Emergency Phone Call Alternatives: a Review

"Submission at CENTRIC 2022"

Author 1:
First Name: João
Last Name: Mendes
Organization: Polytechnic Institute of Castelo Branco
Country: Portugal

Author 2:
First Name: Filipe
Last Name: Fidalgo
Organization: R&D Unit in Digital Services, Applications and Content - Polytechnic Institute of Castelo Branco
Country: Portugal

Author 3:
First Name: Ângela
Last Name: Oliveira
Organization: R&D Unit in Digital Services, Applications and Content - Polytechnic Institute of Castelo Branco
Country: Portugal

Short resume of the presenter

Name: João Mendes

Degree in Informatic Engineering and is a Master's student in Software Development and Interactive Systems at the organization Polytechnic Institute of Castelo Branco.

Works on developing systems for banks and financial institutions.

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

Introduction

Keywords - Emergency; Application; Mobile; Help; Telephone Line.

Generally, requests for help are made only by emergency telephone line. Because it is a telephone call, it is necessary to have a verbal communication between the citizen and the operator, which sometimes becomes a problem due to several factors, either the circumstances in which the citizen finds himself or his weaknesses.

Examples of difficulties in the call for help are: During a robbery, when the robber is nearby; A pursuit; domestic violence or direct aggression; A person with communication difficulties; Or others.

An application where users can make distress calls in situations where verbal communication is not possible or when the conditions for indicating the location are not met, for example, would be the most appropriate solution.

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

Introduction

Keywords - Emergency; Application; Mobile; Help; Telephone Line.

The approach to supporting the development of an efficient solution for the calls for help in these contexts is to carry out a systematic review of scientific studies where the state of the art can be assessed regarding aspects.

However, it also has some limitations. The literature search was performed in three scientific databases, this decision may have influenced the number of relevant studies obtained. The use of other databases could possibly have increased the number of studies analyzed and contributed to improving the general analysis, as well as the search strategy, which had restricted the number of non-relevant studies.

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

The problem

http://clipart-library.com

http://https://media.istockphoto.com/vectors/armed-robbery-vector-id102770405?b=1&k=20&m=102770405&s=170667a&w=0&h=PH7BqX0sjOIBOJoFu_dfwpEcNMrpmZR5b2mjUxjBzgY=

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

Roadmap

State of art

- Research and survey of scientific articles (*ScienciDirect, IEEE Xplore, ACM Digital*)

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Research and survey of scientific articles

Prepare to go

The objective of this work is to analyze scientific articles that contain supporting information for the development of an emergency system as an alternative to the telephone line.

The review includes the following topics:

1. **Research questions**
2. **Inclusion criteria**
3. **Search strategy**
4. **Results**
5. **Discussion**

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Research and survey of scientific articles

A. Research questions

The research questions are as follows:

- **Question 1:** What are the alternatives to the emergency line/other solutions for emergency calls?
- **Question 2:** What mechanisms/computer solutions are necessary or can be used to create an alternative system for emergency calls?
- **Question 3:** What information can/should be transmitted in emergency calls?
- **Question 4:** What are the advantages of alternatives to the emergency phone line?

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Research and survey of scientific articles

B. Inclusion Criteria

The search criteria defined to select the studies are:

Criteria 1: Studies between 2016 and 2021.

Criteria 2: Written in English.

Criteria 3: Studies in which the full text is available.

Criteria 4: Systems that respond to help requests.

Criteria 5: Systems that use mobile applications, desktop applications and different telephone line technologies for emergency calls.

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Research and survey of scientific articles

C. Search strategy

Databases:

- IEEEXplore, ACM Digital and ScienceDirect

Search terms:

- "Emergency Application" AND "Mobile",
- "Emergency System" AND "Mobile".

- The research was conducted between November and December 2021.

