The Old Geeks Shed Product Architecture Overview

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References

Internal

Ser	Description	Location
1	Case study – Supply Chain Performance	Left click here
2	Case study – The Lithium Experiment	Left click here
3	Case study – GDPR Data Protection Officer Task Terms of Reference	Left click here
4	Portal EU GDPR DPO Profile Page	Left click here
5	Sample Portal Gateway	Left click here
6	Portal Risk Register	Left click here
7	Through life folder structure	Left click here
8	Architectural schematics	Left click here
9	Performance Metric Profile Definition	Left click here
10	Policy Gateway	Left click here
11	Internal Training Pack	Left click here

External

Ser	Description	Location
1	HM Treasury "Orange Book"	Left click here
2	The Law of Requisite Variety	Left click here
3	The Viable Systems Model	Left click here
4	Network Science	Left click here
5	Living Systems	Left click here
6	Cognition and Autopiesis	Left click here
7	Capability Management and Lines of Development	Left click here
8	The MOD Architecture Framework (MODAF)	Left click here
9	NATO Architecture Framework	Left click here
10	The AQPC Process Classification Framework	Left click here
11	Capability Maturity Modelling	Left click here

Location Details

Original Path on Development
C:\Users\Windows 7#\Documents\ea co\product Architecture\20180627-Product Architecture-1-U.docx
TLMP Folder Location
C:\tlmp\04 Strategy\01 Commercial Strategy\20180627-Product Architecture-1-U.docx

Product Architecture

Contents

Statement of Copyright

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Fact of the matter is, that the author is retired, not a millionaire and could not protect any copyright in any event….. Help yourselves. The aim of this document is to prompt some thought in respect of just what bias, in software development, is about and it affects everyone nowadays and needs careful consideration across the piece.

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About the Author

In order to decide for yourselves the experience of the author in respect of whether or not to take this document seriously, this brief biography is provided

- Allen Woods, now retired.
- Ex British Army (1971 – 1995) Taught Arctic Warfare, several years on operations, Funded Himself through College to Study IT
- Chartered Member of the British Computer Society for 20 years
- Member of the Chartered Status Interview Panel for BCS
- In 2010, Finalist of UK "Developer Of The Year" Competition for the MoD Health and Safety Information System (HSIS)
- Primarily Employed in UK Defence Supply Chain and Logistics IT since 1995 until 2019
- Credits: MoD Health and Safety Information System, Various Internal to Defence P&G Portals, CATMIS, IQB Oversight to Defence Voyager Programme IM Transformation
- In respect of contract examination, as part of a major due diligence exercise the author was part of a team, the aim of which was to examine the licence terms, as a matter of contract validation, of 20 major systems, each with an annual maintenance fee in the high 6 low seven figure expenditure range.

It is a wide and varied range of IT work experience covering some 30 years in total. In many ways the author was lucky in that he started working in IT when the PC's were beginning to proliferate and along the way was given the chance to work on a wide variety of tasks that simply would not be possible now. A common theme through them all was legal compliance in one form or another.

His by line is "How the hell did that happen" which is appropriate not least because along the way he has made more than his fair share of mistakes and one of the sub plots of the pack that this document forms part, is that it seems to the author that much is having to be relearned. Above all, this document and the pack is an attempt to help. Particularly non-technical people understand some of the technical complexity they are using almost without thought it seems.

None of this is simple. Even writing this document was a complex task.

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Executive Summary Read Me First

With every document we produce and publish via social media we add something like this as a precursor. Feel free to look around and play with the hyperlinks. Anything that can be downloaded (mainly documents) has a copyright message but nevertheless is free to use as you see fit. Treat everything as a pathfinder. Your own circumstances will be different to ours and so, while the words contained in the documents may make sense, it is inevitable that you will need to amend them to suit your needs. What we are content with however, is that everything set out in this document and in others is structurally sound. Nevertheless, beware of geeks bearing gifts, including this one. Question everything.

You may be wondering "why are we doing this". In respect of motivation, when the dog and I read article 17 of the GDPR, our jaws dropped. This regulation is, by any standard a game changer. And when we read the rest, its game changing impact became more apparent. Depressingly and no unexpectedly, it has generated a feeding frenzy of "experts" who clearly know the rules backwards but are seemingly incapable of solving the architectural issues that the compliance with the GDPR represents. And be under no illusion, the GDPR means end to end cultural and technical change. We've seen nothing like it and we are used to working in secure military environments. Case studies (internal reference 1, 2 and 3 are provided)

The author is now retired. The portfolio of tools and other forms of information management artefact have been built over many years. Many have gone through formal UK Defence integration testing and have been used in anger on many occasions. That said, the portfolio is not complete, there is much that the author would like to do, but time precludes it. Nevertheless, the portfolio you see described here has been used to develop the UK MoD's Health and Safety information system, various policy and governance delivery portals and more besides.

None of the code or products are for sale. The portfolio and this document are a guide to the kind of functionality a compliance management system, auditable and configurable, should contain.

Supporting this portfolio is a policy and governance framework and a training pack. See internal references 10 and 11 on page 3. All are intended to be mutually supportive. It is the view of the author that inevitably, developing a portfolio of applications must be supported by both. As a consequence this document should be read taking into account that it is supported by both P&G and training.

This document is divided into three sections, the first setting out architectural intent, in this instance based on a part of systems theory known as the "Law of Requisite Variety" and testing for organisation viability. Part two gives more detail on the history of the portfolio and the kinds of ideas used as an architectural basis and finally the portfolio itself running through it all is the science of communication "cybernetics" but its application in the context of the "living system" but acknowledging the twin constraints of time and limitations of observation.

In respect of compliance, it is not enough to know the law as eventually, the time comes when what the aw says has to be put into practice and in the authors view, privacy regulation is an end to end architectural issue, not an opportunity for a single application to solve. This document sets out what was built with the P&G and training packs being key support capabilities.

Help yourselves to what you can download. But be aware that in September 202 all of this will be deleted from the site as it is closing down. There is a "donate" button on some of the pages, if you the reader think what is contained here or in any of the modules and documents, please, if you want to keep it available, as small donation would be kind.

Purpose of this Document

The purpose of this document is to provide an overview of The Performance Organisers product architecture. This document is provided to illustrate how the product architecture fits such that information management generally, but in particular its ability to manage data to information transition, provide an integrated, structurally coherent, product set.

This document is divided into three parts:

- This section which sets out the basis of the architectural approach.
- "Background and Explanation" section to add context to the intent
- Followed, finally, by the product descriptions themselves.

It is recommended that the whole document is read as then the product set will be in some form of context that will help position the products themselves.

The Architectural Intent – Requisite Variety

The Performance Organiser first started developing software in 1995 on the discharge from the British Army after 24 years exemplary service of the CEO Allen Woods. He had started studying computer programming, in a business context some 15 years earlier taking various courses whilst serving up to honours degree level (as a by the by in 2010 he was a finalist in the British Computer Society Developer of the Year competition and on discharge was described, by his them commanding officer as the "backbone of the REME programming effort").

Within a few years of developing software for the Army on a full time basis, the CEO came to the conclusion that while he had been taught his craft on a systematic basis, that is to say how to develop software using procedural logic, there were often occasions when he realised he had not be taught systemically about the way organisations work. It quickly became apparent that while he was asked to support process level data capture, within a short period of completing a process level task, he was often asked to join solutions together with the aim of providing end users with a more complete picture of the operating environment in which his software was meant to operate. Basically, the development paradigm of "People, Process and Technology" was spectacularly successful at producing silos. But those silos had major conceptual shortfalls.

Research eventually led to the discovery of the concept of the organisation as a system and a living thing that was non-linear and focussed on form and function rather than process. A key concept, that of homeostasis, a more formal definition of which is "a characteristic of a system that regulates its internal environment and tends to maintain a stable, relatively constant, condition of properties. ... This maintenance of body size is an example of homeostasis" made a lot of sense as it reflected what could be observed all around the CEO. Homeostasis led to the discovery of cybernetics, the science or theory of communication that finally confirmed the need for a rethink as, from an information management perspective, cybernetics confirmed that key to software development was dependent on an understanding of the form of "thing", but more powerful was the idea that "thing" formed relationships with other "things" and those relationships may be transient or permanent as need and circumstances dictate. One concept in particular stood out as obviously true, the law of Requisite Variety.

W. Ross Ashby was a British cybernetician working in the 1950s who became interested in the phenomenon of *homeostasis.* Ashby came up with the concept of *variety* as a measurement of the number of possible states of a system. His "Law" of Requisite Variety stated that for a system to be stable, the number of states that its control mechanism is capable of attaining (its variety) must be greater than or equal to the number of states in the system being controlled.

And it was requisite variety that The Performance Organisers set about developing their tools and products to support. Whether or not the attempt to develop tools to support the law of Requisite Variety was worth the effort The Performance Organisers will leave to readers to

consider, but as evidence of the benefit of doing so, this document is supported by three case studies that illustrate the usefulness of the end result.

Caveat

The world of software development seems to have a fascination for "the silver bullet", be it some sort of all singing and dancing tool or some sort of design approach, typically described as a framework. All of them are flawed one way or another. Over the years, The Performance Organisers have identified a number of common themes in them all. At the time of writing the word "Agile" crops up regularly supported by a project management approach called "SCRUM" are cases in point. There can be no agility without stability first and stability requires attention to detail. And learning a project management technique without first learning the basic skills of software design and development, which may take years, is probably not smart you would not let someone build a car who did not know what a car is, developing software however seems to be exempt from that basic truth.

It takes years of effort to build something like the product architecture set out in this document but it too is no silver bullet, just one small company's view based on hard won experience of how to go about joining things up to the point where stability is achieved and agility can be exploited as a benefit. If it helps to put this paragraph into context, left click here and have a read of the document subsequently displayed, for a small company (one, now grumpy old man and a dog) we punch way above our weight, there is a reason for that…

Please question this document, treat its content is a pathfinder, but by no means gospel. However, it does have the advantage that what is set out in it works and can be demonstrated to do so.

Background and Explanation

Background

Over the past 30 years, The Performance Organisers (TPO) have been involved in the development of integrated information management architectures in the UK Defence sector, principally for the UK Ministry of Defence Joint Support Chain. Over that period, TPO have built a number of desktop applications and web information portals covering a diverse portfolio of functional capabilities including a distributed system for to assist in the management of the Army Catering budget, the MOD Health and Safety Hazardous Materials Handling compliance regime and a number of single point of contact information delivery portals in support of the delivery various aspects of supply chain programme management policy and governance. EVERY tool we have built has worked, each has added to the company experience, each has been an improvement on what has gone before, but… It has taken 30 years or more to get this far.

Over the 30 years work, TPO have progressively built on experience to create an integrated code base covering both desk top and server side architectures that concentrates on the management of location of data "thing" (that is to say both structured and unstructured data) such that the same principles of design associated with the concept of a "canonical" or master data model can be applied to data, both structured and unstructured on a generic basis, such that both classes of data can be combined in response to search queries with the end effect that both general classes can be returned on demand in a manner that is contextually coherent in order to better support informed decision taking.

The production of this document is driven by the development and publication of an increasing number national and international governmental legislation/regulation, like the EU General Data Protection Regulations (GDPR) and initiatives driven by the application of professional operating standards like the International Financial Reporting Standards (IFRS), that increasingly mean that information management, in which concepts like "privacy by design" means that what is currently seen as information management "best practise" must increasingly become the norm.

We also view the legislation as generally a good thing. Amongst other things, the level of crime associated with IT is growing and something had to be done. That said, we are firmly of the belief that the kind of legislation that is required needs to be more nuanced than it is if for no other reason than quite simply, much of it cannot be complied with not because people do not want to, or see the point, but because they lack the technical skills to do so.

With that in mind, the TPO product architecture is designed to support, as far as possible, the testing and proving of organisational viability by taking into account requisite variety and its implications. From TPO's perspective, In order to prove and monitor viability there is a need for the provision of an integrated architecture that is multi-dimensional and multi perspective that is top down, bottom up and lateral in its support for navigation, mining and other kinds of investigatory activity. And the first step to achieving the kind of architecture envisaged is to set out a series of operating principles that can be applied to product development so that constituent parts "fit".

Finally, one of the other issues we are trying to address is cost, through life, of IT. In effect, the primes are now equivalent to a taxation agency. It is getting to expensive to run efficient IT. Nothing described in this document is expensive to produce. It just needs a lot of considered design effort and a fair bit of skill of course.. it might be of interest to note that the approach set out in this document was applied to the development of the UK Joint Support Chain deployed inventory management portal.

The Operating Principles

Annex A lists the core operating principles in respect of the architectural design approach. The TPO applies them on every task we undertake. We base the principles set out in Annex A on the idea that organisations are living things and that as a consequence design approaches based on the oft quoted paradigm of "People, Process and Technology" (PPT) are fatally flawed with the end result being the development of data/functional silos for which, eventually, there is a need to federate if only because no one data set is the totality of

available information. And once the need to federate is realised, it is then that functional gaps, particularly a structured way of describing organisation structure, begin to make themselves felt.

Instead, The Performance Organisers contend that in order for an information management architecture to fully support the organisation then the organisations form, function and purpose understood on a multi-dimensional multi perspective basis from the outset makes more sense as ultimately, the aim of an information management architecture is to provide, on request, properly validated decision support. Furthermore, the decision support must be contextually coherent on an on demand basis across the organisation.

Furthermore, PPT has generated silos that are process based, parochial and linear whereas reporting tends to be organic and viral. As far as TPO are concerned, this kind of functional conflict of interest has brought about the need for a rethink about the basis of architecturally sound software design and development. TPO have therefore spent some time proving the viability of the principles set out in Annex A on live tasks where it was possible and sensible to do so. The principles are founded in General Systems Theory as exemplified by books such as "Living Systems" by James Grier Miller or similar conceptual works by the great Russell Ackoff and Ludwig von Bertanalffy. They are a significant departure from PPT and over the years spent formalising them, TPO have written a number of case studies the aim of which is to demonstrate them being applied which are set out in the table below. Readers of this document are invited to download and review them

Ser	Description	Location
1	Architectural Schematics	Left click here
2	Lithium exercise, POC Demonstrator	Left click here
3	Supply Chain Performance Reporting	Left click here
4	MS Office Add Ins Training Pack	Left click here

The final point to be raised in respect of operating principles is that as a result of applying them, the need to develop supporting policy and governance documentation has made itself apparent. If the kind of rethink proposed in this document is to work, then the product architecture must be backed by a working infrastructure on which to base training effort in respect of operational application and of course the means to demonstrate an end to end plan that in principle at least can be tested and proved to be workable. It should be understood that one of the spin off benefits is agility, but it is agility drawn from the stability that is arrived at once the discipline and attention to detail of coherent design is pursued and implemented.

