**D1.4.1 Industrial Use Cases for Turkish Consortium**

ModelWriter

Text & Model-Synchronized Document Engineering Platform

Work Package: WP1

Task: T1.4 - Industrial Use Cases for Turkish Consortium

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Apart from the deliverables which are defined as public information in the Project Cooperation Agreement (PCA), unless otherwise specified by the consortium, this document will be treated as strictly confidential.

Document History

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| --- | --- | --- | --- |
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1. Introduction
   1. Role of the deliverable

This document is the first version of the description of the use cases proposed by the Turkish consortium. It may be up-dated depending on the further details and requirements we get from our industrial use case providers.

* 1. Structure of the document

This document is organized as follows:

Chapter 1 introduces the document.

Chapter 2 describes for each use case: the scope and motivation, the approach and the available resources (corpora).

Annex 1 lists for each use case the annex documents and associated data deliverables, so called “corpora”:

* + D1.4.2 Corpus for Turkish Use Cases (Public)
  + D1.4.3 Corpus for Turkish Use Cases (Private)
  1. Terms, abbreviations and definitions

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| --- | --- |
| Abbreviation | Definition |
| RDF | Resource Description Framework |
| WP | Work Package |
| UC | Use Case |
| BPMN | Business Process Monde & Notation |

1. Use Case Description

The use cases are provided by UNIT, Havelsan, Hisbim and KoçSistem companies.

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UC-TR-04 Requirement Engineering for System Modelling

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Use Case Contribution table is shown below:

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| --- | --- |
| Company | Contributions |
| UNIT | ReqIF/Clafer’s (Feature Modeling) documentation (UC-TR-03)  Requirement Engineering for System Modelling (UC-TR-04)  Synchronous Business Process Design with Use Cases (UC-TR-05) |
| KOCSISTEM | ReqIF/Clafer’s (Feature Modeling) documentation (UC-TR-03)  Synchronous Business Process Design with Use Cases (UC-TR-05) |
| HISBIM | **Error! Reference source not found.** (UC-TR-01)  **Error! Reference source not found.** (UC-TR-01) |
| HAVELSAN | Requirement Engineering for System Modelling (UC-TR-04) |

* 1. UC-TR-01 Production of a proposal in response to an IPA Invitation To Tender

BNB’s main field of activity is developing proposals and implementation of the proposals of IPA, WB and local development agency projects in a multitude of fields. Preparing a first response to an ITT is requires both a methodical and thorough analysis of an ITT document and extensive knowledge on the previously generated information and methodologies of the company preparing the response.

Development and use of a well-defined model to streamline the production of the response will increase efficiency of preparation of the document as well as improving its quality. This use case will also perform as a smaller scale introduction to the UC-TR-02

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| UC-TR-01 | Production of a proposal in response to an IPA Invitation To Tender (ITT) |
| Versioning Info | V1.0.0 dated 28-Sep-2012 |
| Description | Defining and implementing a base model that will be used as basis for analysing an ITT producing a response draft quickly and consistently |
| Actors | Business Developers, Field experts (Varying per requirements of tender), proposal production teams |
| Assumptions | IPA ITT documents are assumed to follow PRAG guidelines used as a basis for the produced model.  Minor consistency problems are assumed to be correctable.  ITT document is obtained or can be converted without significant errors to a document format supported by ModelWriter. |
| Steps | ITT document is obtained from official source.  ITT document is verified to be or corrected to supported document formats  A predefined model consistent with input and the desired output is selected  ITT is parsed nad a proposal draft is auto generated by the ModelWriter for review and improvement |
| Variations (optional) | Multiple models may be required to create output for different type of proposals and sectors even though ITT structure remains totally consistent with the model |
| Non-functional (optional) | (none) |
| Issues | Structural problems and of the ITT that may be corrected during Q&A phase must be accounted for. |

* 1. UC-TR-02 Collaborative production of a proposal for an IPA project

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| UC-TR-02 | Collaborative production of a proposal for an IPA project |
| Versioning Info | V1.0.0 dated 28-Sep-2012 |
| Description | A larger scale use case of proposal draft production using Terms of Reference (ToR) as well as Instructions to Tenderers (ITT) as inputs to the same proposal model |
| Actors | Business Developers, Field experts (Varying per requirements of tender), proposal production teams, Proposal manager |
| Assumptions | IPA ITT and ToR documents are assumed to follow PRAG guidelines used as a basis for the produced model.  Minor consistency problems are assumed to be correctable.  ITT document and ToR are obtained or can be converted without significant errors to a document format supported by ModelWriter. |
| Steps | ITT document and ToR are obtained from official source.  Documents are verified to be or corrected to supported document formats  A predefined model consistent with inputs and the desired output is selected  Documents are parsed and a proposal draft is auto generated by the ModelWriter for review and improvement  Collaborators are defined to the system  Knowledge bases to be utilized by collaborators are defined to the system  Rest of the steps as described in 3.1 |
| Variations (optional) | Multiple models and/or sub-models may be used to produce a more complex proposal |
| Non-functional (optional) | (none) |
| Issues | (none) |

* 1. UC-TR-03 Synchronization of ReqIF/Clafer models from requirement specifications

This Use Case aims at applying ModelWriter on Clafer’s feature models to generate documentation for domain models, architectural templates and product variants.

