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Fundamental Analysis of Information Format Structure Handled in Emergency Operation Center - A Case Study of Evacuation Management in Niigata Prefecture -

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ABSTRACT :

1. Background and Objectives

We have been affected by many kinds of disasters; earthquake, tsunami, rainfall, typhoon and so on. However, our capacity is not built enough to respond at disaster effectively and rationally, because we have no way to manage our experience. Against this issue, we found that an institutional knowledge should be developed based on our experience. On the other hand, it is known that we should develop Common Operational Picture in order to make rational decision. To realize this, we should effective information management sheets for disaster response based on our experience. In this research, we should struggle to abstract items, which should be handled in disaster response, from actual materials processed at Emergency Operation Center (EOC). Especially, in this paper, we introduce what we found as the result of analysis for materials processed in EOC of Niigata Prefecture at rainfall disaster on August 28th, 2011.

2. Framework and Methodology

Firstly, we collected materials processed at EOC of Niigata Prefecture at rainfall disaster on August 28th, 2011. Then, we did structure analysis to 522 collected materials in order to find out which information items were necessary for disaster response. Our analysis model has 4 steps as described below.

1) Digitalize collected forms which are paper-based

Officers of Niigata Prefecture collected and archived them, however they were just copied and put into a folder. Against this situation, we decided firstly to digitalize them as PDFs by scanner, and added unique ID each PDF file.

2) Store the digitalized forms into database

When we just digitalize forms, it is unable to search and retrieve them following users' needs flexibly. Against this issue, we organized the unique IDs added on PDFs in Excel file. Furthermore, we developed a kind of application which enables users to search and to retrieve PDFs.

3) Classify forms and items in a structured manner

We detected which forms were used for what objectives, and added them into that Excel file, and we clarified the structure of these objectives. Furthermore we retrieved items of which forms are consisted, and put organized name on each item.

4) Detect necessary items for disaster response

We classified items structurally following labels, and clarified which items are common to all forms. And, we classified again other items focusing on one disaster response, which is evacuation management. So that we detected which items are necessary for evacuation management.

3. Result of Fundamental Analysis

Following the steps described above, we executed fundamental analysis to 522 forms for all kinds of disaster response at rainfall in Niigata. We found 2 kinds of results described below.

1) We detected 92 materials which were processed for evacuation management. From these 92 materials, 873 items were abstracted. Analyzing 873 items structurally, we found that 34 types of items were essential for

evacuation management. Fig.1 shows which item in 34 items is appeared how many times.

2) We detected 11 categories for coordination of 873 items which were set on forms for evacuation management. Especially almost of 873 items were categorized to “Items for handling forms”, “Items for description about operation type” “Items for targets of operation and staff”. This means that most of items, which should be filled at disaster response, are not specified in the situation change of disaster.

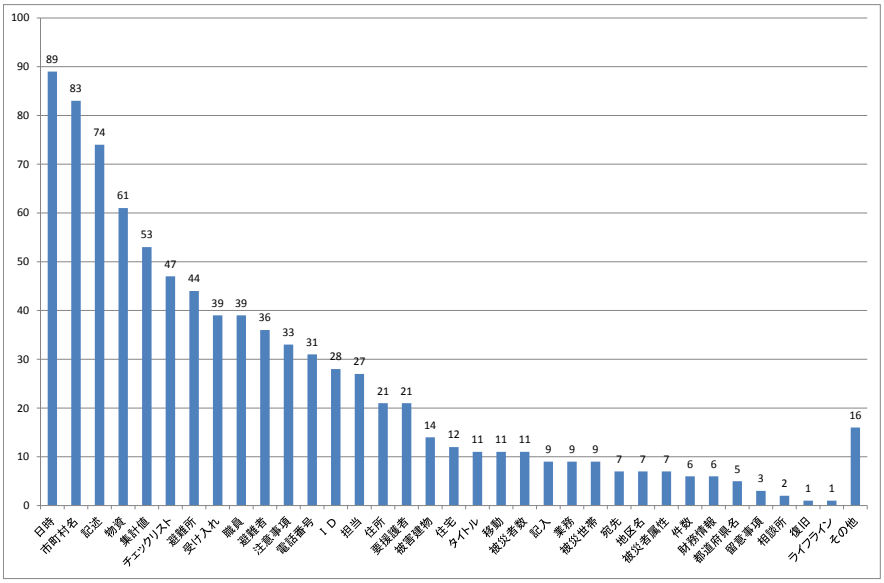

Fig.1 Frequency of items which were consisted of forms for evacuation management

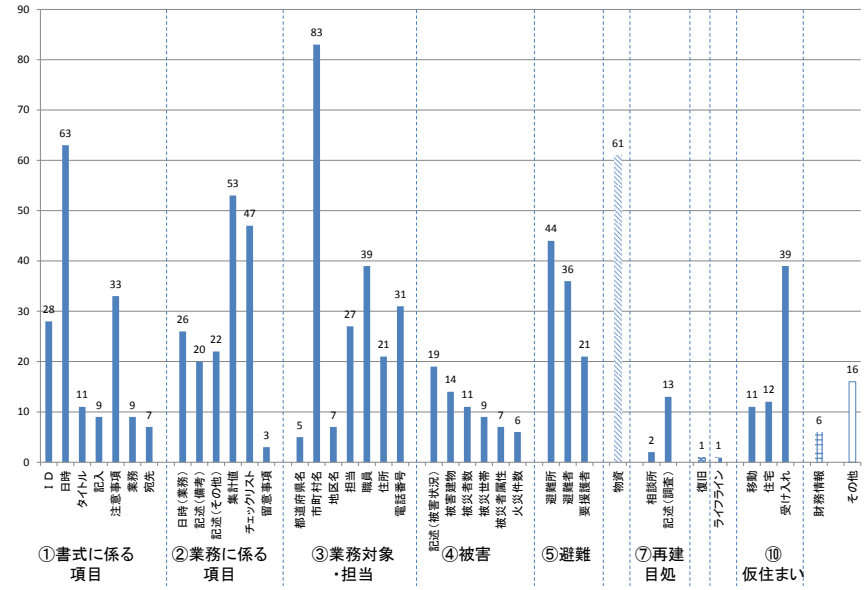

Fig.2 Result of structural classification of 34 items necessary for evacuation management forms

4. Conclusion

In this research, we gathered the filled forms at actual disaster, which is one rainfall occurred in Niigata on August 28th, 2011. We collected 522 forms, and detected 92 forms were used for evacuation management. Carrying out fundamental analysis of those 92 forms, we found 34 types of items are necessary to process information for evacuation management, and 34 types can be classified to 11 categories. In the preparation against other disaster, we should re-design the forms for evacuation management based on this result. We are also planning to develop an application which can create automatically some kinds of forms for disaster response based on the past experience of disaster response in the near future.