

Evaluating Augmented Reality and Mobile App Platforms for Mitigating Risk

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I certify that this document satisfactorily meets the scope and quality as a final paper, and that it fulfills the capstone requirement for the degree **Master of Interdisciplinary Studies**.

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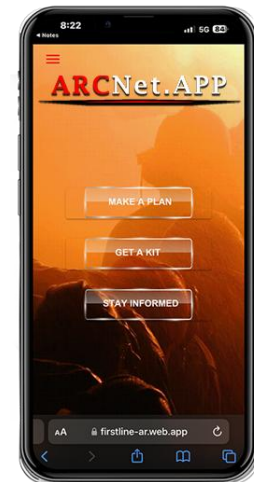
There are many other involvements including business organizations, non-profits, and seasoned veterans within the emergency management community, all of which have contributed to the concept that “Everyone is an Immediate First Responder.”

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ABSTRACT

Natural disasters are a constant force that often create overwhelming and catastrophic events caused by natural processes. Events (to name a few) such as floods, hurricanes, earthquakes, and active-shooter scenarios leave behind a damage path of untenable disruptions that alters every fabric of normalcy to populations worldwide (UNESCO and UNICEF 2012). From 2000 to 2019, natural hazards caused US\$1.23 trillion in damage, claimed 1.23 million lives, and affected over 4 billion people (UNDRR 2020). These events redefined and differentiated *two key response roles*, “**immediate responders**” and “**first responders**” both of which are considered as mission critical for maximizing the tolerance threshold of survivors. The lack or loss of trained emergency first responders (EFR’s or civilian) is a continuous problem affecting EFR response time and emergency services.



Although government agencies are working to increase incentives such as compensation, medical benefits, and training for EFR personnel; the brotherhood of “First-Responders” still suffer from a high rate of resignations, due to underfunding and staffing shortages, the reliance on outdated equipment and deferred maintenance puts emergency first responders and the public at higher risk. Thematic analysis revealed that although EFRs may be exposed daily to these traumatic events, factors that contribute the most to the decline in their professional wellbeing appear from within the organizational environment, rather than from the event itself (Bevan, 2022).

The purpose of this paper proposes a proof of concept (AR app communications) to maximize community resiliency and to counter the number of resignations resulting from the fore-mentioned burnout, and agency deficiencies, with the proliferation that ***“Everyone Is a First Responder.”***

The release of **ARCNet.app** (*Augmented Reality Communications Network App by FirstLine TaskForce*) exemplifies a participatory based approach for a handheld (devices) readiness app for consciousness raising and effectively refueling **awareness**, toward community resilience. At ARCNet, the term “resilience” is the process aiming to call the attention of the larger population to specific causes or conditions impacting community readiness. The readiness app is a game changer for disaster mitigation, prevention, response, and recovery.

The ARCNet.app memberships subsidize and grow the number of participants (**EFR’s or Preparedness PAL’s**) who choose to support local **Business Heroes** that are the cornerstone for individual and community readiness by telegraphing interactive awareness and preparedness initiatives (Private Sector Organizations and Businesses). Preparedness **“PAL’s”** or *Preparedness Alliances and Leadership* have been and always will be *(like-it-or-not)* the first boots on the ground, well within the interior of the damage-path.

Encircling disaster guidelines for mitigation there are three main concepts that were examined for strengthening preparedness PAL’s first response and community multidisciplinary scenarios; “Organizational Challenges, Professional Challenges, Community Readiness skills and business alliances,” none of which are exempt from the reality that ***“Everyone is a First Responder.”***

Private sector business heroes (Quiktrip, Domino's, Coca Cola) and their intellectual properties (foot-traffic, product cultures) not only present opportunities to create revenue streams from app subscriptions (*Preparedness PAL's*); but as industry influencer's these product culture leaders can mass (foot-traffic) recruit individuals (PAL's) through engaging and participatory AR awareness crusades echoing community preparedness deep into the living room of America.

The comparison of scholarly reports such as the International Journal of Environmental Research and Public Health, The PennState Extension, Natural Hazard Science, and News 21 confirm that the majority of the EMS community recognizes that the reference **"Everyone is a First Responder"** is not only mission critical but a reality to address civilian readiness and the conditions concerning EFR weaknesses. The content of this paper will assess how the AR app formulates participatory readiness frameworks toward remedying Organizational Challenges, Professional Challenges, and acknowledge the responsibility each citizen bares in order to increase community standards for resiliency.

