

ESA EOMD



# PIPEMON

Pipeline Route Planning Service

Service Portfolio Specifications

Version 1

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## ACRONYMNS

**TABLE OF CONTENTS**

**1: INTRODUCTION ..... 3**

**2: THE PIPELINE PLANNING SERVICE PRODUCT..... 4**

**2.1: Product inputs .....4**

**2.2: Product outputs.....6**

**2.3: Limitations of eCognition PIPEMON .....6**

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## 1: INTRODUCTION

PIPEMON is a three-year integrated remote sensing and pipeline industry activity that is funded by the European Space Agency (ESA) as part of its Earth Observation Market Development (EOMD) Programme. As part of its portfolio PIPEMON offers a ground and structure motion monitoring service to detect and measure motion along pipelines or over specific installations in relation to landslip, river crossing, tectonic hazard zones and mining / extraction zones.

The end-to-end planning service comprises data provision, value adding, presentation and application provision. The characteristic of such service is that the user in the pipeline operators planning department can fulfill the entire planning process.

In the pipeline planning part of the PIPEMON project, Definiens focused on the added value component by providing Customer Application Service (Definiens PIPEMON) resulting in a Suitability Map. Definiens PIPEMON produces geo-information utilizable for pipeline planning out of EO based and non EO based geo-information.

Terra Map Server provide functionality for the presentation component.

The application component allows to extract easily pipeline planning information to support the planning work process. It can be combined by further services around the operator's pipeline services portfolio. The flexibility of the Service allows to implement customer data (e.g. customer geo-information about the pipeline network, cost functions, ERP data etc.) to provide the full range of available planning information.

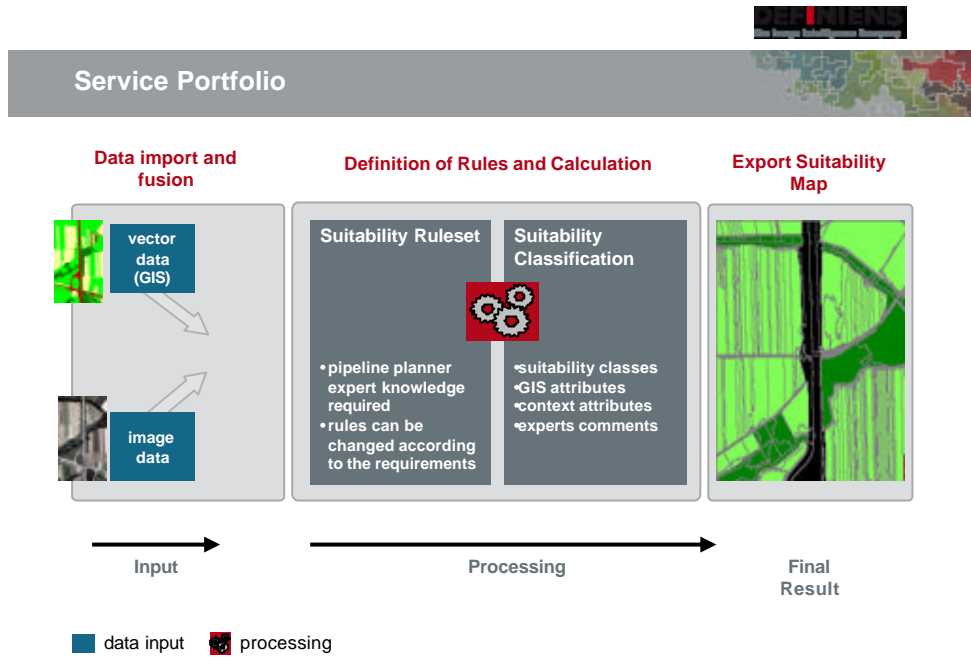
The User is Guided through the processing steps by an easy to use and self explaining Wizard.

The presentation component enables the user to process the provided geo-information. This can use various methods and visualization techniques.

The data pre-processing component produces and makes available geo-information out of raw EO based and non EO based geo-data.

This document provides the technical specification of the Pipeline Planning service product.

2: THE PIPELINE PLANNING SERVICE PRODUCT



121

2.1: Product inputs

The following table presents the datasets to be used as inputs for the generation of the Suitability Map.

