

EO Africa // ARIES

**D05 – Agile Development Plan (ADP) 1.0,
January 2023**

Contract No: 4000139191/22/I-DT

submitted by

 <p>The table contains three logos stacked vertically. The top logo is for Vista, featuring a purple triangle with a white circle inside and the word 'Vista' in purple. The middle logo is for vito remote sensing, with a black bird-like icon and the word 'vito' in black, with 'remote sensing' in a green box below it. The bottom logo is for LIST, with the word 'LIST' in black and a colorful globe icon to its right.</p>	<p>VISTA Remote Sensing in Geosciences GmbH (VISTA)</p> <p>Vlaamse Instelling voor Technologisch Onderzoek, Naamloze vennootschap (VITO)</p> <p>Luxemburg Institute of Science and Technology (LIST)</p>
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ESA STUDY CONTRACT REPORT

ESA Contract No 4000139191/22/I -DT	SUBJECT EO Africa // ARIES	CONTRACTOR VISTA Remote Sensing in Geosciences GmbH (VISTA)
* ESA CR()No	* STAR CODE	Vol. 1
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<p>ABSTRACT:</p> <p>This document describes the agile development approach used for product development and the proposed practical implementation during the project while working together with the African Early Adopters and EO research group(s)</p> <p>Version 1.0</p> <p>Status: 30. January 2023</p> <p>The work described in this report was done under ESA Contract. Responsibility for the contents resides in the author or organisation that prepared it.</p> <p>Names of authors: Veronika Otto (Vista), Silke Midgall (Vista)</p>		
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List of Acronyms

ADP	Agile Development Plan
EO	Earth Observation
ESA	European Space Agency
R&D	Research & Development

1 Introduction

EO AFRICA (African Framework for Research Innovation, Communities and Applications) focuses on building African-European R&D partnerships and the facilitation of the sustainable adoption of Earth Observation and related space technology in Africa. Within “ARIES” experimental EO analysis techniques will be developed and validated, addressing water management and food security in Africa.

To ensure the products developed within the project serve the needs of future users we are working closely together with African Early Adopters, who are and will be involved in every step of algorithm and product development. In order to achieve this, the development work will be broken down into several smaller and precisely defined tasks, following agile development principles and using agile development methods.

2 Agile Principles

Agile development, first brought up in 2001, stresses the importance of individuals and interactions within the development team. It aims to deliver working and relevant software, to remain in continuous collaboration with customers and to be able to respond to change at any time during the development process (Beck et al. 2001). In order to establish this kind of development environment and achieve the connected outcomes we will be using management techniques from SCRUM, a “lightweight framework that helps people, teams and organizations generate value through adaptive solutions for complex problems” (Schwaber & Sutherland 2020).

3 Agility through SCRUM

Scrum is a framework for developing, delivering, and sustaining complex products (see Figure 1). At its heart is the so-called Scrum team, which in this case doubles as the project team consisting of members from Vista, LIST and Vito.

The team's work is completed within successive sprints. The content of these sprints is being defined and redefined by the so-called Scrum artifacts – collections of work packages and product functionalities that are either proposed for acceptance by the team, under work or done.

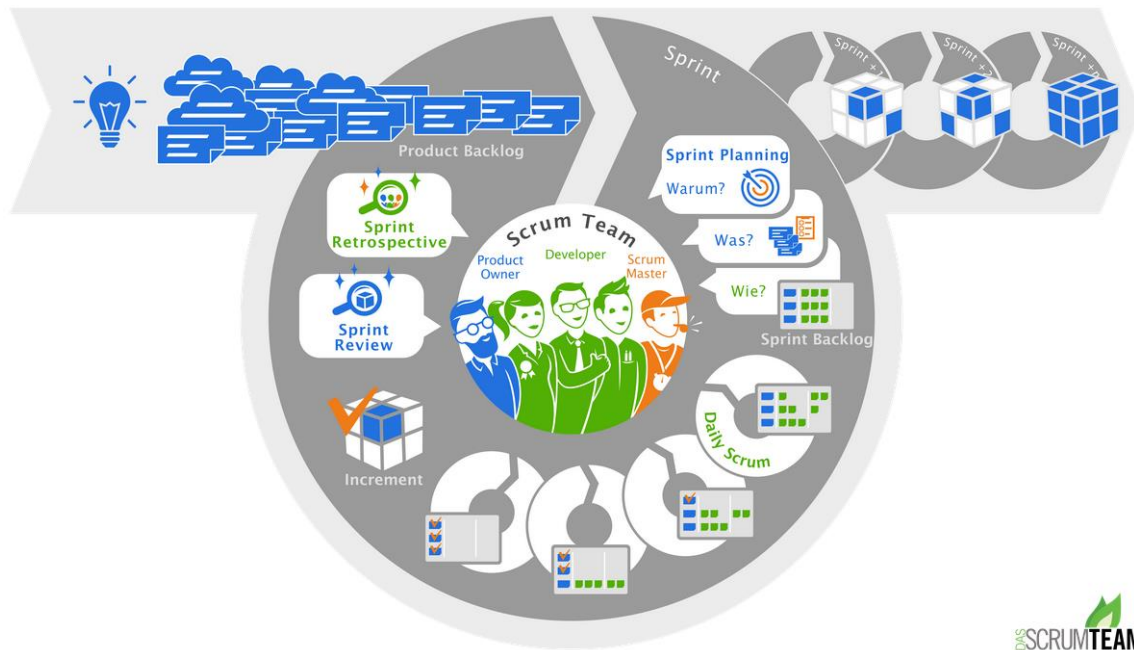


Figure 1 Scrum flow chart (Beck 2015)

3.1 Team

All project team members adhere to five basic values: commitment, courage, focus, openness and respect. The team is self-organized and has all the competencies to accomplish the tasks proposed. It aims to deliver products iteratively and incrementally, thus maximising opportunities for feedback from the African Early Adopters. Due to the character of the project: small extent with competencies being spread between all team members, no separate product owner responsible for the product backlog (see 3.2) has been defined. This task will be taken over by the project manager, who doubles as a Scrum master responsible for the implementation of agile development and for communication within the team. Communication lines outside the development team have already been clearly defined within our proposal (see Figure 2). The responsibility for outside communication is split between prime contractor Vista

and sub-contractor Vito, who is responsible for most of the user communication with the exception of African Early Adopter AKTC, who is in direct contact with Vista.

