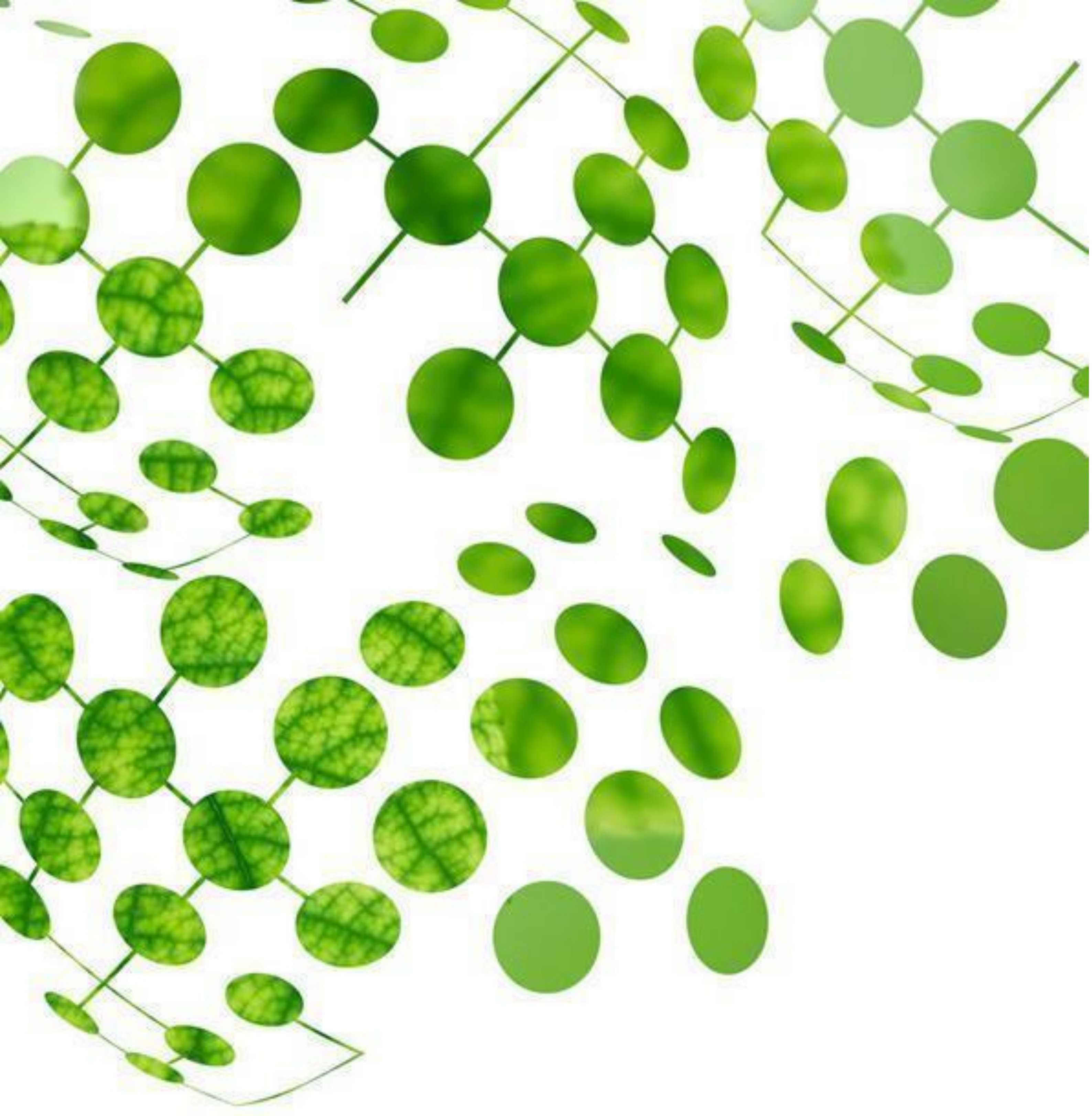


Analytical Models

Analytical capabilities (Context)

From Big Data it has been passed to Intelligence Artificial (IA) when reality has been imposed, "the data per se, do not add value".

Under the label of "Artificial Intelligence" are grouping practices that were already used in companies for many years and some more recent that have been implemented because the computing capacity of the machines has not been a limitation.