Currently the ARCNet.app project is seeking partnerships with non-profit organizations (as recipients from revenue streams), and private sector agencies (commerce) for investment capital and their collection of intellectual properties (foot traffic in billions) resulting from product culture advancements. Product cultures and the value of their brand (market share) stage breeding grounds to publicize that,

"Everyone is a First Responder," and "Preparedness is Your Responsibility."

The advancements of AR technologies and app platforms produce “WOW” factor experiences needed for interactive, engaging, and habitual content for all ages; convincing every living room in America to organize and prepare for the “What If Factor.”

Keywords: [emergency first responders](#), [immediate responders](#), [first responders](#), [disaster response](#), [community resilience](#), [augmented reality](#), [disaster education](#), [marketing readiness](#), [risk assessment mobile app](#)

INTRODUCTION

The concept paper is an “**Introduction**” referencing the National Research Council’s Committee on increasing national resilience. Advocating that in 2012 hazards and disasters were increasing at national level alerting the fact that community resilience should be a matter of national priority, and national security (Cutter, 2013). Furthering the need for increased resilience Cutter acknowledged that, the events of 2017 (a matter of only five years) alone lend credence to the notion that increased disaster resilience is still needed throughout the U.S. This need to increase national resilience is due in both an escalation in overall disaster losses and increased frequency of disastrous events, but also due to a scarcity of national capability to react to these events when they occur (Cutter, 2013).

The response to the increased levels of emergency doesn’t begin at a single defined moment. It begins with overlapping waves. Automated sensors may detect a hazard in under half a second. A person at the scene may begin helping within seconds. A 911 call gets processed within a minute. Professional responders arrive within minutes.

Incident command structures scale up over minutes to hours. Federal or international agencies activate within hours to days. Each layer builds on the one before it, and the earlier each layer starts, the better the outcome. The response begins, in the most practical sense, the instant someone or something recognizes that an emergency is happening (Ashkenazi, 2019). ARCNet' concept to maximize community resiliency exemplifies a multifunctional readiness app for handheld devices producing a common denominator effectively refueling *awareness and* increasing national levels in community collaboration and the response levels.

In a congressional testimony, the Administrator of the Federal Emergency Management Agency (FEMA), Craig Fugate, described today's reality as follows: "Government can and will continue to serve disaster survivors. However, we fully recognize that a government-centric approach to disaster management **will not be enough to meet the challenges** posed by a catastrophic incident. That is why we must fully engage our entire societal capacity.

As a concept, Whole Community is a means by which residents, emergency management practitioners, organizational and community leaders, and government officials can collectively understand and assess the needs of their respective communities and determine the best ways to organize and strengthen their assets, capacities, and interests. By doing so, a more effective path to societal security and resilience is built. In a sense, Whole Community is a philosophical approach to thinking about conducting emergency management (Fugate, 2011).

The Immediate Responder:

The immediate responder is not a term commonly recognized by the emergency management community but is one that plays a pivotal role in life-saving intervention, urban search and rescue, and overall disaster response.

The authors define the immediate responder as those individuals that through no desire or fault of their own are thrust into disaster response simply by being physically found in the immediate disaster zone.

When a disaster occurs, survivors in the immediate area have two options: to help or not. One could certainly make the argument that self-preservation and fear would drive many to either flee the scene or become an event spectator as anxiety and panic replace rational thought processes. These individuals are often not formally trained in disaster management or disaster medicine but rely on natural instincts and local knowledge to visualize problems and devise ad hoc emergency response protocols to solve these problems with immediate resources (FEMA, 2011).

These individuals are often not formally trained in disaster management or disaster medicine but rely on natural instincts and local knowledge to visualize problems and devise ad hoc emergency response protocols to solve these problems with resources.

The ARCNet' Readiness App is formulated to provide solutions to aid with many emergency medical situations such as CPR through augmented reality visualizations showing the procedure in real time. The app is readily equipped to negotiate communications, shelter in place procedures, medical, and security.

Recognized First Responder:

Upon first consideration of the term first responder, images of lights and sirens often jump to the forefront. It has been engrained in the U.S. culture that first responders are police officers, firefighters, and emergency medical technicians, etc. However, in the emergency management and medicine community, the term is now taking on differing connotations and its definition is expanding. As Craig Fugate so elegantly said, “When you step back and look at most disasters, you talk about first responders—lights and sirens—that’s bullshit (Quote).

The first responders are neighbors, bystanders, and the people that are willing to act” (Fugate, 2011). However, it is not enough to simply receive education and training. Additional knowledge, skills, and abilities must be assessed and practiced in ongoing drills and exercises to ensure true understanding of roles and responsibilities in disaster response.

