



Planning and Learning Group



PLG



UNIVERSIDAD CARLOS III DE MADRID



Maintenance task planning



Route planning

Intelligent mission control



Operations optimization



Planning of space missions

Planning and Learning Group

The **Planning and Learning Group, PLG**, is formed by a consolidated group of experts in the development of effective and innovative software solutions for the automation of planning tasks and data analysis through the use of **advanced artificial intelligence technologies**.

PLG is one of the leading spanish groups on **task planning, scheduling, optimization and machine learning**. We master a great variety of techniques that enable us to automate complex services and activities for organizations. We provide a complete and integrating vision of organization solutions.

Our wide experience on integral and tailored services allows us to provide optimized solutions on **R&D, consulting, education**, as well as on the **design and development of software**. The targets of our services are those **organizations that aim at using problem solving tools as the automated planning and scheduling of their processes and resources, with the ability of automatic adaptation to changes in the context, as well as decision support systems for optimization and prediction applied to their services and activities**.

Since the technology and services are independent of the economic sector, we can provide solutions for many different areas, ranging from logistics to manufacturing, or customers personalized services. Our group supports the customers from the design and development of the tools to the final implementation within the company.

READY FOR THE CHANGE?

Incorporating technological changes can become a very difficult goal, that requires a high level of specialization and adequate resources. PLG offers a highly qualified human team and the most advanced technical support for:

- **Automating dynamic processes of planning and decision making.** We have built and put to use several tools that allow automating the planning and scheduling of critical tasks, as well as complex decision-making. These solutions offer huge economic savings due to the (semi-)automation of the activities to be performed by the organization, the intelligent and dynamic resource assignment (human and material) to those activities, and the continuous adaptation of plans according to the current context and its changes. Some examples of applications include the intelligent workflow management, the projects management including resources assignment and re-planning based on the competences of the human resources involved, the efficient automatization of logistics (including transport-related tasks), the dynamic task forces management, or the control and maintenance tasks for industries.

- **Optimizing processes from intelligent data analysis (including data mining) to predict patterns or risks.** We are specialists in automatically analyzing any data described by any variable set independently of its complexity to predict patterns or optimize decisions and processes. We have designed and extensively used powerful technology for multi-criteria, non-linear prediction and optimization. The applications of these techniques are quite numerous and diverse, such as:

- Automatic analysis of processes
- Predictive control of industrial processes and plants, such as temperature prediction for electric companies or network load in telecommunication companies
- Network and logistics optimization
- Automatic analysis of market data for predicting commercial or financial patterns



Processes optimization

User adaptation



Demand prediction

Customization Services



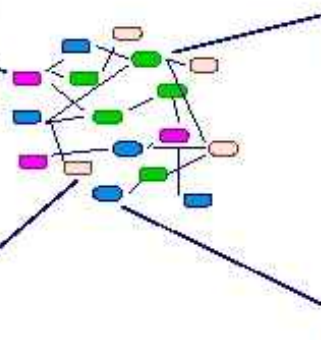
Prediction and planning of control sequences in industrial processes

- **Designing of intelligent information retrieval systems - data mining based on last generation techniques.**

We use advanced technologies to selectively retrieve information for systems design, ranging from *Data Mining* to *Text Mining*. Techniques as semantic data analysis, decision trees, neural networks or genetic approaches, among many others, can multiply the capabilities of data analysis systems based on classical technology.

- **Improving of on-line systems through the use of intelligent agents in Internet.** The group has developed several solutions for the application of intelligent agents in Internet. Intelligent agents can significantly augment the pro-active capability of software, so that they can make decisions on behalf of a user, interact with other agents, learn from them, or optimize their decisions. These solutions provide important improvements, mostly for search engines, and open very interesting applications for electronic commerce, such as recommender systems, web services composition, or decision-making based on competitors behavior.

- **Applying artificial intelligence techniques to companies problem solving (*business intelligence*).** These techniques improve software performance in those cases in which classical algorithms and programming techniques do not work well. We offer technical and strategical consulting services, as well as studies of proof-of-concept development to companies that aim at integrating artificial intelligence tools within their in-house solutions.

