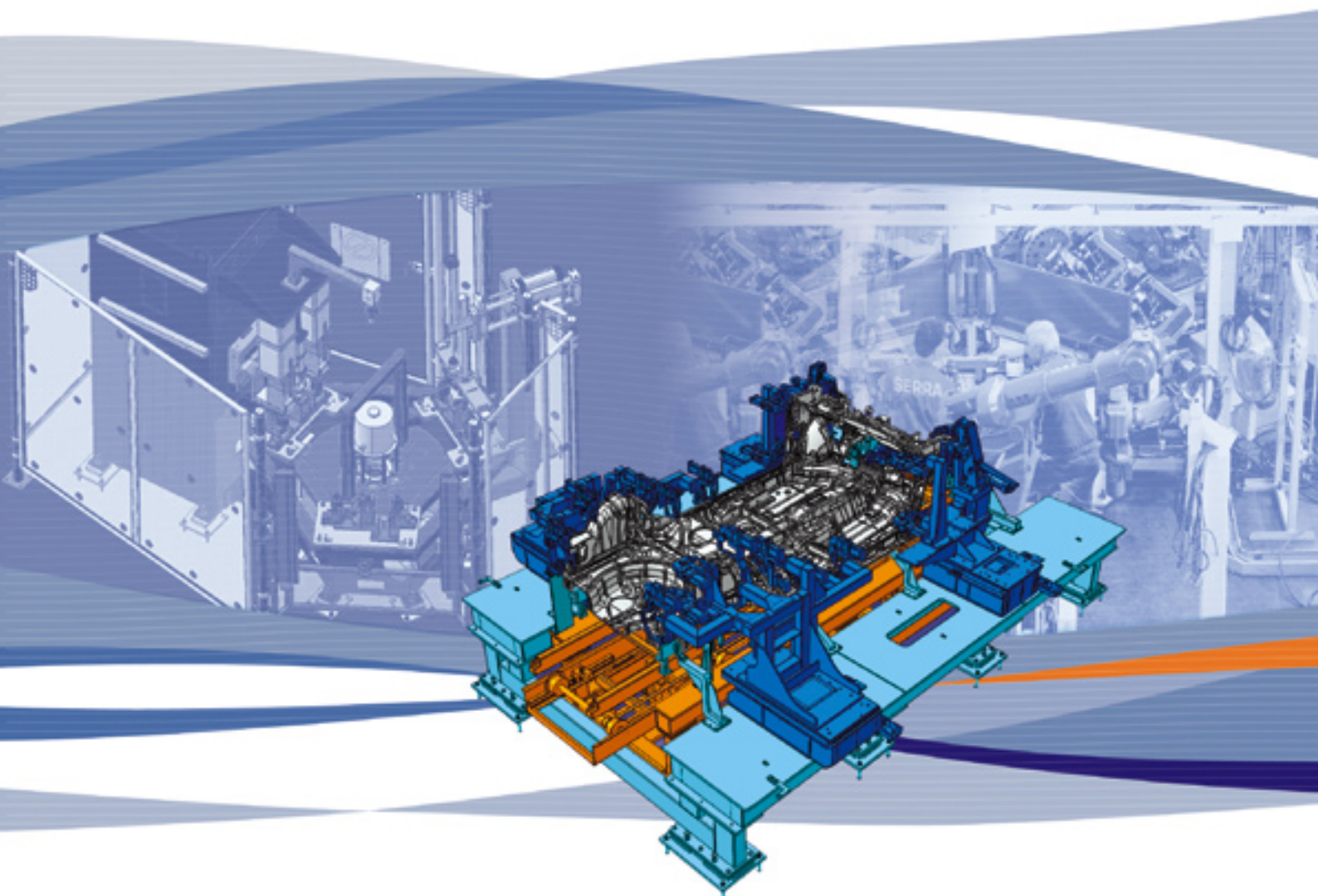


SERRA SOLDADURA

Gaining the edge through CATIA V5 and DELMIA



Company overview

Founded in 1934, the family-owned company Serra Soldadura S.A. has expanded from a small Barcelona-based welding systems workshop into a world-class enterprise with plants in Spain, France, Portugal and Brazil, and 800 employees worldwide, including 380 at its Barcelona headquarters.