The AI practices most commonly reported by clients are:

- Predictive modeling.
- Discovery.
- Machine learning.
- Optimization.
- Stochastic modeling.
- Dynamic systems.

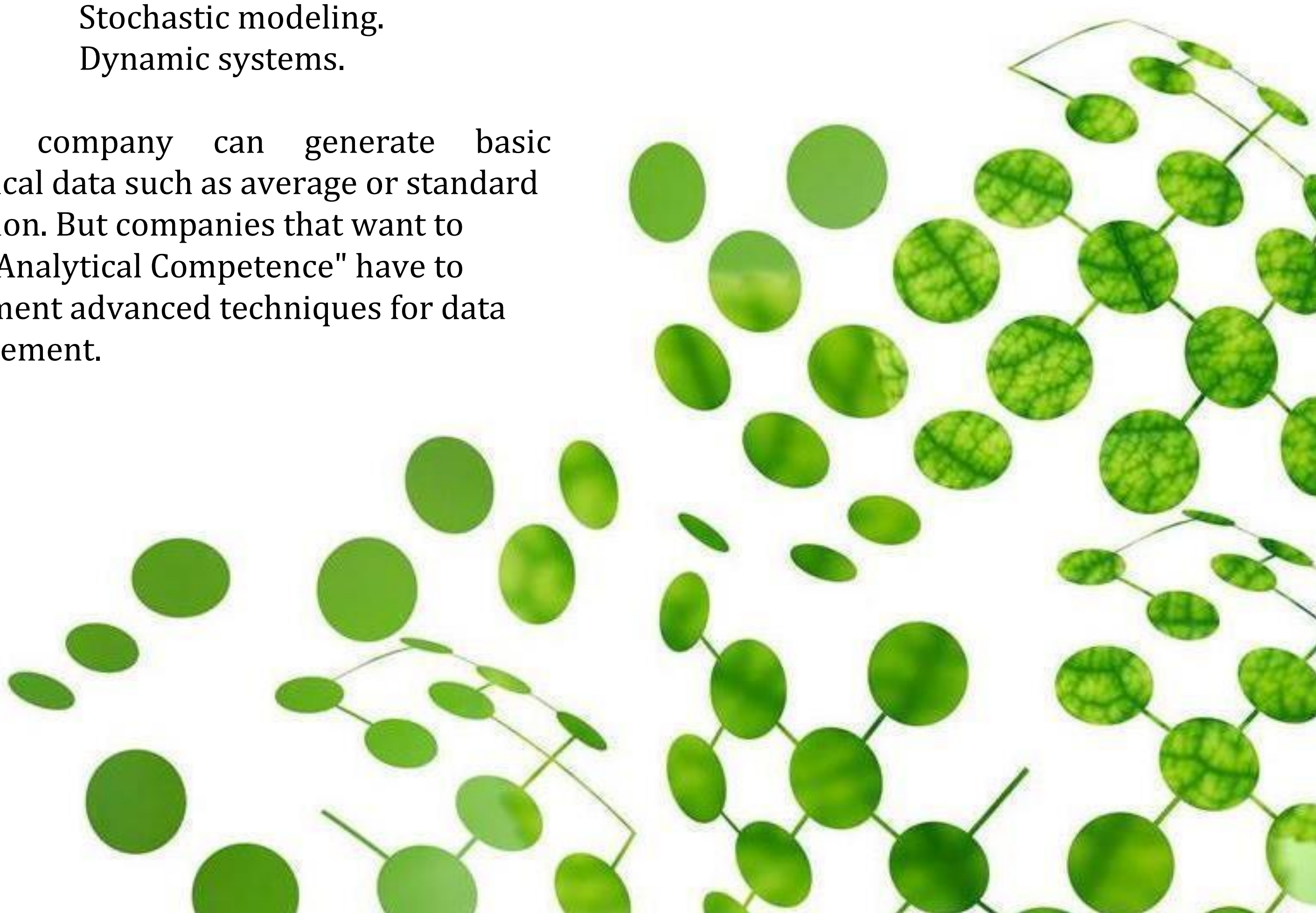
Any company can generate basic statistical data such as average or standard deviation. But companies that want to "Lead Analytical Competence" have to implement advanced techniques for data management.

