IBM's DB2 Product Family

Powering the i2 Optimized Supply Chain

An IDC White Paper
Sponsored by IBM and i2

Analysts: Carl W. Olofson and Nicole Gallant

OVERVIEW

This white paper examines the thesis that IBM's DB2 product family is especially well suited to provide data management services for customers running value chain solutions from i2 Technologies. In particular, it explores the technical design philosophy and practical implementation details of various elements of the DB2 product family, especially DB2 Universal Database (UDB). The paper also includes examples of two leading users of the DB2/i2 solution to illustrate the effectiveness of the offering.

i2, a leading provider of end-to-end supply chain management solutions, and IBM, a leading provider of IT systems, data management software, and business information technology (IT) consulting services, have formed an alliance to deliver significant value through an offering that encompasses the application solution, hardware foundation, middleware infrastructure, and business transformation services. This solution is designed to help deliver optimized return on investment and to help ensure quick time to value for customers deploying i2 applications.

METHODOLOGY

This document is sponsored by IBM and i2. The products from their alliance address key elements of ebusiness trends that IDC has been writing about for several years. We have also analyzed the sponsors' claims and checked them against several case study analyses, which we conducted by applying detailed questionnaires to customers of the IBM/i2 alliance. We found the results consistent with the claims of the sponsors. Summary results and conclusions from two case studies, Carraro Group and Whirlpool, are included in this paper.

IDC OPINION

The CyberSmart Computing revolution is transforming businesses and affecting every aspect of commerce. The result is electronic business, or ebusiness, which demands flexibility, fast turnaround time on demands from customers and partners, quick time to market, and highly efficient operation — all with no room for error. Nowhere are these pressures felt more than in value chain management. In forming their value chain management solution alliance around technology and service, IBM and i2 have shown their ability to provide customers with the tools they need to meet the ebusiness challenge.

IDC

Analyze the Future

The CyberSmart Computing Paradigm

The third paradigm, which IDC has called CyberSmart Computing, represented a usage model for computing that assumes broad interconnectedness of systems, breaking down barriers of architecture, operating system, geography, and application.

Four years ago, IDC recognized a third paradigm of computing, which supplanted the earlier centralized, closed system paradigm and the client/server system paradigm (see Table 1). The third paradigm, which IDC has called CyberSmart Computing, represented a usage model for computing that assumes broad interconnectedness of systems, breaking down barriers of architecture, operating system, geography, and application. It has been enabled by the emergence of key standards, including TCP/IP, the World Wide Web layered over the Internet, HTML, component-based development, the platform-independent Java programming language and environment, XML, and, most recently, a collection of standardized messages and protocols surrounding XML.

What is more significant is the fact that this emerging paradigm demands that IT organizations approach systematic issues, such as value chain integration, strategically *and adopt* holistic *solutions to their solution and management.*

Although IBM and i2 directly address the various elements of CyberSmart Computing, what is more significant is the fact that this emerging paradigm demands that IT organizations approach systematic issues, such as value chain integration, *strategically* and adopt *holistic* solutions to their solution and management. The IBM/i2 alliance is designed to offer such holistic solutions.

CyberSmart Computing Drives eBusiness

eBusiness doesn't just happen by accident. It must be planned and developed carefully, based on a strategy for the enterprise overall and the role that IT will play. A critical element in any such strategy is accounting for the smooth integration and management of the value chain — that succession of supplies, actions, and interactions that adds value through the evolution of a product or service construction and delivery process.

The effective application of ebusiness principles in using IT to manage, enhance, and improve the value chain of a business represents a critical success factor for any enterprise.

Enterprises exist to serve their customers by providing added value. The timeliness and efficiency with which value is added can directly influence the margins of a firm or even if the firm will operate at a profit or a loss. The effective application of ebusiness principles in using IT to manage, enhance, and improve the value chain of a business represents a critical success factor for any enterprise.

The result has been the linking of computer systems internally and externally that leads to electronic modes and media for all aspects of business. Therefore, we have a new way of driving business operations and commercial interchange — one that presumes automated, rational, and timely execution of business functions and smooth interactions within an enterprise and between enterprises. This new way of running a business is called electronic business, or simply ebusiness.