Author 1:
First Name: João
Last Name: Mendes

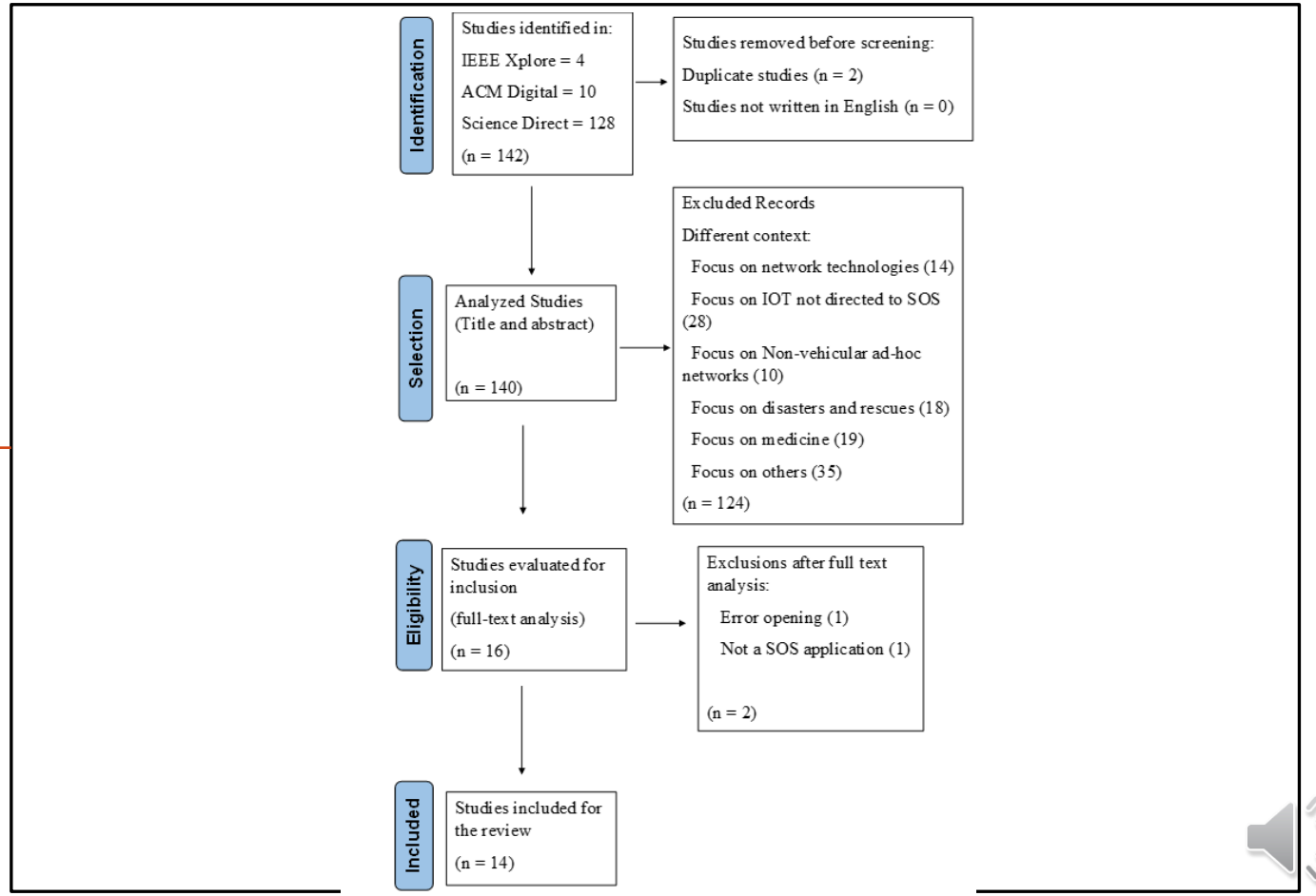
Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Research and survey of scientific articles

III. Results



Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Research and survey of scientific articles

