Success Story

“Enosis supports world’s leading virtual product validation software suite used by the major automakers”

The Client

A world leader and pioneer of developing engineering simulation software used to predict how product designs will operate and how manufacturing processes will behave in real-world environments. They are developing software to solve the most challenging engineering problems allowing engineers to refine and validate designs at a stage where the cost of making changes is minimal. Their simulation solutions are deployed across automotive, aerospace, defense, electronics, marine and shipbuilding industries serving engineers and researchers in corporations that include Airbus Industries, Air Force Research Lab, Bell Helicopter, Boeing, Rolls-Royce, John Deere, LG Electronics, Lockheed Martin, NASA, Toshiba Corporation, US Navy, GE, Hitachi, Toyota, Honda, BMW and Ford.

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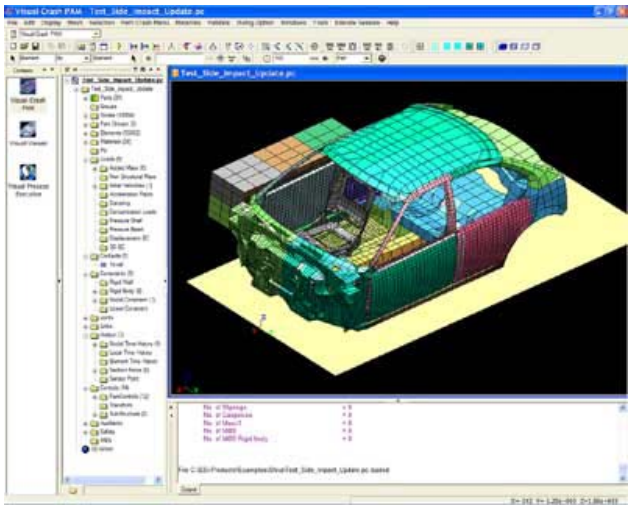
THE SOFTWARE

An engineering simulation solutions suite to predict how product designs will behave in manufacturing and real-world environments. Its integrated, modular and extensible set of solutions address the needs of organizations in automotive and ground transportation industries to study the interactions of assembly components on-screen, before incurring the costs of physical prototypes. The performance solutions simulate static or dynamic loads to evaluate design's performance under stress, strain, and displacement by applying a wide variety of physics-based models to simulate real-world operating conditions for your design.



Software Screenshot

The Solution suite combines several applications and technologies for saving the time and cost of prototyping, while creating safer, more durable products by predicting structural failure thresholds due to yielding, overheating, buckling, and fatigue. The most successful automotive companies including Audi, BMW, DaimlerChrysler, Toyota, Ford, General Motors, Honda, Hyundai, Isuzu, Mazda, Mitsubishi, Nissan, Porsche, Renault, Volkswagen Automotive and Subaru are differentiating themselves by employing the aforementioned simulation technologies in the earliest stages of design to reduce development cycles and lower costs.

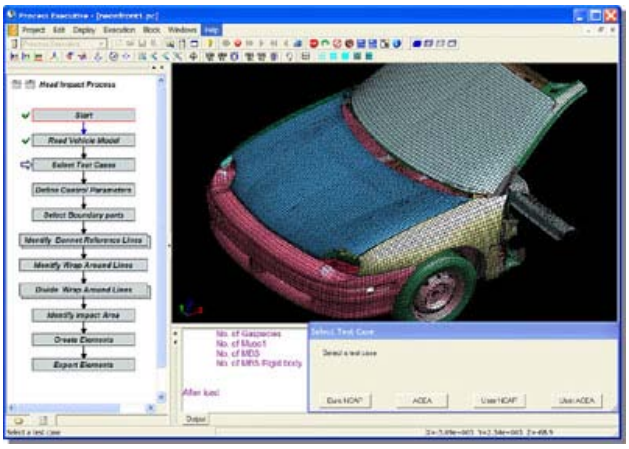
CHALLENGES

- To answer the needs of aforementioned simulation suite, the application development teams require a completely configurable software framework with highly usable GUI to design application layout and API(s) for developing custom functions
- The framework also needs to support simultaneous processing of several documents, adaptive visualization, popular CAD/CAM/CAE files formats, animation, 3D drawing, analysis of models and plug-in applications
- Enhancements, modifications and incorporation of new features in the software framework in a timely and diligent manner is crucial for a successful release of the VE product suite in due time
- The teams and processes were geographically spread across US, France, India and Dhaka, making maintenance of close collaboration a critical challenge
- Managing the software framework was a challenge due to its size and the wide spectrum of engineering applications it had to support