The scholarly report from the International Journal of Environmental Research and Public Health, confirms that the majority of the EMS community recognizes that the reference **“Everyone is a First Responder”** and the difference between immediate responders and first responder is not only mission critical but a reality to address civilian readiness and the conditions concerning EFR weaknesses.

President Trump released his National Security Strategy on 18 December 2017. In the “Promote American Resilience” section of the document, one of the primary actions is to build a culture of preparedness by informing and empowering communities and individuals to obtain the skills necessary to become more resilient against threats and hazards.

This strategy is in direct alignment with what FEMA Administrator Brock Long has been promulgating throughout the devastating hurricane season of 2017—state and local governments must be able to sustain themselves and that FEMA was not, and was never meant to be, a first responder organization. Based on this assertion, there is a simple correlation that can be made to an old adage, it not only “takes a village to raise a child” but also takes a village to respond to a disaster.

Product cultures and the value of their brand (market share) stage breeding grounds to publicize (to billions by way of foot-traffic) that,

“Everyone is a First Responder,” and “Preparedness is Your Responsibility.”

The advancements of AR technologies and app platforms produce “WOW” factor experiences needed for interactive, engaging, and habitual content for all ages; convincing every living room in America to organize and prepare for the “What If Factor.”

THEORITICAL FRAMEWORK and LITERATURE REVIEW

Evaluating Augmented Reality and Mobile App Platforms for Mitigating Risk

The theory of Protection Motivation refers to motivational measures to protect oneself against a personnel threat; it is usually defined operationally as the intention to adopt a recommended action. The Sendai Framework for Disaster Risk Reduction was implemented at the Third UN World Conference on Disaster Risk Reduction held in Sendai, Japan, March 18, 2015.

Of the determinants of intention specified by the model, **the four that have received the most empirical attention are vulnerability and severity** (equivalent to perceived susceptibility and severity in the Health Belief Model), **response efficacy** (the belief that the recommended action is effective in reducing the threat), and **perceived self-efficacy** (the belief that one can successfully perform the recommended action; Bandura 1997).

The theory points out that a person will be more motivated to protect himself or herself (i.e., have a stronger intention to adopt the recommended action) to the extent that he or she believes that the threat is likely if the current course of action is continued, that the consequences will be serious if the threat occurs, that the recommended action is effective in reducing the likelihood or the severity of the threat, and that he or she is able to carry out the recommended action (Ahmed, M. A., Haynes, K., & Taylor, M. 2018). The framework aims to achieve the substantial reduction of disaster risk and losses of individuals and communities. The framework is a call to action for all stakeholders to work collaboratively towards reducing disaster risks and building a culture of preparedness (Wahlstrom, M. 2015).

The Sendai framework of vulnerability and severity as well as the idea of using mobile device apps in conjunction with augmented reality platforms. The advancements in sociotechnical systems and their facilitators have the abilities to overcome communication barriers daunting the efforts of emergency management. Theories using augmented reality apps for education and community resilience constitute innovative tools to enhance learning experiences promoting disaster preparedness. AR mobile apps not only improve the access to knowledge base (messaging) but change forever the sociotechnical system from which users learn (Wooldridge, 2022).

The AR platform allows users to *experience and understand dynamic interactions* (virtual experiences) within the sociotechnical system while also improving mobile device-based AR applications. Additionally, the AR app allows users to develop their own disaster-proof tools that engage and motivate **collaborative community knowledge building**, particularly in disaster prevention education and training (Singh, 2024). Unique AR “WOW Factor” experiences, are revolutionizing education by integrating virtual elements into physical environments, thereby improving knowledge retention and applicable physical performance for readiness (Morgan, J. 2022).

Collaborative knowledge building often flows from professional agencies or groups to the community through traditional methods of disaster education such as speaker events, social media, and community out-reach. However, traditional methods of *disaster education knowledge* flow without adequate community engagement.

Besides the current inadequacies in the delivery of readiness information, incorporating community knowledge in disaster-related decision-making processes through face-to-face participatory methods is costly and time-consuming (Potur, 2025).

Collaborative decision-making has been widely addressed by scholars (Hills, 2004; Raiffa, Richardson, & Metcalfe, 2002; Turoff, White, Plotnick, & Hiltz, 2008); about AR applications in emergency management. However, AR has received limited attention for mitigating preparedness messaging capabilities in the past (Zhu, 2021).

How do people physiologically relate to positive notations or titles?

People and their physiological responses to positive notations or titles are influenced by numerous factors, including the emotional content of the words and the context in which they are used (Weis, Herbert, 2017). So, from our word list acknowledging immediate responders had to identify with business facilitators as well. The title “Business Heroes” suggest an experience of positive feelings, supporting the fundamental building blocks for cultivating community resilience. The concept of a product culture (developed by these organizations) produces a customer base interacting with retail or consumable goods.

