

## **SOCRATES THEMATIC NETWORK TO ENHANCE EUROPEAN TEACHING OF OPERATIONS AND SUPPLY CHAIN MANAGEMENT: GOALS, TASKS AND PRELIMINARY RESULTS**

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### **ABSTRACT**

The EurOMA-sponsored THENEXOM network has been approved by the European Commission through its Socrates community action programme. THENEXOM's short-term goal is to analyse the present state of Operations and Supply Chain Management in European universities and to identify strengths and weaknesses in order to instigate the use of better practices. A census is being drawn up of OM teachers throughout the 24 countries (and 27 universities) making up the network. A survey can then be taken of the teaching-staff, content and methods employed. The network's medium-term aim is to tighten links between teaching, research and business practice by reducing imbalances. In compliance with EU recommendations, strategic connections are being sought with America and Asia to expand aforesaid objectives and actions throughout the world.

**KEY WORDS:** Thematic networks; Production/Operations Management; POM; Supply Chain, Service Operations Management.

### **RESUMEN**

La red THENEXOM, promovida por EurOMA, ha sido aprobada por la Comisión Europea (programa de acción comunitaria Sócrates). Su objetivo a corto plazo es estudiar la situación de la Dirección de Operaciones y la Gestión de Cadenas de Suministro en las universidades europeas, buscando identificar fortalezas y deficiencias y promover el empleo de las mejores prácticas. Para ello se está elaborando un censo de docentes de DO en los 24 países representados en la red (por 27 instituciones universitarias); éste permitirá el desarrollo de una encuesta sobre profesorado, contenidos y metodología docente. A medio plazo, la red ha de servir para estrechar vínculos entre enseñanza, investigación y práctica empresarial, limando los posibles desfases. Siguiendo las recomendaciones de la UE, se están realizando conexiones estratégicas con América y Asia para extender los objetivos y actuaciones mencionados.

**PALABRAS CLAVE:** Redes temáticas; Dirección de Producción/Operaciones; Cadena de Suministro; Dirección de Operaciones en empresas de servicios.

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## **1. INTRODUCTION: OPERATIONS , SUPPLY CHAIN AND SERVICE OPERATIONS MANAGEMENT**

THENEXOM (European Thematic Network for the Excellence in Operations and Supply Chain Management Education, Research and Practice) is a thematic network sponsored by EurOMA (European Operations Management Association) and was established in October 2003 through the European Commission's Socrates community action programme. Expert assessment has described the subject area and the research project as very important for the whole European Union. The well-balanced experience and abilities of the partners both at an academic and a business level were also highlighted.

The THENEXOM network takes a broad view of the definition of Operations Management and includes mainstream Operations Management, Supply Chain Management, and Service Operations Management.

**Operations Management (OM)** is concerned with how organisations produce goods and services, and in particular with the tasks, issues and decisions of operations managers who are in charge of making sure that the design, production, and delivery of products is taking place effectively. Common topics studies in the OM field include Operations Strategy, Product & Process Design and Development, Capacity Management, Location and Layout, Quality Management and Continuous Improvement, Production Planning, MRP/ERP Systems, Just-in-time / Lean Production, Project Management, Process Management, Inventory Systems, Global Operations, Management of Advance Manufacturing Technologies, Service Operations Management, Purchasing and Materials Management, Logistics, Supply Chain management, Performance measurement, Internet-enabled operations, Environmental Operations Management, among many others.

**Supply Chain Management (SCM)** is concerned with the management of logistical flows and with the set of management practices used to design, plan, and control these flows in order to achieve seamless integration of the network of suppliers feeding an operations system. Typical SCM topics are Supply Chain Design (logistics network configuration, flow design, integration,...), coordinated product and supply chain design (variety management, modularity, postponement,...), procurement, supplier management, information management, reverse logistics or environmental issues.

**Service operations management (SOM)** is similar to Operations Management but focuses exclusively on the service industry and on the difficulty of designing, planning, and controlling operations when an operations system output is intangible, co-produced, and involves emotions and experiences. Common topics studies in SOM field are, among others, service operations strategy, design and management quality, internationalization and globalization of service company and world class service companies, selection and design of service, selection and design of service delivery system, technology in services and new technologies, layout in service companies planning, scheduling and control of service operations, management of demand and medium and short-term capacity, operations queue management, yield management, human resource planning and scheduling or measure of customer satisfaction.