Analytical capabilities (Reality)

In 2020, 40% of digital transformation initiatives will be supported by cognitive technologies, artificial intelligence and robotics, a significant change if we take into account that currently only 8% of companies in Spain use artificial intelligence.

By 2019, 40% of digital transformation initiatives will use artificial intelligence services; by the year 2021, 75% of commercial business applications will use IA.

The use of tools and modeling techniques is allowing organizations to take advantage of their data collections to predict future results. If the process is managed correctly, only 1 in 3 AI projects will be successful and will need more than six months to go into production.



Our vision

When we talk about AI, we talk about modeling, data exploitation and automation. Management of analytical assets.

It is changing the culture of companies towards a massive use of data analysis.

There is confusion between the different "roles" and profiles that intervenes in the exploitation of the data. In addition, these profiles have become the scarce resource of the organizations.

It is increasingly "simple" to model, accessing tools and platforms that include packages. Many times these packages are not stable.

We are immersed in a "boom" of model building, where inadequate techniques are applied and very experimental tools are implanted.

The construction of models becomes "isolated" from each other, without taking into account the impact that a business KPI has on others.

It does not get an adequate implementation in production of the models, or this, requires a lot of effort and time, which does not allow obtaining adequate investment returns.

Many of the built models are made with a laboratory approach, which causes scalability.

The robotization of tasks is not applied, or it is applied in inadequate points of life of the data.

The models built are very dependent on technology, making their deployment more expensive.

Specialists must train in subjects that are not known, causing long learning curves.

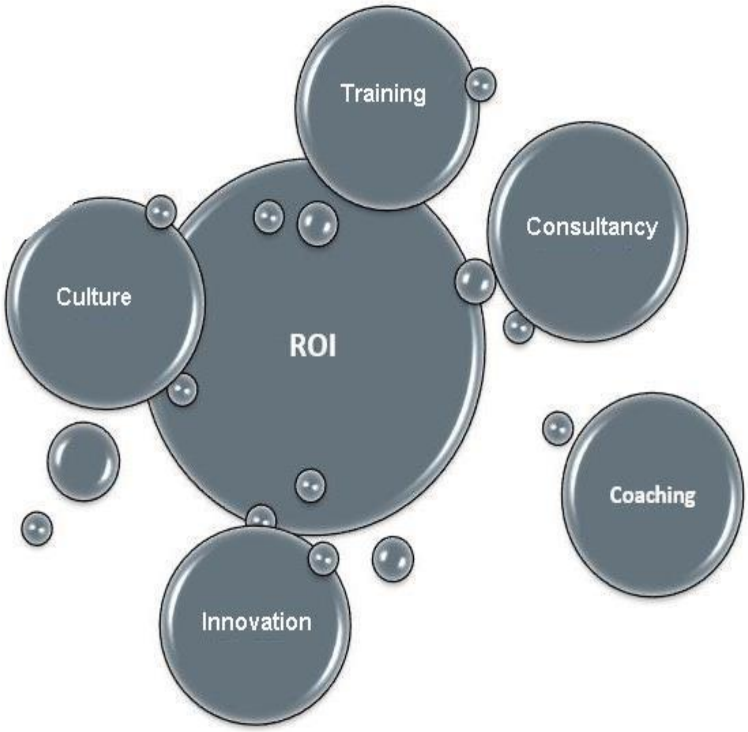
Standardization rules are not applied, neither in the mathematical modeling nor in the construction of the algorithms.

All the practices that are grouped under the "IA" label are modelable with mathematical formulation.

