

Paper:

Treatment of Unexpected Risk on Business Continuity Management Learned from the Great East Japan Earthquake

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The Great East Japan Earthquake hit the Tohoku district Pacific coast at March 11, 2011. This earthquake exceeded by far the earthquake scale, tsunami height, and damage size that had been assumed conventionally by a specialty committee located in Japan's Central Disaster Prevention Council. To fill in the gap between earthquakes that had been assumed conventionally and the reality that was witnessed with their own eyes in this earthquake, trace investigations for gigantic earthquakes and tsunamis in old age are currently being carried out [18]. Under these circumstances, this paper focuses on the problem of unexpected disasters based on the viewpoint of Business Continuity Management (BCM), referring to survey results, which were immediately conducted among domestic companies after this earthquake. Characteristics of the problem of unexpected disasters are to have to solve two problems: how to assume unexpected events and the delay of "current recoverable time" that occurs as a result.

Keywords: Business Continuity Management (BCM), recovery time objective, the Great East Japan Earthquake, risk assessment, unexpected risk

1. Study Objective

On March 11, 2011, the Great East Japan Earthquake measuring a moment magnitude of 9.0 was the largest earthquake in recorded history in Japan.

This earthquake caused large tsunami, and it caused extensive damage mainly to Japan's coastal region along the northeastern Pacific Ocean.

The dead and missing number has amounted to nearly 20,000 people and damage has been estimated at 16 trillion 900 billion yen [1].

This earthquake also led to a widespread impact on corporate activities. In the manufacturing industry, many companies that were damaged directly by this earthquake were forced to disrupt their production. In a case in which their supply chains were disrupted by this earthquake, final assembly companies that were not damaged directly by this earthquake were forced to disrupt or reduce their production, too.

Business Continuity Management (BCM) aims to implement effective strategies for business disruption risk. Under the direct or indirect influence of this earthquake, we must verify how BCM functioned, and the author thinks that the weaknesses that are extracted from that result must be studied for future Business Continuity Management (BCM).

To assist in the extraction of the above mentioned weaknesses, when we interviewed staff members of five disaster stricken companies, a disaster situation such as the following was stated: One company said, "In the future, we will lose the direction to lead how to create Business Continuity Plan (BCP)." Also, another company said, "We determined to move our orders to other companies because we were not able to stop the product supply." The other three companies said, "Many problems of BCP were found but it was good to have already created a Business Continuity Plan (BCP)." Also, the problem that was stated in common by these five companies was that this disaster was far beyond the assumed events for a Business Continuity Plan (BCP). These unexpected events were considered to be consistent with the view for the earthquake assumed so far by the Central Disaster Prevention Council, and the author thinks that the unexpected events is one of weaknesses of Business Continuity Management (BCM). Therefore, the author sets this paper's objective to "Treatment of unexpected risk on Business Continuity Management (BCM)."

2. Approach

Approach of this paper is as the following process: "1. Study objective," "2. Approach," "3. Current situation surveys," "4. Setting of the study target," "5. Modeling of the RTO operations process," "6. Relations of BCM, BCP and RTO," "7. RTO operations process," "8. Estimation of current recoverable time," "9. Performance evaluation of RTO operations process," "10. Conclusion," "11. Future issues." In "1. Study objective," the interview of the disaster stricken companies that the author has made is referred. In "3. Current situation surveys," some parts of published plural surveys are quoted: the author did not participate in those surveys. In "5. Modeling of the RTO operations process," a case study that the author carried

Table 1. Survey for BCP just after the Great East Japan earthquake.

Survey bodies	Date	The number of valid responses
NTT Data Institute of Management Consulting, INC	June 10 th -14 th , 2011	1,020
Nikkei Personal Computing	Mid. May - End. June, 2011	1,120
Nomura Research Institute, Ltd.	June 3 rd -15 th , 2011	423

out is exemplified. In “9. Performance evaluation of RTO operations process,” RTO operations process is evaluated by a case study that the author carried out.

3. Current Situation Surveys

As shown in **Table 1**, three surveys for Business Continuity Management (BCM) were carried out from May 2011 to June 2011 by the three organizations. Although layers of respondents and purposes in each survey are different, it is in common that any surveys aim at the performance of the Business Continuity Plan (BCP) of domestic companies that were affected by the Great East Japan Earthquake. Therefore, this paper is utilizing some parts of three surveys transversely.

According to **Table 2**, companies that directly or indirectly were damaged by the Great East Japan Earthquake account for more than half of respondents [2–4]. As shown in **Table 3**, according to performance surveys of existing BCP (Business Continuity Plan), more than 60% of companies that have already created BCP before March 11, 2011 and were affected by the Great East Japan Earthquake answered that although their BCP was effective, their BCP should be improved further in the future [2–4].

Also, treatment in these three surveys contains two kinds of treatment. One means improvements of the BCP to correct on extension of the current situation. Another means treatment of so-called unexpected disasters. It was because the classification was not clearly defined in the survey stage.

4. Setting of the Study Target

To achieve this paper’s objective, various penetration ways are able to be considered. The penetration way in this paper is described as “setting of the study target” in section 4.2. To set this study target, the relevant terms is defined in section 4.1. in advance.

4.1. Definition of Relevant Terms

In the following, objective risk, subjective risk, unexpected events, and improvement are defined by the viewpoint of Business Continuity Management (BCM).

Table 2. Damage survey by three bodies.

Damage	NTT Data	NIKKEI PC	Nomura Research
Damaged	68%	86%	55%
No damage	32%	14%	44%
Total	100%	100%	100%

Table 3. Performance survey of BCP by three bodies.

Effectiveness	NTT Data	NIKKEI PC	Nomura Research
It was completely effective	34%	13%	7%
It was effective but require improvements	63%	65%	78%
It wasn't effective at all	3%	8%	15%
unknown	0%	14%	0%
Total	100%	100%	100%

1) Objective risk

In the viewpoint of cognitive science, objective risk is defined as what is evaluated using statistics or mathematical sciences [19, 20]. However, in the viewpoint of Business Continuity Management (BCM), this definition isn’t considered to be sufficient.

The Central Disaster Prevention Council has expressed the following. The Tohoku earthquake and tsunami were gigantic earthquakes and tsunamis far beyond past assumptions, and the council must reflect on having ignored earthquake of old times in Japan: “Jougan-Seismicity of the Sanriku coast in A.D.869,” “Keicho-Seismicity of the Sanriku coast in A.D.1611,” and “Enpo-Seismicity of the Boso coast in A.D.1677,” which probably occurred in fact. Also, the council is reviewing earthquake assumptions currently [18]. Risk that is used here is not only the objective risk in the definition of cognitive science but also the risk that has been perceived and authorized by the organization, which had been established under the Government.

In addition, Business Continuity Management (BCM) is intended for risk that is assessed and perceived by organizations such as companies. Therefore, in the viewpoint of Business Continuity Management (BCM), objective risk is appropriately defined as risk that is analyzed and evaluated by rational methods and additionally perceived by organizations.

2) Subjective risk

In cognitive science, subjective risk has been defined as risk that was perceived by each sensibility [19].

In this paper, to make it consistent with the definition of objective risk, subjective risk is defined as risk that is