

A Study for Image Expression of Emergency Alert

Yoonkwan Byun*, Hyunji Lee*, Sek-Jin Jang*, Seong Jong Choi*, Seung-Hee Oh**, Yong-Tae Lee**

*University of Seoul, Korea, **Electronics and Telecommunications Research Institute

comkeen4@gmail.com

Abstract— Emergency alert message is effective way to send text information for public alert service in disaster situation. But the textual information has limitations to make people understand. In this paper, we suggest a method to expression image on cell phone device.

Keywords— Emergency, Disaster, Alert, CBS, Symbol

I. INTRODUCTION

In the Republic of Korea, government agencies issue emergency alert messages to general public in disaster situation. The emergency alert message can send text in maximum of 315 bytes to cell phone using Cell Broadcast Service (CBS). CBS is a method of sending messages to multiple cell phone users in defined area at the same time.

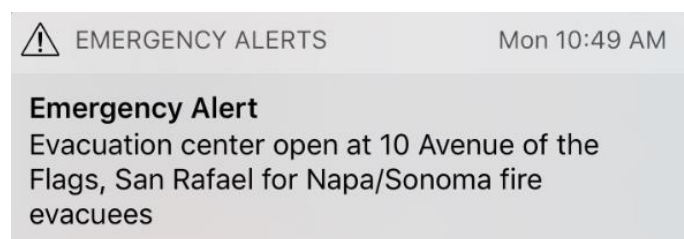


Figure 1. Emergency alert message sample

Currently, the emergency alert message service is provided only in Korean. It is difficult for foreigners who are not fluent in Korean to understand the contents of the emergency alert message. In this paper, we propose an elegant method to solve this problem by providing additional symbols. The exit sign, as an example, is a popular symbol to indicate an exit. The symbol is designed to be intuitive and understandable to anyone.



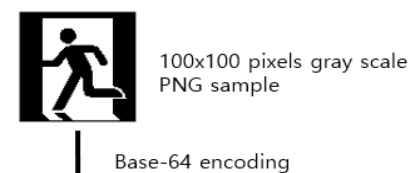
Figure 2. Safety symbols for exit [1]

These symbols representing disaster types will facilitate foreigners to understand what is happening. There are two ways to present the symbols for emergency alert message service.

II. SOLUTIONS

A. Direct transmission a symbol

The first method is to transmit the symbols directly to the device. The emergency alert message service can support text in maximum 315 bytes. We can use this space to transfer small size image. But 315 bytes space is too small to present both text and an image. For example, the result of 100x100 pixels gray scale PNG file encoded by base-64 encoding needs at least 1k bytes. In conclusion, it is difficult to contain an image and text within the constraint of 315 bytes. We should find another way for presentation image except directly transmitting.



