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DVE Simulation architecture and preliminary guidelines for model software implementation

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Executive Summary

This document describes the conceptual structure of the DVE simulation software with particular attention to generic features that the core of the simulator should provide to the developers.

Starting from a simple walkthrough on **simulation concepts and techniques** the deliverable describes the choices made for the conceptual tool. Chapter 1.1 highlights the importance of the modelling phase describing also the process to obtain a software model from a conceptual model.

On top of the final user that is implicitly identified in the AIDE partners, Chapter 2, describes the **technological aspects for usage and development** from definition of the hardware and software running platform to the definition of the development languages, frameworks and related technologies for developers. In this study, market information has been used to better outline which platform best suits the final user for the simulator.

A more in depth description of the simulator and the modules is carried on Chapter 3. Three modules have been identified: the Simulation Manager, the Models Interface and the Data Collection and Representation Engine. All three have been described to the maximum extent possible in the scope of this document, trying to outline critical aspects and potential innovations.

No specific work has been done on model development because of the **decoupling of the simulator from the models** described. Instead, a specific simulator-model interface has been outlined leaving to further activities the freedom to choose which model to implement and use. In a future scenario, a library of models should be kept for different purposes, using the same Simulation Manager and user interface.

Chapter 4 outlines some **guidelines for the future development of D, V and E models** based upon the state of the art of the theoretical models coming from WP1. A refinement of this specification will come out once theoretical models will be complete.

A description of **a hypothetical simulation process** and some consideration over the various aspects of this process (setup, run and analysis) in Chapter 5 leads to the description of the first successful implementation of the simulator concepts. The **Concept Test Tool**, described with its provisory models in Chapter 6, validates all the conceptual work from previous chapters.

Annex I and II contains the UML diagrams of the test tool and some images taken during a simulation process.