Crime Risk Level Calculation Technique of Emergency Calls for Police Dispatch

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Abstract— **In order to quickly and effectively respond to a newly received emergency call, information about crime risk of the emergency call is important for police officer. This paper designs crime risk level calculation technique for emergency call which is received to the police station. The introduced technology can calculate crime risk level using a emergency call information, which is criminal case receipt data. The calculated information can give risk level of the crime case to the police officers.**

Keywords—Crime Risk Level, Smart Policing

I. INTRODUCTION (HEADING 1)

Recently, smart policing technologies have been received considerable attention to secure the lives and properties of the public [1]. In this paper, we propose a crime risk level calculation technique of emergency call to efficiently prepare the emergency situation. The introduced technique calculates the risk level (RL) of emergency call by analyzing text-based crime summaries. This paper establishes RL calculation formula. The formula can calculate the RL of emergency call numerically. The high RL means that the newly received crime can be dangerous and serious. Police officers can effectively respond to criminal incidents from emergency calls by using the calculated RL.

II. CRIME RISK SCORE CALCULATION TECHNIQUE

The development of a crime risk score calculation formula that numerically calculates crime risk is explained. The crime risk score is calculated by considering the crime type and crime information. The formula to calculate the risk level (RL) can be written as follows:

$$RL = BS \times WA + WP + WSN + WSW \qquad (1)$$

where the meanings of the variables are as follows:

- BS (Base Score): weight according to crime type

- WA (weight for age): weight according to victim's age

- WP (weight for physical damage): weight according to victim's physical damage

- WSN (weight for suspect numbers): weight according to the numbers of suspects

- WSW (weight for suspect's weapon): weight according to the suspect's weapon

The BS is a variable for crime type. WA is variable for victim's age. A higher weight value is assigned to young children and the elderly who are vulnerable to crime. WP is variable that reflects the damage level from crime. WP is the victim's physical damage. The weight value of WP is set according to the time required to fully heal the damage. WSN is variable for the number of suspects. A higher weight value is assigned to the high number of suspects. WSW is a variable about the weapon of suspects. Higher weight values are assigned to the strong weapon. Therefore, the high RL means that the newly received crime can be dangerous and serious. Police officers can effectively respond to criminal incidents from emergency calls by using the calculated RL.

III. CONCLUSIONS

This paper designs crime risk level calculation technique. The designed technology can calculate crime risk level using a text-based emergency call information, which is criminal case receipt data. The calculated information can give risk level of the crime case to the police officers.

REFERENCES

[1] M. -S. Baek, W. Park, J. Park, K. -H. Jang and Y. -T. Lee, "Smart Policing Technique With Crime Type and Risk Score Prediction Based on Machine Learning for Early Awareness of Risk Situation," in IEEE Access, vol. 9, pp. 131906-131915, 2021., doi: 10.1109/ACCESS.2021.3112682.