Table 1: The Three Paradigms of Computer Usage

First: Proprietary Computing	Second: Client/Server Computing	Third: CyberSmart Computing
User interface (UI), application, database on one computer	UI and application on client, database on server	UI on "thin" client, application on application server(s), database(s) on local or remote server(s)
Dumb terminals, punch cards, printed reports	Graphical user interface clients	Browser-based clients using ASP, JSP, XML/XSL
Proprietary server operating system (OS)	Open systems server OS	Server OS irrelevant
No client OS	Client is Windows, MacOS, or OS/2	Client is a browser and supporting environment
No middle-tier OS	No middle-tier OS	Middle tier is either .NET or J2EE environment
Remote data access impossible	Remote data access hand-coded via middleware	Remote data available transparently
No UI or hard-to-use UI	Easy-to-use UI	User-configurable UI
Simple data in flat files or proprietary databases	Simple data in relational databases with SQL	Complex, active data in component ORDBMSs
Only data needed for application continuity (such as business records) is stored	Business records stored in operational database, business intelligence in data warehouse or marts	Business records, business intelligence data, customer relationship management data, supporting content (e.g., email), transaction history data (XML), portal content all kept and managed in an unbounded environment of databases and database-managed files
Data exchange by files, requiring programs	Data sharing via FTP, pipes, electronic data interchange (EDI)	Data sharing via XML document exchange
Internal cross-program processes are batch or manual	Internal cross-program processes can be hand-coded via remote procedure call (RPC), pipes, etc.	Internal cross-program processes mediated by integration servers
Intersystem processes nonexistent	Intersystem processes hand-coded using middleware	Intersystem processes enabled by Web services using ebXML
Information delivery requires report programs	Information available via query tools	Comprehensive information via portals

Source: IDC, 2003

eBusiness Demands on the Value Chain

eBusiness is greatly accelerating the pace at which business is done. In response to the overwhelming imperative to process through the enterprise from front to back as cleanly, efficiently, and accurately as possible, enterprises have been turning to IT approaches that enable them to drive the critical processes of the value chain in a reliable and scalable manner. Not only are these approaches a means of enhancing business operations, but they are also increasingly becoming a matter of survival.

eBusiness Principles

Businesses seeking to adopt ebusiness need to consider the following critical success factors in managing those elements of their IT systems that will participate in ebusiness processes:

*   **Speed,** because competitiveness depends on responsiveness

*   **Dependability,** which is paramount because customers and suppliers will abandon an unreliable partner

*   **Flexibility,** because partners and business relationships change over time

To address these factors, an ebusiness must have its IT systems fully and efficiently integrated and must have highly scalable, responsive, and reliable data management facilities.

IBM AND i2 RESPOND TO THE CHALLENGE

As leaders in the areas of supply chain integration and management and IT systems integration and management, i2 and IBM are well positioned to provide superior value chain integration solutions.

For manufacturers, the core of value chain efficiency is in managing the relationship with and among suppliers — that set of functions known as supply chain management (SCM). IDC acknowledges i2 as one of the leaders in the SCM software market. Enhancement of the processes by which interactions with and among customers and suppliers inside and outside the enterprise are coordinated and managed is sometimes called value chain integration. As leaders in the areas of supply chain integration and management and IT systems integration and management, i2 and IBM are well positioned to provide superior value chain integration solutions.

