

# THE SIM-SERV ASSOCIATION: SERVICES FOR USERS AND SUPPLIERS OF SIMULATION IN PRODUCTION AND LOGISTICS

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**Abstract:** The Sim-Serv Association, which was founded with financial support by the EU, offers a range of services to users and suppliers of simulation. The core services for potential users are its website, the help desk and individual consultation by a team of neutral experts. For researchers and suppliers, there are platforms to present themselves, to publish results and news on achievements, to join or initiate working groups and find partners for joint projects. The Sim-Serv association is open to new members at any time. The paper explains its services and how to take advantage of them.

## INTRODUCTION

Sim-Serv has been set up as a “Virtual Institute” in the year 2001. It received financial support from the EU Fifth Framework Programme for Research and Development. It is one of 17 Virtual Institutes which focus on different areas of technology. Their mission is to stimulate and co-ordinate application oriented research and development in dedicated areas, and to ensure a smooth transition of results into applications in industry and society. Each Virtual Institute (VI) is financed by the EU for a limited period, but is meant to operate beyond this period, hence each VI will establish a self-financing organisation which will carry on the activities at the end of the EU funded project. To this end, the Sim-Serv Association was founded in spring 2004. It is a non-profit organisation where every organisation involved with simulation (researchers, developers, vendors, users) can become a member.

Sim-Serv ([www.sim-serv.com](http://www.sim-serv.com)) focuses on product- and production-oriented simulation. It provides practical support to researchers and developers, to those offering tools and services on a commercial basis as well as to industrial users. The following sections of this paper provide a rough survey of the status of simulation in Europe, explain the objectives of Sim-Serv, its organisation, and the services it is offering to its members and to potential users in industry.

## SIMULATION IN EUROPE: THE CURRENT SITUATION

It is commonly accepted that simulation – in spite of its obvious power and benefits – is not widely used in industry, clearly not as wide as it should be. The

estimated potential for savings and improvement in European industry, which could be achieved by proper use of simulation, is enormous. And those companies who used it express a high degree of satisfaction. In the nineties, simulation was considered a rapidly growing market, and the American Integrated Manufacturing Technology Initiative ([www.imti21.org](http://www.imti21.org)) ranked simulation as one of the four most important technologies for future manufacturing. It states that ‘no other approach offers more potential for improving products, perfecting processes, reducing design-to-manufacture times, and reducing product realisation costs’.

In reality however, the quantitative growth of simulation was rather slow – the growth of its use in European industry as well as the growth of European simulation suppliers.

A study of the use of system simulation in UK manufacturing industry /1/ showed a 92% satisfaction rate amongst users, yet a penetration into industry of less than 10%. That pattern is reported as common across Europe /2/. A more recent study shows that not much has changed in the last decade /3/.

We see three major reasons for this slow take-up: Sorted by priority, they are:

1. Simulation and its benefits are still insufficiently known in industry, especially among those who make the decisions whether to use it or not /4/.
2. Simulation is difficult to justify from an economic point of view. Simulation is often used to prove the viability of a system design. But what is the added value of such a proof in terms of money? Maybe the model helps improve the design, but maybe the improvement is also possible without simulation? It is very difficult to make a convincing financial case for simulation: The extra expenses of using it can be estimated, but not the savings or benefits achieved.
3. Simulation appears as an extra effort, compared to the “conventional” way of working. It is not fully integrated in current planning and management procedures. Problems that should indeed be solved using simulation used to be solved without simulation in the past. Obviously, people who work on such problems and do not (yet) use simulation need a strong motivation to start using it.

On the other hand, the supply side in Europe consists of numerous small or even micro-enterprises, offering in many cases highly specialised tools and solutions. Many

of them are recently born spring-offs from research institutes. Their products are often of top quality, but for such small companies it is not easy to get Europe-wide visibility and find customers from a broad range of industry sectors. It is especially difficult because the market is dominated by a number of powerful globally operating suppliers of general simulation packages with professional marketing and sales activities. Hence, in spite of technical brilliance, European products and service suppliers find it difficult to survive on the European market.

To summarise: Excellent technology is available, but not applied to the extent it should. Both sides – suppliers as well as users – are suffering from this relatively low level of application. And many opportunities for further development are lost because the communication of both sides is insufficient.

