

DREAM project by Parcevaux - Pouliquen



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Requirement Analysis and Specification Document

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1 Introduction

This document has been prepared to help you approaching Latex as a formatting tool for your Travlen-dar+ deliverables. This document suggests you a possible style and format for your deliverables and contains information about basic formatting commands in Latex. A good guide to Latex is available here <https://tobi.oetiker.ch/lshort/lshort.pdf>, but you can find many other good references on the web.

okk

Writing in Latex means writing textual files having a `.tex` extension and exploiting the Latex markup commands for formatting purposes. Your files then need to be compiled using the Latex compiler. Similarly to programming languages, you can find many editors that help you writing and compiling your latex code. Here <https://beebom.com/best-latex-editors/> you have a short overview of some of them. Feel free to choose the one you like.

Include a subsection for each of the following items¹:

- Purpose: here we include the goals of the project
- Scope: here we include an analysis of the world and of the shared phenomena
- Definitions, Acronyms, Abbreviations
- Revision history
- Reference Documents
- Document Structure

Below you see how to define the header for a subsection.

1.1 Purpose

First of all lets define the different goals.

- G2 : Allow the farmers to retrieve personalized suggestions (On what are based suggestions ? Weather, location, soil humidity, crop, best practices given by others)
- G3 : Allow the farmers to access data about weather and soil conditions and predictions (In what area ? 10/150 km What kind of data exactly ?)
- G5 : Allow farmers to discuss on forums (Check if it is part of G6 or if the means are separated)
- G.1 : Allow farmers to get advices for optimizing their production
 - G.1.1 : Allow farmers to retrieve personalized suggestions if they perform poorly
 - G.1.2 : Allow farmers to discuss with other farmers about their issues
 - G1.2.1 : Allow farmers to create a discussion forum
 - G1.2.2 : Allow farmers to look for a specific topic among discussion forums
 - G1.2.3 : Allow farmers to send messages on a forum already created
 - G1.2.4 : Allow farmers to contact another farmer privately Allow farmers to send a specific help request
- G2 : Allow farmers to get data that impact their production. Allow farmers to access data about weather conditions and predictions
 - G2.1 : Allow farmers to access data about soil moisture Allow farmers to access data about soil organic carbon

¹By the way, what follows is the structure of an itemized list in Latex.

- G3 : Allow policy makers to globally enhance the productivity of the farmers of their area
Allow policy makers to identify well and poorly performing farmers of their area, according to a chosen metric
Allow policy makers to incent well performing farmers
Allow policy makers to fetch best practices among farmers and provide them to others
Allow policy makers to send personalized suggestions to poorly performing farmers

1.2 Scope

1.2.1 World Phenomena

- Farmers seed their crops
- Farmers fertilize their crops
- Farmers measure the amount of fertilizer used for a specific cropping
- Farmers harvest their crops
- Farmers measure their production
- Water consumption figures are updated (every ... ? by farmers or another state system ?)
- Soil moisture figures are updated
- Vegetation index figures are updated
- Rainfall conditions are updated
- Rainfall previsions are updated
- Global Positioning System (GPS) gets the farmer location

1.2.2 Shared Phenomena

- Farmer releases production data
- Farmer enters the fertilizers he uses
- Farmer releases the amount of fertilizer used for cropping
- Farmer receives special incentive
- Farmer receives a request of best practices
- Farmer provides best practices
- Farmer visualizes the weather forecasts
- Farmer visualizes personalized suggestions concerning crops and fertilizers
- Farmer requests for help
- Farmer creates discussion forum
- Farmer searches for a discussion forum on a specific topic
- Farmer sends a message in a discussion forum
- Farmer sends a message to another farmer

- Farmer registers and provides personal data (mail, name)
- Farmer logs in
- Farmer provides exploitation data (location, type of production)
- Policy Maker registers and provides personal data (mail, name)
- Policy Maker logs in
- Policy Maker provides area he is responsible of
- Policy Maker asks for a ranking of the farmers he is in charge of, based on some metric
- Policy Maker searches for a discussion forum on a specific topic
- Policy Maker sends a message to a farmer
- DREAM displays a notification to farmer for production release
- DREAM displays a notification to farmer for lack of soil or weather data
- DREAM displays a notification to farmer for new message from another farmer
- DREAM displays a notification to farmer for new message from a policy maker
- DREAM displays a notification to farmer for help request proposal
- DREAM displays a notification to farmer for best practice
- DREAM displays a notification to farmer for e-voucher
- DREAM displays a notification to policy maker for help request from a farmer
- DREAM displays a notification to policy maker for new registration
- DREAM displays a notification to policy maker for completion of production data

1.2.3 Machine Phenomena

- Identifies best performing farmers with regard to meteorological events
- Identifies worst performing farmers with regard to meteorological events
- Compute personalized suggestions concerning crops and fertilizers
- Fetchs weather forecasts
- Fetchs data from water irrigation system (whatever it is)
- Fetchs user's location

2 Overall Description

Here you can see how to include an image in your document.

