

2 See https://www.ons.gov.uk/methodology/geography/geographicalproducts/nationalstatisticsaddressproducts for more details

It tries to group data logically and subsequent sections will step through it and make relevant observations.



The pipeline design separates geographical data into two domains – public and government internal (also shareable/unshareable). This is possibly a simplification. There are additional degrees of sensitivity (commercial sensitive, personally sensitive) that will need to be taken into account.

It splits data in to clean and dirty. Essentially all data that is not clean is dirty – so it is worth sketching out what clean means here.

Clean data MUST meet the following (not complete) criteria:

Criteria	Description
Maintained	Someone is charged with ensuring that the data is kept up to date, curated, and maintained against public data standards. In the case of Registers – this obligation is placed on the registered person or organisation to self-maintain on pain of sanction. Government systems that are maintained need to have a mandatory obligation placed on them, might be statutory, might be guidance – my recommendation would be tertiary legislation from a transformed, statutory Digital Assurance Office[3].
Timeous	The data MUST be correctly structured for handling time, statuses and attributes (created, in registration, suspended, closed down) are all time marked, historical data isn't deleted but marked, etc, etc

3 I have a briefing paper for a consultation on an Enabling Act for digital which puts this in wider context. https://scotsconnect-my.sharepoint.com/:w:/r/personal/gordon_guthrie_gov_scot/Documents/Digital%20Fellowship/Insights/Enabling%20Act/Enabling%20Act.docx?d=w3af6067a3aee4e37ae2ad49223ea0d96&csf=1&web=1&e=xQGZDg

Criteria	Description
Immutable	Data structures exported MUST be ledger-based (CR) and not CRUD based[4] (the internal structure MAY be CRUD but the Deltas MUST be transcribed to CR/Ledgers).
Dump/Deltas	Data from a clean database MUST be available as a starting Dump and on-going Deltas – the goal is real-time update flows.
Keyed	The data MUST be supplied with appropriate keys (UPRNs, USRNs, etc). This is to ensure that import to a graph database MUST NOT require AI or fuzzy matching
Shareable (public or gov domain)	Clean data is either public or pan-state shareable – the necessity to maintain RBAC (Role Based Access Control) on a departmental or agency level make it administratively dirty.
Documented	The data has meta-data of the appropriate quality – the data must not just be findable and (legally) usable but able to be used.

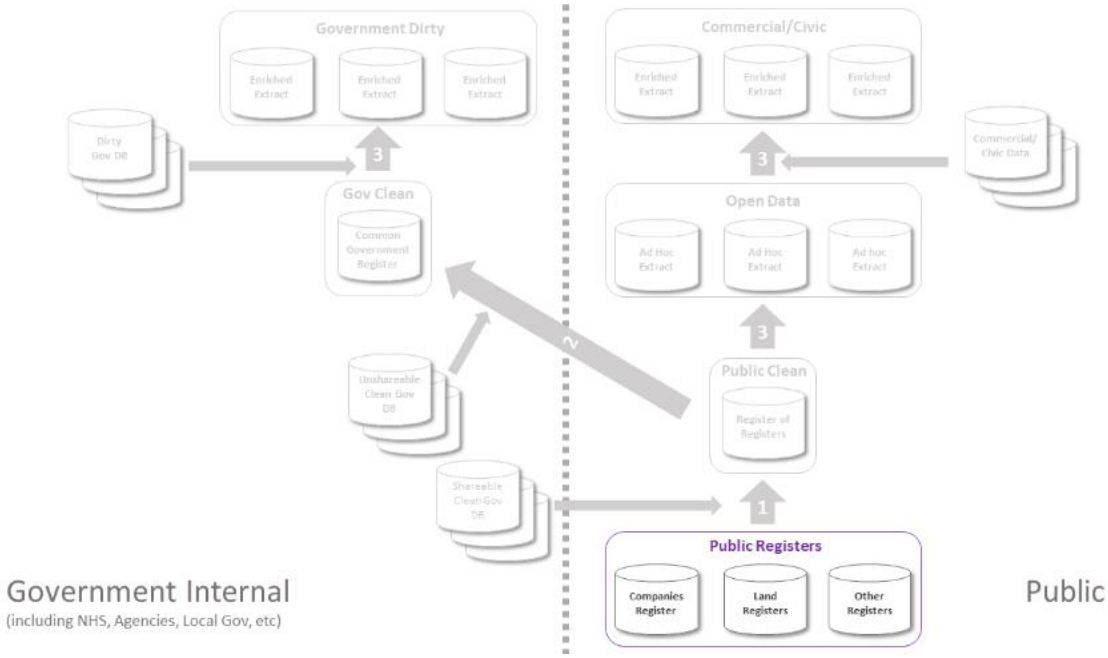
Each step of this pipeline will now be discussed:

- Public Registers
- Public Clean – the register of registers
- Government Clean
- Government Dirty
- Open Data and Commercial/Civic registers

Each stage can ingest data with different characteristics.

4 See Working Paper No 1 – Data and the rule of law. It draws on an extensive review of Universal Credit by the Child Poverty Action Group. It focusses on directly judiciable administrative data used to make decisions, as opposed to analytical data used to inform policy. As such it is not directly relevant, but it does explore civil servant's duty of care with respect of decision making. The forthcoming Working Paper No 5 – Law reform for data explores the issue in more detail.

PUBLIC REGISTERS



There have been at least 2 attempts to put the various land registers onto a single GIS/Land Information System.

The respected former Green MSP and Land Expert Andy Wightman was commissioned by the David Hume Institute to write a report[5] this year on making the 3rd attempt happen.

The report is well worth reading as it summarises the history of ScotlandLIS dating back to the 1990s, through the 2007 creation of Unifi Scotland as the delivery vehicle and 2015 commitment of the then DFM John Swinney to deliver it. Registers of Scotland produced a proposal[6] which was never implemented.

The David Hume report lays down the following principles which is says are vital to success:

1. There needs to be a firm agreement and commitment to deliver ScotLIS by Scottish Government and the wider public sector. Ministers have a key leadership role here.
2. Necessary policy and legislative changes to permit the development of ScotLIS need to be agreed in principle.
3. Agreed protocols on data, access, technical design and data use need to be developed.

5 https://davidhumeinstitute.org/latest-news/2023/3/6/press-release-siloed-land-information-is-holding-back-scotland

6 It is perhaps indicative that this proposal is not to be found (or at least not by me) on public government sites but only on Andy Wightman's personal archive http://www.andywightman.com/docs/Digital-land-and-property-information-system-report-July-2015.pdf

4. There needs to be a suitable governance framework in order to direct and monitor development of ScotLIS with agreed timescales, milestones and final delivery.

5. Any necessary finance needs to be in place.

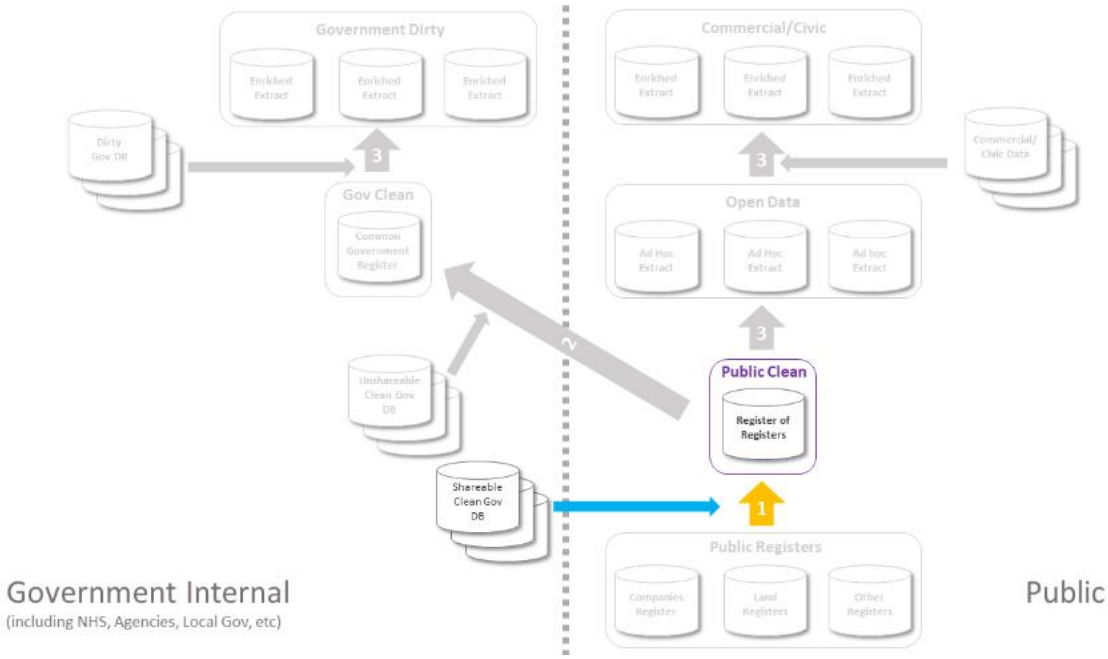
Andy Wightman was interviewed as part of my research project BIus – and most of the interview was spent on this issue. One of the core reasons for continuous failure to deliver new registers in a joined up manner was the absence of a <brain> in the Scottish Public Sector with all the requisite capabilities to hold and drive strategic work in this sector (finance/resource, technical chops, access to the legislative timetable, political/administrative authority across organisations and so on).

Currently the land registers are a mixture of:

- GIS data attached to maps
- Simple tabular data
- Ad-hoc data (like PDFs) with some searchability

Harmonisation of the land-based registers is a foundational task of this entire proposal, without there is no possibility of it working.

PUBLIC CLEAN



In this view the Public Clean step in the pipeline is a database accessible by GraphQL, run and maintained on a statutory basis to which the public has a defined right of access.

The choice of graph database and front-end to use it MUST be an operational decision – but the prejudice SHOULD be towards an open-source implementation.

There are some caveats – not all the existing legislation-based registers are suitable to be added to it in their current form (data might not be maintained well enough).

In an ideal world these registers would enable a point-in-time data dump followed by (batchable) deltas on change to allow the Public Clean to be updated on an appropriate cycle – the expectation might be to start with monthly releases and move to dynamic/soft-realtime updating.

In the absence of deltas updates will need to be done on a read-and-match basis – and as many of the registers have an income stream funding model this is a potential killer.

Fixing the pricing/obligation to provide updates for existing registers won't be a quick process and might require legislative changes[7]. Some of the registers (eg Companies House) are not devolved and putting the screws on them would involve pushing legislation to Westminster via the Joint Ministerial Committee structure (good luck with that[8]!).

Appropriate oversight for the Public Clean MUST be established. It SHOULD at least rhyme with standard internet governance models like the Apache Foundation[9]. It MUST have a route to bring forward appropriate law reform to make it happen.

The organisation model for managing non-functional requirements is outlined elsewhere in Working Paper X – *The heart of the beast* and Working Paper 0 – *The locus of change*.

This work is also a prime candidate for remedial work to address its funding model and so on via an Enabling Act – see Working Paper No 8 – *An Enabling Act*.

The discussion in Working Paper No 11 – *Jeff Bezos's API Mandate but for Government* is also relevant.

The oversight body MUST have ownership and responsibility for all the open source artefacts to be developed to implement the pipeline (at this and higher stages in the solera)

Because all the data in the Public Clean is open data, there MUST be an ability to filter, query and extract datasets from it for use the Open Data and Commercial/Civic parts of the pipeline. That capability (expressed as software) MUST be appropriately open sourced so that it can be reused within

7 The private sector must seduce but the parliament can compel….

8 Caveat Lector: I know the square root of bugger all about the JMC procedures – but anecdata suggests its not going great, if it is at all existent, at Minister/Minister. But work at civil-servant/civil-servant might be going swimmingly [shrugs].

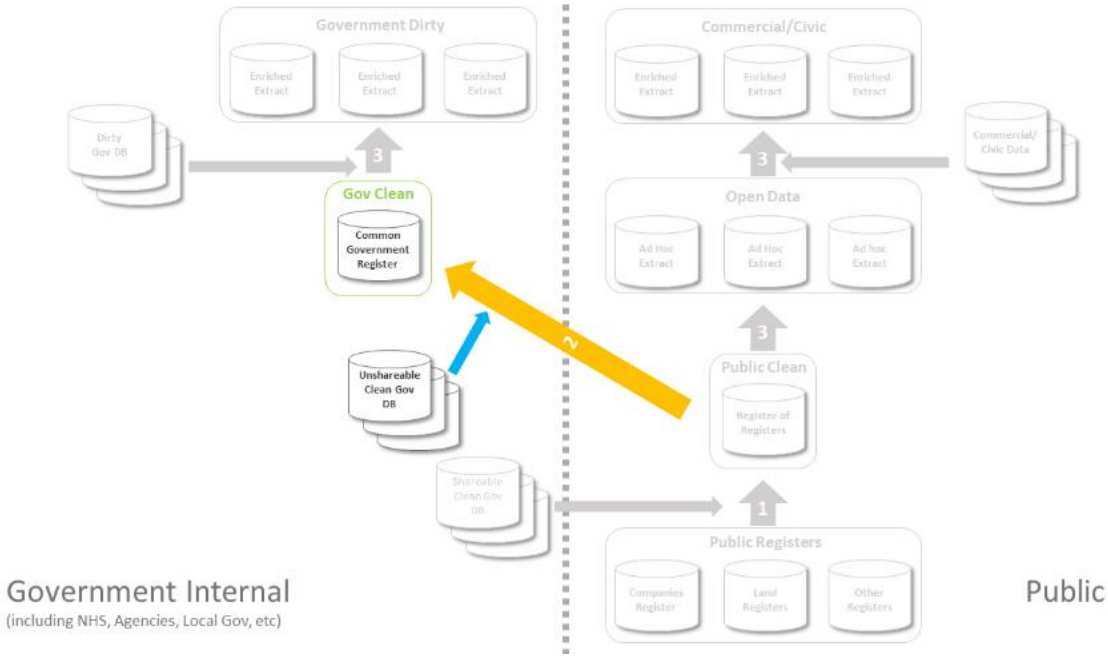
9 https://apache.org/foundation/governance/

government and by commercial suppliers to build augmented (and possibly dirty) data on top of the clean register data.

The extract process from Public Clean MUST itself conform to the clean data standards so that the pipelines built on it can benefit from continuous update.

Once the Public Clean databases start being fed with soft-real time deltas instead of batched updates they in turn will be able to offer soft-real time deltas and commercial providers can build API backed services on the open data – building a commercial landscape of service providers backed by excellent and comprehensive pre-joined up and excellent government data. This will dramatically reduce the barriers to entry for data-driven businesses in the Scottish economy – all that manual cleaning and joining.

GOVERNMENT CLEAN



The Government Clean database takes Public Clean data and augments it with shareable, clean government data to create the pan-Government platform for internal use.

Unshareable in this instance means not to be shared with the public, but able to be shared over all state bodies (Scot Gov, NGAs, Agencies, Local Authorities, Health Boards). Data that is confidential to an agency department is defined as administratively dirty.

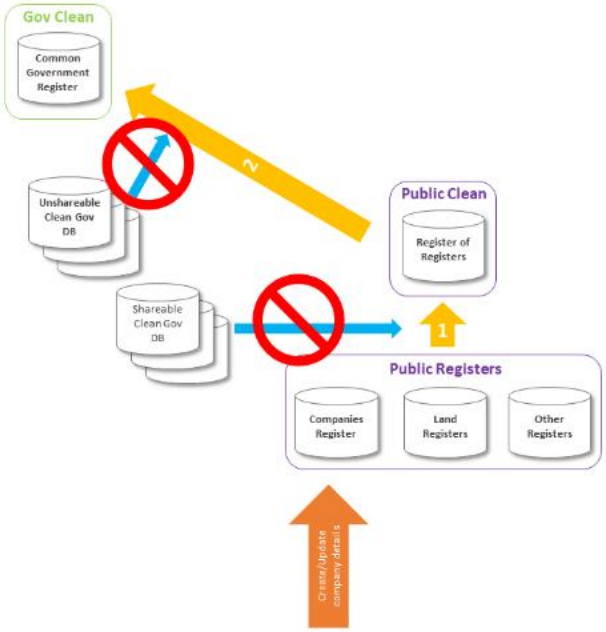
The platform for Government Clean and Public Clean SHOULD be the same, both at a database and query/front end level and it SHOULD run on the same logical platform and it SHOULD be managed by the same service provider. It perhaps goes without saying that the Public Clean and Government Clean

systems will be running in different security zones and MUST be separate to the degree laid down by the appropriate security standards.

It MUST have the same data standards/acceptance criteria as the Public Clean.

It is critical to understand that this pipeline MUST be based on immutable enrichment and not data reconciliation. Enrichment is adding additional data which shares a common key (in property cases a UPRN) of the base date. Editing of data cannot be done in the pipeline – changes do not propagate back down. Data must be consistent.

That means changes MUST flow from the data source up the pipeline:

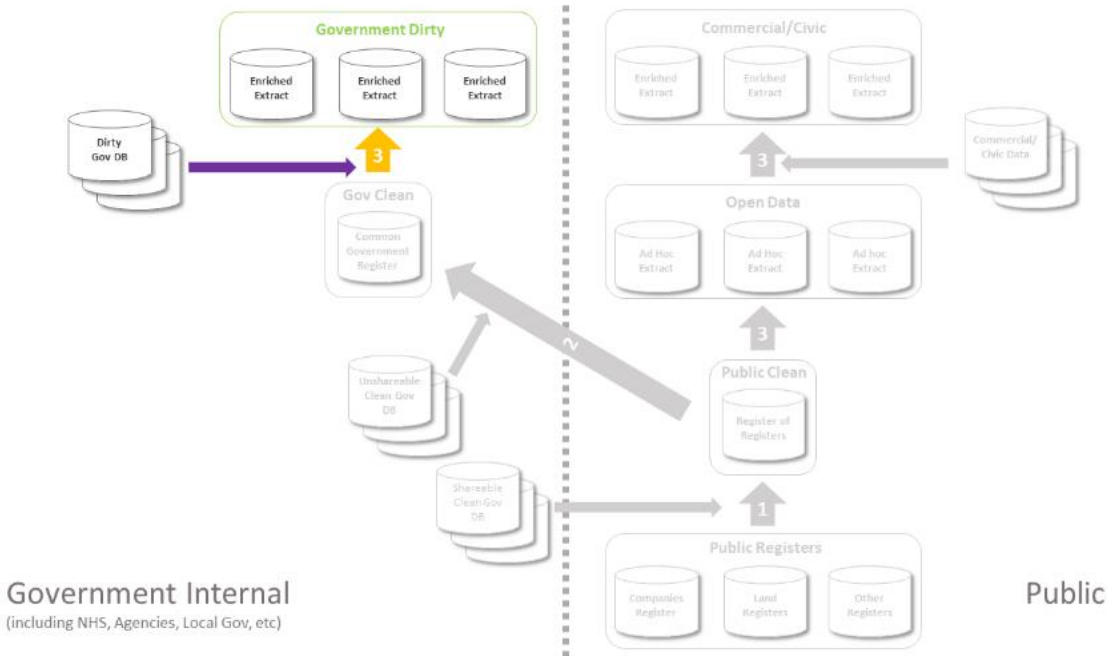


This is *the critical point* in the choice of a solera design for the pipeline. Allowing multiple points of update generates manual reconciliation and clean up. This can often appear reasonable, proportionate and contained in a pilot/prototype – but is a highway to hell and ends in a rotting data environment.

The data refresh rate at each stage is critical to the smooth operation of the entire pipeline – an NBR with a yearly base update from Companies House would be unacceptable. Ideally we want to get to near-realtime but the relevant extracts for augmentation would need to be checkpointed and hold-back as-yet-uncreated-upstream information. (An upstream data source might well know about new company creation before the changes flow upstream from Companies House – but the enrichment process MUST only have the ability add enrichment to existing data but NOT create new or missing instances.

Like Public Clean, the Government Clean data will enable the creation of API based data services for use across the entire public sector – with built in security for commercial-in-confidence information.

GOVERNMENT DIRTY



It should be expected that most of the day to day work would be done at a Government Dirty level – at least initially – for analytical and not operational work.

In this world, the end user is wanting to do some analytical work and orders a snapshot of the dataset they require and it arrives locally for them to do as they see fit.

In this model:

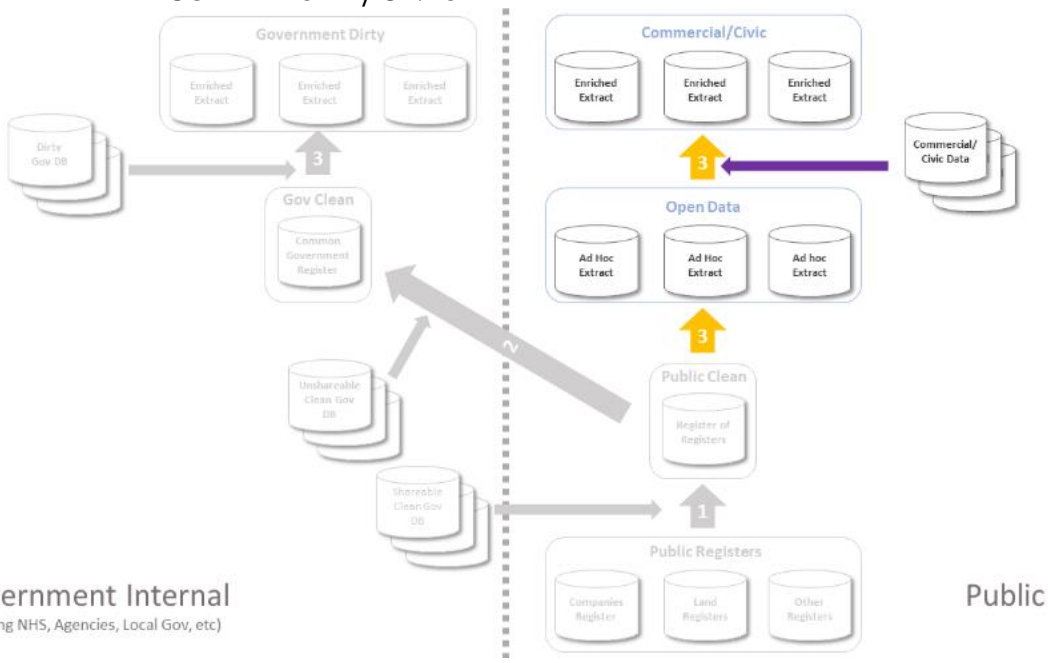
- a user selects a filtered subset of the Gov Clean data
- starts up a containerised solution
    - pre-populated with the snapshot Government Clean subset
    - registered to receive updates from Government Clean
    - with the ability to apply those updates
- is supported in adding their own dirty data set
    - training
    - tools
    - hiring
    - support/help desk
- has power to invite/share within the government domain

The containerisation software, filter/select, transform/update software MUST be Open Source and under the ownership/control/governance of the

body established for Public Clean. Commercial solutions MAY be purchased by Scottish Government to provide both graph DB and query/use tooling – but the containerisation pipeline MUST be constructed so as to allow them to be swapped out. The container solutions MUST be portable over cloud providers.

The deficiencies in this data model - the reason it is dirty – is that it can't be operationalised as a service-over-API. Getting data from Public Dirty to Public Clean and making the API environment richer is necessary for better government outputs.

Open Data and Commercial/Civic



The Open Data and Commercial Civic pipelines are not under the control of Scottish Government. They are run by civic or commercial organisations on commercial clouds or on on-prem as they see fit.

However to enable and support those communities to grow cheaply and effectively the entire software stack that is used in Public Registers -> Public Clean -> Government Clean -> Government Dirty should be managed as a single project under the oversight body (approximately rhyming with an Apache Foundation project in governance terms, with open standards, open road maps, open software, etc, etc, etc).

Needless to say, civil and commercial organisations are under no obligation to use the open source solutions – and steps should be taken to ensure that Scot Gov's choice of analytical software to run against the graph data does not constrain civic/commercial users.

It is good for the economy for public and third sector parties to build APIs and services (and possibly charge for them) by taking open data delivered in

soft-realtime deltas, enriching it with clean data and exposing it. It is also good for the economy for public and third sector parties to do ad-hoc work by joining their own data, dirty or clean, privately to good clean, joined up public sector open data.

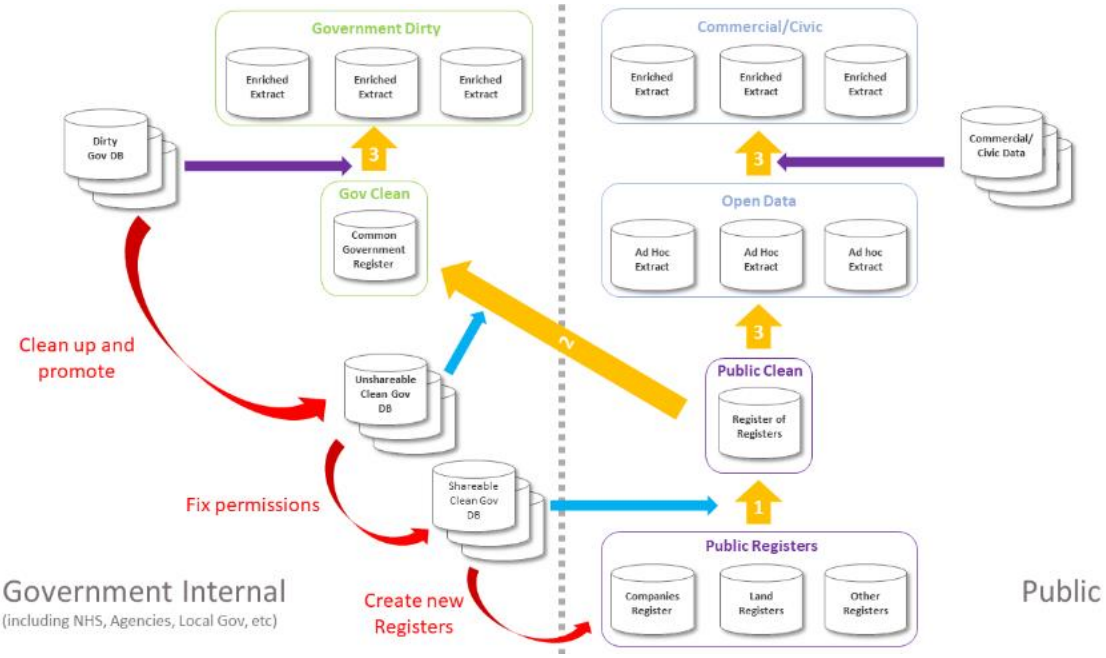
The Data Solera

In this section we show how the various data sets can be independently matured by moving them down the solera so they are injected into the customer pipeline at different stages.

In the early days the expectation is that most data sets are Dirty Gov. Gradually they can be fixed (legally, technically, in terms of documentation, etc, etc) and moved down a step.

In the final state the majority of government data is Shareable Clean Gov data and the number of base registers has increased substantially

By implementing a data solera we can decouple the necessary aging and improvement processes for each data supplier from each other:



Failure to decouple improvement programmes across Scottish Government will ensure that the entire project fails (like the long history of ScotlandLIS initiatives). A solera MUST be built.

In the world of Sherry the customer is interested in the lowest barrel, the finest sherry, but in the data solera the end-user cases, the insight, the buy-in, come from the top barrel – the dirty data.

Lets look at the 3 steps of cleaning in a bit more detail.

The Solera breaks down the 7 criteria:

	Step	Notes
1	Clean up and promote	In this stage the data set is fixed up in regard of the following criteria: • Maintained • Immutable • Dump/Deltas • Keyed • Documented These are all attributes which fall within the control of a particular department responsible for a database – they can get on with fixing it. It also requires addressing the technical basis for: • Timeousness This stage fixes the *means*.
2	Fix permissions	This addressed the legal basis for sharing: • Shareable (public or gov domain) Fixing this might require primary or secondary legislation – or getting citizen/client permissions This stage fixes the *will*.
3	Create new registers	In this final stage responsibility for running a data service is transferred from a government department of body to the Registers of Scotland – a dedicated governmental body that has provided data-as-a-service in the most foundational way for 4 centuries now. Responsibility for data maintenance remains with the Registree: • Timeousness This stage *institutionalises* the provision of this data class.