Today, SERRA is a leader in its field, designing and producing turnkey automated welding installations for the automotive industry and big sized assembly lines and tooling in the aeronautic field.

The company's success stems from its continuous investment in personnel and technology, enabling it to develop innovative concepts for competitive foreign markets. Clients include major automotive manufacturers, such as Volkswagen AG and General Motors, Daimler Chrysler AG, Renault SA and PSA or aeronautics companies such as AIRBUS.



Business challenges

+ Continuously and dramatically reduce time-to-market

+ Substantially reduce costs throughout the supply chain

+ Capture company know-how to define and leverage company assets

Training time -75%

Situation

Today, the lifecycle of a vehicle has been shortened as a result of changing consumer expectations and intensive competition. This means that automotive suppliers are required to continually upgrade their processes to ensure their long term survival.

Reduce Time-to-market

Major OEMs demand dramatic reductions in time-to-market. This has resulted in a faster response from SERRA. "Four years ago, we could design, develop and install a welding line in 18 months, today's target is six months, tomorrow it will take only four months," says Blai Felip, Engineering Director, Serra Soldadura.

Lower Costs

Testing, simulation, manufacturing, raw materials and on-site integration account for approximately 60% of assembly line costs. Early pre-design validation has a direct impact on downstream manufacturing costs and therefore the company profit margins.



"We must meet these three business challenges as quickly as possible to remain viable. The market is extremely volatile. This year, three of our Spanish market competitors folded."

Kenneth Sandven, General Manager, Serra Soldadura.

Capture Know-How

"Our challenge is to preserve the know-how contained in our workforce. Capitalization and leverage of our expertise will enable us to increase value and consequently our margins," says Blai Felip.

Solution

In 1998, Serra Soldadura worked mainly in a multiple system, 2D environment with cumbersome and manual processes that slowed response time and increased costs.

This had far-reaching drawbacks:

- Drawings were inconsistent due to repeated changes during the implementation phase.
- It was impossible to re-use designs to improve design time and reduce errors.
- Assembly errors occurred as pre-production validation was impossible.
- It was not possible to program robots before the welding lines were installed.



"Only CATIA V5 and DELMIA PLM solutions fit all of our requirements. We have harmonized our installation with 40 CATIA V5 seats. We can really leverage V5 potential as our engineers concentrate on one system."

Blai Felip, Engineering Director, Serra Soldadura.



Bidding time -50%

CATIA V5 and DELMIA, the right PLM choice

To become more competitive, SERRA's management decided to completely reengineer their design-to-manufacture processes. Their aim was to be able to reuse existing designs and validate manufacturing early on to produce the right product more rapidly. "We were looking for a unified PLM solution which combined powerful 3D product development capabilities with digital manufacturing solutions," says Blai Felip.

SERRA had clear-cut requirements:

- An across-the-board process centric solution, from conceptual design to FEA (Finite Element Analysis), to digital manufacturing simulation.

- A single architecture to eliminate tedious data transfer, providing multiple iterations between design and manufacturing simulation in order to optimize designs and produce the right product the first time. "The unified V5 architecture which manages Product, Processes and Resources (PPR) in a seamless environment weighed heavily in our decision," says Blai Felip.
- To reduce technology gaps when meeting future demands. "We need a solution for today but also for tomorrow. It's clear to us that CATIA V5 and DELMIA are next generation solutions whose unique technology differentiators will cover our future needs," says Blai Felip.

Results

SERRA has reaped clear and tangible benefits from CATIA V5 and DELMIA implementation.

Smooth Process Reengineering

It was necessary to implement IBM and Dassault Systèmes PLM Solutions without tying up machines or personnel while the company continued to fill its outstanding orders.