The i2 Approach to Value Chain Integration

Figure 1 illustrates i2's view of value chain integration.
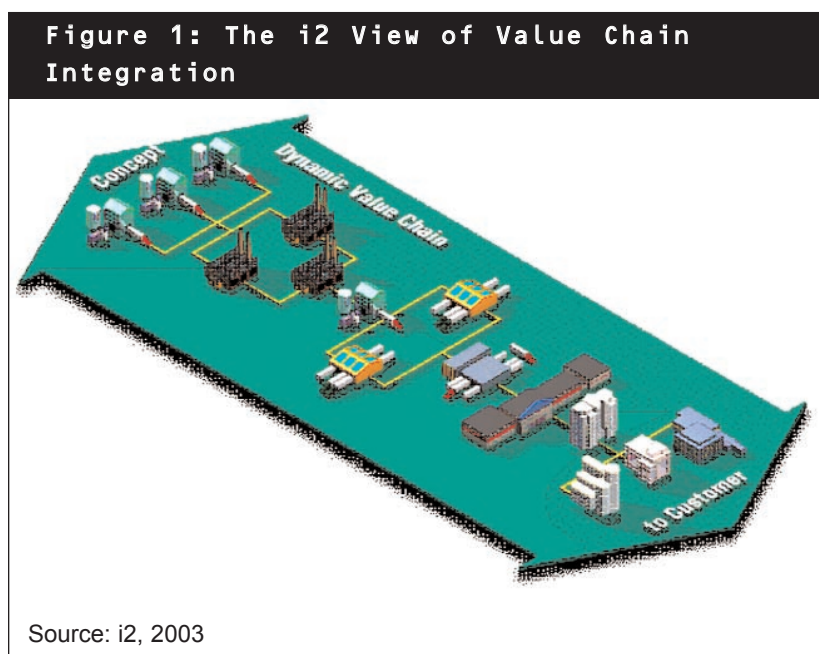
Figure 1: The i2 View of Value Chain Integration

Source: i2, 2003

IDC

Based on this view, i2's approach is a holistic one (see Figure 2) designed to allow companies to continually optimize key supply chain processes to squeeze excess cost out of operations. The results are improved profitability and return on investment. Solutions addressed by i2 Six span the entire supply chain, optimizing processes in the areas of revenue and profit optimization, spend optimization, production optimization, fulfillment optimization, and logistics optimization. They include domain-specific elements backed by extensive knowledge of a wide range of vertical industries, process flow management with transactional functionality, integrated decision support, and online content management. The aim of i2 systems is to provide continuous, reliable, optimized execution of every stage of the value chain from supplier to customer.

Figure 2: The i2 Approach to Value Chain Integration

Source: i2, 2003
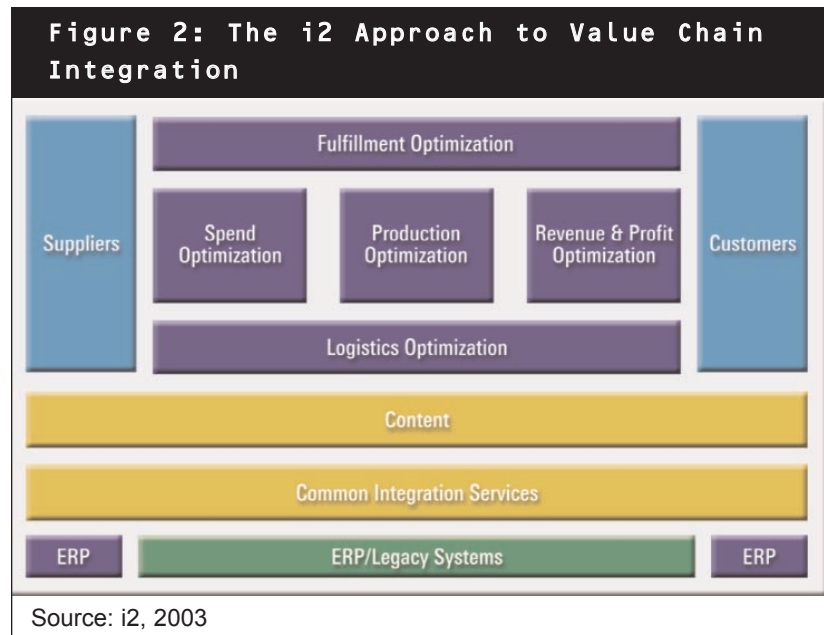
How DB2 Complements i2

Clearly, an integrated environment servicing continuous value chain processes depends on data management technology that is reliable and scalable and that delivers consistently high performance with a minimum of data administration overhead. Such a database management system (DBMS) must also have a proven capability to deliver enterprise-level business intelligence support.

### The DBMS Technology of DB2 Universal Database

IBM's DB2 product family offers technology that addresses all the required areas described above. DB2 UDB, with its internal parallel architecture, provides performance and scalability across a range of symmetrical multiprocessor (SMP) systems and includes optimization features for business intelligence. DB2 UDB Extended Enterprise Edition, with its parallel-node shared-nothing architecture, is specifically designed for very large, highly scalable data warehouse environments, such as those required in support of larger value chain integration deployments.

