L2: Requirements specification IT

INDUSTRY PRACTICES FOR APPLICATION OF COCLASS IN SOFTWARE

SMART BUILT
ENVIRONMENT

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1 Background, purpose and scope

1.1 Background

CoClass is a modern and web-based classification system that is developed to cover the construction sector's complete information need. CoClass builds on standard, science and proven experience since it is based on international standards (see Normative references section)

The vision is that CoClass shall lead to improved communication between the actors within the construction sector. The goal is that CoClass shall be used by all parties during all stages during the lifecycle of a construction complex from early stages to maintenance, operation and demolition. An investigation performed 2014 by Svensk Byggtjänst showed that deficient communication leads to increased spending of approximately 60 billion SEK within the construction sector. CoClass may contribute to the resolution of this problem when used fully through the whole lifecycle. In other words, there is a substantial potential for savings for the sector when using CoClass.

A strive is that CoClass successively will replace the current system for classification, BSAB 96. CoClass is adapted for digital modelling and will play an important role in the realization of the full potential with BIM (Building Information Modelling). CoClass includes definitions for objects, properties and activities through the whole lifecycle for both buildings and infrastructure. This will be the backbone for the communication through the construction, maintenance and operation, from idea to demolition.

1.2 Purpose of the project

One important component to achieve the potential of CoClass is that there exists support in the software systems that are used in different stages through the life cycle. This is vital for achieving a continuous flow of data through the processes thus reducing the risk of misunderstandings and disputes and errors. Adequate support in software will also significantly lower the thresholds for getting started.

To achieve this, it is required that the software which implements CoClass does this in a uniform way. The understanding of CoClass is not allowed to change just because different software systems are used in different parts of the lifecycle.

The purpose of this project is therefore to develop guidelines and recommendations for how CoClass shall be implemented in software.

Primary purpose:
- To develop an industry practice for software implementors on how to implement CoClass in a uniform way.

Secondary purpose:
- To provide an opportunity for software implementors and other actors in the construction sector to put forward requirements on functionality and content in CoClass.

Tertiary purpose:
- To achieve software implementations with built in support for CoClass so that CoClass users can include the use of CoClass as part of their information delivery specifications.

1.3   Purpose of this document

Starting from the deliverable L1 (analysis of user needs), this requirements specification report aims to specify the functional and non-functional requirements that shall form the basis for implementation of CoClass in software.

The figure below illustrates the role and aim of the requirements specification.

- **CoClass**, i.e. the actual content and structure of CoClass that needs to be accessed by users and applications
- The **Web application and Web services (API)** offered by Svensk Byggtjänst for the distribution of the content of CoClass
- The **Industry practices** which is a deliverable from this project
- The **Applications** which offer functionality for end users during various stages of the life cycle. The requirements are collected by the participants of this project but should be expressed in a generic way to be applicable for similar applications covering similar needs at similar stages of the life cycle
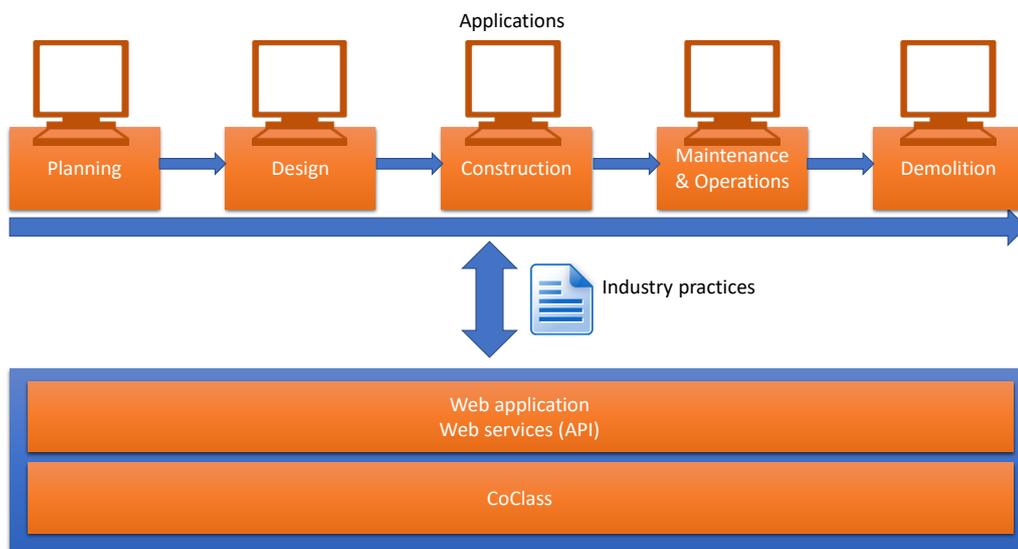
1.4   Scope

Within the scope of the requirements are e.g.:

- Commercial software
    - E.g. Revit or Novapoint
- Proprietary software at e.g. asset owners
    - E.g. ANDA/GUS (Trafikverket)
- Software provided by Svensk Byggtjänst to, in different ways, give access to CoClass content
    - CoClass Web application och Web services (API)
- Industry practices for implementing CoClass

2   Terms and abbreviations

The list of terms and abbreviations will be updated during the course of this project.

