SCRKeeper: Supply Chain Risk Management Service to Connect the World

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In 2011, the Great East Japan Earthquake tremendously affected companies in the manufacturing industry, as in halts in production. One major cause of the halts in production was interruptions in the supply chain due to damage to secondary and subsequent business partners with no direct dealings with companies in the manufacturing industry, revealing vulnerabilities anew. In response, Fujitsu worked on the development of a cloud service for the evaluation and management of business partners' continuity capabilities and, in 2013, started offering FUJITSU Intelligent Society Solution SCRKeeper. This service can be used for the revision of production plans and alternative procurement by quickly grasping the conditions of damage to business partners in the event of contingencies such as disasters. One example of its use is its contribution to the prompt initial response to the 2016 Kumamoto earthquakes in Japan, which was highly appreciated by customers. In the future, we intend to make use of Fujitsu's Global Delivery Centers (GDCs) to accelerate global expansion. This paper outlines the service and describes the effects of its utilization based on the example of its use during and after the Kumamoto earthquakes and its global expansion.

1. Introduction

The Great East Japan Earthquake that occurred on March 11, 2011 caused tremendous damage to various parts of the country with a magnitude as large as 9.0 on the Richter scale. Companies in the manufacturing industry were obliged to halt production and shipping for several months and were seriously affected. One major cause of the halts in production was interruptions in the supply chain due to damage to secondary (Tier 2) and subsequent business partners with no direct dealings with companies in the manufacturing industry, which revealed vulnerabilities anew.

In response, Fujitsu worked on the development of a cloud service for the evaluation and management of business partners' continuity capabilities and, in 2013, started offering FUJITSU Intelligent Society Solution SCRKeeper, software as a service (SaaS) product for disaster preparedness. This service can be used for the revision of production plans and alternative procurement by quickly grasping the conditions of damage to business partners in the event of contingencies such as disasters. At the time of the 2016 Kumamoto earthquakes in Japan, it contributed to the quick grasping of the conditions of damage to business partners and the impact on customers' own products, as well as the prompt initial response, which was highly appreciated by many customers. In the future, we intend to make use of Fujitsu's Global Delivery Centers (GDCs) to further accelerate global expansion.

This paper outlines the service and describes the effects of its utilization based on the example of its use during and after the Kumamoto earthquakes as well as its global expansion.

2. Overview of SCRKeeper

In the wake of the Great East Japan Earthquake, Fujitsu developed a system intended for visualizing Tier 2 and the subsequent supply chain risk as well as for prompt initial responses and recovery of production in the event of disasters. Our desire to use this system as the basis for offering a service useful for the entire manufacturing industry led us to create SCRKeeper in 2013, the first supply chain risk management service in Japan. SCRKeeper is a cloud service that supports

customers' business continuity with ICT.

2.1 Effects of the utilization of SCRKeeper

As shown in **Figure 1**, utilization of SCRKeeper can be roughly classified into two types: utilization in normal times and in times of disasters. The following describes the major effects of its utilization in these two types of situations.

1) Utilization in normal times

• Visualization of supply chain risk

A tree view of the supply chain is provided to visualize potential risks (such as single-supplier order placement and single-site production) (**Figure 2**). This allows for the grasping of high-risk production sites in the event of a disaster.

• Visualization of site risks using a hazard map

The disaster risk for production sites of business partners can be grasped (**Figure 3**). Areas with high disaster risk are shown in red, which allows the risk level to be visually checked.

• Listing of risk preparedness status of business partners

The risk preparedness status (such as alternative procurement and disaster mitigation measures) registered by business partners can be grasped using a list.

By gaining the three types of information above in normal times, business partners can be encouraged to take disaster preparedness measures and alternative business partners can be selected in advance.

In addition, the service allows for easy data maintenance when compared with conventional management with Excel spreadsheets or paper formats because the windows and import features of SCRKeeper can be used. In addition, reports making use of supply

