HM Government

A Concept Model for the UK Public Sector

January 2012, Version 0.2

Introduction

This paper is produced by the CTO Council Information Domain to scope and propose a 'concept model' that universally applies to public sector information.

What is a Concept Model?

Wikipedia describes a concept model as ....

> *... a conceptual model represents 'concepts' (entities) and relationships between them ... explicitly chosen to be independent of design or implementation concerns*
>
> *The conceptual model attempts to clarify the meaning of various, usually ambiguous terms, and ensure that problems with different interpretations of the terms and concepts cannot occur. Such differing interpretations could easily cause confusion amongst stakeholders, especially those responsible for designing and implementing a solution, where the conceptual model provides a key artefact of business understanding and clarity.*
>
> **Wikipedia.org/Conceptual_model_(computer_science)**

For the purposes of the Public Sector Concept Model (PSCM), we shall add:-

- Contains a small number of concepts, which can be applied to any part of the public sector;
- Is immune to future government reorganisations
- Is simple, easy to read and well understood by the audiences

The models are shown graphically here as simple 'Directed Graphs' (http://en.wikipedia.org/wiki/Directed_graph) and are available as simple ontology expresses as rdf-schema (http://en.wikipedia.org/wiki/RDF_Schema).

The concept models should not be confused with process models; they simply introduce a series of concepts and propose how those concepts may be related. The relationships in these models should all be considered to be 'many to many'.

A definition for each concept in the model is proposed later in this document. Attributes for each concept are not defined at this stage.

The Purpose of a Public Sector Concept Model

The Government ICT Strategy[1], published March 2011, emphasises the need and role of a Public Sector Information Architecture.

> Managing information effectively and appropriately is essential to the delivery of secure, seamless and efficient operational services. It provides the basis for informed decision making and the platform upon which performance can be measured. Modern, knowledge-based service delivery underpinned by effective information architecture and open standards will support government to build more transparent, trusted and efficient information exchange

[1] Government ICT Strategy - http://www.cabinetoffice.gov.uk/resource-library/uk-government-ict-strategy-resources

processes. The Government will develop an information strategy that is supported by an architecture framework which will underpin the design of government's new information systems.

A public sector concept model can be used to:-

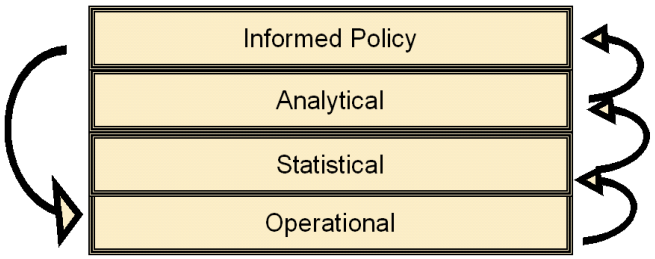
- Underpin logical models within public sector solutions;
- Avoid misinterpretations of data as it is shared and re-used;
- Catalogue public sector data holdings leading to improved discovery and re-use;
- Reduce 're-collection' of data that already exists in the public sector;
- Re-use patterns and components that act on a concept;
- Enable re-use of data, services and solutions between public sector agencies;
- Promote a 'master data' approach where definitive and authoritative information is published for each concept;
- Reduce the time and resources required to produce public sector solutions;
- Support requirements definition and procurement.

Contexts of Public Sector Information

This paper builds on previous work by the CTO Council Information Domain to define an Information Architecture for public sector information.

Public Sector Information may be in contexts of:

- **Operational** – about real people and places, with real circumstances, needing real services, i.e. Case Work
- **Statistical** – aggregated operational information, organized using common classifications and segmentations.
- **Analytical** – the conclusions drawn from the analysis of statistics. i.e. patterns, predictions, inferences, opinions.
- **Political** – the decisions taken to shape services.



When information flows across each context, we can demonstrate that:-

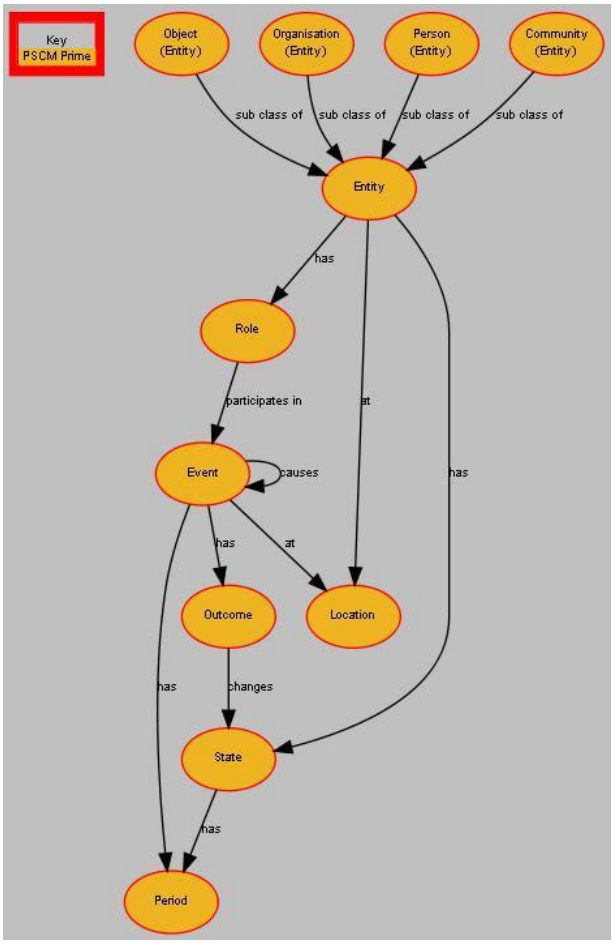
> *The **decisions** that we take, are based on the **conclusions** that we reach, from the **statistics** that we gather, from the **data** that we handle.*

A series of concept models is proposed that underpin how information is exploited in each of these contexts.

Concept Models for Operational Information.

Events

Much of the information handled by the public sector includes recording an ‘Event’.



Events occur irrespective of whether they trigger, or are contained in, public sector services. For instance

- A person may exceed the speed limit in a car
- A person may get a job
- A person may have a fall and injure themselves
- A business may open a new shop
- A tree may be blown down in a gale.

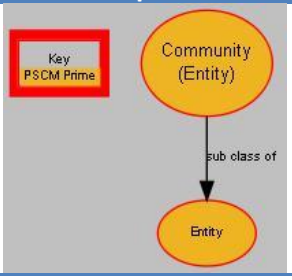
Some of these events may lead to a public sector service being initiated, in which case, they are likely to be recorded within a ‘Case’.

