



# **Better Service Delivery through connected information**

**A DNF White Paper**



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## Responsibility for Content

The DNF Expert Group is responsible for the content of this document.

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## Approval for issue

This paper has been approved by the DNF Expert Group

## This publication

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# 1 Introduction

This DNF White Paper addresses some of the most challenging demands of the decade on the public sector: how to improve service delivery and deliver citizen-centric services. There are various initiatives across the United Kingdom but all these have one thing in common, they demand step-change improvements from the public sector in performance and in delivering back office efficiency improvements and frontline services to the citizen and businesses.

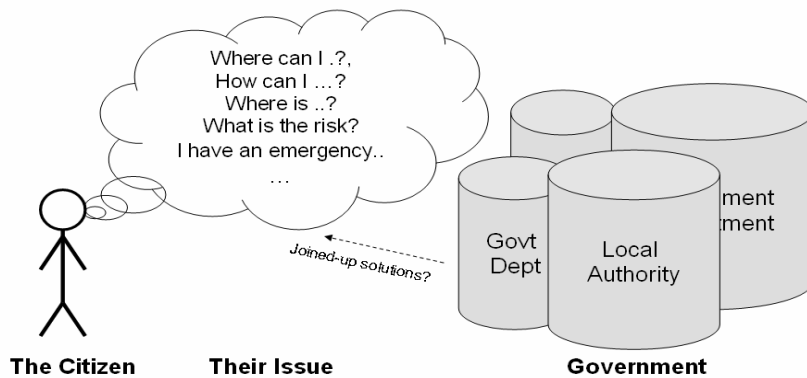
Public services require reliable and timely information and often knowledge about location will provide a key component in this service. The paper also outlines how the Digital National Framework [DNF] can assist in meeting these new challenges by providing the basic principles for integrating and sharing business and geographic information from multiple sources.

The paper may be revised at intervals and feedback is therefore welcome at any time: [contact@dnf.org](mailto:contact@dnf.org).

# 2 “Better Service Delivery”: the challenge

## Citizen focussed Services

As citizens we have all encountered situations where we need to interact with a public sector body. For example when looking for or moving to a new home, or when locating services in the locality or wishing to report some defect that requires attention. On the wider scale we have different needs in our leisure time or when on holiday – in locating services and facilities at locations we are unfamiliar with e.g. access land for walking, car parking, accommodation and travel and tourist information services.





When we need to interact with government the citizen is often confused with whom they need to interact because of the complexity of what is perceived as government and difficulties trying to find a responsible and accountable person. Often to the citizen the different public sector tiers are often seen as “government”. Many of us will have encountered the situation where we wish to report a problem e.g. a highway defect, only for the initial contact to state it is the responsibility of other tier of government. For public sector organisations to become more responsive and citizen facing, they need to reduce the number of persons that deals with such initial contact. It will provide a positive ‘customer experience’ and can improve public sector efficiency in general.

### **Locating the Citizen**

In society many people find themselves disadvantaged for one reason or another and they require assistance to break the cycle and move on. The citizen requires help from outside agencies but their plight needs to be recognised and addressed (e.g. lack of employment opportunities, learning issues, public transport gaps, access to basic services such as GP surgeries etc).

In emergencies such as flooding, the situation is often reversed and the public sector agencies need to locate and or interact with the citizen. Agencies may be disadvantaged because they do not hold the required information and, even if they do it may not be up to date. This could be critical for say, they are trying to rescue elderly during flooding).

Therefore it is not surprising that a key part of the service delivery agenda now being driven by all levels of government<sup>1</sup> is focussed primarily on “Citizen and Business Centred Services”. This requires a rethink of how services are delivered and needs to start from the user’s perspective i.e. the citizen.

### **The “more for less” operating environment**

The old axiom of “better services will cost more” is now being challenged. In the public sector such a statement would mean higher taxation but that is now unacceptable in an era where the public sector purse is getting tighter year on year. The new axiom is “deliver more for less” which indicates the need for innovation and lateral thinking to jump from where we are today to where we need to be.