The Policy and Governance Regime

The first part of the product architecture therefore is a document library upon which to base policy and governance. In terms of history, the documents the Performance Organisers have developed were written after the development of much of the software tools. But the advantage this gave was that the policy and governance document set could be structured as a matter of design.

Figure 1 illustrates the structural end result. The policy and governance structure consists of a series of long term articulations of strategy (Vision, Mission and Charter) on which to base high level policy, which could then be easily subdivided into professional discipline specific detail (Privacy, Document Management, Security for example) from which it is feasible to derive a work breakdown structure (from objective to task) that together form a clear taxonomy, which is relatively straight forward to align ontologically to other parts of the architecture where appropriate.

The way the architecture manifests itself is indicated in the table below, it should be noted that each entry has a "click here" capability that points to a free to download version of working documents).

Ser	Description	Location
1	The Performance Organisers Portal	Left click here

2	Enterprise Architecture Terms of Reference	Left click here
3	Regulatory Compliance Audit Tool	Left click here
4	The Performance Organisers DPO Page	Left click here
5	The Performance Organisers Risk Policy	Left click here
6	The Performance Organisers Risk Log	Left click here
7	The Performance Organisers Privacy Policy	Left click here
8	TLMP Folder Structure	Left click here
9	File Naming Convention	Left click here
10	Document Style Guide	Left click here
11	Document Retention Policy	Left click here
12	Non-Disclosure	Left click here
13	E Mail Management Policy	Left click here
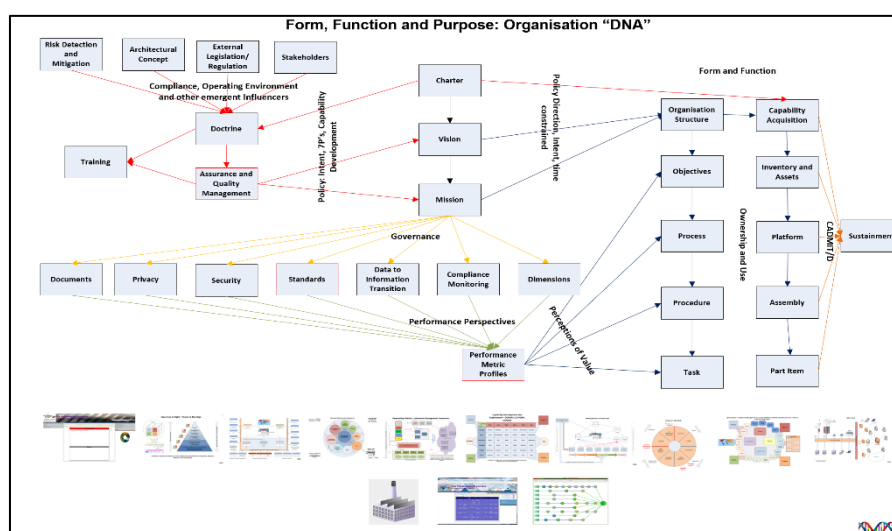
Figure 1 - Policy and Governance Structure

Each of the documents demonstrates a number of the operating principles working, one of which, the concept that each data element stored by the product architecture should be considered as a potential gateway into the wider architecture which means that each document (including this one) is part of a linked information platform. Each of the documents is designed to fit in and of itself as an information resource and as a consequence makes extensive use of hyperlinks to join things up and each document, designed as part of an architecture can be treated as a database record which means content can be cross referenced by data held in other data forms. The "Lithium Exercise", the second case study listed above is provided to illustrate the concept.

The application of the policy and governance design approach set out in this document has been further extended in that part of the architecture is a library of document file templates that are designed to support the application of best practise management planning techniques like PRINE, ISO 9000 and ISO 27000. Those templates, supported by other architectural components like the Through Life Librarian, mean that a natural spin off of the use of the product architecture is that a quality management system (QMS) is a by-product of use as opposed to something requiring special effort. That can be seen by the nature of the capabilities that each of the links in the table above point to which are a mix of other documents, web services and desktop components that each follow the gateway principle in respect of the support for architectural navigation.

Choosing an Infrastructure: The Foundation

TPO have selected the Microsoft WINDOWS family of operating systems as the foundation of its development effort. The company therefore makes extensive use of the Microsoft infrastructure and product set. This decision is an accident of history in that the first 10 years

of the CEO's development experience was with the UK Ministry of Defence in one of its now defunct small systems groups. During the first three years working in UK Defence IT, the CEO was part of a small team that reviewed technical merits of the most common PC based business platforms available at the time and in the opinion of the team, WINDOWS came top of the list for a variety of reasons. That is not to say that WINDOWS is without fault, it is to say that in terms of things like interface, product integration (Microsoft had just introduced the first Office suite of applications), the WINDOWS platform offered a more comprehensive product set at the time than the alternatives that were reviewed.

TPO are, as a result of experience driven by their normal operating environment, a WINDOWS shop. WINDOWS is not without its problems and issues, but given the breadth of the product set, the sophistication of its architecture in object modelling terms, the company will continue to develop for that platform for as long as is affordable and practicable.

Selection of a single platform, that contains a reliable operating system and a continually expanding product architecture designed and integrated into a common software object model means that developing tools and components can be more tightly focussed and issues like network security and data integrity can be more properly addressed. It is stressed that it is not WINDOWS per se that drives the decision n platform, just the need to be in a position to understand one in some detail in order to exploit potential without the complications offered by a mix of architectures.
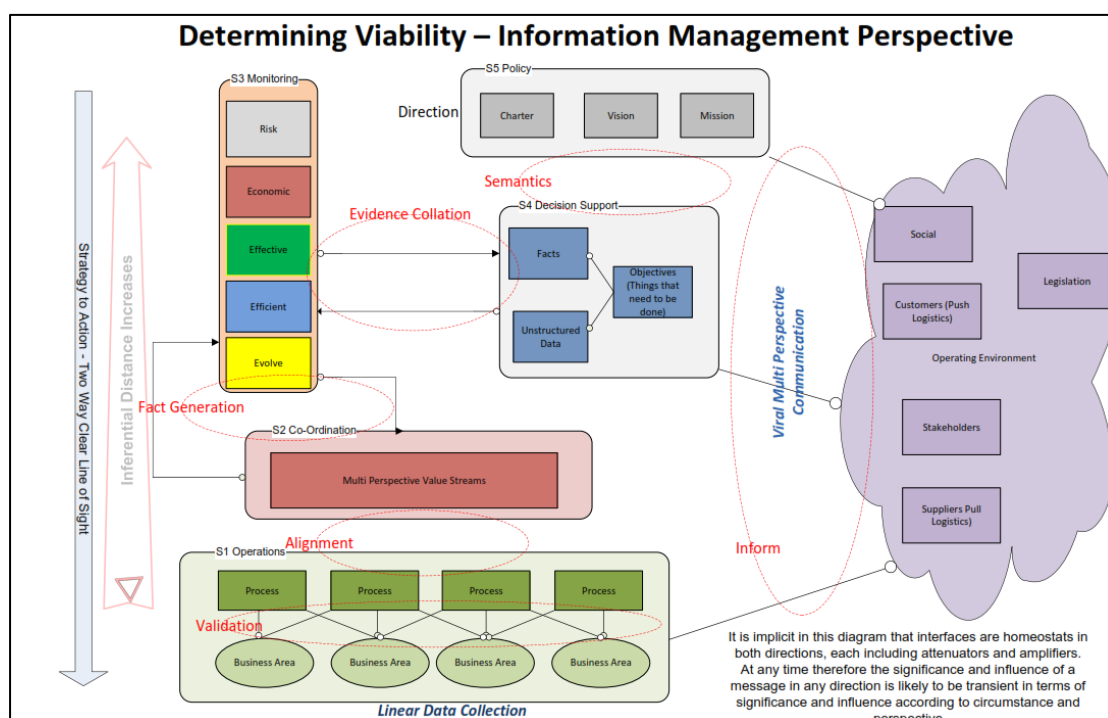
Proving Viability

Figure 2 - Viability Transformations

Of necessity, one of the things an information management architecture must make accessible it is to recognise the difference in the nature of processing between data collection and reporting. Data collection being linear and procedural with reporting being contextual and viral. Both being constrained by time.

The approach taken by TPO is that of the provision of on demand, in context, evidence based decision support that can be demonstrated to have been properly validated and verified by means of the ability to navigate around the available data sets on a top down, bottom up and lateral basis at any point in the architecture with any point in it being capable of being used as a gateway.

In order to achieve that, there also needs to be a recognition that as different parts of an organisation have different reporting requirements, that as data morphs from its raw form, it will go through several transitions, reductionist in nature but capable of supporting multiples of perspectives.

TPO decided to base the way that may be constructed on the organisation "need to know" expressed in the form of performance metric definitions with those definitions being recognised as key business driven specifications of requirement that are truly business driven. To facilitate that a metric catalogue was developed with a standard template.

The transitions, illustrated in figure 2 are:

Ser	Purpose	Nature
1	Validation	Data capture from the outside operating environment. Typically linear and procedural, THE gateway into the architecture and subject to stringent validation and verification testing and proving
2	1st Stage Alignment	Alignment of data in terms of meaning, scope and data type such that data from any number of federated data sets can be aligned. Linear and procedural.
3	Fact Generation	The generation of fact based summaries against which date from the previous two stages are reviewed and a series of reductionist exercises applied, deterministic in nature to support four standard perspectives and multiples of dimensions that support accurate data targeting. It should be noted that fact tables are subject to further normalisation review.
4	Evidence Collation	The marrying up of structured (data in databases) and unstructured (document files). For this element of the architecture a number of additional components were developed both server and client side to align this collation stage.
5	Semantics	Not quite the right word, but this transition refers to the application of a mix of Euclidean, cartesian and Bayesian approaches to data review that also includes a switch in logic form incorporating logic forms like predication.
6	Inform	The planned integration of data from the outside world, across the organisation boundary. Of necessity, this last stage presents more than a few issues of an unknown and emergent nature given the lack of control of the media or content structure that this may represent. However, where possible, standard message forms would be applied (the OAGIS 10 message library for example.)

It should be noted that figure 3 implies a vertical "chain of command" like construct, but that is not the case. The transitions can and were applied on a contextual basis in exercises where the approach was applied.

The major constraint was and will remain the impact of time. Each of the transitions being influenced by it in one form or another. For example, the volume of data and transfer across a network would limit how often fact tables could be amended. Another example is the validity of data in life cycle terms, quite simply data in collated form would become redundant. As a consequence, major effort went into the transition cycle and its design and implementation.
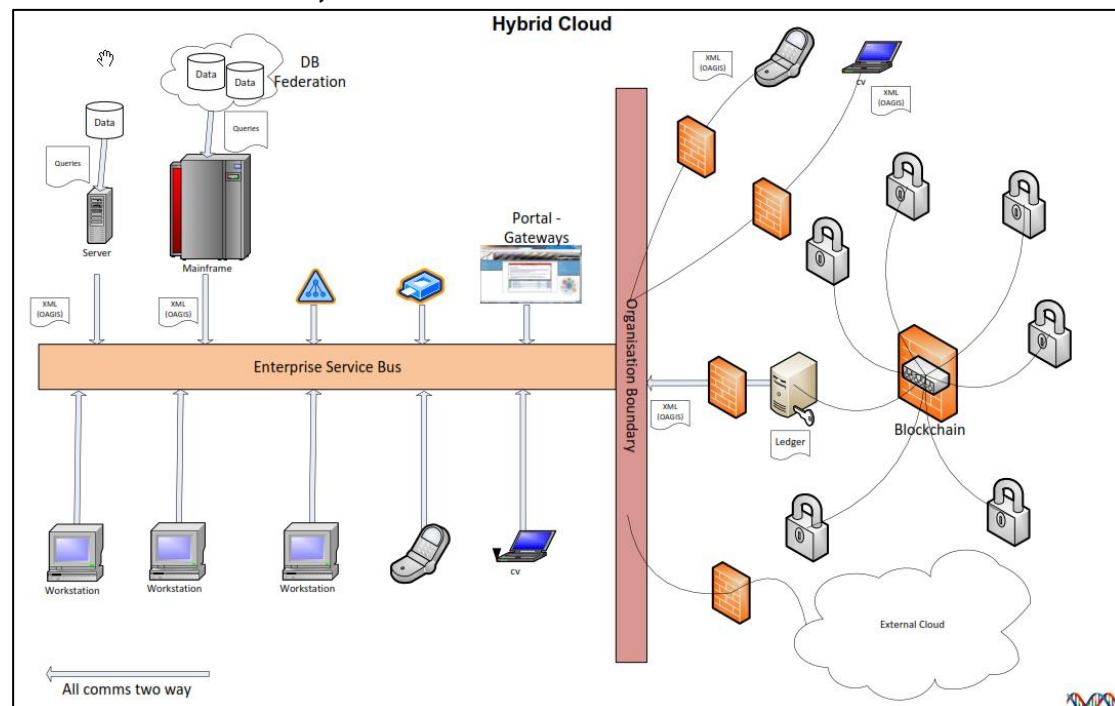
Division of Labour, Cloud vs Internal

Figure 3 - Hybrid Cloud

Having decided on a development platform, the next design step was to work out a viable network topology to suite the kind of service delivery the company saw as necessary viable within the context of the operating principles the company has adopted. Key influencing factors in the preferred approach was the development of a manageable security model, legislation associated with privacy protection and finally minimising the impact of database federation effort. The three considerations in the last sentence led to the decision to opt for a hybrid cloud/internal architecture illustrated in figure 2.