## **2. IMPORTANCE OF THE THEMATIC NETWORK**

During the last 20 years the increasing need for companies to sharpen their competitiveness in international markets has converted the Operations function, and productivity in general, into a key competitive weapon.

During this period, Operations Management has assumed a greater focus in business and academic communities, and the role of the OM function in achieving business success has continued to grow. It is acknowledged as a key to success of many manufacturing and service companies. A study on computer and electronics companies (Lau, 1997) analysed the effect of implementing a variety of OM approaches, methods and techniques, on the results obtained by these companies. The study showed that those companies classified as highly competitive scored higher values in OM characteristics, than the less competitive companies.

Individual companies need to be studied using a cross functional approach, which has to take into account the interconnections between the different business areas/functions. Besides, the evolution of new Information and Communications Technology, and the rapidly expanding globalisation is facilitating the development of multiple networks of companies with many varied specialities. Increasingly both company strengths and competitiveness is residing in networks /Supply Chains with strong interconnections. Empirical studies (Frohlich and Westbrook, 2001) show that the most successful Supply Chains are those that have been able to integrate their processes with their suppliers and customers. Adequate training in the development and management of supply chains is also a necessity, both in the academic and business environment, and in particular the Small and Medium Enterprises environment.

With regard to the services that are offered, these are of an ever greater crucial importance. The OECD's latest statistical data regarding the percentage of the GDB (OECD, 2004a) and employment (OECD, 2004b) is proof of this. This data shows a percentage of the GDP of over 70% for 2002 in the main countries (e.g. 75% in the USA (in 2001), 73.2% in France and the UK and 70% in Japan, Germany, Italy and Spain. Dependent employment in 2003 is over 60% (e.g. 76.5% in the USA (2002) and the UK, 74.5% in France and Canada, 65.2% in Germany and 64.6% in Spain).

To this must be added the growing involvement of service activities in manufacturing companies, calculated at between 30% - 70% for a manufacturer (Rosen, 1998). It therefore comes as no surprise that a clear awareness has existed of the importance of Service Operations Management for over twenty years, and of the role it can and should play in improving management and competitive ability in this domain.

Given that effective management of the three stream of Operations (OM, SCM and SOM) is very important for building a competitive advantage, it follows that the level and quality of training in these areas has a critical influence on this. Academics play a key role in this situation, as future graduates will be the main source of management skills and capabilities needed by companies to maintain and increase their competitiveness. Institutions and academics need to be aware that the supply of well-trained graduates in OM and SCM should match, in quantity, quality and time, the growing needs of companies.

Currently there is a need to bring academics together to cross-fertilise ideas on OM, SCM and SOM, because within European institutions there is a lack of knowledge regarding individual country understanding of OM, SCM and SOM and its sub-disciplines. In addition, given that people with knowledge in OM, SCM and SOM must satisfy the needs of a vast number of companies in many geographical locations, the usefulness of this type of information will increase if comparative data between countries/regions is generated to give a wider perspective of this subject. The effectiveness of these comparisons will also be enhanced if deeper aspects are explored in detail. For example, where differences are highlighted, information on their possible causes is needed, as well as information on how these differences can be corrected.

The current situation with regard to OM, SCM and SOM teaching in European Universities is also unclear. Teaching is undertaken in Polytechnics, Universities, Engineering Schools, Management Departments, Business Schools, etc. The classification of work done in these environments as OM, SCM and SOM is based on the nature of the topics addressed and on the background/profile of the person doing the work. A review of the characteristics of journals where academics publish their work and the list of required readings in doctoral programs shows the same diversity (Vastag and Montabon, 2002). A similar broad scope occurs in courses, research methodologies and teaching techniques used at different levels. An extensive review of the bibliography by the University of Seville has highlighted very few studies of these topics. Many of those found refer to the USA and only touch on some aspects of OM teaching. This in-depth study of OM teaching needs to be undertaken at the European level (Alfalla and Machuca, 2003). There is thus an urgent need for such studies to discover whether there is adequate capacity at the European level to meet an increasing demand for well-trained professionals in the field.