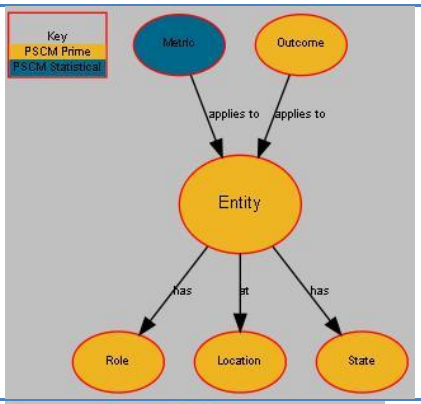
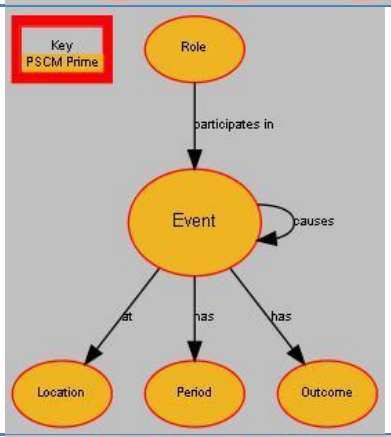
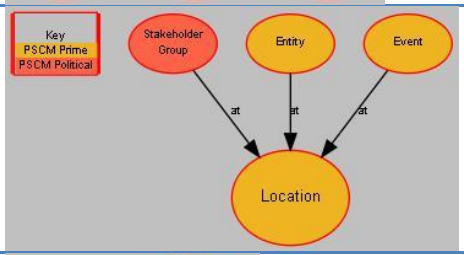
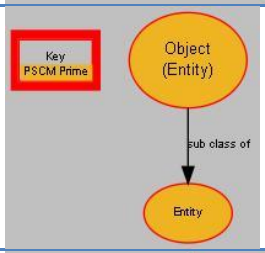
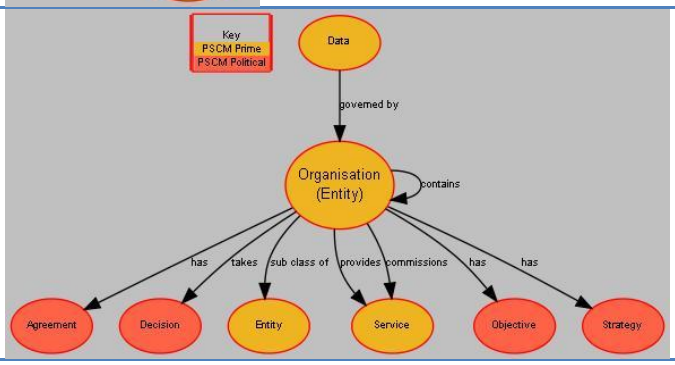
As well as introducing some key concepts, this model shows a usage for recording ‘Events’, in particular:-

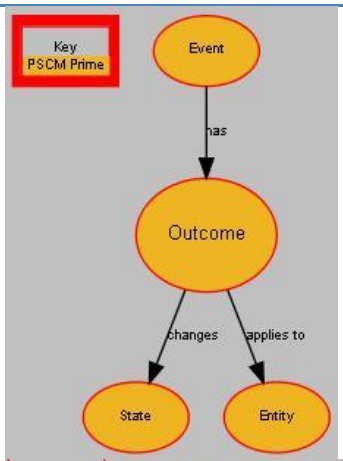
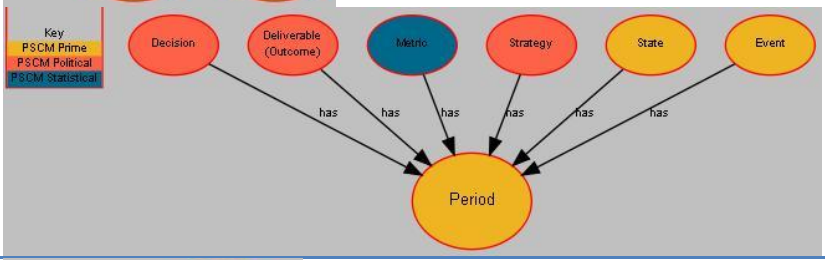
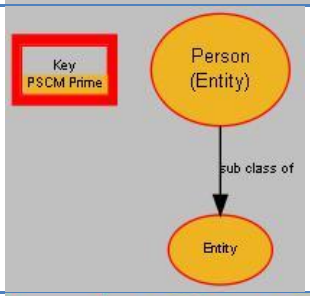
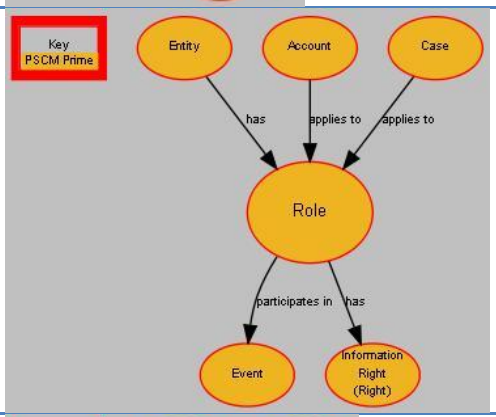
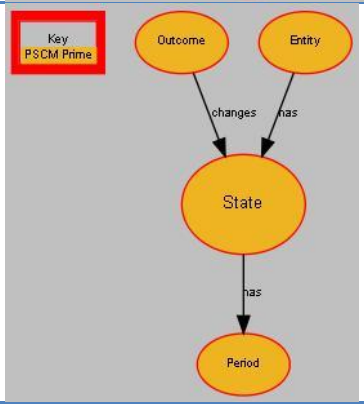
- The participants to an event may be Objects, People, Organisations, and Communities. As they participate they take on 'Roles' such as driver, passenger, keeper, road, obstruction, employer, claimant, informant, residents, pedestrians etc

- An 'Event' may have 'Outcomes' which cause changes of 'State' to the characteristics of a series of ‘Entities’. These may affect more than just the participants to the 'Event', so for instance, a fallen tree may affect commuters between a village and a town.

Concepts introduced by the ‘Events’ view.

