

1. General description of the use case	
<b>Use Case ID / Demonstrator Name</b>	UCx / xxx
<b>Main point of use case scope</b> (please choose between or provide your own: Decision System Innovation Project Workflow QA/QC Guided AI Data Parsing Data Integration Interoperability )	
<b>Use Case Company Name</b>	xxx
<b>OntoCommons Participant Responsible for Demonstrator Contact - Affiliation</b>	Person Name – Partner Company / Use-Case Company
<b>Domain of Application</b> (industry where the ontology solution will be used, e.g. Manufacturing, Processing, LCA, Materials development, Materials Modelling, Materials Characterisation, Nano-safety)	Domain / Subdomain / Subdomain / ...
<b>Domain of Data Used</b> (if it different from the previous, otherwise leave empty)	Domain / Subdomain / Subdomain / ...
<b>Actor Roles of the use case</b> (e.g., knowledge scientist/engineer, material scientist)	

2. Ontology use in the use case	
<b>Ontologies already used in the use case</b> (if No please answer the following fields with the ontologies/vocabularies that you are planning to use within your demonstrator)	Yes / No
<b>Top Level Ontologies used / Developed by</b>	Xxx / xxx
<b>Domain Ontologies Used / Developed by</b>	Xxx / xxx
<b>Other Ontologies / Taxonomies used or suggested to be used (developed by)</b>	Xxxx (xxx)
<b>Actor Roles of the ontologies used or those to be developed</b> (e.g. who can develop them within the use case company, or who can maintain them)	<ul style="list-style-type: none"> <li>• xxxx</li> <li>• ...</li> </ul>
<b>Primary purpose of ontology application in</b>	<ul style="list-style-type: none"> <li>• xxxx</li> </ul>

<p><b>this use case</b> (What would fit at most for the intended use of ontologies within this use case. Please choose one of the following:</p> <p>Data model / data structuring Data sharing Overview and visualisation</p> <p>Context bridging in digital communication Software customisation Artificial Intelligence</p> <p>Service extension Business planning / communication )</p>	<ul style="list-style-type: none"> <li>• ...</li> </ul>
<p><b>Secondary purpose of ontology application</b> (as in the previous point, if more than one, please add them in rows with enter, based on their priority)</p>	<ul style="list-style-type: none"> <li>• XXXX</li> <li>• ...</li> </ul>
<p><b>Identified challenges in the use of ontologies in this use case</b> (e.g. not enough data available for the population of the ontology, data format too diverse)</p>	<ul style="list-style-type: none"> <li>• XXXX</li> <li>• ...</li> </ul>
<p><b>Data Sources (software and/or hardware based) to be accessed/used with the ontologies for this use case</b></p>	<ul style="list-style-type: none"> <li>• XXXX</li> <li>• ...</li> </ul>
<p><b>(small) Examples of problems in ontology usage</b></p>	<ul style="list-style-type: none"> <li>• Example 1</li> <li>• Example 2</li> <li>• ...</li> </ul>

3. Use case primary requirements				
UID	Title	Description	Priority (Shall/Should/May)	Comment
Use/application of ontologies				
UCxx RQ xx				
Development of ontologies				
Maintaining/extension of ontologies				
Tools for ontology				

Standardisation				

#### 4. User-story short description

The user **xx** will feed this ontology to the **xx** system, the system, which will be triggered by **xx** actor/system/event, will perform the **xx** process, and the result will be **xx**.  
In order for the ontology system to work, the **xx** precondition should be fulfilled.

Input data require to be in the **xx** format.  
Output data will be / require to be in **xx** format.

The ontology **xx** will be used, which describes **xx xx xx**, **xx xx xx**.

#### Workflow

Please add here a picture that describes the best the aforementioned user story, in a compact way with discrete steps (as workflow).

An additional picture in the form of use case UML diagram with connections to actors and to software/hardware components would also be helpful.

<b>Important points to be considered in the use case for better understanding</b>	<ul style="list-style-type: none"> <li>• xxxx</li> <li>• ...</li> </ul>
<b>Actor</b>	<ul style="list-style-type: none"> <li>• xxxx</li> <li>• ...</li> </ul>
<b>Associated Requirements</b>	<ul style="list-style-type: none"> <li>• xxxx</li> <li>• ...</li> </ul>
<b>Triggers</b>	<ul style="list-style-type: none"> <li>• xxxx</li> <li>• ...</li> </ul>
<b>Preconditions</b>	<ul style="list-style-type: none"> <li>• xxxx</li> <li>• ...</li> </ul>

#### 6. Purpose of ontology application in the use case (mark the primary with orange colour)

	UC1	UC2	UC3	UC4	UC5	UC6	UC7	UC8	UC9	UC10	UC11
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Data model / data structuring																			
Data sharing																			
Overview and visualisation																			
Context bridging in digital communication																			
Software customisation																			
Artificial Intelligence																			
Service extension																			
Business planning / communication																			
Decision System																			
Innovation Project																			
Workflow																			
QA/QC																			
Guided AI																			
Data Parsing																			
Data Integration																			
Interoperability																			
Other: _____																			

### 7. FAIR data maturity level

We are also surveying the FAIR data maturity level of the use cases. For this survey follow the following link:

<https://ec.europa.eu/eusurvey/runner/b64d2bc9-28da-3347-332b-0dc6970789d3>

### 8. Technology readiness level assessment

A report by Sandia National Laboratories (Albuquerque, New Mexico) [1] provides a comprehensive list of descriptions (that add detail to the commonly accepted TRL definitions) and corresponding questions to measure the maturity level of a project. Each question comes with its own required evidence that will be used to either confirm the TRL level (“yes”) or reject it (“no”). If the answer is “no”, further development is required. Each piece of evidence can be translated into tasks to most effectively guide the development process. Tables 2 – 5 list questions and corresponding evidence requirements for TRL 4 – 7.

