

An Application Design for Emergency Medical System: A Software Engineering Approach

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An Application Design for Emergency Medical System: A Software Engineering Approach

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Abstract

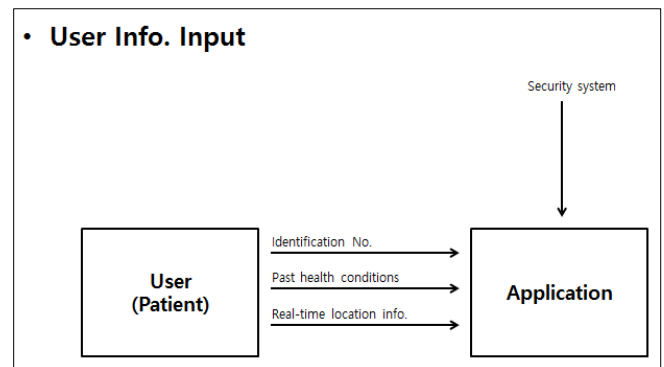
The proposed application design for emergency medical system includes the functions that help securing the window of opportunity for the patients in an emergency situation and efficiently link rescue agency, emergency medical treatment center and patients together. First, the treatment time can be saved at the emergency room by understanding the patient's condition by entering his/her health information such as anamnesis, family history, social history and blood type together with an identification number. Also, if the siren function which signals whereabouts of patients to the rescue crew is used, it will be much easier to find the location of the patient in need. The design allows rescue crew to call the patient to check whether he/she is conscious or not. Just by receiving the call, he/she will be deemed conscious.

1. Introduction

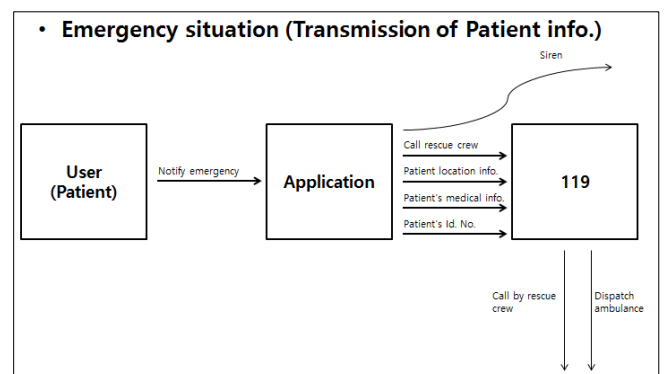
In the Republic of Korea (ROK) one can report emergency situation by dialing 119. However, there still is a possibility of losing the window of opportunity for the patients with a speech disorder/impairment or a laryngeal cancer if these people cannot be provided with outside help. The proposed application was developed to assist these people when they cannot tell their current location due to speech impairment caused by illnesses, injuries or shock, when they are unable to seek other's help, or their treatment has been delayed by the treatment team who needs to understand their medical conditions or histories first, even if they have arrived at the hospital in time.

