IBM Product Lifecycle Management

Product Synthesis solutions

CATIA V5

CATIA® V5 is the leading product development solution for all manufacturing organizations, from OEMs, through their supply chains, to small independent producers. The range of its capabilities allows CATIA V5 to be applied in a wide variety of industries, such as aerospace, automotive, industrial machinery, electrical, electronics, shipbuilding, plant design, and consumer goods, including design for such diverse products as jewelry and clothing.

CATIA V5 is the only solution capable of addressing the complete product development process, from product concept specifications through product-in-service, in a fully integrated and associative manner. It facilitates true collaborative engineering across the multi-disciplinary extended enterprise, including:

- *Style and form design*
- *Mechanical design and equipment and systems engineering*
- *Managing digital mock-up*
- *Machining*
- *Analysis*
- *Simulation.*

CATIA products are based on the open, scalable V5 architecture.

By enabling enterprises to reuse product design knowledge and accelerate development cycles, CATIA helps companies speed-up their responses to market needs and frees end-users to focus on creativity and innovation.

Product Synthesis solutions

Get it right first time!
The extensive range of tools provided with CATIA product synthesis solution set provides easy automation and validation of design and manufacturing data. This also allows the effective capture and reuse of corporate know-how. Some of the highlights include:

Focus on the knowledgeware solutions
The CATIA knowledgeware solution set turns implicit design methods into explicit knowledge for obtaining the optimum design.

- ***The core capabilities of CATIA V5—*** *Enjoy the power of product synthesis embedded within its easy-to-use multi-discipline tools. The CATIA V5 knowledgeware solution turns implicit design methods into explicit knowledge and allow users to capture and reuse corporate know-how throughout the product lifecycle. Users can add and share this extra intelligence in every phase from design to manufacturing, for simple applications or enterprise-wide deployment.*

- ***The capture of expertise and automation of business processes—****The knowledgeware solutions combine the power of explicit rules that define the product behavior, with interactive capture of design intent as the design is built. As a result, the system acts as an expert advisor to guide users through the tasks, warning them of rule violations and conflicts, thus automating design generation and reducing risk. The full power of your accumulated product knowledge can be embedded directly in the design, by storing it in catalogs. It can also be leveraged through the use of custom applications based on CATIA V5 processes, allowing designers to accelerate and secure the design process cycle time, while being more innovative.*

- ***Knowledgeware tools to explore more of the benefits of design alternatives and automated goal-driven design optimization—*** *The knowledgeware solutions permit users to assess and quickly determine the best alternative for a design amongst numerous combinations of parameters and constraints. Its ability to take multidisciplinary specifications into account, such as distance, cost, volume and time, across all the CATIA V5 products, enables users to perform powerful and complete assessments of designs.*

- ***Assured design consistency and quality—****knowledgeware solutions ensure compliance to best practices and corporate standards. Users can validate their designs and ensure acceptable development standards are maintained enterprise-wide. They also assure designers of the quality of their design, enabling them to make the right decisions, faster.*

- ***Solutions that facilitate brainstorming and innovation—*** *Functional and conceptual definition optimization tools are designed to formalize designs. This allows users to detect engineering problems in the functional definition of the system at the conceptual development stage. They can then use solution guidance and links to knowledge databases as a powerful tool for solving them.*

Focus on DMU solutions

CATIA DMU solutions support complex DMU reviews and simulations for quick and efficient engineering and process decisions.

- ***Dramatically reduced costs and design cycle time—****DMU solutions enable people involved in engineering and process decisions to perform a number of time and cost-saving functions. These include collaborative and immersive visualization, navigation, review and simulation of digital mock-ups and technical data of any complexity. Leveraging collaborative design review methodologies across the extended enterprise, DMU solutions allow customers to place the digital product definition at the center of their development process, transforming product information into business intelligence for fast and decisive project decisions.*
- ***Increased levels of responsiveness throughout the design chain—****DMU solutions exploit e-business characteristics throughout the product lifecycle, and are a key component of the digital enterprise. They form a platform on which customers can achieve a real competitive edge through product innovation. DMU solutions strengthen communication across the extended enterprise by providing advanced tools to support collaborative design and manufacturing decisions. Their tight integration with ENOVIA® VPLM solutions contributes to raise extended enterprise performance.*
- ***Proven support for all DMU needs—****DMU solutions offer a unique and extensive combination of scalable applications. They can be used by all user profiles and all levels of specialization in the enterprise at any stage of the digital product development. They also address requirements from design review to quality verification and simulation. Built on the industry-leading CATIA V5 architecture of Dassault Systèmes, this solution set delivers seamless interoperability, reduced training and support requirements, ease of installation and enhanced team collaboration. This enables an accelerated response to business needs and investment protection. Its complete 'plug and play' design review environment and extensive, realtime, multi-user conferencing and reporting capabilities allow all team members to collaborate in a completely interactive review process.*

Configurations

Knowledge

CATIA—Business Knowledge Process Definition 3 (KD3)

The KD3 configuration accelerates a company's business processes, while ensuring compliance with its best practices to take advantage of its intellectual capital. It offers users access to set advanced design parameters as well as knowledge capture and optimization tools. These features are used to define standard rules and checks for design quality assessment.