We can move fastest at the dirty level (we don't need to retrofix institutions and legislation).

It is important to get end-users up and running in the Government Dirty as soon as possible. Delay in getting there will result in increasing pressure to relax the data standards criteria until the inevitable "*the Minister wants this to happen* (*just one time, just one time*)" happens and the pass is sold.

This is an instance of the gearbox problem with is discussed extensively in my blog series[10]:

Part 1 – we need a gearbox (blogs.gov.scot)

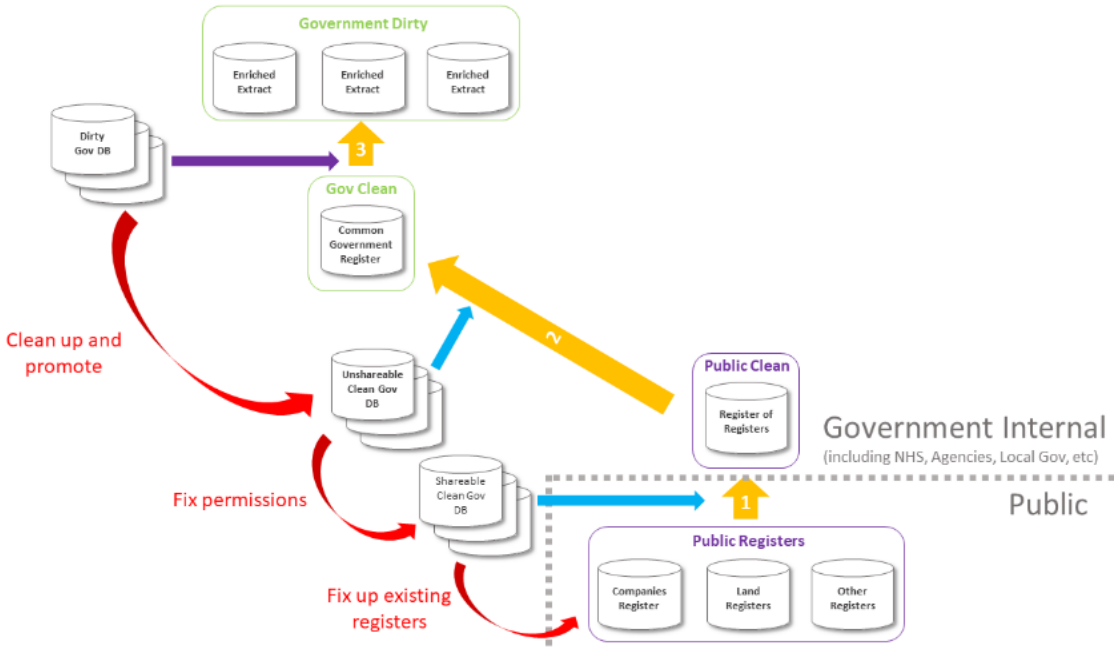
Part 2 – Frankenstein Bill (blogs.gov.scot)

Part 3 – technical pattern books (blogs.gov.scot)

Part 4 – a legislative architecture (blogs.gov.scot)

Part 5 – testing the proposals (blogs.gov.scot)

In order to decouple the project from the legislative engine the solera MUST be built within Scottish Government and then transitioned when the appropriate quality mechanisms/legislative changes are in place:



The implication is that the Public Clean environment will first be deployed inside Scottish Government before being made public.

This enables us to continue learning from end-users throughout the process.

Conclusion

Working Paper No 5 – *Law reform for data* focusses extensively on the *will* to do joined up government.

This paper is a companion piece which focusses on the *means* to do it – and it builds on Working Paper No 1 – *Data and the rule of law*.

10 https://blogs.gov.scot/digital/2023/08/28/basic-law-making-for-legislative-computer-systems-part-1/

https://blogs.gov.scot/digital/2023/09/04/basic-law-making-for-legislative-computer-systems-part-2/

https://blogs.gov.scot/digital/2023/09/11/basic-law-making-for-legislative-computer-systems-part-3/

https://blogs.gov.scot/digital/2023/09/25/basic-law-making-for-legislative-computer-systems-part-4/

https://blogs.gov.scot/digital/2023/10/02/basic-law-making-for-legislative-computer-systems-part-5/

The institutional basis for the creation of a solera and the proposing, designing and scheduling of the work (which will take not a couple of months or a couple of years, but rather be an continuous on-going project) is dealt with in a variety of working papers:

Working Paper X – The heart of the beast

Working Paper 0 – The locus of change

Some of the technical elements of it are described in Working Paper No 8 – *An Enabling Act*.

Working Paper 7 – Experimental digital legislative processes

Version 1.3

Reimagined lawmaking

Introduction

Why experimental digital legislative processes?

We think of the making of laws as a point-in-time event.

The king calls his bishops, barons and burgesses to assemble as a general council, parliament of convention of estates in Kirkliston, Holyrood, Perth, Stirling or Linlithgow. They sit for a day, or a week and vote an Act or set of Acts *en bloc*.

Fast forward 6 centuries and the processes seems similar – the 'point-in-time' is a bit thicker than a day or two. Consider the timetable of Housing (Cladding Remediation) (Scotland) Bill[11] which is in the Scottish Parliament the now:

- Introduced 1st November 2023
- Stage 1 ended 12th March 2024
- Stage 2 ended 23rd April 2024
- Stage 3 planned for Tuesday 7th May 2024

The law-making part of this is about 7 weeks – bigger bills might have a longer duration, emergency bills a much shorter one.

But looking at the Scottish Social Security legislation since 2018, the 3 primary bills and 76 pieces of secondary legislation, we see a very different picture. Social Security has not been a point-in-time process – 79 different pieces of legislation over just under 6 years – 1 a month.

And we take it as read that the bill will go through 3 stages – the 3 normal stages – as defined in the Standing Orders of the Scottish Parliament[12] - these stages were inherited from custom and practice at Westminster.

In his book *How Westminster Works... And Why It Doesn't*[13], Ian Dunt quotes Paul Evans, who worked as a clerk in the House of Commons from 1981 to 2019:

"This is one of the things about the British system. The fact that we have 3 readings is purely invented. It's not written down anywhere."

We also know that the procedures of the Scottish Parliament were not designed to take into account of major digital deliveries[14].

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11 https://www.parliament.scot/bills-and-laws/bills/housing-cladding-remediation-scotland-bill

12 Standing Order 9.5 https://www.parliament.scot/about/how-parliament-works/parliament-rules-and-guidance/standing-orders/chapter-9-public-bill-procedures#topOfNav

13 https://www.weidenfeldandnicolson.co.uk/titles/ian-dunt/how-westminster-works-and-why-it-doesnt/9781399602747/

14 pals of mine shaped and wrote the first version of the procedures of the Scottish Parliament in the 1990s and I asked 'em

In Holyrood it is at least written down – but parliamentary process is a man-made thing, and can be un- and re-made.

This working paper starts from these two premises:

- that laws are not point-in-time events with regard to iterative development of major digital systems
- the process of writing the law is mutable and can be adapted to lead to better and more effective design and oversight of digital systems

The troubled but finally successful delivery of Universal Credit at Westminster has proven very influential in the organisation of major digital programmes worldwide. The delivery of Scottish Social Security was informed by the lessons learned as was the structure of Ontario Digital Service.

This working paper looks at those two major programmes and other lessons learned and suggested a range of possible alternative ways of taking major digital infrastructure legislation through a parliament.

It is important to understand that these proposals for new legislative processes mostly apply to a minority of Bills – ones with substantial long-term digital foundations – finger in the air 1 to 2 bills per session (5% to 10%). One of the options in Section 5.3.3 Pre-legislative design might also apply to smaller bills.

But there are also major digital deliveries that are non-functional in nature and not specified in legislation which need similar oversight.

WHO ARE YOU?

You are a Minister or opposition MSP, a SPAD or policy person, someone with a deep interest in the future delivery of a major digital programme over an extended timespan

WHY SHOULD YOU READ THIS?

Principally, because a botched major IT delivery could cost Scotland £2bn, £3b or £7bn.

You should read this to understand what the lessons of UC where and the different ways in which they have been learned within the confines of a traditional legislative process – and how they might be used to create better parliamentary processes that would catch and kill broken of runaway digital programmes earlier.

Revision notes

Version 1.1 Diagrams of bill processes included Westminster descriptions not

	Holyrood ones.
Version 1.2	Additional discussion of limitations in secondary legislation
Version 1.3	Ottawa Digital Services corrected to Ontario Digital Service

Background

WHY PROCESS MATTERS?

One of the insights to emerge from this research is that there is no effective oversight of non-functional aspects of the digital state – see Working Paper 9 – *Reading legislation with a non-functional eye*. This is a bit more complex because some of the key infrastructural elements of the digital state (common payment rails, common identity systems) aren't formally statutory systems at all. Despite being 100-year infrastructure functions with enduring effect they are not subject to any specific parliamentary oversight. This needs to be rectified.

There is no amount of money that you can't burn in a failed IT delivery. The reality of this was seared into my consciousness in the early 2000s watching the NHS Spine programme play out.

Contracts were signed in 2002-2003 with BT, Fujitsu and Accenture amongst others. I worked for BT a bit later – in the division that had the contract – and colleagues went off to work on NHS Spine and report back informally that it was dead in the water in 2005.

My matrix manager from the Technical Architect team went down from Liverpool and was told something along the lines of "we didn't have time to specify the system, to hit the deadlines we had to just start building it". He fled back home.

By the time the contract was finally killed in 2011 the UK Government was over £10bn in the hole, with the suppliers taking another £5bn hit.

The problem with tyre-fire major IT programmes is not in detecting they have gone rogue, it is in killing them. They are sufficiently complex and large that every actor has both an interest in someone else killing them and taking the blame and a naïve belief that someone else has the full picture. If it hasn't killed it then it is still salvageable and can be got back on track.

The major problem that besets them is lying – not people lying to each other, but people lying to themselves. And the best way to catch and kill a runaway programme is transparency and accountability about progress.

25 years of experience of the tech industry has shown again and again that iterative development processes, with a focus on building up velocity and

learning through iteration is not the best, but the only way to achieve high quality transformational systems design.

But an unexpected side-effect of iteration was that teams ended up in a different place than they aimed to be at the start.

In the case of government – where the citizen is not a customer – where the relationship is not a voluntary one – things are different. The private sector must woo with honeyed words, but the state can compel with bayonets. Techniques like co-designing bring citizen interest to the heart of the systems design in a way that simple user testing and iteration don't.

Unlike the private sector, the state often commissions multiple services to provide the same service – the services being created are to be partitioned. This can be in existing bodies like local authorities or health boards, or in new bodies such as care boards.

This paper seeks to combine these six things to make better government:

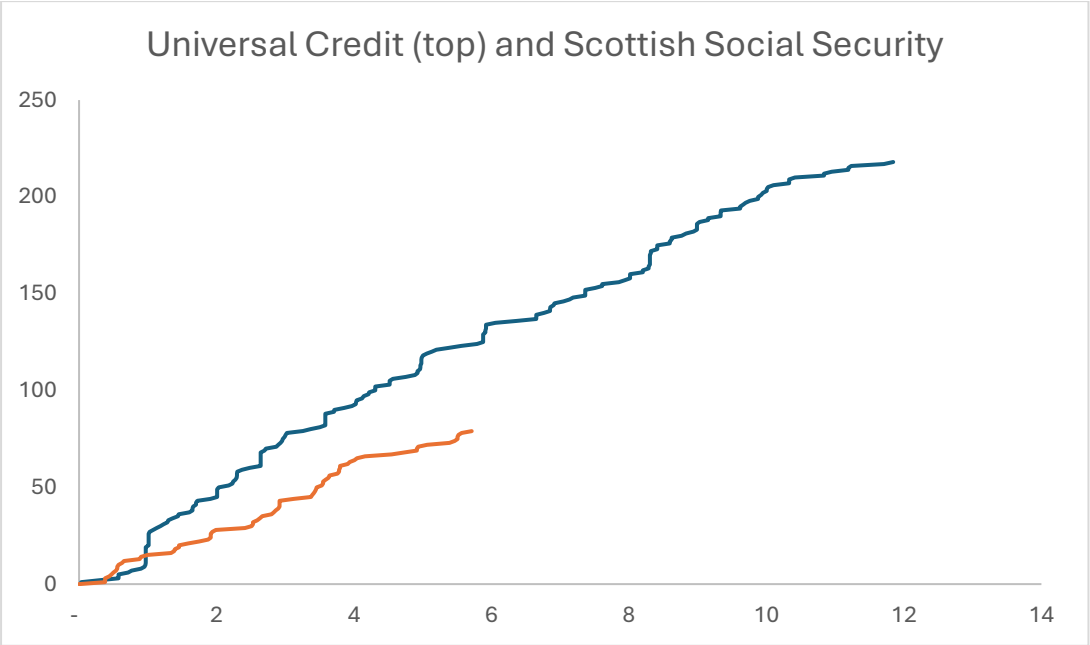
- oversight of non-functionals
- early catch and kill
- iterative development
- learning through building
- co-design
- partition-friendly

And it seeks to do that within the constitutional framework of a separation of powers and parliamentary oversight – it proposes not a technocratic evasion of democracy but a technical empowerment of it.

Continuous legislating

The notion that legislation is a point-in-time thing for major digital systems can be disabused by simply plotting the cumulative amount of secondary legislation since the laying of the primary overarching Act.

This graph shows it for both Universal Credit and the Scottish Social Security system:



Y Axis is pieces of secondary legislation (ministerial orders) and the X axis is years since first bill laid.

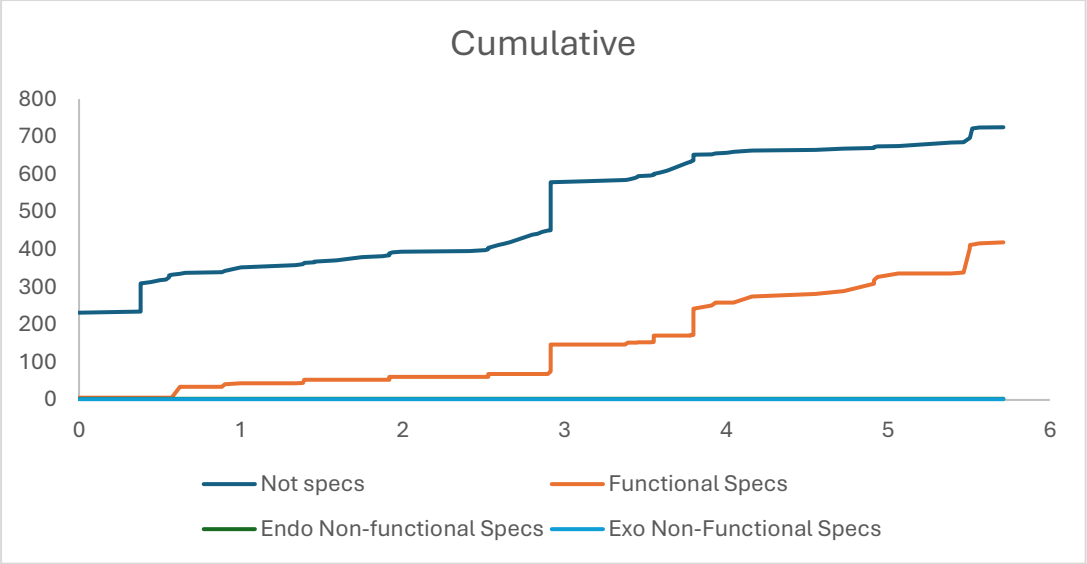
The legislative processes of both social security systems are formally continuous – and each has an independent statutory body[15] to which a sub-set of secondary legislation has first to be considered by before it goes up to Westminster or Holyrood.

Working Paper 9 – *Reading legislation with a non-functional eye* examines the Scottish social security legislation section by section and categorises each as:

- not a specification
- a functional specification
- an endo non-functional specification (restricted to Social Security)
- an exo non-functional specification (relates to external technologies)

15 https://www.gov.uk/government/organisations/social-security-advisory-committee and https://socialsecuritycommission.scot/

Plotting these in a cumulative fashion paints a clear picture:



The Y axis is cumulative numbers of sections, the X axis is years since the first framework bill was laid before parliament.

The key point to notice is that the specification sections are overwhelmingly functional – 98.8% versus 1.2%. The oversight that the social services commission provides is only to the functionality of the system.

Nobody with any reasonable experience of the legislative process will be in anyway surprised by this graph – but it is important that continuous legislation goes from something that is merely accidentally known to an anchoring fact about which we can revisit long-made decisions from a critical perspective.

In this respect the two big social security programmes are abnormal. Dedicated scrutiny of secondary legislation is almost unknown – and the social security programmes both have an independent commission to scrutinise some of the secondary legislation that goes with them.

Limitations of secondary legislation

As the Hansard Society report *Delegated legislation: the problems with the process*[16] noted the entire oversight of Statutory Instruments is problematic – less so at Holyrood than at Westminster.

Whilst focussing on Westminster Statutory Instruments, it makes a number of relevant points about secondary legislation and its discontents.

The section of Introduction which outlines the problem is fairly savage on Skeleton Bills (references from original):

16 https://assets.ctfassets.net/n4nczoio2v4l/2e2hncTHupRnvN4trkguJ6/34ab2e41faa8254985034fab5c466a5c/Charge_Sheet_FINAL_2_Nov21.pdf?utm_source=HansardSociety

The line between what should be a matter for primary legislation and what for delegated legislation is now often perceived to be arbitrary, defined largely by what Ministers and officials consider politically and practically expedient and what they think Parliament will stomach, rather than any constitutional or legislative principle[17].

'Skeleton Bills', or 'skeleton clauses' within Bills, are now a common feature of the legislative landscape: these are Bills that contain broad powers in lieu of policy detail, leaving the actual operation of the Act and the implementation of its policy objectives to ministerial discretion, legislated for via SIs. As the House of Lords Delegated Powers and Regulatory Reform Committee (DPRRC) memorably described them, they are Bills which are "little more than a licence to legislate[18] and so give flesh to the 'skeleton' embodied in the Bill".

Such Bills inhibit effective scrutiny because Parliament is being asked to make laws "without knowing how the powers conferred may be exercised by Ministers and so without knowing what impact the legislation[19] may have on members of the public affected by it". The SIs that Ministers lay before Parliament under these powers are then subject to limited or no parliamentary scrutiny.

Note: *clauses* here would be *sections* in Scottish Bills at Holyrood.

It discusses the inadequacy of the scrutiny procedures:

Delegated legislation is not solely the preserve of the uncontroversial administrative and technical detail for which it was historically intended, and for which the parliamentary scrutiny procedures for SIs – particularly in the House of Commons – were designed nearly 80 years ago.

Principal matters of policy – including some of the most politically salient issues of the day – are now found in delegated legislation. However, the parliamentary scrutiny system is inflexible, so it rarely provides a satisfactory forum for Members to express their concerns about these laws that directly affect citizens.

There is a distinct disconnect between the Hansard Society and this report. Their presumption in all the discussion about delegated legislation is that it is,

17 The Delegated Powers and Regulatory Reform Committee (DPRRC) concluded after listening to evidence from the Lord President of the Council and Leader of the House of Commons that "the Government consider the inclusion of delegated powers as a political and practical decision, rather than a matter of principle." See DPRRC (2021-22), Democracy Denied? The urgent need to rebalance power between Parliament and the Executive, HL Paper 106, para. 125

18 DPRRC (1998-99), 29th Report, para. 23.

19 Joint letter from the Chairs of the House of Lords Constitution Committee, the DPRRC and the SLSC to the Lord

or ought to be, sufficiently 'known' to be appropriately hedged in and delimited by *vires* in the primary legislation.

This appears in a section of the Cabinet Office *Guide To Making Legislation*[20] which they quote (this is the Westminster equivalent of the Scottish Government's Parliament and Legislation Unit's *Bill Handbook*[21]):

Conversely, however, it also notes that the fact that a matter is technical, or that there has been a lack of time to develop the policy detail, is not likely on its own to be "sufficient justification for the inclusion of a delegated power in a bill".

One of the core propositions of this report is that with modern iterative exploratory system, service and software development the necessary knowledge of is not, and cannot be available at the time of writing the initial primary bill - the *vires* are unknowable.

Their proposed solution to some of the problems of delegated legislation does prefigure the institutional suggestions in this report - the creation of a Parliamentary Office for Statutory Instruments, which is prefigured in its own right by the NI Assembly Examiner of Statutory Rules[22].

Sketches of a future state

Introduction

The legislative and supervisory structure should be designed backwards from the needs of a major software delivery programme if we want the best results and the lowest costs.

The core considerations are the aforementioned:

- oversight of non-functionals
- early catch and kill
- iterative development
- learning through building
- co-design
- partition-friendly

20 Cabinet Office (August 2022), Guide to Making Legislation, para. 15.2

21 https://www.gov.scot/binaries/content/documents/govscot/publications/foi-eir-release/2022/07/foi-202200306018/documents/foi-202200306018---information-released/foi-202200306018---information-released/govscot:document/FOI%2B202200306018%2B-%2BInformation%2Breleased.pdf

22 https://www.niassembly.gov.uk/assembly-business/legislation/2017-2022-mandate/examiner-of-statutory-rules-reports/

Oversight of non-functionals

The case for oversight of non-functionals is made in Working Paper 9 – *Reading legislation with a non-functional eye* and the proposed institutional solution is discussed in Working Paper 0 – *The locus of change*. I won't elaborate on that here.

Early catch and kill

Early catch and kill should be a belt and braces solution – as many opportunities to kill a runaway programme as there are ways in which a programme can go rogue. The principle dynamic of runaway programmes is a self-incentivising spiral of group think. The core mechanism for breaking out of the spiral is having the insiders justify themselves to outsiders.

Early in this context starts firmly in the pre-legislative stage: appropriate consideration of programme and team construction.

Once a major programme gets into a good place it pretty much continues to work well. The challenge lies heavily on the programme stand-up and the building out the programme, procedure and software platform scaffolding. So any new proposed legislative process should have external justification points built-in – with a focus on the early stages.

Iterative development

Iteration (sometimes called 'agile'[23]) is a core mechanism for developing large software systems at scale. A small working prototype is built and gradually expanded acquiring both functionality and classes of users. Proposals to spend 3, 4 or 5 years developing and then dropping a new system 'big-bang' – what you might call the bridge or major infrastructure model is often associated with runaway programmes 'we are only a bit late, we will soon be there'. Its not that major software programmes doesn't ever follow a big-drop-in-the-future pattern – software for space exploration is a counter example. But that approach is traditionally much more expensive than simple iteration, with a much higher failure rate.

Iteration is not some magic bullet though, and a clear vision of the destination of the journey in *la longue durée* is necessary upfront. Teams can

23 Agile is formally a particular methodology, but 'agile' is often used as generic adjective for a range of development methodologies – but what they all share is a commitment to building a small working system and growing it towards a larger working system. The term is often used in counterpoint to 'waterfall'. It is substantially the difference between drawing out a vase from a lump of clay on a potter's wheel (agile), versus building it from slabs of clay joined together (waterfall).

iterate themselves into an architectural dead-end and have to reverse out to the beginning.

Learning through building

Both early catch-and-kill and iteration are fairly commonplace in modern state digital delivery. Enough people have been burned often enough with runaways and big bang disasters.

Learning through building is a more fraught proposition. As tech firms gradually addressed all the issues that the state is grappling with and moved toward iterative development they discovered an unexpected side effect. The process of building iteratively brought with it an increase of understanding of the problem and what an optimal solution would look like. The programme team would realise iteratively that there were better ways of achieving their goals than they had planned, and also better goals than they had set out with.The destination changed with the journey.

But the mental model of optimal software development then flipped back to front. From we-didn't-understand-it-properly to it-can-only-be-understood-through-doing. Not having a perfectly worked out picture of the future is the natural state and not an exception or failure case.

The constitutional challenge that learning through building brings is that the government can only act within the approval of parliament. The government consults and then proposes law to the parliament. The parliament disposes. If the destination changes along the delivery journey then to parliament we must return.

The mechanism by which we currently enable iteration is use of framework bills and secondary legislation. The model is: parliament debates the primary legislation in detail and within it embeds the ability of the government to flesh out details by secondary legislation. The secondary powers are supposed to be as narrow and as constrained as they possibly can be.

The reason for this is that secondary legislation is unamendable and subject to a lot less scrutiny than primary legislation.

Given that iteration involves learning and change, granting useful iterative powers involves busting out of constraints, making the secondary powers more general, more powerful – moving against the spirit of the constitution.

If our expectation is that the government will learn from experimentation then the secondary legislation should run back to front. At the debate in primary bill, the government should request the powers to iterate widely with very broad powers. And then having learnt from that what they wish to do, the government should return to parliament with a clear programme and request

permission to do what they have now learned they should do. The returned proposals should be debatable and amendable.

Co-design

Co-design as a principle shares fundamentally violates the constitutional principle that the legislature has the last word. And co-design is not neutral – the outcomes of a co-design process can be altered by the selection of whom to do the co-design with. This suggests a two-pronged approach – the requirement of the government to get parliamentary approval for the selection criteria for the co-designers in advance, and the requirement to bring the learnings of the co-design process back to the legislature for approval.

Partition-friendly

The strategic goal of partitioning state function is to allow for local autonomy, custom ways of working and adaption to particular local conditions. Many state services have profoundly different characteristics in large rural areas versus major cities, or small towns in a rural hinterland.

The challenge of being partition-friendly is that it requires delegating the ability to develop policy and functionality. Legislation must switch to a more formal objectives-and-powers semi-constitutional mode – pushing the detailed powers to the local bodies. The EU has a good legislative model for this.

Oftentimes in the digital age we have seen centralised specification, either directly, or by reports, or nominally partitioned functions. This approach has all the disadvantages of a centralism and few of the advantages of decentralisation.

For partitioned systems it is appropriate to have a centrally defined set of interface processes – what happens when you move from one health board to another.

Summary

The experimental processes outlines later in this paper should be assessed against these criteria to see which best enables high quality digital systems whilst preserving the constitutional framework which is so essential to the health of a democratic society.

Universal Credit

What happened with UC?

It is not this Working Paper's place to recapitulate the entire history of the Welfare Reform Act 2012 and the development of Universal Credit. People

unfamiliar with the story should probably start with the Institute for Government's report *Universal Credit – From disaster to recovery?*[24] which this account draws upon.

In Appendix 1 I have attached a copy of the short timeline for the IfG report which is a useful summary.

To summarise briefly – there was an overriding political imperative that drove the process. The first finger-in-the-air estimates about how long UC would take was 9 years. The 5 year electoral term made getting something live by the time of the next election politically important. The legislative process ate up the first 2 years and lo! an impossible to meet Go Live! date was announced.

There were numerous recognitions that all was not well with the first iterations of Universal Credit. There was a Major Projects Authority review of the project in March 2011 (a full year before the primary legislation was passed) and at the time there was a strong feeling about suppliers and contractors that a train crash was coming. Around the time of the 2nd MPA review in November suppliers were writing formal letters saying that things weren't working (they didn't stop taking money, they were upfront about that). Those formal letters would later stymie attempts to claw back expenditure, but didn't percolate to the decision making level.

There was a gruelling cycle of reviews and resets – the big bang deployment was replaced with rolling pilots, expensively developed software was scrapped, a new team brought in, twin track development commenced. Eventually after a range of false starts the programme moves into a continuous development mode. New features were added, new classes of claimants were included, manual processes were automated and the programme was rescued.

Lessons learned (1) Westminster

Welfare Reform arrived at a transitional time – Francis Maude the Westminster enforcer had put a stop to 'mega IT contracts' and 'big bang' IT solutions – and an absolute prohibition of multi-billion IT solutions with four- or five-year lead times[25]. This approach built on earlier management approaches – major project gateway reviews dating back to the previous Labour government.