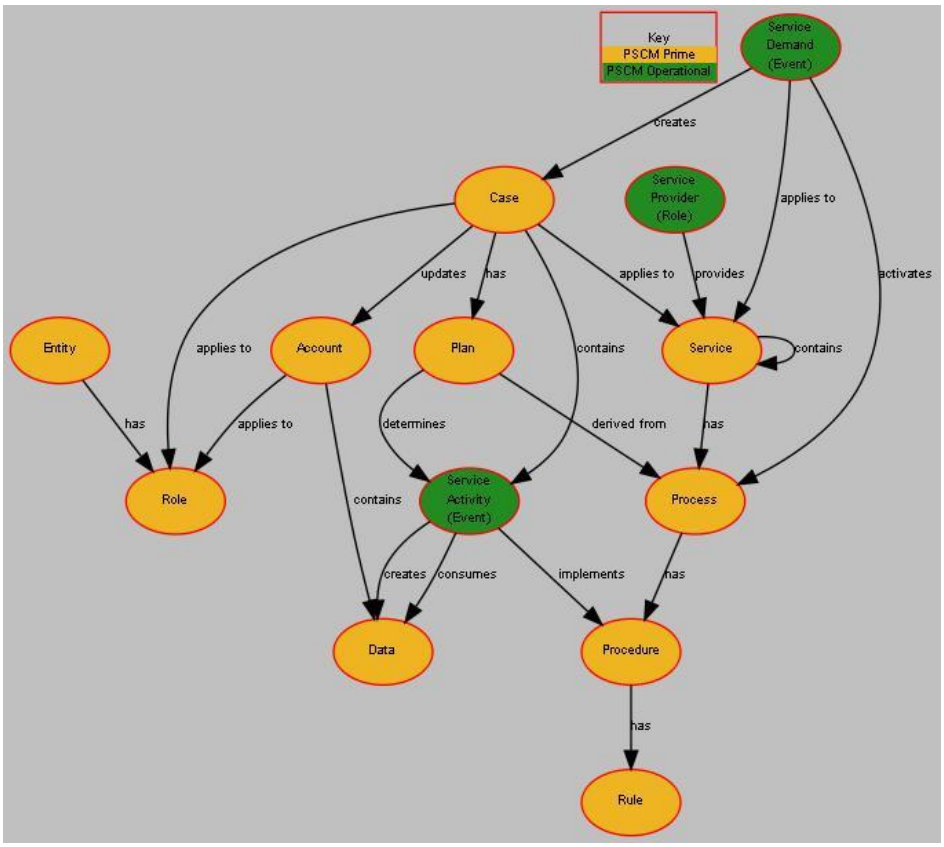
Concept	Definition	Relationships
Community	A group of interacting people that share common values and/or location.	

Entity	Something that has a distinct, separate existence.	
Event	A happening, that has occurred, or is due to occur.	
Location	A fixed point, area, or volume	
Object	A physical item.	
Organisation	A social group which distributes tasks for a collective goal.	

Outcome	The changes of state to an Entity as a consequence of an event.	
Period	A specified division or portion of time.	
Person	A human being	
Role	The manner in which an Entity participates in an Event.	
State	A circumstance or condition of an Entity at a given Period.	

Cases

A public sector organisation will create a series of ‘cases’ to manage and record activities for its services.



A 'Service Demand Event' will occur by which a 'Service Provider' is requested to initiate a 'Service'. As with all 'Events', there may be associated information about ‘Roles’, ‘Entities’, ‘Periods’, ‘Locations’, ‘States’, etc

A 'Case' is created to record the 'Service Activities', and 'Plans' for the instance of the 'Service'.

The 'Service' will have one or more predefined 'Processes', from which a plan may be derived for the 'Case'.

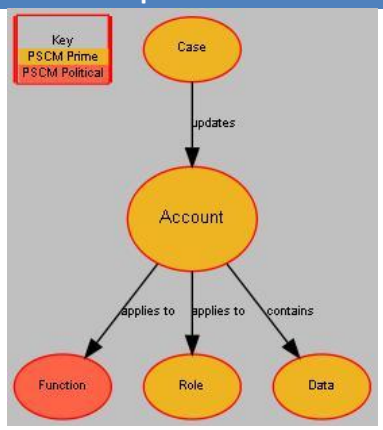
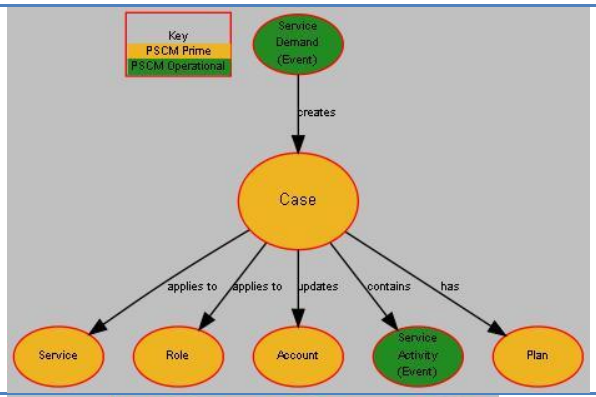
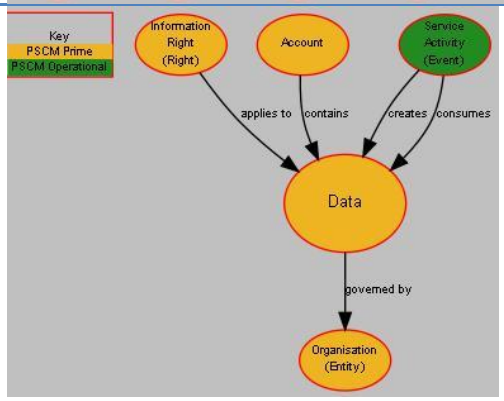
'Service Activity' creates and/or consumes 'Data' that may then be recorded against the 'Case'.

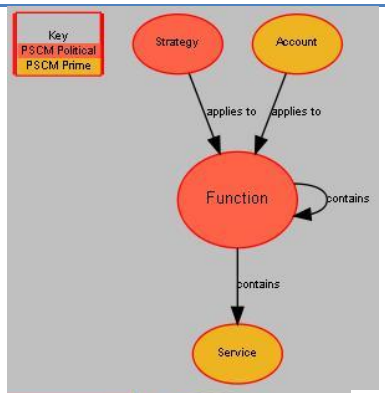
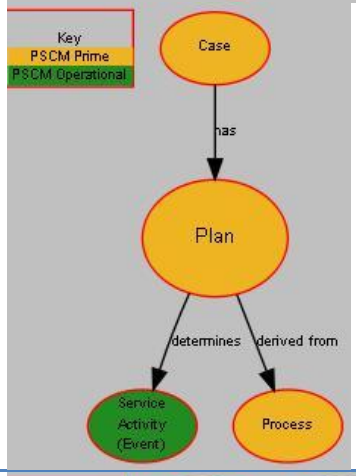
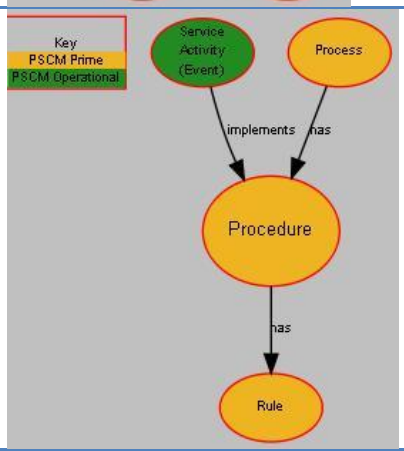
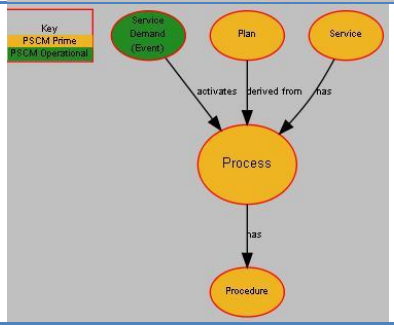
Where the 'Data' is of value beyond the lifecycle of the 'Case', an 'Account' may be created or updated so that the 'Data' can be re-used for later 'Cases' or for other appropriate purposes.