The architecture set out above provides the means to separate out diverse IT processing that that is normally carried out with the graphic giving the means to place capabilities as either inside or outside of the corporate boundary and proceed accordingly in development terms on the understanding that anything out side of the boundary is an inherent risk in which routes in to the architecture must be carefully managed on the basis that a fortress is only as strong as its gateways.

The Performance Organisers product architecture focuses on organisation form, function and purpose with that driving the nature of the product set itself. The topological construct set out above forming a basis on which to develop an integrated suite of documents, databases, software tools, both server and client side with the underlying aim of managing location and the provision of support of ownership providing an architectural operating model that is through life and end to end including both desktop and server side applications and utilities that are coherent across the organisation boundary.

Having decided on the kind of network topology to be employed, the next step was to establish a common meta-model in respect of the definition of "thing" and how "things are interconnected.
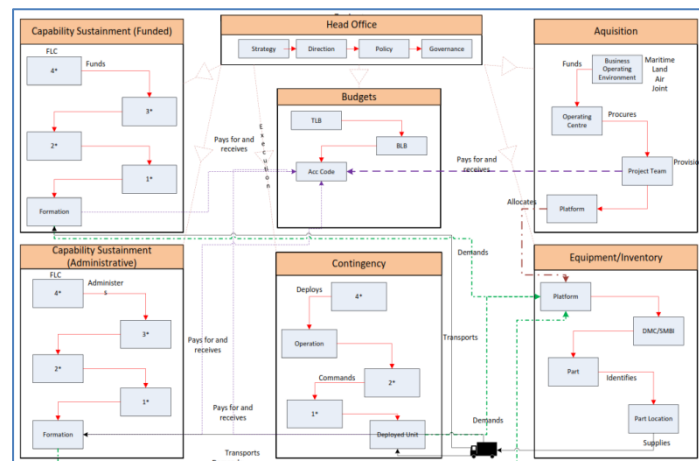
Establishing a Common Meta Model

Figure 3 - Organisation Form, Function and Purpose

Meta-Data is loosely defined as data about data and refers to things like database table names, field and index names and so on that form the data structure of a database. However, the influence of People Process and Technology has arguably caused the generation of functional silos at the process level as a result with each database having a different and distinct design schema that is specific to the process on which data is being recorded and stored for recall.

However, process is parochial by and large and eventually as a database federation grows, the need arises to collate data sets in order to provide more complex reports related to performance for different forms of management control in the organisation. The impact of the variety of forms of management control is that while data collection is linear, the reporting requirement is viral with multiple data sets being used to provide contextual information for various professional disciplines. Basically, money is not managed the same way as inventory as each has their own professional standards and legislative compliance factors tha drive the nature of reporting.

Perversely, one of the meta-model shortfalls, because of the influence of PPT is that many information management architecture do not have an architecturally integrated means to describe organisation form function and purpose in a way that supports the idea of "change the organisation chart, change the information flow". It is the view of The Performance Organisers that the inability to describe form function and purpose is a major mistake and one that the company has gone to great lengths to correct.
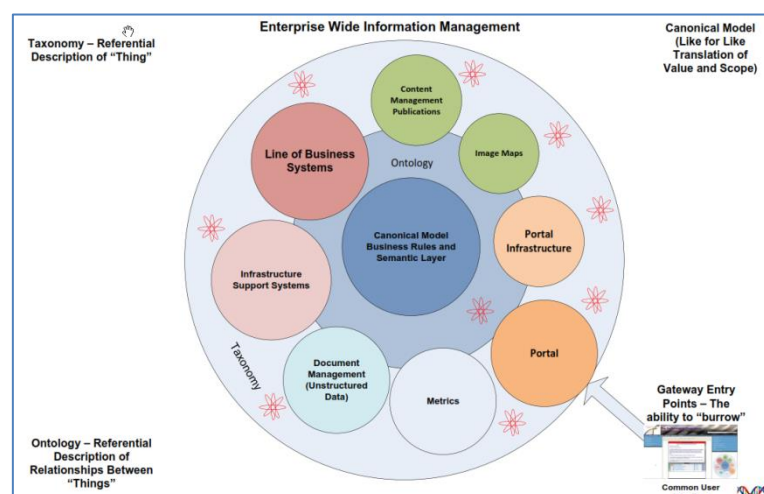

Figure 4 - Taxonomy, ontology and atomic structure

Figure 4 illustrates the nature of the impact the application of the design approach we have taken. For the benefit of this document taxonomy refers to a form of description of "thing" and ontology recognises that "things" interrelate and react to each other and the nature of those relationships will impact on the ability to support evidence based decision making. The Performance Organisers take the view that failure, as a matter of design to be able to understand and exploit relationships between "things" is a lost information generation and decision support opportunity, that once addressed and corrected leads to the means to accurately identify key relationships that can be used on a joint Cartesian/Euclidean basis to connect diverse data sets and put developers in a position to better manage the nature of processing (logical form, programming logic) required to make a successful transition from raw data to deployed, coherent and usable information.

Figure 5 - The Primary Dimensions

In design terms, there is a need to identify a means of structuring the targeting of data as from the identification of structure comes the means to align data from diverse data sets. TPO came to the conclusion that a way of organising data targeting based on the concept of information perspectives the aim of which is to provide a means to structure entry into information management architecture for the perspective of reporting, supported by two levels of dimensions, primary and secondary.

The perspectives, the means to take views of the organisation and its form are:

Ser	Title	Purpose
1	Economic	Data to information transitions related to the use of money
2	Efficient	Internal view of data to information transition based on how well resources and capabilities are used to achieve the corporate mission and vision.
3	Effective	Internal view of data to information transition based on how well resources and capabilities are used to meet customer requirements and needs.
4	Evolution	How well the organisation copes with change in general and emergence in particular.

Which together provide the means to assess "efficacy", or the heath of the organisation and from that derive the notion of testing the viability of same. The benefit of the perspectives is that each can give the organisation the means to focus on what it needs to know in order to judged efficacy and viability and so that through the medium of performance metric definitions, but metric definitions written as the means by which the management of the organisation can direct infrastructure development efforts on the basis of business need.

After a consideration period (approximately 10 years) using volumes of data at the petabyte level, have come to the conclusion that a significant second step (once perspectives have been identified and confirmed) in the design of an information delivery platform is to identify the primary and secondary dimensions on which to base categorisation and subsequent alignment of data. The list of primary and secondary dimensions that TPO have come up with are listed in figure five (it should be pointed out that there are likely to be other dimensions)
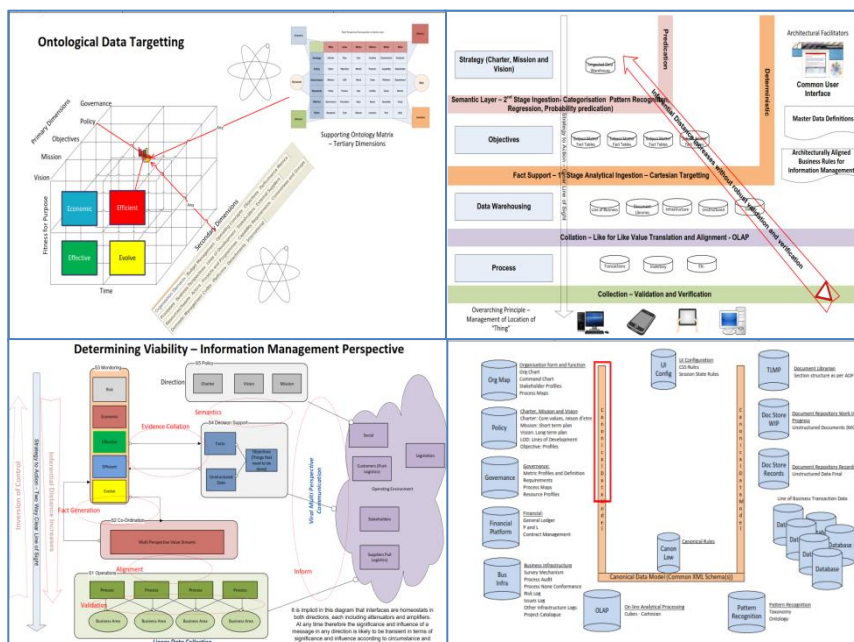
Figure 6 - Multi-Dimensional, Multi-Perspective Data Targeting

Figure 5 presents a collage of key architectural schematics that illustrate the structure of secondary dimensions in Zachmanesque form in the top left hand picture, with the nature of major data to information transitions, the importance of reducing the impact of inferential distance followed by the two diagrams on the right hand side of the collage focusing on the nature of a layered federation of data with a multi-dimensional meta model between the data and the information delivery artefacts that are designed on the basis of exploiting the perspective/dimension construct described in this section of this document.

Having decided on a means of structuring perspective and dimensions on which to base a meta model, the next step that TPO took was to identify any structural gaps that may be present and build applications and tools that would reduce the impact of any omissions and therefore bring the product range closer to the aim of providing information management support based on the Law of Requisite Variety.

The next part of this document describes, in overview, the product set. It should be understood that the product set is not complete there are a number of elements (centering on the logical separation of "person as thing" from other parts of the product set) that are still just an aspiration. Furthermore, The Performance Organiser have been obliged to react to changing circumstances like the EU General Data Protection Regulation (GDPR) but throughout, requisite variety and its understanding has been the guiding force of product development for the company.
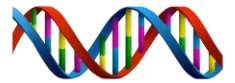
The Product Portfolio

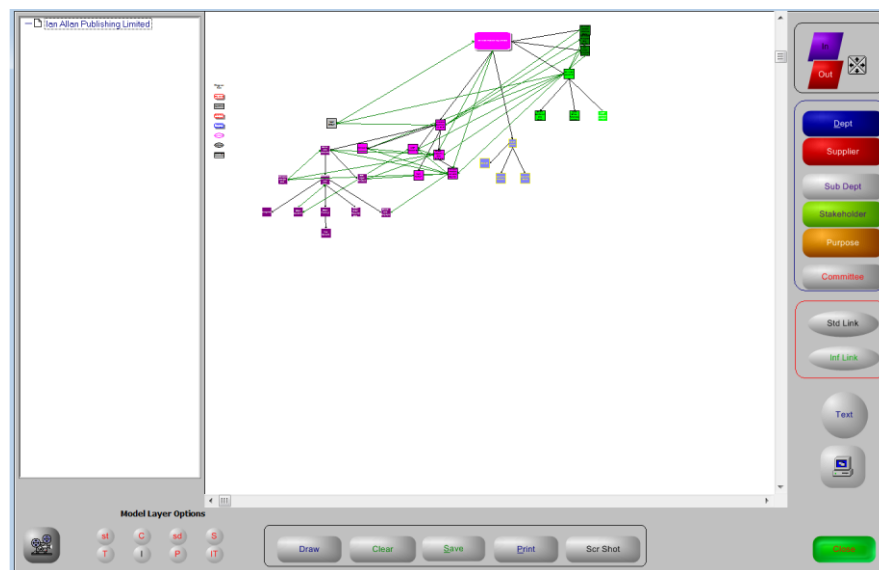# The Architectural Foundation, Organisation Mapping

Figure 7 - The Performance Organiser organisation map

In 1995, TPO were asked to join up two databases, both seemingly innocuous in a military sense, when the job was complete and a full set report was printed for the first time, it contained a complete breakdown of the UK Armed forces at the time including special forces. When the report was presented to the senior officer requesting it, it was immediately shredded and the two databases had their security marking enhanced. The joining of the two datasets also revealed that one of the reasons why the nature of the risk involved in joining the data sets was that there was not the means to prove database content against working model of organisation form and function.

At the time, while there were IT system design applications in the market place, they were in the main designed for IT specialists with the aim of producing technical designs and specifications based on design methods like SSADM from which, in the more sophisticated offerings, it was possible to generate things like skeleton code frameworks. There was nothing (and in the opinion of TPO there still is nothing) that provides a simple means for none technical people to describe their organisation with the end result being a digital database map that describes organisation form, function ad purpose that can be plugged in, as a database, as a key meta model element. TPO set out to build such a tool with the underlying design aim being to introduce something in which "change the map, change the information flow" becomes feasible and relatively easy to implement.

The result was an organisation mapping application called "The Performance Organiser" which the company has been using for some 20 years now on every major programming task it has undertaken with the aim of filling in one of the key meta modelling gaps, a map of the organisation, that can be plugged into a wider architecture supporting a number of primary dimensions on which to base efficient data targeting approaches. The organisation mapping software contains the following core capabilities:

Organisation Charting

The Performance Organiser is a desk top application that provides computer aided design capabilities in the form of a number of drawing pads, which are simple to operate, on which to describe key functional elements of organisation structure.

The first, illustrated in Fig 6 is a management relationship mapping tool which is used to produce active, layered organisation charts. The symbol set is based on the identification and definition of generic organisation elements (department, stakeholder, supplier etc) and a number of different forms or classes of relationship (formal, informal, supplier to organisation etc). The organisation drawing pad has layering capabilities built in such that the complexity

of structure and relationships can be filtered to increase or decrease detail if required. Each symbol, once placed and save to the model then gives access (usually by right clicking on a symbol or relationship line) to other descriptive attributes and look up lists (objective catalogues etc) with which to provide comprehensive descriptions of department or relationships.

The organisation mapping pad is the application start point with the concept of "Organisational Head" or headquarters being the first symbol that will be presented to users when an organisation map is to be generated.

The second major element of the product architecture, an information portal provides the means by which the organisation charts produced by the organisation mapping tool can be shared across the organisation. Left clicking here, will generate a profile for a definition of the task terms of reference for an EU General Data Protection Regulation task terms of reference for a Data Protection Officer, which is also linked, via the diagram, to its position in the management chain using hyperlinks drawn from the map to provide the means to navigate across the organisation structure. A video explaining the concept of "change the diagram, change the flow" can be viewed by left clicking here.