There are a number of lessons learned at Westminster – the National Audit Office report *Welfare Reform*: *lessons learned*[26] documents them in detail. The

24 https://www.instituteforgovernment.org.uk/publication/report/universal-credit-disaster-recovery

25 Section 7 - https://www.instituteforgovernment.org.uk/publication/report/universal-credit-disaster-recovery

26 https://www.nao.org.uk/wp-content/uploads/2015/05/10724-001Welfare-reform-Book.pdf

obvious big lesson was the switch from a waterfall to a proper agile approach – with a focus on building small working systems and scaling them.

But the Audit Office recommendations prefigure some of the arguments in this paper. They make the argument that failure is something to be planned for and not avoided[27] - it will happen, plan to catch and rectify.

The initial delivery was restricted in multiple dimensions[28]. Firstly a small number of pathfinder sites, and then to a pre-selected 'easy' set of citizens - new

claims from single, childless, out-of-work claimants who would otherwise be eligible

for Jobseeker's Allowance.

Howard Shiplee, the Senior Responsible Owner, appointed an independent external chair of the Programme Board[29] to break the 'good news only' cycle.

One of the besetting political problems of Universal Credit was the milestone of the Go Live! date of October 2013. Neither the DWP, the Audit Office nor Lord Freud the Minister himself was able to work out where that date came from and how it became established as gospel. Francis Maude transferred responsibility for setting dates onto the Senior Responsible Officer[30] with an accountability line to Parliament in addition to their minister.

The Audit Office report also established a clear set of guidelines for iterative delivery of new products, pathfinders during the design and policy development phase, followed by phasing-in along different axes: regionally, by claim/application type, by new claimants versus reassessed claims and by functional and policy change[31].

The Audit Office also identified a structural barrier to using iteration – when the legislation requires a big bang[32].

Lessons learned (2) Scotland

The Social Security Scotland programme was specifically designed around smooth delivery. The main legislation was a framework act with a secondary powers granted to implement each of the transferred benefits[33]:

- Carer's assistance

27 Section 2.7 https://www.nao.org.uk/wp-content/uploads/2015/05/10724-001Welfare-reform-Book.pdf

28 Section 2.8 https://www.nao.org.uk/wp-content/uploads/2013/09/10132-001-Universal-credit.pdf

29 Section 9 - https://www.instituteforgovernment.org.uk/publication/report/universal-credit-disaster-recovery

30 Section 5.6 https://www.gov.uk/government/publications/ministerial-code/ministerial-code#ministers-and-their-departments

31 Figure 10 7 https://www.nao.org.uk/wp-content/uploads/2015/05/10724-001Welfare-reform-Book.pdf

32 Section 3.15 7 https://www.nao.org.uk/wp-content/uploads/2015/05/10724-001Welfare-reform-Book.pdf

33 Part 2, Chapter 2 https://www.legislation.gov.uk/asp/2018/9/part/2/chapter/2/enacted

- Cold-spell heating assistance
- Winter heating assistance
- Disability assistance
- Early years assistance
- Employment-injury assistance
- Funeral expense assistance
- Housing assistance
- Short-term assistance

The various benefits were transferred piecemeal with timescales depending on both the ability of the Scottish Social Security Agency to stand up the software, and the DWP to enable the data transfers.

In addition to this first level of phasing, individual benefits had phased deliveries inside them, specified in the secondary legislation[34].

Whilst appreciating the care put into the legislative design and architecture of the Scottish Social Security programme it is worth considering some limitations on it as a general model.

I have shown in Working Paper No 9 - *Reading legislation with a non-functional eye* that legislation is closely related to the functional specifications of software systems (and largely lacks any non-functional specifications).

It is in this context that we should consider the Scottish Social Security programme. A number of social security benefits that had been administered by the DWP on a GB or UK basis were novated to the Scottish Government. The political aim was that Scotland should have the ability to diverge from rUK social security. The political imperative was to deliver new Social Security systems on a like-for-like basis on day 1 so that citizens would see no change to their money.

In Section 3.3.4 the future state requirement of 'learning through building' was outlined. Whilst the Scottish Security Programme did involve a learning process, it was substantially constrained by the fact that the functional specification (pay this amount of money to this class of people under these circumstances) was already known at the start of the programme (to be identical to the corresponding DWP benefit on day 1).

So reading directly across from the Social Security programme to something like the National Care Service is problematic. The best-achievable functional spec of the National Care Service is something to be yet learned.

34 See for example The Disability Assistance for Children and Young People (Scotland) Regulations 2021 https://www.legislation.gov.uk/ssi/2021/174/schedule/part/2

The digital systems in the National Care Service will mostly not be specified in any detailed way in secondary legislation as functional requirements. The digital systems will support staff who will be the main citizen touch point. They are not specified in the bill which is a framework for a huge range of delegated powers[35].

The National Care Service will be a partitioned service and there is no specification of any interfaces (or bodies responsible for delivering interface definitions and policing them) in the current bill.

It is the intention of the government that the National Care Service will be co-designed. If the goal is a partitioned service then that implies co-design on a Care Board area basis, to ensure the adaption of the care service to the local conditions.

The Scottish Social Security system also adopted the Westminster model of a having a custom oversight mechanism for some of its secondary legislation – the Scottish Commission on Social Security[36]. Like its UK counterpart though, the Commission focusses on the functional aspects of the social security system, seeking to understand the impact of policy changes on citizens and society as opposed to providing oversight about software and systems delivery. My thoughts on an adapted model of oversight can be found in Working Paper 0 – *The locus of change*.

Lessons learned (3) Ontario

Ontario Digital Services were set up with a lot of input from people who played a key role in delivering Universal Credit.

Ontario put in a pre-delivery assessment process – for both legislative and non-legislative systems – that looked at how the team was structured, how the policy had been developed, what engagement and design techniques had been used to assess citizen need and possible outcomes.

The mandatory assessment process was constructed as an engagement process to guide teams to best practice and not punish them if they failed to meet a grade.

It can be seen as (in part) a pre-legislative catch and kill.

In addition, the GDS Digital Standards were put on a statutory basis with the Simpler, Faster Better Services Act[37]. Or more correctly the Deputy Digital

35 https://www.parliament.scot/-/media/files/legislation/bills/s6-bills/national-care-service-scotland-bill/introduced/bill-as-introduced.pdf

36 https://socialsecuritycommission.scot/

37 https://canlii.ca/t/563xj

Minister (a civil servant) got the statutory powers to publish mandatory standards that people in service delivery in Ontario were obliged to follow. (My thinking on this is contained in Working Paper 0 – *The locus of change*.)

Possible alternative legislative paths

Overview

In this section I will propose a range of legislative path changes to address the 6 final state requirements. As far as possible they will be composable – the idea being that an actual legislative path could include one or more elements.

But before getting into them there is a choice between 3 top level options to be made:

- do nothing
- fix up current framework
- implement some of the 6 specialist legislative models

The 6 models match the defined final state requirements:

- oversight of non-functionals
- early catch and kill
- iterative development
- learning through building
- co-design
- partition-friendly

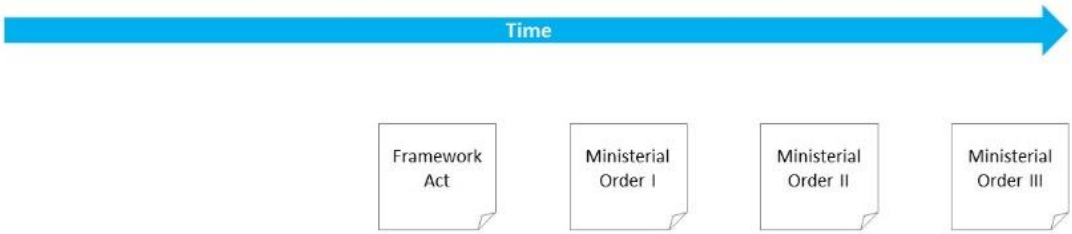
I am being very generous in my definition of 'legislative path' and including pre-legislative work as well.

These legislative paths are proposed mostly only for bills that deliver major digital programmes over many years which are currently handled with framework bills like the Social Security (Scotland) Act 2018[38].

The exception is pre-legislative design in Section 5.3.3 which would be suitable for smaller systems.

38 https://www.legislation.gov.uk/asp/2018/9/contents/enacted

The reality of a big programme is that Social Security had 3 full Acts and 76 pieces of secondary legislation, but I will use a much small explanatory schematic:



A framework act is passed giving the minister powers to make regulations which are then used over an extended period. (A simple bill with a few pieces of secondary legislation would not really be considered suitable, it's the big programmes that we care about).

3 CHOICES

Do nothing

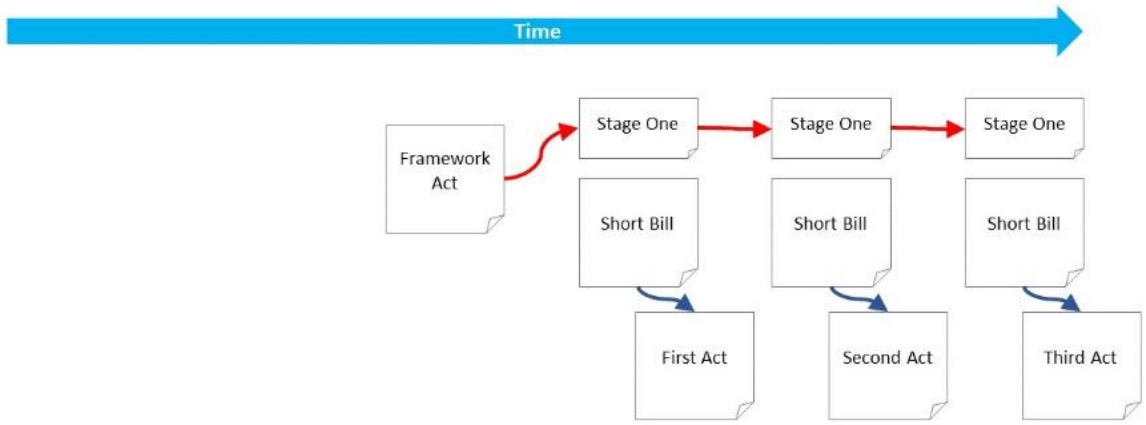
Doing things just for the point of doing things is daft. There needs to be a considered case for changes such as this document explores.

Although the parliament was designed to created major digital programmes, nevertheless it does. Professionals and experts have shaped the process – both within and without parliament. It might be perfectly possible to do major software programmes in the current fashion – perhaps adding only the oversight of the non-functionals of section 5.3.1.

'Fix' Framework Acts

One of the criticisms of the current framework approach is that it grants the government too much power. One mechanism to address that would be to design a bill process that is extended in time. The initial framework act contains both a State 1 vote for the whole programme and specific sections required to establish the long running programme (establishment of corporate bodies, pay and rations, etc, etc). Instead of taking the iterative work in ministerial orders they are taken as 'short' bills – for some definition of short – coming straight into committee – or even have the committee be proactive in the learning process before going to a 3rd reading.

The aim is not to increase the quantum of parliamentary work here but to spread it over 3, 5, 7 years:



The bill process for the short bills is exactly as for current bills – except the Stage One has already been accepted and voted on by the parliament and the wrecking amendment restrictions pertain[39].

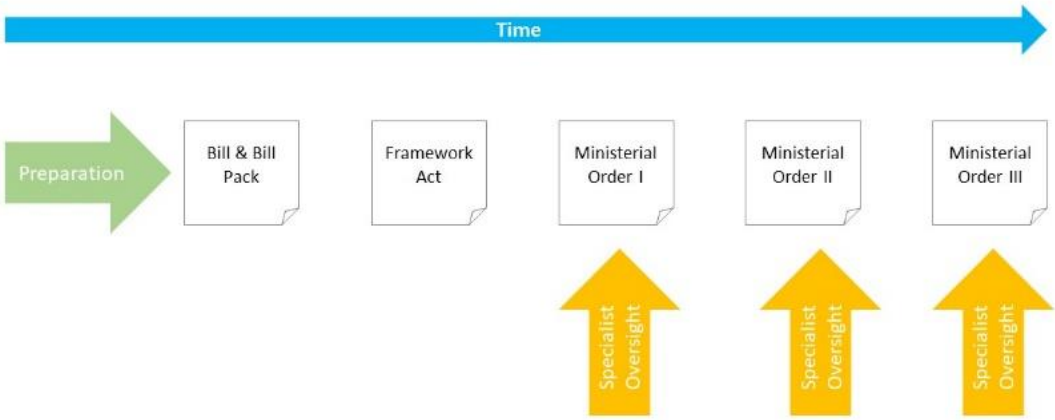
Do one or more of the 6 options

Only if a careful consideration of the current processes indicates that there is still benefit to proceed (and my recommendation is that there is for option 5.3.1 at a minimum) should Scotland proceed to implement some combination of the 6 options for adjusting the legislative process.

39 Standing Orders of the Scottish Parliament Rule 9.10 Section 5.c https://www.parliament.scot/about/how-parliament-works/parliament-rules-and-guidance/standing-orders/chapter-9-public-bill-procedures#topOfNav

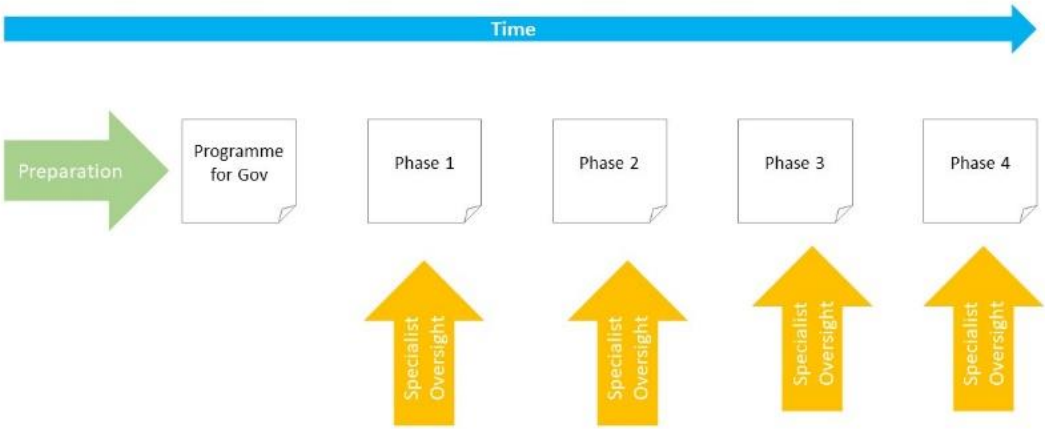
Oversight of non-functionals

The oversight model of functionality for the social security systems is via a parliamentary body – a social security commission (there is one for rUK and one for Scotland).



The model proposed in Working Paper 0 – *The locus of change* is structurally identical – except that the supervisory brief of the Social Security system which has a functional focus is flipped to a non-functional one. The specialist oversight here would be the proposed Digital Audit & Scrutiny Commission.

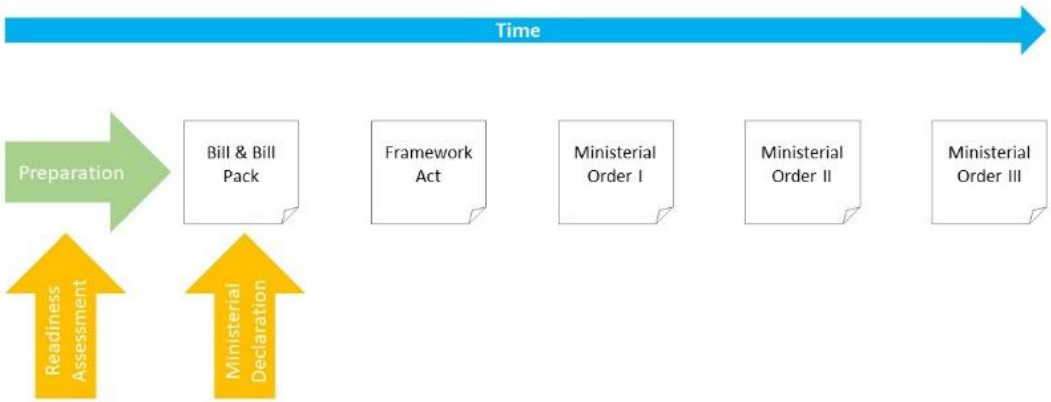
This model can be trivially extended to a non-legislative major programme like payment rails of digital identity:



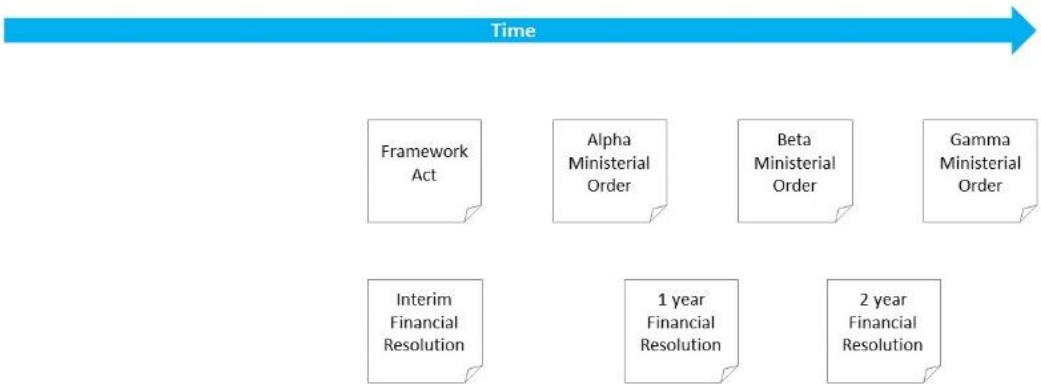
Early catch and kill

This can be considered a version of the Ontario model – a pre-Bill evaluation process is followed to ensure that the policy team is aligned with the in-service and delivery teams and the programme has been fully considered and

appropriately staffed up. In this model as well as assessment, the Minister also gives a declaration to that end in the bill pack – part of the 'charismatic' function of the bill pack.



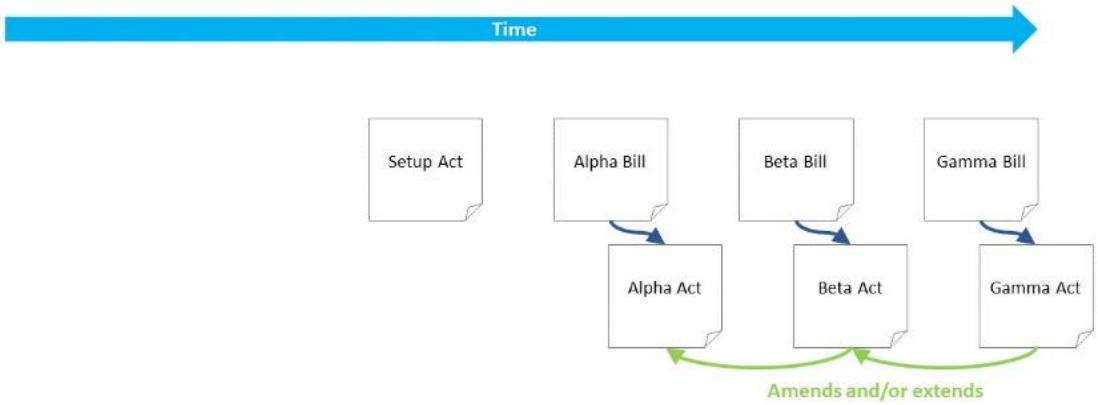
Another variant would be a money catch and kill with the framework bill proceeding as normal but the financial memorandum being spread in time:



In this model parliamentary oversight is built into the time frame and rogue programmes are subject to external independent review as a matter of course and can be caught and killed if they are off track. Note that the financial resolution track is disassociated from the legislative track – the programme is reviewed at fixed pre-defined times.

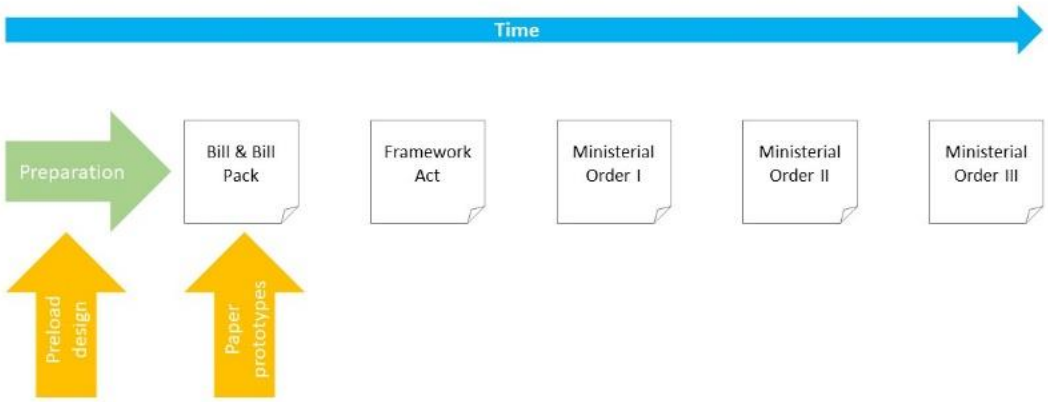
Iterative development

There are a number of iterative options:



In this model the Setup Act just sets the scene, creating the necessary bodies but with the system being substantially undefined. There are then a series of bills (with restricted money in their financial resolutions) develop out the system. This model implicitly implements catch and kill. Each new Act amends and/or extends its predecessors. Having a possible follow-on act was an assumption the design of the Scottish Social Security legislative architecture.

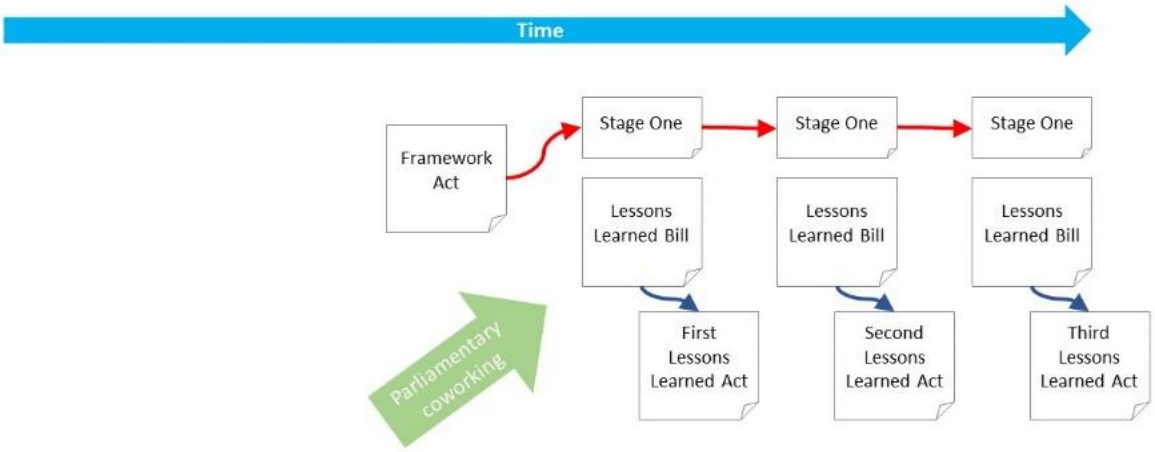
Another more generic approach is to shift the go-to-legislation point as late in the development cycle as possible by insisting up upfront systems design as part of the policy development and delivering a paper prototype of the initial system as part of the bill pack:



There is a lot of anecdotal evidence that exposing senior decision makers to paper prototypes and videos of user testing of live systems is transformative to their understanding of the importance of iteration. Coming to parliament with a paper prototype that reifies the otherwise rather abstract legal text into a comprehensible system must be expected to have a similar impact.

Learning through building

Learning through building is intestinally connected to iteration. The model here looks a lot like both the fixed framework legislation and the iterative model:

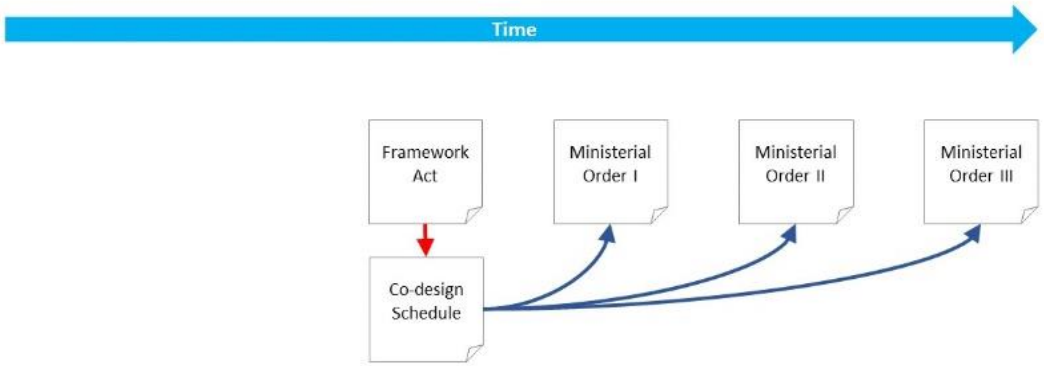


In the Scottish Parliament committees function as both legislative scrutiny, delegated powers scrutiny and post-implementation oversight roles (in Westminster these functions are split across Bill Committees, the House of Lords and the Select Committees).

In a learn-to-build world the boundary between these 3 functions becomes blurred. There are in service systems that are both pre-legislative and in-service. Is there a committee role that combines these three? Is there something between a full amendable act (as shown in the diagram) and an unamendable yes/no up/down delegated power, some sort of super-super-affirmative process with a more dynamic relationship between the committee and the legislative process?

Co-design

The constitutional problems with co-design, that the government has the last word and not the parliament can be partially ameliorated by giving explicit control of the co-designers to the parliament.



It might be better to combine this approach with one of the options that grants stronger oversight powers to the parliament, where ministerial orders are replaced by either full bills or short bills. But perhaps it on itself is enough.

Partition-friendly

The rational for being partition-friendly is to allow agreement on shared objectives but variation on the mechanisms to attempt to achieve that objective.

The vast majority[40] of European Union legislation that specifies or implies digital systems assumes partition as a natural state. Our legislation for partitioned bodies (local authorities, health boards) should assume the same.

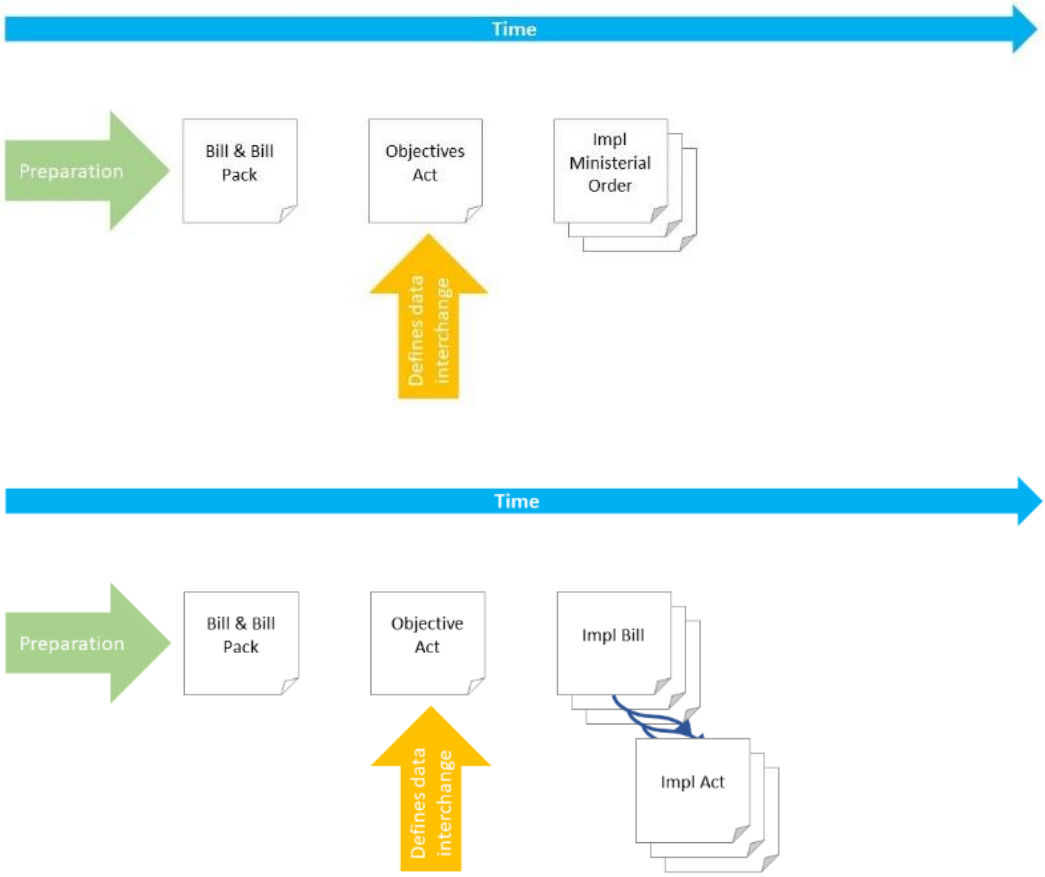
The basic structure of European directives is two part:

- an objectives directive
- implementation directives

If we are serious about organisational autonomy (and we should be) then there need to be mechanisms for co-designing solutions with subordinate state bodies with the parliament giving the lead, the objectives, the implementors having sufficient powers to shape the mechanisms to their local conditions.