These Thematic Network will undertake in-depth studies, in order to build a true picture of the situation of OM, SCM and SOM education in Europe. It will use this information to study collaborative means of improvement, and begin the process of achieving global excellence in the field at European universities. The creation of this network to map and share this varied knowledge can serve teachers and researchers to better understand their positions, discover areas where work is done which could complement theirs and create new international teaching and research networks in the field. Only with adequate data can it be determined whether European universities are responding adequately to companies' training needs in this important management field. Only in this way can possible deficiencies in the educational systems be highlighted, which should facilitate the implementation of the necessary corrective measures. For this reason links with companies will be searched and future surveys will try to map their needs in OM, SCM and SOM fields.

This Network proposes to build upon a preliminary work undertaken in Spain which shows the OM situation in this country in 1997 (Machuca and Alfalla, 2003). In 1997-1998 Alfalla and Machuca (2003) conducted a survey of OM faculties and identified almost 250 academics actively teaching a total of almost 300 OM courses. Analysis of the census identified a geographical imbalance, with almost 70% of academics located in 6 autonomous regions (out of a total of 17).

Also, the study shows that the 64,4% of all the degrees offered only one OM course, not to mention those other BA and IE degrees in which OM is not taught at all. The effect of this situation is that a large number of graduates are receiving relatively little or no OM training, perhaps based on only one course of 45 or 60 hours. This lack of time forces the teacher to concentrate on a very limited set of topics selected from the wide range encompassed by our discipline, or else to pass superficially over a larger number of topics, to the detriment of sufficient depth of treatment. In our opinion, the result can only be an inadequate training in the OM discipline for many students.

Aspects of this research will be replicated by the Network at the European level in the quest for improvement in OM training, taking advantage of the adaptation of the Spanish university system to the European Higher Educational Area. For this reason, for us it is an important consideration that our research come under the Tuning Project framework and that the results of the research might be of some help in the convergence process. The THENEXOM network is therefore one of the official mechanisms through which the European Commission is implementing its TUNING project.

### 3. AIMS AND OBJECTIVES OF THE THEMATIC NETWORK

The first aim of the Thematic Network is to bring together academics in European higher education institutes to identify the European map of OM, SCM and SOM university education.

The network will try to find deficiencies and to try to find their causes as well as to find and to promote best practice content, teaching and assessment methods in OM, SCM and SOM courses, to enhance and develop a European dimension in the field.

The network will assess innovation in OM, SCM and SOM teaching methods and materials and disseminate the wider application of good practice across Europe and beyond in both the academic and commercial environment.

A medium-term additional aim of the network is to establish links between education, research and practice (i.e. companies) in the field in order to reduce imbalances between these three pillars of companies competitiveness. Specifically the objectives of the Network over the first 12 months, are to:

1. Undertake a census of OM, SCM and SOM teachers in participating countries to determine the “capacity” for the “production” of graduates with knowledge in OM, SCM and SOM. This will capture which institutions are teaching OM, SCM and SOM courses, which academics are teaching graduates, what level and type of training do these academics have and what is their experience and background. Given the depth and scope that this study required (for the reasons outlined in the preceding section), the identification of these teachers is a major objective requiring considerable effort, since no official source exists.
2. Design a survey of OM, SCM and SOM teaching in the participant countries to capture data on the quantity and quality of knowledge given to OM, SCM and SOM students, how the teaching of OM and SCM is planned and developed and how the quality of OM, SCM and SOM learning is monitored.
3. Enlarge the network. New members will be searched among representatives from other universities, companies, research centres, governmental and entrepreneurial institutions to increase the European dimension and make the network more relevant to the needs of companies.  
In compliance with E.U. recommendation strategic connections are being sought with America and Asia to expand aforesaid objectives and actions throughout the world.
4. Undertake a network design improvement process, setting up a core membership of 8 partners to manage this process. This is to ensure that the network evolves over time. The core members will work to improve the design of the network.
5. Start to create and populate an electronic knowledge database which when completed, will include data on European institutions and individuals involved in the fields of OM, SCM and SOM, a listing and description of the topics covered in OM, SCM and SOM courses, a description of the teaching and methodologies techniques used as well as related research lines.