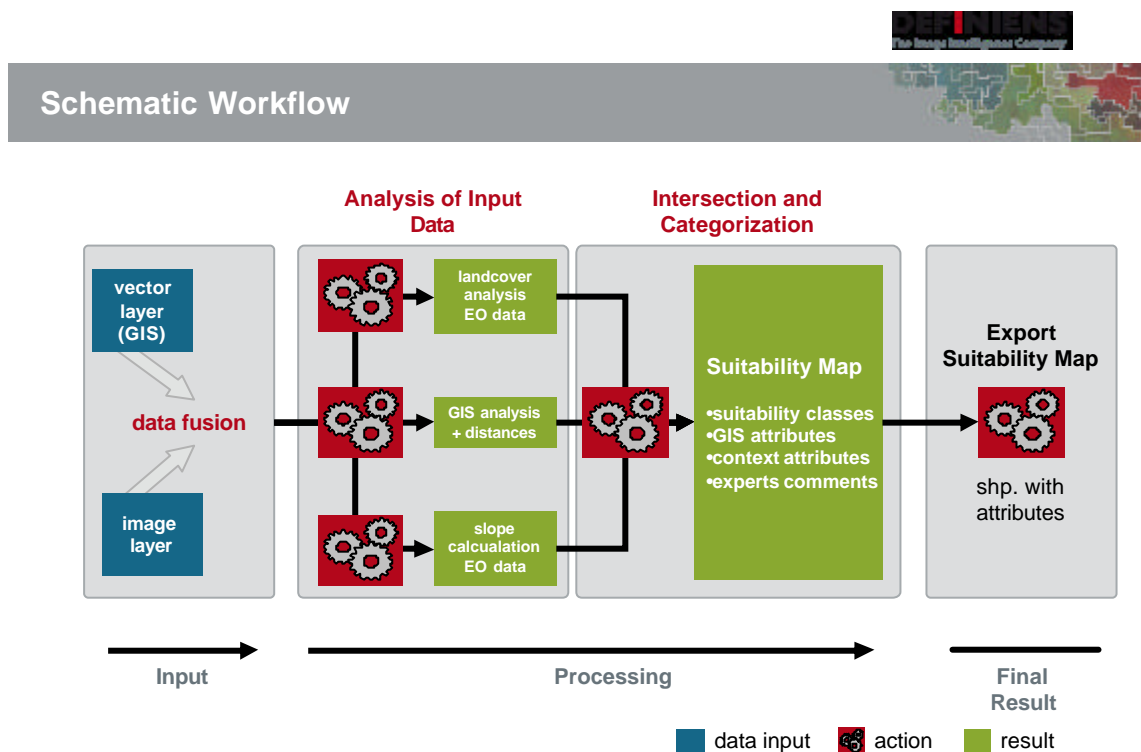
Import File format	File extension	Remark
Arc/Info Binary Grid		
Compuserve GIF	.gif	
ER Mapper Compressed Raster	.ecw	
ESRI ASCII GRID Files	.asc	
Envisat ASAR Files	.N1	
Erdas Imagine Images	.img	
JPEG JFIF	.jpg	
JPEG 2000	.jp2	
PCIDSK	.pix	
Portable Network Graphics	.png	
Tagged Image File	.tif	
Tagged Image File (Geocoded)	.tif	
Windows or OS/2 Bitmap	.bmp	

All import formats supported for image layers also apply for thematic layers. Additionally, .shp vector files are supported.

For polygon shape files and for .img files, the attribute table is automatically selected. For all other formats the respective attribute table has to be specifically indicated. From the Load attribute table dialog, the following file formats can be selected:

- .txt ASCII text files
- .dbf Dbase files
- .csv Comma separated values

The selected data is fused and a rule set calculates the Suitability for every area using Definiens Cognition Network Language.



151

The first step using Definiens PIPEMON is to generate objects. Depending on which data is used the image objects are calculated after their homogeneity and/or on basis of the boundaries of the thematic data (e.g. a digital cadastral map).

The analysis of the input data is done within three steps. A land cover classification of the EO data, a analysis of all GIS data and, if available an analysis of an elevation information.

These three analysis levels are then intersected and categorized after certain criteria and a Suitability map is created. The criteria for the Suitability calculation can be adapted in a very flexible, transparent and easy way.

## 2.2: Product outputs

The calculated Suitability Map is vectorised in Definiens PIPEMON and exported as a .shapefile. All required attributes can be attached to the file.

## 2.3: Limitations of eCognition PIPEMON

A limitation can be the technical equipment. If only one Desktop PC is available only a certain amount of data can be processed. When setting up a cluster of several machines the processing of the data can be spread over all in parallel processing.

AS the Application is tested up to now only on two test sites it is in a prototypical stage. To confirm and refine the Application more test sites are required.