Describing the Importance and Methods of Emergency Communication in EMS Plan

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Abstract

In this article we are defining critical situations with a quick look, and then talk about importance of alerting and being informed, in crisis and emergency times, also by reviewing experiences of past incidents and emergency times of coun-tries and developed emergency alert systems, also by considering their strength and weaknesses. This article introduces a comprehensive in way of system that uses for emergency situations to broadcast messages to public.

Keywords: Emergency situation; Natural disaster; Public alert; Communication equipment; Reduction of casualties; Public notification history; Instant messaging; Mobile communication; Emergency network communication

Introduction

The main goal of this article is reminding the importance of a public Messaging system for emergency situations, This kind of system according to researches of countries like Japan, England, China and United States, It's been years made and using. In addition of reviewing developed countries performance, we find that lack of an emergency message sys-tem will makes lots of irreparable losses thus that force us to research and design such a System, then in this article we'll take a quick look on history of that system then we presents ways of creating an emergency messaging system [1]. A big principle that if we claim we don't need that there is one step to death. Everyone knows the importance of being connected others in today's world, and human kind is developing information technology with an unimaginable Speed, elaborating more about that is over this article. The main goal of this article is focusing on informing public at emergency accidents, because all military, security and governmental forces has Already developed their own systems and plans, but when you discuss about Informing public by the authorities in the shortest time, you'll see weak and Less attention to this case [2].

Our definition of emergency time means, when natural disasters happen.

Examples: Storm, Earthquake, Flood, Volcanoes, Extreme fire and things like them and disasters that happens by the human, like war, Chemical attack, Riot, Cyber-attack, security and terrorist situations that may happen in multi levels.

When something threatens people's lives every second could be vital, Imagine when city water gets infected, even the happening moment also is too Late, people are needed to be inform but how should they be told to not Use water, or in another example hours before storm or flood how should Tell people in the area to leave the area or give them advices to be safe or When losing power for a long time, how can we control and keep people calm. Now we understand how important is sending immediate messages to the People at emergency times [3]. Generally an emergency messaging system is a Program that is made for critical situations for sending messages to people by general links, let review some useful communication links.

Examples: Television, Radio, Telephone, Siren, Cell Phone, Two Way Radio, Satellite Networks (Phone - TV - Radio - GPS), Internet (Website - Application - IPTV).

When importance of emergency message system turns out in the world, United Nations released and accepted this pro-gram plan at 2005 and started Working on an emergency alerting system for natural disasters for the entire World and that plan named[1] IEWP (International Early Warning System). But if we look for background of a system like this, United States of America Started working on a project like this from 1951 with these names.

1951 - 1963 > CONELRAD

1963 - 1997 > EBS (Emergency Broadcast System)

1997 - 2006 > EAS (Emergency Alert System)

2006 - Present > IPAWS (Integrated Public Alert Management System)

And during years they updated their program by advancement of technology.

At this moment IPAWS system works under [2]FEMA organization which has 14 Billion salaries and that is a subset of US department of homeland Security.

IPAWS divides to couples of section that we are taking a quick look on them.

a) EAS (Emergency alert system): This service is designed to send message to radio and TV receiver through satellite and local stations.

b) WEA (Wireless emergency alert): This service is wider and more Important, it was made to send messages to smart phones and usual cell Phones and all the devices that can receive, this service use CBS (Cell Broadcast System) for sending messages.

[1]International Early Warning System

[2]Federal Emergency Management Agency

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c) NWR (National weather radio): US radio service with more than 1000 Transmitter all over the country can be re-ceived by special or normal devices.

d) Internet services: An Internet service that prepares information to Websites and applications.

e) LAS (local alerting systems): This service broadcasts messages through Cable telephone and siren.

Uses of IPAWS

This system manages public alerts in local, state and country dimensions.

IPAWS uses

- Alert at natural disaster situations

- Alert at particular security and army situations

- Amber Alerts[3]

- President Immediate messages

In technical and statistical review of IPAWS, IPAWS-[4]OPEN.