III. Results

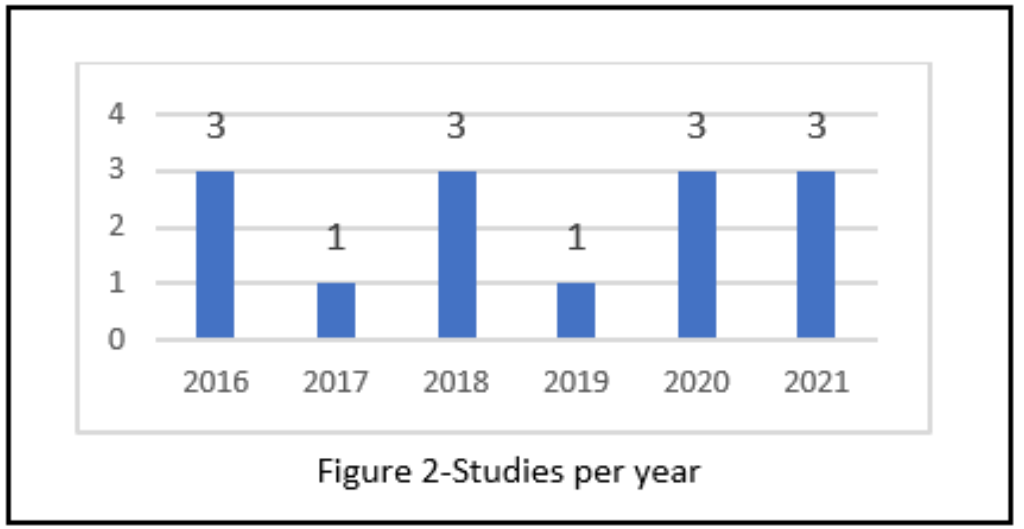


Figure 2-Studies per year

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Research and survey of scientific articles

III. Results

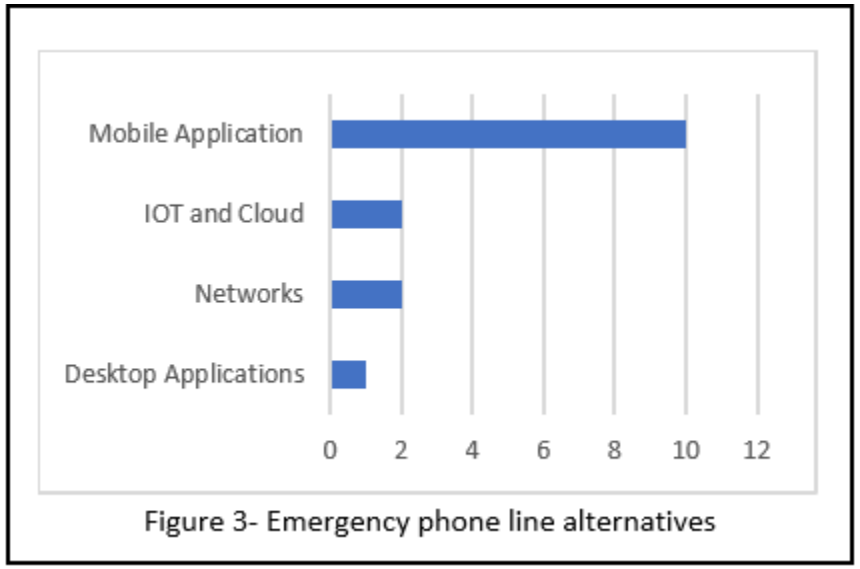


Figure 3- Emergency phone line alternatives

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Research and survey of scientific articles

