PISCES

Connecting the Real Estate Industry

CONTEXT METHODOLOGY

PISCES is the trading name of PISCES Ltd, part of the OSCRE International global network supporting Europe, the Middle East and Africa.

PISCES Ltd is registered in England and Wales.

7/8 Greenland Place
London
NW1 0AP
United Kingdom
Tel: +44 (0) 191 230 8094
Fax:
E-mail: info@pisces.co.uk
Web: www.pisces.co.uk

© 2003, 2004 OSCRE International. All Rights Reserved.
# Version History

<table>
<thead>
<tr>
<th>Version</th>
<th>Author</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Chris Lees</td>
<td>13 May 2004</td>
<td>First draft</td>
</tr>
</tbody>
</table>
1 Introduction

All standards are based on models, or representations, of the real world. These representations are not the same as the real world, but instead are approximations that are sufficiently close to provide a useful and practical simplification.

The complexity of such models typically increases exponentially with the size of the domain being modelled. This is because of the holistic nature of most domains: adding a new element to the model when there are only ten existing elements to check consistency with is a considerably simpler undertaking than adding a new element to a model containing ten thousand elements.

Aside from these interdependencies, another common problem encountered in building large domain models is that terminology varies. Selecting a single “glossary” is often an academically expedient solution, but often leads in practice to difficulty in communicating the model to diverse stakeholders.

The PISCES method mitigates the impact of these interdependencies by adopting a bottom-up approach to defining standards. This means that business requirements drive directly and efficiently the rapid development of solutions.

However, this high-speed approach to developing standards carries a burden: the interdependencies must still be resolved but the solutions delivered do not share a common glossary.

These problems are compounded when consideration is given not only to the standards being produced but also to the supporting documentation that enables adoption – case studies, implementation notes etc.

The solution to these problems lies in the Context Methodology, which allows vocabularies to be created and used within specific, well-defined contexts that can evolve as the entire domain unfolds over time. Through contexts, the interdependencies can be discovered and formalized.
2 Purpose of Context

As discussed in the introduction, Context plays a crucial role in enabling PISCES to function effectively. Below the key uses of context are described.

2.1 Context as a Differentiator

When exchanging data, it is common to find the same concept referred to in several ways by different parties at different stages of a process.

Context enables a shared concept to be defined but then differentiated in vocabulary and business rules for each use case.

For example, the concept of “Postal Address” is shared. Anything that needs to be physically mailed will require a “Postal Address”. This enables many other standards to be defined using this generic “Postal Address” (e.g. invoice, rent demand, purchase order or notice).

However, in each country, postal addresses may be represented differently – both in vocabulary and business rules. For example the postal code is known as the “Postcode” in the UK and “Zipcode” in the US. The format of a postcode is “A[A][A][n][n] AA” (A = alpha, n = numeric, [] indicates optional), whereas a zipcode is “nnnnn[-nnnn]”.

The use of context to enable a “US Postal Address” and a “UK Postal Address” to be derived from a generic “Postal Address” enables concepts to be shared and interpreted during data exchange. For example, in many practical contexts, a US software system that has a field for “Zipcode” would appropriately place a “Postcode” in this field if the address was a UK address.

2.2 Context as a Search Framework

Developing a model is only ever as useful as the ease with which its contents can be extracted and used. Therefore, the model must have a simple and intuitive method for finding relevant content.

Context provides this framework by enabling all model content to be filtered and classified by one or more of the contexts. This enables searches to be much more systematic and refined.

For example, instead of searching for “Lease Termination” (which may, in some cases, have been actually called “Lease Determination” and so not be found, or may throw up lease termination constraints for New Zealand), it is possible to search for artefacts with a Landlord and a Tenant (“role”), in (say) the Corporate Real Estate “industry”, involving a Lease “process” under the law of England & Wales (“geopolitical”).

These contextual constraints provide a filter for the model content and can be applied in any order and incrementally.

2.3 Context as a Communication Framework

One of the main challenges in developing standards is communication. By carefully applying the search framework concepts discussed above, context provides a flexible and automation-ready framework for tailored communication to stakeholders.

This is because context addresses the primary communication barriers for stakeholders: vocabulary and relevance. The contextualized model can be filtered
to illustrate only those parts of the model relevant to a particular stakeholder (or stakeholder group's) context and then present that in their language.