Term/Abbreviation	Definition	Synonyms

3   Summary of the needs analysis

Prior to the requirements analysis, in work package 1, workshops with the aim to investigate user needs, were held together with user representatives. The results from this investigation of user needs is reported in (Project Industry practices for application of CoClass in software, 2019).

The results from this investigation have been compiled into this requirements analysis together with requirements from the participating software providers to capture a representative set of requirements from a large group of stakeholders.

4 Requirements

4.1 Principles

The requirements are subdivided into categories.

On top level, we have separated functional and non-functional requirements.

Functional requirements are directly derived from user needs asking for functionality. These requirements follow the template "*As a <role>, I want to <goal>, so that <motivation>.*" To keep the set of functional requirements on a manageable level they are further categorized as described in the below chapter for functional requirements.

Non-functional requirements specify criteria that can be used to judge the operation of a system, rather than specific behaviors. The non-functional requirements have also been sub-divided into categories as described in the chapter for non-functional requirements.

All requirements are collected in a separate spreadsheet which may be found in Annex 1 – Requirements list.

The documents listed as normative references shall be treated as requirements for this project.

4.2 Functional requirements

Each functional requirement is described as follows:

- **Id** : A unique identifier
- **Object** : Specifies the object of the requirement according to the following:
    o **General** : The requirement concerns all involved parties
    o **CoClass Web/API** : The requirement specifically concerns the web application and/or web services provided from Svensk Byggtjänst
    o **Application** : The requirement concerns an end user application which uses CoClass as part of its operations
    o **Industry practices** : The requirement concerns the industry practice to be produced
- **Category** : A categorization of the requirement into one of the following categories:
    o **Structure templates** : Requirements related to the configuration of CoClass for specific organizations, projects or use cases
    o **Searching/queries** : Requirements related to finding information in CoClass
    o **CoClass development** . Requirements indicating development of CoClass itself
    o **Relating other systems** : Requirements related to the interfaces between different software applications and also interfaces between different classification systems
    o **Rules/validation** : Requirements related to the needs for rules when using CoClass and also data validation based on CoClass

-     o   **Other** : Any requirements that does not belong in any of the other categories
- **Requirement** : The actual requirement statement based on the template "As a <role>, I want to <goal>, so that <motivation>"
- **Verification** : Indication on how the requirement may be verified

4.3   Non-functional requirements

The non-functional requirements are described as follows:

- **Id** : A unique identifier
- **Object** : Specifies the object of the requirement according to the same categorization as for functional requirements.
- **Category** : A categorization of the requirement into one of the following categories:
  - o   **Configurability** : requirements concerning configurability, e.g. means to adapt the system for different purposes without programming
  - o   **Scalability** : requirements concerning scalability, e.g. the capability to handle a growth
  - o   **Performance** : requirements regarding performance, e.g. response times
  - o   **Robustness** : requirements regarding robustness, e.g. the ability to withstand adverse conditions
  - o   **Security** : requirements regarding security, e.g. preventing unauthorized access, tampering etc
  - o   **Usability** : requirements regarding usabability, e.g. the ease of use and learnability of the system
  - o   **Accessibility** : requirements regarding users ability to use the system
  - o   **Interoperability** : requirements regarding interoperability, i.e. the systems ability to interoperate with other systems
- **Requirement** : The actual requirement statement
- **Motivation** : Motivation for the requirement
- **Verification** : Indication on how the requirement may be verified

5 Summary of requirements

As earlier mentioned, the actual set of requirements are listed separately. Even though some duplicate requirements have been removed, there might still be duplicate requirements which needs to be evaluated and resolved. However, due to time restrictions, no combined prioritization and complete resolution of potential duplicates has been performed. It is therefore recommended that any future processing of these requirements considers this. It is also recommended that certain guidelines are observed when prioritizing, within subsequent work packages of this project or beyond. The following criteria should result in higher prioritization:

- A requirement affects many applications or actors
- A requirement has a strong component of interoperability/communication between applications and therefore is interface-related.

Furthermore, all requirements under the category "CoClass development" should be forwarded to the CoClass maintenance process to be handled there, since this project does not handle CoClass development.

6 Normative references

(2019). *IEC FDIS 81346-2:2019 Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations - Part 2: Classification of objects and codes for classes.* IEC.

(2009). *IEC-EN 81346-1:2009 Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations - Part 1: Basic rules.* IEC.

(2015). *ISO 12006-2:2015, Building construction - Organization of information about construction works - Part 2: Framework for classification.* ISO.

(2018). *ISO 81346-12:2018 Industrial systems, installations and equipment and industrial products - Structuring principles and reference designations - Part 12: Construction works and building services.*

Project Industry practices for application of CoClass in software. (2019). *L1 - Slutrapport behovsanalys.*