2. The Design of Application for Emergency Medical System

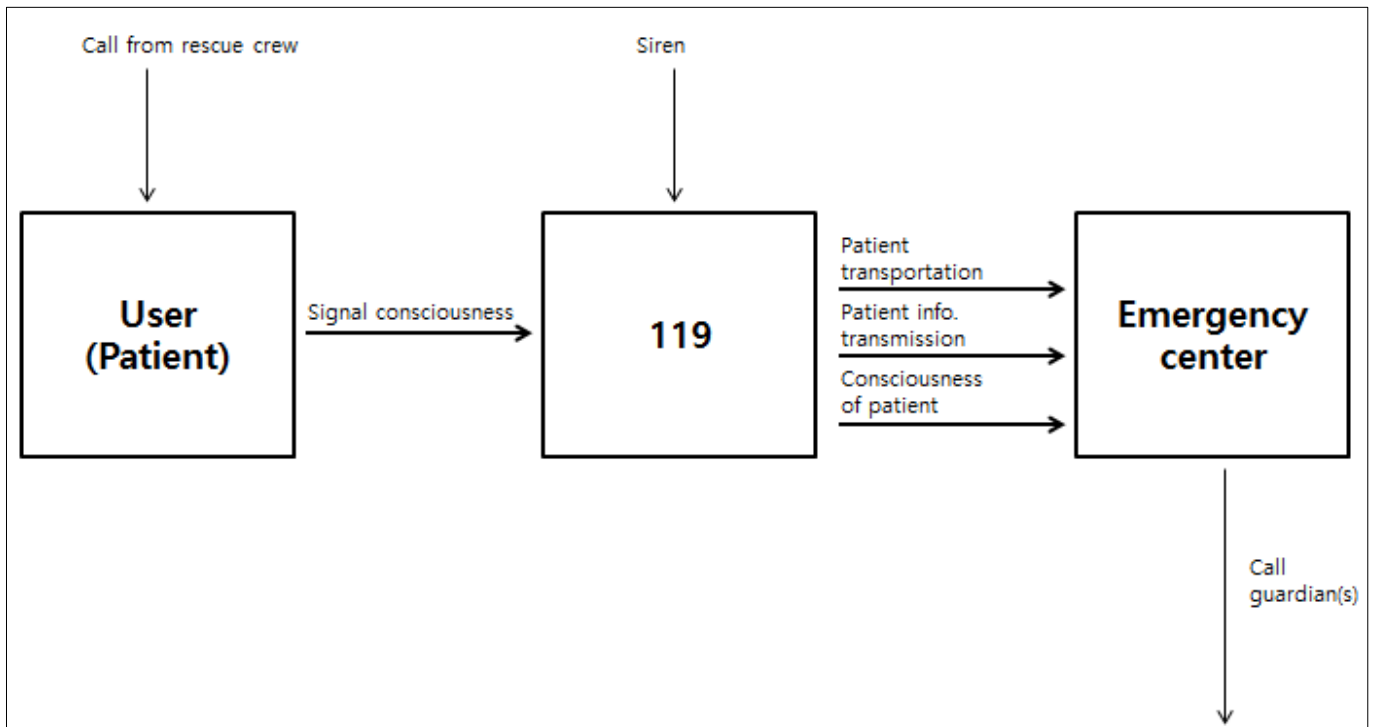
(Fig. 1) shows BPM-form design. And (Fig. 2) shows flow chart of application for the emergency medical system. Also, (Fig. 3) shows emergency situation. (Assessment of patient condition & patient transport).



(Fig. 1) BPM-form Design.



(Fig. 2) Flow Chart of Application for the Emergency Medical System.



(Fig. 3) Design of Application for Emergency Situation.

1) Notifying Patient's Condition

- Sirens: Makes it easy for the paramedics or others to determine the location of the patient in distress.
- Call for paramedics or emergency rescuer: Allow rescue center or crew to call the patient to determine his/her condition (Consider the patient conscious if he/she answers).

2) Providing Patient's Medical Information

- **Provision of past health conditions.**
 - Anamnesis: patient's past medical history.
 - Family history: chronic or hereditary disease(s) of patient's family.
 - Social history: patient's social condition.
 - Blood type: patient's blood type in details.
- **Assigning identification number.**
 - patient's name, birth date, family contact number, their address, relationship with the patient.

3) Providing Patient's Location Information

- Real-time notification of patient's location information

4. Comparison With Other System

(Fig. 4) shows the existing system deployed at Hallasan Mountain in Jeju-Island. The system sends out a location signal (i.e., Eorimok-4, in this case) to 119 emergency response once the user scans the QR code. This is a coping method to deal with the damage or loss of contents like, for example, the experience of the author while he was climbing the same mountain in

February of 2017. The damage is being described in the red box. The core of the proposed system is to provide a better optimized user interface with an adequate UI/UX design. The system allows notification of an emergency just by clicking the emergency button.



(Fig. 4) Existing System Deployed at Hallasan Mountain in Jeju-Island

5. Conclusion

The core of the proposed application is 'Time Saving'. Like the term 'Golden Time', which can be translated as a phrase 'window of opportunity' in western culture, it is imperative that the patients should be transported and treated as early as possible in an emergency. The future emergency response time will be definitely improved by efficiently linking emergency medical treatment centers with paramedics and patients in need once the proposed application is implemented. The application will be also useful to those patients with cardiovascular diseases or high blood pressures.

Acknowledgments

The 4D Health Care Project Group of Catholic University of Pusan aims to cultivate the creative talent who have capabilities in developing 4D contents required for rehabilitation and health care of modern people. Both Department of Physical Therapy and Department of Software of this university are participating and operating the group jointly to perform the task.

The 4D Health Care refers to an advance health care technology which is used for the operation in a 4D-based mixed reality where human senses, cognition and experiences (1D) have been converged with both real and virtual information (3D) and the project group runs various curricular and extracurricular programs to train every participating student to acquire a 4D technology-based health care contents development skills.

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