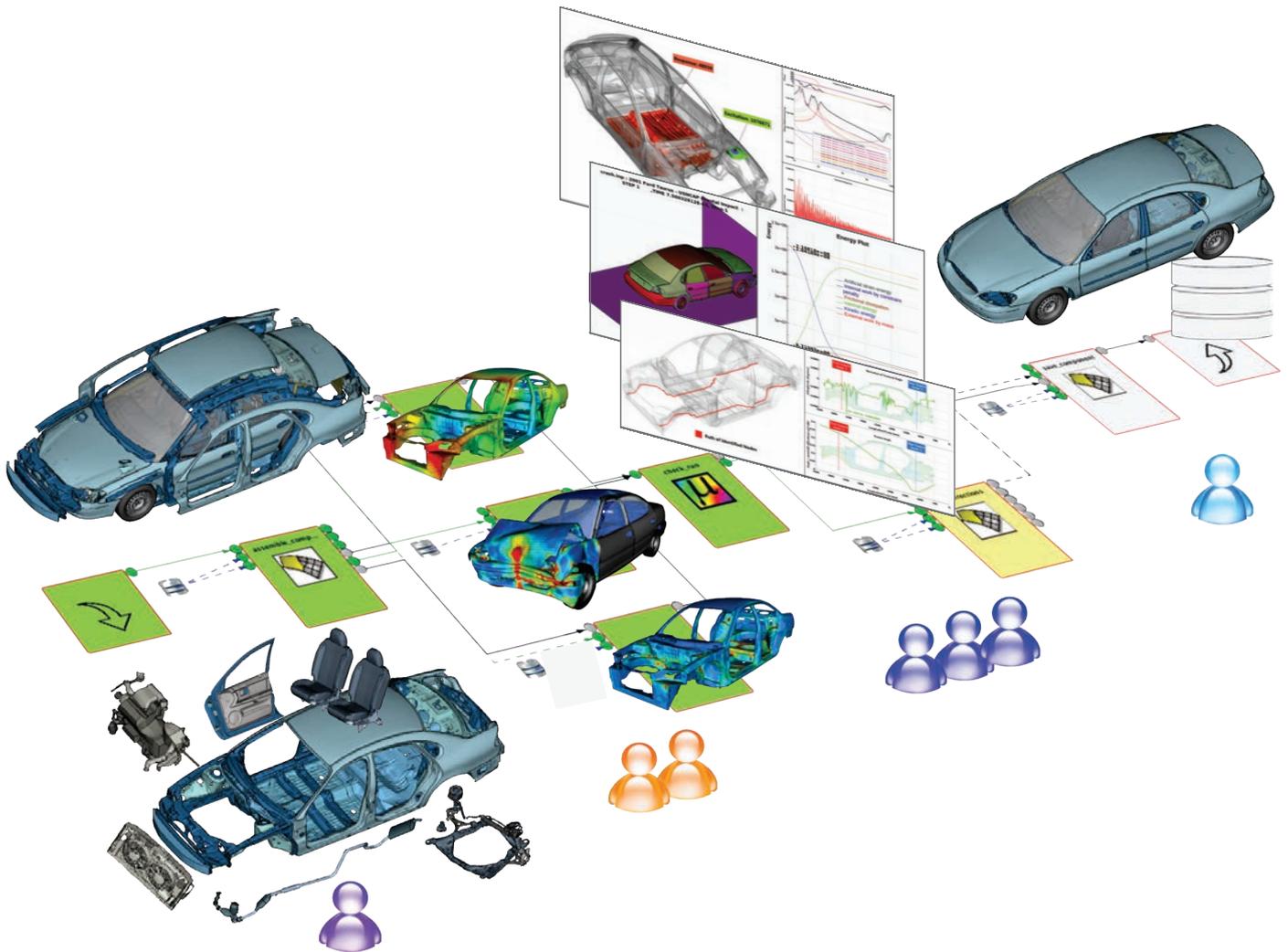
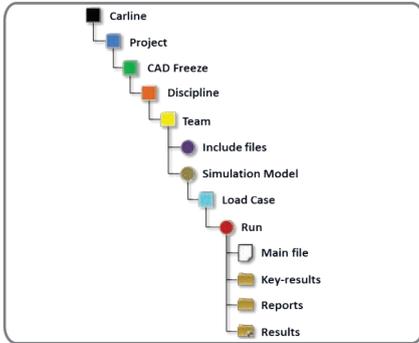