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<sup>1</sup> In England this is known as the “Transformational Government” programme, In Wales as “Making the Connections”, in Scotland as “Customer First Programme” and in Northern Ireland as “Review of Public Administration”



So what will the future environment look like? What is the vision that will guide each organisation to converge on a common point in the future? The statements below are taken from “Transformational Government Enabled by Technology” strategy developed by the Cabinet Office – it is sufficiently representative of the goals of the regional initiatives in the devolved administrations as well:

*“Twenty First Century Government is enabled by technology – policy is inspired by it, business change is delivered by it, customer and corporate services are dependent on it, and democratic engagement is exploring it. Moreover modern governments with serious transformational intent see technology as a strategic asset and not just a tactical tool. Technology alone does not transform government, but government cannot transform to meet modern citizens’ expectations without it.”*

and

- *“Taxpayers benefit from efficiency gains.*
- *Citizens, businesses and the voluntary and community sector benefit from the better regulation, reduced paperwork and lower costs from a leaner, modern, more effective public sector.*
- *Public servants have better tools to undertake their jobs, and the opportunity to provide better service as a result.*
- *Policy makers will be better able to achieve intended outcomes in practice.*
- *Managers are able to free resources from back office to the front-line.*
- *Citizens feel more engaged with the processes of democratic government”.*

and

### “Strategy

21. Achieving the vision will require three key transformations:

- *Services enabled by IT must be **designed around the citizen or business**, not the provider, and provided through modern, co-ordinated delivery channels. This will improve the customer experience, achieve better policy outcomes, reduce paperwork burdens and improve efficiency by reducing duplication and routine processing, leveraging delivery capacity and streamlining processes.*
- *Government must **move to a shared services culture** – in the front-office, in the back-office, in information and in infrastructure – and release efficiencies standardisation, simplification and sharing.*
- *There must be broadening and deepening of government’s **professionalism in terms of the planning, delivery, management, skills and governance** of IT enabled change. This will result in more successful outcomes; fewer costly delivery failures; and increased confidence by citizens and politicians in the delivery of change by the public services.”*

and

*“(5) **Information Management:** to facilitate the move towards more collaborative working on issues that involve a range of government organisations, common standards and practices for information management will be developed, with an effective range of tools to allow the most efficient use and sharing of information to all those across government that have a legitimate need to see and use it.”*

### Making this a reality – enabled by location

The strategies and implementation plans are therefore in place and the weight of government is behind these strategies. Indeed the pressure is on all levels of government to apply the transformations and make the differences on the front line so that the citizen recognises the step changes in how they interact with government and better manage their own lives.



The push is for information centric service delivery and will require investments of all kinds in the ICT domain where significant budgets already exist. In comparison the world of digital geographic information is quite small and often very remote from these front line service agendas. *It is quite clear therefore that there must also be a transformation by the geographical information practitioners to take the necessary steps to move towards and integrate into the mainstream ICT community.* Fortunately there are three current initiatives that support this transformation:

- The EU INSPIRE Directive: the Infrastructure for Spatial Information in Europe mandates Member States to provide their public authority datasets and services so that they can more easily be used by other organisations in the country concerned, in adjacent countries if required, and by the EC itself for policy making, reporting and monitoring.

INSPIRE, as a “framework directive”, is a set of principles and rules that each country must now choose how to implement - it will not necessarily need legislation. Datasets will, by set dates, be capable of being discovered, viewed, and downloaded through common interfaces. Exactly how these services should be provided (other than the EC’s own geo-portal) is left to individual countries.

There is no requirement for new data collection, though it will be necessary for future data collection to comply with Implementing Rules (IRs) now being drafted. The formal IRs will be based on de jure standards and will require a greater degree of professional implementation than has been hitherto. This will also promote greater access to data/information its definition and in particular interoperability. [Ref. DNF White Paper].

It is required that metadata and, for the most part viewing services, will be available free of charge, but there is specific allowance for intra-governmental agreements for the use of data – even if they involve a charging regime. There is a general aspiration to ‘remove obstacles’ – especially those at the ‘point of use’ that reduce accessibility of public sector information.