40 There is an emerging class of European directives that define standard interfaces between national systems – for instance those dealing with exchange of tax records.

There are a couple of variants on this, for shaping orders and shaping acts. The parliament needs to control the over-arching non-functional requirements though – data interchange and how people transition from one partitioned body to another.



Discovery Process

Context

Of all the working papers, this is perhaps the most complex inter-party constitutional one. Exploring these options will need to be a joint project between the government and the parliamentary corporate body.

The proposals involve changes to:

- the format of legislation
- parliamentary process
- the relative role of parliament and government
- parliamentary and non-governmental institutions
- the machinery of government

It is also a proposal that involves several widely separated disciplines, and as described here potentially could go in a range of different directions.

While it is constitutional it is very low-constitutional and a long way from the seismic faults that structure Scottish party politics. It is also a general problem and not a Scottish one. It is amenable to the input of experts furth of Scotland without a dog in our fights. This should help to take the sting out of it.

Luckily there isn't a major digital project on the scale of Scottish Social Security on the horizon at the moment and this lul makes it an ideal time to consider these issues.

The main BIus project will be recommending a lot of different actions and recommending an incremental approach to implementing them, starting with putting in place small prototype institutions and getting a working cycle in place.

Implementing the proposals in this paper will be one of them, and will be recommended to be done later in the process when the basics are all in place.

This approach should ensure that some of the more tricky political aspects have been dealt with up front – general agreement that the programme of work is something that Scotland should be doing, a recognition that people who previously thought they had no role in shaping the digital state do actually have critical roles to play, and the bones of inter-government/parliament working put in place.

As this paper makes clear there are a range of approaches that may be more or less suitable for different projects – I would recommend that the results of this work be an interim report making recommendations as what approaches would work, and that the final reification, the final decision-making about a new process be taken in the context of the introduction of an actual bill intended to achieve a particular major purpose.

I would propose the following approach to tackling it:

- co-design between parliament and government
- small team
- time-bound, short paper-based war-game with balanced participants selected on the basis of experience

This is the process I envisage:

Lets step through each stage.

Decision makers

Small team drawn from both institutions, odd number of participants, but with a brief to try and work by consensus if at all possible.

I would recommend that the parliamentary side include at least one person comfortable with wrestling with Standing Orders.

The decision makers should also be taken through a short 1 day induction into user experience testing, co-design and paper prototyping techniques. There is considerable evidence that simple exposure to some of the user-centred disciplines can be transformative for senior decision makers who have no experience of them.

Staffing

Small staff, drawn from existing Scottish civil servants:

- an organisational designer with experience of running design workshops. Their job is to design and run the wargame to ensure that maximum learnings can be extracted and also arranging the decision maker inductions
- a parliamentary counsel to ensure that the processes under discussion can be appropriately grounded in law
- a wordsmith/organiser/factotum

The final report should take the form of a legislative architecture document – able to be reconciled to business, organisational and delivery programme architectures.

Wargame Participants

The wargame should have between 12 and 20 participants (including the governing board), so quite small. The criteria should be:

Participants	Rationale
People who designed the Scottish Social Security programme/bill	The biggest source of thinking about long-term legislative architecture in Scotland
Current in-service/delivery for Scottish Social Security	Best placed to understand flaws and lacunae in the actual delivery of Scottish Social Security.
Universal Credit old hands	External perspective/anti-group think – in addition the Scottish team were building a like-for-like but UC was a ground-up so they have a different perspective (see Section 4.3)

Participants	Rationale
Participants in major non-functional software programme (payments, messaging, identity)	Social Security is a law-specified system. The War Game needs experience of a general administrative powers major programme. To keep numbers down it is recommended that these participants be double-dunted – having the additional role of coming from outside of Scotland
Local government	Experience of partitioned systems

WARGAME

The wargame should take the Social Security (Scotland) Act 2018 and 2 of the benefits, cut'n'paste them into new formats and then rerun the parliamentary process – 4 years in a day.

The 12 different recommendations here were deliberately broken out to explore particular aspects of the problem space.

In the war game they should be merged down to 3 or 4 (one of them should assume that Social Security is devolved to local councils to explore the partition-friendly space).

The options should be specifically assessed against doing nothing/minor tweaks.

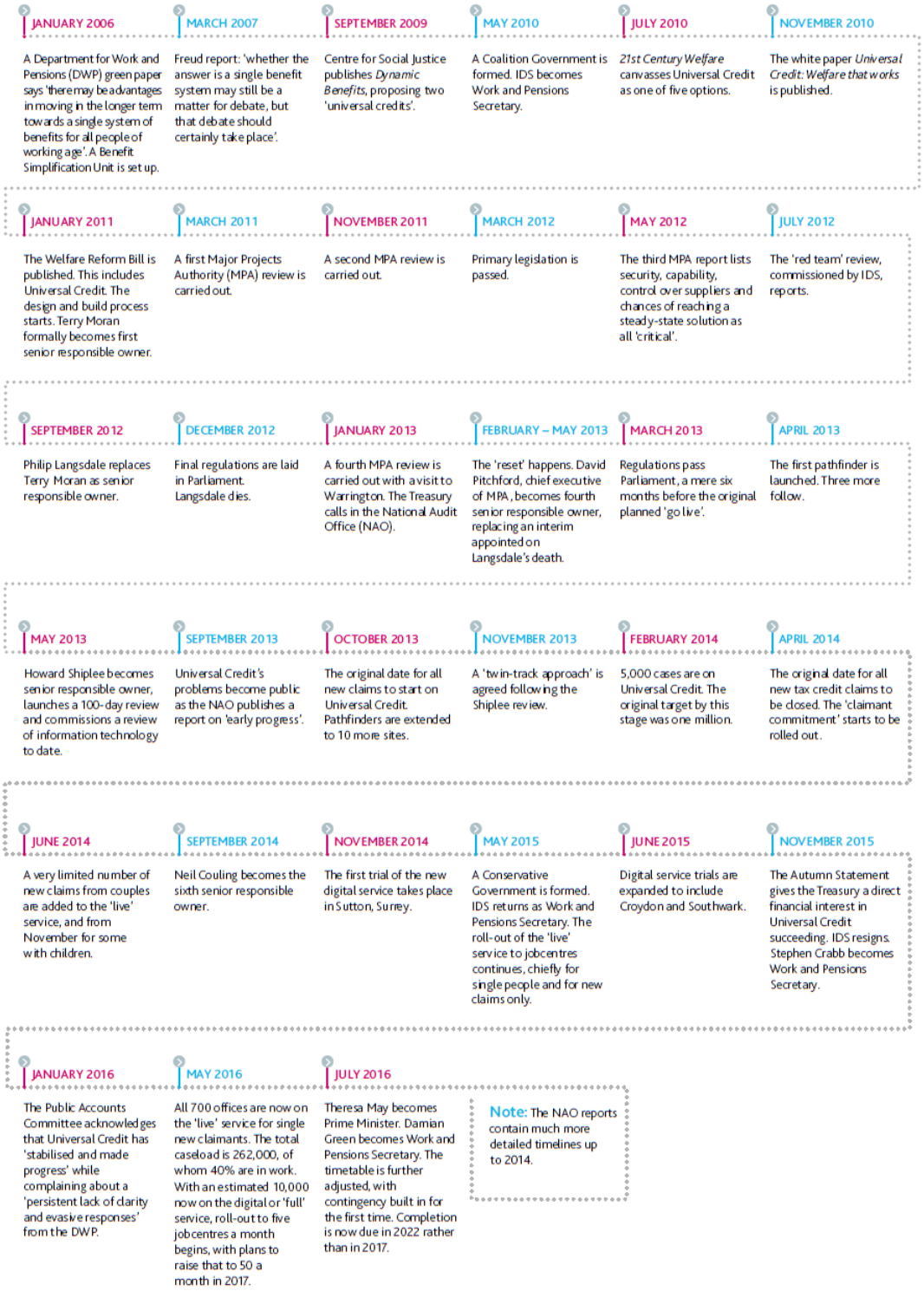
WRITE UP

The secretariat should prepare a draft for the decision makers to finalise, agree, endorse and publish.

It should be structured as much as possible as a legislative architecture – capable of being reconciled with business, organisational and delivery programme architectures.

Appendix 1 – a simplified timeline of UC

A brief and useful summary of the UC delivery process is given by the simplified timeline in Appendix 1 of *Universal Credit – From disaster to recovery?*[41] which I reproduce here:



41 https://www.instituteforgovernment.org.uk/publication/report/universal-credit-disaster-recovery

Working Paper 8 – an Enabling Act

Version 1.0

Productionising Digital Reform

Introduction

Why an Enabling Act?

There are hard limits to the throughput of parliament – approximately 22 Bills per calendar year, and 400-odd Ministerial Orders.

Any proposal to change how the state creates digital systems is Janus-faced, one face looks back to perform Law Reform on statutes that accidently impede the best digital practices – and the other face looks forward to change how we specify new systems.

The first of these views threatens to overwhelm parliament with primary legislative changes which are intended to alter *policy effect* but not *policy intent*.

This paper outlines the upgrade cycle holistically, and shows where an Enabling Bill (one that allows changes to primary legislation to be made by ministerial order) is the appropriate mechanism, if and only if the appropriate oversight and restrictions on ministerial order are put in place.

Who are you?

A parliamentarian, minister, SPAD or engaged citizen.

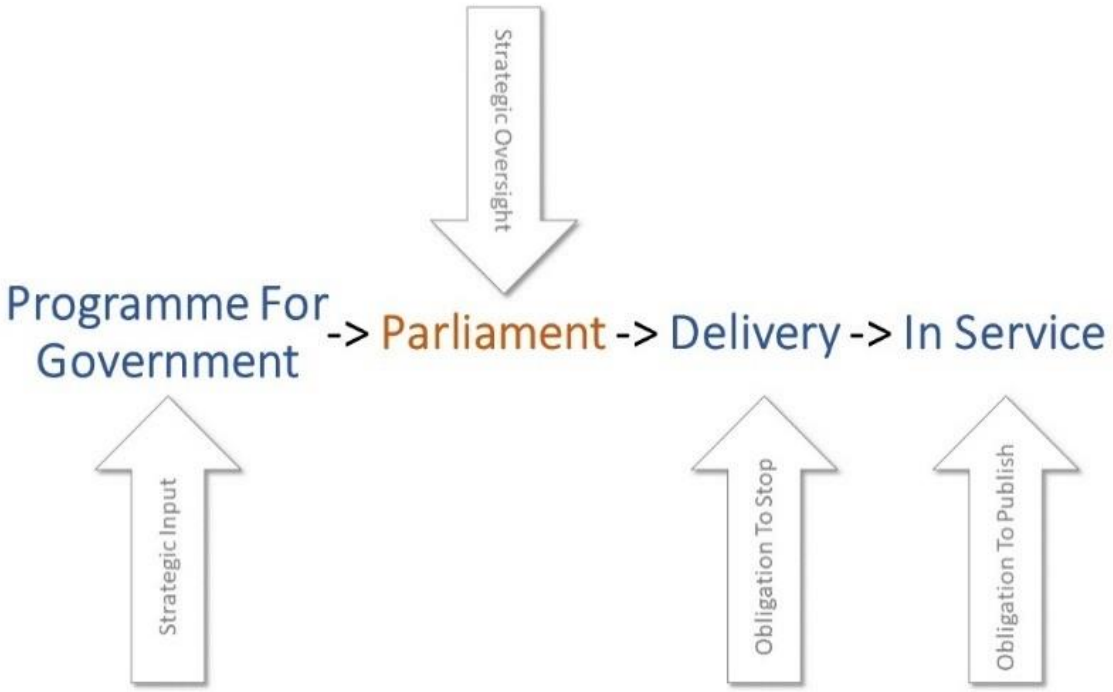
Why should you read this?

Enabling Acts rightly are of concern to all democrats, and proposing them should not be done lightly.

Background

This paper sketches out an architecture of oversight for digital projects and shows where an Enabling Act would fit.

The sketch of the future looks like this:



Each of these elements will be discussed in some detail separately.

Future Elements

Strategic Input

Advancing the digital agenda needs a 'brain' that is capable of co-ordinating and enforcing across departments and up and down the legislative ladder: primary, secondary and tertiary legislation and rules.

This needs to be institutionalised – and contains within it the paradox of decentralisation. To have successful decentralisation and fast iteration, where technical, policy and organisational decisions are devolved to delivery and operational teams there needs to be hard interfaces defined and managed by a central body.

The challenge is making this central body and its edicts as small as possible. It has several distinct roles:

- issuing standards – quality characteristics that devolved teams must meet – but which they are at liberty to meet using whatever tools or techniques suit them

- defining boundaries and alignments – this part of the organisation does this (and has the people, powers, finance to do it in its entirety) and it will expose itself to other parts of the organisation in this manner
- mandating reuse – this system is the sole owner of this data – and other services are to reuse that data via this mechanism

It should as much as possible not be a gateway process, but should be integrated into current processes:

- there is only the most cursory mention of any sort of digital assessment of bills in the L&PU *Bill Handbook* or the *Scottish Statutory Instruments Guidance*, and little training provided to Bill Teams as regards assessing the digital impact of their proposed legislation. The training that does occur aims to make law tech neutral rather than be a proactive intervention
- there should be a programme to identify and promote common software solutions for patterns embedded in the Parliamentary Counsel Office's *Guidance On Instructing Counsel – Common Legislative Solutions*
- the way in which legislation specifies common elements of digital systems (particular with regards to data) needs to be standardised and a common language/structure developed that can be injected into the *Interpretation and Legislative Reform (Scotland) Act 2010*. This is a key element of making legislative specification explicit – so that policy people know that they are making technical decisions rather than assuming that their policy work is disconnected from the delivery side

The model of the organisational unit should be the Scottish Law Reform Commission – which is a body under control of Scottish Ministers (it happens to be statutory). The Scottish Law Reform Commission has the duty of doing technical work regarding the operation of laws and bringing proposals to the attention of Ministers and Parliament – and has its own defined parliamentary procedures (see Strategic Oversight).

The legal mechanism that this body will introduce the majority of its legislative changes would be under the aegis of an Enabling Act – that is to say ministerial orders that have the effect of amending primary legislation.

Strategic Oversight

The thinking behind strategic oversight is that data resembles an asset. Money bills have their own structures, timetabling and parliamentary processes as well as a custom oversight/audit structure.

Data (and the systems built on it) has a very long life. Consequently decisions about digital systems have an impact that will span parliamentary

sessions, elections and governments. It is appropriate that there is strategic oversight.

There are a number of components of this oversight:

- the bill pack should have a digital impact assessment of some description – this would require co-ordination between the L&PU and the Clerk's Office/Parliamentary Corporate Body
- the body making strategic input would need to have procedures for its own bills to be handled in Parliament – analogous to those for Scottish Law Commission, Consolidation, Codification, Statute Law Repeal and Statue Law Revision Bills
- digital transformation at scale will imply a huge number of changes to law and operations – potentially more than the current hard limits of 22 Bills and 400 Orders per year – mechanisms to handle this will need to be put in place. There are two models – it is likely that the oversight will contain both of these elements:
    - the Audit Scotland[42] model – a statutory body with the technical expertise to interrogate the work emerging from the *Strategic Input* and bringing appropriate elements to the attention of Holyrood
    - the Social Security Commission Model[43] of a body that takes proposed and nominally technical changes to legislation under its own consideration (as an appropriately expert group) before they come into the normal Delegated Powers & Law Reform Committee process at Holyrood
- the Strategic Oversight body should be the 'receiver' of Obligation To Stop responsibilities from Civil Servants

Obligation To Stop

Some professions have the ability to stop-the-line – halt work on doing stuff until their concerns are addressed. They are a mixture of 19th century-and-before professions (lawyers and accountants) and very specific modern ones (GDPR/Privacy). (I have written more extensively on it here[44].)

Government procurement and delivery has been plagued by runaway programmes that were known by insiders to be dead but which proved unstoppable while in a herd-rampage-fugue state.

42 https://www.legislation.gov.uk/asp/2000/1/part/2

43 https://www.legislation.gov.uk/asp/2018/9/section/97/enacted

44 https://digitalpolicy.substack.com/p/stop-the-line

After the debacle of the first 2 iterations of Universal Credit, Francis Maude changed the UK Ministerial Code to make Senior Responsible Owners[45] accountable to parliament. (This has not been implemented in the Scottish Ministerial Code which is more tightly focussed on Ministers alone.)

The stop-the-line focus so far has been on projects that were clearly the walking dead at the end – NHS Spine, UC v1 and v2, but in the long term there are more insidious problems where the delivery programme delivers in the short term something that acts as a blocker in the long term – data sets that were supposed to be combined that end up being disjointed being the most obvious one – failure to reuse existing systems and platforms leading to rework. These more insidious problems are also often internally recognised long before they bubble up to the surface. These are essentially the problems that the Digital Assurance Office is designed to address.

There are competing views of how project assurance should be done – in caricature one model looks to a powerful body external to projects armed with sticks and clubs and empowered to dish it out and the other looks to empower individuals within projects to stop the line. The latter tends to work better than the former.

At this point in the process there is not an immediate focus on building out an Obligation To Stop. The reason for including it here is to emphasise the point that the other endpoint of such a power should live within the Strategic Oversight that the parliament provides.

Obligation To Publish

The reporting loop is broken. If the body doing Strategic Input is to work it needs to have access to a complete Service Catalogue, a decent map of data sources and basic performance information. Ditto the Strategic Oversight function.

There is a UK wide requirement[46] to publish basic information. Unfortunately only about 30% of services do so. Some class of gazette will need to exist to capture this information in a single, searchable and summarisable place. It will simply not be possible to build strategic programmes without it – and it will not be possible for proper scrutiny to be undertaken.

Again the development of the obligation to publish is a mixed bag, some steps can be taken immediately, some will require extensive work to build out.

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45 Section =assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1126632/Ministerial_Code.pdf

46 https://www.gov.uk/service-manual/measuring-success/data-you-must-publish

But the key point is that the bodies doing both *Strategic Input* and *Strategic Oversight* need to be designed as future consumers of this sort of strategic information. Without a closed information loop, strategic programmes will drift off into la-la land.

Starting the journey

Strategic Input

The Strategic Input capability can be started with the programme team for the combined licensing proposal. They need to be instructed that they are not just creating software, but a function that can deliver that software in an appropriate manner. It is critical that this team includes an HR/training/change comms component to work out to deploy the new processes and skills to the other policy teams. It's remit should be insert the appropriate content in the L&PU *Bill Handbook* and training programme as well as working with the Parliamentary Counsel Office.

Strategic Oversight

The Strategic Oversight is harder to finangle. Holyrood will need a standing committee[47]. Perhaps its on a par with the Finance, Public Audit, Europe & External Relations, Equalities & Human Rights, Public Petitions and Delegated Powers & Law Reform committees. Perhaps it's a sub-committee of the DPLR. There may or may not be a statutory body alongside that. The goal should be to explore this space with the parliament.

I think we should aim for a temporary amendment of standing orders under Rule 17.1A[48] to create a special path for orders under the Enabling Act.

Rule 6.14 allows joint sub-committees, and Rule 12.7[49] allows for the appointment of external expert advisors. These advisors could charged with designing an oversight mechanism suitable to the parliamentary body as and when the temporary standing order is made permanent.

The changes to the Bill Pack should be declatory and very easy to comply with – the purpose of them is to force the Bill Teams to recognise that their work has a digital component – to make it explicit in the first instance.

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47 https://www.parliament.scot/about/how-parliament-works/parliament-rules-and-guidance/standing-orders/chapter-6-committees#topOfNav

48 https://www.parliament.scot/about/how-parliament-works/parliament-rules-and-guidance/standing-orders/chapter-17-miscellaneous#topOfNav

49 https://www.parliament.scot/about/how-parliament-works/parliament-rules-and-guidance/standing-orders/chapter-12-committee-procedures#topOfNav

I imagine the first draft as just asking people to declare that their system will:

- use the single digital sign-on
- publish its services in the gazette
- use the standard set of operational metrics and make them available in a dashboard
- use UPRNs for address details
- etc, etc

This is a first establish and then incrementally expand approach.

I recommend this approach because it forces the parliament into thinking about what their role is with respect to digital systems and the services that are built on them, but also allows for the co-design of that oversight system with them. It makes explicit that there is a learning process going on.

Obligation To Stop

The first iteration of this should just be the existing Digital Assurance Office.

Obligation To Publish

The first iteration of this is the existing requirement to publish in the UK Government's *Service Manual*.

Relationship to other documents

This working paper should be read alongside - Working Paper 0 – *The locus of change* which fleshes out some of the institutional underpinnings.

Working Paper 9 – Reading legislation with a non-functional eye

Version1.1

Introduction

WHAT IS A NON-FUNCTIONAL EYE?

The specifications of a digital system can be sorted into 2 categories:

- functional specs
- non-functional specs (a bucket for everything *not-in-the-other-bucket* and not *doesn't-work*)

The terms functional and non-functional are technical terms of art – a trade jargon. They are used in this paper- because of the analytical power that their use delivers.

In many cases legislation provides the functional spec[50] for state computer systems, and one of the working premises of the BIus project is that there are no mechanisms for creating pan-state non-functional specifications on the government side, nor for supervising them on the parliamentary side. This is laid out in Working Paper X – *The heart of the beast*.

A road map to putting those mechanisms in is described in Working Paper 0 – *The locus of change*.

Non-functional specifications are important because they include:

- joined up government
- data sharing
- public sector transformation

These are ramparts that government has tried to storm on numerous occasions over the last 20 years and failed.

This working paper will take the Social Security (Scotland) Act 2018[51] and map it to these principles and demonstrate the lack of appropriate institutions.

This paper is belt-and-braces, shoot the vampire with a silver bullet *and* stake it *and* expose the corpse to the sun. Having boldly stated that the functional/non-functional split was the key, then I damn well will read 3 pieces of primary legislation and 76 pieces of secondary legislation and prove to my satisfaction that this in indeed the case.

Functioning computer systems are built with functional and non-functional specifications. Having established that the functional specs are in legislation, the question then arises where the non-functional specs are. The Programme for Government covers the legislative and non-legislative elements of the coming years work. One might expect to find the non-functionals treated there.

50 There is a long technical discussion of this in Working Paper 2 – Rules as code.

51 https://www.legislation.gov.uk/asp/2018/9/contents

A close reading of that reveals they are also absent there. The plane is flying with one wing.

WHO ARE YOU?

You are an MSP, Minister or Spad, a think-tanker or policy person, somebody in delivery trying to build out or drive joined-up government.

WHY SHOULD YOU READ THIS?

You should read this if the analysis of the problem in Working Paper X – *The heart of the beast* and the proposals to fix it in Working Paper 0 – *The locus of change* haven't convinced you – or if you are charged with implementing the new institutions and want better to understand how to do so.

Revision Notes

Version 1.1 has a new section looking at the Programme for Government and identifying the lack of mentions of non-functional elements there.

Reading the legislation with a non-functional eye

INTRODUCTION

This section will consist of a definition of terms.

That will be followed with a quick outline of methodology – with an example. The bulk of the data analysis is confined to the Appendices which run to 83 pages and are a dull as can be imaged and are published separately.

Finally the results of the analysis discussed.

DEFINITION OF TERMS

Let us begin by defining the terms functional specification and non-functional specification. These are both fairly old-fashioned terms dating from earlier days in the software industry. The modern developer, writing code to be deployed in the cloud on Amazon Web Services, Google Cloud Platform or Microsoft Azure, is probably not familiar with them – as much of the non-functional lift is now done by the cloud providers.

Functional specifications are specs that describe the functionality of the system as experienced by the end users – and the functional specs are substantially different for different systems. The term non-functional specifications is a dump-bucket for everything that isn't in the functional spec but is still required.

The non-functional specs are harder to pin down on their own – they tend to be things that could apply to many systems. A typical non-functional spec would include staff sign-ons, use of a database and webserver, and more pertinently requirements around data sharing and joined-up government.

If you look at the functional specs for, say, a social security system and a tax system, it is pretty easy to see which one is which. If you looked at the corresponding non-functional specs for those two systems you would struggle at first blush to tell them apart. You would have to comb them for the specifics of the system to bleed through accidently.

Unfortunately to the civilian ear – non-functional means not-working. Well all trades have their jargon and this is mine.

Systems in the pre-digital can be described in terms of functional and non-functional specifications (even if use of that trade jargon is, in and of itself, chronoclastic).

Examples speak louder than words, so here is a schematic outline of the sort of things you would find in both types of spec, before and after digital technology.

Type	Pre-digital	Digital
Non-functional specs	Buildings	Buildings
	Staffing	Staffing
	Location	Location
	Plumbing	Plumbing
	Transport	Transport
	Electricity	Electricity
		Sign-on
		DB/backup
		Data Sharing
		Joined up government
Functional specs	Paper form design	Digital form design
	Algorithms	Algorithms
	Required information	Required information
	Decisions to be taken	Decisions to be taken

The key point to notice is that there are new non-functional requirements in the digital age that are tightly coupled with the functional requirements.

Electricity is quite interesting as it is a non-functional requirement that pre-dates digital but is handled in the same manner as I will be proposing in my final report – by standards.

What do I mean by electricity is a non-functional requirement? Well, its simple, computers require 12V DC electricity to run – and buildings normally are supplied with 230V AC.

There is a requirement to convert the electricity before a new government department can set up. How do we ensure this at the moment? Well we don't, we just plug kit in. There is a long and historical standard around electricity, plugs, etc, etc and everybody involved just 'knows' what they need to do without communicating.

If electricity was governed in the same manner as joined up government (ie left up to each team to decide) you wouldn't be able to take your kettle from St Andrews House to Victoria Quay because SAH runs American electricity and American plugs, whereas new modern VQ has all LED lights and runs 12V DC over USB C cables from desktop sockets.

The premise that I am testing here is that the format of legislation that leads to the creation of digital systems will reflect the clean separation of the pre-digital era and there will be little or no non-functional specification in the legislation – and delivery teams will be left to define non-functional specs themselves – to choose their own electricity and plug sockets.

Methodology

The methodology used was fairly primitive. I selected every relevant piece of secondary legislation by searching for key words on legislation.gov.uk. There is no formal way to definitively get every piece of secondary legislation issued under an Act[52].

I used the words "social security" and the keywords of each of the title headings in Part2 - Chapter 2 – Types Of Assistance To Be Given[53].

I then went through the 3 primary acts[54] and the 76 bits of secondary legislation, put my business architect/technical architect/code monkey hat on and read them.

I read every section and asked the question "Do I gotta cut some code or do I gotta no?" If yes it's a spec, if no, its non-spec. Then for each spec was in functional or non-functional and if it was non-functional was it endo- or exo-.

52 to the best of my knowledge

53 https://www.legislation.gov.uk/asp/2018/9/part/2/chapter/2

54 Social Security (Scotland) Act 2018, Carer's Allowance Supplement (Scotland) Act 2021, Social Security (Amendment) (Scotland) Bill

An endo-non-functional spec would be a non-functional requirement that only pertained to the Social Security systems in the round, and an exo- one would specify how Social Security systems should work in the round of Scottish government systems.