unique solution
for CAE workflow
and data management

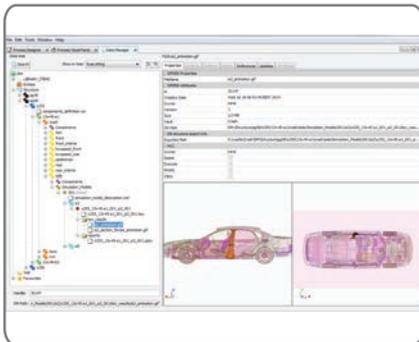


Addressing the problem of contemporary CAE community to integrate data, processes and resources, BETA CAE Systems brings forth a new solution for driving high quality and efficient virtual product development procedures. This new software tool for Simulation Process, Data & Resources Management, named SPDRM, provides a simple and intuitive way to capture, deploy, manage, and improve CAE process workflows by integrating the resources, the tools, and the data associated with these. Reflecting a deep understanding of the demands of simulation and its role in the enterprise, it delivers CAE tasks and associated data to analysts, engineers, designers, suppliers, and managers.



Simulation data management

SPDRM offers a complete solution for the management of all simulation data, from model data and library files, to methodologies, key results, and reports. It integrates a flexible version control system that enables archival of different versions of data during the development of the model and it keeps track of data dependencies, facilitating the effortless identification of data chains. Through its custom data models, it can adapt to any data organization scheme and it can handle unlimited user-defined meta-data. Furthermore, its out-of-the-box support for engineering data elements like the part, the sub-system, the simulation model, and the simulation run makes it easily deployable in engineering environments since it comes with inherent knowledge of CAE terms and procedures.



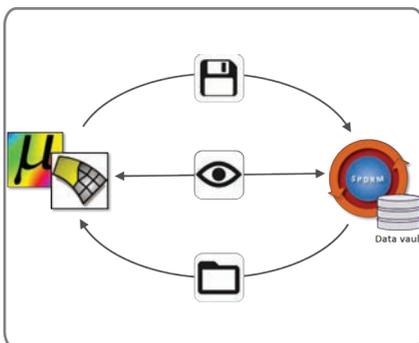
With SPDRM, the enterprise data are secure. The software enables the definition of certain permissions on each data object that control whether a user can view it, modify it, or delete it. Permissions are defined on a user-role basis, allowing fine-grained access control that comes on top of that of the file-system.

Workflow management

Using the "Process Designer" workspace of SPDRM, the user can define simple actions, organize them into sub-processes, define their order, and associate these with the right data, human resources and tools. Each action of a process can be carried-out either automatically, through a Python script, or through an external application. Therefore, SPDRM processes can be as simple as "edit a document, archive it, and email it" or more complex as "download some data from the PDM system, let the modeling team prepare the CAE model, and then simulate a loading scenario". The designed workflows are saved as templates in the process library, which inherently provides version and access control.



Additionally, a dedicated workspace is offered for the execution of the workflows. During process execution, SPDRM automatically informs the designated workflow actors about their assignments, communicates the correct data among actions, and monitors their progress, giving a clear visualization of the workflow status with color coding of the tasks.



Interfaces

SPDRM, standing out from other SDM systems, comes with a built-in interface to ANSA and META, allowing the direct usage of its data repository from the ANSA DM.

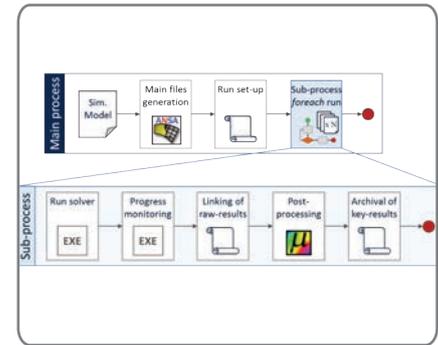
In this way, privilege-based access to the SPDRM data is granted after the secure authentication of the users through ANSA and META. Once a user has been verified, it is possible to browse the SPDRM data straight through the ANSA-META DM browser and perform all data I/O operations through the standard functionality of the pre- and post-processor.



Furthermore, SPDRM offers an API (application programming interface) for the direct communication of data to external applications. Through this API, external applications can directly read and write data in the SPDRM data server.

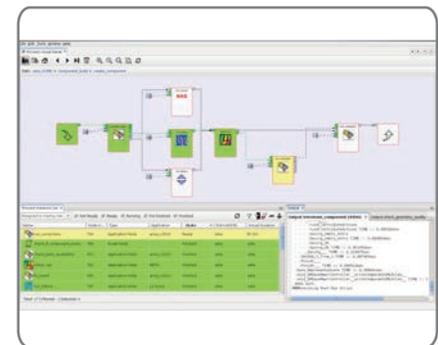
Scalability in workflow build-up

Starting from individual engineers and moving up to workgroups, departments and suppliers, all workflow actors can independently use SPDRM to describe just their own piece of work using their preferred software tools and data formats and then publish it for integration into a higher level process. In this way the complete workflow consists of smaller sub-processes, each built by experts, capturing the engineering knowledge and expertise in each particular field.

