

CPRE Advanced Level

Task definition for the written assignment

RE@Agile

- Specialist -

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0 Introduction

The purpose of this written assignment is to prove your skills and abilities to work with Requirements Engineering in the agile context. Please note that the term "project" is used to describe the environment in which the agile development and requirement engineering should be described and discussed.

Choose a project or a product development effort (later referred to as "project") from your personal background to demonstrate that you played a vital part in the progress and success of this project. The project must be one in which you have applied the agile methodology (just-in-time Requirements Engineering), working in a larger number of progressive iterations (Requirements Engineering and development). Here, the focus of the agile methodology as well as of the description of your work should be understood as primarily Requirements Engineering and not the implementation (development). A purely non-agile (e.g. phase-oriented) project cannot be selected for this assignment.

Your written assignment shall serve as proof of the following capabilities:

- You understand and can apply the main concepts of agile methodologies combined with Requirements Engineering.
- You can apply and have mastered the prerequisites for iterative Requirements Engineering e.g. creating a vision and clear goals, identifying stakeholders and preparing a product backlog.
- You can capture the functional requirements using hierarchical levels such as Epics, Features and User stories.
- You understand the Definition of Ready (DoR) concept and know when to stop with an agile approach in requirements analysis. You understand the Definition of Ready (DoR) concept and know when to stop in an agile approach in requirements analysis.
- You understand and have mastered the handling of quality requirements and constraints in the project
- You can prioritize requirements in agile projects according to business value and risks.
- You can perform release planning and create Minimum Viable Products (MVP), if applicable.
- You are able to reflect upon your practical experience of Requirements Engineering in an agile context with reference to the theory, and suggest improvements.

To demonstrate these abilities, you should describe how you have worked on a real-life project and applied the RE@Agile skills on an advanced level and discuss the results.

0.1 Scope, structure and evaluation

For the scope of the written assignment and the percentage to be achieved in order to pass the examination, see the examination regulations - Advanced Level - (sections 3 and 8.4).

The following table describes the required sections of the written assignment as well as the score achievable for each section.

Section	Content / Document structure	Achievable score
1	Your Agile Project: Project Description (Setup and Structure)	10 points
2	Vision and Goals, Stakeholders, Scope	20 points
3	Functional Requirements Elicitation and Documentation	40 points
4	Handling Quality Requirements and Constraints	20 points
5	Critical Self-reflection, Discussion and Outlook	10 points
Maximum total score that can be achieved		100 points

The achievable number of points per section should serve as a guideline for the scope of that section.

Details of the expected content for each section and the criteria for its assessment are described in the following chapters. When writing your assignment, please note that the content must be understandable for an assessor, as he or she is not necessarily an expert in your application context.

0.2 Anonymisation and confidentiality of content

The contents of the written assignment must be made anonymous to the extent that no reference to real persons and/or companies can be made. Specific company or individuals' names should only be used if strictly necessary for the understanding of the content of the written assignment. Details on the originality and confidentiality of the contents are set out in the examination regulations.

1 Your agile project - Project description (setup and structure)

Expected content of this section

Explain the main characteristics of your project and how you started the work with your agile team. Please be aware of the conditions for a suitable project or product development from chapter 0 Introduction.

Use the following guiding questions to structure this section of this assignment:

- What was the context of the project or product development?
- What was the main goal of the project or product to be implemented and how is this goal fulfilled by the proposed implementation?
- What was your role in the project and what were your specific tasks?
- What was the application domain or subject matter of the project?
- How many people were involved in the undertaking and over what period of time? (How many teams? Co-located or distributed?)
- What responsibilities or roles had these people who were involved in the project?
- What agile methods and which specific tools did you use in this undertaking?
- In what kind of iterations (sprints, releases ...) did you perform the work?
- Which, and how many, people were involved in eliciting and refining requirements?

Evaluation criteria for this section

The evaluation of this section of the written assignment is based on the following criteria:

- Is the application domain, the context and the subject matter of the undertaking clearly described?
- Is the main goal of the project or product development to be implemented clearly described, and to what extent this goal is fulfilled by the proposed implementation?
- Is the definition of the role in the project of the author of this work clear?
- Are the roles and responsibilities of the people involved in the undertaking described?
- Is there a description of how many and which teams were involved in the project, as well as their locations/sites?
- Is the applied agile method described as well as the tools that were used?
- Is the choice of iterations (sprints, releases ...) described?
- Is there a detailed description of who was involved, and how, in the elicitation and refinement of the requirements?