The formal Implementing Rules will be based on de jure standards (largely ISO and Open Geospatial Consortium standards) and this will require a greater degree of professional implementation than has been hitherto. This will also promote higher levels of information engineering and interoperability. [Ref. <http://www.ec-gis.org/inspire/> ]

- The UK Location Strategy. “An overall strategy for geographical information will be developed under the leadership of the Geographical Information Panel recently created by Ministers.” Now accepted by the Minister but not yet published. With strong Cabinet Office participation it can be expected to follow the same thrust as the aims set out by the Transformational Government and equivalent agendas in the devolved administrations. [Ref. [www.gipanel.org.uk](http://www.gipanel.org.uk)]
- The Digital National Framework not only complements the INSPIRE Directive but provides methods, mechanisms and tools to support applications beyond the environmental concerns of INSPIRE. The DNF infrastructure is designed to also align with mainstream ICT integration.



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## How does location information fit in? - examples and case studies

It is clear that all public sector organisations are going to have to transform the way they do things, right across the board in order to be more responsive to the citizen. Information in particular will need to be rationalised to adopt a common infrastructure.

A priority must be to transform the current wastage encapsulated in the “*capture many times use once*” paradigm to the “*capture once – use many times*” model. The consequence of this is that different parts of government will be responsible for specific datasets and that these should not be recollected elsewhere; public sector information reuse is also extremely valid in this context.. It is particularly relevant to location information since the fundamental benefit revolves around the idea of relating different information (or views) about a common location and therefore deriving knowledge and often new knowledge, of that place.

In turn it is clear that such a principle also requires greater external engagement in terms of data and information publication. It means collaboration and data sharing with third parties, service interaction and also greater linkages (using identifiers) from one organisation to another. Information networking of this kind is common practice in other information domains such as banking, electronic point of sale systems, telecoms etc. These provide good examples of information supply chains.

Applications will therefore need to consider the support of both internal and external needs and data architectures will need to be far more robust and professionally engineered than today to accommodate such needs. For example, there is no point enabling increased access and sharing spatial of location data *if it is not fit for purpose*. Mechanisms should be in place to assess data quality, measure and report on it in the context of improved service delivery and ongoing quality assurance should be provided.

## 3 How can DNF help?

The three case study examples that follow illustrate the breadth and nature of the information services and how DNF principles can be used to achieve better service delivery.



## Business Intelligence

**Issue:** Management of assets such as street lighting, road defects, fly tipping etc can be time consuming to locate, collect and manage the information.

The public do not know if the item is being fixed - leading to repeat calls and time lost through staff engagement.



Image:  
[http://www.bbc.co.uk/gloucestershire/content/images/2007/06/26/pot\\_hole\\_1\\_470\\_420x300.jpg](http://www.bbc.co.uk/gloucestershire/content/images/2007/06/26/pot_hole_1_470_420x300.jpg)

**Approach:** *Enlist the citizen as a main part of an automated information collection process.* Using a web map interface they can locate problem items of concern for them and leave a message, photos or other attachments. These are published so that others can see what has been reported and further comments can be added so that the level of local concern can be considered.

The reported information would be recorded in the organisation's database. "Alerts to fix" could be automated and the current status would also be added and updated frequently so that those reporting the problem will know what is happening at any moment.

All the information would be referenced to the location object (road segment, building, pavement, field, river etc) using the national object identifiers also enabling links across other databases such as traffic accidents on a section of highway etc.



FixMyStreet illustrates the potential – though greater linkages and status - responsiveness is required

**How could DNF help?**

The user attaches their “issue” at a location as accurately as possible using a detailed map, The event is cross referenced with the location object which could also have other comments which could be used to determine when attention might be given to resolving the issue(s).



**Social Exclusion**

**Issue:** There are all kinds of ways people can be excluded from society - and the causes also vary enormously.

In many cases people are born into such an environment and there appears to be no way out.

Indeed even the prospect may not occur and this in turn can lead to greater social upheaval in terms of unemployment, drug abuse, crime and the downward spiral people sometimes find themselves in.