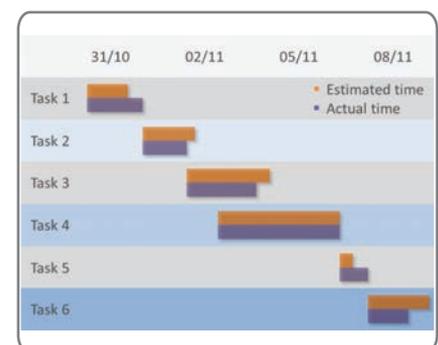


Workflow improvement

Once the complete workflow is built, SPDRM run-time process visualization and monitoring tools provide valuable information about the current state of the workflow, display which actions are completed, which are currently running (and with which data, by which resource, to what extent etc.), and which actions are still pending. Through these tools, it is possible for an authorized user to intervene and alter the process at execution time, in order to bypass an unforeseen stoppage or give a workaround to an action that is taking too much time to complete.

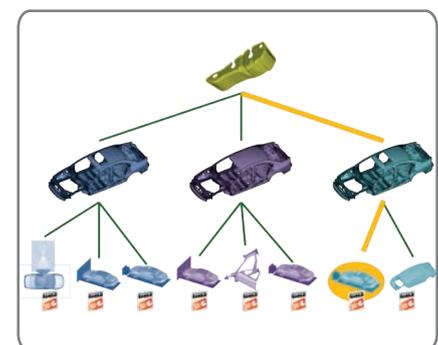


SPDRM also integrates process "profiling" tools that use the duration statistics of process tasks in order to provide estimates for the overall turnaround time of similar processes. This information is visualized through a project schedule graph tool, where the project manager can see the estimated versus the actual time for each of the tasks, check if the project is on track and make informed decision about the management of future operations. In this way, the effectiveness of the existing processes is constantly evaluated.



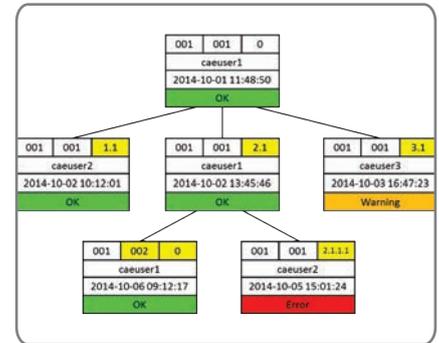
"Search and Find"

The data search tools of SPDRM enable the identification of data based on their meta-data or on their relations with other data. Through the search workspace, analysts can identify data that were nearly impossible to track down with traditional, file-based SDM systems. For instance, a query could identify "the side-crash includes of the body-in-white that were generated in the beginning of March by John", or "the latest key-results of the fmvss208-32kph-unbelted simulations of project x255", or even "all the runs affected by a part, that was later found to have wrong material properties".



Visualization of model history

The SPDRM version tracking capabilities enable the archival of new data with their simultaneous association with their predecessors. In this way, the system keeps track of the data evolution which is then presented in concise, tree diagrams, for both sub-systems and simulation data. Through these diagrams, the user can immediately get basic information on each data object, as well as identify its differences from its predecessor.



Resources management

SPDRM offers convenient administrative tools for the definition and handling of human and non-human resources. Using the “User Management Console”, the system administrator handles the human resources of the system. Users can be created automatically, using the enterprise user management system, and are then grouped according to their role, making it possible for the same user to have different privileges when logging into the system with different roles. Moreover, through the “Registered Applications Console” the administrator also registers the applications to be used by the workflows. Thus, the exact version and the default running options of applications are centrally controlled, easing the maintenance task for the system administrator.

	view	modify	delete	execute
	✓	✓	🔒	✓
	✓	🔒	🔒	✓
	🔒	🔒	🔒	✓

Benefits

- the overall process consistency, at all levels,
- the standardization of the procedures,
- the harmonization of operations throughout the organization but also with its suppliers,
- the traceability of data and meta-data, their modifications and variations,
- the reduction of data redundancy,
- the process progress monitoring and the effective processes quality management,
- the productivity increase thanks to the automatic assignment of tasks as soon as their input becomes available
- the repeatability of processes, even when using updated or different datasets and software tools,
- the quality improvement and standardization of the deliverables,
- the increase of confidence in CAE, plus the time and cost reduction of the overall simulation process,
- the maximization of transparency in decision making,
- the maximization of collaboration between engineers,
- the maximization of reuse, for both data and best practices,
- the maximization of capability in delivering fast, results of high quality.