Users can optimize the design process by exploiting the synergy between the suite of powerful CATIA V5 knowledgeware tools and its ability to maximize the value of corporate knowledge with V5-empowered best-practice workbenches. 'Capture, reuse, automate, explore, optimize, validate', is the unique philosophy that guides the KD3 configuration: Get it right first time!

Products

Knowledge

CATIA—Knowledge Expert 1 (KE1)
CATIA—Knowledge Expert 1 (KE1) allows designers to import and use corporate knowledge stored in rule bases created using CATIA—Knowledge Expert 2 (KWE).
Thus design compliance is ensured with established standards. These rule bases automate knowledge processes such as:

- *Best practices*
- *Application processes*
- *Design validation and corrections.*

The reports generated provide better identification of standards violations and help to implement necessary corrections.

As an integrated product, CATIA—Knowledge Expert 1 (KE1) can be used in conjunction with all other Version 5 products to share process applications throughout the enterprise.

The Knowledge Expert solution consists of a buildtime product, CATIA—Knowledge Expert 2 (KWE), and a runtime solution, CATIA—Knowledge Expert 1 (KE1).

CATIA—Product Knowledge Template 1 (KT1)
CATIA—Product Knowledge Template 1 (KT1) allows the instancing of feature, part and assembly templates, created using CATIA—Product Knowledge Template Definition 2 (PKT), and their modification through the use of appropriate input values and geometry references. The powerful features of CATIA Version 5 allow the intelligence built into such templates to be highly adaptive to its usage context.

Instances of these templates also take advantage of the CATIA Catalog infrastructure to allow easy access to templates references.

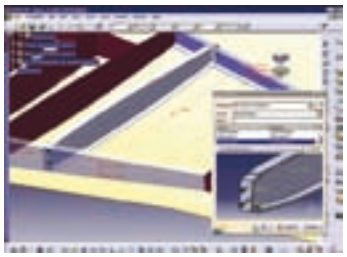
In the extended enterprise, this allows other groups to re-use knowledge encapsulated within such templates through the application of best practices. At the same time, it restricts their ability to fully examine the intellectual capital, protecting the know-how of the creating organization while still facilitating its re-use.

This significantly improves design productivity and can promote standardization of design methodology.

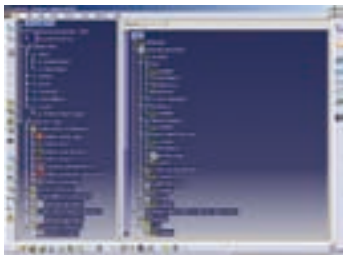
CATIA—Product Knowledge Template 1 (KT1) fits the needs of all types of designers in all industries.

The Product Knowledge Template solution consists of a buildtime product, CATIA—Product Knowledge Template Definition 2 (PKT), and a runtime solution, CATIA—Product Knowledge Template 1 (KT1).

CATIA—Knowledge Expert 1 (KE1)



CATIA—Product Knowledge Template 1 (KT1)



CATIA—Business Process Knowledge Template 2 (BK2)

CATIA—Business Process Knowledge Template 2 (BK2)

The CATIA—Business Process Knowledge Template solution first allows companies to model any of their best practices and know how. It's done in a simple and intuitive way, without coding. From complex conceptual studies in the automotive to airframe structure generation for instance, an expert is able to capture, model, automate design and engineering tasks, embed core-knowledge rules and checks within those tasks. In a second step, the captured best practices are delivered within the enterprise through a customized V5 pseudo-application including all the required features and process knowledge.

The CATIA—Business Process Knowledge Template solution takes advantage of the wide range of products in the CATIA V5 portfolio and leverages their capabilities in a powerful process-driven way. End-users have access to these high level V5 pseudo-applications in the same way as they have access to any CATIA V5 products. Users can create products while following a pre-defined methodology derived from the enterprise's best practices as captured by the experts.

Guided by skilled rules and checks, free from time-consuming, repetitive design tasks, and benefiting from knowledge-driven task automation, users can then unleash their creativity and focus on innovation.