## THE OBJECTIVES OF SIM-SERV:

### Promote the Application of Simulation in European Industry

The main objective of Sim-Serv is to stimulate a wider use of simulation technology in European industry and thus help European companies (especially small and medium-sized enterprises) meet the challenges of global competition. What is required to achieve this wider use? If the three barriers stated above are correct, then it is necessary

1. to spread information about simulation to industry managers, and provide detailed information on the benefits achieved by other users.
2. to gather data about cost and benefits of simulation application in industry, in various sectors and for a range of different problems.
3. to make simulation a standard tool for daily work of engineers and managers, and to integrate it into existing methodologies and tool sets. Until this has been achieved, simulation services of proven quality should be easily available at reasonable cost.

Therefore, Sim-Serv's main activity is dissemination: providing a central entry point for those seeking information, guidance and support. Newcomers find general information, case studies about successful applications (with an emphasis on the business dimension), links to experts, suppliers and tools as well as a help desk and a group of neutral, vendor-independent experts ready to answer any questions regarding the use of simulation. Details of the service offered to industrial enterprises are explained below.

### Stimulate and Co-ordinate Research and Development in the Area of Simulation

The second objective of Sim-Serv is to strengthen the development of simulation technology in Europe. This implies surveys of the state of the art, an analysis of needs and gaps, and the initiation of R&D activities addressing the identified gaps. The main mechanisms of Sim-Serv to meet this objective are the Working Groups which are introduced below.

### Support European Simulation Suppliers

Methods, techniques and tools developed in Europe (often funded by European tax payers' money) should be economically exploited in Europe. This means: a strong basis of simulation professionals is necessary: developers and vendors of commercial tools and solutions as well as professional service providers.

The above mentioned dissemination activities also support European simulation suppliers in that they help expand the market for their tools and services. Sim-Serv is particularly keen on spreading information about innovative techniques and tools, new application areas etc. Through its wide dissemination and marketing activities, Sim-Serv facilitates access to a European market even for small or micro providers. Sim-Serv also assists these small suppliers in developing suitable presentation material.

On the long run Sim-Serv aims at the development of widely accepted standards and quality criteria as well as a suite of tools, which comply the standards and criteria and are offered under a common brand.

The services and dissemination options available for suppliers are explained below.

## SIM-SERV'S ORGANISATION

The basic idea of Sim-Serv is to act as a neutral "mediator" facilitating a smooth matching and interaction of demand and supply. Wherever possible and reasonable, this interaction should use electronic media, however it is understood that face to face meetings cannot always be replaced by virtual interaction. Hence local presence is as essential as European wide recognition.

To get started, Sim-Serv was initially funded by the European Union. In order to continue the activities after the end of the start-up period in October 2004, the not for profit **Sim-Serv Association** was founded. This association is open for all organisations involved in developing, selling or using simulation technology in Europe.

The Sim-Serv Association runs a **Website** and a **Help Desk** which provides industry with general information and consulting regarding the benefits of simulation and possibilities to apply this technology.

The Sim-Serv Association and its central Help Desk are locally supported by a network of **Local Contact**

**Points.** Local Contact Points provide information and services in local languages and are available for face to face meetings whenever the need arises.

The **Sim-Serv Suppliers Group** consists of currently more than 60 members, the number is steadily growing. They represent a good mix of complementary skills and cover the majority of EU member states plus some Central European countries. There is a good balance of academic and commercial partners in the group.

The major role of suppliers is to provide input to the association's web site and to deliver customised solutions on commercial terms, whenever Sim-Serv received a request from an industrial user.

All suppliers are presented on Sim-Serv's web site. The presented material can be easily edited by the suppliers themselves.

The Suppliers Group is open to new members at any time. It is indeed one of the aims of Sim-Serv to expand this group substantially.

In addition, **Working Groups** (WGs) are being set up dealing with various technical or commercial issues of common interest. WG members may be suppliers or users of simulation tools and services, members or non-members of the Sim-Serv network. Currently, the following Working Groups are operating:

- Modular Design of Simulation Tools
- Open Digital Factory
- Simulation Accuracy for Plastics and Rubber Production
- Simulation Assisted Automation Testing
- Quantitative Benefits of Simulation
- Business and Enterprise Modelling
- Simulation of Traffic and Transportation Systems
- Human-Centred Modelling and Simulation
- Road Map of Simulation in Process Industries
- Road Map of Simulation in Manufacturing and Logistics

Sim-Serv also stimulates co-operation and joint developments of suppliers. Sim-Serv supports its members by bringing together partners with similar or complementary aims and skills, and helping them form consortia. Sim-Serv supports the development of research projects and the application for research funding.

Finally, Sim-Serv provides an overview of the state of the art in simulation, it identifies trends and unsolved

problems, and thus provides guidance for research and - last not least – research policy. Sim-Serv will play an active role also in future EU research programmes.

Working Groups generated elsewhere are also invited to use Sim-Serv's facilities and make themselves known via Sim-Serv.

