Activities in the Environmental-Information Business

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Abstract

The spread and application of information technology (IT) is leading to growing concerns about our lifestyle environment. This trend will steer people toward participating in specific environmental activities together. At NTT's Energy and Environment Systems Laboratories, keeping in mind our goal of establishing a society with an environmentally sound material cycle based on new social systems, we are providing environmental solutions aimed at supporting discussions about the environment between the main players in this society—namely, citizens, business, and government—as well as advancing research and development toward our goal of creating a new society. This article outlines the present state of affairs regarding our activities in the environmental-information business.

1. Background of environmental problems

In recent years, environmental problems have expanded both spatially and temporally. In the past, problems had only a local impact, but these days we have global problems and their effects can persist for a long time. Since most of these problems are closely concerned with normal business activities and our daily lifestyles, each of us individually, as well as organizations, must think about environmental problems and make specific efforts towards solving them. However, the huge time-spans and geographical scale of these problems makes it difficult for individuals to see the results of their cooperative efforts toward reducing the burden on and conserving the global environment. It is said that this difficulty is the cause of the lack of concern about environmental problems among ordinary people and the decline in their willingness to cooperate on environmental matters.

Information technology (IT) is considered to be a powerful tool that could improve this situation. The successful integration and application of IT has resulted in growing concern about our lifestyle environment, and it has become possible to connect these concerns with specific activities. At NTT's Energy and Environment Systems Laboratories, aiming at establishing a society with an environmentally sound material cycle based on new social systems, we are providing environmental solutions for supporting "eco-communication" between the main players in this society—namely, citizens, business, and government—as well as advancing research and development toward our goal of creating a new society.

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2. Trend of environmental-information business

Figure 1 outlines the trend in the environmental-information business. It is clear that serious environmental problems must be faced by all prefectural or city governments, and the era in which citizens are gaining first-hand knowledge of environmental degradation is upon us now. The rise in concerns of citizens towards our universal lifestyle environmental is leading to growing demands for the disclosure of environmental information: governments must therefore recognize the importance of such disclosure. However, the actual situation regarding environmental information is not set up in a systematic way. That is to say, each department of a local government body has its own paper-based system or amasses data in its own independent database. Consequently, most of these local governments cannot respond sufficiently to public demands for environmental-information disclosure.

As various environmental concerns become

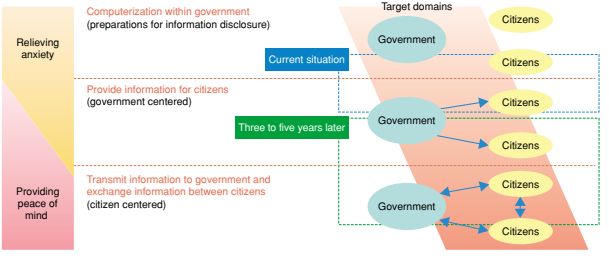


Fig. 1. Target domains of the environmental-information business.

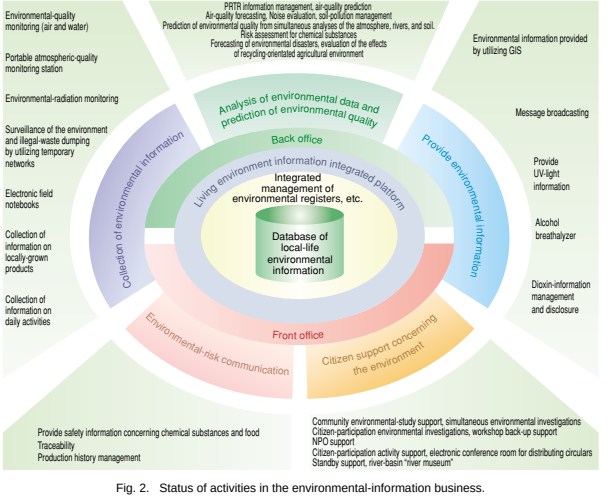


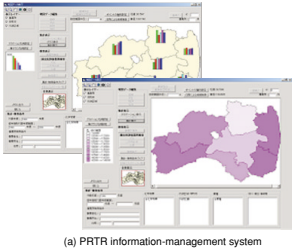
Fig. 2. Status of activities in the environmental-information business.

enshrined in law, some forward-thinking local governments are preparing environmental information and making positive moves towards disclosing it. However, this is still just the phase of one-way communication of information from governments to citizens; i.e., information disclosure is simply used to relieve citizen anxiety. Thus, in preparation for full-blown public information disclosure, local governments are pushing forward with the computerization of their internal information and have just started providing information (mainly information that they themselves held) for citizens.

Meanwhile, combined with the dwindling birth rate and the aging population, the trend of housewives and senior citizens participating in civil and business activities—as well as people forming communities that transcend districts and generations—is continuing to progress. At present, we are in the phase of simply providing knowledge and information, but in the future, this phase will progress toward providing the peace of mind that will establish good relations between citizens and society. In the next phase, this information dissemination from government to citizens will be accompanied by an opposite flow of information from citizens to government and information will also be exchanged among citizens.