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6. Organise and undertake 3 Network meetings, involving 30 academics from the participant countries, as well as invited observers from other institutions and countries.
7. Organise and undertake 4 meetings of the Core group to discuss amongst others, network issues such as scientific aspects, evaluation aspects, network evolution aspects, etc.

### 4. BENEFICIARIES

The direct beneficiaries of the Network will be:

- All academics in the field of OM, SCM and SOM working in European universities. They will directly benefit from increased knowledge of who is teaching which kinds of subject (and which methods / techniques) and undertaking what type of research. Users of the knowledge repository will have a valuable source of information. In addition, many of the partners have links with companies, which should also facilitate increased awareness of best practice within the companies and a direct transfer of knowledge. The network will provide teaching professional with increased awareness and understanding of best practice in teaching OM so they can better integrate their research and teaching to benefit their students.
- Academic in the less developed countries of Eastern Europe will be direct beneficiaries, as their teaching and assessment methods could be outdated, will benefit directly from increased understanding of the impact of teaching techniques such as case studies and ICT simulations. They will also benefit from increased conference presentations and journal publications as the dissemination potential of the network develops further. As the network membership increases to include other organisations, it is anticipated that all involved will directly benefit from the dialogue undertaken.
- Companies and employers organisations in the future design of the network (Year 2 onwards) will provide valuable feedback on the impact of the training techniques and on the relevance of academic research to their needs. Their involvement in the network will lead to collaboration, where they will become instrumental in ensuring that research is relevant and training and assessment is appropriate to their needs.
- Governmental organisations will be able to base their policy on relevant research and knowledge and in collaboration with companies work together to achieve actual business improvement.

There will be indirect beneficiaries of the networks activities. This includes:

- PhD students from universities across Europe who directly benefit from sharing experiences and networking with academics.
- Companies and their employees who undertake MBA programmes, in which OM and SCM subjects are taught, will indirectly benefit from better awareness of best practice techniques.

- Students of OM both at undergraduate and postgraduate level will indirectly benefit from the increased awareness of best practice techniques, which will be mainstreamed into existing courses.

## **5. PARTNERSHIP OF THE NETWORK**

During its first year, 27 university institutions in 24 European countries have belonged to the THENEXOM network. With regard to the make-up of the network, experts who assessed the proposal highlighted the fact that the partnership includes not only great expertise but also partners that could derive great benefits. They similarly pointed out that a mutual complement of activities has been identified and that cooperation and communication between partners seems to be guaranteed. The University of Seville is the coordinating institution, but coordination also involves seven other core members of the network.

Table 1 shows current partners and their corresponding website addresses (institutions shaded in Table 1 are members of the Core Group).

As indicated in section 3, the network must grow in the near future through the inclusion of new universities, institutions and companies. Nevertheless, all new members must provide some added value with regard to the network's objectives and activities in the short-, medium- and/or long-term. Network design is continually being improved, and one of the projects at present being examined is the setting up of domestic networks in the 30 European countries connected through THENEXOM by the creation of one or more representatives in each country on the basis their size and other factors.

CITIES IN COMPETITION

| UNIVERSITY   | COUNTRY  | WEBSITE                   |
|--|----------|---------------------------|
| Universidad de Sevilla (coordinating institution)                  | Spain    | www.us.es                 |
| Vienna University of Economics and Business Administration         | Austria  | www.prodman.wu-wien.ac.at |
| University of Antwerpen  | Belgium  | www.ua.ac.be              |
| University of Cyprus   | Cyprus   | www.pba.ucy.ac.cy         |
| Aalborg University   | Denmark  | www.cip.auc.dk            |
| Estonian Business School Group Ltd.                                | Estonia  | www.ebs.ee                |
| Helsinki University of Technology                                  | Finland  | www.tuta.hut.fi           |
| HEC School of Management Paris                                     | France   | www.hec.fr                |
| International University in Germany, Bruchsal                      | Germany  | www.i-u.de                |
| Athens Laboratory of Business Administration                       | Greece   | www.alba.edu.gr           |
| Eindhoven University of Technology                                 | Holland  | www.tm.tue.nl             |
| Coreinus University of Budapest                                    | Hungary  | www.bkae.hu               |
| University of Dublin-Trinity College                               | Ireland  | www.tcd.ie                |
| University of Padova   | Italy    | www.unipd.it              |
| Riga International School of Economics and Business Administration | Latvia   | www.riceba.lv             |
| University of Malta  | Malta    | www.um.edu.mt             |
| University of Stavanger  | Norway   | www.his.no                |
| The Karol Adamiecki University of Economics in Katowice            | Poland   | www.ae.katowice.pl        |
| University of Aveiro   | Portugal | www.ua.pt                 |
| University Politechnic of Bucharest                                | Romania  | www.pub.ro                |
| University of Economics in Bratislava                              | Slovakia | www.euba.sk               |
| University of Maribor  | Slovenia | www.uni-mb.si             |
| IESE-Universidad de Navarra  | Spain    | www.iese.es               |
| Chalmers University  | Sweden   | www.mot.chalmers.se       |
| Aston University   | U.K.     | www.aston.ac.uk           |
| Cranfield University   | U.K.     | www.cranfield.ac.uk       |
| University of Warwick  | U.K.     | www.wbs.ac.uk             |