2 Vision and Goals, Stakeholders, Scope

As described in the syllabus of this advanced module we start with the assumption that even agile projects need some kind of preparation before product increments can be iteratively developed. In this section of the homework you should describe your starting points:

- Did you create explicit goals or a vision before or at the start of the project?
- Has it been clear who the key stakeholders are and how they should cooperate to achieve that vision?
- How did you manage the stakeholders?
- Did you have any form of scope identification – and if so – how did you capture and communicate that scope?

Elaborate your answers in the following four sub-sections.

2.1 Vision and Goals

Expected content of this section

If you had a vision and goals, please explain and discuss:

- Specific examples of the vision and goals
- How were the goals made measurable?
- What was the process like for defining the vision as well as formulating the goals?
- How was the vision as well as the goals explained or presented to the agile team?
- Who was responsible for formulating the vision and goals?
- What time horizon(s) was(were) set for which goals?
- Discuss and justify the change or potential for change in the vision and goals over time.

If you did not have explicit goals/vision or did not have documented goals/vision:

- What would the vision and goals have looked like (in hindsight) if you had been allowed to define them?
- Explain why - and to what extent - not having a vision or goals was a handicap to the project (or not, as the case may be).
- How was the team aligned without explicit goals?

Evaluation criteria for this section

The evaluation of this section of the written assignment is based on the following criteria:

- Are specific examples of the vision and goals described?
- Is it clear how the vision and goals have been made measurable?
- Is the vision/goal definition process described and is it clear who was responsible for that definition?
- Is the time horizon described, as well as how the goals changed over the course of the project?

If there were no vision or goals:

- Was it outlined what the vision or goals could have been?
- Is there a description of whether not having a vision and goals was a handicap to the project?

- Is there a description of how the team aligned without explicit goals?
- If no changes in goals have occurred, is the potential for such changes indicated and justified?

2.2 Main Stakeholders

Expected content of this section

Describe all sponsors/contractors, stakeholders, and customers of the project:

- Who wanted the product and who set the requirements?
- Explain other key stakeholders in your project and their influence on the project.
- For which target group were the requirements intended?
- Explain how the responsibility for requirements has been organized in your project.
- Who was responsible for requirements management?
- How has stakeholder collaboration on requirements been organized?
- Which stakeholder(s) set the priority of requirements?
- Who else was involved in the prioritization?
- How much did the development team influence the requirements? To what extent have they actively participated in creating or refining backlog items?

You may use a stakeholder map or an annotated organization chart to illustrate which stakeholders were relevant for the requirements process. Be specific!

Evaluation criteria for this section

The evaluation of this section of the written assignment is based on the following criteria:

- Have the sponsors and target groups been identified?
- Is it clear who was responsible for the requirements (including prioritization and selection of backlog items)?
- Is it clear who was responsible for stakeholder management and to what extent that person managed all other stakeholders in handling priorities and conflicts?
- Is it clear to what extent the development team was involved in creating requirements, i.e. backlog items?

2.3 System scope

Expected content of this section

The syllabus suggests multiple ways to define the (system) scope of your project. Please explain and discuss:

- What options did you use to describe the scope of the system?
- How did you document or communicate the scope?
- How did you define interfaces between your scope and your context – especially interfaces to neighboring systems (where applicable)?
- Did your scope change during the project, and - if so – how often? How did you handle that?

Show at least excerpts or examples of how you defined the scope. Be precise and specific! You may include a context diagram, a use case diagram with actors and adjacent systems, the top part of a story map with the key epics, or a list of included and excluded features.

Evaluation criteria for this section

The evaluation of this section of the written assignment is based on the following criteria:

- Is it clear how scope was defined in the project (models or descriptions)?
- Is it clear how the product boundary was determined in the project?
- Are any possible changes to the system scope described?
- Are there specific examples of the system scope?
- Is the notation (how to read the context boundaries) described?

2.4 Interplay and evaluation of the approach for the Clean Project Start

Expected content of this section

Reflect on and discuss in detail the approach from points 2.1-2.3

- Reflect on how vision/goals, stakeholders, and system scope influenced one another.
- Describe any discrepancies between the current RE@Agile handbook and the approach you describe.
- Evaluate any deviations and whether or not they have been successful.
- If you could not find any deviations from the handbook, evaluate what alternatives there would have been in your view that might have added more value.

Evaluation criteria for this section

- Is the described approach discussed in an understandable way and is it justified?
- If the approach deviated from the current RE@Agile handbook, were these deviations critically examined and were better alternatives pointed out?
- If no deviations from the handbook were identified, are possible better alternatives explained?

3 Functional Requirements Elicitation and Documentation

In this part of the written assignment you should explain how functional requirements have been handled in the project. Concentrate on three aspects: content, form and process. Describe what kind of (functional) backlog items have been created and maintained. But also mention how you physically managed functional requirements (on cards, in tools, ...). Describe your experience with content and form.