Here is the command to refer to another element (section, figure, table, ...) in the document: *As discussed in Section 1.2.3 and as shown in Figure 1,* Here is how to introduce a bibliographic citation [1]. Bibliographic references should be included in a .bib file.

Table generation is a bit complicated in Latex. You will soon become proficient, but to start you can rely on tools or external services. See for instance this <https://www.tablesgenerator.com>.

2.1 Product perspective

2.2 Product functions

the product will be used by farmers, policy makers and agronomists

2.3 User characteristics

2.4 Assumptions, dependencies and constraints

Assumptions TODO :

- Cropping seasons are the same on the whole Telengana State and follow the Kharif/Rabi calendar (see Recommended System of Breeder Seed Indent and Supply)

2.4.1 Domain Properties

here are some domain properties/assumptions

- DP1 : Every farmer has a smartphone (with geo-tracking,... properties)
- DP2 : Soil moisture data are updated every 2 days
- DP : Rainfall conditions are daily updated
- DP : Rainfall previsions (24/48/72h) are daily updated
- DP : Data fetched on the different governmental sites are trustworthy reliable
- DP3 : Farmers are fair when providing data, suggestions and problems
- DP4 : There are at least 2 farmers and 1 policy maker
- DP5 : Data from sensors are accurate (in a ... extent)
- DP6 : Data from the Web are accurate (in a ... extent)
- DP7 : Sensors are always available, or at least, there is a sufficient number of them to properly describe an area (precision of the DP ?)
- DP8 : farmers should have received credentials to log in the application

2.4.2 use cases

Here is the diagram for farmers. We suppose they are logged in the application. In case they are not they can simply log in or create an account and then log in.