Process Mapping
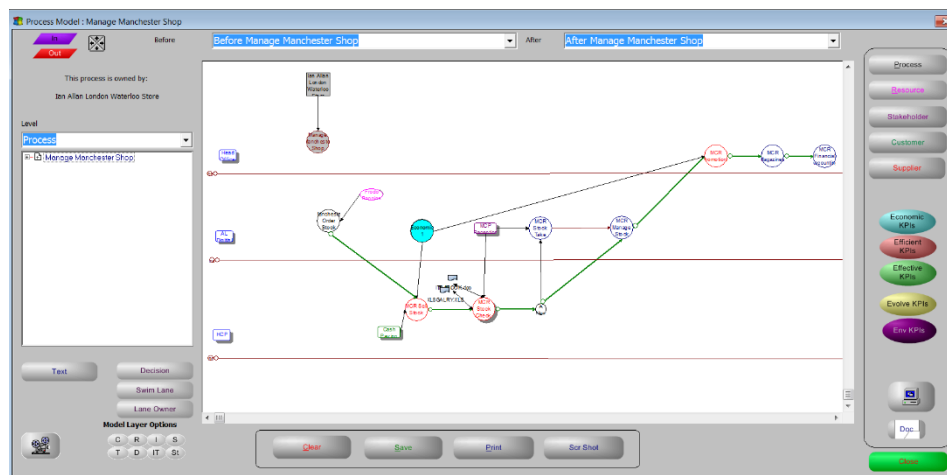
Figure 8 - Process Mapping

The second drawing pad provides a process mapping capabilitiy. Various forms of process can be mapped and the maps can be configured to use other symbol sets if required. But the default symbol set is kept deliberately simple and consists of circles of various colours. As with the organisation mapping toolkit, right clicking on symbols will bring about the display of drop down menus that are contextually specific to the symbol being clicked on.

A key concept with the use of the process mapping tool is that it provides the means to identify the places in a process where measureable transactions can be identified and used as trigger points for performance metric data capture. Part of the definition of process, is that each process entry, which eventually becomes part of a process catalogue, has an owner and ownership is based on organisation element rather than person. The process profile detail is sufficiently comprehensive such that process maps are compliant with the aims of quality management as defined by standards like ISO 9000 or the US AQPC.

Because process maps are owned by organisation element, the net effect is that a process catalogue entry and associated metrics produce, naturally, a department by department process catalogue. This can be seen by viewing the "owned processes" drop down on the right hand side of the EU GDPR DPO profile referred earlier of by left clicking here

Scorecard or Dashboard Construction

As mentioned in the description of process mapping, one of the process elements was support for marking measureable transaction points in process flows. The benefit of this was to identify and specify data collection points as a catalogue of performance metrics that could be used to design a structured set of dashboards that in effect, would be a means to specify information delivery on the basis of need to know that could be aligned with the organisation form and function from high level strategy down to data collection.
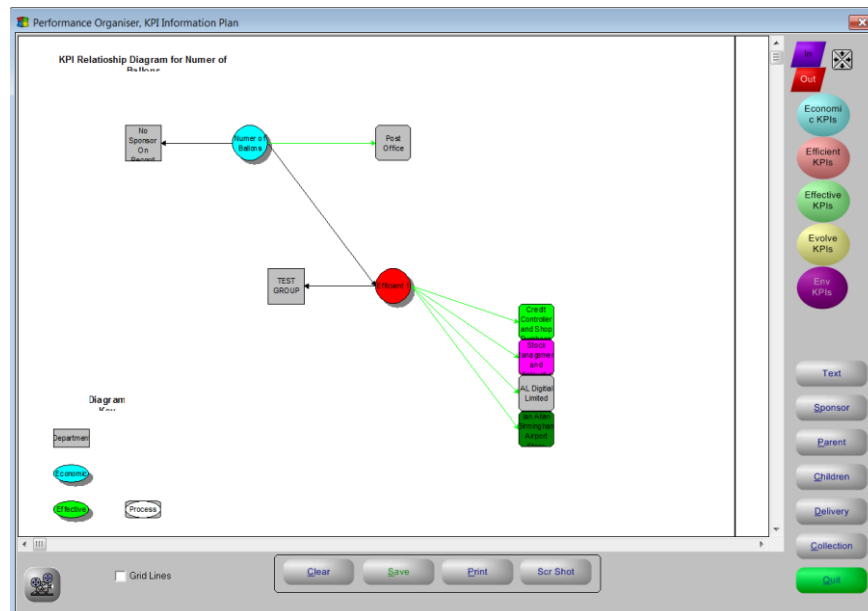
Figure 9 - Metric Dashboard and Pathing Metric Relationships

Figure 8 above is an illustration of part of the dashboard design capability in that the end product of the design tool was to be able to track and examine relationships and dependencies between performance metric profiles and each other and where, in the organisation structure, a performance metric profile is being used. That design capability also provided the means to identify Extract, Transform and Load (ETL) strategies for use across the organisation that would have the added benefit of reducing the impact of inferential distance.

Out of that design capability came the means to produce a metric profile template that could followed the metric data dictionary of the model itself,. This had the advantage of being able to specify to end users how to articulate a performance metric profile and for them to indicate, directly into a map, which processes where being monitored and where the monitoring results would be placed as a report.

A blank metric profile sheet is available by left clicking here

Perceptions of Value and influence

In his book "Competitive Advantage", Michael Porter proposed the idea of a "value stream" the purpose of which was to be in a position to follow a process on an end to end basis (given that operational ownership of processes may change) to determine which parts of it generated and maintained value to the organisation. The implication of Porters description was that the value stream was singular.

TPO recognise the validity of the concept, but while building the organisation and process mapping software described in this section of this document, came to the conclusion that there was not just one value stream and instead there were many perceptions of value that exist in an organisation.

Building on the ability to track relationships between performance measures, TPO expanded the capability to take any organisation element start point (department, process step, objective definition, resource profile) and provide the means to search a model for contextual relationships as each was identified and mapped and the organisation map grew more comprehensive in nature. Figure 9 illustrates the principle of tacking value perception diagram starts with an organisation element
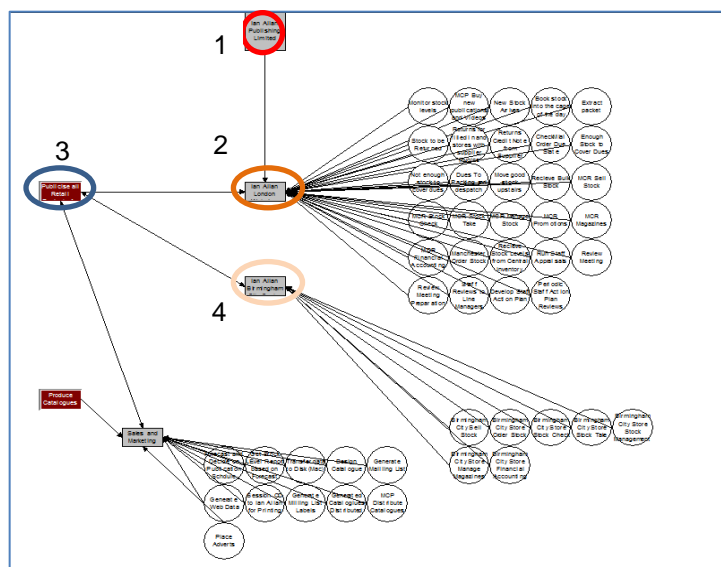

Figure 10 - Tracking value perception

The first step is, using the drawing pad concerned, to select an organisation element, in this case a department (1), then place any children (2), then display the process catalogue and objective profiles (3) and then from the objective profile, display any other organisation elements that may be contributing to the same objective (4) and so on.
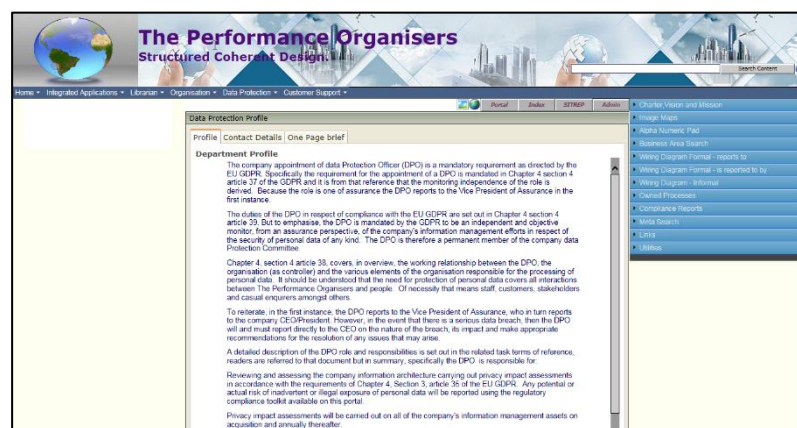
Figure 11 – Sample Department Profile for a DPO

The end result of the mapping in the way described in overview, then provides the means to present sophisticated profile display capabilities for each of the major map elements as illustrated in figure 10, which can be activated and played with by left clicking here

As stated earlier, the Performance Organiser mapping tool is a desktop application, the aim of which was to provide the means to describe, or map organisation form, function and purpose through the medium of integrated and mutually supportive organisation charts, process maps and the means to design dashboards. The end result being to support the concept of "Change the diagram change the information flow", but in order to do that, there is a need for a means to make that capability real which brings the story neatly to the second key element

of the product architecture which in TPO is referred to as a "portal" or gateway into an information management architecture.

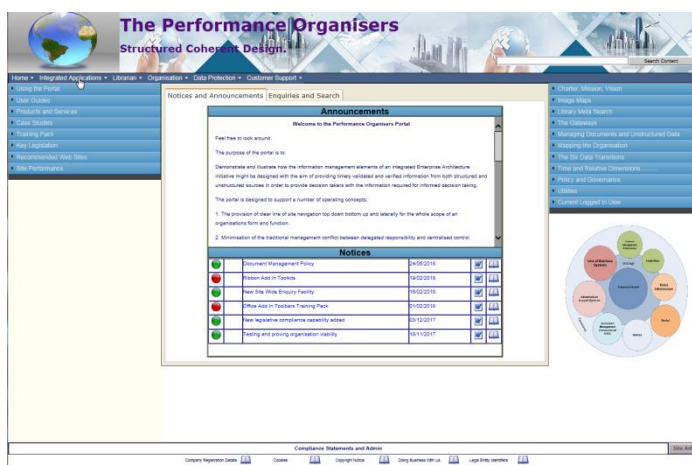## The Portal, Integrated Web Services

Figure 12 - Portal Home Page

The aim of building the organisation mapping tool was to provide the means to describe organisation form, function and purpose in a coherent way with the end result being the production of a digital map, in database form that could be used as part of a common Meta model. One of the shortfalls of the capability, once developed, was how to make the map available to a wider audience. Doing so was important given the longer term aim of providing the means to "change the map, change information flow". As a consequence, there was an imperative, in terms of product evolution, to build a web site, or suite of services, all database driven, into which the maps could be natively inserted to form part of the portal meta model.

Architectural Position
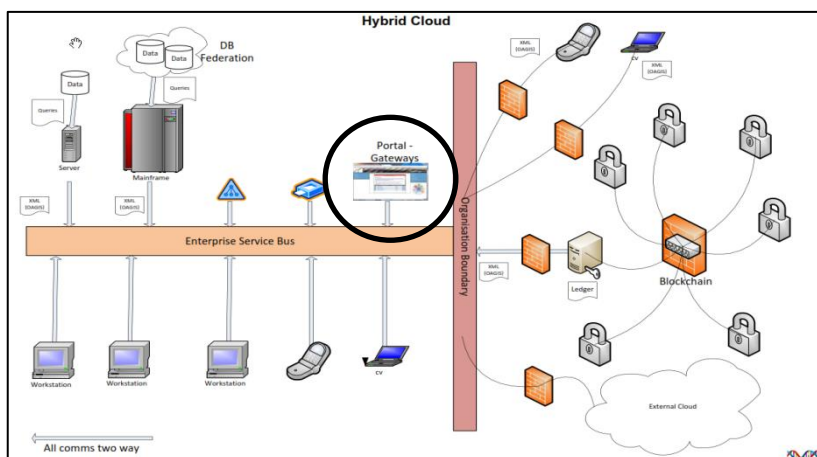
Figure 13 - Positioning the Portal

The first decision was to position both the map and the proposed services architecturally. Careful review of options brought about the conclusion that given the commercially sensitive nature of the proposed architecture, that whatever was developed should not be outsourced (placed in "The Cloud" in modern parlance) but instead should be inside the organisation boundary in the total control in respect of security and commercial sensitivity. Following on from that, the decision was taken that the medium for service delivery would be through a web browser (as opposed to a desktop application). It was deemed important that the domain should only be visible, in its entirety "inside the corporate wire". Figure 12 provides an indication of the architectural positioning of the portal.

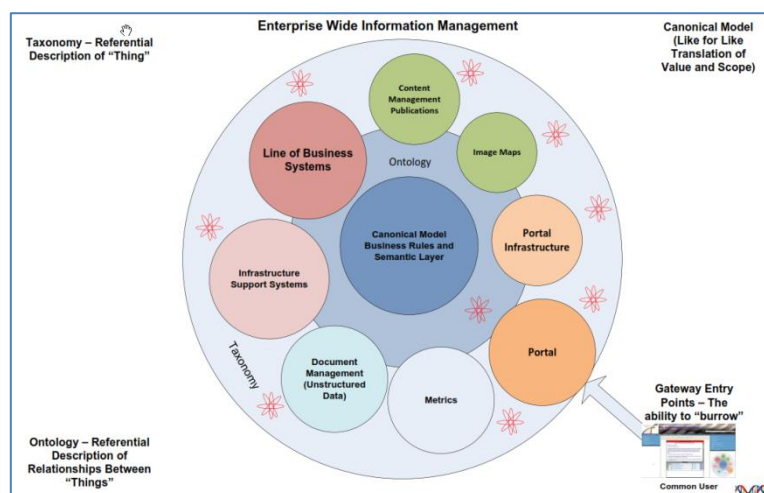## Portal Everywhere – Everything a Gateway

Figure 14 - Everything a Gateway

The second major design consideration was the concept of "every data point a potential gateway into the wider architecture". The longer term aspiration was to apply this principle to artefacts like document files and individual data elements, but initially, it meant that a considerable degree of care was put into providing the means to navigate from any location to any location while at the same time reducing the impact of inferential distance.