This system uses two special protocol, [5]CAP for sending and IPAWS [4] profile for receiving, and its capable to send messages on a average under 2 Minutes in 5 different ways that mentioned. In security Look IPAWS uses [6]PKI Method for encryption. In released statics of 2017 test of IPAWS, 88% TVs, 97% Radios, 97% IPTVs and 98% Cell Phones received message successfully and general Success of system was announced 88% [5].

Now we review public system of emergency alert in some other countries.

United Kingdom: UK has PEA (Public Emergency Alert), this system sends alerts through siren And to mobile devices by [7]CBS and [8]SMS because according UK government statistics 92% of People of the UK have cell phone.

Japan: Japan also has a system since 2007, which is named J-alert it sends alerts at crisis times and uses all communi-cating ways (TV - Radio - Internet - Cell Phone - Siren).

China: The wide and crowded country of china also has such system, The CML (China Meteorological Administration) is Chinese emergency broadcast System, it uses all mentioned ways to send alerts. From other countries we can name Canada with NPAS (National Public Alerting System) that is operational from 2009 and countries like France, Netherlands, Australia and Sweden and etc. By reading the above content we'll understand the necessity of an Emergency broadcast system, that most of the countries didn't pay Attention to that and did not consider even low level functions such as sirens. Take a look on critical situations from not so far, the times that such a System was and was not used. This tip also should be considered, most of the people don't care about TV alerts and pass from them without Attention and specially rural people even don't watch TV [6]. Then a unique message to all receiver devices in that area can be so

effective. Terrorist attacks in France can be a good example of lack of such an Emergency message system, France government understood the necessity of an emergency alert system after some critical situations and quickly developed a mobile application to be able to tell people suggestions immediately. In the second example we talk about the fire of Plasco building in Iran at January 2017, in that Incident EMS (Emergency Message System) could be Used in that area to tell people get out and get away from building to help to Scatter people around the building and help relief forces to perform faster, because being uninformed is one of the crowding reasons of people [7].

In third example we can review riots, when security forces want to send their messages to people immediately and ef-fective, for example leaving Public places or not crossing specific street. But we can name US as a successful example of an integrated emergency Alert system, because United States of America in addition of Meteorological predictions, with using this system significantly decreased Number of losses in Natural disasters [8].

Generally this system can be used for lot of situations because it sends an Effective message to large number of people.

Preview of EMS - (Emergency Message System)

According to experiences that we've gotten from the countries around the World and information from weaknesses, describing a plan of an EMS.

Uses of EMS

Sending message or emergency advice at crisis times:

- Natural disaster times

- Terrorist attack situations

- Military or cyber attack situations

- Specific security times

- Power crisis situations

- Riot times

This system should be in close relation with, meteorological organization, Police, Hospital emergency and fire satiation and it should be out of Paperwork as possible, to save and improve its immediate performance.

Also we need to train people about this system and its messages, so that They understand it if they get a message from EMS it means a serious alert about the subject that message have and they should follow it to save their Lives, in addi-tion should not use this system for unnecessary stuff to keep the effective principal of system [9].

This system can implement in 3 levels, in the following we describe each Level.

EMS should have its own developed software and the software should be Able to do integrated management of mobile networks, telephone and Media regionally.

Level 1: Is the most complete level and encompasses all communicating Ways and that is stable permanently.

Abilities of [9]EMS (Level 1)

- Integration (Software and Management),

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[3]Emergency Abduction Messages.

[4]Open Platform For Emergency Networks.

[5]Common Alerting Protocol.

[6]Public Key Infrastructure Method.

[7]Cell Broadcast System.

[8]Short Message Service.

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[9]Emergency Message System.