Proposal

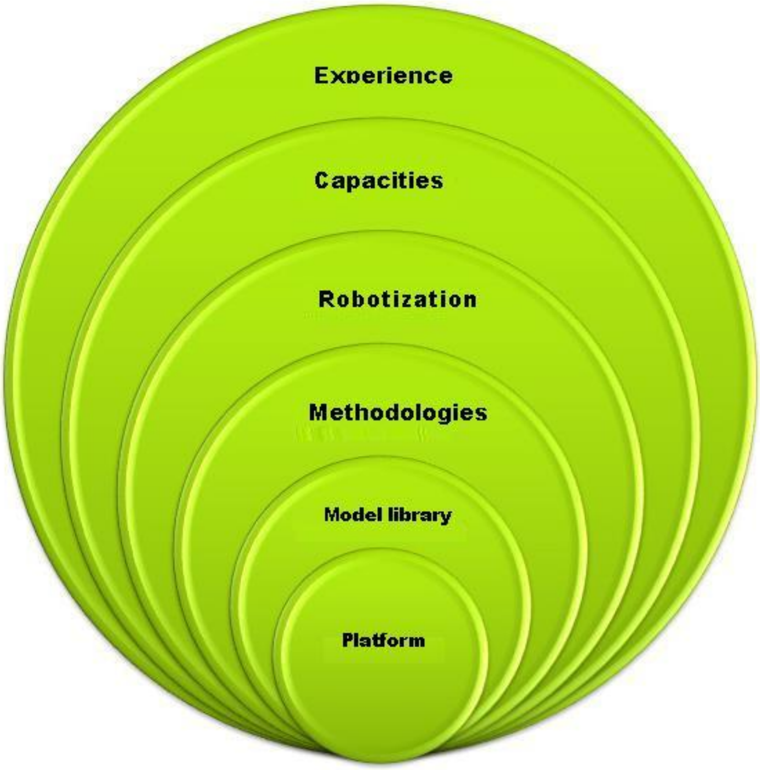
From Autana we propose to take a step back, learn from the past, apply good practices and use technology as a lever for business development.

Our proposal is to abstract the mathematical modeling of the construction of computer code, reusing libraries of algebraic models and integrate these models by software built automatically.



Proposal (Plataform)

Components of our proposal



Algebraic language:

Programming algebraic language. The process of compilation works two steps: in the first one analyzes the syntax of the program and in the second the logic of the content of the program. For the edition of the programs the free software NOTEPAD++ is used.

Development environment:

Corresponds to the IDE (Integrated Development Environment) interface that is normally used by the modeler. Its purpose is to facilitate access to all objects used in modeling. The algebraic formulation of mathematical models, stored in databases, allows the mathematical modeler the concurrent work environment of multiple users in LANs and / or in WANs.

Solver:

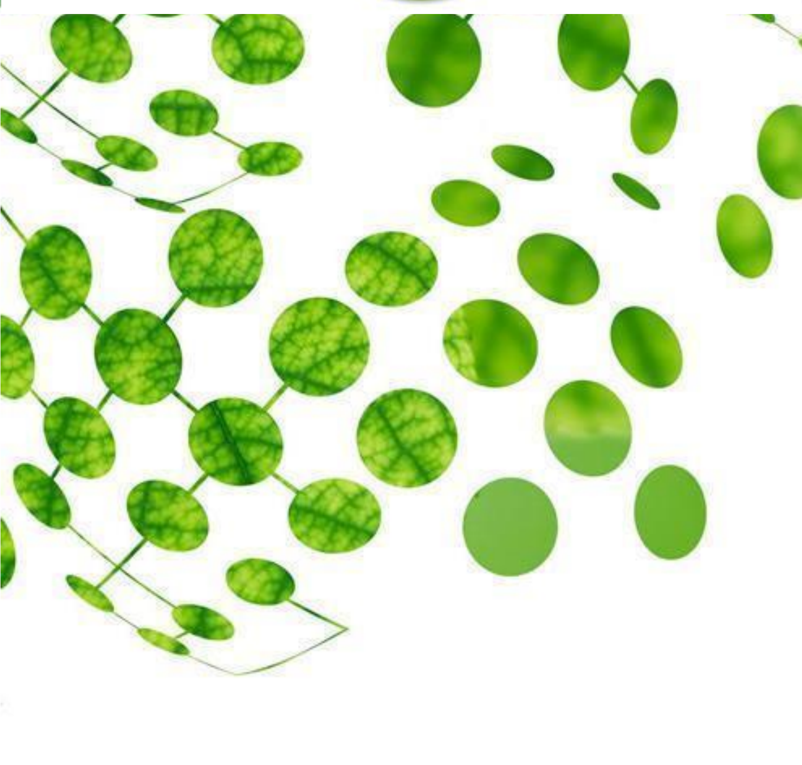
Interactive control that allows the modeler to manage the processes; it can also be executed as a task in the back-end for automatic processing directed by a configuration file.