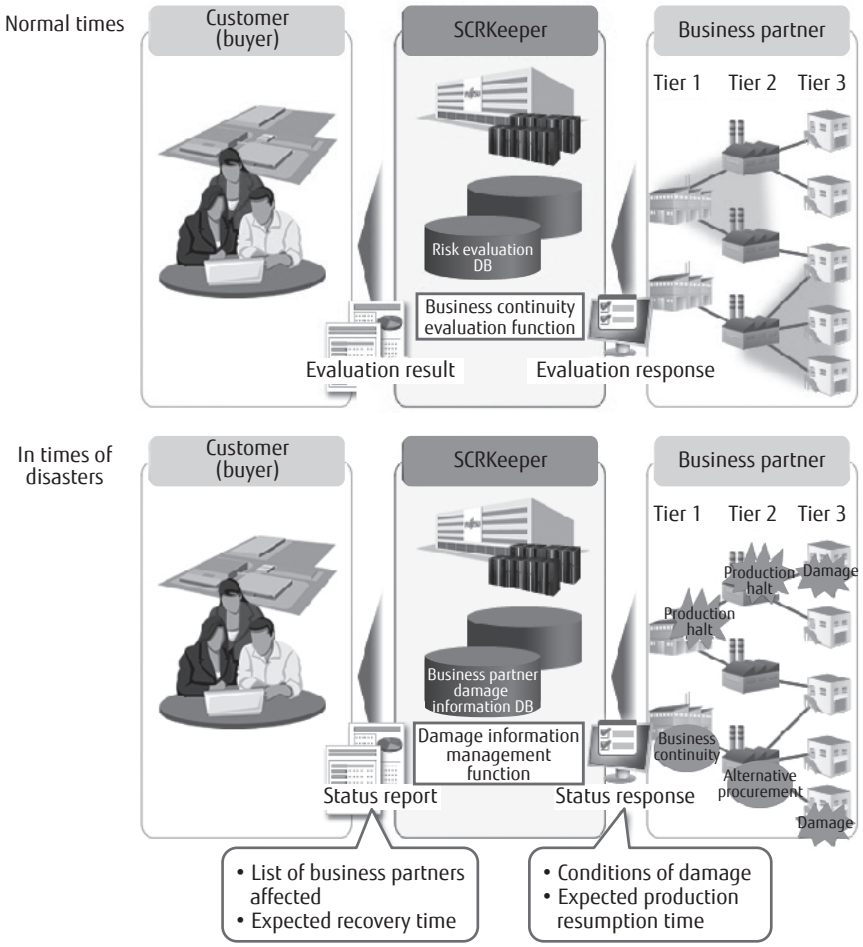


Figure 1
Outline of SCRKeeper.

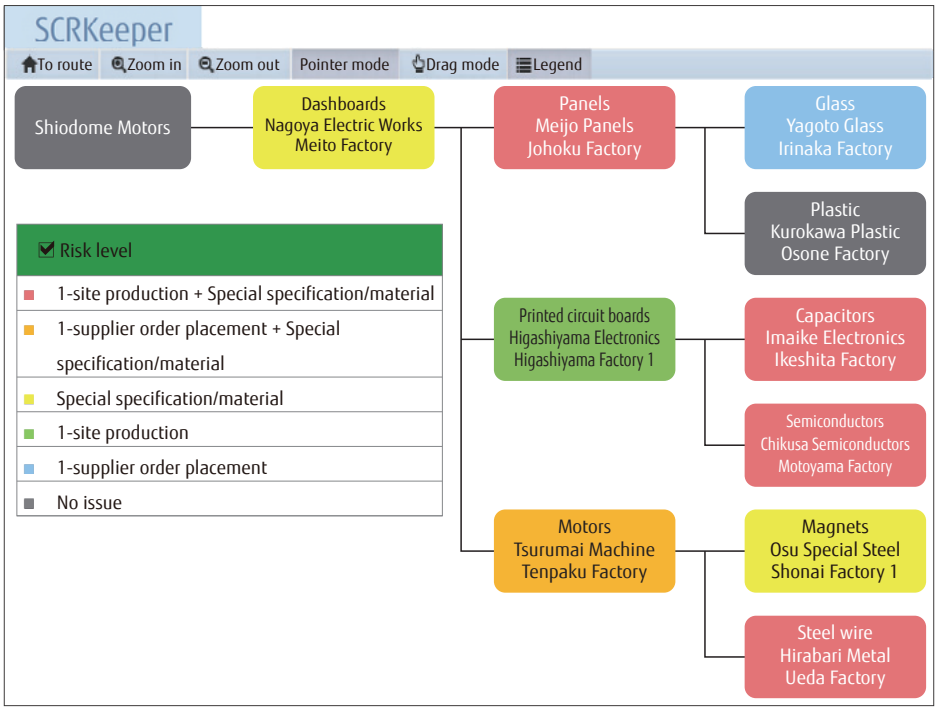
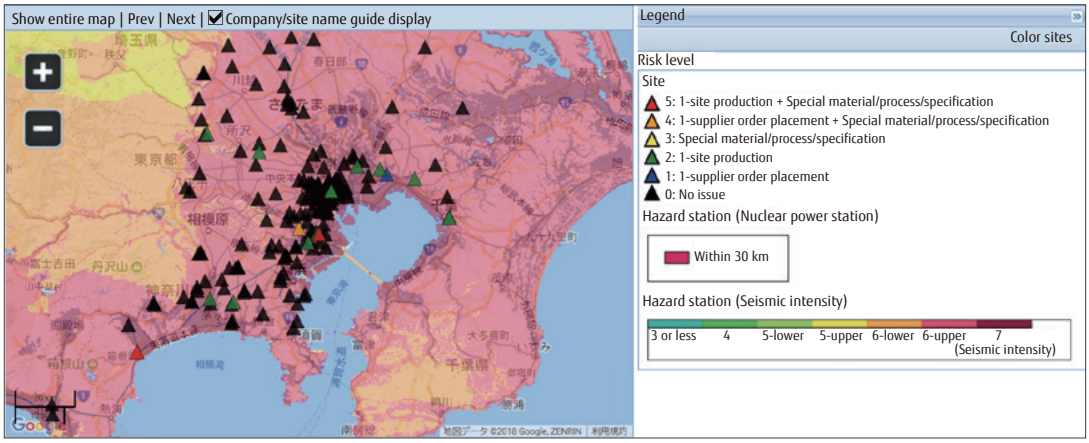