The company increases considerably its competitiveness by providing better products and reducing costs.

The Business Process Knowledge Template solution is divided into a buildtime product, CATIA—Business Process Knowledge Template 3 (BKT), and a runtime solution, CATIA—Business Process Knowledge Template 2 (BK2).

With the CATIA—Business Process Knowledge Definition 3 (KD3) configuration find in one seat all the power of the CATIA V5 knowledgeware solutions.

Products

Knowledge

CATIA—Knowledge Advisor 2 (KWA)
CATIA—Knowledge Advisor 2 (KWA), allows designers and design engineers to capture their know-how and re-use it as best practices.

Users can embed knowledge in their design through formulas, rules, reactions and checks, which can be leveraged at any time. Resident knowledge can then be considered and acted on in context. Its meaning is also accessible. For example, a check intent can highlight the parameters involved in a verification, making it quick and easy to recognize how a standard has been violated.

By accelerating the exploration of design alternatives with regard to rules, CATIA—Knowledge Advisor 2 (KWA) helps users to make better decisions and reach optimal, error-free designs in a shorter amount of time.

It is also used to convert implicit practices into explicit knowledge, thus automating design generation and reducing the risk and cost of repetitive tasks.

As an integrated and scalable product, CATIA—Knowledge Advisor 2 (KWA) should be used in conjunction with all other Version 5 products to add and preserve intelligence from design to manufacturing process.

As a scalable product, it allows users to manage and exploit know-how and intents, from parametric rules and checks to advanced contextual reactions in products and processes. It also allows users to define 'smart' components for morphing re-use.

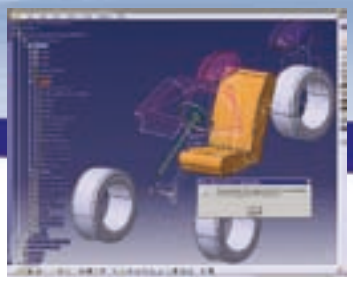
CATIA—Knowledge Expert 2 (KWE)
CATIA—Knowledge Expert 2 (KWE), allows an expert designer to build-up and share corporate knowledge in rule bases, and leverage that knowledge across the enterprise to ensure design compliance with established standards. These rule bases capture and automate knowledge processes such as:

- *Best practices*
- *Application processes*
- *Design validation and corrections.*

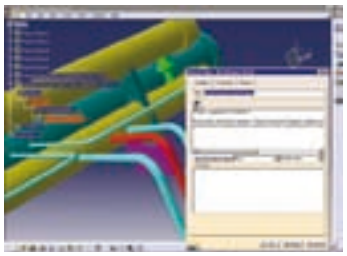
As part of the native capacity of the Version 5 products and architecture to dynamically capture design specifications, CATIA—Knowledge Expert 2 (KWE) delivers a unique way to specify corporate rules and checks which must be employed throughout the corporation to ensure compliance with best practices. Generated reports allow end-users to better identify violations of standards and implement necessary corrections.

As an integrated product, CATIA—Knowledge Expert 2 (KWE) can be used in conjunction with all other Version 5 products to build process applications and share them throughout the enterprise.

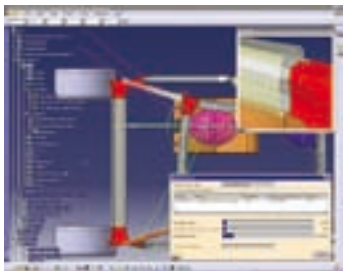
The Knowledge Expert solution consists of a buildtime product, CATIA—Knowledge Expert 2 (KWE), and a runtime solution, CATIA—Knowledge Expert 1 (KE1).



CATIA—Knowledge Advisor 2 (KWA)



CATIA—Knowledge Expert 2 (KWE)



CATIA—Product Engineering Optimizer (PEO)

CATIA—Product Engineering Optimizer 2 (PEO)

CATIA—Product Engineering Optimizer 2 (PEO) allows users to explore additional design alternatives and accurately optimize designs utilizing two complementary tools—Design Of Experiments (DOE) and Design by Goal.

Design Of Experiments

It's clearly difficult to assess and quickly determine the best configuration for a design because of the numerous combinations of parameters (such as lengths, masses and deformations).

CATIA—Product Engineering Optimizer 2 (PEO) enables users to perform virtual experiments taking into account as many parameters as required. Thus, Design Of Experiments allows users to:

- *Evaluate interactions between parameters*
- *Make parameter predictions*
- *Identify which parameter is the most influential.*

DOE is a natural and efficient way to explore and optimize design. It allows users to estimate an optimal design with a few computations and also perform better, faster optimizations. DOE dramatically reduces the number of design iterations avoiding costly re-design and increasing productivity.

