



Emergency Notification Systems

BY EHREN NGO AND RICK WILLIAMS

A Next Step in Preparedness?

“Do not fear” appears repeatedly as a directive in the Bible. Sometimes, this admonition is perceived as simply spiritual advice. During times of crisis or disaster, however, there is a great need to combine our spiritual assurances with practical information and life-saving actions. Most of our educational institutions are subject to the threat of natural disasters such as earthquakes, tornadoes, fires, floods, hurricanes/cyclones, or tsunamis. Likewise, the risk of a violent incident involving a shooting or terrorism, or a nearby technological disaster such as a hazardous materials spill, is a real, and in many places, growing threat. While any of these events justifiably result in fear, having mechanisms to communicate the threat effectively during a crisis can provide a window for lifesaving actions, and prevent the panic that often occurs in emergency situations.

Early emergency warning systems have historical roots in civil defense. Similar to the concept of air-raid sirens used in times of

war, these systems were developed to warn of an imminent threat to the public that spreads over large geographic areas. During the Cold War, the United States established an emergency broadcasting system known as CONELRAD, using radio stations.¹ This national warning system evolved into the Emergency Broadcasting System (EBS), and subsequently into the present-day Emergency Alert System (EAS), which was now used to notify the public of many threats, including severe weather alerts.² Other countries continue to use air-raid sirens as their emergency warning system. Given the global reach of natural disasters, the importance and value of emergency warning systems that can reach out to a large population has been highlighted by the immense death tolls from recent tsunamis, tropical storms, and hurricanes/cyclones.

The proliferation of personal communication devices, such as cellular phones, pagers, texting devices, PDAs, and personal computers, is revolutionizing emergency warning systems. Typically

offered as an off-site hosted service, today's computer-based systems facilitate rapid message delivery to multiple devices, and allow for delivery of the message to specific groups or audiences that can be targeted by the recipients' attributes or geography. One example of this targeted message delivery in action was the use of an automated "reverse 911" system during the 2007 wildfires in San Diego, California, which contacted thousands of residents through their home phones, giving them the order to evacuate.³

How They Work

Emergency notification systems use multiple communication pathways, including voice calls to landline and cellular phones, along with text messages to cellular phones, pagers, PDAs, and e-mail addresses, to simultaneously alert a large group of people about an emergency or disaster condition. On a school campus, specific instructions, such as an order to initiate a lock-down during threat of school violence, can be communicated



ual inquiries or announce the information publicly.

Emergency notification systems can also be used for non-emergency administrative purposes to reduce staff time and the reliance on phone trees. Uses might include conducting a rapid poll to determine the number of staff available for an event, informing a group of administrators about student illnesses, deaths, or localized emergencies, or automatically bridging executive leadership into an unscheduled conference call.

Selecting a System

Selection of an emergency notification system requires an understanding of your institution's needs and existing communication resources, along with the capabilities of the service

provider. Important features to look for in an emergency notification system include the following:

1. *Supports multi-modal notification.* A notification system should be able to quickly contact all of the devices to which you

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electronically to students, teachers, and staff within minutes, even if they are in different buildings on campus. Even individuals who are off campus would receive the notification and could be advised to stay away from the incident until the campus is deemed safe.

When integrated into our educational institutions, emergency notification systems can serve as a valuable tool to ensure early warning about a campus crisis. Several emergency notification systems also provide for two-way communication, which allows the recipients to confirm receipt of the message or even indicate their current status as "safe" or "in need of assistance." Systems that support two-way communication enable administrators to rapidly account for the status of students, teachers, and staff. Access to reliable information is valuable in assuaging the fears that naturally arise during emergency or disaster experiences. Imagine the relief in parents' hearts upon finding out that their children have confirmed through the notification system that they are safe after an earthquake or similar calamity. Similarly, emergency notification systems that include parents can be used to keep them informed about the initial incident and provide timely updates on the status of the emergency, reducing the need to answer individ-

need to communicate. This might include home, work, and cellular phones, along with text messages to phones, e-mail addresses, pagers, or even fax machines.

2. *Allows real-time, two-way communication.* The best notification systems not only send messages quickly, but can also confirm receipt of the message at the time of delivery. Confirmation reports should allow the message sender (or other authorized administrators) to view message confirmations in real-time, and provide both cumulative response data, as well as the ability to view individual confirmation responses.

3. *Provides mechanisms for reliability and redundancy.* The emergency notification system should always remain operational, even if the communication infrastructure in your area collapses. Emergency notification service providers should have mechanisms in place for service redundancy, including emergency self-sufficiency and multiple computer servers that are located in different parts of the country or world.

4. *Has adequate capacity for emergency usage.* If an emergency notification system is to be used for life-safety messages, the system's ability to deliver messages should be measured in minutes, not hours. Evaluating a notification system's total capacity,

voice and text message throughput per minute, and the percentage of utilization historically seen by the service provider, will help you determine if all members of your institution can be messaged within the notification window you need.