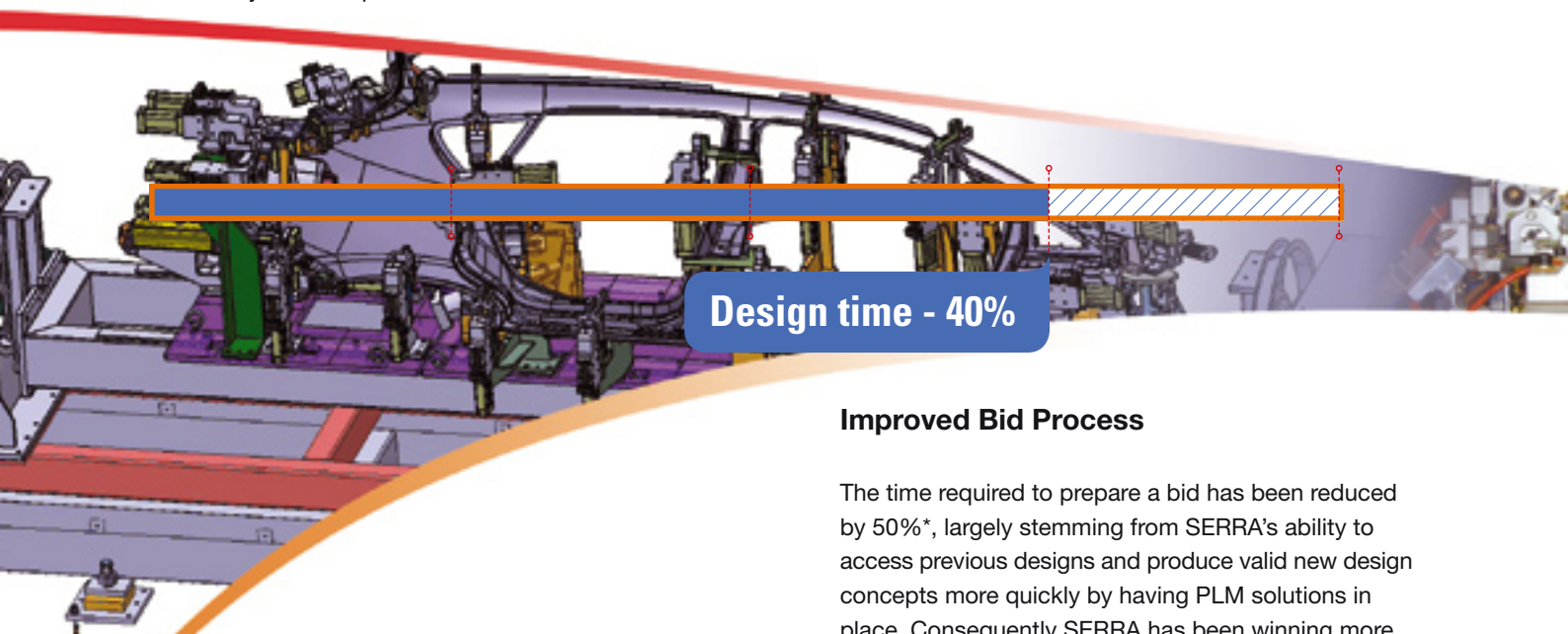
With support from IBM Business Partner CADTECH, this went smoothly, particularly through customized CATIA V5 training which allowed the progressive training of 100 engineers operating 40 workstations over two shifts.

“It usually would take up to five years to train an expert tool designer. By combining this approach with the intuitiveness and the power of CATIA V5, SERRA can now turn a beginner into an expert designer in 12-14 months thus reducing training time by 75%,” says Blai Felip.



The business value resulting from successful bids has increased over previous years when CATIA V5 and DELMIA were not in use.”

Mateu Guiu, Sales Director, Serra Soldadura.



Design time - 40%

Improved Bid Process

The time required to prepare a bid has been reduced by 50%*, largely stemming from SERRA's ability to access previous designs and produce valid new design concepts more quickly by having PLM solutions in place. Consequently SERRA has been winning more bids each year.

Mr. Felip also remarks, “now that the concept creation process is achieved with CATIA V5 we only make drawings late in the development. Using 3D design also streamlines the production of the BOM for the bid process, and allows more accurate costing and faster project startup. This results directly in shorter time to product delivery because we can order materials faster and begin manufacturing earlier”.

*findings based on an independent study performed by CIMdata (November 2003).

Bidding time preparation



Previous 2D/3D approach
220 days



CATIA V5 + DELMIA
110 days

Reusing Knowledge to Reduce Time-to-market

Jigs & fixtures are often very similar in design, therefore designs can often be reused in the same project. CATIA V5 provides easy-to-use and automated solutions for reusing previously validated designs. Flexible parameterization provides unrivalled capabilities for modifying and adapting existing designs to a new environment. This reduces development time and cuts costs while ensuring standardization and design quality. "CATIA V5 has provided us with new ways of thinking when using standard parts libraries, parametric design and in reusing validated designs in new projects. This is a powerful solution with enormous potential. In addition, the immediate visualization features of CATIA V5 and DELMIA helped us to sell our project," says Jaap Wegbrans, Sales Department.