Picking an example at more or less random - The Social Security (Iceland) (Liechtenstein) (Norway) (Further provision in respect of Scotland) Order 2023[55]

Introductory Text	Classification
1.Citation, commencement and interpretation	Not specs
2.Application of article 2 of the 2023 Order	Functional spec
3. Application of article 3 of the 2024 Order	Functional spec
4. Amendment of the Social Security (Iceland) (Liechtenstein) (Norway) (Further provision in respect of Scotland) Order 2023	Functional spec

Status: This is the original version (as it was originally made). This item of legislation is currently only available in its original format.

SCOTTISH STATUTORY INSTRUMENTS

2024 No. 62

SOCIAL SECURITY

The Social Security (Gibraltar) (Iceland) (Liechtenstein) (Norway) (Further provision in respect of Scotland) Order 2024

Made - - - - 21st February 2024
Laid before the Scottish Parliament - - - - 23rd February 2024
Coming into force in accordance with article 1

At the Court at Buckingham Palace, the 21st day of February 2024
Present,
The King's Most Excellent Majesty in Council

His Majesty, in pursuance of the power in section 179(1)(a) of the Social Security Administration Act 1992(**1**) and all other powers enabling Him to do so, is pleased, by and with the advice of His Privy Council, to order as follows:

Citation, commencement and interpretation

1.—(1) This Order may be cited as the Social Security (Gibraltar) (Iceland) (Liechtenstein) (Norway) (Further provision in respect of Scotland) Order 2024.

(2) This article and article 4 come into force on 11 March 2024.

(3) Articles 2 and 3 come into force on the first day of the month after such time as each party to the Agreement has notified the other that domestic procedures for entry into force have been completed, in accordance with Article 61 of the Agreement(**2**).

(4) In this Order—

(1) 1992 c. 5. Section 179(1) has been amended by S.I. 2020/1508. Section 179(2) provides that an Order made by virtue of subsection (1) may, instead of or in addition to making specific modifications or adaptations, provide generally that legislation to which section 179 applies shall be modified to such extent as may be required to give effect to the provisions contained in the agreement, or as the case may be, alterations in question. Legislative competence for some welfare benefits was devolved to the Scottish Parliament by Part 3 of the Scotland Act 2016 (c. 11), which inserted exceptions into the Scotland Act 1998 (c. 46), schedule 5, Part 2, Section F1. By virtue of section 27(2) of the Interpretation and Legislative Reform (Scotland) Act 2010 (asp 10), the function of His Majesty of making an Order in Council, so far as the function is exercisable within devolved competence, is exercisable by a Scottish statutory instrument.

(2) Upon the parties having notified each other that their respective domestic procedures for entry into force have been completed in accordance with Article 61 of the Agreement, a notice will be published in the Gazette by the Department for Work and Pensions of the Government of the United Kingdom of Great Britain and Northern Ireland.

Rinse and repeat for all 1,149 sections and count them up.

55 https://www.legislation.gov.uk/ssi/2024/62/contents/made

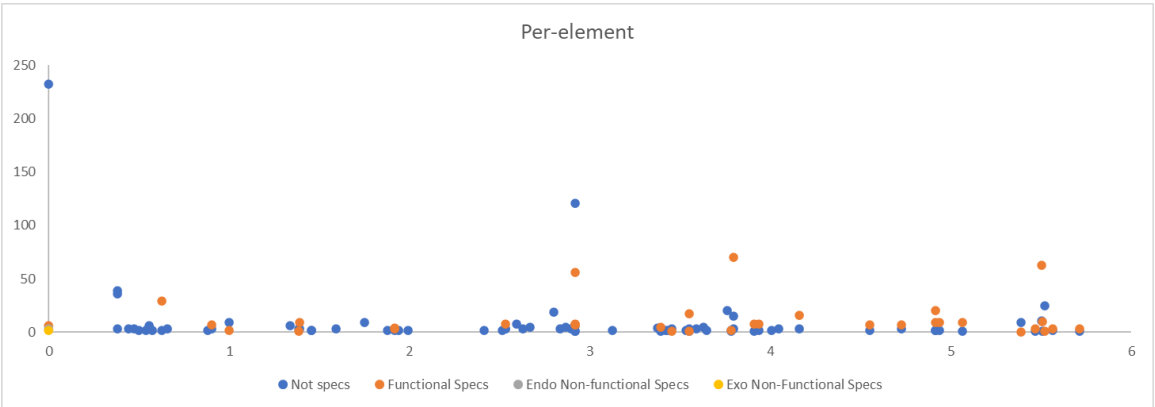
This methodology has a couple of weaknesses. First up, perhaps I have missed some bits of secondary legislation. Secondly quite a few of the sections I declared non-spec I could sort of see with a squinty-eye that they might tangentially include elements of functional specification. Given that the goal of the exercise is to look at the relationship between non-functional and functional specifications with the expectation that there would be little or no non-functionals I didn't regard the fuzziness in the functional spec/non-spec boundary to be significant. Looking at the overall results I can see how a full review of specs cross-checked to business architectures might increase the precision of the count in respect to non-spec/functional spec but that in itself would not increase the accuracy of the final judgement – non-functional specs are almost non-existent.

Results

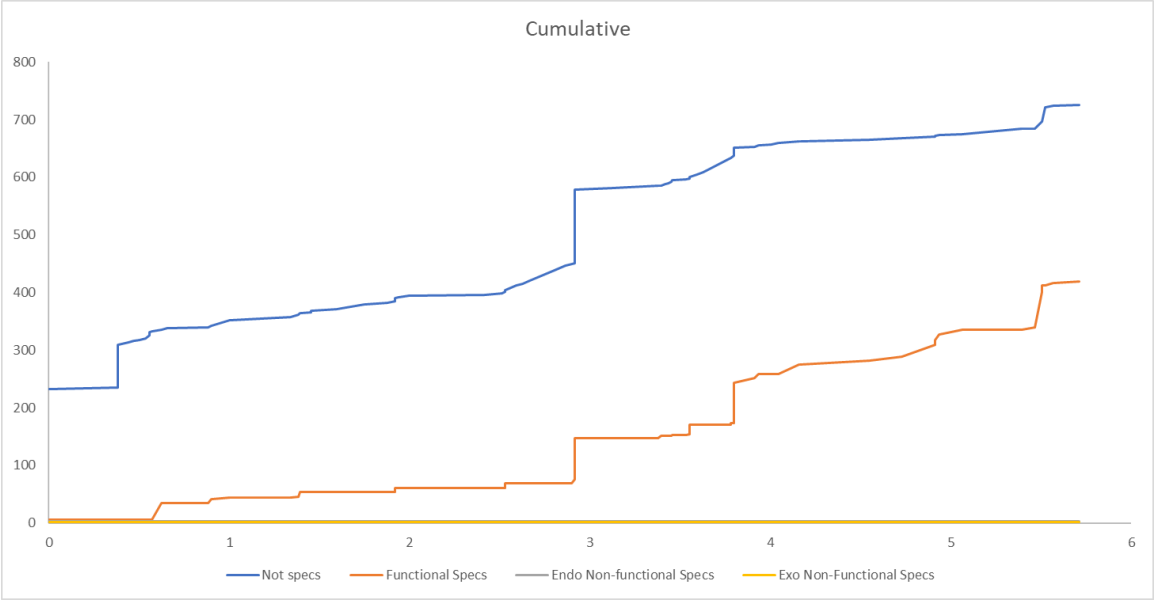
The final totals are:

Taxon	Total No Of Sections
Non-spec	725
Functional Spec	419
Endo Non-Functional Spec	3
Exo Non-Functional Spec	2

We can plot the results as a time series – with the x-axis being years from the first reading of the Social Security (Scotland) Act 2018.



And also cumulatively on the same x-axis.



Only the original Act gave any thought to non-functional specifications – and even then it was cursory.

Reading the Programme for Government with a non-functional eye

If legislation is skewed towards functional requirements and departments and parliamentary committees are functionally aligned then we should expect to see an absence of discussion of non-functional concerns in the *Programme for Government*.

On reading the 2023-2024 *Programme for Government*[56] that is indeed what we see.

The First Minister's overview includes a commitment to public sector reform:

Community: Delivering efficient and effective public services

and

It takes the critical next steps in reforming and modernising our public services

Public sector reform appears again in the DFM's section as an ambition:

We believe in supporting people and communities by understanding their needs and their strengths, so we will enable our public servants to co-design systems focused on early support and intervention where and when people

56. https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/09/programme-government-2023-24/documents/equality-opportunity-community-programme-government/equality-opportunity-community-programme-government/govscot%3Adocument/equality-opportunity-community-programme-government.pdf

need it. We must continue to improve the way we deliver public services, driving efficiencies and use of digital and technology

Digital is seen as important in addressing the financial situation:

Setting out an ambitious ten-year programme of reform will require us to continue to work closely with the wider public sector, the third sector and business partners. This partnership approach will involve considering how power and resources should be shared between national government, Local Government, and our communities. Public service reform is central to how, together, we will respond to a challenging financial environment, make sure services are efficient and effective, and make the most impact on our commitments to reduce poverty and inequality, to support sustainable growth, and to deliver a just transition to net zero.

The existing infrastructure programmes - programmes that will structure the digital state for 100 years - make a tentative entry:

Deliver a framework for digital service transformation with a focus on end-to-end services, including work to catalogue assets available across the public sector, and continue the roll out and development of digital identity, payment and cloud services, and other common components – working closely with Local Government partners to deliver, as well as to share best practice.

These programmes have no formal statutory basis and as a result have little parliamentary oversight.

There is a double or a treble invisibility even. The lack of visibility in the *Programme for Government* dampens political pressure.

The contrast with physical infrastructure is stark. As I write this Ministers are celebrating the new Levenmouth train link opening on social media.

This invisibility is structural and not a reflection on actual work being done or importance. It is the other side of the imbalance that shows up on reading the Social Security legislation with a functional eye.

Conclusion

We don’t specify non-functional requirements in law. And the entire parliamentary system is orientated away from them. They don’t appear in any significant way in the Programme for Government. If we want them specified we need to define institutions and processes to do them.

Working Paper 10 – Immediate Hygienic Measures

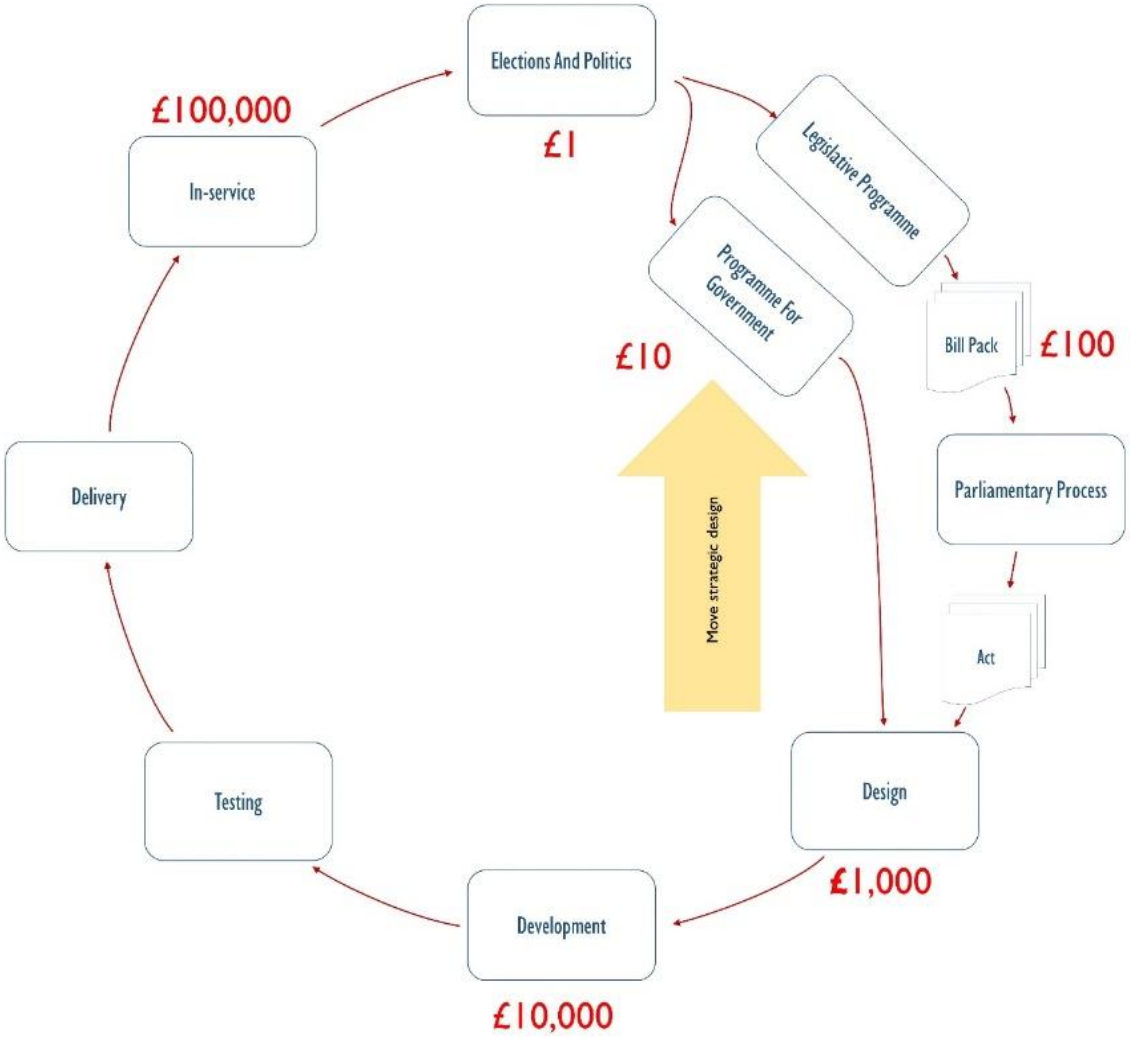
Version 1.3

Just do it!

Introduction

Why hygiene measures?

In digital the costs of fixing errors compounds around the development cycle – the proposals in this paper move error-fixing up the cycle:



The measures are the simplest possible steps to try and shift the critical design decisions to the appropriate place in the end-to-end cycle to ensure that our digital work is more effective.

What are hygienic measures?

There are some things that you just ought to be doing, that you know you ought to be doing, but you don't always do. Hygienic measures are simply the processes you put in place to ensure that you do them 100% every time.

In the context of the digital state the thing Scottish Government just ought to be doing religiously is strategically considering technology and data at the

start of any policy initiative and not after the policy is made, the bill is drafted, and the final act gets Royal Assent.

These considerations include:

- does this policy require new legislation or can existing powers and systems be used to drive it?
- what do success and failure look like in the context of this policy? And how and when will we measure them?
- do we require new measures or statistics to assess the success and failure of this policy? Will they be internal (based on operational data) or from citizen/social surveys or a combination of both?
- does this policy require a new system? Or can it be implemented on an existing system?
- is this proposal generalisable? Can it lead to a strategic technical solution for both this policy problem and range of future policy problems?
- what data would the best solution require? And does that data already exist somewhere in Scottish government?
- if there is a new system, that collects or generates new data, what existing and future systems could make use of that data?
- what existing common services (payment, communication, etc) could and should it reuse to save costs and increase effectiveness?
- what services does it require that could in themselves become once-and-done future common services across Scottish government that could be built alongside it?

The BIus project is going to make a range of fiddly-complicated recommendations which include some basic hygiene measures. The interim recommendations have been workshopped with a range of participants and the question was asked "why don't we just do these hygienic things now?". So here we are.

WHO ARE YOU?

You are an MSP, Minister or Spad, a think-tanker or policy person, somebody in delivery trying to build out or drive joined-up government.

WHY SHOULD YOU READ THIS?

These are the simple measures that can make radical and immediate impact. The benefits of doing in the short term will be minor but will compound like interest and the impact of doing this repeatedly and continuously will have enormous impact in the medium and long term – *if they are proceduralised and made normal, everyday* practice – what we just do.

Revision Notes

Version 1.1	The thinking on future state criteria have evolved slightly – and there are minor languages changes – the use of Systems Impact Assessment instead of Digital Memorandum for consistency with the report and its recommendations.
Version 1.2	Additional material about the history of the bill pack was included in the appendix

RFC 2119[57]

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.

Future State

The key process changes happen at the very start of the Bill Process. The key questions that need to be asked before designing the legislation are:

- does this policy require new legislation or can existing powers and systems be used to drive it?
- what do success and failure look like in the context of this policy? And how and when will we measure them?
- do we require new measures or statistics to assess the success and failure of this policy? Will they be internal (based on operational data) or from citizen/social surveys or a combination of both?
- does this policy require a new system? Or can it be implemented on an existing system?
- is this proposal generalisable? Can it lead to a strategic technical solution for both this policy problem and range of future policy problems?
- what data would the best solution require? And does that data already exist somewhere in Scottish government?
- if there is a new system, that collects or generates new data, what existing and future systems could make use of that data?
- what existing common services (payment, communication, etc) could and should it reuse to save costs and increase effectiveness?

57 https://www.rfc-editor.org/rfc/rfc2119

- what services does it require that could in themselves become once-and-done future common services across Scottish government that could be built alongside it?

Some of these questions needs to be injected at the head of the bill process, others trickled in to the early, decision-making process.

The policy team is fully integrated – with delivery, technical, data, design and analytics/statistical staff engaged from the beginning.

Policies are registered on a policy register (and retired when they are no longer being pursued) and at registration time the plan for monitoring/statistics/verifying effectiveness are also published.

As services are developed or enhanced, their details (and the data they are based on) are updated on the register of services (which is machine readable, contains URL space, data schemas, etc, etc).

Service on the register of services reference the register of powers which describe the various rules for use and reuse of the data.

These registers will be discussed further in Working Paper 5 – *Law Reform for data* which is in preparation).

If primary legislation is required, it will have a digital impact assessment as part of the Bill Pack. If it grants new powers that can be implemented in digital systems, it will result in a new registration of powers that new or changed services can draw upon as their legal basis.

Current State

Introduction

The section will look at:

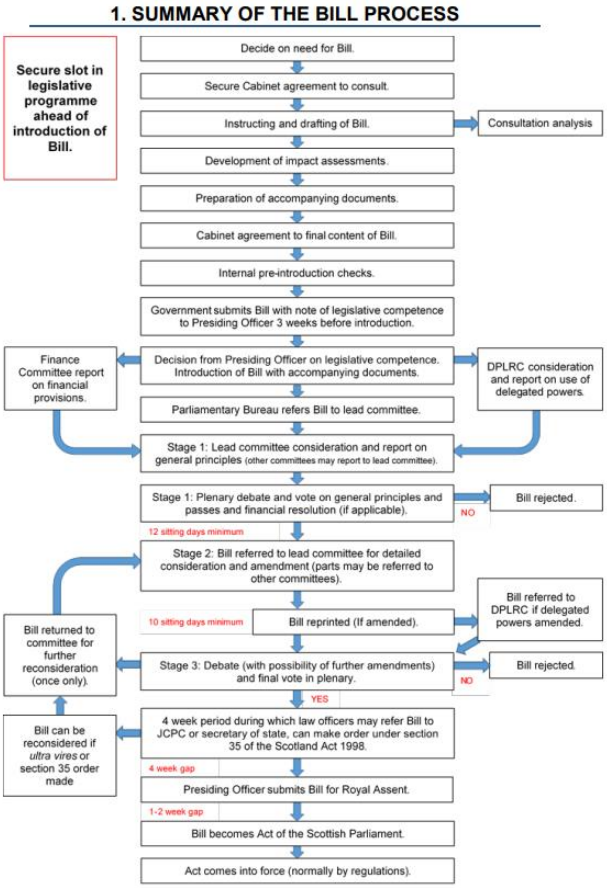
- The Parliament and Legislation Unit's *Bill Handbook* (the process bible) and their *Scottish Statutory Instruments Guidance*.
- Training provided to bill teams
- The current Digital Impact Assessment
- The Bill Pack

Bill Handbook and Scottish Statutory Instruments Guidance

The Legislation & Parliament Unit has a *Bill Handbook*[58] that describes the process a bill team should follow to create a new Bill.

58 https://www.gov.scot/binaries/content/documents/govscot/publications/foi-eir-release/2022/07/foi-202200306018/documents/foi-202200306018---information-released/foi-202200306018---information-released/govscot%3Adocument/FOI%2B202200306018%2B-%2BInformation%2Breleased.pdf

This is the full process:



The Unit also publishes *Scottish Statutory Instruments Guidance*[59] which has no mention of digital in it.

It is likely that the final report will make recommendations on templating for certain types of secondary legislation dealing with data but the final details of that are still being teased out and will be the addressed in three future working papers:

- Working Paper 5 – Law reform for data
- Working Paper 7 – An experimental legislative process
- Working Paper 9 – Reading legislation with a non-functional eye

It is likely to be part of the architecture of reform outlined in:

- Working Paper 8 – *An Enabling Act*

Bill Team Training

Bill Teams are trained every year – the current training cycle is 2 weeks into a 10-week programme so there is still the possibility of slipping an extra slot in.

59 SCOTTISH STATUTORY INSTRUMENTS GUIDANCE V1.1 – personal copy – its in EDRM but I don't have access.

The programme is:

	Details
Seminar 1 Introduction to Bills, 21 February, 10:00 – 11:00	To provide an overview of the Bill process, Cabinet clearances and Political Acuity and reflections from a previous Bill team on the passage of their Bill.
Seminar 2 Legislative programme assurance and oversight, 28 February, 10:00 – 11:00	Overview of governance and project management, the Bute House Agreement, and the development of the Programme for Government.
Seminar 3 External Engagement, 6 March, 10:00 – 11:00	Discusses the need for consultations and how to engage with citizens and stakeholders.
Seminar 4 Finance and Policy-proofing, 13 March, 10:00 – 11:00	Awareness on how to develop Financial Memos and EU implications.
Seminar 5 Impact Assessments	Discusses the importance of Impact Assessments when developing policy through the whole Bill process, highlighting those with a legal requirement.
Part 1, 20 March, 10:00 – 11:00	Human Rights in policy making and Equality Impact Assessment (EQIA)
Part 2, 27 March 11:00 – 12:00	Business and Regulatory Impact Assessment (BRIA) and New Deal for Business Fairer Scotland Duty assessment (FSD)
Part 3, 17 April 10:00 – 11:00	Child Rights and Wellbeing Impact Assessment (CRWIA),Data Protection Impact Assessment (DPIA)
Part 4, 24 April 10:00 – 11:00	Strategic Environment Assessment (SEA) Island Communities Impact Assessment (ICIA)
Seminar 6 Instructions and accompanying documents, 1 May, 10:00 – 11:00	Awareness on what to look out for when considering policy instructions and completing accompanying documents
Seminar 7 Parliamentary Stages, 8 May, 10:00 – 11:00	An insight on the role of the Parliamentary Legislation Team in the bill process and how the Parliament scrutinises accompanying documents

	Details
Seminar 8 Minister for Parliamentary Business, 15 May, 10:00 – 11:00	This seminar is to provide an overview of the Minister for Parliamentary Business role and how officials should engage with Private Office and Special Advisers

The current Digital Impact Assessment

The DIA appears fleetingly in the Bill Handbook in Section 8:

Digital (Administrative)	There is not a formal Digital Impact Assessment. Bill Teams, SGLD and PCO are asked to consider how their Bill can be 'future proofed' in light of upcoming changes to technology. For further advice on this, Bill Team colleagues should contact the Digital Policy and Strategy Unit. Lead contact: [Redacted] (Ext [Redacted])

I tracked down the colleague mentioned and read all the background papers. The guidance was to not use language that specified a technology (ie "cassettes" or "DVDs" but generic terms "digital storage" etc, etc). No bill team had contacted the group in a number of years – this 'informal DIA' is effectively defunct.

The Bill Pack

Bill packs contain some or all the following elements:

	Legal Basis	Type	Responsibility
The text of the Bill		Justiciable	Parliament
The Explanatory Notes	Standing Orders (9.3)	Justiciable	Parliament
Financial Memorandum	Standing Orders (9.3)	Charismatic	Parliament
Policy Memorandum	Standing Orders (9.3)	Charismatic	Parliament
Legislative Competence Memorandum	Standing Orders (9.3)	Indicative	Parliament
Delegated Powers Memorandum	Standing Orders (9.3)	Charismatic	Parliament
Auditor General's Report	Standing Orders (9.3)	Charismatic	Parliament
Business and Regulatory Impact Assessment (BRIA)	Administrative	Charismatic	Government

	Legal Basis	Type	Responsibility
Child Rights & Wellbeing Impact Assessment (CRWIA) [60]	Ministerial duty	Charismatic	Government
Data Protection Impact Assessment (DPIA)	Statutory	Indicative	Government
Digital (DIA)	Administrative	Charismatic	Government
Equality Impact Assessment (EQIA)	Statutory	Indicative	Government
Fairer Scotland Duty (FSD)	Statutory	Indicative	Government
Human Rights	Administrative	Indicative	Government
Island Community Impact Assessment (ICIA)	Statutory	Indicative	Government
Strategic Environmental Assessment (SEA)	Statutory	Indicative	Government

Justiciable elements are those things that a court will consider directly when reviewing state actions taken under the specific law (in addition to those listed under some circumstances the record of the debate of the parliament at the time the relevant text was adopted may also be considered).

Indicative elements are ones where there is an external statute (the Scotland Act 1998, the Islands (Scotland) Act 2018, etc, etc) against which the operation of the bill will be assessed by the courts – and they indicate that the bill team did the appropriate work pre-introduction to satisfy themselves that the final bill will comply with the appropriate legislation.

Charismatic elements are declarations by the minister that certain types of work have been done – considering the financial implications, working through the policy and so on – and are essentially quality measures.

The Clerks at the Scottish Parliament will inspect incoming Bills and Accompanying Documents and ensure that any elements of the Bill Pack mentioned explicitly in the Standing Orders are present. The government is responsible for ensuring that the other elements are done appropriately.

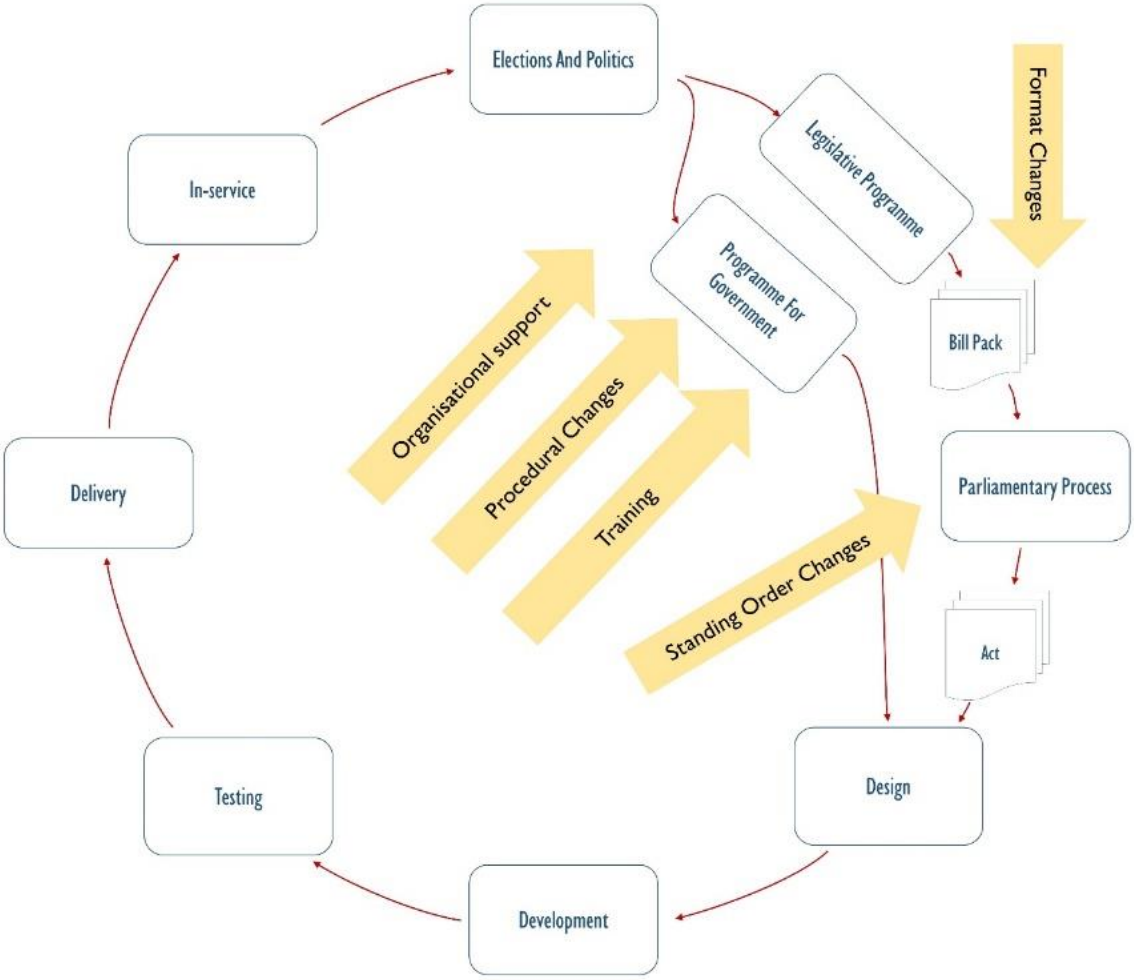
60 The CRWIA will become Statutory/Indicative once/if the UN Convention on the Rights of the Child (UNCRC) is incorporated into Scots Law – whether at Westminster or Holyrood.