- Confidence and Security (Originality, Physical and Cyber Security),

- Real Time Access (Interface, Staff Readiness, Decrease The Delay),

- Ability of control and operate over map (Precision, Performance Speed),

- Ability to Operate in any dimension (Country, State, City, Area),

- Updated map of transmitters and ground changes (Transmitters of TV, Radio, Cell Phone, Natural and Human changes of ground),

- Monitoring System (Preparedness ،Reduce Errors),

- Stability (Hardware and Power),

- Having Website (Informing),

-Having [10]API for Developers (Providing Live Information for Free, Developing Applications by Private De-velopers),

- Ability to send Internet Message (Developed Applications and Websites),

- Ability to send CBS Message (Cell Broadcast System),

- Ability to send SMS Message (Short Message Service),

- Ability to send Radio Message (State and Country Stations),

- Ability to send TV Message (State and Country Stations),

- Ability to send Cable Telephone Message (Regional and State).

EMS server will deploy in center of each service provider (TV - Radio - Telephone - Mobile Operator) then connects to EMS data center, controlling Internet services will be directly from EMS center, and thus integrated Management will take place [10]. TV and radio providers should help the system in hardware and software Cases to establish the communication of platform in any size in regions. Each mobile operator should make a stable link from their data center to EMS data center and organize their internal systems to let EMS operates in any size and form. Telephone providers also need to organize the software and hardware for EMS to make a straight and real time connection (Figure 1).

Level 2: This level especially focuses on cell phones and operates through Cell phone providers and internet. The differences between this level and Level 1 is in removing TV, radio and telephone ways from this level which Decreases setup costs and it will be predicted the decrease of 20% of the Receivers too. In this level also EMS server will be deployed in the center of each provider and will be connected to the EMS data center (Figure 2).

Abilities of EMS (Level 2)

- Integration (Software and Management),

- Confidence and Security (Originality, Physical and Cyber Security),

- Real Time Access (Interface, Staff Readiness, Decrease The Delay),

- Ability of control and operate over map (Precision, Performance Speed),

- Ability to Operate in any dimension (Country, State, City, Area),

- Updated map of transmitters and ground changes (Transmitters of Cell Phone, Natural and Human changes of ground),

- Monitoring System (Preparedness ،Reduce Errors),

- Stability (Hardware and Power),

- Having Website (Informing),

- Having API for Developers (Providing Live Information for Free, Developing Applications by Private Devel-opers),

