Artificial Intelligence: Need and Boon in Exigency Telecom

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Abstract

Over the past decade, the international community has recognized the great position that current telecommu- nications can play in disaster relief and humanitarian work. The Tampere Convention on "Emergency Telecom- munications" was an initiative to facilitate these activities, supported through various international conventions. Being aware of the role of artificial intelligence and knowledge management in emergency telecommunications can be overwhelming, with potential tasks from Nene Orc and workflow management for education and choice support. In the future, extraordinarily large technologies, knowledge administration, should be included in the service of emergency telecommunications, convergence of artificial talent and accordingly should serve the noble purpose of using modern data and communication technologies for disaster mitigation.
Keywords: Artificial Intelligence, Expertise Management, emergency telecommunication.

1 Introduction

A flash flood engulfed a coastal country, ensuing in heavy casualties and lack of shelters. Communication with the relaxation of the sector become absolutely disrupted. Within hours, worldwide seek, and The rescue groups reached the capital as in step with the pressing request of the country wide government. Astonished past notion whilst warned via way of means of a name to movement in extraordinary place of customs ability and use Telecom for humanitarian aid.

2 THE CONCEPT OF EMERGENCY TELECOMMUNICATIONS

2.1 The Road to Tampere Convention

In 1991, a convention on catastrophe communique became held in Tampere, Finland, which became attended through catastrophe and telecommunications experts. The convention followed the Tampere Declaration on Disaster com- munique, which emphasizes that it desires to be made an worldwide felony device on telecommunications provision for catastrophe mitigation and alleviation. This became finished with the popularity that everyday communique contacts had been regularly misplaced at some point of disasters, and that regulatory constraints regularly crip- pled emergency access Communication equipment throughout synthetic boundaries. The Declaration additionally requests the United Nations Emergency Relief Coordinator, in collaboration with the International Telecommuni- cation Union (1TU) and to convene an intergovernmental convention for the adoption of a conference on different applicable organisations, catastrophe communique.

The Tampere Declaration became mixed with the as one followed Resolution 7 (International) Telecommunication Union, 1994a) of the First World Telecommunication Development

Conference held at Buenos Aires in 1994. The resolution urges all administrations to put off countrywide regulatory hurdles To permit uninterrupted use of telecom- munications in catastrophe mitigation and alleviation. Additionally requests The Secretary General of the ITU will paintings intently with the United Nations in the direction of a worldwide convention catastrophe communique.

Within the identical year, Resolution 7 became ratified through Resolution 36 (International Telecommunications. Union, 1994b) of the 1994 ITU Plenary Conference held in Kyoto. Resolution s6 reiterates the want for a worldwide conference on catastrophe communique, and echoes Solution 7 urges administrations to lessen and put off regulatory boundaries to facilitate faster Deployment and powerful usage of telecommunication assets for catastrophe alleviation operations.

2.2 Tampere Convention as an worldwide regulatory frameworkfor emergency telecommunications

The Tampere Convention creates a worldwide framework for the supply of telecommunications resources For disaster mitigation and relaxation between states and a country and a non-country entity. Below it Framework, a country that recognizes the need for disaster telecommunications assistance in its region Request such assistance through the United Nations Emergency Relief Coordinator, Operations Coordinator, Who will forward the requests under the Convention and then to the various applicable entities. On the alternate hand, a Provisional State Party is obliged to decide in writing the EEs which it expects to receive or reimburse. Charge, The agreed version of price and reimbursement, if any, may be primarily based on entirely different factors such as The nature of the disaster and the unique desires of developing countries. Procedures are also a Convention for the termination of telecommunications assistance and dispute resolution. But it is This framework no longer precludes the preparations for the present or destiny between the states and the country. Non-country unit in emergency telecommunications support.

The Convention additionally recommends states to reduce or eliminate regulatory limitations that presently re- strict the use of Telecom sources for emergency mitigation and relay operations. It in addition protects the privileges, immunity's and centers granted to people rendering disaster assistance. Immunity from arrest and detention and exemption from taxation and duties.

