

Delphi Study - Round 1

Dear Panellist,

Thank you for agreeing to participate in this Delphi survey as part of doctoral research project. The study aims to determine the role of RFID as an e-health technology ¹ in disasters in the proposed scenarios/tasks for different disaster phases (mitigation, preparedness, response and recovery). I am interested in your opinion/idea, as an expert in a field related to one or more of the topics of disaster management, disaster medicine, and e-health, on the general application of e-health throughout the disaster management cycle, and in particular, on the distinctive role that RFID can play in these situations.

This questionnaire is the first of three rounds and at the end of each round, after collecting and summarising the findings, the next questionnaire and the feedback of the previous round will be given to the participants.

This questionnaire consists of closed questions; however, space is provided for you to comment and please feel free to extend the comment boxes and explain your ideas in detail as much as you wish. Please try to answer all questions, even though you may not have in-depth knowledge of all of them. Please do not hesitate to comment on any aspect of the questionnaire, terminology or approach. Moreover, it should be mentioned that your participation and responses to this survey will be strictly confidential to the research team and will not be divulged to any outside party, including other panellists. You may withdraw from the process at any time without any given reason. In that case, all your data will be consequently deleted and you will not be included in the study.

A- Demographic Category

Level of Education (you can choose more than one)

Doctorate degree ☐ Master's degree ☐ MBA degree ☐ Bachelor's degree ☐
Others ☐ Please Specify _____

Occupation (you can choose more than one)

Academia ☐ Healthcare ☐ Consulting ☐ Research ☐
Government ☐ Disaster Manager ☐ Healthcare IT ☐
Disaster Medicine ☐ Other ☐ Please specify _____

¹ E-health is defined by WHO as the cost-effective and secure use of ICT in support of health and health-related fields

Total Years of Experience

0-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐
21-30 ☐ More than 30 years ☐

B- RFID Technology

Below is the list of scenarios/tasks which are categorized into disaster phases based on the disaster management cycle includes Mitigation, Preparedness, Response and Recovery. For each phase a brief introduction is given; based on the phase objective(s)/aim(s) and RFID, in your opinion on a scale of 1 to 5 how important is the role of RFID on improving the efficiency and effectiveness of the following tasks (space is provided for your further comments, and if you do not agree on using RFID for the proposed task, please suggest and explain your choice of an alternative technology).

Section 1 – Mitigation Phase

This phase objective is to reduce disaster hazards. It can consist of studying and assessing the risk, investigating the causes of the hazard, and taking administrative measures to prevent or reduce the level of a hazard when it occurs and lessen the vulnerability of both the eco- and social systems (i.e. the community) (1). This phase includes activities like building codes and zoning; vulnerability analyses; public education.

	Task/Scenario	Rating (1=least important – 5=most important)
1	Improving timely decision making in healthcare organizations including reallocation of hospital resources and staff as the need arises by using RFID capabilities such as automatic and real-time capturing the number and location of medical and human resources	
	Comment:	
2	Using RFID to automatically identify and capture healthcare products/equipment by location and analyse usage pattern for each region to predict future specific demands at the time of disaster and constantly monitor the condition of healthcare centre	
	Comment:	
3	Improving integration of information about increased demand on different hospital sectors for the purpose of strategic decision making based on the real-time and precise information captured by RFID tags	
	Comment:	

4	Availability of victims' vital health information like blood type, special disease or potential medication allergies and storing them on an RFID tags and protecting those valuable medical information from local disasters (unlike paper records)	
	Comment:	
5	By recording medical/resource information on RFID tags, electronically, precise and real-time information is available to access and exchange across all medical facilities that would improve and enable healthcare organization to prepare for emergency planning and cope with next natural disaster	
	Comment:	

Section 2 – Preparedness Phase

Preparedness: Means to ensure that appropriate systems, procedures and resources are in place to assist those affected by the disaster and enable them to help themselves (2) and (3). It comprises gathering information, establishing preparedness plans and organizing management structures, doing drills, exercises and training to enhance the capabilities of the society when faced with a crisis, and creating warning systems (1).

