2016

Page system Technical Reference

**Mikhail Gostev**

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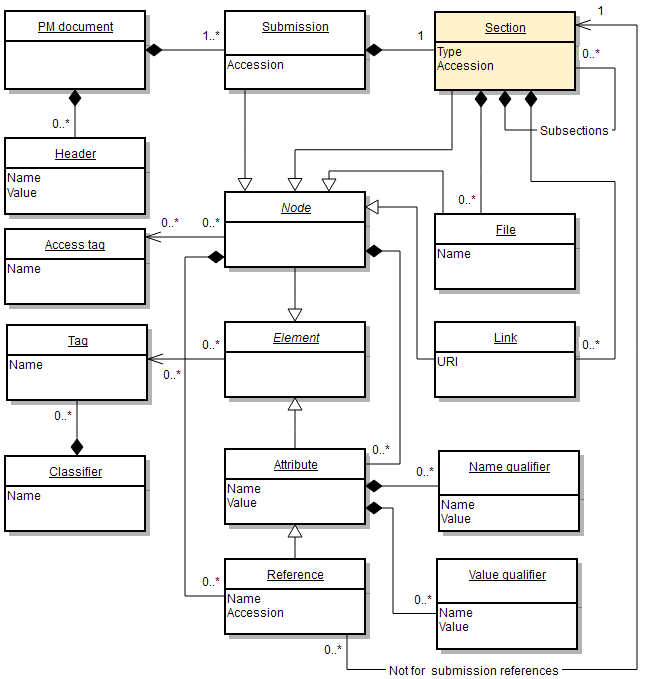
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# Introduction

Page system can be considered as a combination of the Page Model (PM) and a set of formats to describe this model such as Page-Tab, PageML and Page-JSON.

# Terms and definitions

## Page-Model



## Page document

PD is a single piece of data containing one or more submissions

## Accession number

An accession number (or just an accession) is used to identify submissions and sections. Usually but not necessarily an accession number consists if some number prefixed by some characters. A postfix can also be used. But in general an accession is a string of any characters. There are two kinds of accessions – local and global. Local accessions are used for referencing within the current submission and can be reused in the other submissions. Global accessions should be unique across the whole database and can be used for external references. Within the current submission global accessions can be used the same way as local ones. To show that some accession is global the prefixing exclamation mark should be used. Because of special meaning of the ‘!’ sign it can’t be the first character of any accession.

AAB678P – local accession

!XPC123 – global accession ‘XPC123’

There is a special syntax that enables accessions to be generated by the system: !{Pfx,Sfx} where Pfx is a set of symbols not ending with a digit. Sfx is an optional set of symbols not starting with a digit. Prefix and suffix can’t contain the comma sign ‘,’ as well as ‘}’.

!{A,B} – will be replaced with A234B

!{X} – X749

!{P8} – not allowed

!{,PT} – 76438PT

All generated accessions are global.

Unlike a section’s accession, a submission’s accession is always global. The exclamation mark can be omitted in this case.

If it is necessary to refer to a section with a generated accession the special form with temporary accession can be used: !tmpaccno{Pfx,Sfx}

!T1{ABC} - ABC8935 but T1 will be a local accession before new accession is generated.

## Access tags

Access tags are alphanumeric tokens that are used to control access to submissions and their parts. Access tags should be defined within the system prior to a submission process. More than one tag can be assigned at once. A comma-separated list is used for this purpose. E.g. Public,EBI

## Classification tags

Classification tags should be represented in the form <classifier>:<tag> e.g. Color:Red. All referred classifiers and tags should be defined within the system prior to a submission process. More than one tag can be assigned at once. A comma-separated list is used for this purpose. It is possible to provide a value for a tag using the ‘=’ sign. E.g. Render:Bold,Color:Blue,Priority:High,Font:Size=12

## Attributes

An attribute is a pair of string tokens: a name and a value. Classification tags can be assigned to an attribute.

## References

A reference is a special form of an attribute. The value of the reference should be a valid section’s accession defined (may be temporary) within the current submission. If a reference is a part of a submission annotation its value should be a valid accession of some other existing submission.

## Attribute name qualifiers

Attribute name qualifier is a special attribute that is attached to some other attribute. It provides additional information about host attribute’s name. Unlimited number of name qualifiers can be provided.