Hygienic measures

Overview

The hygienic measures are the smallest set of comprehensive measures that will make the new process explicit. They will be the basis of the development of the final state and should be seen as deliberately transitional and transformative – changing by doing. The goal is to drive cultural change into the various teams and have them drive it on into their departments.

There are 5 tasks required to start this off:



- Organisational support
- Procedural changes
- Training
- Format changes
- Standing Order changes

The Programme for Government process

The important thing to understand is that the Programme for Government (and its major sub-component the Legislative Programme) are a proxy for the location of this intervention.

Policy development and implementation involves three separate mechanisms:

- Primary legislation (Bills becoming Acts)
- Secondary legislation (Scottish Statutory Instruments or Ministerial Orders)
- Day-to-day work under existing powers previously granted

It follows that digital implementations are effected by the same three mechanisms.

These 3 channels have different political profiles – going from high to low (primary then secondary then day-to-day) and these profiles don't necessarily reflect their importance for the task of delivering the changes that we need. (Part of the overall project is altering those profiles for key tasks, programmes and services in the digital world.)

As a consequence of the profile, these three channels are differently proceduralised. The primary route is highly procedural, the secondary less so and the day-to-day work is done on a departmental basis.

The hygienic changes in this document are all located at the primary legislative level – the most proceduralised and formal. But they should be seen as the thin end of a wedge that needs to get the desired outcomes (thinking about technology, data, their use and reuse done as early as possible in all policy/implementation development) *especially in the hard to influence day-to-day/departmental sphere*.

Organisational support

The bill teams are not necessarily capable of assessing technical options – because that (currently) is not what they are trained to do. It is known that integrated bill teams (policy and implementation working together) deliver the sort of systems that we want, and the strategic goal is to make integration of policy and implementation simply *how we do things*.

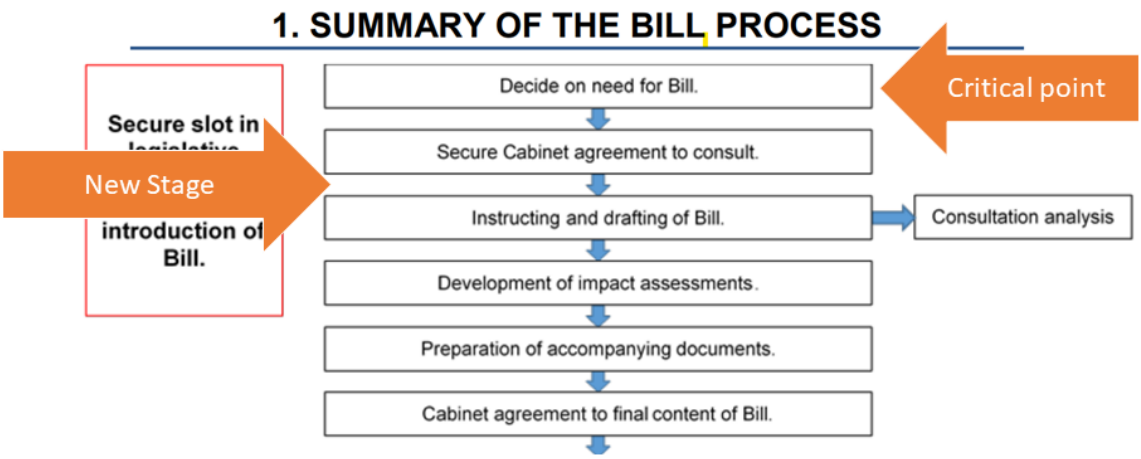
In this initial phase there should be a team who support the bill process – along the lines of the Finance Team that is dedicated to helping teams create their financial memoranda.

This team would be first engagement with the policy makers – ask the questions and probe their intentions before they become hardened and then act as marriage brokers between singleton policy groups and their appropriate

delivery/in-service teams and the technical people along the way. Strategically this team is a scouting organisation identifying weak and strong departments, areas where cultural work and training needs to be done.

It should be a small (and possibly involving part timers) 1, 2 or 3 FTEs – there are 16 to 22 bills per year to be advised on.

The key process changes that this team needs to effect are:



The Bill Process is the way in which the Legislative Programme is built – which is just part of the Programme for Government – part of the team's job is to shape the Programme for Government – and inter alia the Legislative Programme.

Within the Bill Process, the Digital Impact Assessment must precede and not follow the instructing and drafting of the Bill – the technical choices will influence the legal choices (and vice versa) – joint working with the Parliamentary Counsel's Office and the Bill Team is critical in this phase.

Training

There is an existing and repeated training programme for Bill Teams – Digital needs to be injected into it. In the first year (the current and running training programme) that should just be a simple presentation along the lines of "hey talk to us, the digital specialists" and then next year when the programme has matured, there should be a full and dedicated session, a new 11th session, talking through the technical stuff.

Format changes

The Bill Pack needs to have a Digital Impact Assessment and the first iteration should be the simplest one – less than a page of A4.

The introducing Minister should simply affirm that the Bill Team consulted the technical, data, design and delivery/in-service teams appropriately.

The purpose of this declaration is to make "don't embarrass the minister with respect to tech" as a standing rule of policy and bill development – that's all. At this point the content of the DIA is a lot less important that the existence of it.

The temptation will be to rush and introduce a full-scale DIA with all the possible bells and whistles now. This should be avoided. The development of accompanying documents has been a slow and gradual enrichment process (see Appendix 1 – History of the bill pack). The digital part of it has a hundred years to grow up – don't rush it.

Standing Order changes

The final state is a change to Standing Order 9.3 with the parliament expecting (and enforcing) a A Systems Impact Assessment.

The A Systems Impact Assessment should be charismatic – or more correctly it should not be justiciable.

The fact that the existing Digital Impact Assessment which was being done on an administrative basis fell into desuetude is all the motivation for making this properly permanent.

A Systems Impact Assessment could unilaterally be injected into the Bill Pack by the government - as the Digital Impact Assessment was. This would be a mistake.

There are two reasons to push for changes to Standing Orders and the format of the Bill Pack early.

The first is that Ministerial Declarations perform an important normative task. A core mantra of civil servants is *don't embarrass your minister*. If the Bill Team training is the carrot, the Bill Pack is the stick.

The second is that the Bill Pack is the strategic point of unity of specification. We have seen that the functional specification of state systems is written into the legislation and the non-functionals are neglected. Institutions to manage the non-functionals have been designed.

The Bill Pack, with a Services Impact Assessment, is where these two worlds meld into one - *this is what we are doing* and *this is how we are doing it*. Law, standards, services and components - the complete packet of specification.

Constitutionnalité tells us what we need to do, *Explicite* tells us we have to do it, *Simplicité* tells us to do it as early as possible.

Appendix 1 – History of the bill pack

The modern control mechanisms for development of legislative systems are comparatively sophisticated. Each functional bill is accompanied through

parliament by a parallel financial resolution which effectively has a veto role on commencement. If we regard data as a state asset, and code as a state liability then some sort of parallel management process that rhymes with the financial one suggests itself.

The bill pack is the place where non-functional & infrastructural specifications can be added to functional ones. With the charisma of ministers behind it, the civil service will fall in line.

To that end the history and origin of the modern bill pack was investigated.

In 1689 Bills were simple dumps of scarcely structured text as can be seen in this tidied up official version of the Bill of Rights:

1688 CHAPTER 2 1 Will and Mar Sess 2

An Act declareing the Rights and Liberties of the Subject and Setleing the Succession of the Crowne.

[xi]Whereas the Lords Spirituall and Temporall and Comons assembled at Westminster lawfully fully and freely representing all the Estates of the People of this Realme did upon the thirteenth day of February in the yeare of our Lord one thousand six hundred eighty eight present unto their Majesties then called and known by the Names and Stile of William and Mary Prince and Princesse of Orange being present in their proper Persons a certaine Declaration in Writeing made by the said Lords and Comons in the Words following viz

The Heads of Declaration of Lords and Commons, recited.

Whereas the late King James the Second by the Assistance of diverse evill Councellors Judges and Ministers imployed by him did endeavour to subvert and extirpate the Protestant Religion and the Lawes and Liberties of this Kingdome.

Dispensing and Suspending Power.

By Assumeing and Exerciseing a Power of Dispensing with and Suspending of Lawes and the Execution of Lawes without Consent of Parlyament.

Committing Prelates.

By Committing and Prosecuting diverse Worthy Prelates for humbly Petitioning to be excused from Concurring to the said Assumed Power.

Ecclesiastical Commission.

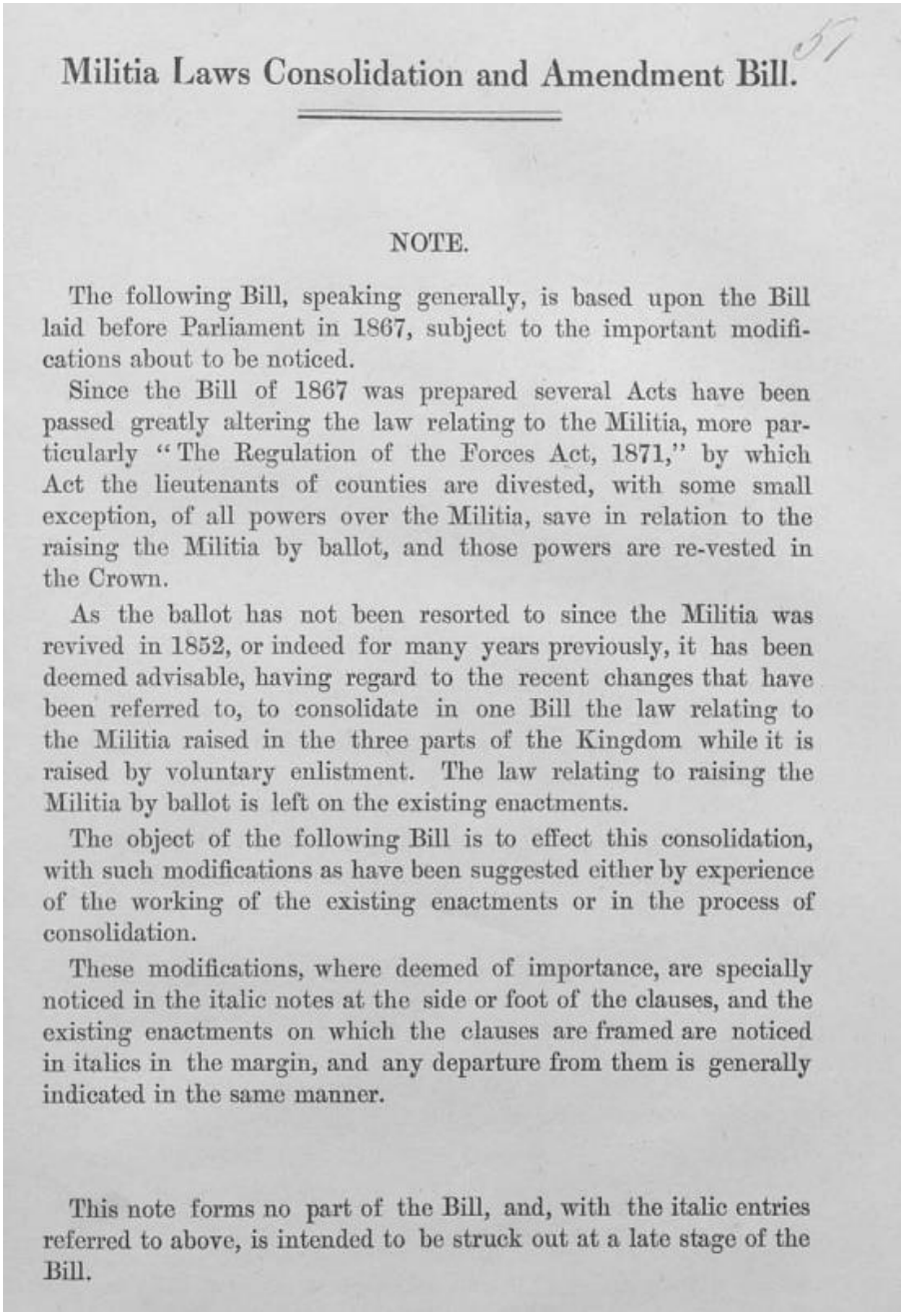
By issueing and causeing to be executed a Commission under the Great Seale for Erecting a Court called The Court of Commissioners for Ecclesiasticall Causes.

The actual text is just a dump:

Until 1875 and the birth of structured legislation, bills were simply slabs of code and structure was applied to them in the reading.

The 1875 Militia Bill marks the birth of the modern bill pack. It tidied up a raft of older legislation. Each clause of the bill was preceded by a heading and the whole bill had a table of contents at the beginning - termed a breviate.

These decorations on the face of the bill were struck out on its passage through to Royal Assent.



Militia Laws Consolidation and Amendment Bill.

NOTE.

The following Bill, speaking generally, is based upon the Bill laid before Parliament in 1867, subject to the important modifications about to be noticed.

Since the Bill of 1867 was prepared several Acts have been passed greatly altering the law relating to the Militia, more particularly "The Regulation of the Forces Act, 1871," by which Act the lieutenants of counties are divested, with some small exception, of all powers over the Militia, save in relation to the raising the Militia by ballot, and those powers are re-vested in the Crown.

As the ballot has not been resorted to since the Militia was revived in 1852, or indeed for many years previously, it has been deemed advisable, having regard to the recent changes that have been referred to, to consolidate in one Bill the law relating to the Militia raised in the three parts of the Kingdom while it is raised by voluntary enlistment. The law relating to raising the Militia by ballot is left on the existing enactments.

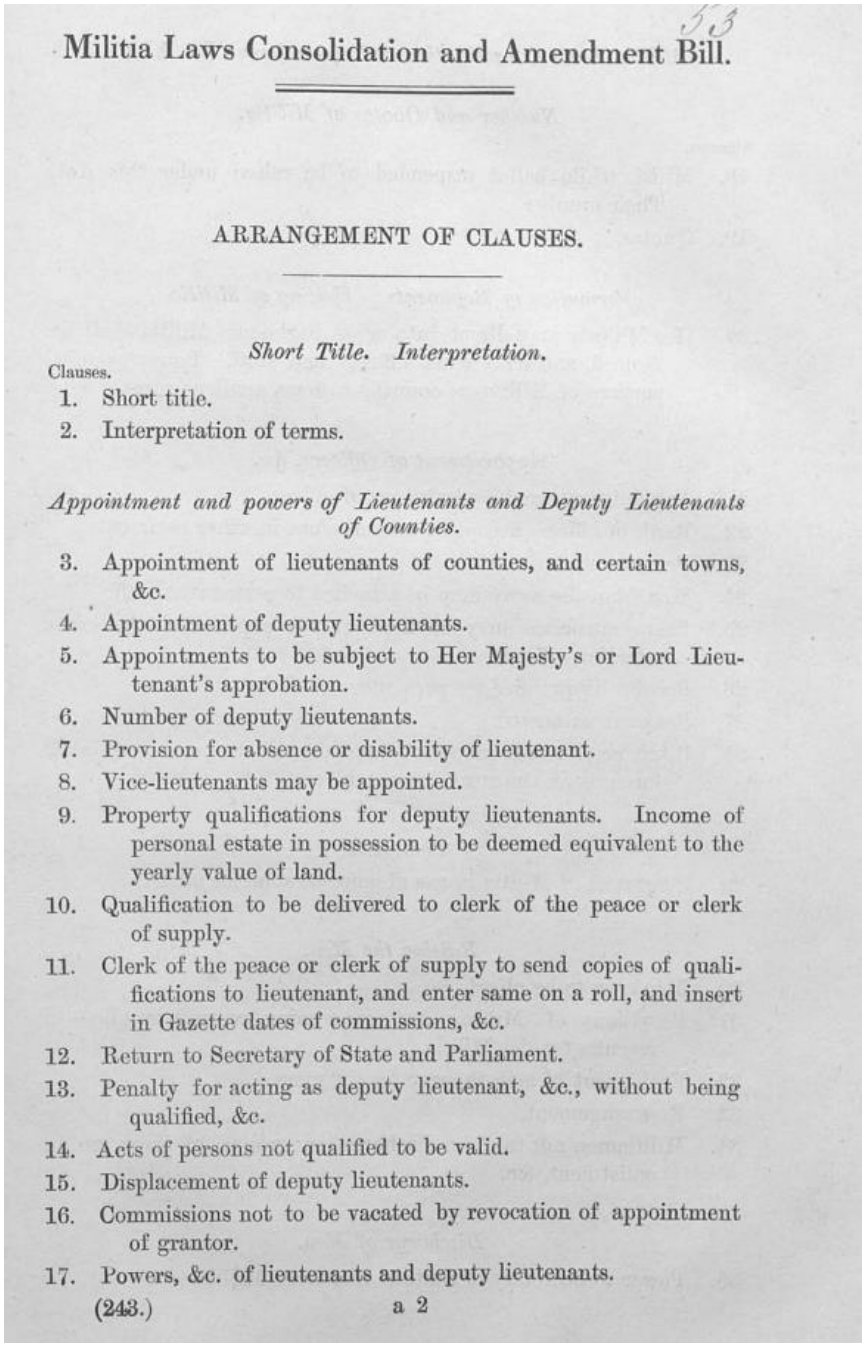
The object of the following Bill is to effect this consolidation, with such modifications as have been suggested either by experience of the working of the existing enactments or in the process of consolidation.

These modifications, where deemed of importance, are specially noticed in the italic notes at the side or foot of the clauses, and the existing enactments on which the clauses are framed are noticed in italics in the margin, and any departure from them is generally indicated in the same manner.

This note forms no part of the Bill, and, with the italic entries referred to above, is intended to be struck out at a late stage of the Bill.

Gradually that breviate and those headings became the standard form of structured legislation and the core of the modern bill pack.

This bill marks the real birth of the modern Bill Pack of Bill and accompanying documents as, alongside the Breviate, it included the first proper Explanatory Notes – a single line explanation of each clause:



Militia Laws Consolidation and Amendment Bill.

ARRANGEMENT OF CLAUSES.

Short Title. Interpretation.

Clauses.

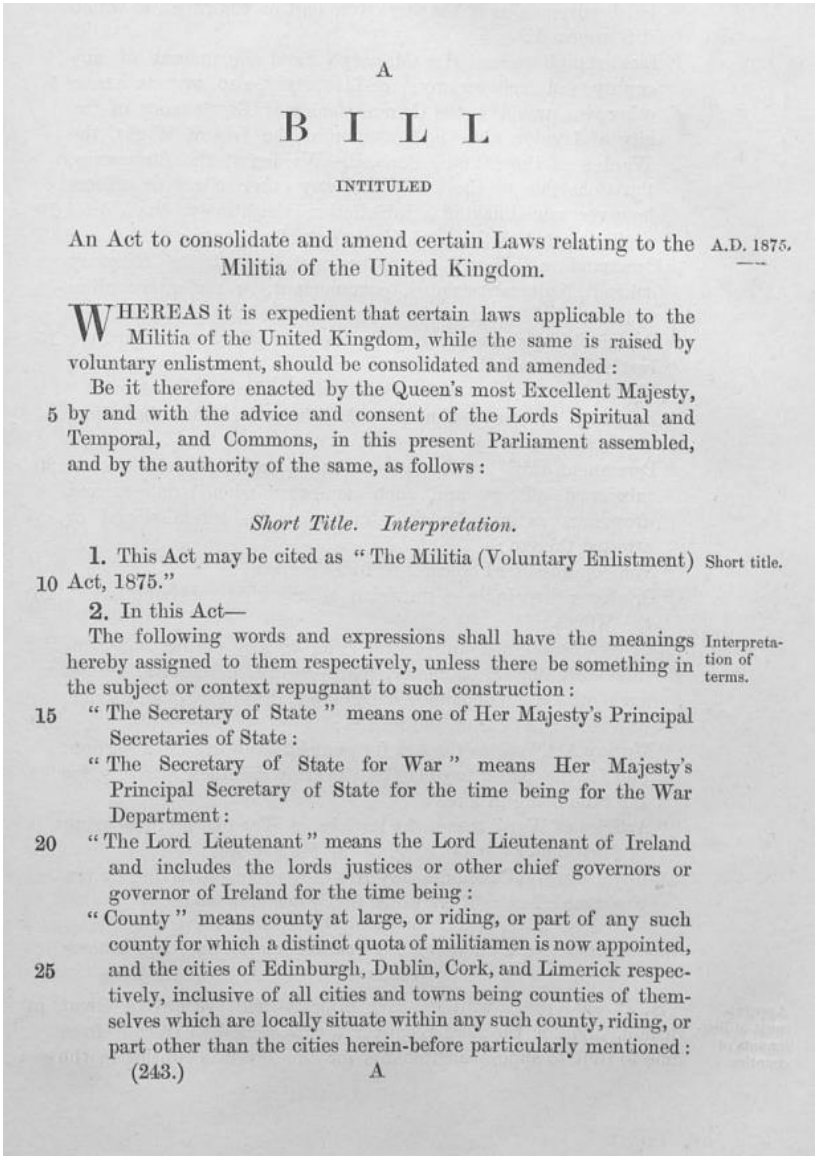
1. Short title.
2. Interpretation of terms.

Appointment and powers of Lieutenants and Deputy Lieutenants of Counties.

3. Appointment of lieutenants of counties, and certain towns, &c.
4. Appointment of deputy lieutenants.
5. Appointments to be subject to Her Majesty's or Lord Lieutenant's approbation.
6. Number of deputy lieutenants.
7. Provision for absence or disability of lieutenant.
8. Vice-lieutenants may be appointed.
9. Property qualifications for deputy lieutenants. Income of personal estate in possession to be deemed equivalent to the yearly value of land.
10. Qualification to be delivered to clerk of the peace or clerk of supply.
11. Clerk of the peace or clerk of supply to send copies of qualifications to lieutenant, and enter same on a roll, and insert in Gazette dates of commissions, &c.
12. Return to Secretary of State and Parliament.
13. Penalty for acting as deputy lieutenant, &c., without being qualified, &c.
14. Acts of persons not qualified to be valid.
15. Displacement of deputy lieutenants.
16. Commissions not to be vacated by revocation of appointment of grantor.
17. Powers, &c. of lieutenants and deputy lieutenants.

(243.) a 2

The text of the Bill was annotated with the text and a modern structured bill is recognisable:



A

B I L L

INTITULED

An Act to consolidate and amend certain Laws relating to the Militia of the United Kingdom. A.D. 1875.

WHEREAS it is expedient that certain laws applicable to the Militia of the United Kingdom, while the same is raised by voluntary enlistment, should be consolidated and amended:

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

Short Title. Interpretation.

1. This Act may be cited as "The Militia (Voluntary Enlistment) Act, 1875." Short title.

2. In this Act—

The following words and expressions shall have the meanings hereby assigned to them respectively, unless there be something in the subject or context repugnant to such construction: Interpretation of terms.

"The Secretary of State" means one of Her Majesty's Principal Secretaries of State:

"The Secretary of State for War" means Her Majesty's Principal Secretary of State for the time being for the War Department:

"The Lord Lieutenant" means the Lord Lieutenant of Ireland and includes the lords justices or other chief governors or governor of Ireland for the time being:

"County" means county at large, or riding, or part of any such county for which a distinct quota of militiamen is now appointed, and the cities of Edinburgh, Dublin, Cork, and Limerick respectively, inclusive of all cities and towns being counties of themselves which are locally situate within any such county, riding, or part other than the cities herein-before particularly mentioned:

(243.) A

It wasn't until 1927 that the Financial Memorandum arrived. The introduction of the Digital Memorandum should be considered in a similar timescale – it will take longer than a single session, or even single parliament to reach its final form. Start small but put in the place the organisational infrastructure and mission to let it organically grow based on actual operational experience.

Working Paper 11 – Jeff Bezos' API Mandate

Version 1.1

but for government

Introduction

What is Jeff Bezos' API Mandate?

Back in 2002 Amazon changed direction. It has established itself as the biggest online shop – but it wanted more. The Bezos API Mandate – a direction handed down by Jeff Bezos – fundamentally altered how Amazon organised themselves internally – and put Amazon on the course to dominate digital tech.

Amazon provide the technology platform – Amazon Web Services – which is it not an exaggeration to say the world runs its tech on. Everyone, everywhere is moving services to the cloud – and AWS is, for most companies, the cloud.

This paper is not about making government a cloud provider – but it is about making a fundamental transition. Scotland can go from a digital also-ran to best-in-world, and this paper is part of that journey.

Being a first mover, like Amazon or Estonia is complicated-difficult. The future must be laboriously invented.

Second mover advantage is that the journey is only fiddly-difficult. Easier to do in the state sector as Scotland doesn't have to compete with Estonia in the way some new company would compete with Amazon.

We know that it can be done, that is one major hurdle knocked down. The challenge is to not be seduced by the facile. "In Silicon Valley they eat pizza and have ball pools at work, if we eat pizza and get ball pools...". The work, the successes, the grunt of the first mover must be studied in "crack their bones and suck the marrow" detail.

Bones having been cracked, marrow having been sucked, let us sketch out a second mover roadmap.

Who are you?

You are an MSP, Minister or Spad, a think-tanker or policy person, somebody in delivery trying to build out or drive joined-up government.

Why should you read this?

You should read this if the analysis of the problem in Working Paper X – *The heart of the beast* and the proposals to fix it in Working Paper O – *The locus of change* haven't convinced you – or if you are charged with implementing the new institutions and want better to understand how to do so.

Revision Notes

Version 1.1 Slight change to terminology to bring it inline with the report.

Jeff Bezos API mandate

WHAT IT WAS

It's the historian's coming nightmare, a document with world impact has been lost to history, like the Emperor Claudius's lost history of the Etruscans. Except this one is from 2002 - only 22 years old – in the modern, the most modern of all eras, written with the most modern tools. Jeff Bezos's API Mandate has joined the ranks of the immortals.

Perhaps a fragment shall be found in the stuffing of an embalmed crocodile, as part of the great and mostly lost poet Sappho's immortal legacy has come down to us? We can but hope.

Steve Yegge's recollection[61] of it goes like this:

1. *All teams will henceforth expose their data and functionality through service interfaces.*
2. *Teams must communicate with each other through these interfaces.*
3. *There will be no other form of interprocess communication allowed: no direct linking, no direct reads of another team's data store, no shared-memory model, no back-doors whatsoever. The only communication allowed is via service interface calls over the network.*
4. *It doesn't matter what technology they use. HTTP, Corba, Pubsub, custom protocols — Bezos doesn't care.*
5. *All service interfaces, without exception, must be designed from the ground up to be externalizable. That is to say, the team must plan and design to be able to expose the interface to developers in the outside world. No exceptions.*
6. *Anyone who doesn't do this will be fired.*

The first thing to note is that this document specifies a set of non-functional[62] requirements for Amazon systems – and in very few words - 129. It doesn't mention *what* they do, but only *how* they do it.