Table 1. THENEXOM Partnership



## 6. TASKS AND PRELIMINARY RESULTS

During its first year, the THENEXOM network has seen its different objectives achieved. These are set out in Section 3. We are therefore going to briefly take stock of the main activities that have allowed us to achieve these goals.

THENEXOM has established a census and prepared a survey, in order to build a complete picture of the situation of OM, SCM, and SOM education in Europe. It will use this Information to study collaborative means of improvement, and begin the process of achieving global excellence in the field at European universities. The creation of this network to map and share this varied knowledge can serve instructors and researchers to better understand their positions, discover areas where work is done which could complement theirs and create new international teaching and research networks in the field. Only with adequate data can it be determined whether European universities are responding adequately to companies' training needs in this important management field. Only in this way can possible deficiencies in the educational systems be highlighted. For this reason links with companies are actively sought and future surveys will map their needs in OM, SCM, and SOM. Taking into account the Bologna agreement, these activities will facilitate the harmonisation of OM, SOM and SCM studies in Europe.

The main contribution to date has been the conducting of the first pan-European survey of OM, SCM and SOM teachers and researchers. This was done via the Internet which meant that some previous contact with the subject's teachers/researchers was required in order for them to register. This required a huge effort on the part of all the network members, but their effort is beginning to show results. An illustration of this is the fact that, as this document is being written, the census is made up of 929 OM, SCM and SOM teachers/researchers. Per-country distribution of these is shown in Table 2. Despite the fact that our forecasts lead us to expect this number to rise even higher, we believe that at the present time the figures are notably significant. By way of comparison, the number of members registered with the EuROMA association, which is the only point-of-reference we have on a European scale, is 318 in European countries in 2002 EuROMA membership.

| Country        | Sum |
|----------------|-----|
| Spain          | 231 |
| Romania        | 74  |
| United Kingdom | 72  |
| France         | 64  |
| Norway         | 61  |
| Italy          | 58  |
| Finland        | 41  |
| Holland        | 37  |
| Hungary        | 33  |
| Germany        | 30  |
| Denmark        | 29  |

## CITIES IN COMPETITION

|              |            |
|--------------|------------|
| Belgium      | 27         |
| Greece       | 27         |
| Latvia       | 22         |
| Austria      | 21         |
| Portugal     | 20         |
| Estonia      | 19         |
| Slovenia     | 16         |
| Poland       | 13         |
| Cyprus       | 13         |
| Sweden       | 11         |
| Slovakia     | 5          |
| Ireland      | 3          |
| Malta        | 2          |
| <b>TOTAL</b> | <b>929</b> |

Tabla 2. Número de censados por países

Secondly, another great effort has been made to draw up a survey to determine the state-of-the-art of OM/SCM/SOM teaching and research across Europe. The survey bore the Tuning methodology in mind in order that it might be of help for the convergence of Business Administration with Europe, in general terms, and of OM in particular. A first draft of the questionnaire has already been drawn up and is being used in a pilot survey being conducted in a number of countries. Once the pilot survey has been completed, any necessary corrections or improvements will be made in order to produce the final version of the questionnaire. The survey will be conducted via the Internet through access to the THENEXOM website.