A second consideration was that as far as possible, no third party components would be used in the development of the web services that were dependent a=on frameworks like ".NET". The reason for that was because of the need to reduce the financial impact of integration testing in which maintenance of network integrity is paramount. As a consequence the portal and associated web pages are entirely scripted.

Finally, the usefulness of third party code, in the form of libraries of scripted code was considered and some of them were adopted (JQuery.js, D3.js to name two), but only if the libraries could be installed and called from within portal architecture. In respect of this decision, there is an additional spin off advantage in that all code execution takes place in the domain of the portal itself.

Standard User Interface
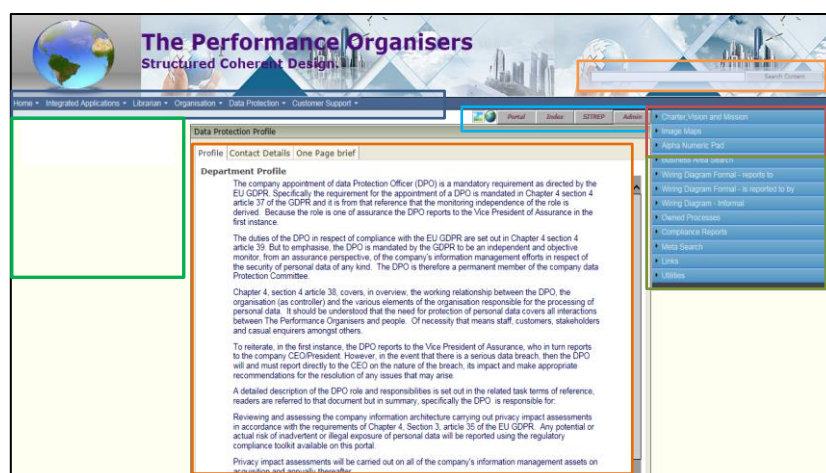
The last key element of design was to build into the portal standard features that support sophisticated navigation and access, on a point and click basis, to other parts of the portal

and the supporting application infrastructure. Briefly, each page on a portal is laid out as follows:

Ser	Area Name	Notes
1	Page header search Facility	The header search facility appears on every page on the site. Entering a search word or phrase, then left clicking on the "search content" button will trigger the site search engine with a similar capability to that described in the "Lithium" case study (see internal reference 2 for more details).
2	The Main Menu Bar	The main menu bar is configurable by users and is a global facility providing the means to log, by hyperlink, 60 individual navigation options.
3	Command Buttons	Command buttons appear immediately below each main menu and provide access to add. Edit, delete, configuration options appropriate to the site section of which a page forms part of. The number of command buttons displayed at any one time depends on the site access status of the viewer.
4	Key Documents Panel	Built into the portal architecture is a document librarian designed around the concept of "through life management". The librarian itself is a web service (see below) and part of its capability is to be able to mark documents as globally significant. Globally significant documents appear on each page of the portal.
5	Page Content Panel	This area contains task or function specific data depending on the nature of the service delivered.
6	Policy and Governance Drop Downs	The top right hand side of each page, across the portal, contains links to key strategy documents (Charter, Mission and Vision) with each of the strategy documents being contained in a standard page layout.
7	Navigation Support Drop Downs	This area of each screen, using an accordion panel display analogy provides additional navigational support features that are contextual to the page being displayed. This section contains a mix of specific ad generic navigation support. Each page will contain a hyperlink library manager and meta search capability by default.

A second common feature is that command buttons, where they are used, are labelled as unambiguously as possible. For example, where an "Add" button appears, then its purpose is to generate a new data capture screen for the area of the site being used. The number and function of buttons displayed with be driven by the access and visibility standing of visitors.

Compliance and Policy Distribution

Finally, at the bottom of each page, there is a footer section that will display on each page access to key policy and governance documentation published through the in site content management and desk top publishing tool. This capability means that such documents need only be written once, but once marked, will be distributed across a portal without the need to add links to key pages.

It should be noted that each of the capabilities described as part of the gateway user interface are fully configurable by end users. The page header for example, can be made to point at a different banner image than that displayed in this document. Each of the web services offer similar data/information management facilities that do not require coding knowledge.
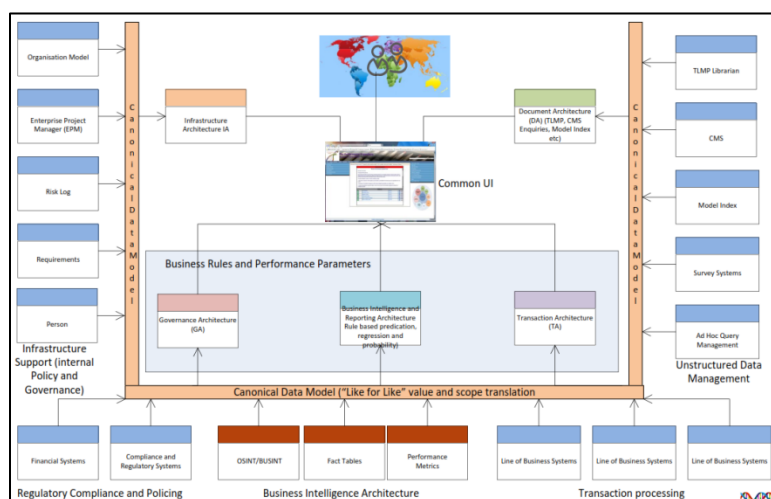
Federated Data

Figure 15 - Federated Data Sets

The final major design consideration was the construction of a federated set of functional databases, designed and built using the same descriptive attribute specification approach was applied to the design of web services that are commonly used but are often designed as silos as they are based on process. Additionally, when designing a new web service, considerable research was carried out the aim of which was to identify appropriate standard behaviours that lend themselves to automation that if implemented in a standard way would also provide the means to provide web services that by definition were standards compliant.

An example of this is the built in risk register. The risk register hs been designed to support the HM Treasury "Orange Book" which sets out the approach to risk management that all UK Government departments are obliged to follow. There is a fully configurable process catalogue that can be used for ISO 9000 compliance purposes and capitalising on experience building and maintaining the UK Ministry of Defence Health and Safety Information System (HSIS), each portal contains a process audit and reporting capability that lends itself to compliance monitoring of other legislative forms including the EU GDPR.

The Portal – Caveat

The portal is not a selling vehicle. It is functional and utilitarian by design hence the positioning of it as a means to deliver integrated decision support services inside the corporate boundary.
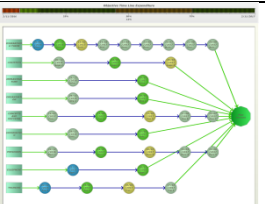
Web Services Catalogue

The list that follows contains overview details of the web services contained in a Performance Organisers Portal. It should be understood that the list will be enlarged as development of the portal is an ongoing exercise, for example, the recent publication of the EU GDPR and the passing into law of the UK Data Protection Bill has led to the development of new components and the modification of existing ones as the impact of both, in functional terms, were understood.
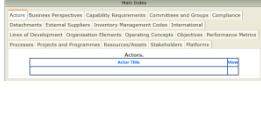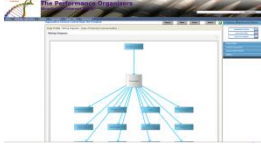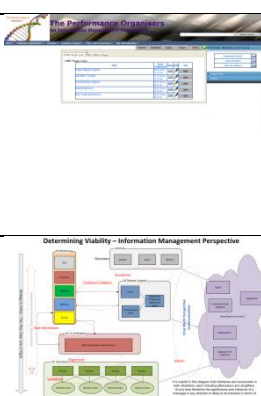
New components will be added therefore as need and circumstances permit or demand. What can be said is that the effort put into the architectural design and the related code has been of enormous benefit to the company as developing new components is easier if for no other reason than much of the required infrastructure is in place and ready to expand.

It should be noted that the images in the table below are active, and using the "CTRL + Click" keyboard and mouse control options will launch a sample web application on TPO web site

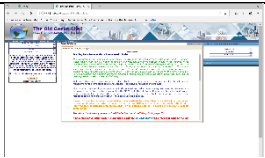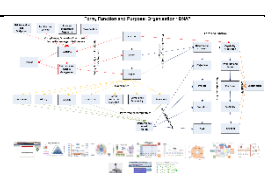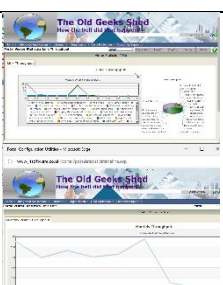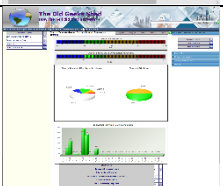| Ser	Title	Image	Purpose
1	Document Librarian		One of the elephants in the room in information management is document files and their management. Various studies have been undertaken into the potential BI shortfall document management represents and all that have been studied by TPO estimate the loss of capability at over 80% of potential. The Document librarian produce by us follows the paradigm of "through life" as applied by the US DoD and MoD with an emphasis on control and management of location. Supporting the librarian are appropriate policy documents that describe operating concept and associated architectural issues. The document management policy can be viewed by left clicking here
2	Stakeholder Matrix		The organisation mapping software we have developed recognises several distinct forms of interaction, one of which is stakeholders and their profiling. The stakeholder catalogue provides the means to score influence using the popular RACI technique and presents stakeholder profiles in a variety of ways. As with all architectural elements, the stakeholder catalogue is a gateway into the wider architecture.
3	Risk Log		TPO chose the HM Treasury "Orange Book" as the basis for development of a risk log. The end result provides the means to assess risk and amend scores as a risk becomes an issue that requires action. Risk log entries can be individual referenced by hyperlink and because of the application of a common meta model, risk entries can be "sliced and diced" at the point of record creation with the end effect being a multi perspective risk reporting capability.
4	Objective Catalogue		The Objective catalogue forms part of a work breakdown taxonomy which goes from definitions of long term strategy (mission and Vision for example) and cascades downward through process, using the process catalogue, down to task. Objectives can be shared.
5	Objective Lines of Development Planner		A second key feature of objective management is the means to develop a plan, based on the concept of "Lines of Development" (LODs) for which TPO have chosen the defence approach of TEPIDOIL. The key concept of "decision points" of a "go/no" go nature (as opposed to milestones) is applied which means that the lines of development planner can be used for programme management purposes. This tool is supported by a number of templates, for example a composite PERT project plan divided into LOD's and the UK Defence CADMIT cycle.
6	Process Catalogue		The process catalogue draws its process descriptions from process maps drawn in the organisation mapping software. It divides process listings into "decomposed processes" and "others". TPO have built a catalogue of industry standard process lists freely available from public web sources. Those standard processes can then be grouped in multiples of composites. The end result is the backbone of a "Quality Management System" that meets the aims and aspirations of a number of ISO standards, but with the advantage that it is a live catalogue into which can be connected other data with comparative ease.

7	Image Mapper		A key concept of the Performance Organiser product set is that each data element should have the potential to be an architectural gateway. TPO see image files as a particularly useful way of illustrating context and therefore have built a tool that provides the means for non-technical people to map any image file form with hotspots that can be hyperlinked. The image provided here is an example.
8	Reference Data Catalogue		Over the years, TPO have built up a catalogue of reference data available from public web sites. The reference data includes things like ISO country codes etc.
9	Map Index		The map index lists the primary dimensions applied to the architecture as a whole which also includes key data from an organisation map. It acts as a primary gateway, along with the portal front end, into the wider architecture.
10	"On the fly" Organistion Charting		The portal provides the means to generate organisation charts and other similar wiring diagrams as part of an organisation element description, where appropriate. The aim is to provide the means to support "change the organisation structure, change the information flow".
11	Requirements Log		Given the nature of the Portal as a business infrastructure support tool, there was a need, as the product grew in terms of capability and complexity, to create a tool for tracking modification requirements. This has now been implemented as a part of the product architecture.
12	Compliance Log		TPO built and maintained the UK Ministry of Defence's Health and Safety Information System (HSIS). The concept behind the HSIS system was expanded by the company to be in a position to be able to be used for any regulatory conformance exercise based on a question bank. The tool was further refined to include various forms of performance reporting. The product now includes question banks for hazardous material handling, GDPR Data Protection Impact Assessments and more.
13	Data Dictionary Toolkit		Associated with the process compliance audit tool, as part of an assessment of the impact of the GDPR< a data dictionary product was built that provides the means to create reference definitions of data descriptive attributes and then associate them with individual database structures (table, indexes and fields) that can be described and associated with the reference values.
14	Content Management System		To add additional flexibility to the ability to publish data, a content management system was introduced that supported navigation by hyperlink and web publication. The content management system includes an in line HTLM editor, spellchecker and more besides. A sample document, that points to the MS Office menu ribbon add ins, referred to later in this document can be viewed by left clicking here
15	Performance Metric Catalogue		See Annex E for a description of the nature of performance reporting supported by the portal

16	Training Pack		The portal contains its own training pack. A sample time table is displayed here, but the training pack includes internally produced simple explanatory videos, powerpoint slide decks covering many aspects of the design theory of the portal and more besides.
17	User Management		The portal is account driven, with a sophisticated access and visibility control mechanism. Logging in to the site gives users the means to create add and delete portal content on an on demand basis.
18	The Portal		Finally, there is the portal front end. In itself a sophisticated link management system, the portal contains support for many of the infrastructure reporting needs of end users including a notice board, enquiry management capability and more.
19	Marketplace emulator		In order to support the training pack as a training aid a an on line marketplace emulator has been built with which to demonstrate the nature of big data and the kind of commercial edge it brings when the kinds of architectural approach the catalogue represents is applied.
20	Policy and Governance Framework		A Policy and Governance framework has been constructed, it with the training pack are key support capabilities without which the application portfolio would not be properly functional
21		Legisllation Librarian	The TPO portal contains a legislation that provides the means to include primary legislation as an integral part of the architecture such that organisation element profiles can contain legislation clauses and schedules relevant to them from multiple legislation forms
22		Cookie free traffic analysis	The portal also contains a traffic and visitor analysis package built on the the idea of who clicked on what part of the site to view. Underpinning the tool is a database of IPv4 address construction details. No visitor data is stored in the analytical data.
23		Impact Analysis	Impact analysis is not new. The portal also includes the means to analysis compliance survey results and present analysis of the data as an integral part of normal performance reporting.