III. Results

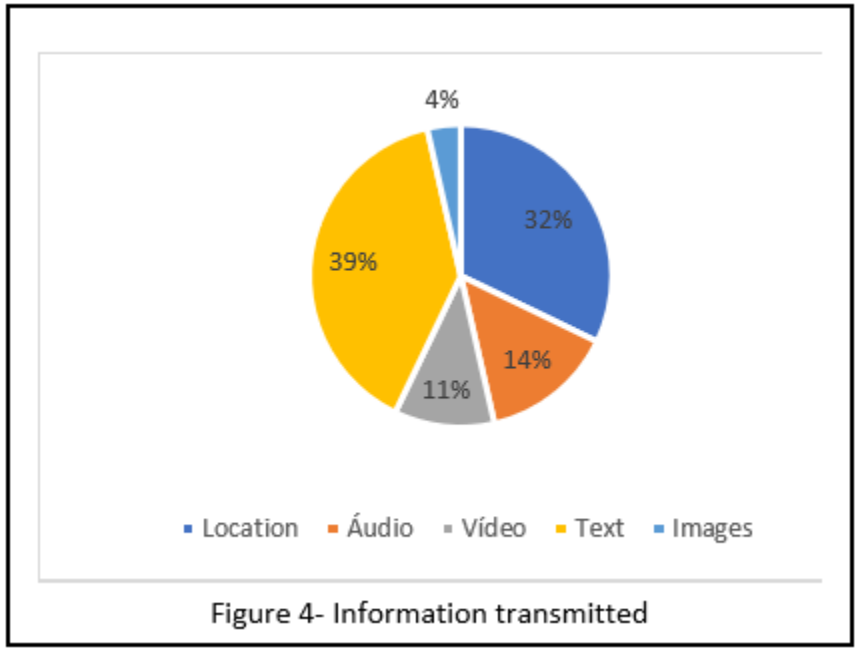


Figure 4- Information transmitted

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Research and survey of scientific articles

the main conclusions

Question 1: What are the alternatives to the emergency line/other solutions for emergency calls?

Mobile applications and computer systems are a great alternative to the current emergency line.

These solutions have the advantage of allowing many features, such as:

- sending the exact and updated location in the distress call;
- sending distress calls discreetly;
- sending distress calls facilitated by people with disabilities;
- sending information through audio, video, and text;

Which phone calls do not allow, becoming an asset for the calls and consequent response to them.

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Question 2: What mechanisms/computer solutions are necessary or can be used to create an alternative system for emergency calls?

Research and survey of scientific articles

the main conclusions

- Mobile devices;
- The internet of things,
- Cloud computing systems to create alternative systems for distress calls

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Question 3: What information can/should be transmitted in emergency calls?

Research and survey of scientific articles

the main conclusions

With today's technology it is possible to transmit any information needed in a distress call

Examples:

Audio, video, images, exact location, text, etc

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

Research and survey of scientific articles

the main conclusions

Question 4: What are the advantages of alternatives to the emergency phone line?

- Adapt to the various circumstances in which the emergency call is made
- Adapt to the difficulties of the person making it
- Possibility to send the exact and up-to-date location of the distress call
- Send distress calls discreetly
- The sending of distress calls made easy for people with disabilities
- Send information via audio, video, and text

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

STRENGTHS AND LIMITATIONS OF THIS REVIEW

Some limitations:

- The search for literature was carried out using three databases (ScienceDirect , IEEE Xplore and ACM Digital)
- Restrict the number of non-relevant articles
- Only articles written in English were included in the study

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

State of art

CONCLUSIONS

There are some systems developed however each one has its characteristics and focuses on a particular context.

New technologies have also given an impulse to the development of these new systems because they allow the improvement of the current emergency systems and make them even faster, more accurate, and more accessible to everyone.

The need to connect to the internet is the major obstacle to these new alternatives, but 5G tends to tackle the problem.

There is a need for systems that allow the communication of distress messages discretely, as well as tracking the route or location of the victim, but no information was found on systems with these characteristics, which shows a research opportunity.

Based on the analysis made, the lack of information and support systems for victims would be beneficial to analyze and develop a system that solves this gap for future work

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira

End

João Mendes
Joao.mendes2@ipcbcampus.pt

Author 1:
First Name: João
Last Name: Mendes

Author 2:
First Name: Filipe
Last Name: Fidalgo

Author 3:
First Name: Ângela
Last Name: Oliveira