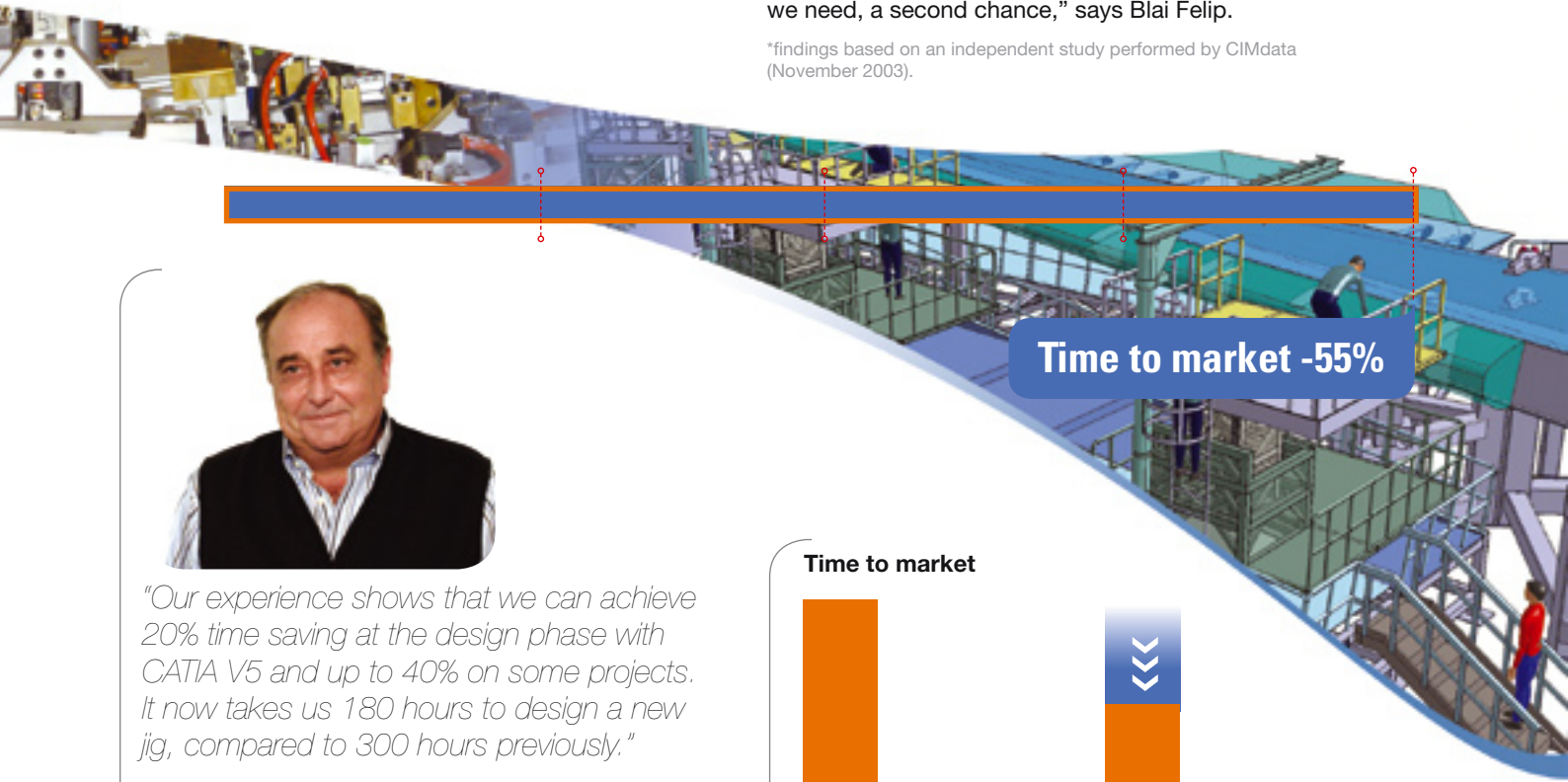
CATIA V5's unique shape morphing capabilities ensure that when a panel or a part change, the tools can be immediately updated and repositioned.