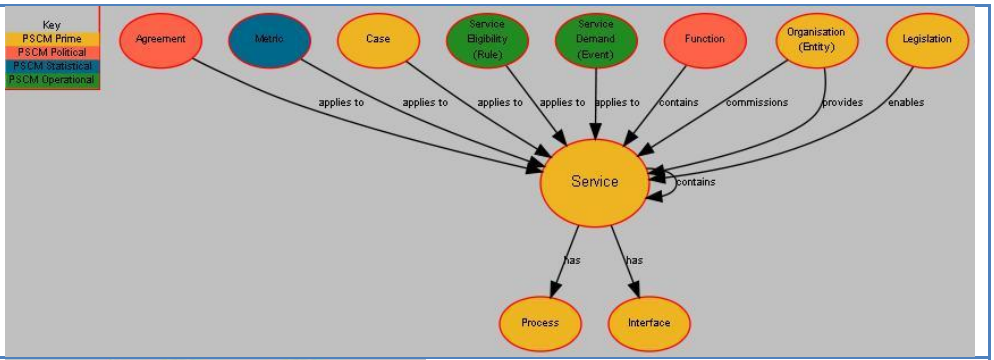
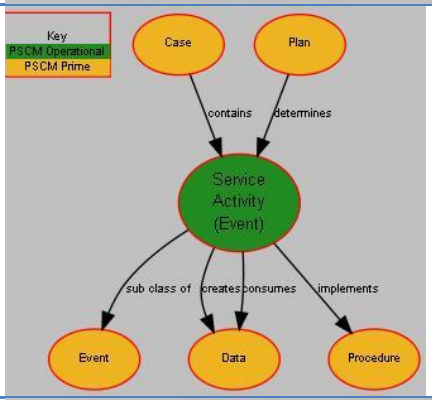
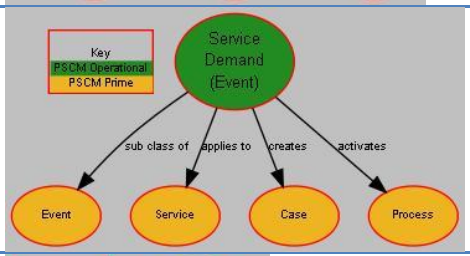
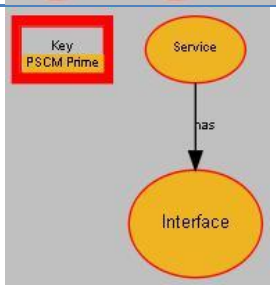
An 'Account' typically contains 'Data' for a 'Function' and for a 'Role', for example:

- A patient record
- An ongoing claim for benefit
- A driver's licence
- A food premises inspection history
- An Equipment Log

Concepts introduced by the ‘Cases’ view.

Concept	Definition	Relationships
Account	A container for information about 'Events' and 'Statuses' for a 'Function', that relate to an 'Entity' and a 'Role'. For example • A patient record • An ongoing claim for benefit • A driver's licence • A food premises inspection history • An equipment log	
Case	The management of a Service Demand.	
Data	The recorded value of an attribute. When organised, data can be the basis of * Information * Knowledge * Wisdom * Insight	

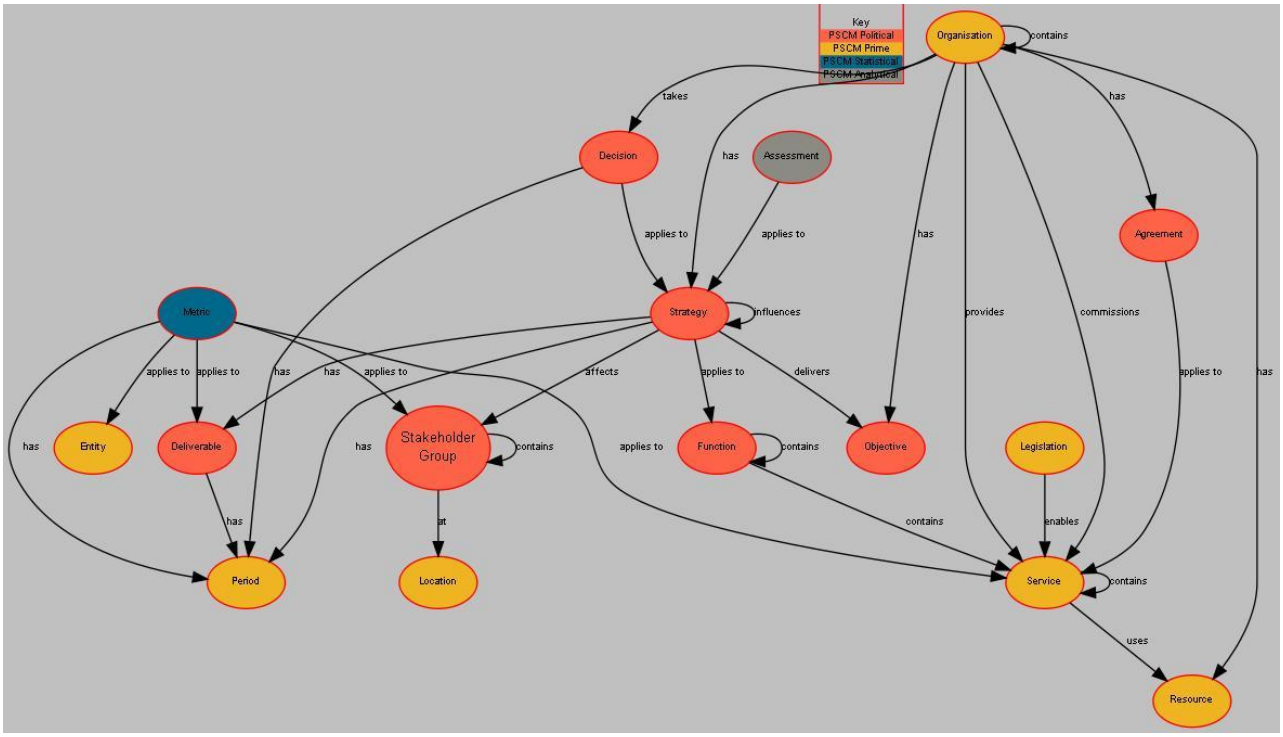
Function	A collection of services that come together into a cohesive set.	
Plan	A list of procedures with proposed periods and resources, used to achieve a desired outcome.	
Procedure	Definition of steps and methods that would achieve an outcome. Procedures can be re-used in many Processes.	
Process	A predefined set of Procedures, and decision points based on the outcome of each procedure.	