Design by Goal

CATIA—Product Engineering Optimizer 2 (PEO) helps define optimization targets and means for multidisciplinary specifications. Objectives, captured interactively, drive the system to determine an optimal solution for designs with many variables and criteria.

Objectives are embedded into CATIA V5 documents and leveraged through sharable, integrated and automated goal-driven specifications. Real-time feedback and outputs are provided to satisfy users' requirements for immediate assessment or analysis.

As part of the native capacity of Version 5 products and architecture to dynamically capture design specifications, CATIA—Product Engineering Optimizer 2 (PEO) delivers a unique way to specify objective-driven specifications.

As an integrated product, CATIA—Product Engineering Optimizer 2 (PEO) can be used in conjunction with all other Version 5 products to increase design performance.

Products

Knowledge

CATIA—Product Knowledge Template Definition 2 (PKT)
CATIA—Product Knowledge Template Definition 2 (PKT) allows users to easily and interactively capture engineering know-how and methodology for highly efficient re-use. PKT helps organizations share best practices and avoid duplication of effort due to the inability to re-use existing designs because they are too complex or difficult to understand. This can all be achieved without the need for skilled programming resources, ensuring that all engineers can instead participate in knowledge sharing and capture activities within the organization.

For organizations working within extended supply chains, this allows the delivery of design data to partner organizations without exposing the embedded intellectual capital of design methodology or rules. Partners are, however, still able to capitalize on this embedded knowledge.

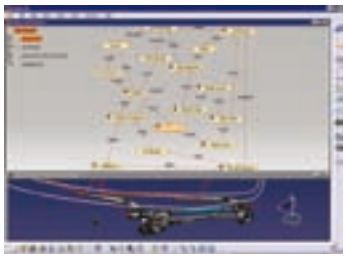
CATIA—Product Knowledge Template Definition 2 (PKT) allows the interactive creation of feature, part and assembly templates which encapsulate geometry specifications, associated parameters and relations (knowledge) for associative re-use.

The Product Knowledge Template solution is divided into a buildtime product, CATIA—Product Knowledge Template Definition 2 (PKT), and a runtime solution, CATIA—Product Knowledge Template 1 (KT1).

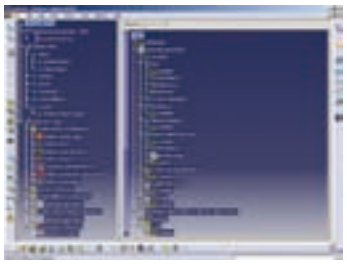
CATIA—Product Function Definition 2 (PFD)
CATIA—Product Function Definition 2 (PFD) describes the functional systems of a product to be designed and visualizes them in a schematic-like viewer. This application also manages variants for the functional systems. In addition, it enables users to create links between the functional systems and CATIA product items, thus allowing full functional and physical definition in V5. Finally, scripts can be created from the functional view to generate 3D data.

This product focuses on functional modelling extending the V5 portfolio through the conceptual stages. Seamless integration between classical detailed data (3D) and formal functional specifications offers full product definition capabilities.

CATIA—Product Knowledge Template Definition 2 (PKT)



CATIA—Product Function Definition 2 (PFD)



CATIA—Business Process Knowledge Template 3 (BKT)

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With the CATIA—Business Process Knowledge Definition 3 (KD3) configuration find in one seat all the power of the CATIA V5 knowledgeware solutions.

Products

DMU

CATIA—DMU Navigator 1 (DN1)

CATIA—DMU Navigator 1 (DN1) performs collaborative DMU review using powerful visualization, navigation and communication capabilities. A large number of tools (annotation support, hyperlink and animation creation, publishing and conferencing tools) facilitate collaboration between all team members involved in DMU inspection. User productivity is enhanced through the ability to automate commands and work on visualization files for quick data loading. Complete DMU review and simulation is made possible through the native integration with other DMU products.

Addressing all populations involved in Digital Mock-up related processes, CATIA—DMU Navigator 1 handles digital mock-ups of all sizes from consumer goods assemblies to very large automotive, aerospace, plant, ships or heavy machinery mock-ups, while being entirely available on Windows® and UNIX®.

