MISSIONS OF THE CAPE-OPEN LABORATORIES NETWORK

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Abstract

The CAPE-OPEN Laboratories Network (CO-LaN) is the internationally recognized user-driven organization for the testing and management of the CAPE-OPEN standard targeted at Computer Aided Process Engineering (CAPE) tools. The standard defines rules and interfaces that allow applications or components to inter-operate. The CO-LaN Society also helps to facilitate implementation of standard interfaces in commercial solutions such as AspenPlus™ from Aspen Technology Inc., Hysys.Process™ from Hyprotech, gPROMS™ from PSE Ltd, VALI III from BELSIM SA, INDISS from RSI, etc ... The CO-LaN Society acts as a new player in the process modelling area and proposes a different business model.

Keywords

Process industries, Simulation, CO-LaN, Process Engineering Software, CAPE-OPEN, Architecture, Components

Introduction

Facing economic, environmental and safety constraints, process industries are forced to improve performance of their plants and to reduce cost and time for plant development. Process industry (simulation) software provides vital tools to achieve these goals and to be competitive in a market with increasingly short innovation cycles (Braunschweig and Gani (2002) describe the state of the art on the tools for computer aided process engineering). These Process (Simulation) Engineering Software (PES) design, simulate and control critical

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business processes. They are provided by companies that develop proprietary systems within a purely competitive market.

Despite strong competition, the different actors from the CAPE market (the operating companies, the software suppliers and the research institutes) have decided to collaborate. This new collaboration framework is called here "*co-opetition*" as defined by Brandenburger and Nalebuff (1996): *"Business is cooperation when it comes to creating a pie and competition when it comes to dividing it up"*. Plug-and-play capacity will stimulate the market and create new opportunities.

The adventure of *co-opetition* for the process industry started in 1997 with the European funded CAPE-OPEN project. Braunschweig et al. (2000) explain this project, a collaboration between industrial companies, software suppliers and academics to produce a single standard for process industry simulation software. This standard is called CAPE-OPEN (CO). Belaud (2001) introduces the standard and its related technology. CAPE-OPEN standardizes business interfaces and defines an open architecture that allows PES from diverse sources to inter-operate. Belaud and Pons (2002) detail the version 1.0 of the standard and list software solutions that are already compliant with this open architecture.

The expected result of this *co-opetition* process is to reach a three-win situation (one win for each type of actor!). The software suppliers hope to extend the current market by increasing the use of PES by their clients and expect to create a new market of CO compliant PES components. The operating companies want to decrease their dependence on proprietary integration approaches and expect to reduce the integration cost of third-party codes. "Develop once and run everywhere" is a strong motivation, using the plug and play pattern into any PES open environment. The desired benefits for academics are to propose adequate modern educational courses in CAPE field, to improve dissemination of research results and to achieve a better adaptation to industrial needs.

CO-LaN, a new player

Accompanying this *co-opetition*, a new player is needed. It should be an independent international communication platform. Through a formal organization, it should manage and propose technical orientations about the CAPE-OPEN standard. It is worth noting that the approach of standardizing a specific business domain using a not-for-profit exchange organization, is a usual trend in information technologies. For example, the Object Management Group (2002) is an open membership, not-for-profit consortium that produces and maintains computer industry specifications for interoperable enterprise applications.

In order to manage the CAPE-OPEN software architecture, more than twenty companies, institutions or individuals have launched a neutral organization in January 2001, the CAPE-OPEN Laboratories Network

(CO-LaN). CO-LaN organizes the lifecycle of the CAPE-OPEN standard. In 2002 CO-LaN became an industrial end-users oriented organization. It is now funded only by the operating companies. However the CO-LaN Society retains two categories of members, full members with membership fees for the end-users and associate members with free membership for the academics and software suppliers.