## Attribute value qualifiers

Attribute value qualifier is a special attribute that is attached to some other attribute. It provides additional information about host attribute’s value. Unlimited number of name qualifiers can be provided.

## Submission

A submission defines a single unit of information in a database. A submission can have its own annotation with attributes and references. A submission should contain exactly one section (except subsections). A submission can have its own set of tags and access tags. A submission can have a defined accession, generated accession or omitted accession. In the latter case the system should use some default pattern to generate an accession. There is a set of submission attributes that have a special meaning for the System.

**AttachTo** – provides an accession of the ‘parent’ submission.

**RootPath** – provides a path relative to a user’s directory that will be used to resolve file references

**ReleaseDate** – a date when the submission should be made public. For textual files format its value as YYYY-MM-DD. For Excel files the corresponding cell should formatted as a date.

**Title** – provides a submission title.

## Section

A section represents a block of information that should be rendered or processed by some other way by the system. Each section can have its own type designated by an arbitrary string. A section has a set of attributes and references. Like a submission a section can have sets of tags and access tags. A section can have a set of other sections called subsections. Optional sets of files and links can be attached to a section.

## File reference

A file reference is used to attach a physical file to some section. A file reference can have sets of tags, access tags, attributes and references like a section block.

## Link

A link attaches some external link to a section. It can have sets of tags, access tags, attributes and references like a section block.

# Syntax

## Comment

Any cell started with # is considered by parser as an empty cell. If you have a data cell starting with # the \# prefix should be used instead.

#Hello – comment, will be ignored

\#Hello – will be #Hello after parsing.

## Page document

Page document is a single table (physically it can be Excel spreadsheet or comma/tab-separated text file) that consists of one or more submissions.

|  |  |
| --- | --- |
| Submission |  |
| … |  |
|  |  |
| Submission |  |
| … |  |

XML

<pmdocument>   
 <submissions>  
 <submission …>  
…  
 </submission>  
 <submission …>  
…  
 </submission>  
</submissions>  
</pmdocument>

JSON

{

"submissions" : [

{

"type": "submission",

…

},

{

"type": "submission",

…

}

]

}

## Page document headers

It is possible to provide information that belongs to the whole Page document. One can add one or more headers in the form of name-value pairs:

|  |  |
| --- | --- |
| #@Header1 | value1 |
| #@Header2 | value2 |
|  |  |
| Submission |  |

XML

<pmdocument>

<header>

<name>Header1</name>

<value>value1</value>

</header>

<header>

<name>Header2</name>

<value>value2</value>

</header>

<submissions>

…

JSON

{

"@Header1": "value1",

"@Header2": "value2",

"submissions" : [

…

## Submission

Submission heading format is the following:

|  |  |  |  |
| --- | --- | --- | --- |
| **Submission** | [accession] | [access tags list] | [tags list] |

Submission heading can be followed by a number of attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Submission** | S-EBI001 | Public | Priority:High,Type:Publication |
| Title | Test submission |  |  |
| RootPath | Pub1/data |  |  |

XML

<submission acc="S-EBI001" tags="Priority:High,Type:Publication" access="Public">

<attributes>

<attribute>

<name>RootPath</name>

<value>Pub1/data</value>

</attribute>

<attribute>

<name>Title</name>

<value>Test submission</value>

</attribute>

</attributes>

</submission>

JSON

{

"type": "submission",

"accno": "S-EBI001",

"accessTags": ["Public"],

"tags": [

{

"classifier": "Priority",

"tag": "High"

},

{

"classifier": "Type",

"tag": "Publication"

}

],

"attributes": [

{

"name": "RootPath",

"value": "Pub1/data"

},

{

"name": "Title",

"value": "Test submission"

}

]

}

## Section

The section heading format is the following:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| <section type> | [accession] | [parent accession] | [access tags list] | [tags list] |

A section heading can be followed by a number of attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Run | R-INV1 | E-EXP1 | Public | Render:Popup |
| Title | Control run |  |  |  |
| Concentration | 0.01 |  |  |  |

XML

<section type="Run" acc="R-INV1" accGlobal="false" tags="Render:Popup" access="Public">

