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Society 5.0 @ Amami Islands

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From the hunter-gatherer society (Society 1.0), agricultural society (Society 2.0), industrial society (Society 3.0), and information society (Society 4.0), we are about to welcome the new society that comes next. Society 5.0 is a society where everyone can live comfortably by utilizing cutting-edge technologies such as artificial intelligence—a so-called super-smart society. Super-high-speed internet lines and broadband are indispensable for achieving this society. Among these, super-high-speed broadband provided by optical fiber networks has become indispensable as a lifeline of the future.

However, the development of the optical fiber network was mainly carried out in urban areas, and its development in areas with unfavorable geographic conditions such as remote islands and mountainous areas has been delayed.

Even in such situations, the development of optical fiber networks in the Amami Islands has progressed through the joint efforts of residents and local governments. With the exception of secondary and tertiary remote islands, many of these islands have been able to use super-high-speed broadband that is equivalent to urban areas, starting with Yoronjima and Okinoerabujima.

Meanwhile, there were some voices saying, “the internet speed is slow even when an optical fiber network was set up.” The reason for this is actually due to the mechanism of the internet. The mechanism used for exchanging data on the internet requires that the next set of data be sent after confirming that the previous data has arrived to ensure the reliability of communication. If there was no response, the data is retransmitted in order to ensure reliable data transmission. This mechanism results in less data being sent per second with greater distance to the communication partner. In other words, the data transmission becomes slow. In Japan, the servers that provide internet services are concentrated in Tokyo, so internet speeds become slower the farther you are from Tokyo. This problem manifested on Yoronjima, the longest distance from Tokyo in Kagoshima Prefecture.

When compared with a transportation network, the development of an optical fiber network is equivalent to the development of a multi-lane paved road. No matter how good the road may be, the amount of luggage that can be transported will not increase unless the car performance changes. The communication mechanism at the time when the optical fiber network was established in Yoronjima was, so to speak, luggage transportation by lightweight trucks. Despite all the effort that went into building a good road, it was not fully utilized.

In order to resolve this problem of slow internet, Kagoshima University developed a high-speed technology by dividing the communication intervals. This would be the equivalent of setting up relay warehouses in terms of transporting luggage. The notification of completing the delivery can be obtained by transporting the luggage to warehouses along the way, shorten the time for shipping the next package and increasing the number of packages that can be carried.

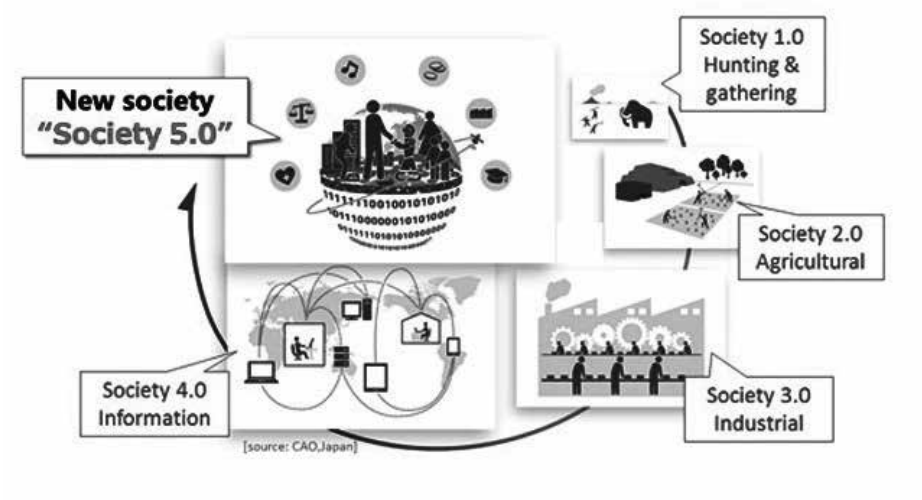
This was a practical technology, but it was unfortunately not adopted. All of a sudden, the internet speed in Yoronjima was no longer slowing down.

Communication performance was greatly improved in Windows Vista and later versions. This could be thought of as upgrading from lightweight to medium-weight trucks. The amount of data that could be transported at once greatly increased, and the performance of the optical fiber network could be utilized.

Technological advances have also improved the relay devices, which have shortened the communication path as well as the time to and from Tokyo. In terms of the transportation network, this was the equivalent of developing bypasses and motorways. These advances removed the perception of a slow internet.

Furthermore, new communication methods have also been developed, enabling higher-speed communication. Now, heavy-duty trucks have been coming and going. If the optical fiber network was not established, this communication method, the equivalent of these heavy-duty trucks, could not be utilized.

With the full utilization of the capabilities of the optical fiber network, it has become clear that the next development is the 5th-generation mobile communication system (5G). Although 5G is a super-high-speed wireless technology, communication with 5G is limited to communication between mobile phone base stations and terminals. The upstream from the base station is an optical fiber network, so 5G will not be installed in areas where the optical fiber network is not developed. Society 5.0 will not arrive unless the optical fiber network is in place. In that sense as well, it can be said that the people of the Amami Islands, who were among the first to work towards the development of an optical fiber network, had foresight. They will undoubtedly introduce 5G into their society without greatly falling behind urban areas. Only then will the true power of the optical fiber network be demonstrated and a super-smart society be realized in the Amami Islands.



Society 5.0 is a human-centric society that balances economic development and the resolving of social issues. (Source: The Cabinet Office)