For example, at a conference for Corporate Real Estate professionals in the US, the contexts could filter all the model content to that which specifically applies to that industry and geopolitical area. Likewise, for a presentation to the head of asset management in a specific investment company with a global portfolio of real estate and issues around reporting of value, the contexts could filter content to appraisal processes, owner role and investment industry.
3 Requirements

To support the applications of context discussed in section 2 above, the Context Methodology must meet certain core requirements. These requirements are discussed below.

3.1 Local Terminology

When describing a standard, either during its definition or a particular implementation, it is vital that the language used is familiar to the individuals involved.

These individuals will come from a specific domain, or "context": perhaps geographically based (e.g. Canada); perhaps product based (e.g. Appraisal Report); perhaps role based (e.g. Investment Surveyor).

The vocabulary used may depend on these contexts. For example, an Appraisal Report in Canada would be called a Valuation Report in the UK.

Each context may have its own language for identical or related concepts.

The vocabulary will be used across the whole range of artefacts produced by PISCES, from process maps to case studies, except for the schemas themselves, which will use a non-contextualized vocabulary.

Therefore, the Context Methodology must enable a vocabulary peculiar to one context to be related, where appropriate, to vocabularies in other contexts.

3.2 Exclusion and Inclusion

Typically, when defining the context of an artefact, the subject matter experts will be unable to provide a definitive and complete contextualization. For example, a Canadian Appraiser may well know that the term “Appraisal Report” is used in Canada and the US, and also know that it is not used in the UK, but they may be unsure about Australia.

Therefore, any Context Methodology must enable an incremental contextualization (i.e. one that is refined over time) and must enable each context to contain explicit inclusions and exclusions at each stage of refinement.
4 Context Drivers

The axes that are used to differentiate artefacts are known as Context Drivers. The Context Drivers used by PISCES are based on those created within the ebXML project at OASIS and UN/CEFACT.

ebXML defines eight Context Drivers. Of these, five have been selected for use within PISCES.

4.1 Geopolitical
The Geopolitical Context Driver differentiates based on geographic location. It is used to address differences arising from:

- Varying practice around the world;
- Local dialect (note that this does not include local language); and
- Legislative factors.

It is hierarchical in nature, with classifications both at aggregate country level (e.g. continents or economic region) and sub-country level (e.g. states or cities).

4.2 Industry
The Industry Context Driver differentiates based on the particular real estate vertical involved. Examples include Finance, Construction, Corporate Real Estate and Facilities Management.

4.3 Product/Service
The Product/Service Context Driver differentiates based on the specific products or services being traded. Examples include Security, Auditing, Appraisal, Insurance, Residential Property and Benchmarking.

4.4 Business Process
The Business Process Context Driver differentiates based on the particular business process within which the vocabulary arises. Examples include Grant of a Lease, Processing a Work Order and “Hotelling” Booking.

This is the only one of the Context Drivers that is not context neutral. Business Processes are themselves contextualized by the three contexts above: Geopolitical, Industry and Product/Service.

4.5 Role
The Role Context Driver differentiates based on the particular role played by a participant. Examples include Landlord, Tenant, Subcontractor and Broker.

Many roles are qualified according to who they are representing. Hence a “Solicitor” may be qualified as the “Landlord’s” Solicitor. These qualifications may be omitted by Workgroups where the context is clear but must be included when the Submission Package is brought into the library.
5 Contextualized Artefacts

Artefact is the general term for the discrete deliverables from the PISCES Workgroup process and other PISCES processes.

These artefacts are defined elsewhere, but in this section those that are contextualized are identified and the purpose of the contextualization is explained.

In some cases, artefacts are contextualized independently, enabling them to be indexed and used on their own. In other cases, context is wholly or partly inherited based on relationships with other artefacts.

5.1 Case Studies
Case studies are contextualized separately because they may pertain to a cross-section of individual data-exchanges or even workgroups. Therefore, to make locating appropriate case studies as efficient as possible they are independently contextualized.

5.2 Class Model – UML
Each workgroup gives rise to a single UML Class Model in normal circumstances, and therefore the context of the Class Model is the same as the context of the Workgroup.

However, large Workgroups may require more than one Class Model. In this situation, each Class Model will need to be separately contextualized. The relationship between the Class Model context and Workgroup context is as follows:

- If there is only one Class Model for a Workgroup, the context of a Class Model must be at least as generic as the context of the Workgroup (because otherwise it cannot represent the full scope of the workgroup);
- Where there are two or more Class Models for a Workgroup, each Class Model should have a different context (unless the Class Models have been separated for reasons of clarity).

The later rule is based on the assumption that two Class Models with identical contexts should always be merged into a single Class Model.