Now, the “Foot traffic” or customer interactions from our Business Heroes represents a measure of connectedness that is calculated into the billions. The identifier, “Business Heroes,” will help mitigate social acceptance and participation that balances out any negative barriers stifling preparedness messaging. The AR experiences stimulating the massive numbers of foot traffic is critical for conducting sociotechnical messaging and system dynamics for app content and development (Alexander, 2021).

The introduction of interactive AR app content by Business Heroes (Fortune 500 industry leaders and influencers) maximizes the potential to communicate preparedness concepts throughout their (Business Heroes) product networks (overcoming limited attention). ARCNet recognizes the urgency and need for producing critical infrastructures acceptable to all stakeholders for risk reduction.

By engineering the AR sociotechnical technology, we create a culture of preparedness in America (Wahlstrom, M. 2015). The **ARCNet**’ project **“Everyone Is a First Responder”** emphasizes the critical role of business heroes and citizenry in both pre-disaster and post-disaster scenarios, delineating the importance of collaborative community preparedness and empowerment. The theory of being a “secure nation” does not mean that adverse events never occur (Harris, 2018).

ARCNet’ s initiative that everyone can function as a first responder stems from the acknowledgement that in emergencies, the first individuals at the scene (boots on the ground) are the bystanders or community members rather than the help from trained professionals. ARCNet’ mission is to empower individuals with collaborative knowledge and skills, that significantly enhance community resilience. The method of connectedness for building a culture of preparedness is realized through the power of sociotechnical technology, a collaborative tool for **“immediate responders” and “first responders.”**

LITERATURE REVIEW

Immediate Responders - Versus First Responders

Systematic reviews are qualitative methods used to show literature on the topic of interest, (in this case, “Everyone Is a First Responder”) using a step-by-step process to engender new meaning and knowledge from existing evidence and inform on new research and/or highlight research gaps in current literature on disastrous events and the critical aspects to first response (Bettany-Saltikov, 2016).

Through the depth of ethical understanding there is, (perceptions of risk management) “More than Meets the Eye” when mitigating community readiness and framing first steps to show the difference between immediate responders and first responders.

ARCNet’ claim that disastrous events have redefined and differentiated, *two key response roles*, **“immediate responders”** and **“first responders.”** Both of which are considered as mission critical roles for maximizing the tolerance threshold of survivors. The lack or loss of trained “Emergency First Responders (**EFR’s or civilian**) is a continuous problem affecting **EFR** response time and emergency services.

1. **Title: Expanding Understanding of Response Roles:** An Examination of Immediate and First Responders in the United States

Citation: Harris, C., McCarthy, K., Liu, E. L., Klein, K., Swienton, R., Prins, P., & Waltz, T. (2018). Expanding understanding of response roles: An examination of immediate and first responders in the United States. Retrieved from <https://www.mdpi.com/1660-4601/15/3/534>

Review:

Human behavior during disasters is shaped by a complex interplay of psychological, social, cultural, and economic factors. Understanding these elements is critical to improving disaster preparedness, response, and recovery efforts (Erokhin, 2024). Disastrous events over a millennium have redefined and differentiated *two key response roles*, **“immediate responders”** and **“first responders”** delineating their duties to maximize the tolerance threshold of survivors. The concept paper argues that the U.S. needs to expand its understanding of response roles and imbed the concept of immediate responders into the emergency response protocol.

Immediate responders are individuals who find themselves within the damage path (disastrous event) or at the scene of an emergency, aiding others (Harris, 2018). The article supports the theory of adding “**immediate responders**” as a mission critical resource for “**first responders.**”

2. Title: Evaluating usability of a storm preparedness and risk assessment mobile app.

Citation: Lin, C. A. (2025, February 1).

<https://www.sciencedirect.com/science/article/abs/pii/S1051200421000968> | request PDF.

Evaluating the usability and usefulness of a storm preparedness and risk assessment mobile app.

https://www.researchgate.net/publication/351163114_httpswwwsciencedirectcomsciencearticleabs/pii/S1051200421000968

Review:

The abstract of this article points out that storm preparation reduces damage to property and the loss of life. In recent years, mobile communication applications (apps) have become a crucial tool for individuals to engage in risk communication to help prepare for environmental disasters such as severe storms.

These preparedness management apps are a type of crisis informatics that integrates “disaster management, information, and communication technology, and socially generated and processed content” Risk communication at both individual and community levels is essential to guide community residents on developing an understanding of the localized consequences of a natural disaster and practicing the skills of disaster preparedness. (Keller, 2006).