The DB2 Product Family and Integration

Because the DB2 product strategy has always presumed a heterogeneous environment, IBM can provide suitable technologies for integrating the DB2 database component of an i2 solution with existing enterprise resource planning applications and databases, including non-IBM databases, without requiring changes to those applications or conversion of the databases.

In addition to the DBMS itself, the DB2 product family includes tools that support online analytical processing (OLAP), complex query optimization, data mining, and enterprise information portal development and deployment. Because the DB2 product strategy has always presumed a heterogeneous environment, IBM can provide suitable technologies for integrating the DB2 database component of an i2 solution with existing enterprise resource planning (ERP) applications and databases, including non-IBM databases, without requiring changes to those applications or conversion of the databases. IBM technologies can also integrate DB2 databases with data and content in a variety of other kinds of files. Figure 3 illustrates these access options.

Figure 3: DB2/i2 Data Integration Capabilities

Source: IBM, 2003
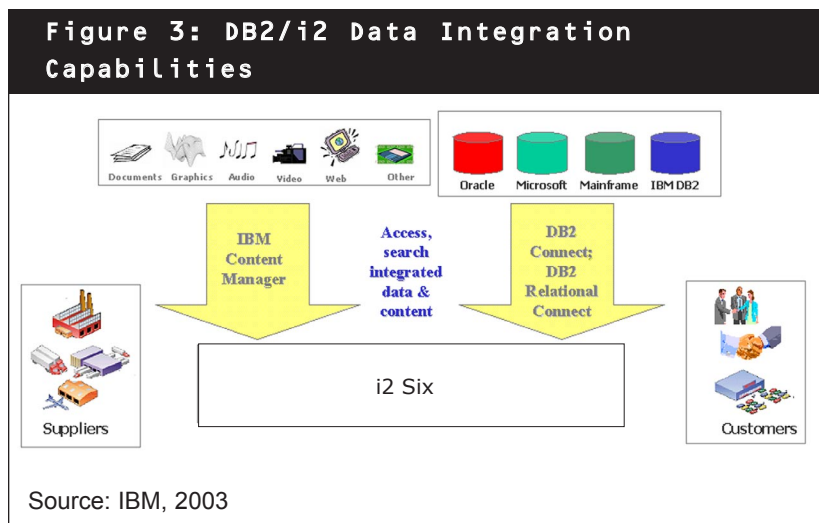
It is also useful to note that the DB2 product family spans the widest possible range of enterprise computing platforms, including PCs running Windows or Linux operating environments, leading Unix operating environments, AS/400 systems, and IBM mainframes running Linux or IBM mainframe operating environments (OS/390 or zOS).

VALUE CHAIN INTEGRATION SOLUTIONS USING DB2 AND i2

Sales and support personnel are fully trained and briefed about the DB2/i2 solution at the IBM and i2 Competency Center in Irving, Texas.

IBM and i2 have teamed up to provide integrated support for their combined products, ensuring that the relationship is far more than a "press release partnership." Sales and support personnel are fully trained and briefed about the DB2/i2 solution at the IBM and i2 Competency Center in Irving, Texas. As a result, users will find knowledgeable field support personnel from both companies ready to assist them. In addition, users will find support for planning and briefing preparations regarding the DB2/i2 solution at IBM's Centers of Excellence in Hawthorne, New York, and Stuttgart, Germany.

To demonstrate the success of this combination and solution, IDC interviewed two users: Carraro Group and Whirlpool Corporation.

Carraro Group

Based in Padua, Italy, Carraro Group is a leading manufacturer of machinery for agricultural and warehouse management, including tractors, backhoes, and front-loaders, with 2001 revenue of 385.12 million euros (about US$342.72 million). Carraro is also a world leader in the manufacture of drivetrains for on- and off-highway vehicles. The company has 11 manufacturing plants on four continents that, until the installation of i2, had been using different and incompatible means of managing their supply chains. Carraro has committed itself to the use of ebusiness for streamlining its relationships with suppliers and customers.