We assume that you mainly used textual requirements (features or stories). Discuss whether you have used other requirements artefacts (like glossaries, graphical models, prototypes, ...) to support textual requirements.

This chapter intentionally has the most points of all the chapters and thus is also the main focus of your work. Be sure to include sufficient content in this chapter. Make sure as well that you include examples of functional requirements or backlog items in your text. It should also be clear how coarse-grained requirements have evolved over time into fine-grained requirements.

3.1 The backlog

Expected content of this section

Explain how functional requirements have been handled in your project:

- What names have been used to talk about requirements: Backlog items? Epics? Features? Stories? Others?
- Explain the abstraction levels (e.g. epic, feature, user story, ...) in your backlog and explain how different abstraction levels build on each other. Give examples of backlog items from all levels of abstraction.
- Explain how imprecise requirements were documented, and how a subsequent refinement was documented.
- Give examples for various kinds of functional requirements and explain how they may have changed/developed over time.
- How were the measurement criteria for requirements captured (e.g. acceptance criteria, Definition of Ready)? Give clear examples of each.
- How was it ensured that the requirements were well enough articulated to be understood by the development team?
- Which natural or formal language was used? Explain the templates or structures used in creating your requirements for each level of abstraction!
- Have you also used requirements models or requirements artifacts (e.g., process models, data models, state charts, other documents)? Did you use Mock-Ups or other forms of prototypes to better understand and communicate the functionality of the product or system to be developed? If so, how did these interact with the backlog? If no, why didn't you need more artifacts?
- Add quantification: How many functional requirements did you handle at any given point in time (on average)? If you used abstractions like epics or features mention their quantities as well, not just the stories.

Evaluation criteria for this section

- Is the structuring of the requirements hierarchy (abstraction levels) clearly described and, if applicable, are names for the different levels given?
- Are there clear examples of the different levels of abstraction?
- Are the examples (for all levels of abstraction) meaningful, clearly articulated, and accompanied by measurement criteria?
- Is the template structure described and if not, is it stated why none was used?
- Is it explained how imprecise requirements were documented, and how a subsequent refinement was documented?
- Are the backlog as well as, where applicable, other requirements artifacts at a level that meets the "definition of ready"?
- Is it convincingly demonstrated that the requirements were good enough to be understood by the development team, thus avoiding misinterpretation?

3.2 The Requirements Engineering process

Expected content of this section

Describe how you physically managed your backlog:

- How did you capture requirements, manually or electronically?
- Did you maintain them in any kind of tool? In which one?
- What other information did you add to your backlog items (business value, estimate, keywords to help search or filter, ...)
- Give concrete examples of how you physically collected the requirements.

Describe the process of working with functional requirements. Explain the way you created and managed your product backlog. Explain in particular who worked on the backlog and in which role: who created items, who refined items and how communication took place within the team.

- How were the requirements (both abstract and detailed) identified? Give concrete examples.
- How much time was used for refinement meetings, and how early and often were the development team involved?
- Explain how early or how late the backlog was refined to the level of the DoR.
- How did you determine the ordering (priority), and who was involved in such decisions?
- How did the estimation process work?
 - Who was involved in the estimation process?
 - Which methods were used to come up with estimates?
- How did you handle requirements changes?
- Did you use any mechanism or tool for versioning, variant or configuration management?
- Discuss the interplay between roadmapping and the detailed backlog (including configuration management).
- Describe what happened to requirements that according to DoD were completed.

Evaluation criteria for this section

- Is a detailed description (including examples) provided on how the requirements have been physically collected?

- Is the identification of requirements clearly described with examples?
- Is it fully explained how and by whom the backlog was created and managed?
- Is the refinement process described clearly and in detail (effort, people involved, involvement of the development team, interaction with DoR, communication within the team)?
- Are the criteria and the procedure for prioritization clearly described (persons involved, criteria)?
- Is the interplay between backlog and roadmap clearly described (including configuration management)?
- Are the estimation process and method fully and clearly described?
- Is there a clear description of what happened to requirements that were completed according to the DoD?

3.3 Interplay and evaluation of the approach to the functional requirements

Expected content of this section

Reflect on and discuss in detail the descriptions of points 3.1-3.2:

- Describe any discrepancies between the current RE@Agile handbook and the approach you describe.
- Evaluate the deviations and whether or not they have been successful. Which deviations have proven successful? Which deviations would you no longer make in a similar situation?
- Explain why the chosen approach was the most appropriate for the described method.
- If you could not find any deviations, evaluate whether there would have been alternatives that in your view would have added more value.
- Explain the level of agility present in your project. Was this appropriate? Why? Why not?
- Describe how the chosen means (e.g., tools, methods, requirements hierarchies, requirements descriptions, notations) supported the approach.