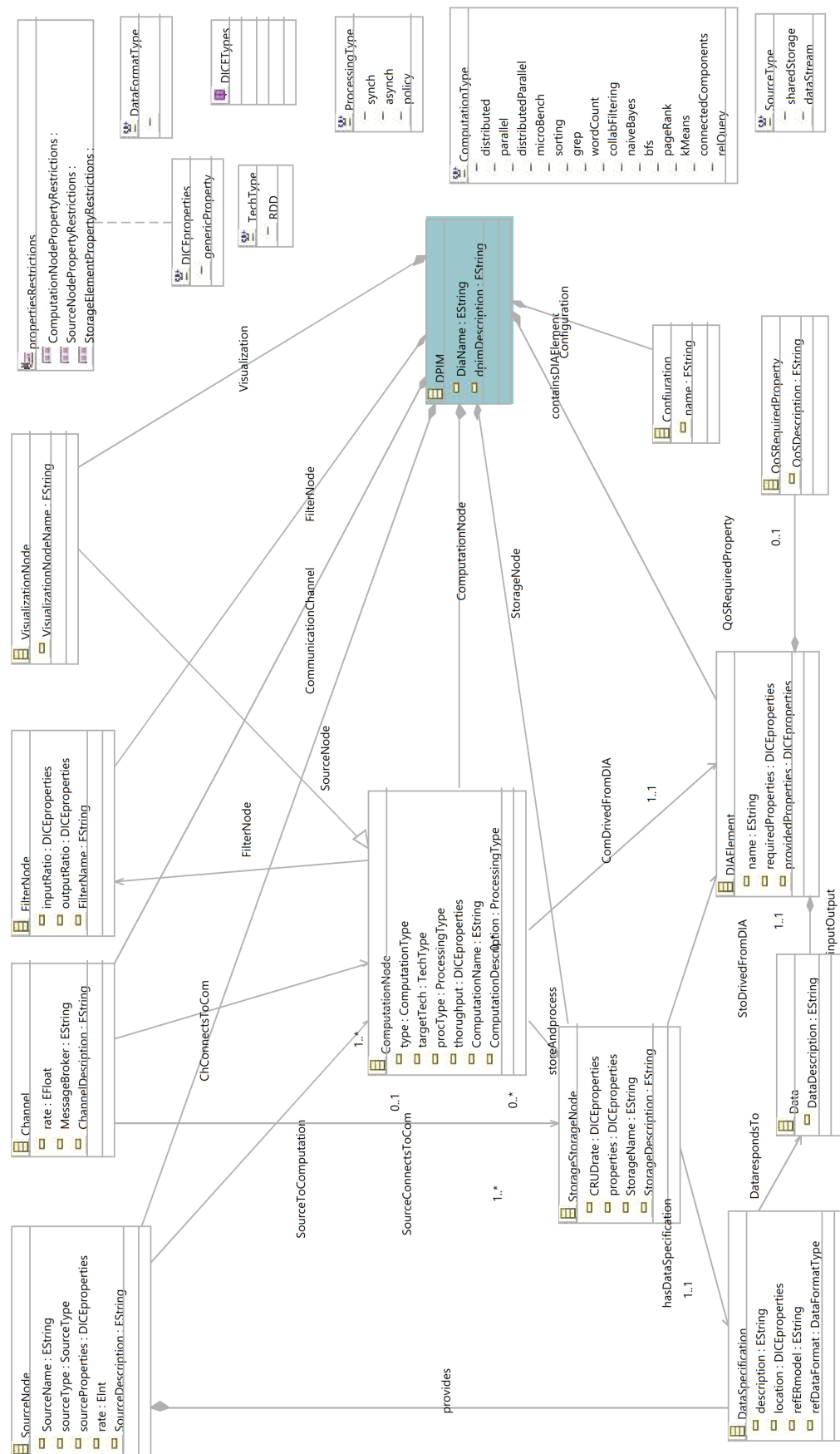


Figure 1: DICE DPIM metamodel.

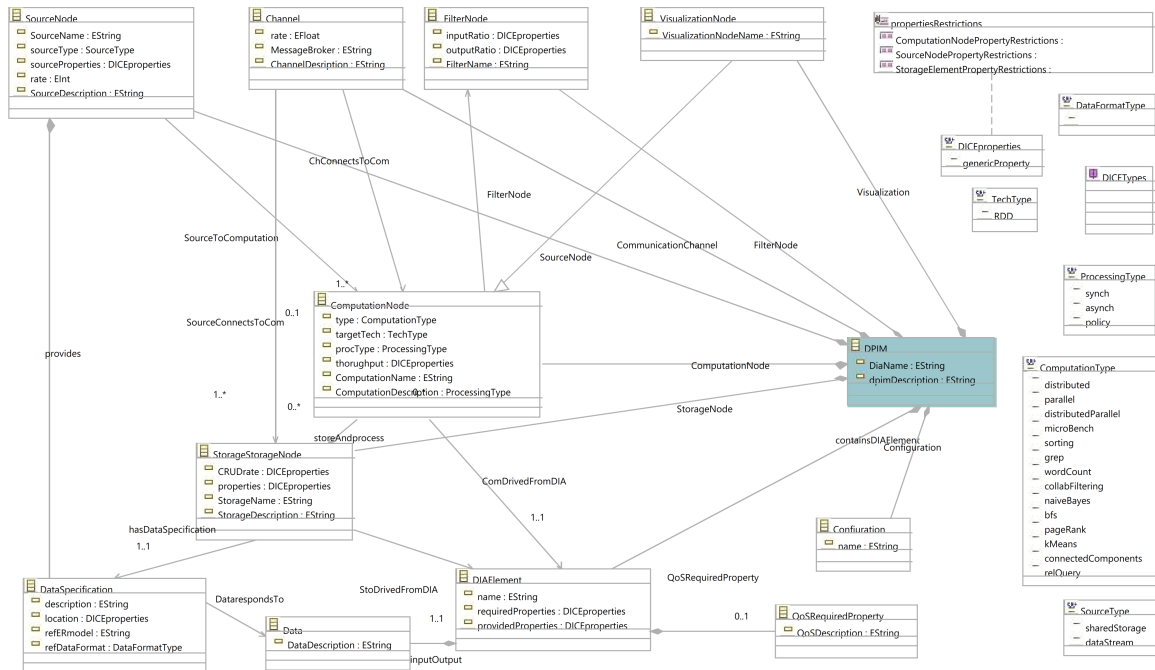


Figure 2: DICE DPIM metamodel in portrait form.