<attributes>

<attribute>

<name>Title</name>

<value>Control run</value>

</attribute>

<attribute>

<name>Concentration</name>

<value>0.01</value>

</attribute>

</attributes>

</section>

JSON

{

"type": "Run",

"accessTags": ["Public"],

"accno": "R-INV1",

"attributes": [

{

"name": "Title",

"value": "Control run"

},

{

"name": "Concentration",

"value": "0.01"

}

],

"tags": [{

"classifier": "Render",

"tag": "Popup"

}]

}

## Subsections

Any section can have a number of subsections. A subsection is a normal section but it has another section as its parent. Subsections can have their own subsections. The first section that follows to a Submission block is a root section. It has no parent. Other sections that follow the root section are subsections of the root section if no explicit accession of the parent section is provided.

|  |  |  |  |
| --- | --- | --- | --- |
| Submission |  |  |  |
|  |  |  |  |
| Experiment | E-EXP1 |  | #Root section |
|  |  |  |  |
| Run | R-INV1 |  | # Subsection of root |
|  |  |  |  |
| Run | R-INV2 |  | # Subsection of root |
|  |  |  |  |
| Data | D-DT1 | R-INV1 | # Subsection R-INV1 |

XML

<pmdocument>

<submissions>

<submission acc="" id="0" ctime="0" mtime="0">

<attributes/>

<section type="Experiment" acc="E-EXP1" accGlobal="false">

<attributes/>

<subsections>

<section id="0" type="Run" acc="R-INV1" accGlobal="false">

<attributes/>

<subsections>

<section id="0" type="Data" acc="D-DT1" accGlobal="false">

<attributes/>

</section>

</subsections>

</section>

<section id="0" type="Run" acc="R-INV2" accGlobal="false">

<attributes/>

</section>

</subsections>

</section>

</submission>

</submissions>

</pmdocument>

JSON

{

"submissions" : [

{

"type": "submission",

"section": {

"accno": "E-EXP1",

"type": "Experiment",

"subsections": [

{

"accno": "R-INV1",

"type": "Run",

"subsections": [{

"accno": "D-DT1",

"type": "Data"

}]

},

{

"accno": "R-INV2",

"type": "Run"

}

]

}

}

]

}

## Section table

Sometimes it is required to define a set of subsections of the same type and with the same set of attributes. A section table could be used for this purpose. A table format is the following

|  |  |  |  |
| --- | --- | --- | --- |
| <type>**[**[parentacc]**]** | Attribute1 | …. | AttributeN |
| <accession 1> | Val11 |  | Val1N |
| … |  |  |  |
| <accession K> | ValK1 |  | ValKN |

Neither sections nor their attributes can have tags and access tags attached if they are represented as a table.

Example:

|  |  |  |
| --- | --- | --- |
| Experiment | E-EXP1 | #Root section |
|  |  |  |
| Run[] | Concentration |  |
| R-INV1 | 0.01 |  |
| R-INV2 | 0.02 |  |

XML

<section type="Experiment" acc="E-EXP1" accGlobal="false">

<attributes/>

<subsections>

<table>

<section type="Run" acc="R-INV1" accGlobal="false">

<attributes>

<attribute>

<name>Concentration</name>

<value>0.01</value>

</attribute>

</attributes>

</section>

<section type="Run" acc="R-INV2" accGlobal="false">

<attributes>

<attribute>

<name>Concentration</name>

<value>0.02</value>

</attribute>

</attributes>

</section>

</table>

</subsections>

</section>

JSON

"section": {

"accno": "E-EXP1",

"type": "Experiment"

"subsections": [[ *<-Note double array!*

{

"accno": "R-INV1",

"attributes": [{

"name": "Concentration",

"value": "0.01"

}],

"type": "Run"

},

{

"accno": "R-INV2",

"attributes": [{

"name": "Concentration",

"value": "0.02"

}],

"type": "Run"

}

]]

}

Note: sections that were represented as a table go to their own array as elements of the ‘subsections’ array.