DMU Dimensioning & Tolerancing Review 1 (DT1)

DMU Dimensioning & Tolerancing Review 1 (DT1) is a new generation product dedicated to visualization, query and filtering of mechanical dimensioning and tolerancing in the context of the immersive and collaborative design review environment of the full digital mock-up. DT1 facilitates the full integration of Digital Mock-up centric processes within the global engineering environment of the customer. DMU Dimensioning & Tolerancing Review 1 (DT1) gives access to Dimensioning & Tolerancing information to users without their having to generate 2D drawings, thus implementing a complete, 3D-only process. It also allows you to visualize 2D Layout information created in the CATIA—2D Layout for 3D Design (LO1) Product. Dimensioning and Tolerancing Review 1 (DT1) enhances understanding through its rich two-way associativity between Dimensioning & Tolerancing annotations, geometrical elements and features. It also makes apparent underlying geometry semantics.

DMU Space Analysis 1 (SP1)

DMU Space Analysis 1 (SP1) performs interference detection and 3D geometry comparison for DMU verification. It computes clash, clearance, and contact information and enables users to view conflict details. 3D geometries can also be compared and the result can be visualized in a dedicated viewer where sectioning and measurement on the section are available to further understand and assess differences between them.

DMU Space Analysis allows validation of designs by ensuring a better understanding of the problems for quick solving. It addresses populations involved in digital mock-up review and product packaging processes and can be used all along the product life cycle, from the design in context to the maintenance review.

DMU Space Analysis is capable of handling digital mock-ups of all sizes from consumer goods assemblies to very large automotive, aerospace, plant, ships or heavy machinery mock-ups.

CATIA—DMU Navigator 1 (DN1)

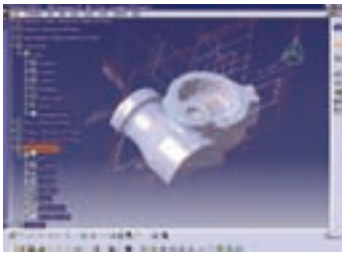
DMU Engineering Analysis Review 2 (ANR)

DMU Engineering Analysis Review 2 (ANR) provides the capability to easily access and review the analysis results generated through the CATIA Analysis suite of products or results created by third party CAA applications. Using a digital mock-up, this product takes the integration of design and analysis to a new level with the ability to check interferences and perform measurements between the deformed shape and surrounding solid parts. This ensures that this part will operate within its expected limits in loaded and unloaded conditions.

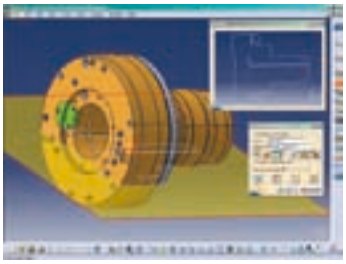
CATIA—DMU Navigator 2 (DMN)

CATIA—DMU Navigator 2 (DMN) performs advanced collaborative DMU review, packaging and pre-assembly, using optimum visualization, navigation and communication capabilities. High graphic performance is provided to the user. Productive 3D navigation is ensured through group management and selection capability. A large number of tools (annotation support, hyperlink and animation creation, publishing and conferencing tools) facilitate collaboration between all team members involved in DMU inspection. User productivity is enhanced through the ability to automate commands and work on visualization files for quick data loading. Batch mode can be used to further improve cache management. Combined kinematics and fitting simulations can be performed to extend review capabilities. Interoperability with CATIA V4 is supported.

Addressing all populations involved in Digital Mock-up related processes, CATIA—DMU Navigator 2 handles digital mock-ups of all sizes from consumer goods assemblies to very large automotive, aerospace, plant, ships or heavy machinery mock-ups.



DMU Dimensioning & Tolerancing Review 1 (DT1)



DMU Space Analysis 1 (SP1)

DMU Engineering Analysis Review 2 (ANR)

CATIA—DMU Navigator 2 (DMN)

Products

DMU

DMU Optimizer 2 (DMO)

DMU Optimizer 2 creates alternate representations of products or assemblies for size reduction or geometry creation better adapted to specific contexts. Thus, the user can create reduced but accurate representations of parts or assemblies by keeping their external representation only. He can generate simplified representations of parts ensuring confidentiality protection when communicating with suppliers. Surfaces can be converted to volumes for realistic DMU analysis. Further design is facilitated by performing space reservation through swept volume or free space calculation. Finally, all generated representations can be managed easily by saving and reusing them for productive DMU review and analysis.

DMU Optimizer 2 (DMO) increases the ability to handle digital mock-ups of all sizes in industries as various as consumer goods, automotive, aerospace, plant, ship or heavy machinery.

DMU Fastening Review 2 (FAR)

DMU Fastening Review 2 (FAR) is dedicated to the validation and the documentation of fasteners in the frame of the collaborative automotive Body in White fasteners process. This product suits both to company teams, such as DMU, Product Synthesis and Structural Analysis, and to product design suppliers, as part designers and prototype makers.