5.3 Component Model and Component Library
The component library must hold both context-free (Core Components) and contextualized components (Business Entities). The contextualized components will be related to the context-free components using the five Context Drivers.

CHECK: What are we actually going to do: ebXML CC -> BIE OR UBL?

Each component begins its life as a Business Entity defined as part of a particular Workgroup’s Component Model – either identified by the workgroup or imported from another standard. The component will occur in one or more data exchanges identified within the workgroup. The relationship between the context of a component and the context of the data exchange(s) it is used in is:

- If the component is mandatory in the data exchange, the context of the component must be at least as generic as the context of the data exchange. For example, a data exchange that is contextualised as “applicable in the UK” cannot mandatorily use components that only have a
context of "applicable in Wales" or have a context of "not applicable in Scotland".

Contextualization of the components involves extension or restriction; it never involves renaming of components.

5.4 Data Exchange

Data Exchanges are identified by reference to swim lane diagrams. It is allowable for a data exchange to appear on more than one swim lane.

Data Exchanges are fully contextualized, and the context of a Data Exchange is related to the context of the Business Process(es) it is used in as follows:

the context of a Data Exchange must be at least as generic as the contexts of the business processes in which it appears unless there are business rules that constrain its use in those business processes by context.

In other words, the context of the Data Exchange inherits and possibly extends the context of its containing Process Map, subject to business rules that may introduce restrictions.

5.5 Documents

The Workgroup process provides standard documents that are maintained in a library by PISCES.

These documents are also contextualized. They will typically relate to a specific data exchange but may occasionally relate to a process map or whole workgroup. Although the context of such a document is likely to be similar to the related artefact, it may be more specific or more general.

5.6 Implementation Notes

These are contextualized because they may pertain to a single data transfer (schema), a data exchange, a group of data exchanges, a whole process map, multiple process maps or even the relationship between distinct workgroups.

Their contexts are usually simply identical to the artefact they pertain to, but may be more specific if they are detailing implementation considerations of the artefact that can be expressed by contextualization. For example, in a schema whose context included the geopolitical context of North America, implementation notes that related specifically to use in Canada would be contextualized as Canada and not North America.

5.7 Process Maps

The PISCES method represents business processes using the swim lane diagram technique to produce Process Maps. These Process Maps are arbitrary in the sense that their scope is determined by each workgroup to meet their immediate needs.

As discussed above, the Business Process Context Driver is a special case in that it is directly contextualized using just the Geopolitical, Industry and Product/Service Context Drivers. Therefore the context for a Process Map consists of these three contexts plus, of course, its own name as its "Business Process Context".
5.8 Schema

Each transfer within each data exchange has an associated schema. A schema may be used for more than one such transfer, and its use is not restricted to multiple transfers within the same data exchange, process or workgroup.

Therefore, the context for a schema can be related to the data exchange(s) in which it is used as follows:

the context of a schema must be at least as generic as the union of the contexts of the data exchanges in which it is used.

Where two data exchanges using a single schema have apparently contradictory contexts (e.g. data exchange A has a geopolitical context of England but not Scotland and data exchange B has a geopolitical context of Scotland but not England), the relationship can be further qualified as:

contexts that are both explicitly excluded and explicitly included when creating the union of the contexts of the data exchanges must always be explicitly included in the context of the corresponding schema.

5.9 Workgroups

Workgroups are contextualized in respect of their mission and scope.
6 Context Classifications

Each of the five Context Drivers represents an independent classification. These classification are set out in this section.

In each case, classes from the classification can be used as either inclusive or exclusive (i.e. this artefact either does or does not apply in this context), and multiple classes from the same Context Driver may be used (read as this artefact applies in [this] and [this] and [this] context).

6.1 Geopolitical

This is a hierarchical classification that uses at its heart the ISO3166 standard. ISO3166 has two parts: ISO3166.1 provides a list of country codes (http://www.iso.ch/iso/en/prods-services/iso3166ma/02iso-3166-code-lists/index.html) while ISO3166.2 provides a regional decomposition within each country.

In addition to the ISO3166 hierarchy, four aggregate levels are defined: Continent, Economic Region, OSCRE International Region and Currency. These are simply shorthand for the ISO3166.1 country codes to enable more efficient referencing of common groupings. For example, it is possible to provide a geopolitical context of the Eurozone (currency = “EUR”), or the continent of “Africa”.