Evaluation criteria for this section

- Has the representation of the requirements been adequately evaluated (notation, means of expression)?
- Is the process and, if applicable, the usage of tools appropriately evaluated?
- Is the explanation of the degree of agility in relation to the requirements well described?
- Is the fulfillment/non-fulfillment of agility in terms of methods well described?

4 Handling Quality Requirements and Constraints

4.1 Quality Requirements

Expected content of this section

Quality Requirements as an addition to functional requirements are an often-neglected area in agile projects. Explain if and how you handled quality requirements in your project.

- With reference to existing quality requirements standards (for example, ISO 25010), discuss which of these were included in your project and which were not.
- How did the project ensure that all categories of quality requirements were considered?
- Discuss how you have documented and communicated quality requirements in your project.
- Give examples where you were able to add qualities directly to functional requirements.
- Especially for cross-cutting quality requirements: Discuss how these were captured and how you linked them to all functions to which they apply (or how they were linked to each other).
- Explain how quality requirements were made more precise (measurable) so that developers understood them and you could verify their fulfillment for delivered product increments.

Base your explanations on particular examples from your project.

If you have not explicitly raised quality requirements, define the quality requirements for your project using what you know today.

Evaluation criteria for this section

- Were specific examples of quality requirements and their relationship to existing standards described?
- Was it shown how these examples were related to functional requirements?
- Is how quality requirements have been made measurable clearly described?

4.2 Constraints

Expected content of this section

Unlike classical requirements specifications the (agile) product backlog normally does not contain sections on constraints.

- Explain which organizational or technological constraints influenced your requirements work and how.
- Are there identifiable organizational standards for such constraints that are valid for all projects? Did somebody in the project define such constraints? Were the developers aware of the degree of freedom in their choices and of their limitations?
- Where did you capture constraints and how did you communicate them to the team?
- Give at least one explicit example each of an organizational constraint and a technological constraint from your project.
- Explain how compliance with the constraints was ensured.

If there were no explicitly formulated constraints:

- What constraints did you discover during the course of your project?
- How should the compliance with these constraints have been ensured?
- What was the effect of not having explicit constraints?

Evaluation criteria for this section

- Is the handling of constraints explained in detail in the project?
- Is there a detailed description of how compliance with the constraints was ensured?

If no explicit constraints were stated in the project:

- Is it stated what constraints were discovered during the course of the project?
- Is there any discussion of how compliance with the constraints could have been ensured?
- Are the effects of the missing constraints in the project discussed?

4.3 Interplay and evaluation of the approach to quality requirements/constraints

Expected content of this section

Reflect on and discuss how quality requirements and constraints were dealt with:

- Use the explanations in the current RE@Agile handbook as a reference.
- Critically discuss the advantages and disadvantages of your chosen approach by means of specific examples.

Evaluation criteria for this section

- Is the handling of quality requirements discussed and justified on the basis of the current RE@Agile handbook?
- Is the handling of constraints discussed and justified on the basis of the current RE@Agile handbook?
- Are plausible advantages and disadvantages of the selected approach for quality requirements and constraints stated, including specific examples?

5 Critical Self-reflection, Discussion and Outlook

Expected content of this section

This reflection serves to look back at the project once again and to draw lessons from it.

For this purpose, select three concrete insights (related to chapters 1-4 of this written assignment) that you have gained during the project concerning Requirements Engineering in an agile context, and relate these to the theory (current RE@Agile handbook). What would you do differently in the future (in relation to Requirements Engineering in an agile context) if you had the opportunity?

Name a specific weakness that knowing what you do today you have been able to identify for you personally and which of your competencies you would like to develop in the future as a result.

You don't have to pretend that everything worked perfectly in your project. This section should demonstrate that you know what went well, but you also know what was less than optimal. And you should explain what you would definitely not do again and which alternatives you now see in hindsight. Openly discuss your "lessons learned". Reflect on your project from a personal perspective. Try to avoid "textbook wisdom" in your reflection. Specifically address Requirements Engineering in an agile context, rather than agile or the agile approach to development in general.

Evaluation criteria for this section

- Are three findings elaborated and plausibly derived based on the written work?
- Is a link established between the practical implementation and the theory?
- Have alternatives to the chosen approach been discussed?
- Are the findings backed up with examples in a comprehensible way?
- Is there a specific idea for improvement and are possible ideas for further development provided?