Thus very much as in other technological areas, the process industry software market is moving from a three-actors competition business model to a four-actors *co-opetition* business model. Figure 1 symbolizes this new model and the underlying relations.
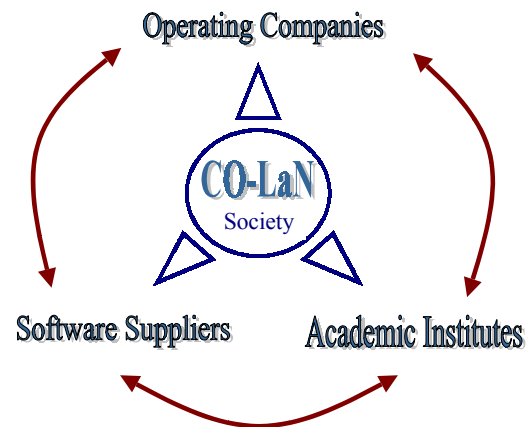

Figure 1 Four-actors co-opetition model

Currently the main impact of this set of interactions lies with PES development strategies. In addition to the assimilation of web based advanced technologies, PES are or will be compliant with the CAPE-OPEN architecture that is standardized by the three former actors through the CO-LaN. The software suppliers will deliver CO compliant PES environments and CO compliant high added-value PES components. Belaud et al. (2001) detail commercial developments from Aspen Technology Inc. and Hyprotech. The industrials will develop CO compliant PES components gathering their internal know-how while the academics will supply CO compliant research oriented PES environments and components.

Through the four-actors *co-opetition* business model, the CO-LaN and its associated results (such as the CO standard) are changing the PES market and the way to develop PES. Costly, fully proprietary PES solutions are being replaced by open PES solutions that encourage innovation and create new business opportunities. The resulting "new" market pushes the former competitors to work together in order to realize a historic chance of innovation and growth for the whole community of process industries.

The next sections describe the new player, the CO-LaN, in particular its missions, organization, and technical infrastructure, and briefly the services which are (or will

be) offered. Detailed information can be found in CAPE-OPEN Laboratories Network (2002).

Missions

The CAPE-OPEN Laboratories Network is the internationally recognized user-driven organization for the testing and management of the CAPE-OPEN standard. The standard defines rules and interfaces that allow PES solutions to inter-operate. CO-LaN also helps to facilitate implementation of standard interfaces in commercial software. The missions of the CO-LaN are :

1. User priorities for CO standard: work with software suppliers to clarify user priorities for PES solutions interoperability and also to promote communication and cooperation among software suppliers to insure that the CO standard actually translates into commercially valuable interoperability.
2. Exploitation and dissemination: promote the CO standard to end-users and distribute CO information and technology internationally. CO-LaN promotes the CAPE-OPEN standard so that it is effectively used for the business operations of end-users. For example, a journal called *CAPE-OPEN Update* is a free brochure issued three times a year.
3. CAPE-OPEN specifications life cycle management: organize the maintenance, evolution, and expansion of the specifications; This is organized through Special Interest Groups (SIGs), each created to take care of a meaningful subset of the standard. The work done by SIGs follows a well-defined approval process.
4. Testing and interoperability facilitation: supply compliance testers to support development of components, organize interoperability tests between suppliers of CO compliant solutions.
5. Training and Migration facilitation: ensure that training modules are developed and available; supply migration wizards to automate component wrapping. The CO-LaN will not develop nor provide training sessions. However, the CO-LaN may provide public information and materials, by making them available on the web. Migration wizards that automate part of the development of a component, guidelines that explain how to do it, and other tools, are offered for download on the CO-LaN web site. On its web site CO-LaN will promote the list of companies offering training and consulting services on its web site.

Organization

The organization operates as a network of virtual and physical offices located within the membership. It mainly uses the internet for internal communication and for communication with other parties and with the CAPE community as a whole. www.colan.org is the official web portal that gives to members and non-members information and services about the CO-LaN and the CAPE-OPEN standard.

CO-LaN is a not-for-profit Society established under French Law of 1901. So, CO-LaN operates as a not-for-profit membership organization with end-user companies as full members, and other types of organizations as associate members. Full members are paying membership fees while associate members are not subject to membership fees. A Management Board consisting of industry representatives and its Chairman are in charge of the strategy and decision making.

Full members are end-user (industrial) operating companies. These companies use PES in their business activities and can be considered as end-users of the CO standard. These are mainly operating companies, process licensing companies, and (not academic) research institutes. The CO-LaN full members as of June, 2002 are Air Liquide, BASF AG, BP International, Dow Chemical, Shell International Chemicals B.V., Institut Français du Pétrole, TotalFinaElf, Norsk Hydro AS and Mitsubishi Chemicals Corporation.