Given the definitions in the tables below, please specify the Technology Readiness Level for your use case:

Table 2: TRL 4: Key elements demonstrated in laboratory environment

TRL 4 Definition	Question	Evidence
“The key elements must be integrated to establish that the pieces will work	Has a laboratory prototype been created that integrates all key elements necessary	<ul style="list-style-type: none"> <li>What problem does the prototype address?</li> </ul>

<p>together. The validation should be consistent with the requirements of potential applications but is relatively low-fidelity when compared to a final product. Examples include integration of ad-hoc hardware or software in the laboratory such as breadboards, low fidelity development components, and rapid prototypes”</p>	<p>to address a particular problem or application? [Q1]</p>	<ul style="list-style-type: none"> <li>• What key elements were integrated?</li> <li>• Describe how the prototype integrates the key elements and solves the problem.</li> </ul>
	<p>Has a laboratory demonstration been conducted that integrates all key elements necessary to solve a particular problem and shows functional aspects of the prototype operated according to what a customer would expect? [Q2]</p>	<ul style="list-style-type: none"> <li>• Describe the demonstration.</li> <li>• What key elements were part of the demonstration?</li> <li>• What functionality was demonstrated with the prototype?</li> <li>• What metrics were used to conclude that the prototype worked as expected?</li> <li>• How does this demonstration correlate with what a customer of this technology would expect?</li> </ul>

Table 3: TRL 5: Key elements demonstrated in relevant environments

TRL 5 Definition	Question	Evidence
<p>Fidelity of the key elements increases significantly. Key elements are integrated with realistic supporting elements so that the technology can be tested and demonstrated in simulated or actual environments</p>	<p>Is there an end-user customer for this technology?</p>	<ul style="list-style-type: none"> <li>• Is the customer working with the supplier to define functional and performance requirements?</li> </ul>
	<p>Is the customer working with the supplier to define functional and performance requirements?</p>	<ul style="list-style-type: none"> <li>• List and describe functional and performance requirements for the product.</li> <li>• Describe how these requirements meet the customer's needs.</li> </ul>
	<p>Is the supplier working with the customer to define integration and</p>	<ul style="list-style-type: none"> <li>• Describe the integration requirements.</li> </ul>

	environmental requirements including abnormal or extrema events?	<ul style="list-style-type: none"> <li>Describe the plans for integrating the product within the customer's system.</li> <li>Describe the environmental requirements including abnormal or extrema events. What are the expectations for the product after exposure to abnormal environments?</li> </ul>
	Has a prototype been built and used to successfully demonstrate required functionality and performance before, during, and after exposure to the customer's environments?	<ul style="list-style-type: none"> <li>Describe the demonstration and discuss key elements integrated and included in the prototype.</li> </ul>
	Does the demonstration include all functionality and performance metrics the customer expects?	<ul style="list-style-type: none"> <li>List and describe the metrics used to conclude that the demonstration was a success.</li> <li>How do the metrics correlate with agreed-upon requirements for functionality, performance, and environmental exposure?</li> </ul>

Table 4: TRL 6: Representative of the deliverable demonstrated in relevant environments

TRL 6 Definition	Question	Evidence
Represents a major step in a technology's demonstrated readiness. Examples include testing a prototype or representative of a deliverable in a high	Have the supplier and the customer developed a set of requirements for the product?	<ul style="list-style-type: none"> <li>Provide documentation of the requirements</li> </ul>
	Has a prototype been created that is consistent with all of the agreed-	<ul style="list-style-type: none"> <li>Describe how the prototype meets form, fit, and function</li> </ul>

fidelity environment or in a simulated environment. laboratory or in a operational environment.	upon requirements?	requirements. <ul style="list-style-type: none"> <li>Describe how the prototype satisfies additional expectations/requirements that go beyond form, fit, or function.</li> </ul>
	Has the prototype been demonstrated successfully in the customer's required environments?	<ul style="list-style-type: none"> <li>Describe the demonstration</li> </ul>
	Do the customer and supplier agree that the demonstration was representative of the customer's needs and that it was successful?	<ul style="list-style-type: none"> <li>How was the demonstration representative of the customer's specific needs?</li> <li>What metrics were used to conclude the demonstration was a success?</li> <li>How do the metrics correlate with the agreed-upon requirements?</li> </ul>

Table 5: TRL 7: Final development version of the deliverable demonstrated in operational environment

TRL 7 Definition	Question	Evidence
Development version of the deliverable is near or at the planned operational system. This represents a significant step beyond TRL 6 and requires the demonstration of an actual development version of the deliverable in the operational environment. Examples include integration and demonstration within the next assembly, and advanced concept technology demonstrations of integrated systems such as flight testing.	Are the customer and supplier in full agreement that requirements are completely established and in final form?	<ul style="list-style-type: none"> <li>Provide the final set of requirements.</li> </ul>
	Has a prototype been integrated within the customer's operational platform and demonstrated to function as expected in appropriate environments?	<ul style="list-style-type: none"> <li>Describe the demonstration and how the prototype integrates within the customer's system.</li> </ul>
	Are the customer and supplier in agreement that the demonstration was a success?	<ul style="list-style-type: none"> <li>List and describe all elements of functionality and performance that were demonstrated.</li> <li>What metrics were used to conclude the demonstration was a</li> </ul>

		success? <ul style="list-style-type: none"><li>• How do the metrics correlate with the agreed-upon requirements?</li></ul>
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## References

[1] Mitchell, J.A., Measuring the Maturity of a Technology: Guidance on Assigning a TRL, SAND2007-6733, Sandia National Laboratories, Albuquerque, NM, October 2007.