Carraro is using the i2 Supply Chain Planner (SCP) and Factory Planning (FP) components, which are connected by i2 RhythmLink. The i2 applications have integrated SCM for Carraro's main plant and its five subsidiary locations within Italy. The company is looking to implement the full Supply Chain product in the near future. The i2 applications run on IBM's eServer pSeries M80 server and use DB2 UDB for AIX, which is integrated with Carraro's legacy DB2 for OS/390 database.

The product was installed and configured by IBM consultants, who tuned the full system with DB2. It has been deployed in six plants, and production planning and logistics specialists in each plant use it to drive factory production. No customization of the application or database was necessary for full, successful implementation.

The associated data warehouse is seated on DB2 for OS/390, and Carraro uses standard business intelligence and OLAP tools for analytical purposes. Carraro reported that its ongoing familiarity with IBM technology and personnel and with DB2 made its adoption of i2 fairly straightforward. The company expressed satisfaction with the ability of the DB2/i2 combination to support its ebusiness initiatives.

Dr. Daniele Vergani, Carraro's systems manager, expressed great satisfaction with the role DB2 has played in various phases of the i2 deployment and is especially pleased with its features for ensuring the security and integrity of the data. "We are very confident in DB2 regarding security and integrity; we never lost data," said Dr. Vergani.

Since installation, Carraro has seen inventories and production lead times drop by more than 10%. Assembly productivity has increased by 5%. Routine inquiries between Carraro headquarters and subsidiaries have declined substantially. Carraro expects the SCM installation to pay for itself within 24 months. The company has been very pleased with the DB2/i2 combination and plans to extend the use of the SCM solution to all 11 facilities in the near future.

Whirlpool Corporation

Whirlpool, with 2001 revenue of US$10.3 billion, is a major manufacturer of appliances with international operations and supplier relationships to manage. Its SCM systems are located in North America and Europe. Although long committed to DB2 for mainframe database management, Whirlpool only recently began deploying DB2 UDB for midrange applications. Based on a stocktaking exercise a year ago, Whirlpool has decided to concentrate on DB2 UDB as the data management platform for new application deployment where feasible. It was in this context that Whirlpool decided to invest in the IBM/i2 solution.

Whirlpool had been eyeing SCM functionality for some time and ultimately decided to work with i2. The first module deployed was Supply Chain Planner, which uses a 30GB database at present, though Whirlpool expects that number to grow to 75GB as it installs Deployment Planning and then adds Demand Fulfillment.

Although the Whirlpool team had not worked with either i2 or DB2 UDB and was accustomed to using competing relational DBMS (RDBMS) software, team members quickly gained confidence due to the ease of use of the products and the support they received from the vendors, particularly from IBM's DB2 support team.

According to Tom Winter, Whirlpool's director of IT operations, "Getting in on the ground floor with a new technology is always a challenge, but you also learn a lot — you quickly develop an expertise. [We have been] learning as we work with both i2 and IBM. [We have also been learning] as issues come up and [we] deal with the deployment."

Some of Whirlpool's database administrators (DBAs) were accustomed to working with another brand of RDBMS. While they were impressed with DB2's flexibility, the one drawback they found in working with DB2 was the lack of easy-to-use tools relative to the other RDBMS. However, they found that the overall utility of DB2 and the ease with which it can be integrated into the existing environment more than make up for this deficit. IDC also notes that Whirlpool was working with version 7 of DB2 and that version 8 has a wealth of new features that may address the usability issues they encountered.

Whirlpool has indicated general satisfaction with database and application performance to date. In addition, the company has reported that the DB2/i2 combination is fast, reliable, dependable, and flexible, which are key characteristics to its trading partners. Whirlpool ranked faster time to market and improved inventory management as key benefits of the combination. The manufacturer also noted that DB2 is significantly less expensive to operate than its other major RDBMS.

CHALLENGES AND OPPORTUNITIES

The combined solution from IBM and i2 offers a great deal to companies that need the speed, dependability, and flexibility required to compete in the ebusiness world. The challenges that this alliance faces are typical of any alliance. IBM and i2 must remain committed to their union, communicate and share their goals, and work through design disagreements that may arise. They must also provide uniform and consistent service to their joint customers, not just initially but also over the long run. To date, the alliance appears to be rising to those challenges. That said, the opportunities in the manufacturing industry and related industries will make the efforts of both companies rewarding.