Service	The capacity to carry out a defined process. A service exists even if it is not accessed.	
Service Activity	An event that is undertaken within a Case.	
Service Demand	An event that causes a service to create a case.	
Service Interface	The facility that enables a Service Activation. This may be • A web site form • An API • A help desk • An Application Form ... etc	

Concept Models for Political Information.

Commissioning Services

This view illustrates how information that informs how public sector services are commissioned. This type of view supports the drive towards ‘Open Public Services’ by enabling the public to discover information that enables them to take part in local decision making and service provision.



This view shows how the concept model can be used to combine information from many sources, to provide a joined-up set of information on a topic, in particular:-

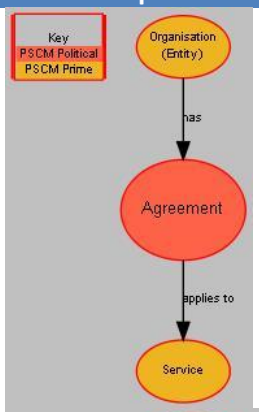
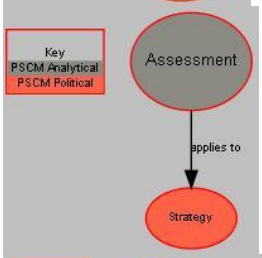
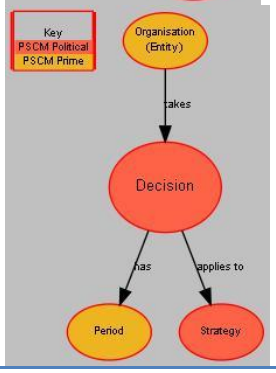
- A *Service* is commissioned by a ‘*Public Sector Body’* and may be contained in one or more functions, for instance
  - An ‘Education’ function may contain a ‘Schools Admissions Service’
- One or more ‘*Strategies’* will apply to each ‘*Function’* setting out purpose, ambition, throughput, performance targets, and so on.
- ‘*Strategies’* will have been informed by ‘*Assessments’* which include studies, analytics, forecasts and so on; ‘Strategies’ will be influenced by the core ‘*Objectives’* of the commissioning *Organisation*.
- ‘*Services’,* and the commissioning rational contained in the associated *Strategies* are of interest to a range of *Stakeholder Groups,* where those groups are segmentations such as
  - Business Community
  - Localities
  - Communities
  - Circumstances

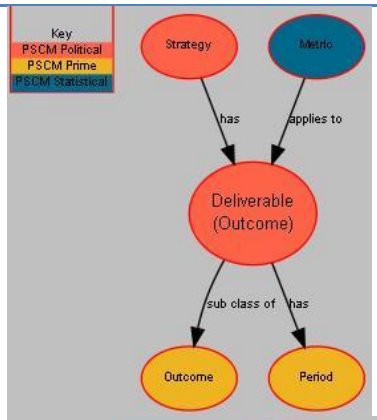
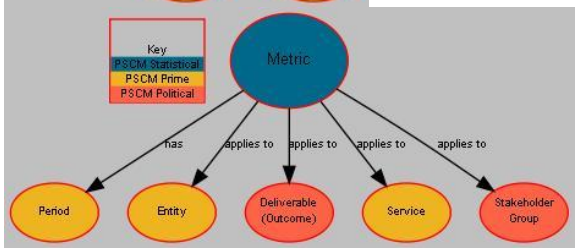
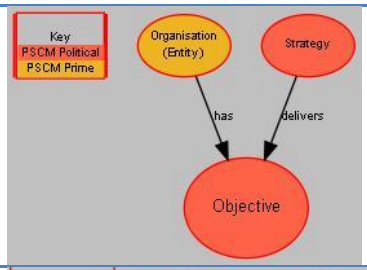
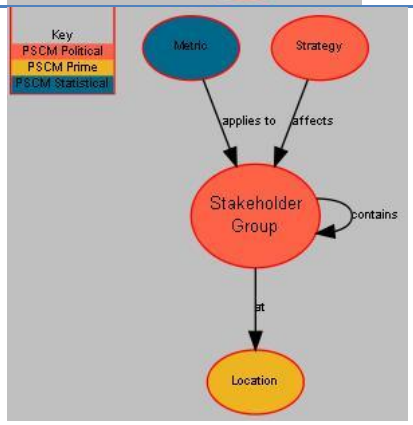
... and where each can be further broken down and recombined, for example

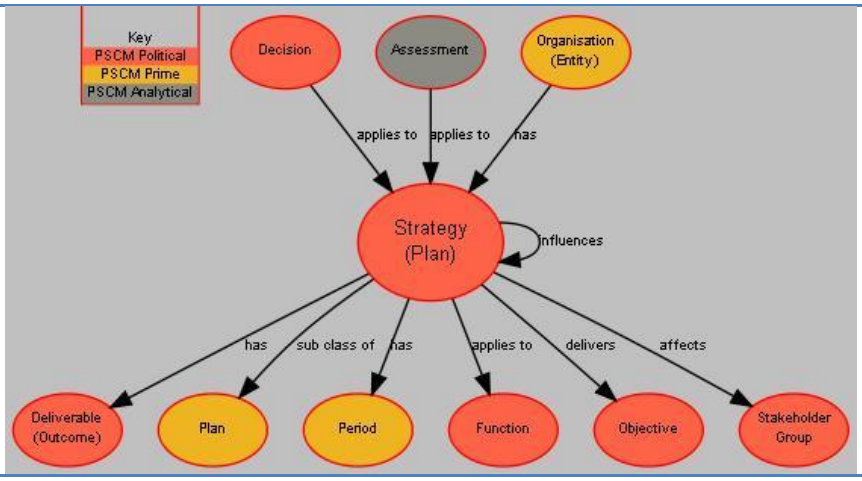
- Business Community
  - Manufacturing
  - Tourism
  - Retail
  - Service
  - etc

Metrics can then be associated with each stakeholder group.

Concepts introduced by the ‘Service Commissioning’ view.