## File references

A file reference is always owned by the section that it follows. A file reference has the following heading:

|  |  |  |  |
| --- | --- | --- | --- |
| **File** | <file name including path> | [access tags list] | [tags list] |

Example:

|  |  |  |  |
| --- | --- | --- | --- |
| Experiment | E-EXP1 | #Root section |  |
|  |  |  |  |
| **File** | e1/data.zip | Private | Render:Link |
| Type | archive |  |  |
| Description | Experiment data |  |  |

XML

<section type="Experiment" acc="E-EXP1" accGlobal="false">

<attributes/>

<files>

<file type="file" tags="Render:Link" access="Private">

<path>e1/data.zip</path>

<attributes>

<attribute>

<name>Type</name>

<value>archive</value>

</attribute>

<attribute>

<name>Description</name>

<value>Experiment data</value>

</attribute>

</attributes>

</file>

</files>

</section>

JSON

"section": {

"type": " Experiment ",

"accno": "E-EXP1",

"files": [{

"path": "e1/data.zip",

"accessTags": ["Private"],

"attributes": [

{

"name": "Type",

"value": "archive"

},

{

"name": "Description",

"value": "Experiment data"

}

],

"tags": [{

"classifier": "Render",

"tag": "Link"

}]

}]

}

## File references table

Sometimes it is desired to attach a set of files with a similar annotation. In that case file tables can be used.

|  |  |  |  |
| --- | --- | --- | --- |
| **Files** | Attribute1 | …. | AttributeN |
| <path 1> | Val11 |  | Val1N |
| … |  |  |  |
| <path K> | ValK1 |  | ValKN |

Like a section table no tags and access tags can be used in such table.

Example:

|  |  |  |
| --- | --- | --- |
| Submission |  |  |
|  |  |  |
| Experiment | E-EXP1 | #Root section |
|  |  |  |
| **Files** | Type | Description |
| e1/data1.zip | archive | Experiment data part 1 |
| e1/data2.zip | archive | Experiment data part 2 |
|  |  |  |
| **File** | e1/pic.zip |  |
| Type | image |  |

XML

<section id="0" type="Experiment" acc="E-EXP1" accGlobal="false">

<attributes/>

<files>

<table>

<file size="0" type="file">

<path>e1/data1.zip</path>

<attributes>

<attribute>

<name>Type</name>

<value>archive</value>

</attribute>

<attribute>

<name>Description</name>

<value>Experiment data part 1</value>

</attribute>

</attributes>

</file>

<file size="0" type="file">

<path>e1/data2.zip</path>

<attributes>

<attribute>

<name>Type</name>

<value>archive</value>

</attribute>

<attribute>

<name>Description</name>

<value>Experiment data part 2</value>

</attribute>

</attributes>

</file>

</table>

<file size="0" type="file">

<path>e1/pic.zip</path>

<attributes>

<attribute>

<name>Type</name>

<value>image</value>

</attribute>

</attributes>

</file>

</files>

</section>

JSON

"section": {

"accno": "E-EXP1",

"type": "Experiment",

"files": [

[

{

"path": "e1/data1.zip",

"attributes": [

{

"name": "Type",

"value": "archive"

},

{

"name": "Description",

"value": "Experiment data part 1"

}

]

},

{

"path": "e1/data2.zip",

"attributes": [

{

"name": "Type",

"value": "archive"

},

{

"name": "Description",

"value": "Experiment data part 2"

}

]

}

],

{

"path": "e1/pic.zip",

"attributes": [{

"name": "Type",

"value": "image"

}]

}

]

}

## Links and link table

A link is always owned by the section that it follows. A link has the following heading:

|  |  |  |  |
| --- | --- | --- | --- |
| **Link** | <URI> | [access tags list] | [tags list] |

Like file references, links can be formatted as a table.

Example:

|  |  |  |
| --- | --- | --- |
| Experiment | E-EXP1 | #Root section |
|  |  |  |
| **Links** | Type | Description |
| E235 | Biostudy | Related study |
| E324 | Biostudy | Related study |
|  |  |  |
| **Link** | http://somewhere.com | |
| Description | External resource | |