The purpose of this paper proposes a proof of concept (AR app communications) to maximize community resiliency and to counter the number of resignations resulting from

burnout, and agency deficiencies, with the assumption that ***“Everyone Is a First Responder.”***

The release of **ARCNet.app** (*Augmented Reality Communications Network App by FirstLine TaskForce*) exemplifies a multifunctional readiness app for handheld devices producing a common denominator effectively refueling ***awareness resulting in community resilience***.

3. Title: Virtual and augmented reality technologies for emergency management in the built environments: A state-of-the-art review.

Citation: Yiqing, Z., & Nan, L. (2021, March). *Machine Learning for Sports Betting: Should model selection be based on accuracy or calibration?* - *sciencedirect*. Virtual and augmented reality technologies for emergency management.

<https://www.sciencedirect.com/science/article/pii/S266682702400015X>

Review:

With the rapid technological advancements in recent decades, virtual reality (VR) and augmented reality (AR) technologies have been increasingly adopted to address various challenges in emergency management in the built environments.

This paper presents a review of state-of-the-art applications in this rapidly evolving area.

Significant applications of VR/AR include safety training.

Virtual simulations can simulate complex situations in a realistic manner, enabling trainees to have a comprehensive understanding of safety issues. Research on evacuation behavior and search and rescue behavior is one of the most active areas in VR/AR-related emergency management studies (Yiqing, 2021).

The AR app formulates participatory readiness frameworks toward remedying organizational challenges, professional challenges, and acknowledges the responsibility each citizen bears in order to increase community standards for resiliency.

4. Title: Expanding Understanding of Response Roles: An Examination of Immediate and First Responders in the United States

Citation: Harris, C., McCarthy, K., Liu, E. L., Klein, K., Swienton, R., Prins, P., & Waltz, T. (2018). Expanding understanding of response roles: An examination of immediate and first responders in the United States. Retrieved from <https://www.mdpi.com/1660-4601/15/3/534>

Review:

Events such as floods, hurricanes, earthquakes, and active-shooter scenarios leave behind a damage path of untenable disruptions that alters communities worldwide (UNESCO and UNICEF 2012). From 2000 to 2019, natural hazards caused US\$1.23 trillion in damage, claimed 1.23 million lives, and affected over 4 billion people (UNDRR 2020). These events redefined and differentiated *two key response roles*, “**immediate responders**” and “**first responders**” both of which are considered as mission critical for maximizing the tolerance threshold of survivors. The lack or loss of trained emergency first responders (EFR’s or civilian) is a continuous problem affecting EFR response time and emergency services.

While there are some educational programs that do exist providing training materials, the challenge of improving the desired resiliency lies in the accessibility of said materials. Incorporating augmented reality core concepts into a required high school level curriculum would be a way to ensure information is universally available to the targeted populations (Harris, 2018).

5. Title: Gamifying Community Education for Enhanced Disaster Resilience.

Citation: Kankanamge, N., Yigitcanlar², T., & Goonetilleke³, A. (2022, June 9).

Gamifying Community Education for Enhanced Disaster Resilience: An Effectiveness Testing Study from Australia. MDPI. <https://www.mdpi.com/1999-5903/14/6/179>

Review:

The abstract for “Gamifying Community Education for Enhanced Disaster Resilience,” states that the effectiveness of disaster education is questionable due to the limited use of online tools and platforms, which also results in narrow community outreach. Understanding public perceptions of disaster education methods and experiences for the adoption of novel methods is critical, but this is an understudied area of research.

The aim of this study is to understand public perceptions towards online disaster education practices for disaster preparedness and evaluate the effectiveness of the gamification method in increasing public awareness (Kankanamge, 2022). Twitter analytics emphasize the community demand for novel approaches to increase disaster education.

It highlights the need to upgrade the traditional education methods integrated with innovative approaches to increase the efficiency of prevailing methods. As an original approach, this study evaluated the usability of gamified applications to increase efficiency in disaster education. As the study findings revealed, gamification is an ideal tool to be used together with traditional disaster education approaches which could lead to increased community engagement and knowledge (Kankanamge, 2022).

In a congressional testimony, the Administrator of the Federal Emergency Management Agency (FEMA), Craig Fugate, described today's reality as follows:

*“Government can and will continue to serve disaster survivors. However, we fully recognize that a government-centric approach to disaster management **will not be enough to meet the challenges** posed by a catastrophic incident. The immediate first responder initiative is a consideration for the whole community. Trained Immediate responders increase response time by up to 80% during impact.*

CONNECTION BETWEEN ARTICLES, FRAMEWORK AND PROJECT

This paper aims to identify what **leaders** should do and what **leaders** do when managing real **disasters** and what can be learned from it. The information researched in the literature reviews discusses the incongruence between leadership theory and reality in disaster management, particularly focusing on how **immediate responders** are a crucial resource to aid **first responders** and the victims they respond to. It highlights two major mismatches: effective communication and the ability to coordinate resources at all levels (Mahmud, 2020).