Concept	Definition	Relationships
Agreement	An agreement between two parties. For example • a contract • a memorandum of understanding	
Assessment	A study that reaches conclusions to inform a decision.	
Decision		

Deliverable	An 'Outcome' of a 'Strategy'	
Metric	An analytical measurement intended to quantify the state of a system. For example • population density"	
Objective	A desired state	
Stakeholder Group	A segmentation defining groups of people or organisations, who affect or can be affected by an organization's actions.	

Strategy	A plan chosen to bring about a desired outcome or objective.	

Definitions of each Concept.

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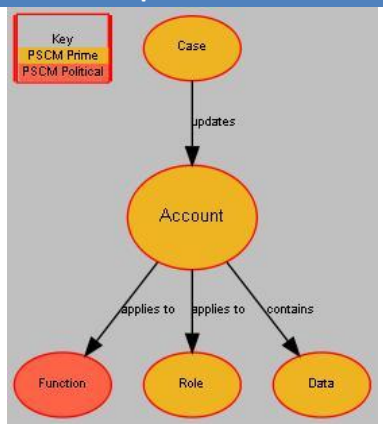
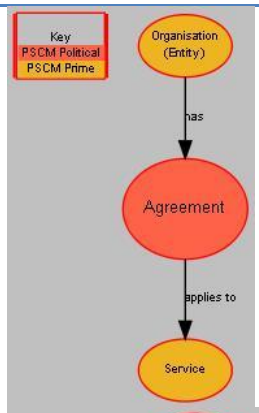
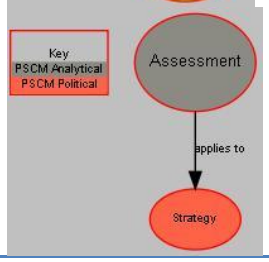
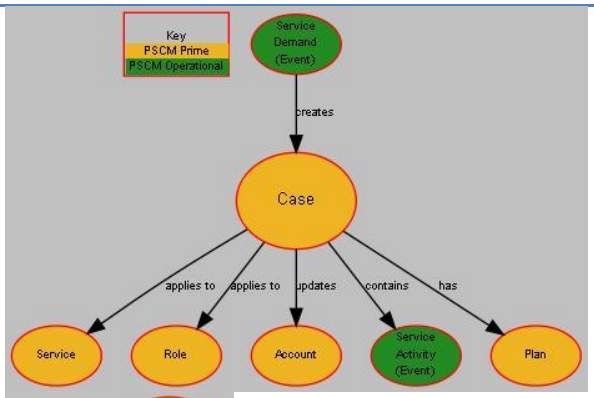
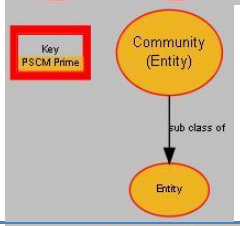
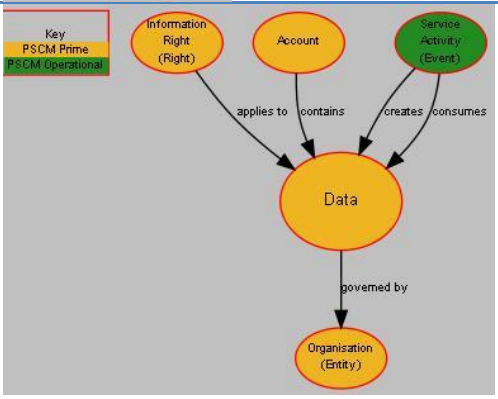
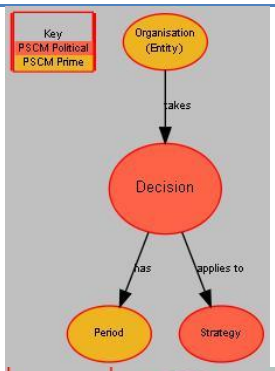
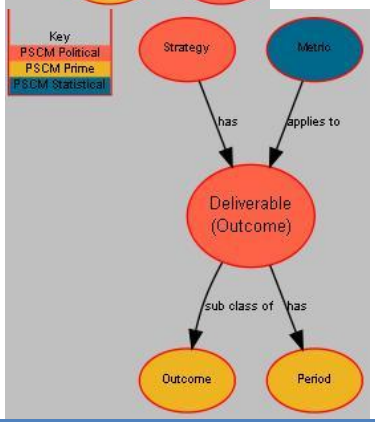
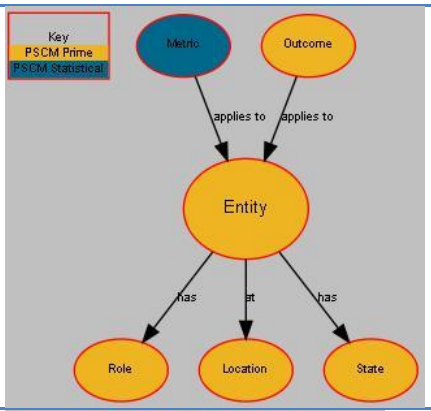
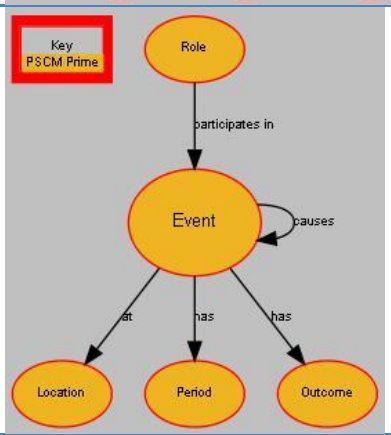