CONCLUSION

i2's SCM experience and IBM's technology, heterogeneous philosophy, and global reach make an ideal combination for building the value chain integration and management solutions demanded by ebusiness.

Establishing full integration of the value chain and managing effectively are keys to success for any business that intends to exploit the opportunities presented by the ebusiness world of CyberSmart Computing in the coming years. IBM and i2 both have a history of success in providing flexible software that works well in complex IT environments. i2's SCM experience and IBM's technology, heterogeneous philosophy, and global reach make an ideal combination for building the value chain integration and management solutions demanded by ebusiness.

IDC

IDC Worldwide Offices

CORPORATE HEADQUARTERS

IDC
5 Speen Street
Framingham, MA 01701
United States
508.872.8200

NORTH AMERICA

IDC Canada
36 Toronto Street, Suite 950
Toronto, Ontario M5C 2C5 Canada
416.369.0033

IDC California (Irvine)
18831 Von Karmen Avenue
Suite 200
Irvine, CA 92612
949.250.1960

IDC California (Mountain View)
2131 Landings Drive
Mountain View, CA 94043
650.691.0500

IDC New Jersey
75 Broad Street, 2nd Floor
Red Bank, NJ 07701
732.842.0791

IDC New York
2 Park Avenue
Suite 1505
New York, NY 10016
212.726.0900

IDC Texas
100 Congress Avenue
Suite 2000
Austin, TX 78701
512.469.6333

IDC Virginia
8304 Professional Hill Drive
Fairfax, VA 22031
703.280.5161

CENTRAL AND EASTERN EUROPE

IDC CEMA
Central and Eastern
European Headquarters
Male Namesti 13
110 00 Praha 1
Czech Republic
420.2.2142.3140

IDC Croatia
Srednjaci 8
1000 Zagreb
Croatia
385.1.3040050

IDC Hungary
Nador utca 23
5th Floor
H-1051 Budapest. Hungary
36.1.473.2370

IDC Poland
Czapli 31A
02-781 Warszawa, Poland
48.22.7540518

IDC Russia
Suites 341-342
Orlikov Pereulok 5
Moscow, Russia 107996
7.095.975.0042

MIDDLE EAST AND AFRICA

IDC Middle East
1001 Al Ettihad Building
Port Saeed
P.O. Box 41856
Dubai, United Arab Emirates
971.4.295.2668

IDC Israel
4 Gershon Street
Tel Aviv 67017, Israel
972.3.561.1660

IDC South Africa
Building 9, Pebble Beach
Fourways Golf Park
Roos Street
Fourways, Gauteng
South Africa
27.11.540.8000

IDC Turkey
Tevfik Erdonmez Sok. 2/1 Gul
Apt. Kat 9D
46 Esentepe 80280
Istanbul, Turkey
90.212.275.0995

EUROPE

IDC Austria
c/o Loisel, Spiel, Zach Consulting
Mayerhofgasse 6
Vienna A-1040, Austria
43.1.50.50.900

IDC Benelux (Belgium)
Boulevard Saint Michel 47
1040 Brussels, Belgium
32.2.737.76.02

IDC Denmark
Omøgade 8
Postbox 2609
2100 Copenhagen, Denmark
45.39.16.2222

IDC Finland
Jarrumiehenkatu2
FIN- 00520 Helsinki
Finland
358.9.8770.466

IDC France
Immeuble La Fayette 2
Place des Vosges Cedex 65
92051 Paris la Defense 5, France
33.1.49.04.8000

IDC Germany
Nibelungenplatz 3, 11th Floor
60318 Frankfurt, Germany
49.69.90.50.20

IDC Italy
Viale Monza, 14
20127 Milan, Italy
39.02.28457.1

IDC Netherlands
A. Fokkerweg 1
Amsterdam1059 CM, Netherlands
31.20.6692.721

IDC Portugal
c/o Ponto de Convergancia SA
Av. Antonio Serpa 36 - 9th Floor
1050-027 Lisbon, Portugal
351.21.796.5487

IDC Spain
Fortuny 18, Planta 5
28010 — Madrid
Spain
34.91.787.2150

IDC Sweden
Box 1096
Kistagangen 21
S-164 25 Kista, Sweden
46.8.751.0415

IDC U.K.
British Standards House
389 Chiswick High Road
London W4 4AE United Kingdom
44.208.987.7100