## **SIM-SERV'S SERVICES TO INDUSTRY**

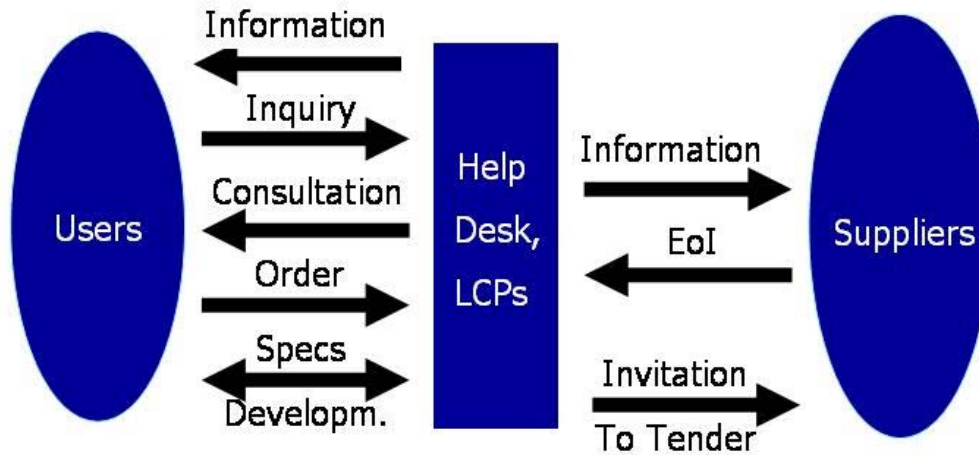
The central service of Sim-Serv is the web site. It contains general information about simulation, a database of technical and scientific information, news and information on relevant events, case studies and success stories, a list of suppliers and presentations of simulation tools.

A relatively new service is the self evaluation tool, which is freely available on our web site. A simple questionnaire of 10-12 questions help an industrial user define very roughly his situation and aims, and to check if simulation should be applied in this particular situation. 2-3 days after submitting the questionnaire, he will receive a report and a recommendation written by one of our experts.

Besides, Sim-Serv offers the following services to potential simulation users in industry:

- the help desk answers specific questions and offers a first and rough evaluation of problems
- independent technical consultation supports the user in analysing his problem and checks if simulation should be applied and how,
- a supplier-independent functional specification of the application /solution is developed on request by technical experts
- the best suited supplier(s) of the specified solution are found (see below for details)
- project management support, quality assurance and an evaluation of the solution after its implementation are offered

Figures 1 and 2 show how these services guide a novel user from first information and contact through to a co-operation with a member of the Sim-Serv Suppliers Group.



*Figure 1: The interaction of Sim-Serv, Users and Suppliers (part 1)*

## TEST CASES: SOLUTIONS DELIVERED TO INDUSTRY

In a number of test cases, the Sim-Serv approach proved feasible and beneficial to both customers and suppliers. Test cases are industrial applications of simulation where Sim-Serv assisted the customer analyse the problem, checked applicability of simulation and searched for suitable suppliers. Here are some examples of test cases:

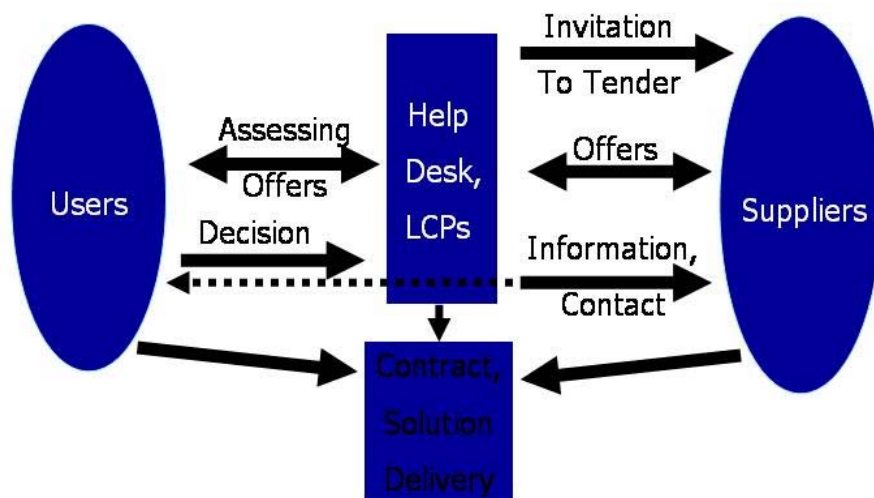
A medium sized UK based manufacturer of aluminium parts was looking for tools to support production scheduling. They had already made a pre-decision for a particular tool, but did not know how to make best use of it. Sim-Serv established a contact to Riga Technical University who developed a simulation model of the plant and used it for testing out several scheduling strategies and predicting the effects of various configurations of the tool. As a result, the company managed to reduce stocks of raw material by 50% /5,6/.

