

# SRS Inspection

## 1. Do requirements exhibit a clear distinction between functions and data?

The SRS does exhibit a clear distinction between functions and data. This is shown in the requirements as it defines how data is collected (**3.2.1 in requirement 1**) compared to how the function utilizes the collected data (**3.2.1 in requirement 3**).

## 2. Do requirements define all the information to be displayed to users?

The document defines an overall description of the system, specific requirements, constraints, attributes, and use cases.

The use and scope of **Crop Disease Surveying Drone Software** are well defined in the document. The user interface that is to be implemented is also depicted in figures (**ch 3.1**). However, *figure 1.0* is missing details for the current status of each sector of the farm.

The **product functions** part (**ch 2.2**) includes most of the important functions the system requires. However, it can add more details about system flexibility such as giving the choice to the user of the system to choose whether to follow the algorithm's recommendation on treatment.

## 3. Do requirements address system and user response to error conditions?

The SRS successfully addresses the interface, functional, and user requirements by breaking them down into easily understandable sections that offer comprehensible insights into the purpose and necessity of each requirement. Within **3.1, External interfaces**, the weather, plant diseases library, and plant inventory system interfaces are well documented and properly addressed.

Within each interface requirement, aspects such as "Description of purpose" to "Data Formats" are properly expressed.

Within **3.2 Function Requirements**, the system function requirements display a strong understanding of how each part of the proposed programme will function together. The 'main page' of the proposed programme is explained well and covers each aspect. However, a notable omission is the absence of any mention of utilizing AI for 'crop disease detection', which was desired.

A disappointing aspect is the forgotten idea and 'want' of A.I use in the determination of crop diseases which is crucial to the overarching system.

Infact, the function requirements do not include any function requirements tied into the 'crop disease detection' or the predicted crop disease antidotes. **R.6** only provides a brief and surface-level description of this system aspect. However, within **3.2.2 Use Cases**, there is a good explanation of more lower-level system requirements in relation to 'crop disease detection', described within **3.2.2.2 View Sector Information**.

Within all three sections of the **3. Requirements** (Function, Interface, Use case), no 'user response to error conditions' is found.

4. Is each requirement stated clearly, concisely, and unambiguously?

In **3.1**, most of the requirements mentioned are very accurately written and explained in terms of the external interfaces, but each section "Command Formats" and "End Messages" are mentioned but are simply written as "N/A". For all parts in **3.1**, there is no reason to be written as N/A and rather not include them. With this addition of the information lies ambiguity. Aside from that, each requirement throughout the document very well articulated and the connection of each requirement to each use case help provide a reason for why they exist.

5. Is each requirement testable?

Most of the requirements are testable, but the group did miss testing two requirements in their use cases, this being **requirements 2** and **8 (R2)**. Although both requirements are basic in nature, the SRS does not have an explicit connection to any example or use case. Therefore, each requirement should be testable, but is not explicitly stated that all requirements are.

6. Are there ambiguous or implied requirements?

Mentioned in **number 4** of this *SRS inspection*, ambiguity does exist in **3.1** of the SRS. Aside from that, the document is very unambiguous and is very detailed throughout the entire SRS.

7. Are there conflicting requirements?

After reviewing the SRS, there were some conflicts identified in terms of being hard to achieve. Specifically, requirements **R4** and **R1**, which relate to real-time drone data updates and real-time image analysis for disease detection, respectively, both emphasize real-time functionality. This raises potential concerns given the "**Design Constraints**" in section **3.5.4**, which stipulate the need for a stable internet connection for real-time image analysis. Additionally, Requirement **3.1.1** specifies a strict 5% deviation tolerance for weather data, which may become unachievable with regards to the demand for real-time analysis. These design constraints may become conflicting requirements.

8. Are there areas not addressed in the SRS that need to be?

The specific area of the use of Artificial Intelligence needs to be addressed within the SRS. While the implementation is not to be demanded, the conceptual framework for the use of an AI model needs to be described. The initial demand was that A.I or M.L was to be used, and to be trained on a data model we have supplied. The A.I model forms the core of advanced image analysis, particularly focussed on disease detection and crop monitoring. A key feature of this A.I model is for its continuous learning, which allows it to evolve and improve by autonomously training itself on the image analysis which is continuously collected.