3 In Artificial Intelligence and Expertise Management Emergency Telecommunications Service

As the above introduction on emergency telecommunications shows, the problem count can be concept of as: Con- sisting of elements "emergency" and telecommunications. e.g., a discussion on the jobs of synthetic Intelligence and understanding control in emergency telecommunications could now no longer be beneficial in isolation. Rather, take a significant examine these "niche" application regions of synthetic intelligence and understanding. Management technology should necessarily tour and make a contribution to artificial intelligence and information control pro- grams in telecommunications in general, in addition to related" "Emergency" regions of seek and rescue, disaster prevention and relief, resettlement and refugee control, in addition to military and

law-enforcement operations (Gray,2000), to call however a few.

3.1 intelligent factor

It can be said that the biggest influence of artificial intelligence in telecommunications in general (and .) Emergency telecommunications in particular) have been used as artificial agents (Gaal, 1994). To meet telecom demand on artificial agents, the latter is required to bear features such as: Reliability, Realtime Performance, Openness, Se- curity Management and Mobility (Albayrak, 1998). for example Intelligent agents must be completely trustworthy and generally require an integrated set of capabilities (Albayrak, L1998). And it remains a challenge for intelligent agent technology in the more general application area. Telecommunications (Albayrak, 1998). According to Intel- ligent Agents Group (IAG) (Artificial Intelligence) Group, 2002) at the Department of Computer Science, Trinity College Dublin, Intelligent Agents Act Autonomously on behalf of a user or process, without the direct interven- tion of humans or others. These Agents have some level of intelligence, ranging from pre-set rules to self-learning,

which enables Agents must act both reactively and proactively. In addition, agents can communicate or even col- laborate Users, system resources, and other agents to perform their jobs, sometimes from a system another. Based on these characteristics, IAG divided intelligent agents in telecommunications into three types - Interface Agent, Affiliate/Competitive Agent and Mobile Agent.

An interface agent is a computer program that provides assistance to a user dealing with a particular computer. application" (Maes and Kozierok,1993). Interface agents perform various functions such as information retrieval and filtering as they communicate with their users or other agents. More Advanced Interface Agent Team by Detecting patterns and regularities in users' behavior so that they can make decisions in new situations Without interaction with the user (Artificial Intelligence Group, 2002). The interface is in an application for agents Telecom network supervision and management. Interface agents can automate some networks Management and supervision functions such as log recording and fault detection, freeing up network operators To focus on more important tasks. The interface agent observes and learns how the user resolves defects, thereby creating possible future scenarios that he can use to guide his actions without needing Interaction with the User (Gaal, 1994, Artificial Intelligence Group, 2002). This is certainly very important in a emergency or catastrophic setting, when, typically, the entire city's telecommunications network (sometimes entire country) could go down, requiring network operators already heavily burdened to participate recovery efforts.

As stated above, agents often have to communicate not only with their user and system resources, but also withthem. Communicate widely and work with each other, solving problems and taking on tasks that are beyond TheirPersonal Capabilities (Artificial Intelligence Group, 2002). There are two types of agents that are active this respect:Competing agents whose aim is to maximize their (or their users') interests when attempting to reach agreements with other agents, and Associate agents who share their knowledge and experience in an effort to maximize overall profit Agent (or User/SY STEM) community (Artificial Intelligence Group, 2002).

These agents also find applications in telecommunications. For example, researchers of The Department of Computer Science at Dartmouth College (Dartmouth College, 2002) proposed a graph based Abstraction for collecting and disseminating reference information, as well as a

prototype ”Solar” system that can be used in ”ubiquitous or” widespread computing applications where there is a constant flow of Information about the computing environment is essential in order to adapt to the changing context (Chen and Kotz, 2002a; Chen and Kotz, 2002b). In pervasive computing, a user can interact with many computing devices that compete for his attention, and he often expects to manage or configure These devices while they and their interactions change with the changing environment (Chen and Kotz, 2002a). Artificial agents can assist in these context aware environments, which are often found during disasters. Relief work after the onset of a major disaster, when uneven, often inconsistent telecommunications Tools from various search-and-rescue teams, along with on-site attention and service Remote Telecom Coordinator.