ASIA/PACIFIC

IDC Singapore
Asia/Pacific Headquarters
80 Anson Road
#38-00 IBM Towers
Singapore 079907
65.6226.0330

IDC Australia
Level 3, 157 Walker Street
North Sydney, NSW 2060
Australia
61.2.9922.5300

IDC China
Room 611, Beijing Times Square
88 West Chang'an Avenue
Beijing 100031
People's Republic of China
86.10.8391.3610

IDC Hong Kong
12/F, St. John's Building
33 Garden Road
Central, Hong Kong
852.2530.3831

IDC India Limited
Cyber House
B-35, Sector 32, Institutional
Gurgaon 122002
Haryana India
91.124.6381673

IDC Indonesia
Suite 40, 17th Floor
Jakarta Stock Exchange
Tower 2, Jl. Jend. Sudirman Kav. 52-53
Jakarta 12190
6.221.515.7676

IDC Market Research (M) Sdn Bhd
Jakarta Stock Exchange Tower II
17th Floor
Jl. Jend. Sudirman Kav. 52-53
Jakarta 12190
62.21.515.7676

IDC Japan
The Itoyama Tower 10F
3-7-18 Mita, Minato-ku
Tokyo 108-0073, Japan
81.3.5440.3400

IDC Korea Ltd.
Suite 704, Korea Trade Center
159-1, Samsung-Dong
Kangnam-Ku, Seoul, Korea, 135-729
822.551.4380

IDC Market Research (M) Sdn Bhd
Suite 13-03, Level 13
Menara HLA
3, Jalan Kia Peng
50450 Kuala Lumpur, Malaysia
60.3.2163.3715

IDC New Zealand
Level 7, 246 Queen Street
Auckland, New Zealand
64.9.309.8252

IDC Philippines
703-705 SEDCCO I Bldg.
120 Rada cor. Legaspi Streets
Legaspi Village, Makati City
Philippines 1200
632. 867.2288

IDC Taiwan
Room A2, 21st Floor, Hsin Kee
Building, 460 Hsin Yin Road, Sec 4
Taipei, Taiwan
886.2.87806818

IDC Thailand
27 AR building
Soi Charoen Nakorn 14,
Charoen Nakorn Rd., Klongtonsai
Klongsan, Bangkok 10600
Thailand
66.02.439.4591.2

IDC Vietnam
Saigon Trade Centre
37 Ton Duc Thang Street
Unit 1606, District-1
Hochiminh City, Vietnam
84.8.910.1233; 5

LATIN AMERICA

IDC Latin America
Regional Headquarters
8200 NW 41 Street, Suite 300
Miami, FL 33166
305.267.2616

IDC Argentina
Trends Consulting
Rivadavia 413, Piso 4, Oficina 6
C1002AAC, Buenos Aires, Argentina
54.11.4343.8899

IDC Brazil
Alameda Ribeirao Preto, 130
Conjunto 41
Sao Paulo, SP CEP: 01331-000 Brazil
55.11. 3371.0000

International Data Corp. Chile
Luis Thayer Ojeda 166 Piso 13
Providencia
Santiago, 9, Chile
56.2.334.1826

IDC Colombia
Carerra 40 105A-12
Bogota, Colombia
571.533.2326

IDC Mexico
Select-IDC
Av. Nuevo Leon No. 54 Desp. 501
Col. Hipodromo Condesa
C.P. 06100, Mexico
525.256.1426

IDC Venezuela
Calle Guaicaipuro
Torre Alianza, 6 Piso, 6D
El Rosal
Caracas, Venezuela
58.2.951.1109

IDC is the foremost global market intelligence and advisory firm helping clients gain insight into technology and ebusiness trends to develop sound business strategies. Using a combination of rigorous primary research, in-depth analysis, and client interaction, IDC forecasts worldwide markets and trends to deliver dependable service and client advice. More than 700 analysts in 43 countries provide global research with local content. IDC's customers comprise the world's leading IT suppliers, IT organizations, ebusiness companies and the financial community. Additional information can be found at www.idc.com.

IDC is a division of IDG, the world's leading IT media, research and exposition company.

IDC
Analyze the Future

www.idc.com