To improve leadership in disaster management, the examination of immediate and first responders suggests that mitigation measures, preparedness, and crisis communication skills must be top-notch, and communication disruptions must be overcome as soon as possible. Additionally, all entities involved in disaster management should be aware of their roles and responsibilities. The level of disaster management reviewed was limited to the period from 2018 through 2025 and disastrous occurrences in that time frame. This review does not assign responsibility nor blame to any individual or entity that can be generated by any emergency event.

Understanding human behavior during disasters and how they shape into a complex interplay of psychological, social, cultural, and economic factors is critical to improve disaster preparedness, response, and recovery efforts. This is the place where to make connections to your reader about how your literature, your theoretical framework, and your project interact. You might discuss the theories or ideas that drove your thinking and understanding when it came to conducting and reflecting on your project.

The benefits were quite clear; preparation reduces damage to property and the loss of life. The persistent lack of effective communication and the ability to coordinate resources at all levels is still the problem that is driving the research. The why for this project is the favorable results constituting the ability to organize the whole community (America) to build a preparedness culture to withstand the what if factor.

The why for response efforts is a focus on the paradigm about “bystanders need to shift from being the problem to successfully transforming into a skilled immediate responder. Changing our terminology from “bystanders” to “immediate responders” supports what has been observed in response to multiple disasters across the world, may increase professional responders' engagement of immediate responders, and recognizes the critical role immediate responders have in saving lives in the silent gap (Ashkenazi, 2019).

Facts and Principles that Should Guide Our Thinking About Immediate Responders:

1. There never will be enough professionals to save lives in large mass casualty events. Professionals cannot ever be there fast enough unless they are on the scene when the event occurs.
2. The public is always at the scene at the moment the event occurs. They are there at the right time, at the right place.
3. Trained official emergency responders in the United States traditionally have not been accustomed to embracing and empowering bystanders at the scene.
4. The public will always outnumber professional rescuers. In the United States.
 - a. First responders: Firefighters about 1.2 million; police over 900,000 sworn police officers, EMS credentialed professionals about 826,000 (11– 13).
 - b. Immediate responders: Over 320 million potential active bystanders.

While the training and experience of the official emergency responders is greater, the number and availability of the public is dominant. The new label for these conditions is noted as

the “Obstacles Decreasing the Propensity for the Public to Act,” is why immediate responders may be reluctant to help because of the prosecutable liabilities associated with self-injury, HIV, hepatitis, lack of knowledge, and concern about hurting rather than helping. In addition, emergency professionals in some cultures and countries frequently discourage immediate responders from helping. Plans, training and policies for preparedness and response have not included the public as partners that can help save lives (they’re wrong).

Continued research is needed to understand how immediate responders and trained responders work together in a response. Said research should take into consideration the fact that immediate responders will be the only responders who can save the lives when trained responders can't arrive soon enough or the number of injured exceeds the number of responders.

To coin a phrase – “Who you Gunna Call”

The “lens’ through which we view your project and the events that occur while carrying it out are discussed here, because this is the section of the paper that supplies the answer to the question “why did this do this project (or internship), and what particular view did they take while conducting it?”

PROJECT METHODOLOGY

MID-AMERICA REGIONAL COUNCIL (MARC)

MARC is an NGO for emergency management under the direction of Homeland Security (currently on government shutdown) supports the initiative to train and equip **immediate responders** as part of the first response protocol. Over a period of 18 months myself and Erin Lynch (Director of MARC) have pursued pathways to involve both public and private sector partnerships and their collective resources for the development of ARCNet; potential partnerships include H&R Block, Domino's, QuikTrip, and Home Depot.

ARCNet' mission is to empower individuals with collaborative knowledge and skills, producing outcomes that significantly enhance community resilience. The method of connectedness for building a culture of preparedness is realized through the power of sociotechnical technology, a two-way tool for mitigating responsibilities encompassing “**immediate responder and first responder operations**” before, during, and after a catastrophic event.

Literature reviews based on qualitative methods identify five topics from scholarly journals contributing substantiated facts about immediate responders and risk management. The application range of papers that (*Web of Science Direct Articles and Natural Hazard Science*) were used was based on search engines selecting relevant materials regarding human behaviors, VR/AR technologies, and mobile apps for disaster response.