	Task/Scenario	Rating (1=least important – 5=most important)
1	Through matching the population size of each region and their pattern of health needs/demands and combining them with available hospital resources in each region, we can be better prepared for disasters, and in this regard RFID helps us to keep track of available medical resources on a real-time basis to match with the region's health demands.	
	Comment:	
2	Through automatic data capturing, RFID helps us to track and share information on a regional healthcare centre and make sure about types and availability of the medical resources	
	Comment:	

3	RFID can be used to collect and utilize the critical information needed for Just-in-Time disaster plan as well as medical resource planning and allocation of new resources to depots	
	Comment:	
4	Patients' medical data (important ones) should be pre-entered into RFID tags so that data are immediately available at the time of disaster and can facilitate disaster response mission.	
	Comment:	

Section 3 – Response Phase

Response: Measures taken during or immediately after a disaster to bring relief to people and communities affected by disaster its purpose is to transfer disaster responders, resources and services to the disaster site (3). The response phase includes the measures taken to control and manage different effects of disaster and to minimise losses to property and human life. It consists of an array of emergency services following the crisis with the aim of saving human lives and property, providing relative welfare, and preventing the spread of the crisis including search and rescue, emergency relief controlling the crisis, the establishment of order in society, and arranging temporary housing.

	Task/Scenario	Rating (1=least important – 5=most important)
1	Paper triage complicates information turnover and has several limitations such as being easily damaged or destroyed and having the limited space for information, but RFID tags facilitate the response mission and eliminate the drawbacks of paper triage. RFID tags have this capability that the first responder writes triage once and after that all information can be captured automatically and even transferred to the database and all of which brings time efficiency during response mission.	
	Comment:	
2	By using RFID tags (especially if people start using them from the previous stages), since all the important health information is already available on their tags, patients care continuity would be guaranteed.	
	Comment:	

3	<p>By using RFID tags during response phase, victim identification and tracking would be facilitated, something which is time consuming and in certain circumstances impossible through the traditional way.</p> <p>Patients/medication misidentification and generally medicinal care can be very vulnerable to different kinds of errors, even fatal ones; however, RFID can help to recognize the patients faster and more easily improve disaster victim tracking, triage, patient care, and facility management; moreover, it can improve response times, help to present more effective ‘first response’, and thus reduce the mortality rate.</p>
	Comment:
4	<p>By using RFID in the healthcare centres (especially from preparedness phase), since responders have the real-time information on the available medical resources on each healthcare centre, they are able to transport victims to the correct facility as quickly as possible.</p>
	Comment:

Section 4 – Recovery Phase

Recovery: Refers to those actions after a disaster that attempt to bring order to the disaster site and aid in bringing the situation back to normal. (2); it aims to restore the disaster-stricken area to before-crisis state. This phase is a stabilization phase and it may last for a long time (3). Recovery phase includes “long-term activities which should be performed after disasters to help the community to regain its normal conditions and become stabilized” (4). In other words, it comprises taking necessary measures after the crisis to restore the normal conditions to include: restoration, reconstruction, development, establishing normal conditions, evaluating and assessing the programs, and studying and evaluating the performance.

	Task/Scenario	Rating (1=least important – 5=most important)
1	By using RFID special tags this opportunity is given to healthcare provider to continuously monitor patients’ health conditions, record and report vital signs all of which leading to optimizing care management and reducing.	
	Comment:	
2	By using RFID tags, since all the victim’s health condition information before disaster and during response time is available on the tag, care disruption caused by disasters will be reduced, specifically for people with chronic disease, and continuity of care becomes possible	
	Comment:	

3	Through real-time monitoring capabilities of RFID, it would be possible to provide special advice to remote patients	
	Comment:	
4	One of the tasks in this stage is fatalities identification which can be improved through using RFID tags instead of paper ones that would facilitate further related procedures like their location tracking and transferring to their relatives.	
	Comment:	
5	Since, top managers have real-time and precise information about medical resources either used or in stock, they would be able to do medical planning for recovery more effectively and efficiently.	
	Comment:	

Reference:

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3. Baldini G, Braun M, Hess E, Oliveri F, Seuschek H, editors. The use of secure RFID to support the resolution of emergency crises. Security Technology, 2009 43rd Annual 2009 International Carnahan Conference on; 2009: IEEE.
4. Altay N, Green III WG. OR/MS research in disaster operations management. European Journal of Operational Research. 2006;175(1):475-93.