Associate members are all others: software suppliers, universities, individuals, governmental organizations, etc. These associate members do not have to pay membership fees (but they can make donations), and have no voting rights. They can, however, participate in the Society's activities.

Membership is not required for developing or using CO compliant software solutions. Specifications and other services are available to non-CO-LaN members as well. Nevertheless some additional community services may be restricted to CO-LaN members.

The Society is governed by the Management Board (MB), consisting of the officers of the Society and additional members as elected by the full members. Other responsibilities in the MB correspond to lines of actions, running SIGs, marketing, links with software suppliers, links with academia etc. The SIG is the typical approach that CO-LaN uses for CO standard development or revision. A SIG is composed of the appropriate representatives of CO-LaN full members and associate members, and is chartered by the CO-LaN Management Board with a specific task of CO standard development or revision.

Technical infrastructure

Pons et al. (2001) explain the technical approach of the CO-LaN to the maintenance of the CO standard. To

minimize the resources needed to run such a Society while fulfilling its missions, CO-LaN has been developed as a virtual network, which relies heavily on internet technologies to achieve its goals. Since CO-LaN aims at creating and supporting a CO community, it is focused on collaborative work within the Society. This implies that the CO-LaN has to offer facilities for efficient information exchange among its members and other interested parties. Therefore, it includes a virtual workspace for different user groups where documents can be stored, shared and managed by different CO-LaN members.

Thus the CO-LaN web portal provides the main technical support for organizing all the missions of the Society. The portal will be the dissemination and business-to-business mechanism for CO-LaN. It provides information about the CO standard. It contains technical information and is the backbone for further activities of CO-LaN, ensuring dissemination through sophisticated communication mechanisms including easy access to the technical repository and remote testing. CO-LaN puts a lot of emphasis on this portal since it is the centre of all CO-related activities.

Services

The CO-LaN brings services not only to the CO-LaN members (whatever the type of membership, full or associate) but also to the whole process industry community. These services encompass all aspects of the CO standard and specifically target the two basic groups who make use of CO-LaN services: software component developers and process (simulation) industry engineers. Also specific material is available for high level decision makers.

CO-LaN web portal includes the CAPE-OPEN documentation set, as well as additional resources for implementing and using CO compliant components (FAQ's, discussion board, how-to's, software migration support, etc.). Visitors will find services to help them develop new standard interfaces or improve existing ones, as well as dedicated help for implementing CO compliant software solutions. The range of services is summarized in figure 2 and full details can be found at www.colan.org.

Conclusion

With today's fast-paced rate of technology change, PES suppliers as well as users want to make use of CO-LaN's co-operative platform as input to their operational, marketing, product development and technology acquisition strategies. The CO-LaN inaugurates a four-actors *co-opetition* model and is now a new player in the process industry field. Considering the recent merging of two major PES suppliers, its position could be strengthened in the future in guaranteeing a suitable "equilibrium" between all the market actors.
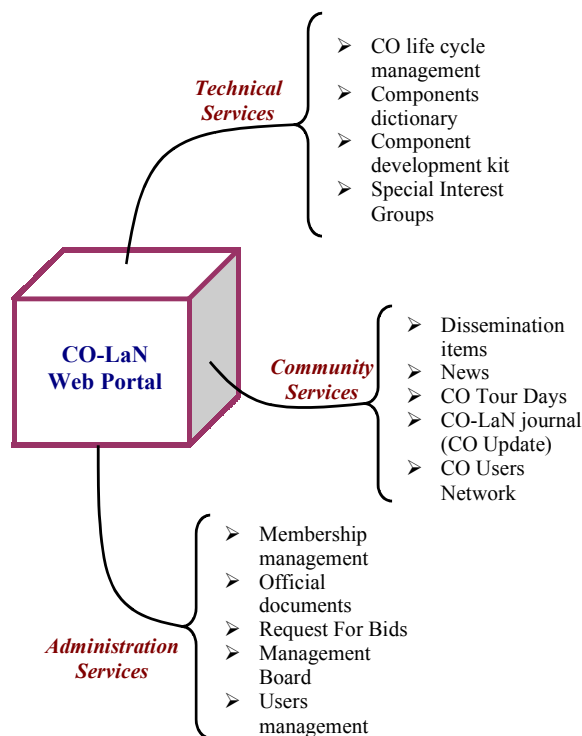

Figure 2 CO-LaN services

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