Only articles from the International Journal of Disaster Risk Reduction Index (ScienceDirect) database and the Oxford Research Encyclopedia of Natural Hazard Science Index (SSCI) database were retrieved for these reviews.

The filters applied for the required application range of data regarding VR/AR/AI technology for disaster response and purpose of gap-time (time it takes to aid others) were focused upon **keywords**, including emergency first responders, immediate responders, disaster response, community resilience, augmented reality VR/AR, AI, disaster education, marketing readiness, risk assessment mobile app, and emergency management methodologies for training immediate responders were included in the search process. A total of 27 publications were researched. Only five of the scholarly papers were content acceptable for this review.

The authors among these 5 articles consisted of directors of emergency management, software engineers, and VR/AR, AI developers:

- The Department of Construction Management, Tsinghua University Beijing, China
- University of Connecticut, Storrs, United States
- International Institute for Applied Systems Analysis Cooperation and Transformative Governance Group Laxenburg 2361 Austria
- Professor and Director, QUT Urban AI Hub, Queensland University of Technology
- Craig Fugate (Former Director of FEMA)
- MARC (Mid-America Regional Council)
- The Journal of the Human Factors and Ergonomics Society for Interactions in Sociotechnical Systems

According to Science Direct regarding the countries and regions, the number of authors publishing on technologies and emergency management the Chinese institutes assumed the top position in the number of publications (25). The United States ranked second (23), followed by Italy (10), Australia (7), and Korea (6) (Zhu, 2021).

The cited works were published from 2018 through 2025. Given the rapid developments of VR/AR (Virtual and Augmented reality) and AI (Artificial Intelligence) technologies and how they are continuously changing the research boundaries were set within the last decade.

Human interactions with hand-held devices are significant behaviors toward emergency management connectedness. Only by focusing on the interaction between participants and the virtual (VR/AR) environment can researchers properly present disaster scenes to participants, collect realistic behavioral data for analyzing how disaster scenes will affect people, and explore how to develop and implement effective emergency management measures (Zhu, 2021).

The animated characterization or wow factors of VR/AR technology illuminate information so that learning skillsets for readiness becomes edutainment that effectively refuels societal “*awareness*.” It is important to understand that citizenry that is exposed to the knowledge derived from edutainment segments describing the damage-path (after-math conditions and the new reality about normalcy) is a collection of neighbors, friends, pets, children, and the considerable risks concerning the elderly and physically challenged.

VR/AR platforms allow the **immediate responders** the immersive and interactive experiences before these conditions occur. The AR platform enhances engagements making digital content feel tangible and present, leading to a more informed and readiness connected community. The center of this paper considers how everyday citizenry can support emergency first responders. Their participation is critical due to the silent response gap that occurs between the injury of a person and the arrival of trained responders.

The term *gap of response time* can lead to significant deterioration of the injured person's condition and even death before professional help arrives. To address this issue, it is essential to prepare emergency agencies to engage the public in mass casualty incidents. This involves educating individuals that “Everyone is a First Responder,” and that “Preparedness is their Responsibility.”

By accepting these roles and responsibilities for family and the “Whole Community,” during emergencies and disastrous events, ensures a community that is prepared to act when they find themselves at the scene of an active shooter, bombing, hurricane, earthquake, tornado, fire, vehicle crash, or other life-threatening emergency (Ashkenazi, 2019). Increasing the number of individuals who are motivated, prepared, and ready to respond appropriately, we can significantly reduce the **silent response gap** and improve the chances of survival and recovery for those affected by emergencies.

The response to an emergency begins the moment a threat is detected or an incident occurs. In formal emergency management terms, the response phase starts immediately after an event happens and continues until the immediate danger has passed. But in practice, the response unfolds in layers: it starts with the people already at the scene, escalates through dispatch and first responders, and can extend to national or global activation depending on the scale of the event (Ashkenazi, I., & Hunt, R. C., 2019).

Currently the ARCNet.app project is seeking partnerships with non-profit organizations (as recipients from revenue streams), and private sector elites (commerce) for investment capital and their accumulation of intellectual properties (foot traffic in billions) resulting from product culture progressions. The timeline for completion ranges between 18 to 24 months. Product cultures and brand value (market share) stage breeding grounds to publicize an inescapable truth about community resilience is a message that everyone should ponder from the standpoint of what if (billions by way of foot-traffic).

“Everyone is a First Responder,” and “Preparedness is Your Responsibility.”

The advancements of AR technologies and app platforms produce “WOW” factor experiences needed for interactive, engaging, and habitual content for all ages; compelling every living room in America to organize and prepare for the “What If Factor.”