A mobile agent is an execution program that can migrate from machine to machine at any time of its choice. machines in a heterogeneous network (Gray et al., 2000). On each machine, the agent interacts with the stationery Service agents and other resources to perform their tasks (Gray et al., 2000) have different advantages or mobile Agents have been identified. These include bandwidth conservation (Gray et al., 2000; Gray, 2001), reduction of completion times and latency (Moizumi and Cybenko, 2001), and dynamic deployment (Gray et al., 2000). some Researchers predict that the Internet will soon host many mobile agents (Cotz and Gray, 1999). In After the September 11, 2001, tragedies, it may be worth noting that a mobile agent application which is somewhat related to emergency telecommunications, counter-terrorism, where there are mobile agents. Scenario-specific code is accessed dynamically on troops (communications) equipment, and is used to execute queries B against available information resources (Gray, 2000; Gray et al., 2000).

3.2 Network Management

As mentioned briefly above, the field of telecommunications network management is one of the most widespread applications of artificial intelligence in general and emergency telecommunications, particularly in telecommunications network management (Pruitt, 1986; Karponsky, 1991; Kennedy, 1996). been in the area.

Network management includes three areas, in all of which artificial intelligence is applied 1. Monitoring and control, 2. administration, and 3. planning and design (Valovic, 1987). There are two types of networks Management techniques that include artificial intelligence. The first is a partially distributed network Management system, where the main management system is centralized while intelligent agents are issued Network To distribute certain network management tasks and share knowledge and workloads, often for Specific network areas (Artificial Intelligence Group, 2002, Meyer et al., 1995, Busuok, 1996, Gyres and Muthuswamy, 1996). The other network management technology is fully distributed technology, which can be avoided.Agents must act both reactively aAs a trade-off between network size and management precisionnd proactively. found in centralized management systems (Artificial IntelligenceGroup, 2002).

3.3 Knowledge Management Expert Systems

As modern beings, we are constantly bombarded by an avalanche of information that often leaves us incapacitated. To digest and apply information effectively. In the event of a disaster, the situation gets worse. Load of Information, some true but more false, must be processed by crisis managers, who must deem it useful. Information from a wide pool of data. This is where the

concept of knowledge management Artificial intelligence helps.

Artificial intelligence has played an important role in knowledge management and will continue to be so, especially for those useful in helping to move through information, problem-solving, and disposing of the rest. Some of these artificial intelligence systems are called ”expert systems”.

Specialist systems applications include help desk, network filtering, network management, capacity planning, Operations, and Procurement (Hokron, 1990). Although faced with difficulties in its early days (Cook, 1989), For example, expert systems have been widely used. Solving telecommunications problems (Cheslow, 1986). Expert systems are believed to be able to preserve and disseminate expertise (Kirvan, 1986). Enhancing organizational learning (Bhattand Zaveri, 2002), provides a more actively usable knowledge base of Increase in efficiency and speed of problem-solving compared to information found in books (Krawan, 1986) (Kirvan, 1986). Expert systems can provide learned guidance to decision-makers, who often have to make other decisions that can still affect the lives of thousands of people.

3.4 Training

Shortage of experienced telecom professionals is a long-standing problem across the world (Sullivan-Trainer, 1988). The situation is particularly dire in emergency telecommunications, because, Apart from purely technical skills, telecom operators working in disaster scenario must other desirable characteristics such as the ability to perform under stress, increasingly psychological and Cultural adaptability, and experience in dealing with bureaucracy etc. Training in these and other related areas can be enhanced by artificial intelligence (Heathman and Kleiner, 1991) and knowledge management. For example, realistic simulations and games, which are increasingly being used militarily, can be designed to incorporating artificial intelligence elements (The Economist, 2002).

4 Research Methodologies

Both descriptive and analytical factors can be found in a model. To cause approximately a system, logical relation- ships in a descriptive model can be tested and conclusions drawn. The outcomes of logical analysis, however, are very distinct from quantitative chemical exam of system characteristics. To gain perception into public awareness, we first performed a survey of people the use of a web form builder and information collection services.