There are other modules available (for instance a project management portfolio tool) and the list provided here is illustrative. The portal is under regular review and is frequently enhanced as a result. All modifications and updates are passed to the user community when they are completed and stable.

Future Additions to the Web Service Catalogue

Two additional web services are nearing completion. A Project/Programme portfolio manager, based on the principles of acquisition management used by the UK MoD and US DoD and a performance dashboard toolkit.

The development of the dashboard toolkit is well advanced and will produce the kind of multi-dimensional multi-perspective reporting framework illustrated here. A case study, describing the design approach taken to its construction can be viewed here.

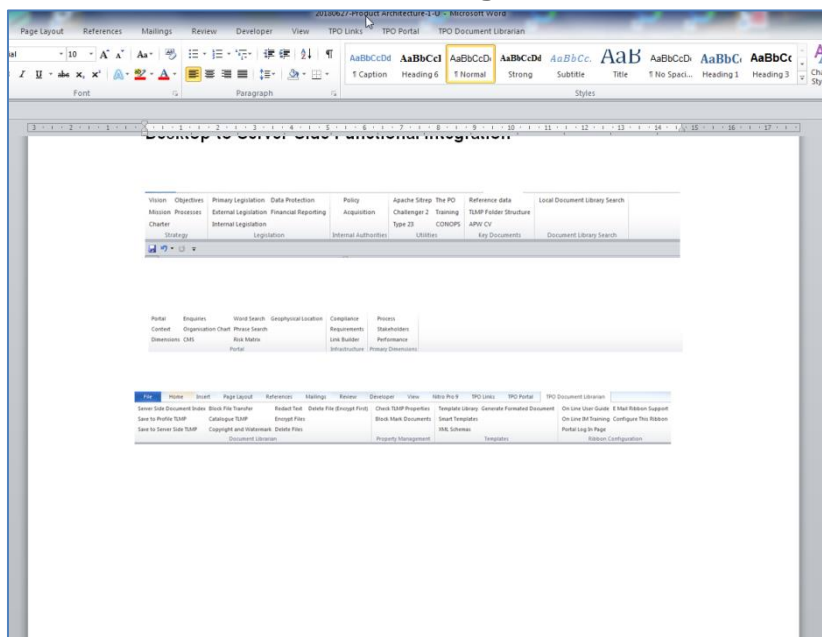## Desktop to Server Side Functional Integration

Figure 16 - Desktop to Server Side Integration

The third major element of TPO product architecture is a series of Microsoft Office Add in components that provide sophisticated document file management capabilities and the means to connect, natively, from inside Microsoft office into the web service catalogue and vice versa. In order to achieve this, TPO developed a number of components that once installed, are integral to MS Office. The components have the necessary secure certification validations and are installed on a "one click basis" using default MS Visual Studio product installers. There are ribbon sets for MS Word, MS Excel, MS Powerpoint, MS Project, MS Outlook and MS Visio. In support of the ribbons, the following components and facilities were also developed:

Ser	Title	Purpose
1	A Through Life Management Standard Folder Structure	A copy of the related definition document can be downloaded by left clicking here
2	A TLMP Database	Used to contain a reference to document location and content catalogued using…
3	A document "spider" or crawler	The purpose of the spider being to provide a similar cataloguing function to that operated by Google and other search engines (though by no means as sophisticated). The purpose of the spider is to open and read MS Office document files and then read the content by word, scoring each word using Soundex techniques and to record a relationship between document location and word appearance. The end result is described in the "Lithium" experiment which can be downloaded here
4	A TLMP Folder Structure Generator	A small programmable component that can be called from any environment that supports the MS COM object model that can generate in a few seconds, the folder structure referred to in serial 1 of this table.

The combination of ribbons and the infrastructure components described out below giving a sophisticated information management toolkit that can be deployed across an organisation such that the management of location and cataloguing of content is both comprehensive and standard. For each ribbon add in there are three tabs that appear in the main menu ribbon of the parent application. The purpose of the tabs is:

Tab 1 – Link Librarian

Figure 17 - Ribbon Tab 1 Link Librarian

The link librarian tab provides a single click interface to connect to external web services wherever visibility and access permissions allow. The screen shot above is taken directly from this document during its writing

Tab 2 - Portal Access

Figure 18 - Ribbon Tab 2, Portal Access

When enabled (using the configuration screen built in to each ribbon) and providing a portal is available, the second tab provides the means to query the portal it is pointed are. This tab includes automatically parameterised querying capabilities such that in order to (say) query the associated risk register, the ribbon user only needs to enter a search word or phrase directly into the ribbon in order to search the on line register.

Tab 3 – Document Management

Figure 19 - Tab 3, Document Management Support

The final tab contains document management support including the provision of the ability to do block document redaction (which is logged in the TLMP database), file encryption, block file transfers, block file watermarking and more. The aim is to provide the means for desk officers to be able to gain control of the management of location through the use of the ribbons.

As an illustration of the kind of capabilities the ribbons have made available, readers are invited to look here, then review this Linked In article here and then review this video on document redaction available by left clicking here

Ribbon Configuration
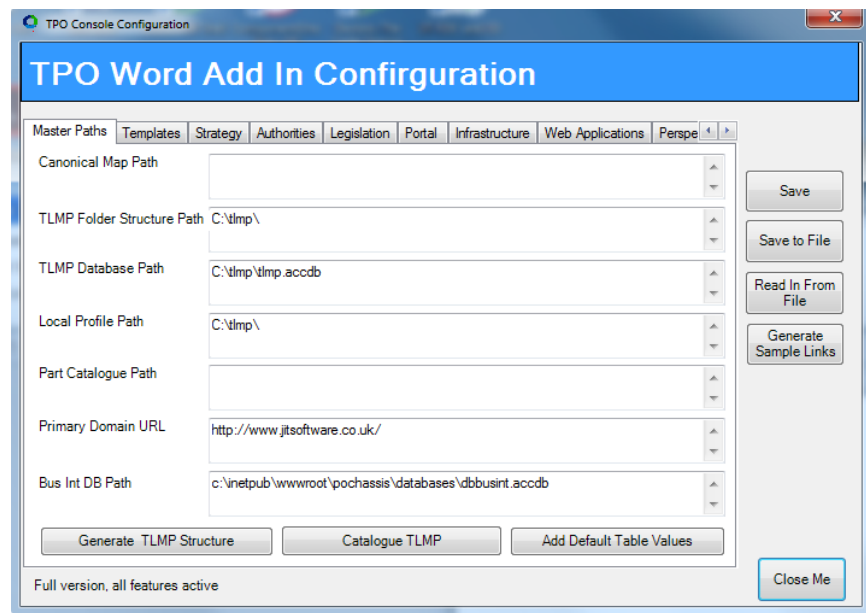
Figure 20 - Ribbon Configuration Utility

Tab three provides the means to launch the ribbon configuration screen illustrated above. With it, end users can adjust the way the ribbon works, manage their links and more. The aim being to provide the means for ribbon users to have reliable access to an integrated information a architecture that stretches from the desktop into a portal (capitalising on the "gateway" architectural concept.

Smart and Inert Document Templates

TPO have also extended the idea of an integrated architecture to document files themselves. A library of some 150 inert document templates have been gathered or made available with permission from copyright holder s such that each is designed to a specific layout which is understood (see figure 21). The aim them is to provide documents for which there is a design that can, if necessary, be searched in whole or in part because the form of the document is understood.

At the time of writing (July 2018) the inert template library contains templates for PRINCE, elements of GDPR Compliance, ISO 9000 and ISO 27000 (supplied externally and/or developed by TPO. The templates are usually supplied as on request to interested parties. However, while the templates are usable in their own right, the intent is that they are designed documents that conform to a style guide from which it becomes easier to manage external properties, content and other support activities and do so, on a programmatic basis.
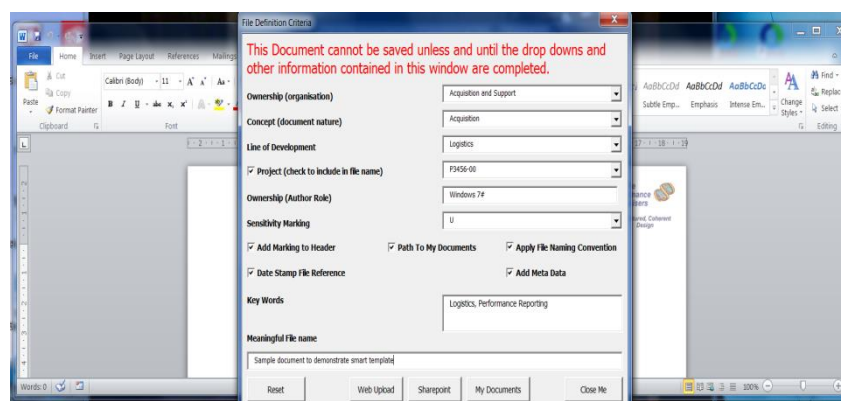
Figure 21 - Smart Location Aware Template Control Screen

The final step in respect of document management is to introduce the idea of a "smart" template. See figure 20. These templated have sophisticated macros embedded in them that ensure that documents produced using them can only file themselves into a targeted TLMP folder structure. When opened, to ensure the intent, the main office application "Save" facility is disabled (so as not to accidentally over write the template) and the "save As" feature causes the simple form illustrated in figure 20 to be generated which provides the level of control required to place documents in a mandated location, generate an approved file name and ensure that key document properties are completed properly.

Figure 22 - Standard Inert Template Layout

Like the inert templates, the smart templates are similarly formatted using the layout illustrated in figure 21 thereby ensuring, as far as possible, that documents produced using smart templates are internally structured as they should be and therefore fit naturally into the company quality management system.

Other Desktop Tools

In addition to the ribbons and other desktop tools, there are a number of desktop applications available, the first is a simple to use email audit tool which goes by the name of MAGIC (see figure 22). MAGIC is a macro enabled spreadsheet that can be used by E mail auditors (as per GDPR end to end processing requirements) to check email account content quickly if required.

The MAGIC component is portable, lightweight and can be moved around license free, but it dependent on the presence of Excel and is targeted at outlook as an email client. We have also written a supporting policy document related to the nature of management control that increasingly will have to be applied to email. The policy document itself is listed in the next section of this document.
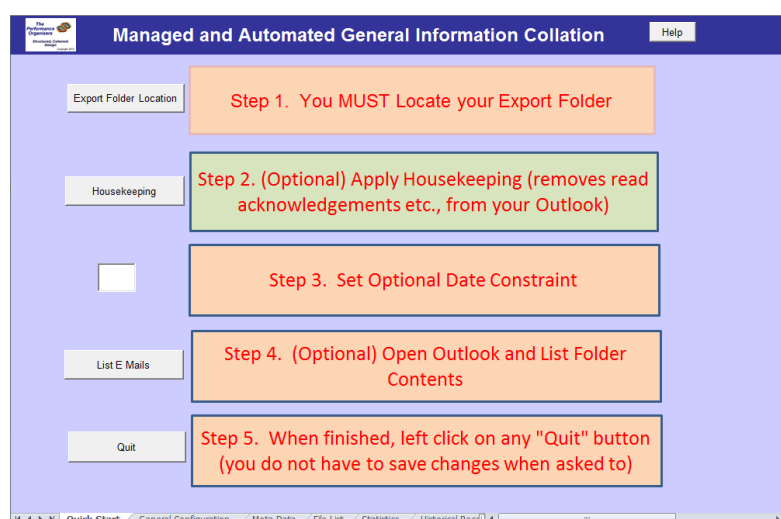
Figure 23 - The MAGIC spreadsheet

The most recent addition to the portfolio is a simple to operate file encryption and decryption utility. One of the features of the desktop ribbons is to support secure file encryption, when considering the impact this capability, one of the concerns that was raised was how to arrange the transmission and subsequent decryption of sensitive material sent to external agencies. The desktop file encryption and decryption application pictured in figure 23 is the result.
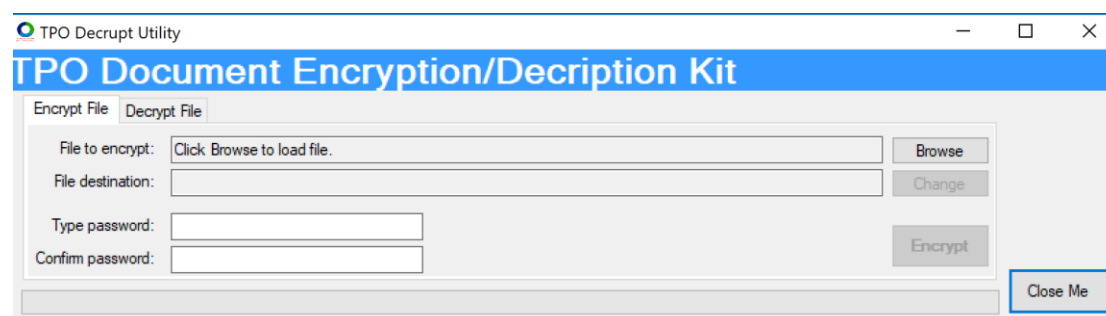
Figure 24 - File encryption and decryption utility

The encryption and decryption capability can be deployed to external agencies using WINDOWS machines who can then be sent encrypted files for them to read. The encryption utility uses the same encryption method as the ribbons themselves, but the passwords can be passed separately on a 2 Factor Security basis.