- Neighbourhood Statistics – domains and sub-themes*
- Access to services**
    - Accessibility of:
      - GP/hospital/other health care
      - Legal advice
      - Leisure facilities
      - Post Offices
      - Schools
      - Shops
  - Community well-being/social environment**
    - Caring responsibilities
    - Participation in community organisations
    - Perceptions of neighbourhood and service provision
    - Population turnover
    - Voting turnout
  - Crime**
    - Fear of crime
    - Numbers of crimes of different types, including domestic burglary, auto crime and violent crime
    - Offender data
  - Economic deprivation**
    - Dynamic measures of low income
    - Indebtedness
    - Low income
    - Wealth/assets
  - Education, skills and training**
    - Absenteeism
    - Adult learning
    - Driving licences
    - Early child development
    - Numbers achieving qualifications
    - Numbers without qualifications
    - Pre-school provision
    - Progress through education
    - School exclusions
  - Special needs in schools**
    - Staying on in education
    - Young people not in education, work or training
  - Health**
    - Accident and emergency statistics
    - Disability
    - Drug and alcohol misuse
    - Healthy lifestyles
    - Maternal, infant and early child health
    - Mortality
    - Physical and mental health
    - Social services caseloads
    - Teenage pregnancies
  - Housing**
    - Affordability, including house prices and rents
    - Composition of dwelling stock
    - Homelessness
    - Houses in multiple occupation
    - Overcrowding
    - Stock turnover
    - Unfit housing and disrepair
    - Vacant properties
  - Physical environment**
    - Air quality
    - Land use, including dereliction
    - Traffic volume and speed
  - Work deprivation**
    - Availability of child care
    - Dynamic measures of worklessness (duration, persistence and turnover)
    - Employment
    - Job losses/notified redundancies
    - Measures of worklessness
    - Workless households

The PAT18 report in April 2000 examined this issue and among many issues it identified knowledge of location as a key component in addressing the problem though at that time there was no national referencing framework.

The above list comes from that report – ideally each item would be georeferenced to a common framework to develop a cause and effect model and to isolate areas for investment.

**Approach:** Addressing the problems of social exclusion requires the interplay of many government departments. Through partnerships at the local level (regional bodies and local authorities), the local authority and many voluntary bodies at the community level, investment is made in renewal and regeneration projects, education, social benefits and development grants. While extremely deprived areas are obvious to many there are many borderline communities who may fall into decline or just recovering, whatever the criteria of measurement.

The consistent application of georeferences using unique location identifiers across government offers a powerful capability to link up disparate datasets around any location. This offers the potential to determine cause and effect, address the cause rather than the symptoms, target key areas, monitor change over time (has the investment worked or just moved the problem somewhere else?). The main benefits are:



- Improvements in peoples lives
- Targeting and minimising the use of scarce resources



**How could DNF help?**

Events are cross referenced to objects they are associated with e.g. addresses, addresses to buildings or other base reference objects. This then enables the sharing of records from multiple sources irrespective of the origin. Reporting units are related to the same reference objects to support consistent aggregation and thereon through derived aggregations to regional and national levels.

A level of accuracy and consistency is required when combining data in this way. The process of referencing to a common base dataset not only enables data sharing but it even helps the respective organisations to improve their data quality from the outset.



**Emergency: Flooding**

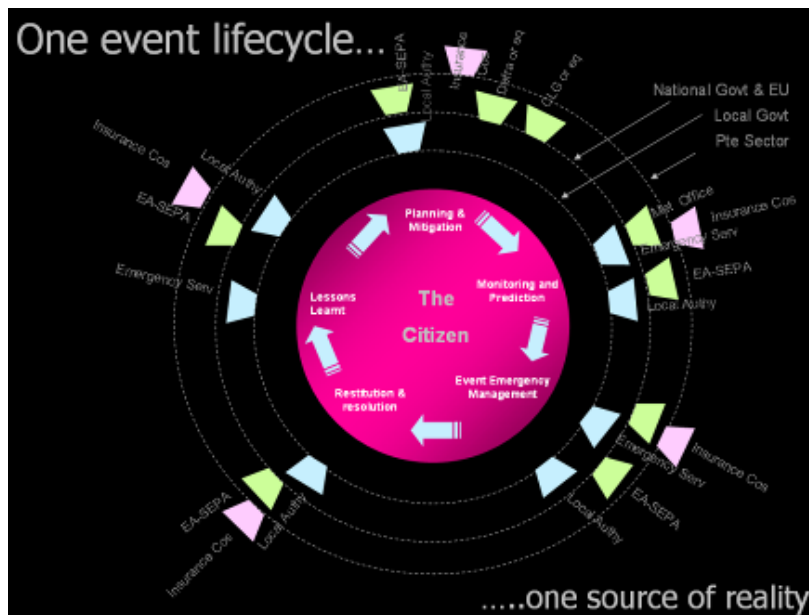
**Issue:** Flooding for those whose homes or businesses are directly affected is a distressing experience. The adverse effects of just a few hours water ingress in a building can last weeks, months and sometimes years. While flooding is a large topic and overall it cannot be prevented, improved information can help communities better manage those environments and assets that are at risk.