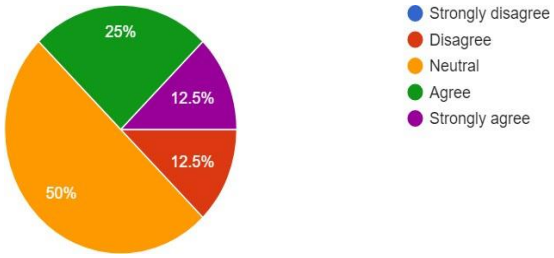
5 Questionnaires

- Is Artificial Intelligence helps in emergency telecom?
- Do you think it can help in disaster management?
- Is we need an emergency telecommunication system or services?
- You know how emergency communication systems work?
- Do you know any emergency communication service?
- Can people communicate each other without phone or Internet?

6 Final Survey Analysis

When people were asked, Is Artificial Intelligence helps in emergency telecom?, about 12.5 percent of people arestrongly agree, and half of peoples are still confused.

Figure 1: AI in emergency telecom



When we asked, what do you think Artificial Intelligence can help in disaster management? About 75 percent ofpeople are strongly agree and more confident.

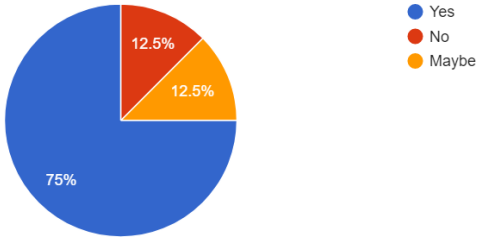


Figure 2: Disaster Management

About 87.5 percent of people want emergency communication system , who were asked Are we need an emergencytelecommunication system or services?

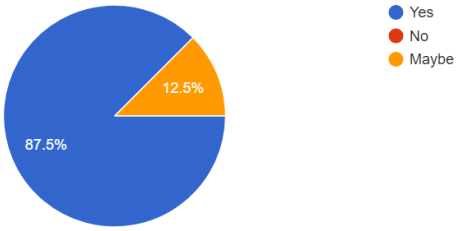


Figure 3: Exigency telecom

When we asked about do you know any emergency communication service? around 25 percent of peoples knowabout emergency service.

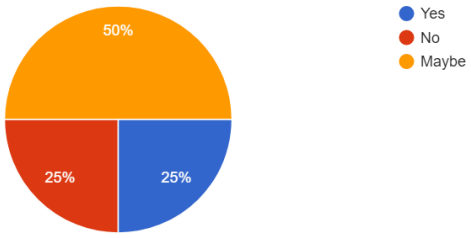


Figure 4: Telecom Services

when we asked, How people can communicate each other without phone or Internet? they say satellite phone, tracking device or personal locator beacon (PLB), two-way radios : Two-way radio allows information to be sent and received. They are highly valued for communicating over short distances as well as transmitting information over long distances, even with the proper equipment around the world.

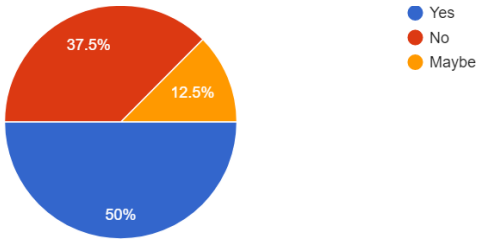


Figure 5: Without phone or internet

7 Conclusion

For most people, emergency telecommunications may appear an instead exoteric, even trivial issue area of research. However, for the ones who've long been worried in humanitarian affairs, in addition to the global attempt to sell the adoption and implementation of the Tampere Convention on Emergency Telecommunication, that is a topic which concerns the existence and loss of life of thousand of disaster sufferers across the world. It is the noble and lofty deed of trying to make the fine use of contemporary-day statistics and communications technologies to relieve human sufferings, be it natural or man-made.

The function of artificial intelligence and knowledge control in telecommunications in standard and emergency telecommunications specially has long been recognized and is developing in jump and bounds, remodeling each the structure and applications of statistics and communications technologies. In the future, it could be foreseen that the convergence of many exceptional technologies, starting from artificial intelligence and knowledge control generation to bio-sciences and area programs, will in addition enhance the capacity of disaster alleviation employees to perform their painful however noble works of mitigating the damages due to disasters.

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