| <b>Future new members</b>                       | <b>Country</b> |
|---|----------------|
| Carl von Ossietzky University Oldenburg         | Germany        |
| Bogazici University                             | Turkey         |
| University of Economics, Prague (UEP)           | Czech Republic |
| University of National and World Economy (UNWE) | Bulgaria       |
| Renault Spain (Factory of Sevilla)              | Spain          |
| University of Bradford School of Management     | United Kingdom |
| Brno University of Technology                   | Czech Republic |
| Complutense University Madrid                   | Spain          |
| Copenhagen Business School                      | Denmark        |
| University of Ghent                             | Belgium        |
| University of Iceland                           | Iceland        |
| University of Udine                             | Italy          |
| International School of Management              | Lithuania      |
| Polytechnic of Milan                            | Italy          |
| University of Salford                           | United Kingdom |
| Polytechnic University of Valencia              | Spain          |
| University of Salerno                           | Italy          |
| University of Huelva                            | Spain          |
| University of Oviedo                            | Spain          |
| Heineken Spain                                  | Spain          |
| Delphi Automotive Systems                       | France         |
| Nike Europe                                     | Holland        |

Table 3: Future network members.

Thirdly, endeavours to enlarge the network have also been successful, and we can now count on a number of institutions and companies joining, with some already taking an active part in the network. In the near future, 22 new members will be added to the network (see Table 3). Work is already being done to extend the network to countries in Latin America and Asia. To be specific, the inclusion of the following as Associated Members is anticipated:

- ✓ Universidad de Sao Paulo (Brasil)
- ✓ Fundación Getulio Vargas (Brasil)
- ✓ Universidad Nacional de Colombia (Colombia)
- ✓ Instituto Tecnológico de Monterrey (ITESM) (México)

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- ✓ Universidad de Guadalajara (México)
- ✓ Universidad de La Habana (Cuba)
- ✓ Universidad Austral (Argentina)
- ✓ Universidad de Lima (Perú).

Finally, we should like to draw special attention to the construction of the THENEXOM website (<http://www.thenexom.net>). The site's homepage can be seen in Fig. 1. This is not only conceived as a means of conducting tasks that are characteristic of the network (censuses, surveys, etc.), and as a place to bring together all the information that derives from the network. It is also intended to be a point-of-reference for the subject both on an EU level and beyond EU borders. As such, the site contains links to scientific societies and institutions, and there is a forum where issues both relating to the network and, in the future, matters relating to the subject as a whole, can be discussed.

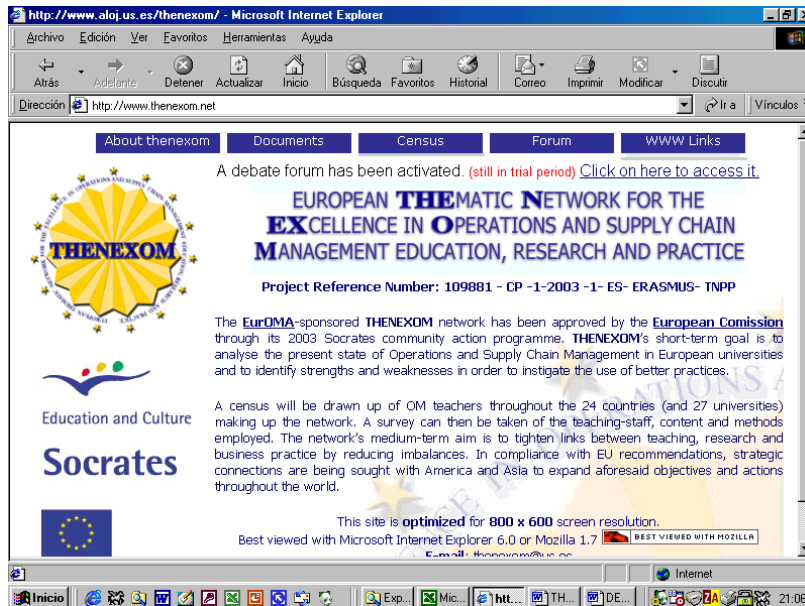


Figura 1. Página web de la red THENEXOM

### Contact us

Given the great interest the network's goals and objectives have for scientific and business communities in the fields of Operations Management and Supply Chain Management, we would like to encourage you to get in contact with us.

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