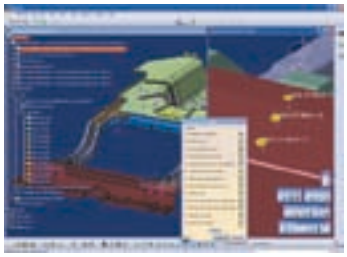
DMU Fitting Simulator 2 (FIT)

DMU Fitting Simulator 2 (FIT) is dedicated to the definition, simulation and analysis of assembly/disassembly operations to validate a product design regarding the feasibility of its maintenance operations (assembly/disassembly operations). It generates useful information on space reservation for the dismantling operations, to be taken into account in future design modifications. The product also helps identify a trajectory allowing to dismantle an assembly.

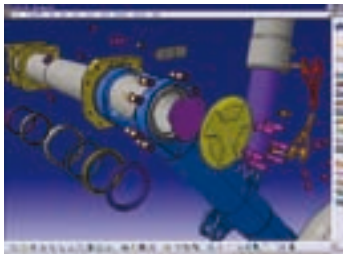
The simulation and analysis tools of DMU Fitting Simulator 2 (FIT) address the needs of product design, recycling, serviceability and maintainability departments. Moreover, DMU Fitting Simulator 2 (FIT) animation, simulation and video creation capabilities are very useful for sales and marketing and training departments.

DMU Fitting Simulator 2 (FIT) can handle digital mock-ups of any size, making it suitable for all type of industries, and is entirely and identically available on Windows and UNIX.

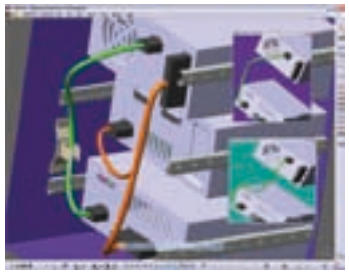
DMU Optimizer 2 (DMO)



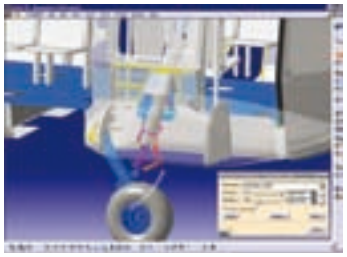
DMU Fastening Review 2 (FAR)



DMU Fitting Simulator 2 (FIT)



CATIA—Flex Physical Simulation 2 (FLX)



DMU Kinetics Simulator 2 (KIN)

CATIA—Flex Physical Simulation 2 (FLX)

Flex Physical Simulation 2 enriches the design of electrical harnesses by realistically simulating the deformation of components, such as electrical wires, within their environment by taking into account such conditions as gravity and the physical non-linear behavior of the harness and its protections.

By leveraging CATIA—Electrical Harness Installation (EHI) as a co-requisite, this embedded behavior simulation technology facilitates harness design in the most simple manner and introduces reality beginning with the early design phase. The product is dedicated to industries that make extensive use of flexible harnesses whose real shapes are not purely geometric, but are natural shapes resulting from environmental conditions.

DMU Kinematics Simulator 2 (KIN)

DMU Kinematics Simulator 2 (KIN) defines mechanisms for digital mock-ups of all sizes using a wide variety of joint types, or by generating them automatically from mechanical assembly constraints. DMU Kinematics Simulator 2 (KIN) also simulates mechanism motion easily with mouse-based manipulation in order to validate mechanisms.

DMU Kinematics Simulator 2 (KIN) analyses mechanism motion by checking interferences and computing minimal distances. It generates the trace or the swept volume of a moving part to drive further design. Finally, it allows combined simulations through the integration with other DMU products.

Addressing people involved in activities ranging from the design of mechanisms to the functional verification of mechanisms, DMU Kinematics Simulator 2 (KIN) is targeted for all types of industries.

Products

DMU

DMU Space Analysis 2 (SPA)

DMU Space Analysis 2 (SPA) performs optimum DMU verification using advanced interference detection and analysis, superior sectioning analysis, measurement, distance analysis and 3D geometry comparison tools. Interferences can be detected interactively or in batch mode, analyzed, and results can be saved. The user can do sectioning dynamically with mouse-based manipulation and save the section results for re-use. Tools are included in the product for distance analysis and 3D geometry comparison. Distance analysis of motion simulations and animation of sectioning results are possible through integration with other DMU products.

DMU Space Analysis 2 (SPA) allows advanced validation of designs by ensuring a better understanding of the problems for quick solving. It addresses populations involved in digital mock-up review and product packaging processes and can be used all along the product life cycle: from the design in context to the maintenance review.