A Finnish manufacturer of rubber and plastic parts had to reduce product development time. With the support of Sim-Serv they tested a simulation tool and decided to introduce it. Production cost was reduced by 30% on average /7/.

A French manufacturer of laminates was offered a new technology for producing multi-ply laminates. They were looking for a proof of technical and economic feasibility of the proposed process. Sim-Serv brought them in touch with two simulation service suppliers: one of them developed a model of the entire process which allowed estimating production output and cost. The second made a very detailed model of the most critical part of the process in order to prove technical feasibility /8/.

An application in a German manufacturer who had to design a new assembly line is described in /9/.

/10/ describes a simulation study carried out by an Italian Sim-Serv member in a UK based manufacturing enterprise. This paper as well as /9/ is particularly remarkable in that both describe in detail the procedures applied by Sim-Serv to match demand and supply. Both cases gave rise to modifications of Sim-Serv's procedures, and both led to an ongoing co-operation of supplier and user. Both user companies were sceptical before the project, and now want to continue using the model for production planning and scheduling. This proves that Sim-Serv' approach is well suited to introduce simulation in enterprises which never used this technology before.



*Figure 2: The interaction of Sim-Serv, Users and Suppliers (part 2)*

In /11/, the introduction of a simulation based scheduling tool in a German SME is described. This case as well as /9/, /6/ and /7/ prove that simulation is applicable also in SMEs.

## SERVICES TO RESEARCHERS AND SIMULATION PROFESSIONALS

To researchers and simulation professional (suppliers), Sim-Serv offers essentially two advantages:

- the chance to present themselves to potential users in industry and thus to find additional partners / customers
- the chance to network and co-operate with other simulationists, to co-ordinate and join forces.

More specifically, the following is offered:

- space on our web site to present themselves, their expertise, their successful projects, and their tools
- guidance and support for the preparation of this material
- support for its translation to other European languages
- news and information about relevant events on the web site
- a data base containing up to date technical information

- working groups as a possibility to co-operate with other suppliers
- the chance to contribute to joint (funded) research and development projects
- professional, European- wide dissemination activities to attract potential users to our web site, and to acquire commercial or research projects
- offerings for additional commercial projects acquired by the Core Team

Sim-Serv helps its members find partners/customers, and it searches customers itself, e.g. by means of the self evaluation tool. Whenever a customer approaches Sim-Serv and asks for some simulation service, Sim-Serv offers the services described above: neutral advice, supplier independent development of a functional specification, search for suited supplier(s). The search for suppliers is done by the following "internal bidding procedure":

A functional specification is developed by Sim-Serv in close co-operation with the customer. This specification and an Invitation to Tender are then circulated to the Suppliers Group or to a subset of members pre-selected jointly by Sim-Serv and the customer.

The members who are interested in the offered projects submit their offers, which contains details of the solution they offer, the price and the earliest possible delivery date. Based on criteria defined by the customer, Sim-Serv evaluates these offers and presents them to the customer who makes a final selection.

In reality, some iteration may be needed, e.g. suppliers may ask for more information before they submit an offer, or the customer asks for modifications of the offers. In general our experience shows that this procedure is considered effective and fair by both sides.

## SIM-SERV'S FUTURE

Sim-Serv as a funded project terminates end of October 2004. From then on, the Sim-Serv Association continues providing the services and operating the web site.

Sim-Serv closely co-operates with other virtual institutes, mainly with the virtual institute for advanced manufacturing technologies ADMAN ([www.max-serv.com](http://www.max-serv.com)). These two institutes seem to complement each other in a most natural way.

Sim-Serv is aware of the existence of numerous organisations active in the simulation field. The intention is by no means to compete with them. We rather intend to complement the more science-oriented organisations such as the national and international simulation societies or EuroSim, and to support the commercial organisations in order to promote our common goal:

*To improve the general knowledge about simulation and its benefits, particularly in industry, to stimulate and facilitate a wider take-up, and to create an environment for fruitful and exciting further developments of simulation technologies.*

All researchers, commercial suppliers and users of simulation technology are invited to join Sim-Serv, use our services and become members of the Association in order to contribute to the shaping of the future of simulation in Europe.

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interests include conditions for simulation success and failure, and simulation quality criteria.

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