Policy and Governance Development

Ser	Description	Location
1	Architectural Design Principles	Left click here
2	The Performance Organisers Portal	Left click here
4	Enterprise Architecture Terms of Reference	Left click here
5	Regulatory Compliance Audit Tool	Left click here
6	The Performance Organisers DPO Page	Left click here
7	The Performance Organisers Risk Policy	Left click here
8	The Performance Organisers Risk Log	Left click here
9	The Performance Organisers Privacy Policy	Left click here
10	Document Retention Policy	Left click here
12	Architectural Schematics	Left click here
13	TLMP Folder Structure	Left click here
14	Style Guide	Left click here
15	File Naming Convention	Left click here
16	Lithium Exercise, proof of concept	Left click here
17	Microsoft Office Add Ins	Left click here
18	Non-Disclosure Policy	Left click here
19	E Mail Management Policy	Left click here

Developing tools is a legitimate thing to do, however, by themselves, software tools are ephemeral and without sound policy and governance that can be actively implemented and managed, the tools themselves will be not as effective as they have the potential to be. Writing policy and governance is also time consuming. With that in mind, TPO have also developed the relevant documentation, a sample of which is listed above that provides, on a pathfinder basis, the means to direct the implementation and use of the toolkit described in this document.

Many of the documents listed above have been reviewed by people the company respects and have been further distributed for comment on to various social media outlets on a pathfinder basis. The number of downloads (in excess of 10k over 7 months) has been pleasing as it means that there is a need for such documents in their own right. That the documents are also part of an integrated architecture and are part of the design scope is we believe a useful indicator of what must be in place in the kind of legislative environment that seems to be developing such as the US Cloud Act, EU GDPR and UK DP Bill.

Next Steps

The next major developmental step is to separate "person as thing" in architectural terms as a separate database kin, at least in part, to the kind of central ledger concept suggested for "blockchain" distributed secure transaction processing.

Shortly after starting to study the GDPR in detail, TPO published on Linked In a series of short articles on what the perceived nature of change that GDPR and other privacy legislation represented. The article, through humour and allegory sets out the basic problem the GDPR represents in that it is the case that data related to person can and does appear multiples of times in many circumstances, best illustrated by the idea that a person could, say, be an employee and therefore appear in an HR system, while at the same time take advantage of a staff discount scheme and purchase goods and services from the employer and then end up appearing as a customer in (say) a transaction tracking platform. Needless to say that situation could present problems of like for like value translation, scoping and definition issues.

The TPO view is that increasingly there will be a need to separate out person into a separate ledger or database with the key concept being to store personal identifiers and other descriptive attributes of person in one database, with other parts of the federation identifying person by the nature of the relationships between person and organisation that may exist. But before that can be done, there is a need to develop the kind of information management

architecture suggested in this document as key to exploiting relationships between person and organisation is the development of a digital map of organisation form function and purpose etc. TPO have built the kind of architectural infrastructure required, the next major step is to design an appropriate infrastructure to describe person and organisation interactions.

Conclusion

The purpose of this document is to describe, in overview TPO information architecture. The primary justification of the document is to illustrate the nature of an integrated architecture of the type TPO are confident will become the norm. The reason for that confidence is derived from the concept of "privacy by design" which we believe will render redundant the design paradigm of "people, process and technology" which we see as being spectacularly successful at producing data silos for which there is an ever present need eventually to integrate. Our view is that the integration effort will require the elimination of a number of meta data gaps, notably the means to describe organisation form function and purpose coherently and to bring closer integration of structured and unstructured data with the aim of both enhancing decision support capabilities.

The Performance Organisers do not see what has been produced as the only way to do what has been done. Just one way, that has the advantage of working. We recommend therefore that readers use this document as a pathfinder, in other words we offer up what we have done as possible way to achieve more integrated data collection and information delivery. There are functional gaps, of course there are, but consider this, the thought and effort required to produce the mapping software, web services and other infrastructure elements has come from a company that employs just one person and a rather aggressive little terrier. The tools described in this document enabled that micro company to punch way above its weight…… There has to be something in it…….

In closing, thank you for reading this document, we hope it is thought provoking as that was the intent.

Document Ownership and Amendments

This document is owned by the Vice President of Assurance and its application and monitoring will be carried out by the company Librarian. Annex A provides an illustration of the ownership management chain with Annex B providing an illustration of document "fit" in the policy library.

Document Review Timetable

This document will be reviewed on or about 31/05/2023 or in the event that circumstances may change and a review may be necessary before then.

Quality Management and Compliance

This product portfolio is a mandated document. As a consequence, all company staff will be obliged to follow it. The policing and governance of this policy with the aim of ensuring compliance with it, will be the responsibility of the Vice President of assurance who will delegate the responsibilities to the company Librarian. The Librarian will develop, produce and maintain an audit plan, the aim of which is to ensure that this policy document is followed.

Document Sign Off

This document has been reviewed by the Quality Assurance Manager and approved for inclusion in the project requirements catalogue.

Printed/Typed Name	**Signature**	**Date**

This document has been reviewed by the Quality Assurance Group and approved for use.

Printed/Typed Name	**Signature**	**Date**

This document has been reviewed by the Software Asset Manager

Printed/Typed Name	**Signature**	**Date**

Annex A – The Operating Principles

Beware of Geeks Bearing Gifts	Quite simply there are no silver bullets. In software development in particular, there is always more than one way to solve a problem and the Performance Organisers are no different in that respect to any other IT development company. Keep this principle in mind at all times
Organisation form function and purpose is more important in architectural terms than "people, process and technology".	People process and technology (PPT) as a design paradigm has been spectacularly successful at the production of silos. The manifestation of silos is made worse by dint of the need to demonstrate compliance with various legislative forms by the use of cloud services on the basis of supporting process. Far better, from an end to end perspective to have an information architecture that is designed to support organisation form function and purpose on a top down, bottom up and lateral basis. In terms of information delivery, process tends to be linear in nature where reporting is viral. PPT is not compatible with the viral nature of reporting and it is reporting that key to information delivery for decision support purposes.
Goal - Prove Viability	The strategic goal of any information architecture is to test and prove the **viability of the organisation** it is meant to support. To do that, there will be a need to apply various forms of statistical and analytical techniques (deterministic, Bayesian, Game Play etc.) at the appropriate architectural level, taking into account that a number of transitions from data to information must be robustly designed constructed and maintained in respect of the maintenance of referential integrity on a multi-dimensional multi-perspective basis.
Ownership of Data and Information	Increasingly, the regulatory and legislative environment that information management is obliged to operate in requires a clear understanding of the concept of ownership in respect of data. The design imperative being made more prominent by the EU GDPR which, while not explicitly using the word ownership, gives rights in respect of personal data that in effect, give data subjects (people) the right to reach into an organisation and demand changes, corrections and deletions which may be refused, but any refusal will require justification. The need to understand who owns what is an increasingly significant issue.
Single Source of Truth	Any information architecture should support the concept of "Single Source of Truth". That means the need for design and integration of all components such that validation at the point of data capture can be verified and therefore relied on. That also means acknowledging that information delivery depending on providing the means to navigate in a sophisticated way, across the entire architecture that everyone can use (subject to "need to know").
Clear Line of Sight	An information management architecture that is fit for purpose should support the ability to view information on a "top down" and "bottom up" and lateral basis constrained by the "need to know". "Clear line of Sight" is contextual and multi-dimensional with both being constrained by time. It should also be understood that information delivery should be available on an "on demand" basis.
The Central Control vis-a-vis delegated responsibility paradox	"Clear Line of Sight" implies that the information architecture should be flexible enough to cope with the conflict of interests that are caused by the need to delegate over the need to manage centrally. This also implies that navigation and different perceptions of value must be accessible across the information management architecture in order to resolve "my numbers are not your numbers" debate.
Any Point Entry	An information architecture should support the concept of "any point entry" that is to suggest that any document or other artefact should be capable, natively, where possible, of acting as a gateway into the architecture without especial effort. "Any point entry" should be contextual. This means the provision of desktop entry points that are native to the desktop applications themselves such that desk level

	operators can connect seamlessly into the architecture and draw down information in a form that whichever desktop application they are using can read the data itself.
The Provision of the Ability to "Burrow"	Once entered, any entry point should provide, natively, the means to burrow into or navigate in and around its architecture acting as a gateway. In effect, "discovery" should native and as simple to accomplish as possible Any entry point can be both self-contained but capable of bringing together, on the basis of collation any architecture elements and do so on, an autonomous basis.
Evidence Based Decision Support	On entry, a fit for purpose architecture should provide, on demand and in a timely manner evidence based decision support that can, if necessary, be validated and verified by the gateway or entry point user. It is imperative that evidence based decision support includes the means to aggregate through to support a particular decision hypothesis. In effect, to determine "cause and effect" and operate on the principle of "change the diagram, change the information flow" where feasible and possible.
Data collection is carried out at process and is linear or procedural in nature. Reporting is contextual and viral	Broadly, this principle acknowledges that data collection and reporting are fundamentally different in processing terms. Data collection is the foundation activity of any information management architecture and is dependent, for its success, on robust validation as without validation, all data collected is suspect in terms of integrity. Reporting on the other hand is contextual and in principle is required by any organisation member on a random and on demand basis. The major features of reporting activity are collation and the management of the general transition of data, multiple sources, into report forms. And in respect of the form of reporting, that will be dependent on the "need to know" and constrained by issues like system access policy. A sound information architecture should provide the means, by "drill down" and/or lateral navigation, to verify and prove the validity of any collected data. To the satisfaction of an enquirer.
Validation	All information management is founded on the input of accurate and complete (as far as possible) data. Data input is totally dependent on robust, verifiable in terms of rule definition validation. Time spent on validation with the aim of securing data integrity is never wasted.
Treat Structured and Unstructured Data as mutually supportive evidence	An architecture that is fit for purpose should be as capable of tapping into document files as databases such that when queried, both documents and database search results can be presented in the same gateway. Inevitably this means that the capability to read and catalogue document content in such a way that techniques like referential design can be applied using the same meta model or master data register, but without the need for design or architectural understanding of referential theory etc.
Comprehensive Management of Location	Basically, all of the above counts for naught if both structured and unstructured data cannot be found when required. That means that understanding location, on a cartesian basis is one of the building blocks with just as much significance, in terms of referential integrity, as normalisation and other database tuning techniques. The underlying principle being that if something cannot be found, then it may as well not be there. This means that broadly the same principles of database design (record once use many) must be applied to database design and file folder storage and that both should be capable of being treated the same way in respect of the maintenance of referential integrity It also implies an understanding of the concept that in spatial terms,

	dimensions and perspectives are relative to each other at any one time in respect of time and the impact of inferential distance.
Reduction of the Impact of Inferential Distance	The term "inferential distance" refers to the idea that the further away you are in architectural terms from the point of data collection, then the various transitions data goes through for reporting purposes will because of ETL actions, reduce the reporting accuracy by virtue of volume reduction amongst other things. Simply, a coherent information architecture should provide the means to drill down into the line by line detail of data collection in order to prove reporting accuracy.
Provide the means to detect instances of Inversion of Control.	Increasingly, one of the many benefits of information management is the means to pass decision made by those in charge of an organisation across the organisation structure. How those decisions are actioned however is often a matter of interpretation and often those assessments of what was originally meant may end up being detrimental to the achievement of managerial intent. An information management architecture must provide the means, evidence based, to detect that kind of misinterpretation.
Agility cannot be achieved without first gaining stability	Information management is a composite of activities. It is part databases design and implementation, part software development and part policy and governance. Until all elements have reached a point of stasis in which all of the parts are mutually supportive and understood by all concerned with this use, the ability to apply the principles of agility set out in the Agile Manifesto are but an aspiration. Achieving stability requires attention to detail.
Any one dataset is a filtration of the totality of available data.	By this TPO means that initially, what is recorded as data is not all of the information available and instead is a sub set that someone, with sufficient authority has deemed it necessary to collect. Furthermore, such data collection exercises tend to be at the process level and are therefore parochial. Instead, there should be an emphasis on organisation form, function and purpose, which inevitably means one or more collation or transition (in the modern vernacular "Export, Transform Load (ETL)" exercises, which may mean changes in storage form and logic form and supporting software development effort (from the procedural to predication for example).

Annex B – Key Legislation

This annex provides a list, that is not exhaustive, that is to be used as a guide in respect of other UK legislation that will need interpretation in respect of GDPR compliance. In particular, the view of the Performance Organisers is that much of the defence in respect of the recording, storing and retention of personal data on the grounds of legitimate interest and contract is contained within such legislation.

This list will be subject to regular review by the company DPO and its legal representatives as the circumstances demand and where appropriate, those legislative articles that apply will be incorporated into this policy document.

Ser	Legislation Name
1	The UK Companies Act 2006
2	The UK Consumer Credit Act
4	The UK Sales of Goods Act
5	The Health and Safety at Work Act
6	The Value Added Tax Act
7	International Financial Reporting Standards
7	The UK Bribery Act
8	UK Commercial Law
9	UK Criminal Law

It should be noted that the United Kingdom Information Commissioner is also responsible for the monitoring and policing of the following statutory instruments which may, as a consequence, influence the content of this policy document.