The second thing to note is that it grants different parts of the business autonomy on their internal technical matters – do what you like.

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61 https://gist.github.com/chitchcock/1281611

62 Working Paper X – The heart of the matter

The third thing to note is that it enforces decoupling – different parts of the business only know of each other through the interfaces they publish and maintain.

The fourth thing to note is the outward turn – every service might at some stage be exposed outside the company and must be designed to do that from the ground up – integration is not a specific feature that that some teams might *do*, it is a capability that all services *have*.

Why it matters

It matters because it represented a fundamental change in direction for Amazon. The company had built a dominant e-commerce franchise since its foundation in 1994 and had started breaking decisively out of its home market – books.

If you were simply doubling down on where the money came from you would make selling more stuff – the functional side of the business – the core focus. Instead the focus switches to capability – the capability to expose, to reuse, to integrate, to externalise, to decouple.

Some of this drove change on the functional side – more capability meant the ability to sell more stuff – and some transformed the functional side. Things that had previously just been day-to-day work, costs and not values, became products.

Amazon took databases and turned them into storing-data-as-a-service – and sold it at thick margins. And monitoring servers, and deploying software updates, and using queuing managers, and providing web servers and creating security zones, and managing users, and, and, and a whole bunch of services that only technical people know exist and are needed for web activities at scale.

One of the tropes of the age is that software eats things. Once you would have had an address book, and a paper calendar, and a phone, and a camera, and a record player, and a notebook, and a dictionary, and an A-to-Z, and a train timetable. And now you have a phone.

Amazon Web Services is software eating software and software eating companies that write and use software.

The mandate was issued in 2002 – and the services it enabled, Amazon Web Services (AWS) emerged 4 years later in 2006. Currently AWS generates all of Amazon's profits – every other service runs at a loss[63].

63 Caveat Lector/Reader Beware: Amazon is still aggressively expanding to individual products and product lines might be cohort-profitable with aggressive re-investment in growth and marketing bring a particular operating element into loss.

What would a Government Mandate look like?

Introduction

Working Paper 0 *The locus of change* proposes new institutions for managing non-functional/infrastructure requirements across the state.

It proposes an executive body – the Digital Services Reform Office – which is the body that would take a Government Mandate as its charter and use that to build out a set of technical standards.

There is a proposed parliamentary body – the Digital Services Audit & Scrutiny Committee which provides technical oversight on behalf of the parliament.

A draft of a Government Mandate as a charter for the DSRO

Lets have a pop at it.

1. *The state shall design all services to be externalisable, self-describing and multi-client (with sandboxes and public test infrastructure) from the ground up, no exceptions.*
2. *Organs of the state that provide services to each other will do so over defined interfaces.*
3. *All state-written software will be open source and open available for download.*
4. *The state will publish appropriate registers that are machine readable and traversable and that state servants will be obliged to maintain, to wit:*
   - *a Register of Powers that are used to grant state servants the power to store and process digital data*
   - *a Register of Data Sharing Powers between different state organs cross-referenced to the Register of Powers*
   - *a Register of Services that the state provides and the URL space they cover. It will cross reference the Register of Powers*
5. *Registers will have the form provided for in statute*[64].
6. *All state administrative data will be written in ledgers*[65] *which will have the form provided for by statute.*
7. *Services will be accompanied by a change log in the form of a ledger that will provide a comprehensive history of when they changed and why – it will cross reference the register of powers.*

64 in an Interpretation Act – see Working Paper 5 – Law Reform For Data (forthcoming)

65 see Working Paper 1.1 – Data and the rule of law

8. *Servants of the state will use the same login and identity system as citizens when using state systems.*
9. *The state will make all services available online to:*
    - *citizens directly*
    - *persons delegated to act on citizen's behalf*
    - *persons delegated by persons delegated to act on a citizen's behalf*
10. *All state technical standards will be discussed and adopted in public.*

The Draft Government Mandate – but in layman's terms

Now I claim in the introduction that this paper is meant to be readable by the generally interested citizen – and here I am chucking down technical stuff and expecting you to unroll the consequences, so lets rewrite this mandate in non-techie terms.

1. *The state shall design all services to be externalisable, self-describing and multi-client (with sandboxes and public test infrastructure) from the ground up, no exceptions.*

When you use a website the client (your browser) runs a load of code and makes calls to a service (the server) and then builds your user experience. There is two ways you can do that – messy and clean. In a messy implementation the developer goes "yah, my webfront end is the only client, Billy Bodger and down the pub". This mandate says "Uh, no. Design it to be multiclient".

In a multiclient world the Citizen's Advice Bureau can say "UC's front end is rubbish, 90% of our queries are about this aspect of Benefit X, lets write our own app" and then do.

If you pop developer tools in your browser you can look at the messages that whizz about between the web page and the back end. Some of them are totally cryptic, {0, 1, "up", "down", "top", "quark"}. The meaning and acceptable values of each of the data items will be described somewhere, in documentation, in a developer notebook.

Self-describing just means that that documentation is integrated with the service – so the social security servers emit data – and the documentation about what the data means. Its no good saying the CAB can write a GUI if you don't give them the documentation to do so. Ditto sandboxes and testing infrastructure – it is not in the state's interest for other people's GUI's on state services to have bugs.

Now the technical capability to write a GUI is non-functional – but whether for this system, at this moment in time, the state allows someone to write a GUI, or what category of organisations that the state so allows, well that is a

different question – and not one the technical element of the state has a privileged opinion on.

2. *Organs of the state that provide services to each other will do so over defined interfaces.*

This is the no-cheating provision – if different parts of the state are allowed to dodge Mandate 1 then they will. This is called making you eat your own dogfood.

3. *All state-written software will be open source and open available for download.*

This just means that if Glasgow develops a bit of software to manage, I dunno, taxi licenses, then Perth can download and use it. It happens already a bit. UK.Gov open-sources software that Australia users.

4. *The state will publish appropriate registers that are machine readable and traversable and that state servants will be obliged to maintain, to wit:*
    - *a Register of Powers that are used to grant state servants the power to store and process digital data*
    - *a Register of Data Sharing Powers between different state organs cross-referenced to the Register of Powers*
    - *a Register of Services that the state provides and the URL space they cover. It will cross reference the Register of Powers*

One of Lord Bingham's eight principles of the rule of law[66] is:

The law must be accessible and so far as possible intelligible, clear and predictable.

State computer systems concretise, and make real, law and regulation – and at the moment the legal basis of them is obscure, smeared across many statutes and not available easily to citizens. This mandate doesn't fix problem, but is an important part of it. The ability of citizens to reason about the state in its totality is a key part of the rule of law.

For further discussion of this please see:

- Working Paper 1.1 – Data and the rule of law
- Working Paper 5 – Law reform for data

5. *Registers will have the form provided for by statute.*

Registers and ledgers are data formats with a long, long heritage. Ledgers took their form in the 11th century, and the oldest Scottish register dates from 1617.

Both formats are deeply entwinned with the rule of law. In the early days of computing when both memory and disk space was expensive they were

66 T Bingham, The Rule Of Law, Allen Lane, 2010

considered a luxury and we moved away from them. Hitherto we have neglected to return to them – and we should.

See the discussion in Working Paper 1.1 – *Data and the rule of law*

Renormalising them would reduce costs and improve access to, and reduce the costs of, justice.

6. *All state administrative data will be written in ledgers which will have the form provided for by statute.*

See the discussion on the previous mandate.

7. *Services will be accompanied by a change log in the form of a ledger that will provide a comprehensive history of when they changed and why – it will cross reference the register of powers.*

Going back to Bingham and the rule of law is. Knowing exactly how decisions are taken now is only one side of the story, knowing how decisions were taken then is another. State systems (which embed legal decisions and processes inside themselves) are mutable and fast changing in a modern software development world. Citizens and their advocates must be able to reason about changes to software systems.

Again the change logs exist already, but inside the developers tools or private work books. The production of change logs can be built into deployment systems.

Automating processes and making them self-describing is a super-power of Silicon Valley behemoths and one that is cheaply and easily available to governments – with the appropriate investment in tooling – tooling which can be shared across all departments, all local governments and abroad as well.

8. *Servants of the state will use the same login and identity system as citizens when using state systems.*

The internet is a perfect example of the paradox of decentralisation. In order to have the enormous decentralisation and autonomy of the internet, yet retain its ability to connect wildly disparate communities and products, it is necessary to have centralisation – think IP address allocation, DNS names, website security certificates, etc. The key is to keep that centralisation to the minimum while enabling maximum decentralised autonomy.

This mandate rather opaquely defines one of those required centralisations. And it appears to the public not as the bland statement here, but in a flexible, refocussable state – which is far from obvious on a plain reading of it. See Working Paper 4 – *The remixable state* for more details.

9. *The state will make all services available online to:*
    - *citizens directly*

- *persons delegated to act on citizen's behalf*
- *persons delegated by persons delegate to act on a citizen's behalf*

This mandate is even less clear that the previous one, but flows from the same well spring. Please see the discussion in the previous mandate.

It is important to note that like in Mandate 1 it only mandates that systems have the capability to have delegated access. The terms on which access could, would or should be delegated is not a matter for the technical communities – it is a matter for operational departments, ministers or parliament as appropriate.

10. All state technical standards will be discussed and adopted in public.

The salience of technical standards has been slowly rising since the foundation of the International Telegraph Union in 1865 and the Universal Postal Union in 1874. These both once independent international organisations were absorbed into the UN in its early years.

The internet has made the modern world, the world of standards. Technical standards are one of a small set of organising principles that have remade the world by virtue of their core characteristic: co-ordination without communication.

The arrival of written law allowed the nascent state form of the late bronze age to expand from a township and the territory within walking distance of the lawgiver to a group of cities, a land a country, an empire. Co-ordinated law without continuous comms. Likewise the price mechanism which flows around economies enables co-ordination autonomously without communications.

Technical standards have these properties because while they are not law, they do rhyme with it.

The purpose of adopting a standards-first approach is to drive co-ordination without communication into state functions.

Traditional public sector reform approaches have tried to use co-ordination-by-communication – a strong central organisation, and iron hand that makes the scattered tribes squeal and conform.

The purpose of this mandate is to make it impossible to forge standards into a command and control, centralised cudgel. Standard setting bodies should be a parliament of standards.

Parliaments are devices for maximising agreement and ensuring losers consent among a community – they are only accidentally democratic if their community is the demos. They can be oligarchic, partriarchic, feudal.

A parliament of standards is not a democratic parliament (though it should certainly be under the supervision of one) but technocratic. The wider issues

about a Parliament of standards are discussed in Working Paper 0 – *The locus of change*.

WHY WOULD IT MATTER?

Fundamentally joined up government and data sharing are non-functional requirements. Government is all set up around functional requirements – it passes functional laws which are implemented in functional departments overseen by functional ministers. Without a counterbalancing force the state will production siloed functional systems.

Jeff Bezos enforced his mandate with his iron will – that is the way of private companies which are, to a degree, a tyranny, a tyranny of will certainly.

That is not the way of states, of democracies. To be implementable, to survive, to have public trust, a public sector mandate would need to be implemented in institutions, both of will and action and of oversight – the executive and the legislature.

The point of this document is to show the small size of the starting point. A good starting point, a sound starting point, can grow into a fine thing, but small it must start.

HOW WOULD IT FAIL?

The journey outlined in this document will fail in a number of ways.

The first way it will fail is if it lacks the equivalent of Bezos's No 6:

6. Anyone who doesn't do this will be fired.

And I don't mean that in the fatuous and frivolous sense captured by the plain text – the American method, an actual tyranny of a workplace unencumbered by labour laws and social norms, hiring and firing like drunken sailors.

But there must be consequences (political, organisational, reputational) for failing to follow the mandate.

The institutional structure of the state (departmental delivery) strongly steers towards siloed outcomes. The mandate needs enough teeth to hold against that steer. Departmental avoidance (we will do what is required for joined up government tomorrow, always tomorrow, because today, always today, there is a more immediate problem) is not a personal choice with this institutional structure. It is not a choice but a structural pressure, a systematic behaviour.

It will fail if it is turned into a fife-and-drums parade, big teams, big plans, big central control, if it inverts the plan – to enable decentralised autonomy, to eliminate communications by co-ordinating via standards, to build consensus

and losers consent – and instead makes a procrustean bed, a regime of clubs and sticks, to compel adherence to centralised, top down, circumstance-ignoring fantasy and utopian implementation plan.

The gap between Jeff Bezos issuing the mandate and AWS being offered to customers was 4 years. A government mandate would be immediately transformative for the Scottish state – *on a hundred year timetable* – on an electoral cycle, not so much. Trying to ram this through for narrow political gain, without bringing the opposition and wider Scotland with you, would run the risk of the mandate being killed before it was able to flower.

Working Paper 12 – A theory of state

Version 1.0

for digital systems

Introduction

Why a theory of state?

The report that this working paper was written in support of is designing new state structures to better support services based on digital systems.

The purpose of articulating a theory of state is to lay down some criteria that that design, and it's eventual implementation, can be judged against.

Estonia has shown that there is a better way to do digital systems, but like many first movers it is unable to articulate quite how and why it is successful. It falls to second movers to define a theory of state – in another world Scotland would simply copy some other countries, but that option is not open to us.

Who are you?

You are an MSP, Minister or Spad, a think-tanker or policy person, somebody in delivery trying to build out or drive joined-up government.

Why should you read this?

Other working papers outline new proposed structures, this paper goes into how the new structures should work, their internal regime and their wider more diffuse impact on the civil service and civil society. You should read this to deep your understanding of how this new world will work.

Why a Theory of State is required

The second mover

Scotland seeks second mover advantage as a digital state. We are at the back of the peloton.

We require a theory of state to inform and structure our thinking. The first mover usually wins by luck and instinct and often lacks a clear understanding of why and how. So it was with the UK after the Industrial Revolution - and so it seems with Estonia in the Digital Age.

The second mover must develop the theory of state, to do and for others to copy.

A statement of the problem

The problem is articulated in Working Paper 9 *Reading legislation with a non-functional eye*. Two sets of requirements or specifications inform the creation of digital systems: functional ones – *what* the system must do and non-functional/infrastructural ones, *how* it must do it.

Legislation specifies the functional requirements. The task is to design institutions that allow the executive to develop non-functional/infrastructural ones and the parliament to supervise it.

The scope of this theory of state

This new theory of state deals with a narrow remit - things that pertain to services that are built on digital systems.

The vast majority of the work of both parliament and government will not be affected by it at all.

Elements of the theory of state

Introduction

There are a number of key elements that inform this theory of state:

- basic characteristics of state systems
- functional versus non-functional or the democratic parliament versus a parliament of standards
- *contra* central planning
- organising in the context of complexity and opacity of digital services
- decentralisation
- diffuse boundaries of the state

And these imply a weak but guiding centre.

A parliament of standards

This proposal contained in Working Paper 0 *The locus of change* recommends a parliament of standards as one of its key institutions. The use of the phrase is quite deliberate. A parliament is an organisational form that maximises consent. In particular it seeks losers' consent. And historically parliaments have done that for different communities at different times.

The old Thrie Estaitis of Scotland were:

- the first estaite – prelates
- the second estaite – nobles
- the third estaite – burgh commissioners

Powers in the land all. After Union more communities were brought it – the big city rate paying men in 1832, then in 1918 returning soldiers and older women, before all citizens in 1928 and reaching its current form in Scotland of all residents in 2020 with the Scottish Elections (Franchise and Representation) Act[67].

67. https://www.legislation.gov.uk/asp/2020/6/contents/enacted

The constituency of the standards body is not the citizenry, or even all civil servants, but the critical technical staff who both write and implement its 'laws'. Standards are not laws in the conventional sense, there is no judiciary and legal process, but they are things-that-must-be-done and things-whose-violation-will-have-consequences.

The Thrie Estaitis of the digital world are:

- the first estaite – the data teams from all the departments and NDPBs
- the second estaite – the coders from all the departments and NDPBs
- the third estaite – the designers from all the departments and NDPBs

Like their predecessors these good burghers need to have their voice heard and say *that won't work*. *Speaking truth to power* in the civil service argot.

If parliament of standards seems like a grand description, be mindful that such a body will make decisions that the state will be living with for a hundred years or more. The Register of Sasines has been with us for 406 years.

These decisions and conversations and the seeking of agreement and consent already happens, in corridors and meeting rooms, on slack conversations and team meetings. The point of raising these conversations to the dignity of a parliament of standards is to make them visible and make them subordinate to a real parliament, a parliament of residents, a democratic parliament. And critically to make them enforceable.

There needs to be a single co-ordination point between the functional specification and the non-functional specification. The functionals are already in the bill and the non-functionals will be in a systems impact assessment as part of the bill pack. This will provide unity of specification. The minister brings to parliament both the *what* and the *how* at the same time.

Basic characteristics of state systems

There are a number of basic characteristics that state systems must have. These derive from their being built on top of digital platforms:

Characteristic	Notes
being found and enumerated	digital systems are embedded in an URL space but that is not enough - the state and society needs a comprehensive and complete list of every digital system
being understood	systems needs to be understandable - the legal powers they operate under must be know and the data they contain and its meaning must be exposed

Characteristic	Notes
interoperating	individual systems should be able to work together and share data - under a rights and permissions regime the protects citizens privacy and autonomy
being extendable	both state data and state systems are the collective property of the citizen and society and they should be usable and extendable by them
being composable	systems (in the sense of things being exposed to the user) should consist of smaller technical subsystems which are composed to give the user experience
emitting desired outputs and interfaces automatically through tooling	as far as possible the requirements to comply with both law and standards must be baked into the technology and not be left to individual civil servants to manage. This implies the creation of libraries, tooling, frameworks that are law/standards made code
being able to be reasoned about	citizens must be able to reason about procedures and decisions armed only with the law and the underlying data - the system-as-implemented should not be required
being able to be consolidated and improved	there must be mechanisms to identify and eliminate systems overlap (substantially based on the same data and the same processes) and there need to be mechanisms to identify systems that hold similar data under similar processes and co-ordinate the end-to-end dance (law, organisation, resourcing) to align them with a view to consolidation
being able to be measured and assessed	systems must both have the technical ability to emit measurements and the legal duty to do so in an appropriate manner

The purpose of a standards regime and a parliament of standards is to build institutions and procedures that give life to that future state.

Functional versus non-functional or the democratic parliament versus a parliament of standards

The existing arrangement whereby the functional requirements of major systems are specified in legislation and implemented by functional departments must be augmented by new institutions[68] that specify the non-functional requirements.

68. These are discussed extensively in Working Paper X The heart of the beast, Working Paper 0 The locus of change, Working Paper 5 Law reform for data and Working Paper 9 – Reading legislation with a non-functional eye

Non-functionals will be developed and approved by a government body acting as a parliament of standards, which is in turn under the supervision of a committee of the democratic parliament of law augmented by appropriate independent technical and social expertise.

The non-functionals include setting standards for:

- technical standards for interoperability and discovery
- data standards for data hygiene, maintenance, concordance with the rule of law and annotation
- UX Design standards for components, composition and use
- testing standards
- process standards and best practices for organisation and service design, team construction, project initiation, oversight
- development of tooling and components across software, testing, design and operations which embed and incorporate standards and enables push-button compliance
- development of plans for componentisation[69] and the creation and promotion of patterns across domains

The publication of standards will be established in statute and there will be enforcement mechanisms. Ministerial approval will not be required for their enactment. (This is not the case with all the activities of the parliament of standards.)

The parliament of standards shall apply the principle of *de minimis non curat lex*[70].

The parliament of standards will operate as a parliament with a constituency consisting of members of all the technical trades in Scottish Government, government agencies or statutory corporations of all stripes and local government.

It is not an elected or democratic parliament, it is a technocratic one. Democracy is applied through supervision by the elected parliament.

The government departments, government agencies or statutory corporations and local authorities, whilst being bound by the standards issued, shall decide the how and who of their representation in the standards process under their own recognisances.

Individuals, whether civil servants, local government staff or individual citizens within or outwit the jurisdiction will have the right of audience.

69. See Working Paper 3 The Lego state for more details

70. The law doesn't concern itself with trifles – small systems will be exempt

The parliament of standards will aim to work by maximum consensus and ensure losers consent. It will work in public using a RFC[71] process.

It will have responsibility for establishing its own working processes, having taken into account the operating models of organisations such as the Mozilla Foundation[72], the Apache Software Foundation[73], the IETF[74], W3C[75] and ICANN[76] with whom it is expected to rhyme.

The executive of the parliament of standards, who have the power to execute its decisions, will be appointed by the government.

Any tooling developed under its aegis will be released under an appropriate open source license[77] suitable for both other governments and commercial partners.

The mission of the parliament of standards shall be to continuously and incrementally increase the capability of the state, in particular the capability for joined up government, the *means* to data sharing, componentisation and remixability. The democratic parliament shall have an absolute veto on the permission to share data - the *will*.

Where appropriate the parliament of standards will work with its peers in other jurisdictions, it may establish joint procedures and issue joint standards in conjunction with any other parliament of standards it so wishes, or it may simply mandate use of an extra-jurisdictional standard. Common standards will enable shared development of the tooling that implements it. It will build on existing internet technical standards issued by the IETF.

When patterns are promoted to actual services[78], they shall pass from the remit of the parliament of standards to the government - having become a functional body. They will be a normal government department which might in some circumstances be put on a statutory basis. The role of the parliament of standards shall then be reduced to mandating their use in new and existing systems design.

The parliament of standards will not have the *strong powers* required to allocate resources, define tasks or control programmes of work necessary to

71. https://www.ietf.org/process/rfcs/

72. https://foundation.mozilla.org/en/

73. https://www.apache.org/

74. https://www.ietf.org/

75. https://www.w3.org/

76. https://www.icann.org/

77. https://opensource.org/osd

78. Examples would be single government authentication or payment systems. These are sometimes referred to as cross-cutting functions in Whitehall

achieve compliance. It will enforce its will through the *weak power* of setting a future compliance date with an appropriate time to enable autonomous departments, government agencies or statutory corporations and local government to comply. It is not a centralising command and control body.

The expectation is that standards compliance will be funded out of the 15% of technical OpEx (operational expenditure) that is already spent on maintenance activities and not on CapEx (capital expenditure). The parliament of standards may propose work programmes that require their own dedicated funding. Such proposals would need to be adopted by the government to proceed.

The parliament of standards will also have the responsibility of studying the data model of the state and proposing data consolidation exercises that might result in Machinery of Government (MoG) changes. Such proposals would need to be adopted by the government to proceed. This is a departure from constitutional norms in the UK and Scotland.

The parliament of standards may take suggestions as to changes to primary or secondary legislation that would enable better and more effective state systems from any quarter. It will have the responsibility for instructing parliamentary counsel to draft legislative instruments[79] to that effect - and will need to be staffed appropriately. Such instruments would need to be adopted by the government to be introduced into the elected parliament and will be under the direct remit of a new proposed overseeing committee of that parliament. That overseeing body will be appropriately supported and staffed to discuss deep technical matters in an overarching social, legal and ethical context.

The remit of the parliament of standards in this matter will be *policy effect*, with *policy intent* reserved to the elected government.

The parliament of standards shall have the right to address both the Scottish and Westminster parliaments, and the obligation to publish an annual report. The Scottish Government shall have the right to comment on both.

Contra central planning

Declaring yourself against central planning smacks of accidentally finding yourself in a costume drama, resisting the mores of days long gone.

State expertise lies in the vasty deep of the departments, in the operational teams. Communication, now made so simple, can slide into micro-management.

79. See Working Paper 8 An Enabling Act for a more detailed discussion

When combined with a fetishisation of management, data and analysis this can tip into state central planning[80].

Dashboards and measurements are by their nature retrospective, and often proxies for what matters and not the thing itself. They can only shakily be projected into the future. When the future suddenly changes, as events interpose, whether Covid, the financial crisis or the wars in Ukraine and Palestine, the retrospective looses its utility.

The past is knowable and observable at least slightly, the future is unknown and only slightly predictable - data and management fantasies not withstanding.

The asymmetry of information between operations and the centre remains and attempts to manage the relationship by contracts, legal obligations, targets and incentives become gambles.

Healthy ecosystems consist of droplets of order with an ocean of disorder. The miracle of life is contained within individual animals, but the development of those miraculous forms was driven by death and natural selection. Companies succeed when they can promote and create organisational miracles.

The delusion of socialism was that if a company can create order within itself by scientific planning that order should be extended to the whole economy. Capitalism brings with itself pointless destruction, bankruptcy, sudden market shifts. How much better everything will be when those are removed and pure order reigns!

The point of course is that the destruction and bankruptcy is far from pointless, anymore than beast-eat-beast has no good effect. The death of the system is what keeps the companies honest. The absence of death leads to lethargy, corruption and decay, not more life.

A centrally controlled and planned system is less resilient, less able to respond to shocks and changes of circumstances than a free market one. Death cannot be outrun.

So it is with state functions. Death is more indirect - usually expressed in elections in the modern world. A rich variety of elected bodies with powers appropriate to their niche subject to electoral death is the best option. But individual state functions exist as drops of order in an ocean of disorder and unexpected events. The resilience of the state is the sum of the capabilities of its components, its ability to adapt and shift to different circumstances, and unexpected events.

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80. Innes, A. (2023) Late Soviet Britain: Why Materialist Utopias Fail, Cambridge University Press, 2023

The dream of a single government system, a single user journey, that touches all citizens in all their relations with the state is a cousin of the fever-dream of the centrally managed economic state.

By switching our focus from single monolithic outcomes to the capability to refocus and reassemble state systems from smaller components we can break out from the centre-knows-best fantasies. And that requires us to embrace decentralisation both within the Scottish government and from Holyrood downwards.

Organising in the context of complexity and opacity of digital services

Digital systems are opaque and hard to reason about at the best of times. Under daily releases and constant change, doubly so. *Contra* popular belief this opacity extends to technical experts and people who work in the field – nobody is blessed with some magical x-ray vision to peer into the abyss and see the skeleton, muscles, tubes and organs of large digital systems.

It is not for nothing that the dominant technical methodologies focus on getting systems with limited functionality into the hands of users quickly. The use of systems is comprehensible even when the system itself isn't. Engineers only truly know what they are building when they can watch people using it.

This opacity can be mitigated a bit. Source code can be released so it can be inspected. But digital systems will always be hard to reason about even when they have use-tangibility, *it does these things on these screens*.

For the development of new systems, or the design of standards that create new capabilities that is not the case. And the loss of comprehensibility is increased by simple overload - the state now does so many sophisticated functions, each of which requires intense engagement with to understand.

In a phrase made popular by Ronald Reagan in the context of nuclear disarmament *trust but verify* is the watchword of the day. As in the case of the mobile phone, we need to focus on what is comprehensible, the roles and responsibilities of parts of the state, and the definition and management of interfaces with each other - which is principally data sharing.

The overriding problem with state opacity comes in the context of low citizen trust. The journey from *this is hard to understand* to *conspiracy* is but a step.

A key consideration in handling opacity is transparency - and this requires the state to be open about data structures and services.

This requires a fundamental information architecture - registers of systems, registers of powers, registers of standards, mandatory reporting of data

structure and their history over time, public metadata on data structures - the state needs to be put under the microscope holistically as a matter of legal rights not favour.

Decentralisation

There is no ship but instead a fleet of state. There is too much going on to be under the control of a single central authority.

Centralisation is the enemy of resilience. Everything is flawed, to some degree. Policy is built around models of society and citizen behaviour. There is an aphorism named after the British statistician George Box which states:

All models are wrong, some are useful.

If the models are wrong then the systems built on them are wrong - errors and defects are not edge cases but normal working behaviour. But wrongness comes in many forms and is of many degrees. Models can be slightly and incidentally wrong [81]or importantly wrong, better the former. Good enough is good enough. And wrongness can be corrected to a degree by observation and adjustment.

And sometimes models are good enough until the world changes underneath them. With highly coupled systems model collapse can lead to contagious collapse across the piece. Better to have loosely coupled systems which can tolerate partial failure.

So it is with the state, a failing social security system can be counteracted (in part) by a robust schools system. Different parts of the state stepping up as other fall down.