Conectividad:

To support the information system, connectivity services are available with tables stored in EXCEL, CSV, DBF and SQL servers such as ORACLE, DB2, SQLServer, MySQL, ACCESS, which are accessed through ODBCs.

Visualization:

It is fundamental to be able to chain the results with tools oriented to the exploration and to the visualization of large volumes of data.



The Autana Business Partners analytics unit has reached an agreement with the company Decision Ware to develop joint way the Spanish market of advanced analytics.

With a novel approach to separate the construction of mathematical models from its implementation in programming languages and the latter automate it with robots, our proposal advances in offering solutions for the urgent need to standardize modeling practices, automate the generation of software, reuse components Throughout the life cycle of the models, obtain a global approach to the interrelation of models in a business environment, increase the quality of analytical assets and abstract them from an execution environment will be exploited.

"We get the mathematical talent to work in a mathematical environment without having to worry about its implementation in a programming language.".

The first robot generator of large scale optimization models

Model information system:

It allows to store in a relational format, the different components that intervene in the mathematical formulation.

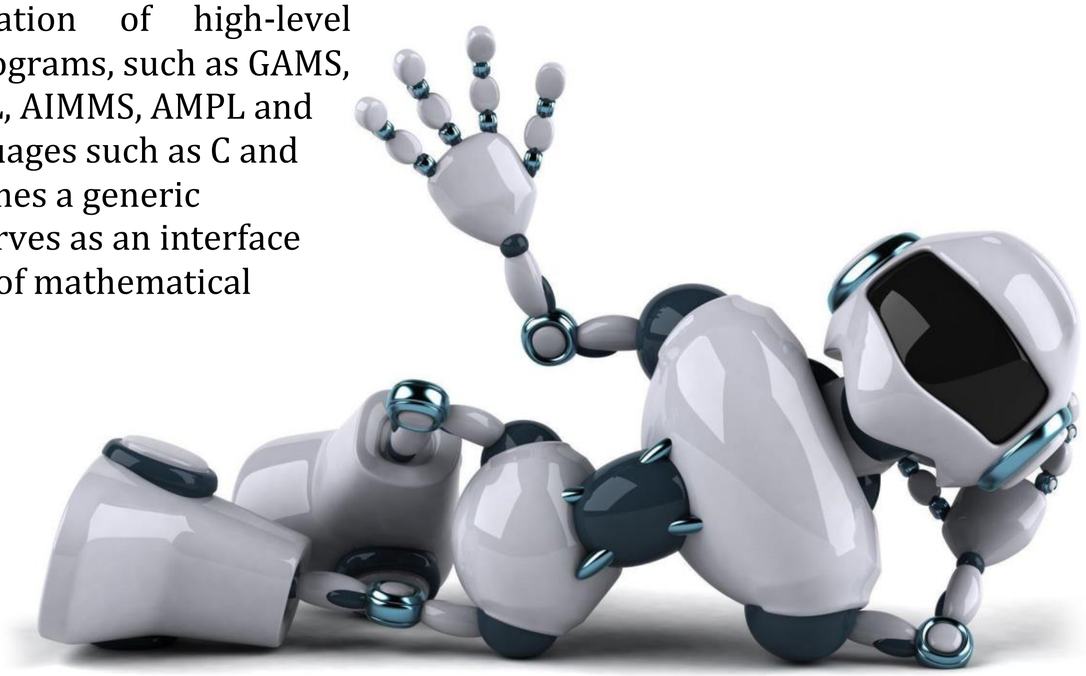
It standardizes the management of the entities and the relationships that define it. This standardization is centered around an algebraic language that allows the handling of linear equations and non-linear equations.

Handles all aspects related to the formulation, solution and use of mathematical models. Conceptually, it groups information according to the stages that must be carried out in the process of developing an application:

- Formulation of mathematical definitions.
- Formulation and solution of problems and models.
- Connectivity with optimization libraries.
- Models use.

Algorithm generator:

Automatic generation of high-level algebraic language programs, such as GAMS, IBM ILOG OPL, MOSEL, AIMMS, AMPL and general-purpose languages such as C and PYTHON, which becomes a generic meta-platform that serves as an interface for multiple products of mathematical programming.



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