Figure 2
Visualization of supply chain risk.



*Google Maps used for this service.

Figure 3
Visualization of site risks using a hazard map.

chain data can be made to different manufacturers as well, leading to reductions in workloads.

2) Utilization in times of disasters

- Visualization of seismic intensity information and business partners' production sites

  The seismic intensity information automatically linked from the Japan Meteorological Agency and the location information of business partners' production sites can be viewed on a map (**Figure 4**). Grasping the conditions of damage to business partners is useful in the initial response for recovery.

- Visualization of conditions of damage to business

*Google Maps used for this service.

Figure 4
Visualization of conditions of damage to business partners.

partners

Conditions of damage to individual production sites reported by business partners can be viewed.

The two forms of utilization shown above support quick grasping of the conditions of damage to business partners and the impacts on customers' own products, production line operation continuity, quick decision-making on alternative procurement and production, and prompt initial responses by customers.

This service uses Fujitsu's robust data centers (Tatebayashi DC for the production environment and Akashi DC for the disaster recovery environment), which form a disaster-resistant system.

2.2 How the service works

The customer who placed an order in SCRKeeper (Tier 0) provides their primary business partners (Tier 1) with user IDs for free and requests the registration of supply chain information about suppliers under the Tier 1 business partners. If any Tier 1 business partner wishes to manage the supply chain under them, they are positioned as a source of the order when using SCRKeeper. That is, triangle trees with stars at the top as shown in **Figure 5** can be expanded vertically and horizontally.

2.3 Status of service utilization

SCRKeeper is being used by 30 customers as of February 2018, and the number of user IDs registered exceeds 8,800. In particular, utilization by automobile-related companies is striking, and the service has established a position as the de facto standard of the Japanese automotive industry with a large number of automakers and auto parts manufacturers using it.

3. Utilization of SCRKeeper during and after the Kumamoto earthquakes

This section describes how SCRKeeper was used by a customer in relation to the foreshock of the Kumamoto earthquakes that occurred on April 14, 2016. The earthquakes, which had a maximum magnitude of 7.3 on the Richter scale, caused significant damage to Kumamoto and Oita Prefectures.[1)]

SCRKeeper sent automatic notification e-mails to the source of the order and business partners a few minutes after the earthquake occurred. The source of the order that received the notification used SCRKeeper to check on the earthquake-hit areas and business partners' production sites, and the business partners registered their conditions of damage with SCRKeeper. The source of the order checked the impact on themselves, such as the conditions of damage registered and expected recovery times for the individual sites, and, on the next morning, reported to their executives and relevant departments.

During these customer activities, SCRKeeper was used as described in the following process from the occurrence of the earthquake to implementation of recovery measures.