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| UC-TR-04 | Synchronization of ReqIF/Clafer models from requirement specifications |
| Versioning Info | V1.0.0 dated 14-May-2013 |
| Description | Show that the ModelWriter’s artefacts can be fruitful for synchronization of ReqIF/Clafer’s feature models and required documentation. In this way, the architects/developers ought not to reproduce the documentation due to changes or inconsistencies (dependencies and constraints between features in specification) in feature models. |
| Actors | Architect, developer |
| Assumptions | (none) |
| Steps | * From requirements specification, ModelWriter creates a ReqIF/Clafer representation * The ReqIF/Clafer model is generated and verified using Alloy analyser.   Alloy analyser can find counter-examples which show inconsistencies or conflicts in feature model. |
| Variations (optional) | (none) |
| Non-functional (optional) | Interpretation of first-order logic from natural language can be important (we consider industrial validations and checking). |
| Issues | It is expected that using ModelWriter we will have models from ReqIF/Clafer documents which include desired rules of developer in natural language. So it is also expected that ModelWriter can interpret natural language text, e.g. in SBVR (Semantic of Business Rules and Vocabulary) format, to generate its model. |

* 1. UC-TR-04 Requirement Engineering for System Modelling

Developing applications and tracing the lifecycle of the applications is a very complex task and it has many inherent challenges. Application lifecycle includes the entire time from the idea of developing the application to the end of application’s life. In general, the main lifecycle activities of Application Lifecycle Management (ALM) are reported as follows: project & portfolio management, [requirements management](http://en.wikipedia.org/wiki/Requirements_management), architecture and design, software development, software testing,  software configuration management, change ( [issue & defect) management](http://en.wikipedia.org/wiki/Change_management_(engineering)), and build & [release management](http://en.wikipedia.org/wiki/Release_management).

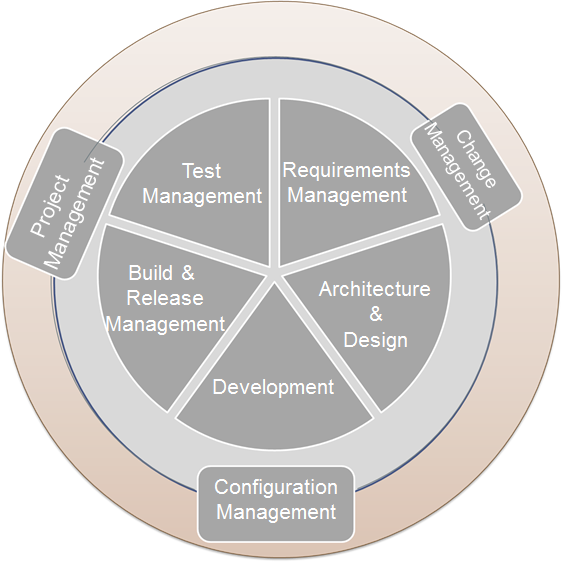


Figure 1. ALM basic activities

A lot of the big software development companies have made a lot of investments to build an integrated ALM platform which would cover the entire lifecycle of an application.

This Use Case aims at integrating ModelWriter with requirements management portion of the Application Lifecycle Management (ALM) tools. In a typical ALM platform, “requirement” is represented as a structured requirement object rather than text.

We defined a structured requirement object as an entity, that have a set of lifecycle states, defined transitions between these states, history of changes, related attributes (unique id, priority, severity, validation method etc.), and traceability information to various project artefacts such as other requirements, design model, source code, bugs, test cases etc.

Here, the textual representation is regarded as de-normalized output of the live object, however it is still needed because of contractual obligations in CMMI type projects.

“Context Diagram for Traceability“

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| --- | --- |
| UC-TR-03 | Integration with ALM tools |
| Versioning Info | V1.0.0 dated 28-Apr-2015 |
| Description | Show that the ModelWriter can extract required elements from structured requirement objects in ALM tool to generate automatic design model.  Show that the ModelWriter’s can generate requirements specification document from structured requirement objects in ALM tool. |
| Actors | Requirements Engineer/Manager, System/Software Architect |
| Assumptions | * All the traceability information would continue to be followed from the structured requirement object via ALM tool. (ModelWriter does not need to have any traceability information) * Textual representation of requirements are stored in MS Word documents. * Design models are stored in Sparx Systems Enterprise Architect. * Structured requirement objects are stored in Microsoft Team Foundation Server. |
| Steps | * Scenario1:   + From a set of structured requirement objects in the ALM tool, ModelWriter would create a natural-language text requirement document. * Scenario2:   + From a set of structured requirement objects in the ALM tool, ModelWriter would create/synch a design model.   + From a design model, ModelWriter would create/synch to a set of structured requirement objects. |
| Variations (optional) | Scenario1: From a natural-language text requirement document, ModelWriter would create/synch to a set of requirement objects. |
| Non-functional (optional) | The system should have a Word plugin for natural-language text transformation.  The natural-language support should be in both English and Turkish |
| Issues | A common format between ALM platforms and ModelWriter may need to be implemented. |

* 1. UC-TR-05 Synchronous Business Process Design with Use Cases

Business processes can be described with diagrams, e.g. BPMN diagrams, or as text. Use cases are a text-based notation. They are semiformal: a business process is expressed as a sequence of steps and each step is presented in a natural language. We aim to synchronize diagram-based and text-based notations and provide required tool.

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| UC-TR-05 | Synchronous Business Process Design with Use Cases |
| Versioning Info | V1.0.0 dated 17-May-2013 |
| Description | Show that the ModelWriter’s semantic parser can extract required elements (e.g. activities, actors etc.) for business process model from use cases to generate automatic design documentation. Also ModelWriter’s mechanism for transforming model-to-text can be applied in this case study to generate formally specified use case documents from business process models. |
| Actors | System Analyst, SW designer and developer |
| Assumptions | Ontological based transformation from model-to-text and vice versa. |
| Steps | This case study will show that use case documents can be converted to related business process models and vice versa. |
| Variations (optional) | (none) |
| Non-functional (optional) | (none) |
| Issues | Dynamically created actors and actor metamorphosis |

References

N/A