Complex Products Right the First Time

The advanced simulation capabilities of IBM and Dassault Systèmes' PLM solutions make it possible to produce an error-free product the first time. With CATIA V5, designers can virtually simulate kinematics and structural analysis at a very early stage in product development. DELMIA IGRIP is used to optimize robot locations, motions and cycle times while the DELMIA DPM Assembly Product optimizes the assembly process, as well as planning and verification.

Both CATIA V5 and DELMIA operators can access the same data. In addition, the NC programming cost has decreased by 66%* because this work is now done directly on the design models in CATIA. Likewise, assembly line layout costs have decreased by more than 60%*. "We save mainly on feasibility and assembly. Four years ago, it took us 18 months to put a new assembly line into an OEM. We can now do it in eight months*. This is only possible because we can now get it right the first time. Today we do not get, nor do we need, a second chance," says Blai Felip.

*findings based on an independent study performed by CIMdata (November 2003).



"Our experience shows that we can achieve 20% time saving at the design phase with CATIA V5 and up to 40% on some projects. It now takes us 180 hours to design a new jig, compared to 300 hours previously."

José Bernal, Design Group Manager, Serra Soldadura.

Time to market -55%

Time to market



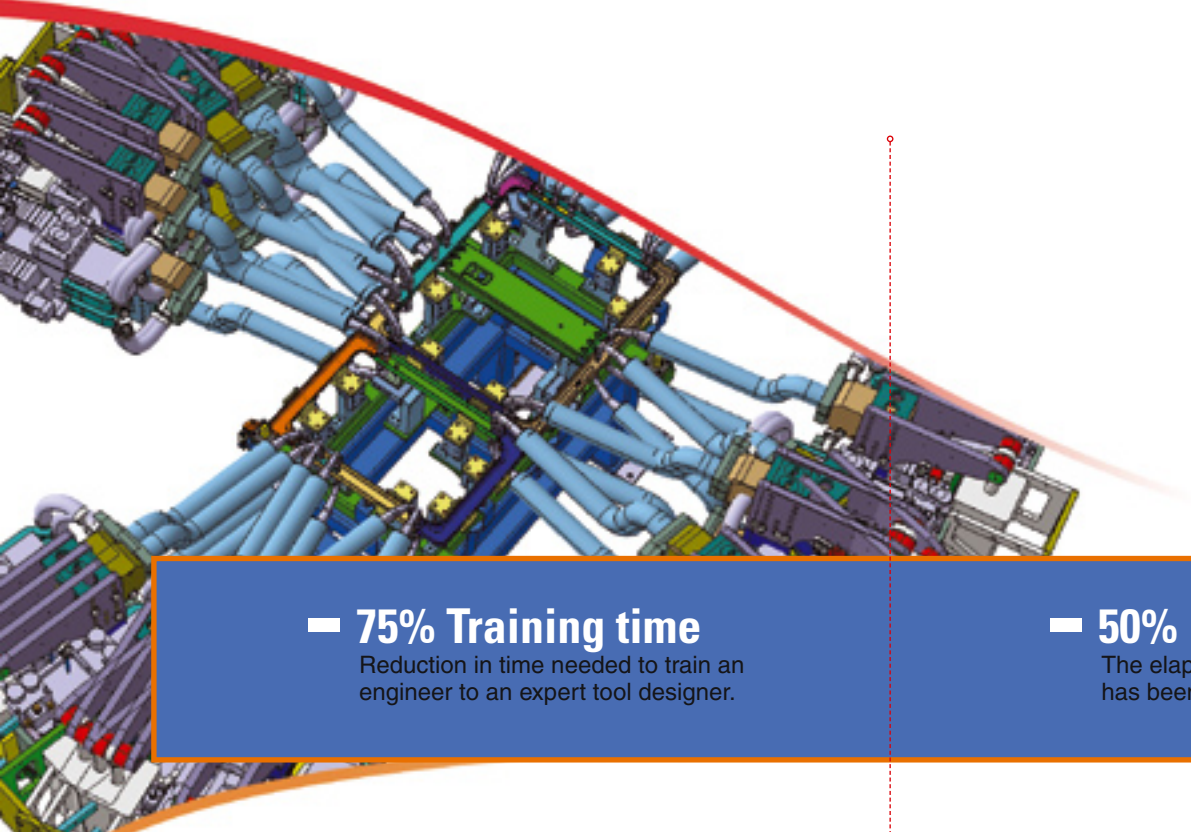
Previous 2D/3D approach
18 months



CATIA V5 + DELMIA
8 months

Challenges met

CATIA V5 and DELMIA provided SERRA SOLDADURA with the competitive edge it needed to reduce its design phase and to improve quality by designing right the first time. Today, SERRA has reaped clear and tangible benefits from IBM and Dassault Systèmes' PLM Solutions.



