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EMS Resource Management

Problem

- EMS often face challenges like heavy work loads, optimizing deployment, response times, limited resources ,and when they need to allocate those resources during emergency situations
- I'm not going to lie I chose this solution after the suggestions from class, but I think it's cool that improving something like resource management can potentially save lives, or at least impact the outcomes, hopefully positively
- Another reason I chose this problem is because I understand the problems that occur from limited resources or poor resource management caused or at least realized from covid

Summary of Findings

- Current solutions
  - There is an app called CrisisTrack
    - This app conducts damage assessments, helps with disaster management, and it does help manage resources. But it doesn't seem to be accessible for all. May be a hassle to use for small teams
  - Another App called Nemesis
    - This app collects data on EMS incidents, but it's more focused on collecting and sharing data than it is on optimizing resources

        - There's also the Federal Emergency Management Agency (FEMA). They have toolkits and guidelines for resource management, but seems to be more for local governments or large-scale problems.

- # Real World Applications
    - This can impact EMS response times, reduce resource shortages, and hopefully improve coordination among dispatchers and responders
    - Quickly allocate resources
    - Fire departments and volunteers can use this program to manage limited resources
    - Improve the outcomes on patients by making a part of the EMS process faster, increasing response times
- # Describe Design Approach
    - I want a real-time EMS resource management system that also uses live maps and allows communication
    - I want it to be used by not just organizations but also households, without all the features that EMS uses.
    - Still provide useful features for households
- # Solution Design Proposal
    - The app should connect to gps
        - GPS track ambulance locations, available personnel, and medical equipment
    - Should allow dispatch operators to have access to resource management tools
    - A way to allow ems teams to communicate to each other and dispatch operators
        - Where to receive updates from each other or receive reports on patient status

- Allow EMS to assign resources to emergencies or locations
- Provide alerts when low on resources or when resources become available

Pseudocode

```
#Resource Management
def addResource(resourceType, quantity, location):
   Add resource to resources list
   Display "Resource added"

def allocateResource(resourceType, quantity, emergencyLocation):
   If enough resources available:
      Allocate resource
     Display "Resource allocated"
   Else:
      Display "Not enough resources"

def updateResourceStatus():
   For each resource:
      If quantity is 0:
         Display resource "out of stock"
      Else if quantity is below threshold:
         Display resource "running low"
```

User Interaction(UI) Design

- A dashboard that has a real-time map
  - To track ambulances and see their status
  - A section to view resources
  - A section for EMS and dispatch to see patient information

- # Open Questions
    - One question I have is security issues, others might be able to see patient data and how to make it more secure.
    - I want to know if using AI in this program could help predict equipment needed during events.

Research

https://nemsis.org/

https://www.fema.gov/emergency-managers/practitioners/recovery-resources

https://crisistrack.juvare.com/

https://preptoolkit.fema.gov/web/nims-toolkit/resource-management