

Is the Internet the Global Information System?

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The Internet provides a broad area of services to business and individual users and the World Wide Web (WWW) is its fastest-growing application. Because the WWW can reach any Internet-connected computer in the world, users typically call the Internet a global information system. Although the Internet and the global information system are closely related, they also have characteristics that distinguish each from the other. The purpose of this article is to identify the differences and address ways of building an Internet-based global information system.

What is the Internet?

The Internet was initially designed to serve the academic world for accessing supercomputers. Now its primary role is to serve the world of business and home. The Internet provides a high-speed, low-cost global communications network for millions of people. As globalization increases, the Internet's inherent capability will be used to provide world-wide information for business to synchronize subsidiary operations, access data, exchange information, and communicate on a global scale. As the perception of the global information system matures, the capability to synchronize and access data will have a profound effect on global business markets. Corporations have the capability to conduct uninterrupted business trading and operations because they are linked into all of the business markets. Nowadays, corporations can access real-time market status and then adjust their corporate strategies accordingly.

Internet technology can support corporate collaboration. Group conferencing, group negotiation, and group decision support systems can be activated through a web-based network. Information communications such as e-mail, facsimile, elec-

tronic data interchange (EDI) interface, data warehousing and data mining, and digital library are accessible using Internet tools such as WWW, file transfer, remote log-in, and software agents.

Intranet and extranet are two by-products of the Internet. Intranet is a secure and internal implementation of the Internet. All intranet technologies and software are protected by corporate firewalls that enables the connection of network while maintaining its security and integrity with other networks. On the other hand, an extranet is a use of Internet/intranet technology to serve an extended enterprise, including customers, suppliers, partners, and other businesses that share a common goal. An important feature of extranets is that they are typically behind firewalls and closed to the public.

What is the global information system?

A global information system is a data communication network that crosses national boundaries to access and process data in order to achieve corporate goals and strategic objectives (Gensler and Chou, 1991). Its allied technology offers the essential competence to achieve these functions. Therefore, multinational corporations face the challenge of developing the global information systems for global data processing and decision-making.

The organizational decision-making process in a multinational corporation is very different from that of a domestic corporation. The heterogeneity of language, cultural, regulation, currency, government, and time zone causes complexity and uncertainty of corporate decision-making. Therefore, a global information system should include the following components:

1. A multi-language processor.



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2. Compatibility in data formats and structures.
3. A database of local regulatory and legal systems.
4. A database of cultural patterns of management and decision-making.
5. Security provisions.
6. The ability to accommodate differences in time zones.

Also, a decision-support-oriented global information system needs to possess the following characteristics (Chou, 1996):

1. It performs global coordination within the system.
2. It performs system integration.
3. It has a powerful repository for storing system-wide data and information.
4. It can perform the intelligent work.
5. It has an integrated CASE-based environment.

Computer-aided software engineering (CASE) tool can be used to automate the analysis, design, coding, and development of global information systems. Its code generator creates usable programs for system implementation. In addition, it can be a reverse engineering tool for rebuilding legacy systems quickly. CASE tool also supports intelligent software such as expert systems, neural networks, and fuzzy logic systems.

How is the Internet different from the global information system?

The Internet is the largest information network in the world. It spans dozens of countries and connects millions of computers. This network transmits text, video images, audio and music, phone calls, fax, e-mail, and others.

The Internet is not the global information system for the following reasons:

1. **They have a distinct system boundary.** The Internet is an open system available to anyone who has access to a computer and an Internet Service Provider. While the Internet is open to everyone, global information systems are only open to corporate users who have been given permission to access the system. How-

ever, an intranet/extranet covers the same system boundary as that of the global information system. An intranet demonstrates the "any-to-any" connectivity of a corporate network that supports the collaborative work and flat organizational structure in business environment. A powerful intranet system allows a company to communicate inside its organization freely. Moreover, an intranet system can be connected with the Internet for global information processing.

2. **They provide distinct system functions.** The main use of the Internet is for information delivery. A global information system, however, has additional features for fulfilling its decision-making capability. A powerful global information system needs to provide the functions of performing collaborative work, data warehousing, and electronic commerce.

Building an Internet-based global information system

Most organizations maintain their legacy systems and databases. Integration of legacy applications with new applications and end-user tools is a very effective strategy for many organizations in the 1990s and beyond (Umar, 1997). An efficient and effective way to build a global information system is to integrate existing corporate information systems to web-based tools and applications. This approach leverages the existing investment in legacy systems and minimizes the risks of converting large-scale business applications.

An Internet-based global information system allows multinational corporations' employees, customers, suppliers, and partners to access corporate data and to perform group decision-makings. This system can be linked to corporate intranet or extranet, depending on the corporate goals and their security needs. Also, this system is capable of supporting collaborative work, data warehousing, and electronic commerce.

In an Internet-based global information system, Web browsers provide a front end because they can invoke, through appropriate Web gateways, the mediators that access existing corporate information. For

example, a Web gateway program can invoke a screen scraper, data gateway, or procedure gateway (Umar, 1997). Web gateways can be used to integrate the corporate information that contains HTML documents, relational databases, and legacy information sources. A common technique is to use an object wrapper that can be invoked from a Web gateway. Now, many Web gateways use CGI (Common Gateway Interface) technology. In addition to CGI gateways, the legacy surround technologies can also be invoked from the Java applets or Microsoft ActiveX components residing in the Web browser. Also, CORBA (Common Object Request Broker Architecture) enabled Web browsers can directly invoke the CORBA object wrappers.

Collaboration work includes publishing internally, sharing corporate knowledge and support, searching for data and information, group scheduling, accessing information from a known source, editing and managing documents in a group, managing projects in a distributed workgroup, accessing remote or distributed applications, and supporting mobile workers (Chou, 1998). Web groupware is online software that assists group decision making on the Internet. Web conferencing user interface can be easier as Javascript, dynamic HTML, and similar developments free software designers from the HTML constraint.

A data warehouse is a collection of data in support of the managerial decision-making process. The data warehouse has four essential characteristics: subject-oriented, integrated, time-variant, and non-volatile (Inmon, 1995). Data warehousing specializes in aggregated, summarized, and integrated information relevant to the user. Most data warehouses are designed to support data queries requested by decision support system or executive support system users. Building a Web-based data warehouse is similar to that of regular data warehouse except for the involvement of Web server and browsers on the network.

The Internet facilitates business transactions and marketing exploration. The Internet has vast potential for conducting electronic commerce without boundaries. Electronic commerce attempts to improve the execution of business transactions over various networks. It results in effective performance such as better quality, customer satisfaction and decision making. Elec-

tronic commerce also creates economic efficiency such as lower sale costs and real-time interaction. Electronic commerce also supports global processes on online publishing, supply-chain management, customer asset management, and logistics management.

Conclusion

The global information system links the corporate information systems with a set of information systems in each foreign subsidiary with the goal of integrating organizational operating functions in order to achieve a global strategy. In addition to systems integration discussed above, a successful global information system should support common languages interface, common data format, and sufficient databases on cultural, sociological, and historical

knowledge. A CASE tool would enable the use of various knowledge bases in the multinational information processing environment. For each individual global information system, the embedded expert systems and/or decision support systems perform the tasks of improving the decision-making processes in accordance with corporate global strategies. ■

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