THE SOLUTION

We have been upgrading, enhancing and providing developer support for a unified software framework that facilitates the development of superior applications in a timely manner; internally referred as 'HOST'. The simulation suite adheres to plug-in architecture where the applications are developed and deployed as plug-ins to the software framework. Characterized by the high usability of the GUI, the framework follows Document-View architecture and provides highly performing

development tools for the application developers. This facilitates modeling, interoperability and visualization in seven different platforms namely, Windows (both 32 and 64 bit), Linux (both 32 and 64 bit), IBM, Sun and HP. HOST enables the application developers to define their own application from a very large set of packaged tools characterized by their friendliness to use and interoperability. It allows the users to display attributes which contain topology and geometry; and interactively work with their contents. If the user wishes to connect application specific data, the pre-defined set of attributes can be easily extended by user defined attributes.



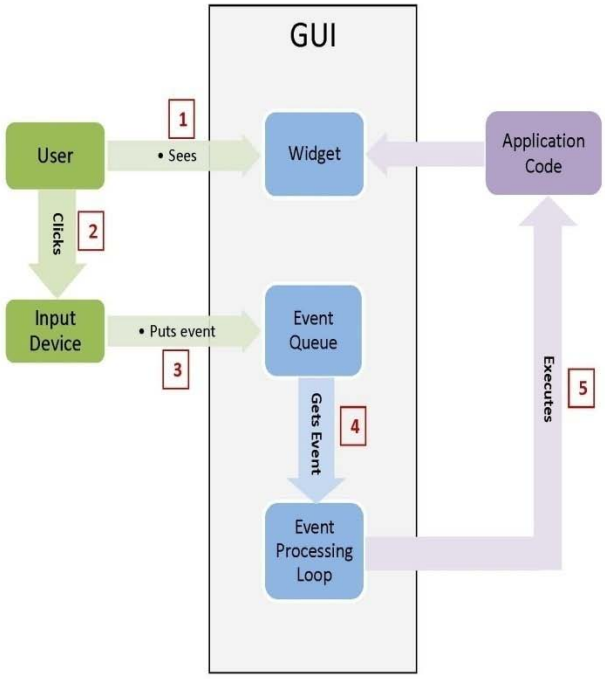
Software Screenshot

One of the main features of the framework is support for 'On-The-Fly' customization and personalization of the screens through context-based menus and clicks. The development team had to come up with innovative techniques to ensure such superior experience for the end-users.

The Application framework consists of:

- Set of visual objects (often called widgets) such as menus, buttons, and icons
- Event queue
- Event processing loop.

The GUI objects form the visual elements of the GUI that are seen by the application's user are connected to the internal application code. The application user generates events by operating an input device such as a pointer or keyboard while looking at the visual elements of the GUI. The input device generates an event which the operating system collects and puts on the GUI's event queue. The event processing loop acquires the event from the event queue and executes the application functionality that is associated to the GUI object. The following diagram illustrates this event sequence.



Event Sequence

HOST is a complete set of tools answering the needs of application developers by incorporating:

- Graphic interface that helps to visualize, explore and analyze the results of development
- 3D display management capabilities
- Simultaneous processing of several documents
- Adaptive visualization
- Input/output of numerous major industry standard CAD/CAM/CAE file formats
- Animation

- Projection from 3D to drawing
- Measurements and analysis of models
- Transparent « plug-in » of applications

BENEFITS

- Provides a whole set of functions eradicating the need to reinvent them for different applications
- Graphic interface inspired from office automation products making it easy to use and learn
- All-in-one framework and uniform look-&-feel speeds up data exchange
- Automated processes and reports generation yield improved productivity
- Best-in-class data model offers a very versatile environment where new applications and interfaces with tier solutions are easily implemented

TOOLS AND TECHNOLOGIES

Programming Language: C**,** C ++, MFC, Open GL

Platform: Win XP 32/64, Vista, Linux 32/64

Tools: Valgrind, In house tools for memory and performance measurement