DMU Space Analysis 2 (SPA) is capable of handling digital mock-ups of all sizes from consumer goods assemblies to very large automotive, aerospace, plant, ships or heavy machinery mock-ups.

CATIA—DMU Space Engineering Assistant 2 (SPE)

DMU Space Engineering Assistant 2 (SPE) shortens design cycle time by giving designers the ability to check for interference impacts of their design modifications as they are working. Knowledgeware rules pilot interference analysis to ensure best practices compliance at the company level. Interference analysis results are stored in ENOVIA VPLM.

DMU Space Engineering Assistant 2 (SPE) fits the needs of designers working in a collaborative environment, in industries dealing with large assemblies such as shipbuilding, automotive, and aerospace.

DMU Composites Review 2 (CPR)

Distributed supply chain organizations need a way for stakeholders to view, understand and evaluate a virtual product definition—anytime, anywhere, in any format. DMU Composite Review 2 allows users to share composite knowledge across the value chain. It gives them on-the-fly composite information access, numerical analysis and core sampling in product context.

DMU Composite Review 2 is part of the global V5 solution for composite design and manufacturing that allows manufacturers—aerospace, automotive, shipbuilding or consumer goods companies—to reduce the time needed to design composites parts.

HUMAN

Human Activity Analysis 2 (HAA)
Human Activity Analysis 2 (HAA) is an add-on to Human Builder 2 (HBR) allowing the user to maximize human comfort, safety, and performance through a wide range of advanced ergonomics analysis tools that comprehensively evaluate all elements of a human's interactions with a product and specifically analyze how a manikin will interact with objects in its virtual environment.

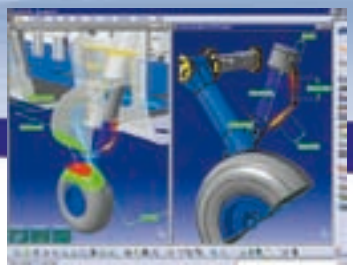
Human Activity Analysis 2 (HAA) addresses the needs of human factors engineers, assembly and decommissioning planners, maintainability engineers, packaging engineers, and manufacturing engineers from industries as diverse as aerospace, automotive, plant design, shipbuilding and electrical goods.

It is effectively used in conjunction with Human Measurements Editor (HME) and Human Posture Analysis (HPA). These products are combined to create a fully integrated Human Engineering Design solution.

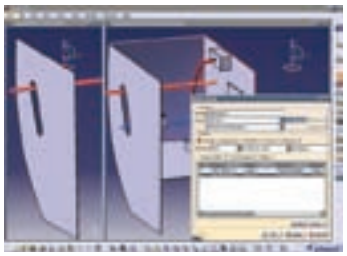
Human Builder 2 (HBR)
Human Builder 2 (HBR) creates and manipulates accurate standard digital humans in the DMU environment for early human-product interaction analysis. Tools provided within Human Builder 2 include manikin generation, gender and percentile specification, manikin manipulation techniques, animation generation, and advanced vision simulation. A user-friendly interface ensures that first level human factors studies can be undertaken by non-human factors specialists.

Human Builder 2 (HBR) addresses the needs of design engineers, managers, maintainability engineers and concept designers from the aerospace, automotive, plant design, heavy engineering, shipbuilding and electrical goods industries.

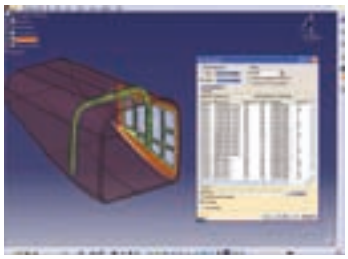
Human Builder 2 (HBR) is effectively used in conjunction with Human Measurements Editor 2 (HME), Human Posture Analysis 2 (HPA), and Human Activity Analysis 2 (HAA) for advanced detailed digital human creation and analysis, improved human comfort, performance, and safety. These products are combined to create a fully integrated Human Engineering Design and Review solution.



DMU Space Analysis 2 (SPA)



CATIA—DMU Space Engineering Assistant 2 (SPE)



DMU Composites Review 2 (CPR)

Human Activity Analysis 2 (HAA)

Human Builder 2 (HBR)

Human Measurements Editor 2 (HME)
Human Measurements Editor 2 (HME) is an add-on to Human Builder 2 (HBR) allowing the user to create advanced, user-defined manikins using a number of advanced anthropometry tools.
The manikins can then be used to assess the suitability of a product against its intended target audience.

Human Measurements Editor 2 addresses the needs of human factors engineers, maintainability engineers, and packaging engineers in the aerospace, automotive, heavy engineering, plant design, shipbuilding, white goods and electrical industries.