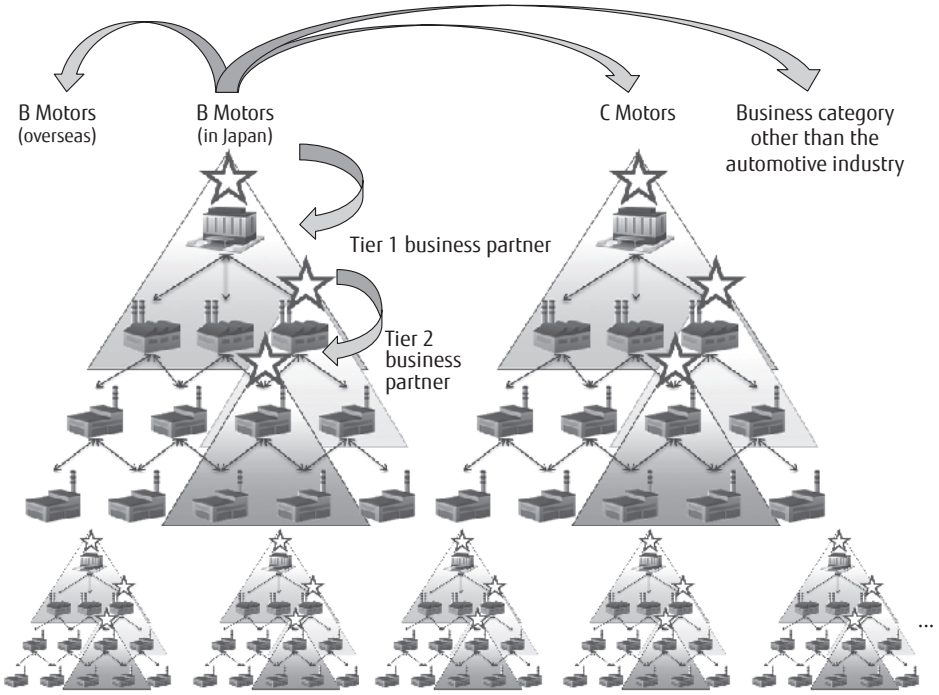


Figure 5
How SCRKeeper works in the automotive industry.

1) Immediately after the earthquake

Concentrated logins (about five times more than in normal times) to SCRKeeper occurred temporarily. At this point, some of the conditions of damage were registered and checked.

2) One day after the earthquake

The number of logins reached more than 40 times that of normal times.

3) Two to three days after the earthquake

Use of about 10 times more than in normal times was observed, which is assumed to be related to dealing with the main shock.

4) Fourth and following days after the earthquake

Use of about 20 times more than in normal times followed, which is assumed to be related to dealing with aftershocks.

These results show that SCRKeeper was constantly used from the occurrence of the earthquake to the implementation of recovery measures. While more than 40 times the access as in normal times was concentrated in the day following the earthquake, no response degradation was observed and the service was used smoothly, which contributed significantly to the quick initial responses by customers.

Customers offered the following comments on the utilization of SCRKeeper during and after the Kumamoto earthquakes:

- The service enabled us to report to executives in a timely manner.
- While sites in Kyushu were seriously damaged, we were able to contact business partners and quickly grasp the extent of the impact.
- The initial response was conducted and impact checked much more quickly than at the time of the Great East Japan Earthquake.
- We were able to share the status of impact by using SCRKeeper within the procurement department starting the next morning.

Many other customers gave us compliments, which proved the effects of SCRKeeper in disaster situations.

4. SCRKeeper connecting the world

We are also taking approaches to use SCRKeeper to connect the world. The following presents one example.

The SCRKeeper service is being deployed globally, and the service desk for accepting inquiries and requests from customers is located in Japan. To realize smooth handling of overseas customers, we will transfer

this service desk function to a GDC in the Philippines in FY2018. In the future, we plan to transfer functions beyond the service desk, such as operation and sales promotion, to the GDC as we aim to expand the service.

In this way, we intend to sublimate the SCRKeeper service, which has been promoted mainly in Japan, into a "service connecting the world" by developing it into a global system.

5. Conclusion

This paper presented an overview of FUJITSU Intelligent Society Solution SCRKeeper, examples of its utilization during and after the 2016 Kumamoto earthquakes occurred in Japan, and our approach to global expansion by making use of Fujitsu's GDCs.

In the future, we intend to further develop the SCRKeeper service in the arena of the global market.

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