States capabilities should be organised on the assumption that some state functions will always be in crisis, because some will be. Belt and braces, overlapping areas of concern, the ability of A to ride to the rescue of B. Instead of bone-paired efficiency, the state needs to maintain a reserve of capacity that can be sent to the battle when the front collapses, for there will always be a collapsing front.

And states need better to be equipped to deal with success.

Building technical subsystems as composable components will enable the citizen-facing super-structure to reorganise itself and reprioritise - to wind down in light of success as well as chase down in light of continuing failure.

Decentralising also means decoupling, reducing the communication and decision radius. Small teams deliver better, faster results. That requires giving

81. This working paper, and the report in whose orbit it revolves can only be at least slightly wrong, touching as they do on several areas of deep expertise that require a whole working life to master.

government departments, local authorities and health boards stable funding, technical and control over their spending - holistic and stable autonomy which needs to pass down through them to projects and teams at the sharp end.

Loosely coupled systems also serve as the gravestone of the *single user journey* - the design utopia which is close kin to the panoptical data delusion.

Systems must know their boundaries, and be optimised and organised in such a way that citizens can construct their own single user journey out of them with ease.

Diffuse boundaries of the state

Digitalisation, open data, delegated permissions and the exposure of services as APIs enable a blurring of the boundaries of the state. Using remixability[82] the state will encourage that blurring and the provision of alternative customer journeys by the 3rd sector and state and semi-state bodies.

The weak but guiding centre

In this theory of state the centre guides transformation weakly. Standards are a mechanism for establishing co-ordination without communication - a foundational and transformative power shared[83] with few other mechanisms outside written law and pricing mechanisms.

The departments and bodies will continue to be funded in the normal way and their functionals will continue to be defined in law as they currently are.

They will have maximum autonomy and the ability to choose technologies, plan development and maintenance activities, allocate resources, specify work sequencing and perform other policy, development and operational activities.

The centre will set the rules of the game and focus on developing capability in the round and in the particular. The centre will remain responsible for securing the powers and funding required for state organs to have the maximum capability, and for the ensemble of state organs and the appropriate allocation of resources across that ensemble.

The centre will have direct control in the gross and for leadership and direction. It will be responsible for setting overall integrated *objectives*, but the state organs will have the duty and autonomy to develop their own *plans* to achieve those objectives.

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82. See Working Paper 4 The remixable state for a detailed discussion

83. There is an argument that standards as described here are just another form of written law, with weaker and more indirect enforcement mechanisms

The centre will have the responsibility for determining how different state bodies work together, their interfaces and interactions, with less say over their internal organisation.

Legislation concerns *things*, and data represents a *model* of that thing - and this is not a deterministic relationship[84]. There are many possible models and the boundaries of models are determined by case law.

The focus on interactions is about transfer of standard data between organisations and not reports coming from them. Reporting is intimately tied with the operational arrangements that a service or system has in place. Reports should be expressed as objectives (*health boards shall publish appropriate waiting time statistics*) and not specifications (*health boards shall report waiting times under the following categories of treatment with this resolution*).

Specification of system by reports is the worst of all worlds. A central and incomplete specification that pretends to accord the subject under reporting autonomy.

Autonomy means autonomy or it means nothing.

Running a health board is hard. Reconciling inconsistent reports due to differences in internal organisational issues and priorities of health boards occasioned by different facilities, resources, social factors in the catchment area is very much a second order consideration.

Unifying reporting is often cited as way of creating direct political pressure. Democracies have another mechanisms to achieve that: elections. Where there are autonomous institutions they should be aligned with appropriate democratic oversight.

The centre will have responsibility for proposing and leading learn-through-building strategic projects where the final systems are unclear and need to be discovered iteratively. This will involve tripartite co-design with parliament, government and appropriate citizen constituencies.

As small as possible, but no smaller

A core purpose of this proposal is to enable decentralisation by decoupling – and use standards which enable co-ordination without communication as a core organisation device.

To support this the standards regime must be as small as possible, but no smaller. Each standard must be constrained likewise.

This is not an exercise in bureaucracy but empowerment.

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84. See in particular Section 3 of Working Paper 5 Law reform for data

Operational considerations

Introduction

These new institutions operating inside existing processes and departments and due care and consideration must be given to all aspects of state operations: pay and rations, accounting, management lines and so on.

Decoupling

The core element of this theory of state is the conscious uncoupling of streams of work in different departments and strong departmental, systems-level and even team-level autonomy to deliver and improve state services built on digital and other systems.

It is important to recognise that the state must go where the citizen is, and most citizens are on screens, but some aren't. By contrast, all civil servants are on screens. The blast radius of these proposals extends beyond screens to wherever citizens are.

But the fundamental systems specifications – *what* the system does and *how* it does it, are intrinsically decoupled. The cycles of specifying standards is different to that of making laws.

Similarly the proposed law and the proposed standards in the Bill and Bill Pack that are presented with unity of specification are of different temporal effect. The law is the law until it is changed, but the commitment with regards to standards might adherence to an existing standard, or adherence to an as-yet unwritten one.

Existing systems may have standards retrospectively applied to them.

The operational implications of these differences need to be recognised in the day to day organisation of departments of state.

Lines of responsibility

The Armstong memorandum[85] is the closest thing the UK civil service has to a constitutional basis and it has this to say on the duty of departmental staff:

The duty of the individual civil servant is first and foremost to the Minister of the Crown who is in charge of the Department in which he or she is serving.

The creation of these new institutions violates that precept. The purpose of this institutional redesign is to rebalance specification, to fly a plane with two wings, not one.

Legislation is functional, departments are functional, Cabinet Secretaries have functional titles, oversight is provided by functional committees. The

85. https://www.civilservant.org.uk/library/1996_Armstrong_Memorandum.pdf

Armstrong view of duty is functional duty. This theory of state implies that the ordinary civil servant has two duties – to the minister for fidelity to the functional components – and to the standards body (a pan-governmental body) and via that to the parliament for the non-functional/infrastructural aspects.

Conclusion

This theory of state is a consolidation and codifying exercise of activities already being done – in a partial, haphazard and unsupervised manner. Standards are issued at all levels of the state. Compliance is voluntary and driven by political heat. Cyber security is hot, data standards are cool.

Nothing unprecedented is being proposed, with the partial exception of Machinery of Government changes and dual mandates for Civil Servants.

Working Paper 13 – The weak centre

Version 1.0

Sometimes counterintuitive

Introduction

The weak centre

The UK (including Scotland) is one of the most centralised countries in the world. And yet a major portion of UK politics remains half in love with more centralisation and worships at the altar of the strong centre.

I resile strongly from this. This paper makes the case for a weak centre and strong departments/sub-state bodies and local authorities.

Designing and building a weak centre requires addressing and discarding some of the fallacies that have informed state construction.

Who are you?

You are an MSP, Minister or Spad, a think-tanker or policy person, somebody in delivery trying to build out or drive joined-up government.

Why should you read this?

The proposals in the forthcoming report for Scottish Government –*The Foundations of the Digital State* – embody a theory of state that is explicitly about a weak co-ordinating centre. This paper will provide some of the background to that – and to help you understand how the proposals in it differ from competing proposals from a range of think tanks working on the problems of public sector reform. That theory of state is discussed in Working Paper 12 *A theory of state*.

The current state

The base constitutional position of the British state is strong departments.

Minsters have legal and parliamentary responsibility for the departments and since Gladstone permanent secretaries and accounting officers have the same for the expenditure of money voted to departments.

In as much as there is a constitutional position on the civil service it is expressed in the Armstrong Memorandum[86] from 1985. There are a number of salient points:

Civil servants are servants of the Crown. For all practical purposes the Crown in this context means and is represented by the Government of the day.

which is slightly caveated:

There are special cases in which certain functions are conferred by law upon particular members or groups of members of the public service; but in general

86. https://www.civilservant.org.uk/library/1996_Armstrong_Memorandum.pdf

the executive powers of the Crown are exercised by and on the advice of Her Majesty's Ministers, who are in turn answerable to Parliament. The Civil Service as such has no constitutional personality or responsibility separate from the duly constituted Government of the day.

and gives strong direction to junior civil servants:

The duty of the individual civil servant is first and foremost to the Minister of the Crown who is in charge of the Department in which he or she is serving.

It makes the point about the central role of the Minister and Department very clearly:

The determination of policy is the responsibility of the Minister (within the convention of collective responsibility of the whole Government for the decisions and actions of every member of it). In the determination of policy the civil servant has no constitutional responsibility or role, distinct from that of the Minister. Subject to the conventions limiting the access of Ministers to papers of previous administrations, it is the duty of the civil servant to make available to the Minister all the information and experience at his or her disposal which may have a bearing on the policy decisions to which the Minister is committed or which he is preparing to make, and to give to the Minister honest and impartial advice, without fear or favour, and whether the advice accords with the Minister's view or not.

The arrival of digital technology has built on this long running institutional state construction – which goes back to Gladstone and before.

My research written up in Working Paper 9 *Reading legislation with a non-functional eye* shows that legislation that is implemented in major computer systems is functionally specified by legislation. What isn't specified in any centralised manner is non-functional or infrastructural requirements. Functional requirements cover *what* the system should do. Non-functional/infrastructural requirements cover *how* it should do it.

Joined-up government and data-sharing are both covered by non-functional/infrastructural requirements.

Because the functional requirements are expressed in law they are *must haves*. Because the non-functional/infrastructural ones are not they are *nice to haves*. Whenever there is a clash (there is always a clash) because of scheduling, resources, any prioritisation process for any operational reason, the *must haves* win – joined up government *must lose* in aggregate. This is not a personal choice, nor can it be fixed by a better minister or better civil servants.

So there is a complete legal and financial oversight and reporting line build around departments, deepened by adding digital. Departments are strong.

These critical specifications are intermittently specified by a range of central(ish) functions or simply deferred to the departments. Instead of fixing and centralising the specification of non-functional/infrastructural requirements, recent governments have focussed on command-and-control and financial gatekeeping, or pulling engineering and technical functions back from departments into a bloated Cabinet Office.

The centralisation of the specification of non-functional/infrastructural requirements, paradoxically, is the key to decentralisation and a weak centre.

This centralisation is a weak for because it uses standards à la internet, it's based on consensus across the technical professions and departments and isn't imposed.

Challenges to the status quo

This narrowly constructed view of single lines of accountability has been challenged recently. The Institute for Government's report *A new statutory role for the civil service*[87] proposes a new civil service act which would enshrine new responsibilities:

The core features of a statute would set out:

- The civil service's permanence, impartiality, objectivity and requirement to maintain the highest standards in public life
- A new objective for the civil service to implement government programmes, with additional responsibilities for the head of the civil service and permanent secretaries to maintain the capability of UK governments to meet such an objective
- New accountability and responsibility for the head of the civil service for the administrative work of departmental permanent secretaries, so that he or she can better maintain and enhance the capability of the civil service
- Clearer responsibilities and accountabilities for ministers and civil servants
- Greater parliamentary scrutiny of the civil service, with a formal reporting requirement for the civil service to parliament, and more direct questioning of senior civil servants by parliamentary committees.

There are two elements of these recommendations that chime strongly with recommendations in the forthcoming report - the obligation to maintain the capability of the state and a more civil servants having a dual reporting line to Holyrood, directly or indirectly.

Civil servants are creatures of law, a new government inherits a statute book and capability from its predecessor, adjusts and changes that capability

87. https://www.instituteforgovernment.org.uk/sites/default/files/publications/new-statutory-role-civil-service.pdf

and hands over the new inherited capability to its predecessors - civil servants have obligations to governments past, present and future.

The Foundations of the Digital State has at its core the management of a pair of tensions: between functional and non-functional/institutional requirements, and between policy intent and policy effect[88].

Francis Maude reflects some of these tensions in his Independent Review of Governance and Accountability in the Civil Service[89]:

It is widely recognised that departmental structures and vertical lines of resourcing and accountability in Whitehall impede effective cross-government working. This builds in substantial barriers to achieving cross-cutting policy objectives. Siloed approaches and entrenched ways of working make collaboration towards common purpose arduous, time consuming and fraught with difficulties even in the highest priority public policy areas. Given the extent to which national and global challenges require contributions across government entities in providing solutions, it is imperative that Whitehall embraces new joint-working models to meet the substantial and complex cross-cutting challenges we now face. It is impossible for the old models to serve the nation well in the current context and it is time for change.

The argument in the report is stronger - that the state lacks institutional support for digital infrastructure that will have impact and structure its operations for a hundred years to come and which entangles its departmental or narrowly functional operations.

Any state function that has a substantial digital component (which in the modern era means almost all of them) will have a dual line of responsibility: to meet functional and non-functional/infrastructural requirements, and the addition of a new reporting line will invariably undercut the old world of Armstrong.

Joined-up government requires junior civil servants to have a dual mandate - their current minister and the wider capability of the state.

88. See Working Paper 9 Reading legislation with a non-functional eye and Working Paper X The heart of the beast

89. https://www.gov.uk/government/publications/review-of-governance-and-accountability/independent-review-of-governance-and-accountability-in-the-civil-service-the-rt-hon-lord-maude-of-horsham-html

Fallacies

Introduction

There are a number of fallacies that have driven public sector thinking over the last four decades, understanding a weak centre means understanding what it is trying to avoid, principally these three fallacies:

- the market fallacy
- the data fallacy
- the Silicon Valley fallacy

The market fallacy

Companies are bubbles of order inside a sea of market chaos. The old socialist utopianism believed that capitalist companies, by building the working class, would dig its own grave. The mechanism the working class would use would be taking the scientific principles and organisational precepts used inside capitalist companies and apply them to wider society. Surely if order-with-chaos could create such impressive results, then order-everywhere would be even more impressive?

Hélas, it was not so. It turns out the sea of chaos, the market, is a critical part of the success of capitalism – an apex predator that culls the weak and keeps the herd and ecosystem healthy.

Between birth and death a lot of economic function (the commanding heights) passed from private to state hands. Mrs Thatcher, a woman strongly misremembered[90] on both left and right, took the first steps of rebalancing that. It's strange to remember that Gleneagles Hotel and Golf Course (a railway hotel) was state owned and run.

She was initially prudential in her privatisations, but became increasingly ideological. Industries that had once been private sector, like gas, electricity and railways, but which were widely recognised both as natural monopolies and critical infrastructure were privatised, but with a regulatory wrap.

Her successors not so much.

On the right a theology of market-perfectionism took over and attempts were made to turn everything into a market.

There is both a marketplace and a clearing price for a can of coke, and likewise for a seat in the House of Lords. There is a place to go, and an amount to pay. Not such place or price exists for the rehabilitation of a prisoner.

90 Mother of the European Single Market of blessèd memory

The idea that any market defect could be fixed by a regulator wrap took hold – and subsequently regulators bloomed across the state.

The left correctly abandoned the state-run economy, but didn't leave all of socialism behind. The one-time saviour of communism, *Homo Sovieticus*, the worker-bureaucrat who would know what and how to do things through sound class analysis was reborn in *Homo Economicus* adopted wholesale from neo-liberalism - a rational purchaser with a panoptical perspective operating in a utopian perfect market. Simply <getting one of them in> would rejuvenate public service with their fresh ideas, peppy dynamism and get-go. There was a recognition that the pseudo-markets of state function weren't actual markets, and an elaborate infrastructure of regulation and target setting was put in place to correct these defects.

These two approaches of marketising state functions have not stood up to scrutiny.

The net result was the creation of vast tax farms masquerading as commercial capitalist companies. Organisations with guaranteed income collected at the point of the state's bayonet with risk-of-death transferred off back to the state.

Abby Innes's magisterial *Late Soviet Britain: why materialist utopias fail*[91] is the go-to work on this.

The data fallacy

The data fallacy is a child of the market fallacy. As the marketisation and regulation of public services consistently delivered worse services at higher costs a believe arose that *we just need to do it to them harder*. If the centre and the regulators had more data, more real time, then, then, then it would be able to bend the periphery, the great blob, to its will.

Abby Innes's commentary[92] on Michael Gove's Ditchley lecture summarises the point concisely:

Like Gove and his long-time partner in this scheme, Dominic Cummings, Soviet cyberneticians would depict the governmental system as an object of technical control, with inputs, outputs, and feedback loops: the language of machines. The post-Stalinist recourse to mathematics (and extensive conversations with Western neoclassical economists and operations research specialists) gained some traction around the optimisation of production, input-output tables, and linear optimisation problems within single enterprise that

91 https://www.cambridge.org/core/books/late-soviet-britain/6C375F1A3E6007A1496A52F8BF313277#

92 https://blogs.lse.ac.uk/politicsandpolicy/gove-ditchley-lecture/

sought to improve the production of simple and notably inanimate products. The Soviets also solved some logistical challenges around transport, but progress stalled every time they confronted the problems of change. They failed around any task that was characterised by uncertainty, complexity, interdependence and evolution i.e. precisely the qualities of most of the tasks uploaded to the modern democratic state.

Real time data should be provided to those people who have the capability and capacity to make decisions in real time – and that is rarely the centre, the Cabinet Office, the Ministers.

Data has also acquired a fetishistic quality. Operational data doesn't tell you about the real world, its tells you something, often not what you think, about the operational system. It is contained within a curtilage. Think of the Health Boards that got the waiting times down by having patients sit in the car park in ambulances, waiting but not on the waiting list.

I was long of the belief that the West Wing was the worst television ever to distort British politics, but I am increasingly coming to the conclusion it was the moon landings.

When NASA started its mission to put a man on the moon it didn't have a mission control. It was an engineering organisation that systematically built the capacity to put a man on the moon – testing rockets, spacesuits, developing training programmes and food, optimising rocket engines, building landing modules and so on.

At the end, with the capacity, it handed it all over to an operational team to execute. They had a mission control, and it was televised. Little boys, now in power, watched and thought "that's how to do it". Mission Control is not the <government> of NASA, but it did play it on telly.

The UK equivalent of Mission Control is the operations team at a hospital, in a 999 centre, social security processes teams. And guess what, they all look like Mission Control, dashboards on the walls, real-time figures and stuff – and have done for years, if not decades.

The Cabinet Office doesn't look like Mission Control because it isn't, and it doesn't look like NASA either – a practitioner- and expect-led organisation that systematically builds capacity. (I am being a bit unfair here for the sake of a banging metaphor, but hey! writing is an artistic job.)

And fundamentally data is contradictory – there is a separation of power in it. Operational data is the preserve of the operators and is extracted from their existing machines and systems. There is another world of social data, collected

externally by surveys and all the apparatus of social science that reflects indirectly the operational data.

Think of crimes-as-report-to-the-policy-and-recorded (and operational view of crime) and citizen-experience-of-crime – an external social science statistical set collected formerly in recurring crime surveys.

These do not match. The reconciliation of contradictory data, from different internal and external sources is a key management function. Data is not pure and self-describing but must be interrogated and wrestled with.

The Silicon Valley fallacy

Every pol loves a *deus ex machina* who will swoop in and fix the plot holes. Silicon Valley and now especially AI are the preferred man-in-a-fake-beard-descending-from-the-ceiling *de jour*.

Silicon Valley/tech has already had a considerable impact. The victory of agile over waterfall in the public sector follows the same triumph in the internet sector.

Iteration, fast reaction, exploration are embedded in tech companies - to the extent that it is taught in universities and preached as gospel up and down the land.

In Scotland that can be clearly seen in the Logan Report - *The Scottish Technology Ecosystem Review*[93].

Aspires to operate according to Internet Economy methodologies. We use this term to characterise a certain approach to product development and management. It is characterised by a strong focus on speed of iteration within a business context, on organisational agility at all levels of scale, on a relentless pursuit of product-market fit, on the application of modern growth engineering techniques such as the exploitation of compounding growth mechanisms, and on a very high degree of data-driven experimentation, to highlight just a few examples. Another short-hand term that could be applied to summarise these practices is The Silicon Valley Playbook.

The Silicon Valley Playbook cannot be simply transcribed over to the public sector though, government is government. The company development journey alluded to in Mark Logan's paragraph - a relentless pursuit of product-market fit - is widely misunderstood.

As Marc Andreessen[94] put it:

93. https://www.gov.scot/binaries/content/documents/govscot/publications/independent-report/2020/08/scottish-technology-ecosystem-review/documents/scottish-technology-ecosystem-review/scottish-technology-ecosystem-review/govscot%3Adocument/scottish-technology-ecosystem-review.pdf

Product/market fit means being in a good market with a product that can satisfy that market.

Before product/market fit a tech company is scrappy, reactive, moves fast and break things, changes direction, runs experiments constantly, pivots, changes ducks and dives.

After product/market fit the company becomes system- and process-bound - all be it with a strong emphasis on data-driven decisions. Iteration and experimentation become less wild and impulsive, switching to continuous improvement and adjustment and optimising of existing services.

In no sense at all is government pre-product/market fit. Do countries need roads and schools and hospitals and trains and parking and electricity and water? Yes to all.

Iteration in the private sector provides precedent for individual techniques and components that must be taken and adapted for use in the public sector. Learning, adaption, data-driven decision making and course correction are all critical, but only when disassembled and reconstructed for work in government. Government is government.

Tech companies have as a form of marketing art, origin stories. Amazon is tables built from doors, Google, HP and Apple it's the humble garage. The human story, ambition, hubris, nemesis, near extinction, miraculous recovery and eventual triumph. All of these (bar eventual triumph) are pre-product/market fit.

The Silicon Valley fallacy is thinking government should be organised like an early state startup not like an actual tech behemoth.

For a weak centre

It was a Tory Minister Francis Maude who brought digital in-house and stopped the practice of hiring major systems integrators to build new state systems.

Core competencies should be done in house, and technology, design and data are all as much core competencies of the state as policy development. There should be no place for commercial system integrators in the new world.

The use of external contracts to be able to pay technical staff market-competitive wages is a mistake, the bullet should be bitten - the commitment to tech as a core competency should be made up front.

No serious and ambitious firm in the private sector or Silicon Valley would outsource their tech - neither should government.

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94. https://pmarchive.com/guide_to_startups_part4.html

The question is then how to organise tech as core competency.

Fundamentally with digitalisation and the modern world, there is no ship of state - there is a fleet of state. An appropriate strategy is a direction of travel, a North Star, around which the subordinate institutions can define their own objectives and plans, the delegation of action and autonomy down the chain with the minimum of communication to achieve co-ordination, and a responsibility to grow and foster the capability of subordinate organs of the state. Lots of small flexible teams with the maximum autonomy under constitutional and legal oversight.

And instead of bringing cross-cutting work to the centre and inventing new structures to deliver missions, the capability to refocus and remix[95] the state should be pushed to departments. Departmental monoliths should be broken down into composed, and recomposable, services.

North Korea has a strong centre, and that centre is capable of making critical decisions that have strong outcomes - the creation of a nuclear ballistic missile programme being one.

However it can only make one decision at a time, it lacks the capability to make the tens, hundreds, thousands, tens of thousands of decisions that are required to make a successful modern complex society.

The Institute for Government is icily polite[96] about the decision to cancel HS2:

When the centre micro-manages it runs into trouble. The 'Network North' announcement made by Rishi Sunak at the 2023 Conservative Party conference is a recent example of this problem. The initiative was held closely by No.10, away from departmental officials, leading to serious flaws in the policy, as well as presentational errors. The latest evidence suggests that Network North will mean that popular routes like London to Manchester will actually have reduced passenger capacity[97].

Pace North Korea, this is the strong centre in action - strength is *macht* - the power to do something not the wisdom to do it well. It is an institutional and not a political failure when the Prime Minster holds his own infrastructure planning spreadsheet. Leadership requires trust and letting control go.

The democratic centre should make clear statements of policy intent. And civil servants should have the autonomy to address policy effect subject to the

95. See Working Paper 4 - The remixable state for a further discussion of this topic

96. https://www.instituteforgovernment.org.uk/commission-centre-government

97. Pickard J, Georgiadis P and Plimmer G, 'HS2 considers scrapping first-class seats to maintain passenger capacity', Financial Times, 26 January 2014, www.ft.com/content/17dc0a18-f56b-4ecc-9676-0113c09d6811

rule of law and statutory powers in a decentralised state. This is the core of the theory of state outline that informs the forthcoming report.

A worked example

This is all a bit theoretical – best use a worked example.

This example will step through a range of choices that are informed by various previous working papers.

There is a social security system. It is specified in law (the *what* of a digital service, the functional requirements are in statute and secondary legislation).

The evidence of Working Paper 9 *Reading legislation with a non-functional eye* is that the necessary non-functional/infrastructural requirements are poorly specified and spread across many places.

We wish that system to be developed in way that facilitates joined-up working. To do that in a decentralising manner with a weak centre, the centre is going to issue technical standards and guidelines that cove all parts of the state.

There will be technical guidelines about data sharing – we want to separate the *means* to share data from the *will* to share data. The former goes to the technical standards org, the latter to parliamentarians.

There will also be guidelines about exposing functional services as API and splitting GUIs from service layer, and ones about authentication and delegation.

The state first creates an institution that is capable of issuing the necessary standards – they pass and become obligatory for the social service department. They are timed in – so the obligation is set now, and must be complied with in, say, now +3 years. The structure of that body is described in Working Paper 0 *The locus of change*, a theory of state that supports it is in Working Paper 12 *A theory of state*, and a draft initial charter and discussion of the contents of the standards are given in Working Paper 11 *Jeff Bezos' API Mandate, but for government*.

The social security system comes into line with the standards over time.

Now we know that 80% of social security claimants are one and done and 20% need help – which is provided by a call centre.

So the social security agency can be reorganised into a service platform team, a front-end self-service team and a call centre team.

Now the call centre teams realises that its 20% is 15% fairly simple and 5% high dependency cases. It approaches the social work teams and suggests that they proactively take on high dependency cases. Because social security is delivered as a standard API, and because the social service team's software is

also aligned with that API the social security system can be embedded into social work workflows. The shared delegated permissioning system allows the citizen to give permission to their social worker to apply for benefits on their behalf and this permission passes through to social security.

Dundee implements this, Highland and Islands doesn't – it doesn't chime with how they work, their social workers will phone the call centre on their clients behalf (using the same delegated powers).

Dundee Social Security realise that of their 5% of the total, 1% is care leavers and 1% prison leavers – they reach out to the care service and prison service and the dance continues.

(The technical mechanics of this process are described in more detail in Working Paper 3 *The Lego state* and Working Paper 4 *The remixable state*. These proposals are profoundly infrastructural and will continue to inform the organisation of the state for 100 years – so the parliamentary oversight outlined in Working Paper 0 *The locus of change* is critical here.)

Essentially we are breaking down the monolithic departments into smaller systems with published interfaces that conform to shared, known and stable standards.

The central standards body has an overview of state data and can use that to suggest Machinery of Government changes based on data and process consolidation (Working Paper 5 *Law reform for data*) – some of these will require legislative consolidation which can be effected without overwhelming parliament (Working Paper 8 *An Enabling Act*).

Once that has happened we can remix the state, and redirect resource, more money for social work, less for social security call centre, etc, etc.

At the core is a small team with maximum autonomy over resources, how they spend their money, technical choice, sequencing, delivery, testing, etc, etc.

These co-ordinate without communication by using standards – and interact via defined interfaces. These interfaces present automatically by use of open-source, shared standards-embodying software components. The centre also promotes technical tools that embed the standards (publishing meta-data and data models, API documentation, change log generation and release documentation, etc, etc) to make compliance press-button and not slog-through-paperwork.

The centre is weak, but co-ordinating, the periphery, here teams within departments are strong.

The strength of the weak-centred state is the depth of its expertise, the speed with which it can reconfigure and regroup, the ability of multiple

systems and services to survive and work around the acute crises that some will always be in, its ability to cope with sudden unexpected external shock.

It is a state that looks like the modern internet – a similar weak-centred organisation - which was expressly designed to continue to work after the Soviets dropped the bomb, with self-routing and self-fixing at is heart.

Conclusions

You should now have a better understanding where this body of work stands against others in the field.

Note: This discussion of decoupling and the weak centre focuses on the *how* of digital systems. *Foundations of the Digital State* contains a whole other stream of work looking how to better define the *what* of state computer systems – in particular Working Paper 7 *Experimental digital legislative processes*.