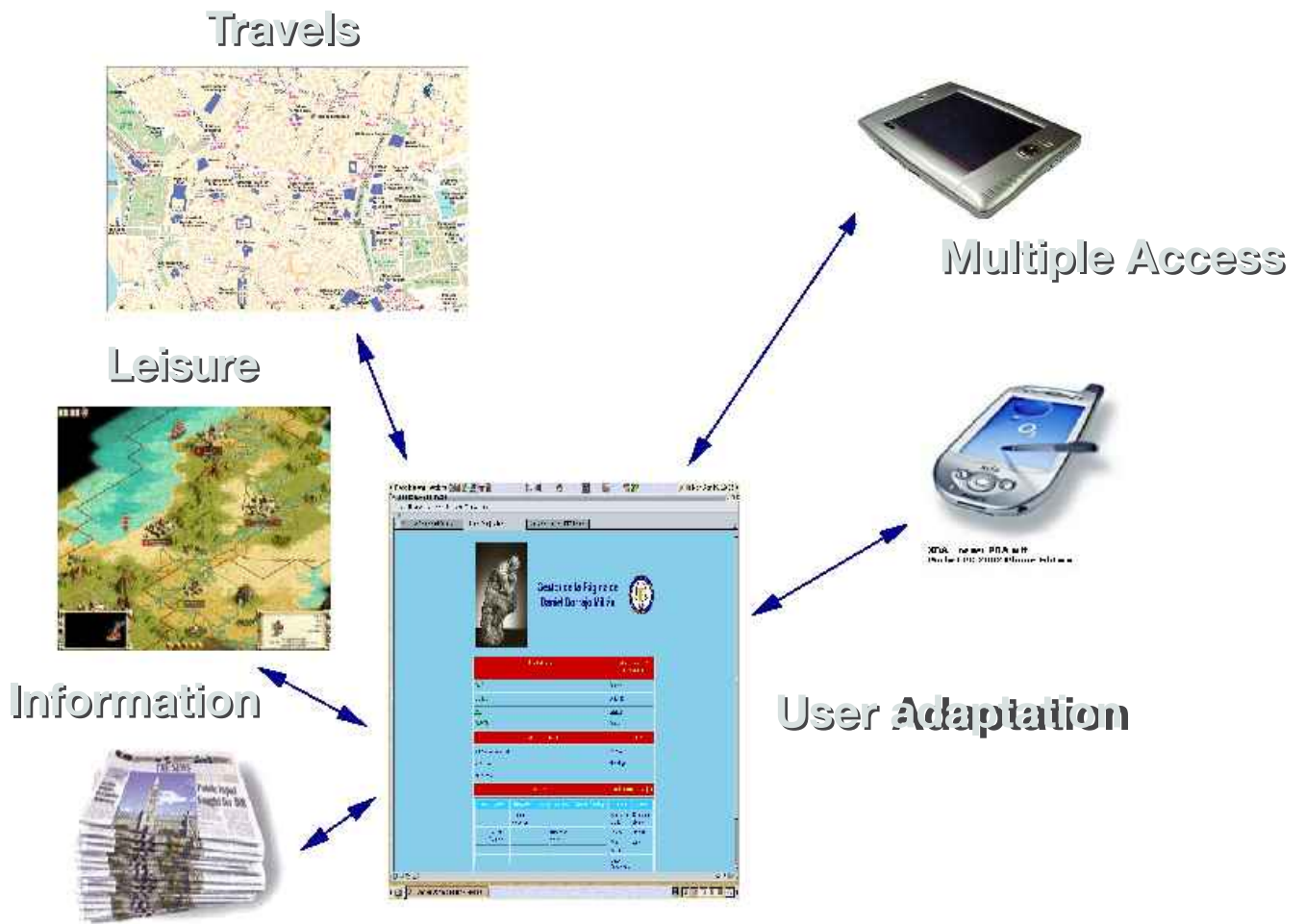


Planning of logistics processes

OUR EXPERIENCE

PLG collaborates with a wide network of companies and institutions that work in diverse economic sectors. We have provided added-value to organizations through consulting services, “ad hoc” education, and research and development projects either national or internationally funded. PLG maintains strong links with well known international research groups in prestigious universities, as Carnegie Mellon University (EEUU), or with research institutions, as CNR in Italy, among many others.

PLG has collaborated with HISPASAT, UNIÓN ELÉCTRICA FENOSA, SOFTWARE AG, PULEVA, or ABB, among other companies.