Ser	Legislation/Regulation Title
1	Privacy and Electronic Communications (EC Directive) Regulations 2003 (PECR)
2	Freedom of Information Act 2000 (FOIA)
3	Environmental Information Regulations 2004 (EIR)
4	Environmental Protection Public Sector Information Regulations 2009
5	Investigatory Powers Act 2016;
6	Re-use of Public Sector Information Regulations 2015
7	Security of Network and Information Systems Directive (NIS Directive);
8	Electronic Identification, Authentication and Trust Services Regulation (eIDAS)
9	Data Protection Act 2018 (DPA);
10	General Data Protection Regulation (GDPR)
11	The UK Data Protection Bill 2018

Annex C – Reading List

ISBN	Title	Author	Reason
978-1845119867	The Puritan Gift	William and Kenneth Hopper	De-facto history of US Management from the puritans to just after the Lehmann Brothers crash.
0-256-17894-1	Corporate Strategy	Colis and Montgomery	A classic on the nature of strategy and its definition
978-0470060568	The Fractal Organisation	Patrick Hoverstadt	An introduction to the Viable Systems Model
978-1-138-24267-8	Patterns of Strategy	Patrick Hoverstadt	A second recommendation for Patrick Hoverstadt this excellent book provides a comparative overview ov various general systems theory analysis techniques.
978-1905211203	The Fifth Discipline	Peter Senge	A description or method explaining how to apply systems thinking to organisation design and optimisation
978-0385042352	My Years With General Motors	Arthur P Sloane	A management masterpiece and classic.
089-4354361	Enterprise Architecture Planning	Steven H Spewak	A precursor to Zachman an Enterprise Architecture Classic.
0471-93052-0	Creative Problem Solving	Robert Flood and Michael Jackson	Describes the application of the concept of "Total Systems Intervention" related to managed application of multiple design and process based methodologies
13978-0-471-98606-5	Systems Thinking, Systems Practice	Peter Checkland	The trio of books by Peter Checkland set out the design principles and justification for the Soft Systems Methodology a key aim of which is to move from the prevalent goal driven positivism to something more interpretive in nature in the field of information management
0471-95820-4	Information Systems and Information Systems	Peter Checkland	The trio of books by Peter Checkland set out the design principles and justification for the Soft Systems Methodology a key aim of which is to move from the prevalent goal driven positivism to something more interpretive in nature in the field of information management
0471-986054	Soft Systems methodology In Action	Peter Checkland	The trio of books by Peter Checkland set out the design principles and

			justification for the Soft Systems Methodology a key aim of which is to move from the prevalent goal driven positivism to something more interpretive in nature in the field of information management
978-1-63157-276-0	All Services, All the Time	Doug McDavid	Takes the view that organisations are living systems and addresses issues related to capability sustainment and development in that context.
	Functional Decomposition	Paul Kisak	A series of essays on the design discipline of functional decomposition
0471-09009-3	Creating the Corporate Future	Russel L Ackoff	No book list on enterprise architecture would be complete without naming Russel Ackoff. A classic in the field organisation design
978-1-84890-116-2	Beyond Alignment	Edited by John Gotze	A series of essays on matters related to the application of the Viable Systems Model invented by the pioneering Stafford Beer
0-0876-0453-4	General Systems Theory	Ludwig von Bertanalffy	An introduction to general systems theory, its principles and some descriptions of observational experiments proving the validity of the subject area.
978-007042-015-1	Living Systems	James Grier Miller	Quite simply a work of genius.
978-0471948377	Heart of the Enterprise	Stafford Beer	The following three books on the idea of a viable system are basic study for anyone wishing to know how the viable system is meant to work.
978-1-107-07626-6	Network Science	Albert-Lazlo Barabasi	An underlying theme of the architecture described in this document is that of exploiting relationships between things as efficiently as possible. This book, amongst other things, introduces graph theory key elements of network design approaches and more.
	Visual Explanations	Edward R Tufte	We have copies of two of Edwarde Tuftes books on graphical representation of data. Neither has an ISBN. Essential reading for thos who for one reason or another have a need to work out how to display data but are graphically challenged

	The Visual Display of Quantitative Information	Edward R Tufte	Must have books as a result
978-0471948391	Brain of the Firm	Stafford Beer	
978-0471951360	Diagnosing the Systems for Organisations	Stafford Beer	
978-0566079405	The Requisite Organisation	Elliott Jacques	
978-0932633491	An Introduction to General Systems Thinking	Gerald M Weinberg	
978-0195123876	Recreating the Corporation	Russell Ackoff	
978-0955008122	Management F-Laws	Russell Ackoff	
978-0471858089	The Art of Problem Solving	Russell Ackoff	

Annex D – Glossary of Key Terms

Ser	Term	Brief Description
1	Requisite Variety	W. Ross Ashby was a British cybernetician working in the 1950s who became interested in the phenomenon of *homeostasis.* Ashby came up with the concept of *variety* as a measurement of the number of possible states of a system. His "Law" of Requisite Variety stated that for a system to be stable, the number of states that its control mechanism is capable of attaining (its variety) must be greater than or equal to the number of states in the system being controlled.
2	Inferential Distance	This refers to the idea that the further away, topologically, you get from the point of data collection, because of things like collation exercises, inference and summary starts to effect what is reported. In principle, a coherent information management architecture should be able to provide the means to navigate to source data from any point in any reporting mechanism.
3	Inversion of Control	Refers to the idea that nowadays, decisions take anywhere in an organisation can have an impact across the organisation and that impact is flet faster nowadays because of information technology. A comprehensive information architecture using a common meta-model, should make detection of phenomena like that easier by virtue of the potential of sophisticated cross referencing.s.
4	Cybernetics	the science of communications and automatic control systems in both machines and living things
5	Lines of Development	A method of planning capability development and sustainment invented by the MoD and DoD and one of the corner stones of MODAF and its descendent the NATO Architecture Framework.

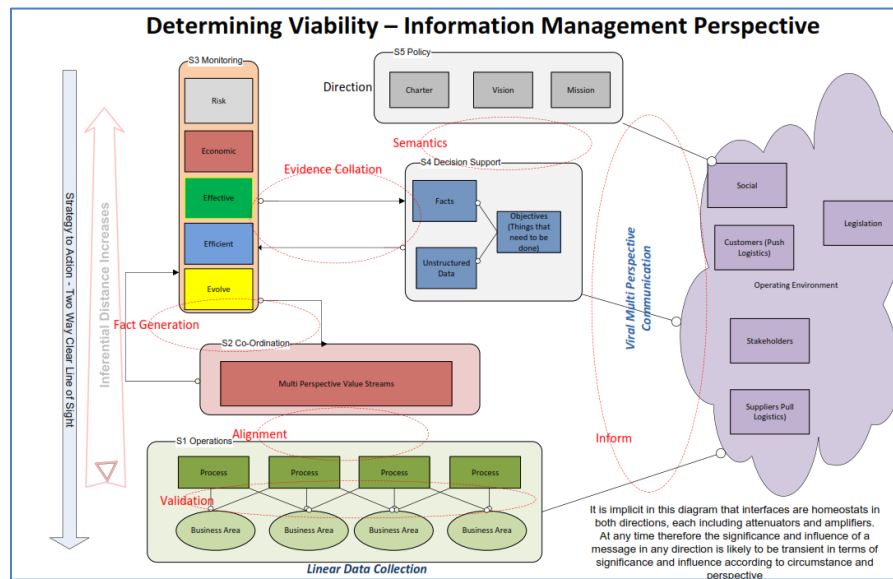# Annex E – The Architectural Impact of Performance Metric Profiles

Figure 25 - Proving Viability - Data to Information Transitions

The primary aim of any information management platform is the provision of contextual decision support on an "on demand" basis. TPO way of conceptualising this requirement is to prove and test organisation viability and for that we use another element of general systems theory, Stafford Beers "Viable Systems Model" (VSM) as the architectural basis for reporting.

The VSM recognises five "systems" or classes of behaviour that manifest themselves in most organisations. It proposes that between each of them there is a feedback loop the primary purpose of which is to facilitate bidirectional and synchronous messaging between each system with the two ways being reporting and evidence based decision making. It should be stressed that the VSM systems are not hierarchical in nature they reflect behaviour patterns. TPO have focused on the feedback loops as a means of defining the nature of the transition of data at the point of collection to usable information for decision support purposes. Figure 23 provides an illustration of the concept.

TPO view is that there are six transition stages:

Ser	Stage Name	Purpose
1	Validation	Initial data collection that is both accurate and verified.
2	Alignment	Collation of data from multiples of systems and databases on the basis that no one data set is the complete body of knowledge and therefore alignment, on the basis of like for like value translation must occur
3	Fact Generation	The reduction of the volume of data to facts based on an expression of the need to know with facts based on perceptions or views of organisation behaviour (Economic, Effective, Efficient and Evolved together giving efficacy from which can be determined ethics)
4	Evidence Collation	The alignment of document file content and database records
5	Semantics	The application of alternative logical forms to the procedural (predication for example) or the use of regression and probability testing to determine "what if".
6	Inform	The provision of the means to present data across the organisation boundary, or to accept external data, for
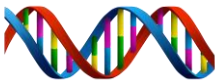
		example as reference data (ISO country code definitions for example). But do so in a way that can be validated and verified.

The transition stages set out above, lend themselves, in design terms, certainly at the stage of fact generation, to a consolidation of Extract Transform and Load (ETL) using a multi-dimensional approach to fact alignment illustrated in figure 24.
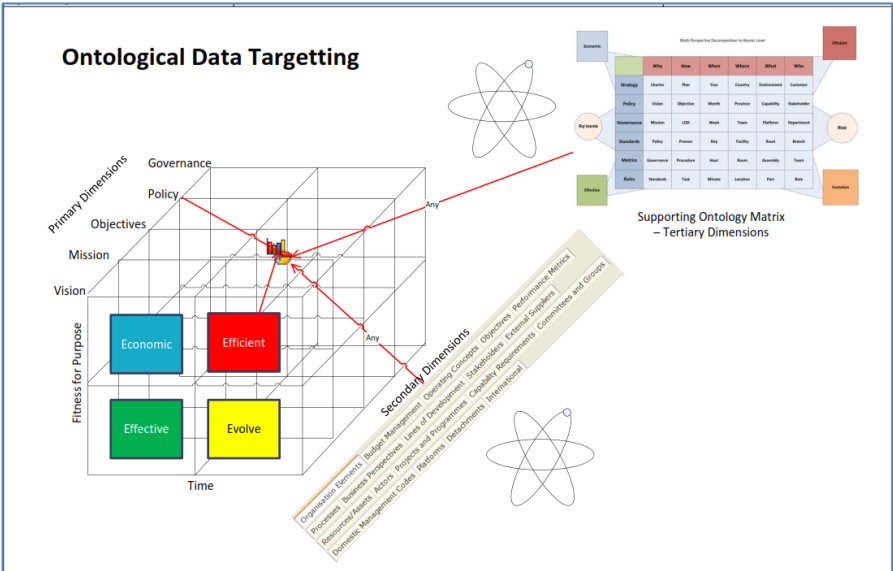

Figure 26 - Ontological Alignment

The end effect being able to target data, on a Cartesian multi-perspective/multi-dimensional basis and then provide the means for Euclidean targeting and analysis aimed at the fact based data rather than the bulk. With the added benefit of being able to assess and illustrate the impact of inferential distance and inversion of control (see Annex D for definitions of both).

To achieve that however, while there is a need to treat performance metric definition as an expression of what "needs to be known", but perhaps more importantly, to understand that metric profiles are a key, strategically significant statement of requirement of data collection and information delivery as specified by "the business". In short, a key means by which "the business" can provide direction to information management professionals.

With that in mind, TPO has produced a Performance Metric Profile definition template which we use for the definition of reporting requirements. The end effect being the development of multi-dimensional, multi perspective dashboards of the type illustrated here and described at length in the case study available here

Annex F – Co-ordinating the Effort

Clueless De Plonquer walked into his office. He had been appointed DPO for Widgets'r'Us some four months previously and was already regretting his decision to interview for the job. A veteran of the operating system wars of the 1990's, Clueless bore the scars of many of the technological copyright battles that had been fought over the years. In particular, his tee shirt showed the stains of trying to sniff countless cans of coke (he could never get the hang of the new ring pulls) while trying to solve obscure c# null pointer problems. Today, already, looked like it was going to be grim, an early morning phone call from his specialist team of data redactors sounded more than usually stressed and as he walked into the building, the hushed tones of the front door concierge staff (how did they always seem to know what was going on before he did) made the sense of foreboding seem much worse.

He looked around him, his team, bleary eyed after a long nights co-ordinated redacting showed the strain they were under. It wasn't enough that the number of GDPR Section 3 requests was rising, it was the nature of the changes that was causing a particular problem…

"Well?", said Clueless…

Pierre Bidet the lead redactor looked down at the floor and started to mumble….

"Speak up Pierre", Clueless said sternly… Clueless regretted the outburst, he knew that Pierre was under considerable stress and was of a nervous disposition...

"It's one of our regulars" Pierre said..

"Which one" Clueless asked with increasing concern..

"Charlotte" Pierre replied. "She has changed her name again, remarried and wants to add more words to her surname, only this time, in Mandarin". Pierre looked up, the stress in his eyes revealed by the tiny tear that started to build up. "The latest change takes her over the surname field length in 8 of our databases and in any event, our desktop machines don't do Mandarin".

Clueless knew of Charlotte, she was one of a number of known serial name changers who, for whatever reason, wreaked havoc on his team. She now had four hyphens in her surname,

each recording her marriages to various people of indeterminate nationality going by the variety of alphabets she appeared to use. It only added to the frustration that once his team got all of the surname parts translated and they all came out as variations on "Smith".

Clueless was sure, since the number of denial of service attacks had gone down, that the anarchist hacker group "Anonymouse" had gone for the easy option. Why spend hours cracking system and network security routines when all you needed to do was to get half a dozen or so people to ask for a name change and exercise their Section 3 rights at about the same time…

Things were manageable before this though. Until now, a Section 3 request of any sort, meant getting the database Administrators of the eight (HR, Marketing, Sales, EMail, PR, Finance, Contracts and Big Data Analysis) systems that contained personal data co-ordinated and to execute any of nineteen standard update queries and that was that. In the early days, getting the co-ordination right was a bit more difficult than it needed to be, but now, Clueless and his team were just about on top of things… Only a week ago, they had their third complete redaction done in the required time limit, it had been a struggle, but it came right in the end..

But what was happening now was different, worryingly so, as it seemed to mean that a redesign of their whole personal data infrastructure was on the cards….

Annex G - Footnote

One of the documents that supports this one is a case study on performance reporting for the UK MoD supply chain. The Performance Organisers were tasked with proving the viability of cross budget, cross organisation and cross platform performance using relatively low specification personal computers as the end user delivery mechanism.

Using the design approach applied by The Performance Organisers proved that relatively low cost reporting of the type asked for was indeed possible. The resulting reporting dashboard system was deployed and tested and eventually was used to provide management reporting up to board level of the organisation sponsoring the exercise.

One of the more interesting statistics is that given the size of the UK armed forces, the NATO stock catalogue and more, was that the kind of relationship mapping capability the architecture exposed was of the order of some 3Bn potentially exploitable relationships between "things". Just an observation.