Our group believes that every other topic and other necessary point(s) in regards to what we (No Name Brand Softwares) stated in the RFP and elicitation meeting is covered in this SRS.

9. Are performance requirements (such as response time, data storage requirements) stated?

Yes, performance requirements are mentioned in the report through the many examples in which they are required for. An example is wireless connection to then connect to the database.

10. If the requirements involve complex decision chains, are they expressed in a form that facilitates comprehension (i.e., decision tables, decision trees, etc.)?

All decision chains mentioned in the SRS in the *use cases* (3.2) and *program models* (3.7) are very clear and simple to understand through the thorough actor and system charts in each use case and easy to understand connections for the program model.

11. Have requirements for performing software upgrades been specified?

Updating the software and maintaining it has been mentioned in **section 3.6.2** but it is not defined as a requirement, but listed as an attribute. An attribute is something that supplements the overall project, but is not necessarily listed as something required in the SRS, even though it is important to the system's longevity.

12. Are there requirements that contain an unnecessary level of design detail?

In **section 3.3**, it is found that there are a few instances of unnecessary levels of design detail such as how they often mention how long the images on the display stay on the user's screen for. Although it can be considered useful in the overall development process later on, it was never asked of during the elicitation meeting and is unnecessary in the overall report of required features.

13. Have the real-time constraints been specified in sufficient detail?

In section 3.5, design constraints are mentioned and each constraint that uses real-time data analysis and collection are explicitly mentioned. This includes **3.5.2-4** and **3.5.6**. Where each of these constraints rely on real-time data analysis and collection.

14. Has the precision and accuracy of calculations been specified?

Within section **3. Specific Requirements**, the units of measure, timing, and valid range, accuracy, and/or tolerance are supplied and well explained. Furthermore, within **3.2.1 Requirements**, the requirements include specific percentages in relation to whether a crop is salvageable.

In regards to specific calculations in terms of the A.I model, such as the calculations induced by the A.I model are not stated or described.

15. Is it possible to develop a thorough set of tests based on the information contained in the SRS? If not, what information is missing?

It is possible to develop a thorough set of tests based on the information in the SRS. The main functional requirements are testable and can be based off of the many requirements and constraints given throughout the document. However, testing the non-functional attributes mentioned in **Attributes section** such as security and reliability aspects are not explicitly described in the SRS document.

16. Have Assumptions and Dependencies been clearly stated?

**2.5 Assumptions and Dependencies** states any assumptions and dependencies made. Each assumption is clearly explained and can be discussed in the next elicitation or interview. However, as mentioned in the elicitation, the system has downtime depending on the weather. The details of how to function the hardware in an extreme weather was not discussed yet. The document could include an assumption and dependency about how the system should behave depending on the weather and how to handle the downtime.

17. Does the document contain all the information called out in the outline for the SRS?

The document is following the standard template (IEEE 830-1998 or ISO/IEC/IEEE 29148:2018) with the correct version numbering and sectioning throughout the SRS. The document does an excellent job at explaining the stakeholders, purposes, and functional requirements, but lacks the non-functional requirements such as Security or Reliability are not mentioned in the **Requirement** section. Rather, these are described in section **3.6 Software System Quality Attributes** which differ from what requirements are. In addition, the document does not explicitly state whether each requirement is functional or non-functional, however, there is classification within specific requirements such as *Performance Requirements* and

*Logical Database Requirements.* All information is provided in the individual requirement statement making them unambiguous as there are no contradictions between the SRS and RFP.

The SRS contains proper formatting with features such as terms and words are defined in **1.3 Definitions, Acronyms, and Abbreviations**. However, the Glossary section could explain the terminologies like cutting-edge computer vision (CV) and AI/ML algorithms mentioned in **2.2 Product Functions**, and lacks proper figure numbering as its done incorrectly.