XML

<section type="Experiment" acc="E-EXP1" accGlobal="false">

<attributes/>

<links>

<table>

<link>

<url>E235</url>

<attributes>

<attribute>

<name>Type</name>

<value>Biostudy</value>

</attribute>

<attribute>

<name>Description</name>

<value>Related study</value>

</attribute>

</attributes>

</link>

<link>

<url>E324</url>

<attributes>

<attribute>

<name>Type</name>

<value>Biostudy</value>

</attribute>

<attribute>

<name>Description</name>

<value>Related study</value>

</attribute>

</attributes>

</link>

</table>

<link>

<url>http://somewhere.com</url>

<attributes>

<attribute>

<name>Description</name>

<value>External resource</value>

</attribute>

</attributes>

</link>

</links>

</section>

JSON

"section": {

"accno": "E-EXP1",

"type": "Experiment",

"links": [

[

{

"attributes": [

{

"name": "Type",

"value": "Biostudy"

},

{

"name": "Description",

"value": "Related study"

}

],

"url": "E235"

},

{

"attributes": [

{

"name": "Type",

"value": "Biostudy"

},

{

"name": "Description",

"value": "Related study"

}

],

"url": "E324"

}

],

{

"attributes": [{

"name": "Description",

"value": "External resource"

}],

"url": "http://somewhere.com"

}

]

}

## Attributes

Attributes are used for submissions, sections, files and links annotation. If the corresponding block is formatted in a vertical (not table) manner it is possible to assign tags to an attribute.

|  |  |  |
| --- | --- | --- |
| Submission |  |  |
|  |  |  |
| Section |  |  |
| Attr1 | value | Color:Red,Render:Font=12 |

XML

<submission>

<attributes/>

<section type="Section">

<attributes>

<attribute tags="Color:Red,Render: Font=12">

<name>Attr1</name>

<value>value</value>

</attribute>

</attributes>

JSON

"section": {

"type": "Section",

"attributes": [{

"name": "Attr1",

"value": "value",

"tags": [

{

"classifier": "Color",

"tag": "Red"

},

{

"classifier": "Render",

"tag": "Font",

"value": "12"

}

]

}]

## References

References can be used wherever attributes can be applied. The value of a reference should be an accession (local, global or temporary) of some section. In the case of the submission, references should point to other submissions.

|  |  |  |
| --- | --- | --- |
| Section | S1 |  |
| Attr1 | value |  |
| <belongsTo> | S2 | #Reference |
|  |  |  |
| Section | S2 |  |

XML

<section type="Section" acc="S1" accGlobal="false">

<attributes>

<attribute>

<name>Attr1</name>

<value>value</value>

</attribute>

<attribute reference="true">

<name>belongsTo</name>

<value>S2</value>

</attribute>

</attributes>

<subsections>

<section type="Section" acc="S2" accGlobal="false">

<attributes/>

</section>

</subsections>

</section>

JSON

{

"type": "Section",

"accno": "S1",

"attributes": [

{

"name": "Attr1",

"value": "value"

},

{

"name": "belongsTo",

"isReference": true,

"value": "S2"

}

],

"subsections": [{

"accno": "S2",

"type": "Section"

}]

}

## Name qualifiers

Name qualifier is an attribute that annotates the name of another attribute or reference. Unlimited number of name qualifiers can be used. Name qualifiers can’t be used in section, file or link tables.

|  |  |  |
| --- | --- | --- |
| Section | S1 |  |
| Species | Human |  |
| (Term) | ONTO\_12345 | #Name qualifier for ‘Species’ |
| (Term) | VOC\_12345 |  |

XML

<attributes>

<attribute>

<name>Species</name>

<nmqual>

<name>Term</name>

<value>ONTO\_12345</value>

</nmqual>

<nmqual>

<name>Term</name>

<value>VOC\_12345</value>

</nmqual>

<value>Human</value>

</attribute>

</attributes>

JSON

{

"type": "Section",

"accno": "S1",

"attributes": [{

"name": "Species",

"valqual": [

{

"name": "Term",

"value": "ONTO\_12345"

},

{

"name": "Term",

"value": "VOC\_123"

}

],

"value": "Mouse"

}]

}

## Value qualifiers

Like a name qualifier, a value qualifier is attached to an attribute but annotates its value. Value qualifiers can be used in both vertical and table blocks.

|  |  |  |  |
| --- | --- | --- | --- |
| Section | S1 |  |  |
| Weight | 15 |  |  |
| (Term) | VOC\_3456 |  |  |
| [Unit] | kg | #value qualifier |  |
|  |  |  |  |
| Section[] | Species | [Term] | [Term] |
| S2 | Mouse | ONTO\_12345 | VOC\_123 |
| S3 | Fly | ONTO\_12345 | VOC\_123 |