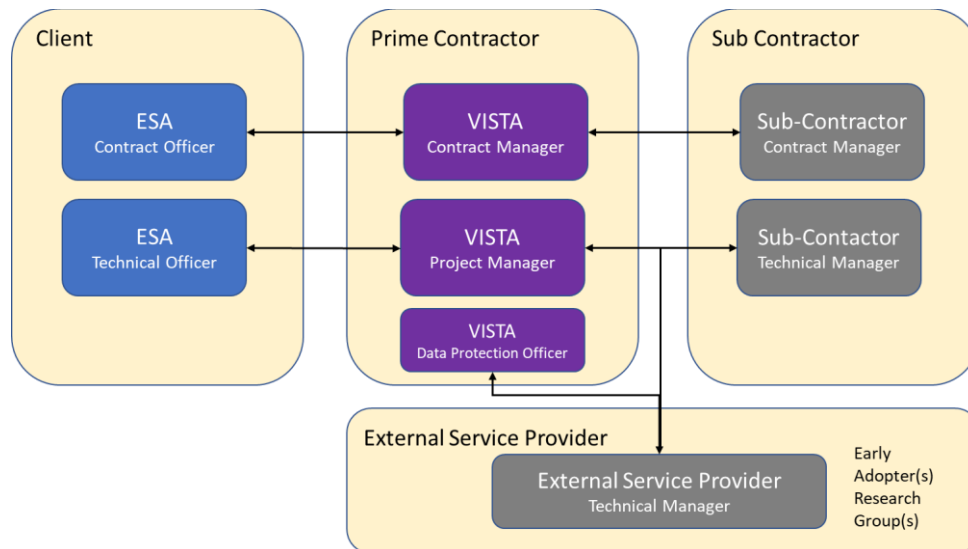


Figure 2 Responsibility and communication lines within ARIES

3.2 Sprints

All work done within ARIES is pre-structured by milestones and progress meetings, as detailed within our proposal and project management plan (D15). Especially during the completion of Task-A - Algorithm development and validation, there is a long period during which no final results are expected by ESA. To give structure to our work, especially during such periods, and develop products that fit user needs we will further structure our work into successive sprint periods. Progress meetings will double as opportunities to review the products (with input from the African Early Adopters, which has to be gathered in advance), talk about work efficacy, improve development practices (sprint retrospective) and to plan for the next sprint, which will then last until the next progress meeting. This means that every sprint cycle in ARIES will be two months long.

In order to ensure all activities in the project are synchronized, short weekly or bi-weekly meetings can be held instead of so-called Daily Scrums, which seems too ambitious for a small project, such as ARIES. In particular with regards to the development of ECOSTRESS-derived indicators, which will be done in close

collaboration between VITO and LIST, such intermediate bi-weekly sprints are expected to boost the efficiency of the development work.

3.3 Artifacts

In order to ensure everyone within the project team is always up to date with regards to current and upcoming tasks, Scrum is making use of three planning documents, the so-called Scrum artifacts.

The product backlog, which is being managed and updated by the project manager contains all items that could be or will be implemented within the project in order to reach the product goal. Since ARIES is not a pure software development project, but also has objectives with regards to documentation and knowledge dissemination we aim to not only keep track of development and programming ideas for single products but also of items pertaining to the planning of outreach activities and the preparation of deliverables. As this is not the definitional content of a Scrum backlog (Schwaber & Sutherland 2020) we suggest the use of progress reports as a substitute for the product backlog. The respective current progress report already contains all relevant current tasks and planning.

Before the start of each sprint period the team will evaluate the last progress report, add missing items and choose items for implementation during the next two-month period of the project. These items will then go into a new “upcoming tasks” section of the next progress report. Each fresh progress report, based on the discussions during the progress meeting preceding the sprint period, can then double as a sprint backlog which defines the work necessary to reach the goal of the single sprint period. No new items or tasks should be added at a later point during the sprint, as this would hinder self-organised and streamlined work by the team.

At the completion of a sprint, all items completed go into the increment together with all the results from earlier sprints. Even if the products or deliverables are not scheduled for delivery, they should be in a usable state. Everyone involved (developers, management, users etc.) should agree, that they meet the “Definition of Done” (Schwaber & Sutherland 2020).

4 Adaptability

The ways we live agility within our project might change over time. If and anytime this happens we are going to deliver ADP Progress Reports.

5 Conclusion

While there are many advantages to agile development, most importantly allowing us to give structure to our project in times during when it is needed, while at the same time accelerating the provision of working algorithms, there are also methodological drawbacks, which we hope to mitigate at an early stage by raising our awareness of them. Our biggest concern here is that agile development does demand a high time investment from the users - in this case the African Early Adopters – which might not be available from all of them at all times throughout the project. Following Zowghi et al. 2015, we hope to mitigate this risk by keeping the users continuously engaged and by entering a reciprocal relationship with them at the earliest possible time, through the delivery of relevant information e.g., demo products and workshops.

6 Literature

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