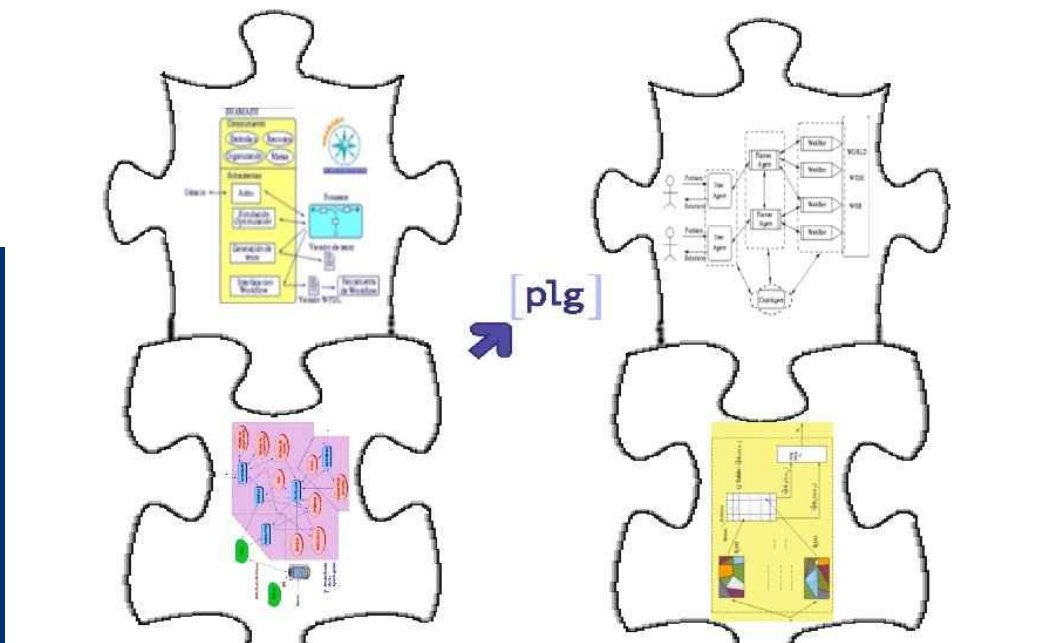


Building of automatic customization tools

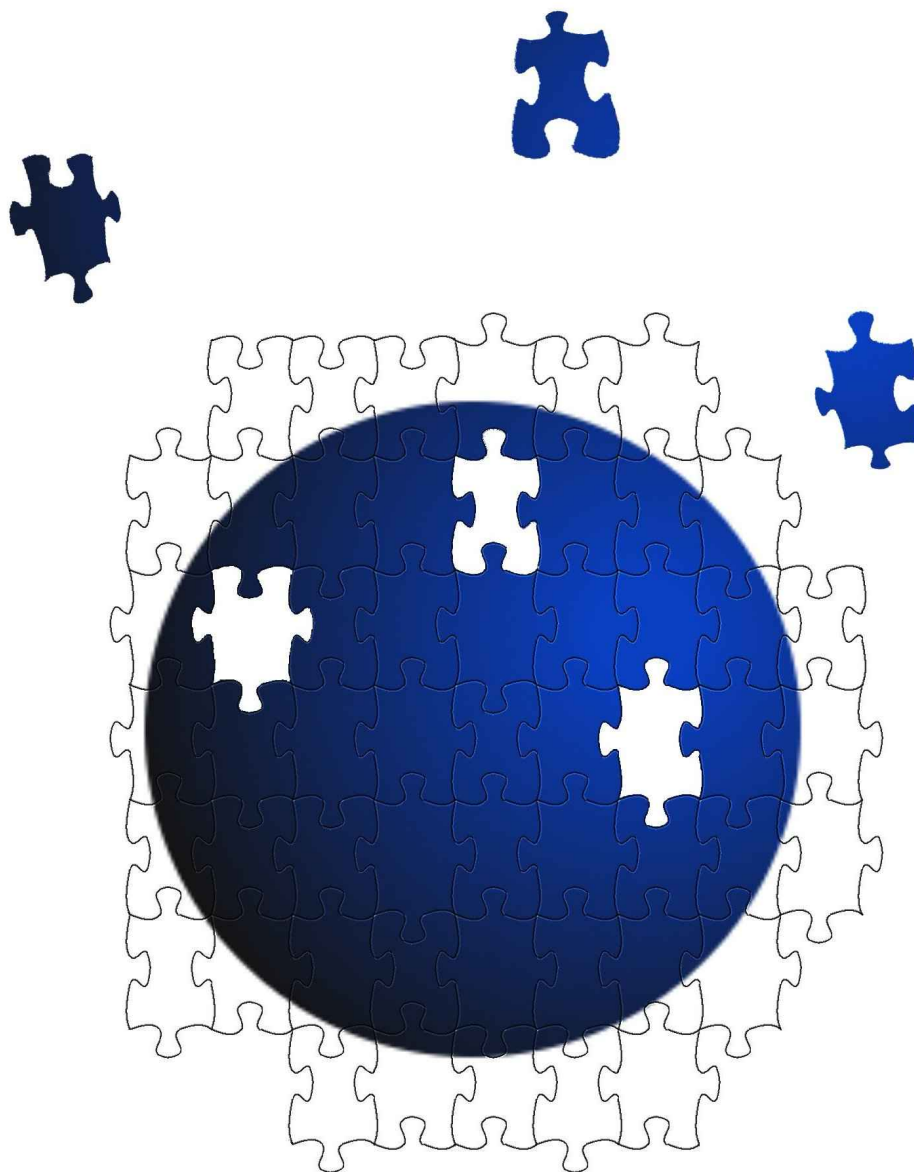
INNOVATIVE SOLUTIONS

Some research and development projects have generated novel products and tools that we offer and adapt to interested organizations. A few examples are:

- **Automated planning of maintenance activities** (application on satellite maintenance)
- **Tool to automatically generate sequences of control instructions** for industrial plants
- **Planner for visits to a city.** It can generate complex plans for people visiting cities. It can generate several itineraries, that incorporate different transports, as well as considering constrains such as schedules of places to visit, or user preferences. These plans are built from on-line information automatically extracted from the Web and user modeling.
- **Intelligent semi-automatic modeling tool of organizations processes,** as well as their knowledge-based simulation and optimization.
- **Tool for the semantic retrieval of information from documents** (including the Web) that improves over classical syntax-based information-retrieval approaches.
- **Artificial Intelligence software** targeted to computer sector companies interested on integrating these techniques in current products and solutions.



Modelling tools for processes management (workflow)



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