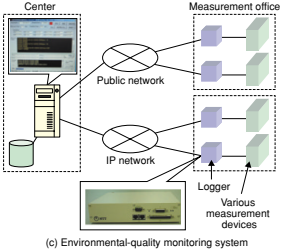
3. Current status of efforts in the environmental-information business

Figure 2 schematically shows the current status of activities—including on-going research and development—in the environmental-information business. At the core of these activities is a database of local-life environmental information. This database will enable centralized administration of various kinds of

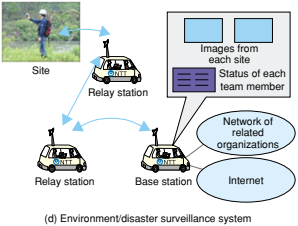


(a) PRTR information-management system

(b) Soil-pollution information-management system



(c) Environmental-quality monitoring system



(d) Environment/disaster surveillance system using wireless network

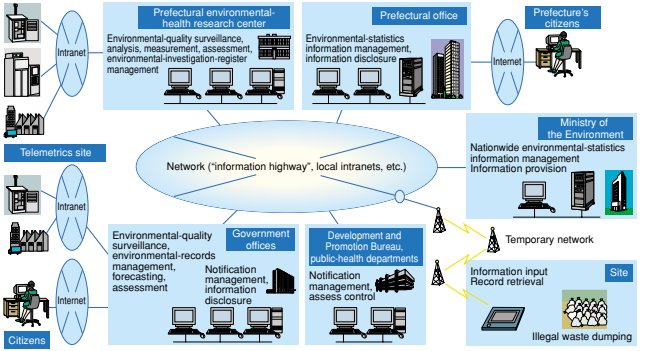
Fig. 3. Examples of environmental-information systems.

environmental information held by the government so that various businesses and services can utilize it. It will also provide information for citizens so that they can monitor their environment in the future. The present phase (Fig. 1) is the preparation of internal government information. The database shown in Fig. 2 makes up the core of an environmental-information system comprising three key functions: (i) collection of environmental quality monitoring data (air and water quality, etc.); (ii) measurement and analysis of data from risk assessment of chemical substances and data from chemical-substance and soil-pollution discharge records and regulations; and (iii) environmental-information provision utilizing the geographic information system (GIS).

Figure 3 shows some examples of the systems described in Fig. 2. An information-management system—based on the PRTR (pollutant-release transfer register) for keeping emission records—is shown in Fig. 3(a). This system enables information management and disclosure based on the PRTRs kept at local government bodies. A soil-pollution information-management system that incorporates integrated control of environmental records is shown in Fig. 3(b). In compliance with a soil-pollution-prevention law enacted in February 2003, this system can be utilized for implementing government measures concerning the pros and cons of recycling and for understanding and assessing soil-use records. An environmental-quality monitoring system is shown in Fig. 3(c). This system enables communication between the central administration and survey agencies via not only phone lines but also various network environments like IP networks. A system using a wireless network for environmental and disaster surveillance is shown in Fig. 3(d). As well as making possible temporary surveillance of sites of illegal waste dumping and river-pollution discharge—even in places not yet covered by a network—this system can be used for in-field environmental studies under normal conditions by IT.

Regarding future trends, in response to the growing concerns of citizens for the environment, we are supporting citizens by so-called "environmental-risk communication" by preparing information in an easy-to-understand format and providing safety information concerning food and chemical substances. Moreover, to support citizens' environmental activities, we are carrying out lifestyle-environment surveys by utilizing IT as well as holding workshops and conferences. The result of our support is steering citizens toward planning and proposing environmental measures.

Figure 4 shows a scenario in which environmental



Telemetrics: A system that provides remote surveillance—via phone lines, etc. connected to a server—by specialized terminals with a function for signal communication with unmanned devices (such as meters, analysis tools, and parking meters).

Fig. 4. An application scenario of environmental information.

information is provided by networks. In this scenario, local government bodies or their environmental research centers are connected to municipal authorities, health centers, and so on within their administrative areas via the "information highway" and local intranets. This setup enables data from sites for monitoring the environmental quality of air, water, and soil to be collected and analyzed at various research centers. Environmental information concerning every-day environmental matters can then be mutually exchanged with factories and businesses (in the form of notifications, reports, and so on) by centrally administering the environmental information held by the local government bodies (such as the research centers). This information can be used for assessing air and water quality and for forecasting environmental quality. Risk assessment of chemical substances can then be performed by utilizing the results of these environmental assessments and forecasts. Furthermore, if temporary wireless networks and public wireless networks are utilized, real-time environmental surveys can be carried out, and environmental crimes such as illegal-waste dumping (which has increased significantly in recent years) can be prevented.

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He received the B.S. and M.S. degrees in mechanical engineering from Keio University, Yokohama in 1977 and 1979, respectively. He joined the Musashino Electrical Communication Laboratory, NTT, Tokyo, Japan, in 1979, where he begun conducting research on electrical packaging for high-density systems. Since 1999, he has been engaged in developmental research on environmental information systems. Currently, he is a Project Manager of the Eco-community project, Energy and Environmental Systems Labs, NTT. He is a member of IEEE and the Institute of Electronics, Information and Communication Engineers.