**Approach:** The Pitt Report (December 2007) highlighted many of the issues regarding the sequence of floods during the summer of 2007. These form part of a pattern of frequent events and are no less distressing because of that. Several of the interim findings highlight weaknesses in knowledge before and during events; this mirrors some of the Atlantis Initiative findings.

**Risk mitigation:** the fact that currently around one third of respondents spend between 25%-50% of their project resources simply getting hold of data, cleaning it up and preparing it for use. Clearly wasteful, this is a major impediment to scenario planning of the nature “if it rains for 5 hours in this locality what is the risk?” The Atlantis Initiative seeks to ensure the data of the participating organisations is interoperable and ready for use “out of the box” and therefore in web reliable and dependable web applications. Again ensuring spatial data is fit for purpose is essential.

**Emergency Rescue:** when an event does occur there is often insufficient information. Imagine late evening, the river burst its banks 6-8 hours ago and has been rising all day, its going dark and several small towns are under threat. First of all the complexity of the river system, the location of the rainfall and the elevation of the land make a dangerous situation complex, will the river rise or fall?, which streets and buildings will be affected? Which buildings contain elderly or infirm people? Surprisingly while many of the necessary datasets exist e.g. social services care lists etc, few if any of these are joined up e.g. care lists/addresses with buildings, river gauges with the river network etc and access to this information on the ground in real time. Again Atlantis is promoting this kind of interoperability but in turn need to rely on the Transformational Government programme to support the wider step changes in approach required.



Flood and water management lifecycle (courtesy of the Atlantis Initiative) – demonstrating the need to use common datasets at all stage of the lifecycle and the need for public sector bodies to share information at all stages and for private sector access.

**How could DNF help?**

River network linked to river objects i.e. banks and hydrologically consistent DTM. Sensors referenced to the river network

Care and occupier information using local address list e.g. LA address gazetteer, cross reference to associated building footprint identifier.

**DNF as a location enabler**

It is clear from the three examples above that we are ultimately reliant on fit for purpose information and that *reliable information enables the delivery of better and more reliable services*. DNF is designed to support the location element of that goal. How does DNF support the above needs and applications?

**DNF Registry** - definition of a common coordinate system, a national system of unique identifiers and object catalogues (definitions of building, address etc).

**Methods & Tools support** – Technical Guides and Example Guides define how objects are defined and how cross references and linkages are made and maintained.



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**DNF compliant Datasets** - support automated processes through the adoption of common standards and protocols so that the data is fully interoperable.

#### **DNF demonstrators –**

To illustrate the potential for your organisation, including:

- 1) Generate associations from your assets to reference identifiers in datasets like OS MasterMap
- 2) Use these associations to get a preview of how your assets will be affected when you apply incremental updates
- 3) Generate complementary geometries (elements of your assets that are described by partial not whole reference identifiers)
- 4) When sharing and integrating data between organisations, use toid references to quickly and easily identify spatial co-location.

#### **DNF case studies**

- Dudley Metropolitan Borough Council  
<http://www.dnf.org/Case%20Studies/Dudley%20DNF%20casestudy%20lores.pdf>
- Atlantis Initiative – [www.dnf.org/applications/atlantis](http://www.dnf.org/applications/atlantis)
- Adding value to the Isle of Wight Street Gazetteer -  
<http://www.dnf.org/Case%20Studies/Isle%20of%20Wight%20DNF%20casestudy%20WEB.pdf>
- Creating the Oxfordshire Street Gazetteer -  
<http://www.dnf.org/Case%20Studies/Oxfordshire%20DNF%20casestudy%20lores.pdf>

## **4 Conclusions**

1. The end user (i.e. the citizen) expects public sector delivery to be integrated and joined up – this implies greater collaboration across all parts of government (local, central etc) and easy sharing of business information across these bodies to deliver a step change in public sector service delivery.
2. Government policy at all levels of government and across the devolved administrations is now driving this agenda. The citizen will be able to see a difference and in turn be enabled to make better decisions for themselves.