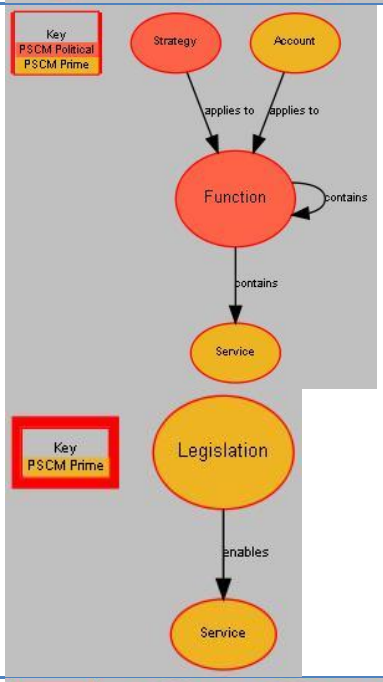
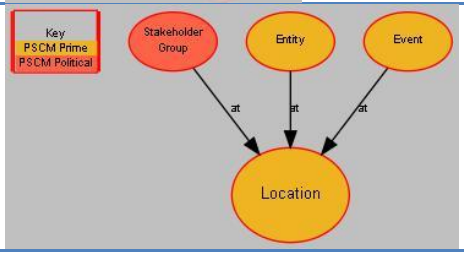
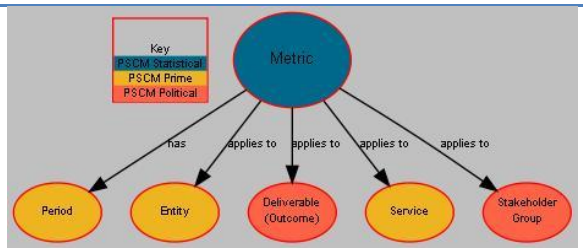
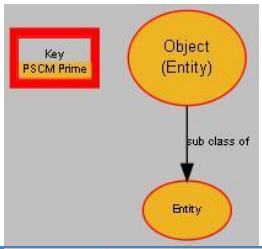
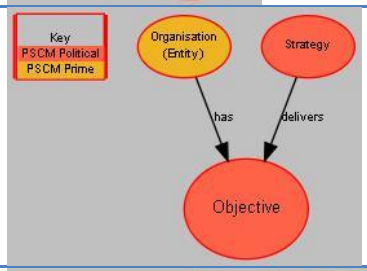
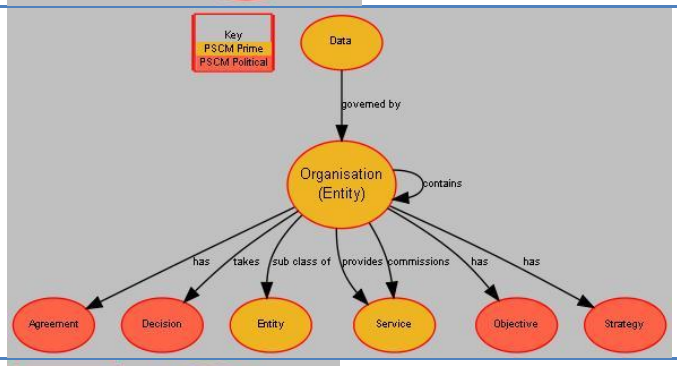
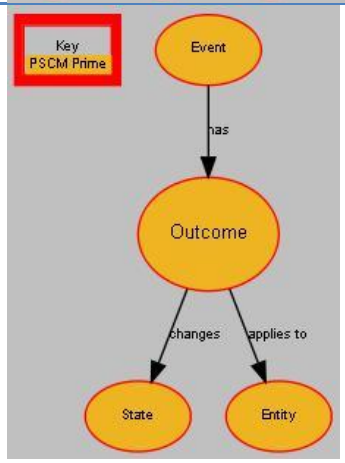
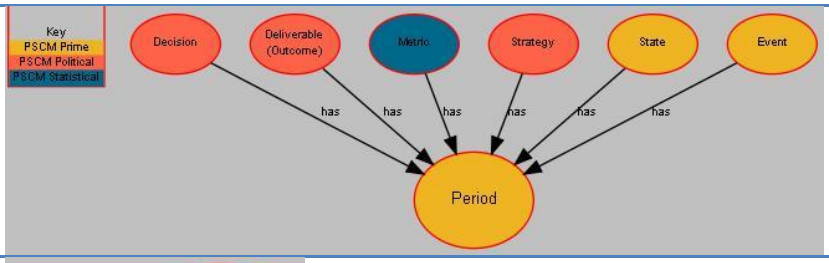
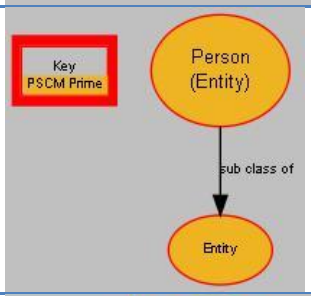
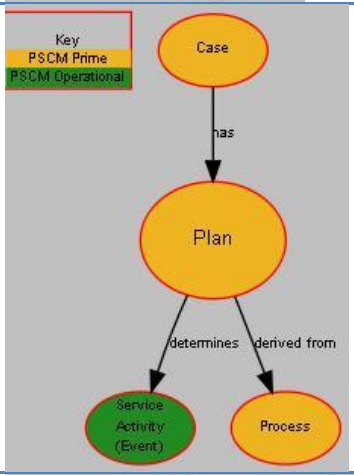
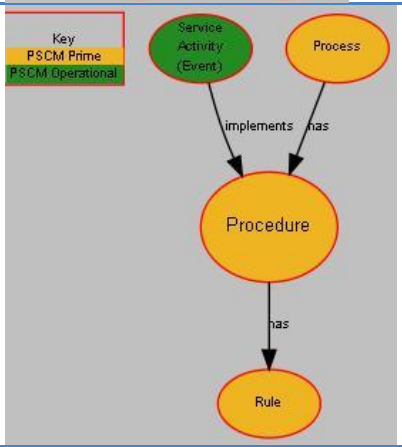
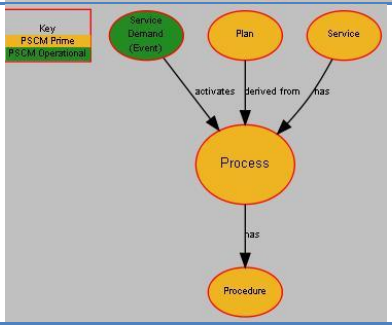
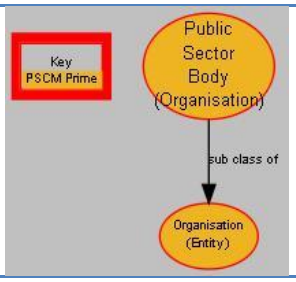
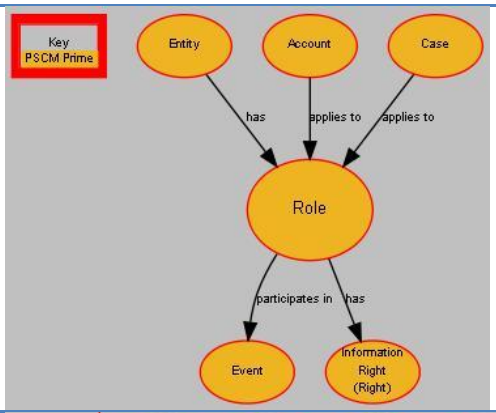
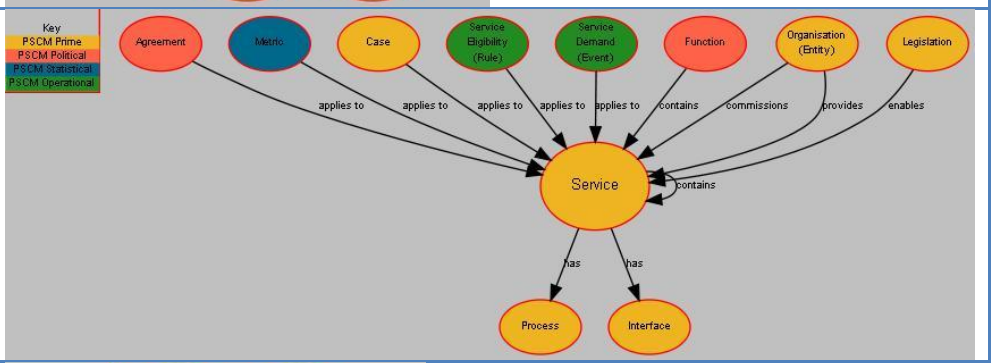
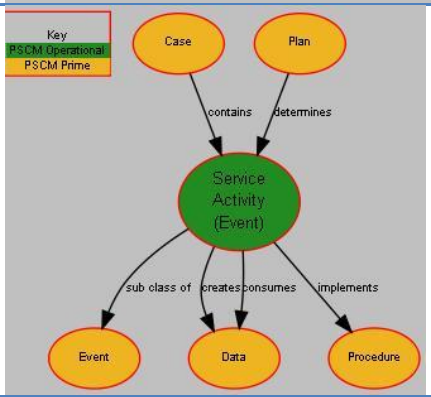
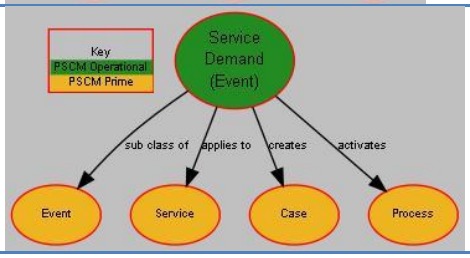
Account	A container for information about 'Events' and 'Statuses' for a 'Function', that relate to an 'Entity' and a 'Role'. For example • A patient record • An ongoing claim for benefit • A driver's licence • A food premises inspection history • An equipment log	
Agreement	An agreement between two parties. For example • a contract • a memorandum of understanding	
Assessment	A study that reaches conclusions to inform a decision.	