— 75% Training time

Reduction in time needed to train an engineer to an expert tool designer.

— 50% Bidding time

The elapsed time to prepare a bid has been significantly reduced.

Future

Serra Soldadura plans to implement more solutions from the IBM and Dassault Systèmes portfolio to extend the benefits of PLM to the entire company.

SERRA's main mid-term objective is to accelerate concurrent and collaborative engineering, and to expand its digital manufacturing capabilities. SERRA is on the road to even greater success by reorganizing engineering design and simulation operations through integrated CAD.

Robotics Simulation

Implementing DELMIA Robotics V5 will improve SERRA's automatic layout elements recognition and made it possible to create a 3D model directly from a 2D layout. In addition, DELMIA Robotics V5 will generate tools for I/O (Input/Output) connections between robots which optimizes station cycle time.

Generative Tooling Deployment

Dassault Systèmes has developed a unique and evolving set of PLM practices for automating and accelerating Tooling design. By combining this Generative Tooling Solution for Jigs & Fixtures with its own expertise, SERRA will be able to adapt predefined toolsets that incorporate standard components, design rules, and past experience. By removing manual design phases and facilitating automatic tooling reconfigurations, the Generative Tooling Solution drastically cuts engineering and manufacturing costs and speeds up design creation and modification.

With the Generative Tooling Solution, SERRA will go far beyond traditional tooling design methodology. It will experience the full power of PLM and reap the benefits of faster time-to-market, reduced errors and costs, and greater quality and innovation.

Return on Investment

An independent ROI study

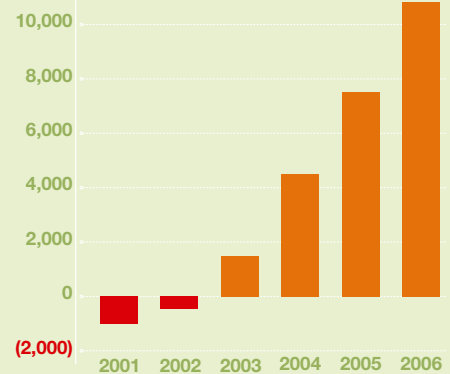
CIMData performed an independent Return On Investment (ROI) study on Serra Soldadura's implementation of IBM and Dassault Systèmes PLM solutions. The study was based on Serra Soldadura data on the benefits of PLM versus the cost of implementation (software, hardware, training, maintenance and administration).

Findings

Serra Soldadura's overall ROI is impressive with a short payback period and a very high internal rate of return.

- **Payback period is 1.7 years**
- **Net Present Value of Investment (over six years) is superior to € 10 million**
- **Internal rate of return is 162%**

Cumulative Discounted Cash Flows - k€



CIMdata is a leading and independent worldwide consultancy specialized in PLM strategy

Nov 2003 - **CIMdata**

40% Design time

Design phase was improved by moving from 2D to 3D solutions.

55% Time to market

Time-to-market for new assembly lines has been cut from 18 to 8 months.

Conclusion

Serra Soldadura chose Dassault Systèmes and IBM PLM solutions for their capacity to support both current and future requirements.

The CATIA V5 and DELMIA combination has demonstrated its power and opened up previously unimagined new worlds. Results are clear-cut and impressive as SERRA benefits from the incremental business it has been able to win.

CATIA V5 allows SERRA to work in the same design environment as its OEM customers and combined with DELMIA 3D manufacturing solutions, this makes SERRA confident that they design right the first time.

Cycle times for a new assembly line have been cut from 18 months to eight months, and by using libraries of standard parts, validated designs can now be reused across various projects.

With the Dassault Systèmes and IBM Generative Tooling approach, Serra Soldadura are well placed to realize even more potential from their PLM system in the future and continue to remain ahead of their competition.



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