3. This implies an integrated approach to organisational information strategies where location is seen as an integral component in the ICT strategy - not a separate development.
4. This in turn requires spatial information management professionals to adopt:
  - a. key principles of collect once and use many times
  - b. professional standards in data management (data modelling and definition, storage and access)
  - c. common protocols across government (no more silos)
  - d. web enabled access and delivery mechanisms
  - e. mechanisms to assess and ensure fit for purpose data
  - f. collaboration across government and the sharing of best practice
  - g. shared service culture and the economies of scale that offers.
5. DNF methods and protocols support this agenda by enabling the integration with the ICT agenda and in defining components that support formal data definition (eg feature catalogues) data linkages (eg cross referencing) and tools to support data sharing (eg XML schema).

## 5 References

### Publications

2005	Cabinet Office	Transformational Government Enabled by Technology
2006	Cabinet Office	Transformational Government Implementation Plan
2006	The Scottish Government	Scottish Executive Report on progress with Public Sector ICT Initiatives (A response to the UK Transformational Government Annual Report)
2007	Welsh Assembly Government	One Wales a progressive agenda for the government of Wales



2007	Office of the First Minister & Deputy First Minister	Programme for Government
2007	DNF	DNF Overview
2008	DNF	Cross Referencing – Technical Guide (in progress)
2006	DNF	Association Model
2007	Cabinet Office	Learning lessons from the 2007 floods An independent review by Sir Michael Pitt 165 pages
2000	Cabinet Office	Report of Policy Action Team 18: Better information

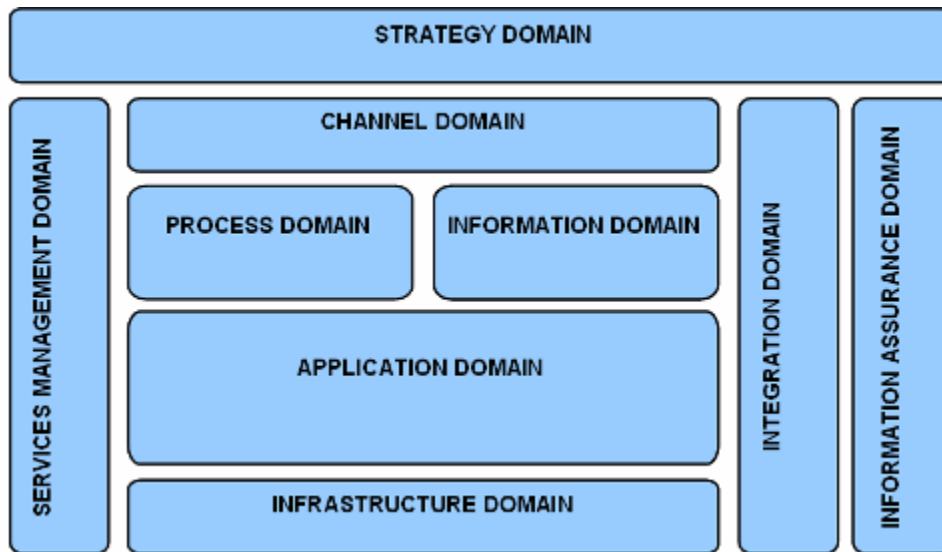
### Web References

Year,	Reference	Web Address
2008	Cabinet Office	<a href="http://www.cio.gov.uk/transformational_government/index.asp">http://www.cio.gov.uk/transformational_government/index.asp</a>
2008	UK Location Strategy	<a href="http://www.gipanel.org">www.gipanel.org</a>
2008	INSPIRE	<a href="http://www.ec-gis.org/inspire/">http://www.ec-gis.org/inspire/</a>
2008	Atlantis	<a href="http://www.dnf.org/applications/atlantis">www.dnf.org/applications/atlantis</a>
2008	Digital National Framework	<a href="http://www.dnf.org">www.dnf.org</a>
2008	DNF Demonstrator	<a href="http://www.mgeomatics.com/DNFDemo">http://www.mgeomatics.com/DNFDemo</a>



## Annexe A

### Enterprise Architecture Model



The Enterprise Architecture Model – work currently being developed by the CIO-CTO Councils.