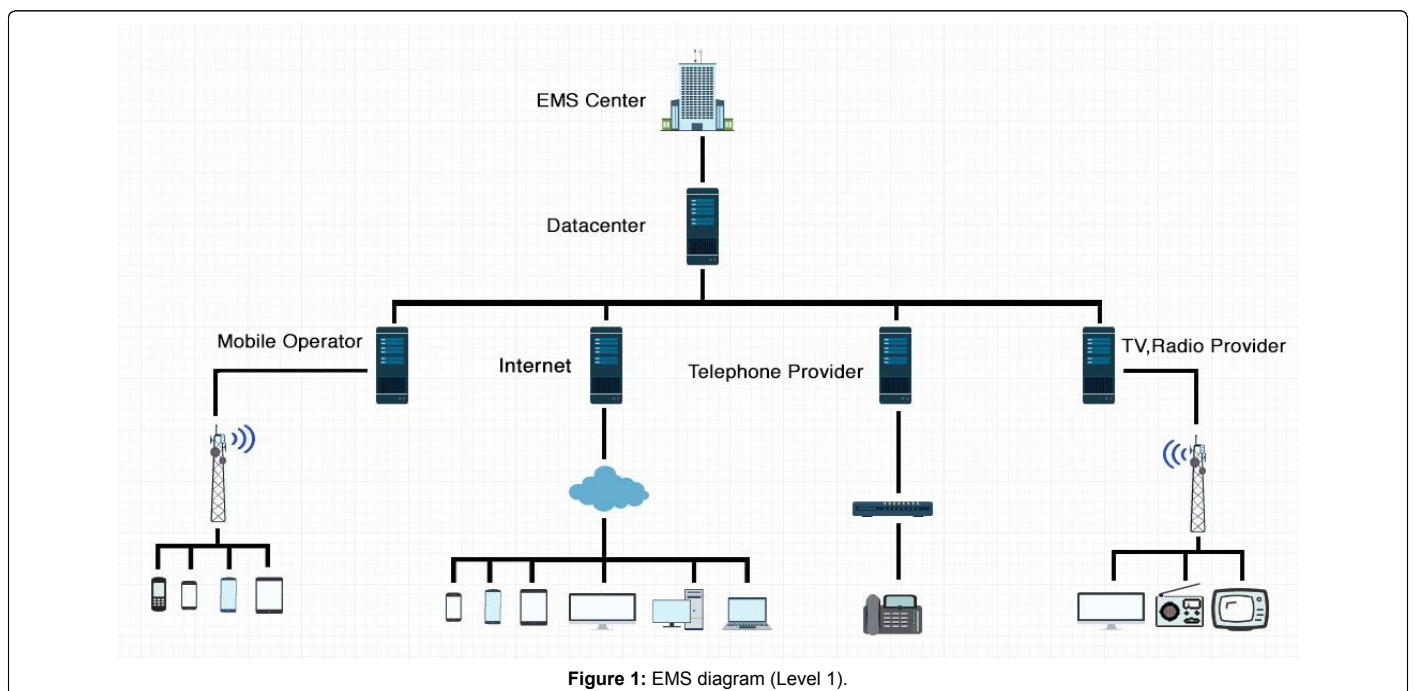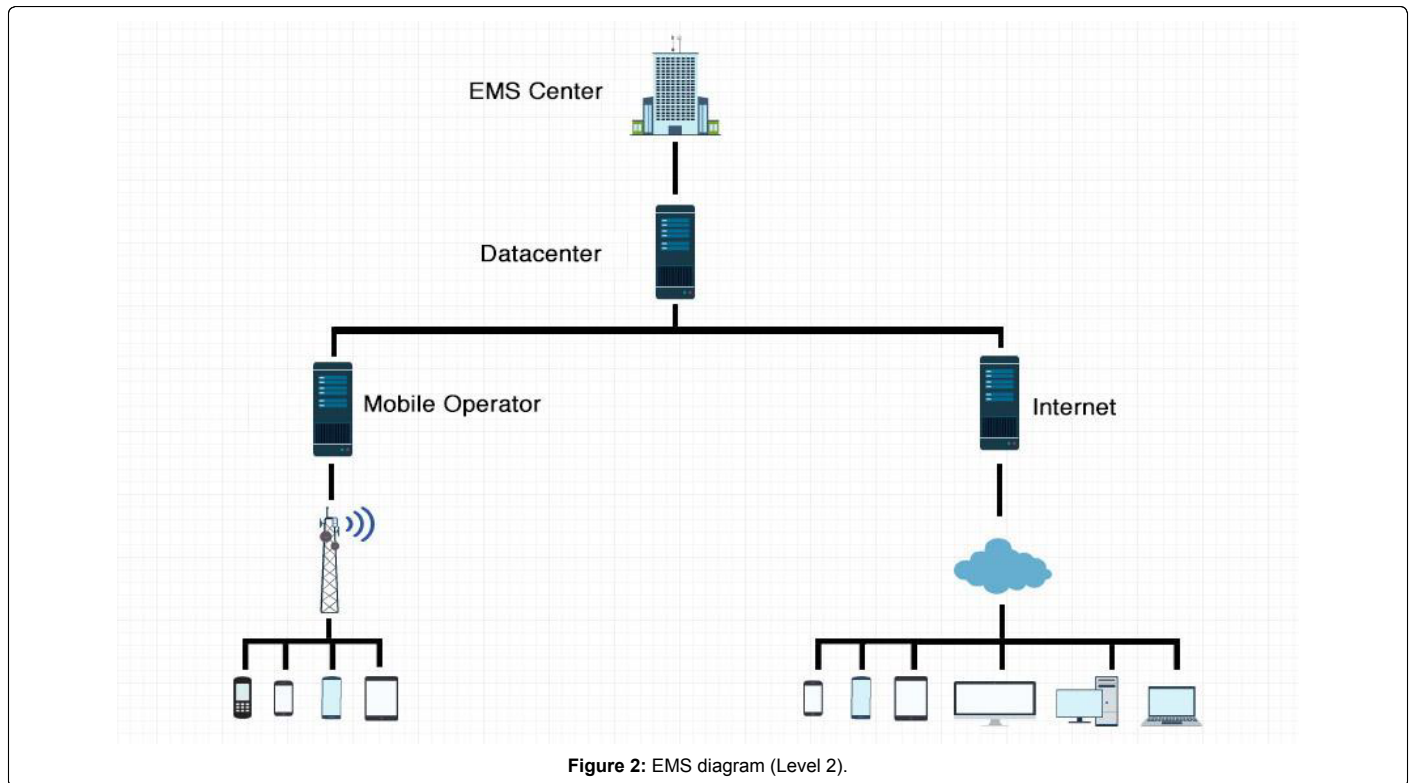- Ability to send Internet Message (Developed Applications and Websites),