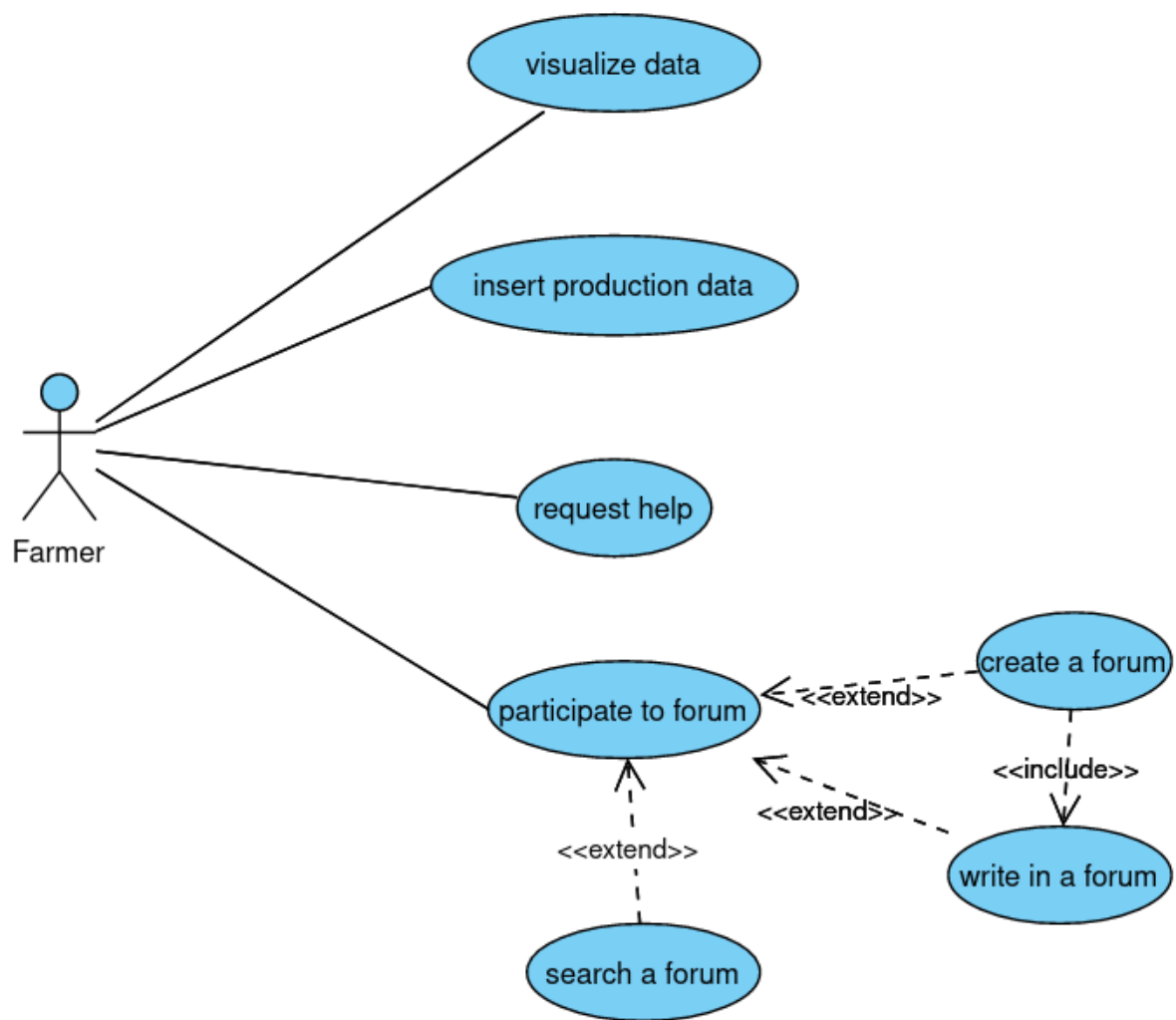


Figure 3: Use case diagram for logged in farmer



Figure 4: Use case diagram for logged in policy makers

3 Specific Requirements

Organize this section according to the rules defined in the project description.

3.1 External Interface Requirements

3.1.1 User interfaces

3.1.2 Hardware Interfaces

3.1.3 Software Interfaces

3.1.4 Communication Interfaces

3.2 Functional requirements

3.3 Performance Requirements

3.4 Design Constraints

3.4.1 Standards compliance

3.4.2 Hardware limitations

3.4.3 Any other constraint ??

Do we keep it ?

3.5 Software System Attributes

3.5.1 Reliability

3.5.2 Availability

3.5.3 Security

3.5.4 Maintainability

3.5.5 Portability

4 Formal Analysis Using Alloy

Organize this section according to the rules defined in the project description.
TO be done

5 Effort Spent

Provide here information about how much effort each group member spent in working at this document. We would appreciate details here.

References

- [1] S. Bernardi, J. Merseguer, and D. C. Petriu. A dependability profile within MARTE. *Software and Systems Modeling*, 10(3):313–336, 2011.