Where possible, when aggregate shorthands are used, they should not be mixed. For example, a geopolitical context of “EUR and Europe” (meaning all the countries that are in the Eurozone and all the countries in Europe) should be avoided. This is simply for clarity, so where such a mixture does provide the most easily understood definition of a context, it is permissible.

CHECK: ISO3166.2 is chargeable – need to establish how PISCES can use this information.

6.2 Industry

While there are a number of industry classification codes (for example the Standard Industry Code – SIC), none provide a breakdown of the real estate industry. Therefore, a controlled list has been produced that will be used by PISCES and that will evolve as PISCES’s needs grow.

It is intended that such a code will be harmonized to the extent this is practical with other industry classifications over time.

6.3 Product/Service

Similarly, a number of product and service classifications exist (primarily for statistical purposes). However, none of these provide a detailed breakdown of the real estate domain. Therefore, a controlled list has been produced that will be used by PISCES and that will evolve as PISCES’s needs grow.

It is intended that such a code will be harmonized to the extent this is practical with other industry classifications over time.

6.4 Business Process

This is a controlled list based on the names given to the PISCES process maps – names must be unique within context.
Business Processes, and hence the corresponding process maps, can overlap or intersect.

6.5 Role

There is no pre-existing classification for the Role Context Driver. Therefore, PISCES maintains its own Role Classification. This is based on the role discovered during Workgroups, particularly from the process maps.
7 Defining Context in Workgroups

This section describes how context is identified and documented during the course of a Workgroup.

7.1 When to contextualize

The table below shows at which point in the workgroup process each artefact should be contextualized:

<table>
<thead>
<tr>
<th>Artefact</th>
<th>When to contextualize</th>
<th>Who should contextualize</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Study</td>
<td>On completion (or submission to PISCES, if this is not at the same time)</td>
<td>Workgroup/Technical Team/Subsequent implementers</td>
</tr>
<tr>
<td>Class Model</td>
<td>At or near the end of the joint workshop between the Workgroup and the Technical Team representative.</td>
<td>Workgroup/Technical Team</td>
</tr>
<tr>
<td>Component Model</td>
<td>Once the data exchange – component matrix is complete and the component model is complete.</td>
<td>Workgroup</td>
</tr>
<tr>
<td>Data Exchange</td>
<td>When the data exchange is complete (in practice, this is normally when all the data exchanges for a given process map are complete)</td>
<td>Workgroup</td>
</tr>
<tr>
<td>Document</td>
<td>On submission to PISCES.</td>
<td>Workgroup</td>
</tr>
<tr>
<td>Implementation Note</td>
<td>On completion (or submission to PISCES, if this is not at the same time)</td>
<td>Workgroup/Subsequent implementers</td>
</tr>
<tr>
<td>Process Map</td>
<td>When the process map is complete.</td>
<td>Workgroup</td>
</tr>
<tr>
<td>Schema</td>
<td>Post harmonization</td>
<td>Technical Team</td>
</tr>
<tr>
<td>Workgroup</td>
<td>Should be indicated within the Request for Development and completed in the Charter (and therefore part of the Executive approval process for new workgroups).</td>
<td>Workgroup</td>
</tr>
</tbody>
</table>
7.2 How to contextualize

Every context has two components: its inclusion list and its exclusion list. The inclusion list determines in which classes of the context the artifact applies. The exclusion list determines where it does not apply.

It is important that the people providing the context have a very high degree of confidence that their inclusion and exclusion lists are correct. It is always better to err on the side of caution and leave a class out of either list rather than to incorrectly include or exclude it.

Given an artefact, A, it is contextualized by considering for each context driver in turn:

1. For which of the classes in this context does A definitely apply?
2. For which of the classes in this context does A definitely not apply?

The answer to each question may involve a list. This is entirely permissible. Most contexts also have a hierarchical structure enabling shortcuts to certain aggregates. For example, using “Europe” instead of listing all the countries in Europe. When using these aggregates, always double check that it is intended to include all of the classes in the aggregate.

It is permissible to use negatives within each list. For example, an inclusion list of “United Kingdom” except “Northern Ireland” is the same as “England”, “Scotland” and “Wales”.

NOTE: This is not the same as an inclusion list of “United Kingdom” and an exclusion list of “Northern Ireland”. In the first case, the meaning is that this artefact definitely applies within England, Scotland and Wales and is silent on whether or not it applies in Scotland (presumably the group defining the context simply didn't know). In the second case, Northern Ireland is explicitly excluded and therefore the artefact definitely does not apply in Northern Ireland.