5. *Offers multiple access points and methods for initiating an emergency message.* Most emergency notification systems require messages to be initiated from a secure Website, or by phone, using a touchtone keypad or interactive voice menu. Some systems offer access to a live operator who is trained to take and send the message, and a few allow the initiation of messages from an application downloaded to a smart phone.

6. *Remains affordable with your usage patterns.* Emergency notification service providers offer different pricing packages—some allow a small number of messages and charge for overage, while others package large bundles of notification messages for a single price. A few providers allow unlimited usage of the notification system. Service providers' prices are competitive; thus, you should get comparative bids from several companies (many of them offer special pricing for schools). Recently, one notification system was made available to schools at no cost.⁴

7. *Provides a user-friendly mechanism to manage and maintain the user contact database.* Emergency notification service



providers use different mechanisms and procedures to maintain a current database, ranging from manual data entry to automated systems that link to existing databases. Manual data entry works for small user groups, while larger institutions will likely benefit from linked systems that capitalize on existing databases, such as those from human resources. Some systems allow the use of a limited database, using names of users and e-mail addresses, to invite users to enter and update personal contact information via a secure Website.

System Limitations

Understanding the inherent limitations of emergency notification sys-

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tems is crucial to the choice and successful integration of a system. Because these systems use existing communications and Internet infrastructure—telephone lines, cellular phone towers, and Internet providers—damage to these resources will compromise their ability to deliver messages. In situations with service denial due to high system usage or damaged infrastructure, text-

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Emergency notification process for system in place at Loma Linda University

Systems that support two-way communication enable administrators to rapidly account for the status of students, teachers, and staff.

based messages may be more reliable due to a lower consumption of bandwidth, compared to voice messages. Systems that span different technologies and use multiple methods of notification reduce the likelihood of message failure resulting from overload or damage in any one area of the infrastructure.

Opt-in or Opt-out?

Emergency notification systems are only as good as the contact information entered into the system's database. For example, if an individual has an outdated cellular phone number or e-mail address listed in the database, the system won't be able to contact this person. Two primary approaches exist for enrolling users and their contact information into the notification database: opt-in and opt-out. The opt-in approach requires individual users to voluntarily enter their contact information if they wish to receive notifications. One of the disadvantages of opt-in systems has been a relatively low percentage of participants.⁵ The opt-out approach utilizes contact information from existing databases, and requires users in the database to opt out of the system if they do not want to receive notifications. While the opt-out approach usually results in a higher percentage of participants, the information stored tends to be less reliable than obtained through opt-in programs, resulting in a higher number of undeliverable messages.⁶ Hybrid approaches are possible in an educational setting, as students can be required to update their information and then be given the choice to opt-out during registration periods.

A database management plan is an important foundation for a successful emergency notification system. At a minimum, this plan should address which contact points will be used by the emergency notification service, whether the system will utilize an opt-in or opt-out approach, how often the database will be updated, what process will be used to update batches of users as well as individual users when the need arises, and what measures will be taken to address database privacy and security concerns. Discussing how the database will be managed and maintained with a prospective vendor is critical. And developing a clear plan for keeping the database accurate and up to date *before* contracting with an emergency notification service will help to ensure successful implementation and reliable ongoing service.

One of Many Tools

Finally, as with all technological resources, emergency notification systems should be viewed as one tool in a larger communication and notification strategy. Alternative methods for localized message delivery include public address systems, sirens, bullhorns, electric signs, and even runners carrying written messages. Targeting a broader audience for message delivery includes the use of the school's Webpage and partnerships with local

broadcast media to deliver information through cable channels and radio stations. Emergency plans that integrate these methods into a layered approach with an emergency notification system will help ensure that the message is delivered even in adverse conditions.⁷

Successful communication is a key element in managing crises and disasters. With their ability to quickly distribute messages to individuals through multiple devices regardless of their location, emergency notification systems represent a significant breakthrough in facilitating communication during emergencies and routine business. When used in conjunction with a well-developed and maintained emergency plan, these systems can help to overcome many of the traditional challenges of delivering practical and life-saving information to an entire institution in the event of an emergency. ☞



Ehren Ngo



Rick Williams

Ehren Ngo, M.S., EMT-P, is Program Director for Emergency Medical Care's Bachelor of Science and Emergency Preparedness and Response Certificate at Loma Linda University (LLU) in Loma Linda, California. Mr. Ngo has a long-standing interest in disaster and emergency management and the application of technology. His Master's degree in Emergency Health Services focused on the health impacts of disasters. He serves as LLU's disaster operations coordinator and is a liaison and trainer for the city of Loma Linda's Community Emergency Response Team (CERT) program. **Rick Williams, Ph.D.**, is Vice President for Enrollment Management and Student Services at Loma Linda University. His responsibilities include managing the university's emergency notification system for contacting LLU students.

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