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iQBQAE4ARwANAAoAGgAKAAAAA0ASQBIAEQAuGAAAAAABIA
AAAAAAAAAGQAAQADAAAAAUA7gBsACkAAAAAQAQBzAFI
ARwBCAAAAArgDOABwA6QAAAAAEEAGCAQQBNAEEAAAALEJwA
LAPwAYQAFAAAAAAYAUABMAFQARQAAAAAAD/AP8A/wCIANK
AnwDdAAAAAABkAcABIAFkAcwAAAAADgDEAAAAAQAQAAQ
CVACsADgAbAAAAAABABIASQBEEAEVAA4AMsAvQDUAEAbgDDAC
AAEAAFAANAQQAsAOgAogCSALcAWQBUAOIACgA9AEAAJQD3ACgAPQ
BIACQA6AAqANcA4gAoAPQABgBeAHOAgQCgAAwAMQDDAEwAogBYA
FEAqgCUAJUAnwBsAMEAwAFAAwAhQCNAPUAQDKAEAAwwD8AEkA5
wAJJcAfWCUAOYASgBKAAGAPwAmALUAPQAZALkABwB1AHsAvQAsAG
oAKQCnAUJAqgAXANAATAeAMAAADQDVAMMANADHAJwAQgCpAMoA
sgBaAAAAJgD5AAIAKgBJABkAUgAEAMgAmgAUAIQA/AAADgARQCCA
AAA7gC7AAsAVACEANKAcwAFJIAJgBgAlcA6gBaAPYAhwBUAOsAmADY
AP4A1gAdAKUACwCZAJsAWgB3AFQAnwC4AF4AuADiAKsA0AAAbFcAkA
D6AOAA8gBSAEcAlgA4AGoArACgACsA1QDkAEcAYgA1ACUAHQc6ABQ
AZgAWAKkAXwDwAHQAvGc6ADQA6gC9AKcA2QB0AOGAMgCFAGkAM
QAYACEAaQDCAGYASgA9AFsA1ABIANoA8gA+AAsAUgAzAH8A5wCIAG
oAkWAPAGEAywAzAPEA3gDNAOoA7gC7ACkA5gB0AG0A9QB+AGYAcwC
rADMAbQCcyAG0ARwB5ANMAIAAMAE4AswDJALQAWwBVAPwA1QDfAO
YA0QB/AN0AnQAQAOsALwCvAlwA8QB4FAAAoADrAMoAAAAAABIA
BJAEUATgBEAK4AQgBgAIIA
```

1k bytes size

Figure 3. 100x100 pixels gray scale PNG sample to base-64 encoding

B. Transmission a message with an identifier of symbol

The second method is to transmit a message with an identifier of symbol. A cell phone application detects the identifier of symbol and present the pre-stored symbol matched. Even though this method needs only few bytes, the device is required to implement additional necessary functions,

such as storing symbol images, detecting an identifier in the message text, and loading and presenting stored symbol image.

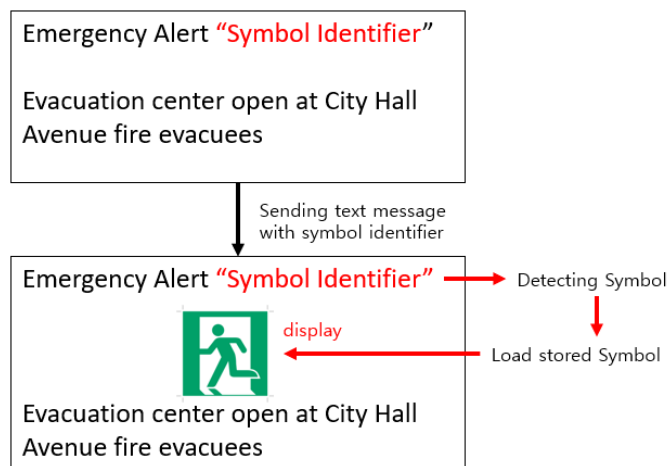


Figure 4. Example of a symbol expression with symbol identifier

III. OTHER METHOD

In Japan, some mobile service provider sends an alert message to general public and expression image their cell phone device about earthquake and tsunami situation. Japanese CBS identifies message's source and type by message identifier. [2]



Figure 5. Method of expression symbol by message identifier

Earthquake and tsunami situation have mapped specific message identifier, then cell phone device can detect which situation is. For example, if a cell phone device received message identifier as 4352, it means earthquake situation. Then device loads matched symbol and expression image on display.

IV. CONCLUSIONS

Currently, direct transmission of symbol images is not a practical solution due to the various constraints. We need to find another way to present images on cell phone device. Therefore, we suggest a way to contain symbol identifier in text. Then a cell phone device required appropriate function can detect symbol identifier, load pre-stored symbol and expression symbol image on the device. We are expecting this symbol provide an effective service to recognize and understand easily for people.

For this service requires several works in future. It needs international standard for symbol of disaster type. It should be designed to be understandable to anyone. And it needs an application supports this service.

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Yoonkwan Byun

- University of Seoul, Department of Electron Electronic Engineering Graduate (2014)
- University of Seoul, Electron Electronic Engineering Master (2016)
- University of Seoul, Electron Electronic Engineering Ph.D. Candidate (Present)
- Major: emergency alert



Hyunji Lee

- Chung-Ang University, Department of Administration Graduate (2000)
- KWANGWOON UNIVERSITY, Department of mass communication Ph.D. (2014)
- University of Seoul, Research Professor (Present)
- Major: digital media usability



Sek-Jin Jang

- Korea University, Electron Engineering Graduate (1991)
- Korea University, Electron Engineering Master (1993)
- University of Texas at Austin, Electronic and Computer Engineering Ph.D. (1991)



- University of Seoul, Professor (Present)
- Major: wireless communication

Seong Jong Choi

- Seoul National University, Electronic Engineering Graduate (1982)
- Seoul National University, Electronic Engineering Master (1984)
- University of Florida, Dept. of Electrical Eng. Ph.D. (1992)
- University of Seoul, Professor (Present)
- Major: emergency alert



Seung-Hee Oh

- Jeonbuk National University, Computer Science Graduate (1999)
- EWHA WOMANS UNIVERSITY, Computer Engineering Master (2001)
- Electronics and Telecommunications Research Institute, Principal Researcher (Present)
- Major: defense and safety



Yong-Tae Lee

- Korea Aerospace University, Aerospace Electron Engineering Graduate (1993)
- Korea Aerospace University, Aerospace Electron Engineering Master (1995)
- YONSEI UNIV., Electronic Electron Engineering Ph.D. (2007)
- Electronics and Telecommunications Research Institute, Director General (Present)
- Major: defense and safety