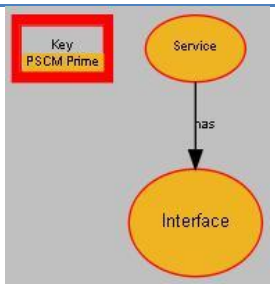
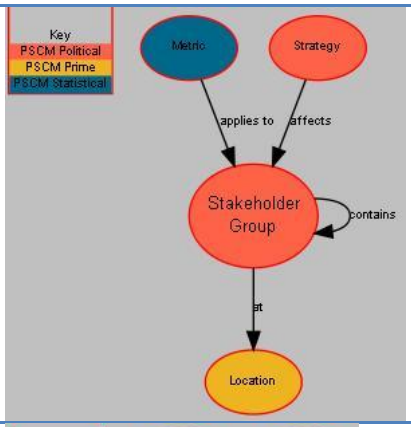
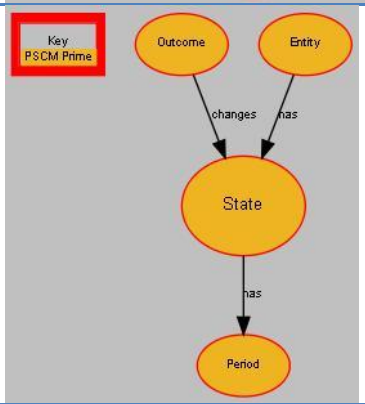
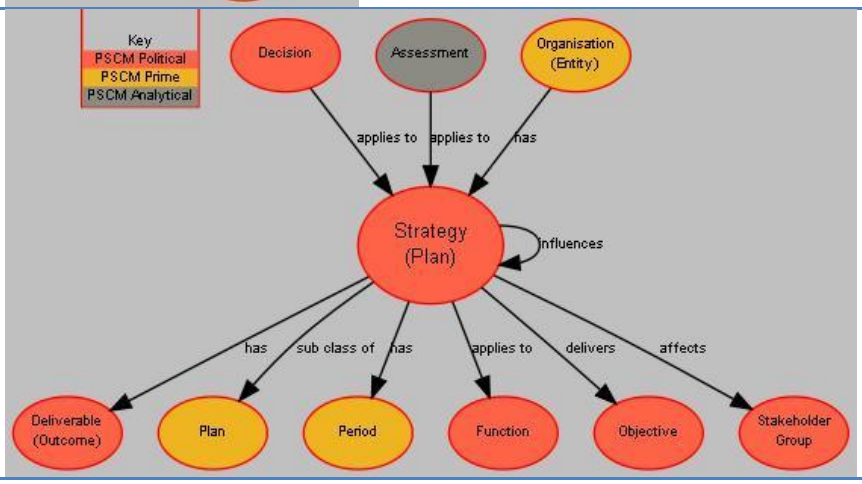
Case	The management of a Service Demand.	
Community	A group of interacting people that share common values and/or location.	
Data	The recorded value of an attribute. When organised, data can be the basis of * Information * Knowledge * Wisdom * Insight	
Decision		
Deliverable	An 'Outcome' of a 'Strategy'	

Entity	Something that has a distinct, separate existence.	
Event	A happening, that has occurred, or is due to occur.	
Function **Legislation**	A collection of services that come together into a cohesive set. Law which has been enacted by a governing body.	
Location	A fixed point, area, or volume	

Metric	An analytical measurement intended to quantify the state of a system. For example • population density"	
Object	A physical item.	
Objective	A desired state	
Organisation	A social group which distributes tasks for a collective goal.	
Outcome	The changes of state to an Entity as a consequence of an event.	

Period	A specified division or portion of time.	
Person	A human being	
Plan	A list of procedures with proposed periods and resources, used to achieve a desired outcome.	
Procedure	Definition of steps and methods that would achieve an outcome. Procedures can be re-used in many Processes.	
Process	A predefined set of Procedures, and decision points based on the outcome of each procedure.	

Public Sector Body	An organisation that is a part of the Public Sector.	
Role	The manner in which an Entity participates in an Event.	
Service	The capacity to carry out a defined process. A service exists even if it is not accessed.	
Service Activity	An event that is undertaken within a Case.	
Service Demand	An event that causes a service to create a case.	

Service Interface	The facility that enables a Service Activation. This may be • A web site form • An API • A help desk • An Application Form ... etc	
Stakeholder Group	A segmentation defining groups of people or organisations, who affect or can be affected by an organization's actions.	
State	A circumstance or condition of an Entity at a given Period.	
Strategy	A plan chosen to bring about a desired outcome or objective.	

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