XML

<section type="Section" acc="S1" accGlobal="false">

<attributes>

<attribute>

<name>Weight</name>

<nmqual>

<name>Term</name>

<value>VOC\_3456</value>

</nmqual>

<value>15</value>

<valqual>

<name>Unit</name>

<value>kg</value>

</valqual>

</attribute>

</attributes>

<subsections>

<table>

<section type="Section" acc="S2" accGlobal="false">

<attributes>

<attribute>

<name>Species</name>

<value>Mouse</value>

<valqual>

<name>Term</name>

<value>ONTO\_12345</value>

</valqual>

<valqual>

<name>Term</name>

<value>VOC\_123</value>

</valqual>

</attribute>

</attributes>

</section>

<section type="Section" acc="S3" accGlobal="false">

<attributes>

<attribute>

<name>Species</name>

<value>Fly</value>

<valqual>

<name>Term</name>

<value>ONTO\_12345</value>

</valqual>

<valqual>

<name>Term</name>

<value>VOC\_123</value>

</valqual>

</attribute>

</attributes>

</section>

</table>

</subsections>

</section>

JSON

{

"type": "Section",

"accno": "S1",

"attributes": [{

"name": "Weight",

"nmqual": [{

"name": "Term",

"value": "VOC\_3456"

}],

"value": "15",

"valqual": [{

"name": "Unit",

"value": "kg"

}]

}],

"subsections": [[

{

"accno": "S2",

"attributes": [{

"name": "Species",

"valqual": [

{

"name": "Term",

"value": "ONTO\_12345"

},

{

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# All-in-one example

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| --- | --- | --- | --- | --- |
| #All in one Page-Tab example | |  |  |  |
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| [#@Author](http://invalid.uri/) | Mikhail Gostev |  |  |  |
| [#@Date](http://invalid.uri/) | 01/12/2016 |  |  |  |
|  |  |  |  |  |
| Submission | !{SBM} | Public | Project:Doc |  |
| Title | All in one Page-Tab example | |  |  |
| RootPath | doc/files |  |  |  |
| <Related> | SMB236 |  |  |  |
| AttachTo | TestProj |  |  |  |
|  |  |  |  |  |
| Study | !TST1 |  |  |  |
| Title | Demo study |  |  |  |
| Species | Human |  |  |  |
| (Term) | OnTO\_7583 |  |  |  |
| [Term] | OnTO\_873 |  |  |  |
| <Administrator> | cn1 |  |  |  |
|  |  |  |  |  |
| File | data.zip |  |  |  |
| Title | Data archive |  |  |  |
|  |  |  |  |  |
| Files | Type | Desc |  |  |
| pic1.jpj | Image | Phase 1 image | |  |
| pic2.jpj | Image | Phase 2 image | |  |
|  |  |  |  |  |
| Link | http://test.embl.de | |  |  |
| Title | Project home page |  |  |  |
|  |  |  |  |  |
| Links | Type | Desc |  |  |
| TST1 | Biostudy | Related study | |  |
| TST2 | Biostudy | Related study | |  |
|  |  |  |  |  |
| Phase[] | Title | Component | |  |
| p1 | Case study | R657 |  |  |
| p2 | Control study | R874 |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Organization | org1 |  |  |  |
| Title | EMBL |  |  |  |
|  |  |  |  |  |
| Address[org1] | Location |  | #org1 is a parent section | |
|  | Cambridge |  |  |  |
|  | Heidelberg |  |  |  |
|  |  |  |  |  |
| Finding |  | org1 | #org1 is a parent section | |
| Tile | EU budget |  |  |  |
|  |  |  |  |  |
| Contact | !cn1{PERS-,-EMBL} |  | Private | #Access tag (note column) |
| Name | May Day |  |  |  |
| <Affiliation> | org1 |  |  |  |
|  |  |  |  |  |
| Contact | !cn2{PERS-,-EMBL} |  |  | Render:Emphasize |
| Name | G. Cardinal |  |  |  |
| <Affiliation> | org1 |  |  |  |

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