Figure 1: EMS diagram (Level 1).

[10]Application Programming Interface

Figure 2: EMS diagram (Level 2).

- Ability to send CBS Message (Cell Broadcast System),

- Ability to send SMS Message (Short Message Service).

Level 3: The third level of this system will not operate by TV, Radio, telephone and cell phone. It just works over internet and Sends messages to developed applications and websites on any Platform, thus EMS data center controls all Operations, also EMS level 3 in addition of decreasing cost will decrease setup time too, but we should keep it in mind that it will lost lots of Receivers too.

- Integration (Software and Management),

- Confidence and Security (Originality, Physical and Cyber Security),

- Real Time Access (Interface, Staff Readiness, Decrease The Delay),

- Ability of control and operate over map (Precision, Performance Speed),

- Ability to Operate in any dimension (Country, State, City, Area),

- Updated map of ground changes (Natural and Human changes of ground),

- Monitoring System (Preparedness ، Reduce Errors),

- Stability (Hardware and Power),

- Having Website (Informing),

- Having API for Developers (Providing Live Information for Free, Developing Applications by Private Devel-opers),

- Ability to send Internet Message (Developed, Applications and Websites).

We hope that EMS will be run as soon as possible in all countries and save Peoples life and assets and be a long step in the way of improving any kind of security (Figure 3).

Figure 3: EMS diagram (Level 3).
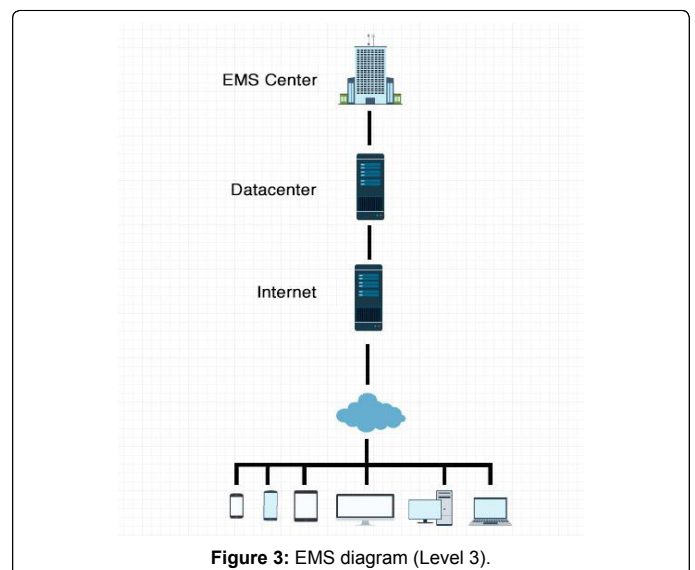
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