INSTRUCTIONS: The methodology section simply describes in detail 1) what you did, 2) how you did it, 3) when you did it, 4) what sorts of financial or other resources were involved, and 5) how you collected and analyzed any data or information associated with your project - it simply discusses process.

In short, the methodology is a road map and/or a recipe for others to come after and repeat your project. Each project is unique and the actual methods and procedures utilized will vary greatly. Therefore, the subheadings might vary as well and/or be incorporated within paragraphs and not delineated in individual sections.

Below are some explanations of what needs to be included in the methodology section even if they are not discussed separately as there are. Each of the bold words represents elements needed to be discussed in the methodology section.

We talk about **participants** if there are any because people add interesting dynamics to anything that is being studied. You are always a participant so a brief discussion of how you are a player in your project is helpful. We talk about **materials** involved in our projects because often these can present challenges on a daily basis. The **design** or structure of your project talks about what had to be in place, or what you had to orchestrate to make your project (or internship) happen.

Often our design or our intent changes when faced with the reality of obstacles or factors beyond our control. Talking about both the good and the bad, and any changes you need to make to that design is highly beneficial for the reader. The **timeline** of the project is especially important for

the write-up of our work because it helps readers understand the scope of the work, and it also speaks about the weight of the results or conclusions made regarding the study or project. For example, a project conducted over several months or a year infers trust-able and believable results.

RESOURCES & BUDGET

Even though this section could be within another paragraph, it is separate here to model what itemizing these ideas looks like. Sometimes budgets come in the form of opportunity costs. That is, by working on your project, you were precluded from doing something else which was a cost that was non-financial.

It is possible that you spent little money on a project because you owned the resources, but in the interests of full disclosure it would be prudent to discuss what the costs associated with your project would be for someone else trying to replicate your work.

RISK MANAGEMENT

This is the part of your paper that discusses liabilities. In other words, who is affected by your study and what potentially could go wrong with this project? Readers of academic work are particularly interested in potential harmful effects on people, property, and institutions. On occasion risk management issues can cause us to alter our plans or methods in completing our projects.

Results, (or) Project Implementation, (or) Conclusion, (or) Summary

All of the terms for the last section of the paper are synonymous. Different projects may favor different terminology. You may have a favorite term that elicits certain types of thinking for you. These are your concluding remarks that sum up your work. This is your opportunity to discuss what you learned, and how your results can or could be used. We take on projects to evaluate assumptions, and/or to create something we can use or implement in the future. Readers want to know all about how your accomplishment will be realized in the near or distant future. Don't be afraid to let your excitement shine through in this particular section.

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Appendix A

Timeline

DATE	EVENT/ACTIVITY
WEEK 1	Complete/submit committee formation.
WEEK 2	Start Project Proposal rough draft.
WEEK 3	Compile resources; submit Proposal to writing center.
WEEK 4	Submit Project Proposal; begin Literature Review & Theoretical Framework.
WEEK 5	Submit Literature Review & Theoretical Framework.
WEEK 6	Prepare Methodology rough draft; submit to writing center.
WEEK 7	Submit Project Methodology.
WEEKS 8-9	Finalize project content; Report Methodology.
WEEKS 10-12	Finalize project organization & cohesiveness; Report Methodology.
WEEK 13	Final “sweep” of project; finalize & submit Project Report rough draft to writing center.
WEEK 14	Revise Project Report as needed & record summary video. Submit Project Report rough draft to committee for review. Complete Library Permission Form.
WEEK 15	Final Report & Video Presentation Submission.

Appendix B

Resources & Budget

Budget			
Item	Dollar per unit	Quantity	Total
Internet Access	\$60.00	4 months	\$240.00
Paper	\$3.99	2 reams	\$7.98
Printer Ink	\$29.99	4 cartridges	\$119.96
Tuition Costs	\$426.17	6 cr. hours	\$2,557.02
Technology Fees	\$90.00	1	\$90.00
Student Fees	\$233.75	1	\$233.75
Lab Manual	\$122.49	1	\$122.49
Lab Manual - eText	\$90.00	1	\$90.00
Phys. Geog. Textbook	\$197.20	1	\$197.20
Phys. Geog. eText	\$70.21	1	\$70.21
Atlas	\$11.95	1	\$11.95
Essentials of Online Course Design text	\$34.95	1	\$34.95
21st Century Skills text	\$37.95	1	\$37.95
Classroom Assessment text	\$64.65	1	\$64.65
Introduction to Education text	\$76.40	1	\$76.40
Literary Reviews	\$43.00	5	\$215.00
Total			\$4,169.51