Human Measurements Editor 2 is effectively used in conjunction with Human Builder 2, Human Posture Analysis 2 and Human Activity Analysis 2. These products are combined to create a fully integrated Human Engineering Design solution.

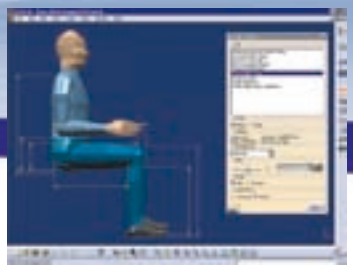
Human Posture Analysis 2 (HPA)
Human Posture Analysis 2 (HPA) is an add-on to Human Builder allowing the user to quantitatively and qualitatively analyze all aspects of manikin posture. Whole body and localized postures can be examined, scored and iterated to determine operator comfort and performance when interacting with the product in accordance with published comfort databases. User-friendly dialog panels provide postural information for all segments of the manikin and color-coding techniques ensure that problem areas can be quickly identified and iterated to optimize posture. Human Posture Analysis 2 (HPA) allows users to create their own specific comfort and strength library for the needs of each individual application.

Human Posture Analysis 2 (HPA) addresses the needs of human factors engineers, assembly and decommissioning planners, maintainability engineers, packaging engineers, and manufacturing engineers in industries as diverse as aerospace, automotive, plant design, heavy engineering, shipbuilding, and electrical goods.

Human Anthropometry Catalog 2 (HTC)
Delivers a set of anthropometry data dealing with different population sizes. It enables designers to optimize and validate products against different population segments to increase market acceptance. Being able to select from the standard manikins in the catalog makes it easier to use digital human manikins and promotes the use of ergonomic simulation by more designers.

Human Posture Catalog 2 (HPC)
Boosts user productivity by delivering two sets of catalogs containing more than 350 postures for both static and grasping postures. These catalogs enable users to quickly insert a human manikin into a digital mock-up and then, if needed, fine-tune the mock-up until the targeted manikin position is reached. Catalog-based simulations offer up to a 70 percent productivity gain over non-catalog based processes.

Human Posture Catalog 2 provides climbing, driving, crawling, hand counting, sitting, and standing static postures with more than 200 grasping postures adapted to more than 60 tools. Catalogs are also adapted to different population percentiles for maximum grasping precision.



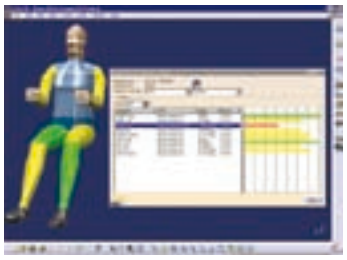
Human Measurements Editor 2 (HME)

Human Posture Catalog 2 also affords the designer with an improved user experience. Being able to select from the hundreds of standard positions available makes it easier to use digital human manikins and promotes the use of human modeling by more designers. It also makes it easy for a designer to create a new posture by starting with a standard catalog posture, fine-tuning it, and then saving it for future use.

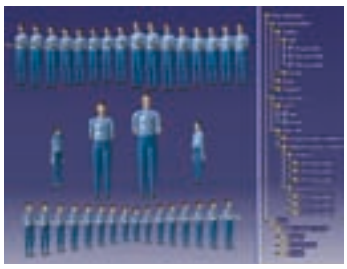
Human Preferred Angles Catalog 2 (HAC)
Delivers a set of preferred angles related to the comfort, safety and strength of different postures. It enables users to quickly optimize human manikin postures. Benefits include:

- *Enhances analyses results precision by providing catalogs containing advanced comfort, safety and strength data*
- *Optimizes manikin posture based on scientific references for comfort, safety and strength*
- *Promotes human ergonomics simulation to more users though an improved user experience.*

Vehicle Occupant Accommodation 2 (VOA)
Reduces the cost of interior vehicle design regulatory conformance validation—Vehicle Occupant Accommodation 2 provides a set of tools to enable the reduction of the number of physical prototypes, to minimize customer focus groups, and to reduce the number of design iterations required to ensure an interior vehicle design that meets the occupants' needs in terms of comfort and accommodation. Based on the Human Builder 2 (HBR) product, Vehicle Occupant Accommodation 2 allows companies to explore, compare and validate more design alternatives by letting 3D information accessible to all stakeholders.



Human Posture Analysis 2 (HPA)



Human Anthropometry Catalog 2 (HTC)

Human Posture Catalog 2 (HPC)

Human Preferred Angles Catalog 2 (HAC)

Vehicle Occupant Accommodation 2 (VOA)

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IBM Eurocoordination
Product Lifecycle Management
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