**The London Ambulance Service Debacle:**

**An Examination of the 1992 Computer System Failure**

Md. Mahenur Islam, ID: 2023-1-96-023, MSc in Software Engineering,

East West University, Dhaka

**Introduction:**

Computerized systems are increasingly important to the smooth operation of companies. Computerized or automated technologies are utilized to help firms become more efficient because of the globe becoming a more competitive environment. This led to the evolution of several software initiatives throughout the years, some of which were successful while others were not. The three possible failure modes include total system failure, running over schedule and budget, as well as failing to deliver the required functionality.

Software errors can have serious financial, time, or resource costs—or, in the worst situations, all three.

In this report, we'll talk about how the computerized dispatch system (CAD) for the London Ambulance Service (LAS) failed in all three areas, causing both human and financial losses.

The London Ambulance Service (LAS) is responsible for providing emergency medical assistance to the residents of Greater London, United Kingdom. In 1992, the LAS implemented a new computer-aided dispatch system (CAD) with the aim of improving response times and efficiency. However, the CAD system failed within hours of its launch, resulting in a significant delay in emergency response times and several deaths. This report will provide an overview of the LAS failure, its causes, consequences, and recommendations for avoiding similar incidents in the future.

**Background:**

The LAS, which was founded in 1930, is the largest ambulance service in the world, responding to 2000 to 2500 calls daily with a fleet of 750 vehicles at its disposal. The offering includes the Metropolitan Police and the London Fire and Civil Defence Authority worked together to protect the larger London area (600 square miles). It consists of the Patient Transport Service (PTS) and the Accident and Emergency Service (A&E). It has been supported by the government as a component of the National Health Service (NHS) since 1974. The London Ambulance Service's budget income for the years 1992–93 was £69.7 million, with 2700 employees working there at the time, according to the report of the inquiry (released in February 1993). The service has 318 accident and emergency ambulances and 445 patient transport ambulances, a motorcycle response unit, and one helicopter. 2,746 staff are based in the 70 ambulance stations divided into four operating divisions. Out of the 318 emergency ambulances, 212 may be restored to be in use, at any time. The remainder are relief vehicles are being serviced. The LAS carries out the responsibility of answering emergency calls, screening them, and then dispatching an ambulance to the incident scene in less than three minutes.

Prior to the implementation of the CAD system, the LAS used manual dispatch methods that were slow and inefficient. The new system was designed to automate the dispatch process, improve response times, and provide real-time data to emergency responders. The CAD system was launched on October 26, 1992, but within hours, it encountered technical problems that caused delays in dispatching ambulances to emergency calls.

**Volume Of Work:**

The LAS receives between 2,000 to 2,500 calls and transports over 5,000 patients daily. Emergency calls account for 60 percent of the calls and result in roughly 1,400 (of the 5,000) transported patients. The ambulances attend an average of 1,200 incidents a day.

**Manual Dispatch System (Paper Based):**

The original manual system was structured around three major components:

**Call taking** – At Central Ambulance Control (CAC) a Control Assistant (CA) writes down the call details on a pre-printed form, including the reference coordinates of the incident location, which must be identified from a map book. The form is placed onto a conveyer belt, together with details of calls from other CA’s, for transport to a central collection point.

**Resource Identification** – At the central collection point, the details are reviewed by another staff member who gives the form to one of the three resource allocators, depending on whether the incident occurred within the North East, North West or South division. The resource allocator is responsible for maintaining a form for each ambulance with information about the location and status of the vehicle; such information is reported by the ambulance’s radio operator. The resource allocator uses this information to decide which ambulance to send to the call. The choice is noted on the form and the form passed to a dispatcher.

**Resource Mobilisation** – The dispatcher would telephone the relevant ambulance station or, if the ambulance is already in the field, would pass mobilisation instructions directly to the ambulance’s radio operator.

The procedure had to completed within the national standard 3-minute activation.

Some of the major deficiencies had the potential to further delay the entire procedure. These included:

a) Manual searching of the map book often requiring a search for several alternatives due to incomplete or inaccurate details.

b) Inefficient movement of paper around the control room.

c) Maintaining up to date vehicle status and location information as provided by the radio operators and allocators.

d) Communication procedure and the use of voice communication were slow and inefficient and could lead to mobilisation queues.

e) Over-reliance on human ability and memory to identify duplicate calls and avoid mobilising multiple units to the same incident.

f) Over-reliance on human ability to note and trace all available units.

g) Call back (caller phoning for second time) which forced the assistants to leave their post to talk to the allocators using up time and introducing physical

congestion into the control room.

h) Identification of special incidents (large or extremely urgent) depended on human judgement and memory.

**Computer Aided Dispatch System (CAD):**

**The Proposed System:**

It was hoped that the computerised system would handle all the major tasks which existed in the manual system. Calling 999 and asking for the ambulance service would connect the caller to a despatcher who records details of the call and assigns a suitable vehicle. The despatcher would select an ambulance and the system would transmit details to the selected vehicle.

**The major components**:

* **Computer-Aided despatch system** – including the infrastructure hardware and software, incident record keeping system, a radio system, and a radio interface system.
* **Computer Map Display system** – including mapping software.
* **Automatic Vehicle Location System** – with the ability to position units optimally to minimise response times and tracking long term asset performance. Also including radio system, radio interface system, and mobile data terminals.

**Component and Functions of CAD:**

A CAD system typically consists of the following components running at the command centre.

* CAD hardware and software
* Gazetteer and Mapping software
* Communications interface
* A radio system
* Mobile data terminals
* Automatic vehicle location system

Its functions typically consist of:

* Taking calls about incidents
* Automatic resource allocation
* Communication of incident details to the chosen ambulance
* Management and location of suitably equipped and staffed vehicles to minimise response times.
* Production of MIS reports to support longer term resource planning

**What Went Wrong?**

The London Ambulance Service Computer Aided Despatch (CAD) system failure in 1992 was caused by a combination of technical and managerial factors.

One of the main technical issues was the use of a new software system that had not been adequately tested before it was implemented. The software was designed to automatically dispatch ambulances to emergency calls based on information received from the emergency call takers. However, the system was unable to cope with the volume of calls and the data input, which led to delays and errors in dispatching ambulances.

Another technical issue was the lack of a backup system. When the primary system failed, there was no backup system available to take over, which caused further delays in the dispatch of ambulances.

In addition to these technical issues, there were also managerial problems. The system was implemented without adequate training for the staff, who were not familiar with the new software and were not prepared to handle the increased workload caused by the system's failure.

Furthermore, the management did not communicate effectively with the staff during the crisis, which caused confusion and contributed to the delay in resolving the issue. The lack of a clear and effective crisis management plan also meant that the organization was ill-equipped to handle the situation.

Overall, the failure of the London Ambulance Service CAD system was caused by a combination of technical and managerial issues, including the use of an untested software system, the lack of a backup system, inadequate staff training, poor communication, and ineffective crisis management.

**Consequences:**

The failure of the LAS CAD system had severe consequences.

**Individuals** - Claims were made in the press that up to 20-30 people may have died because of ambulances arriving to late on the scene. One 14-year-old boy died of an asthma attack after waiting for 45 minutes, whilst an 83 year old man died before the service reverted back to the old system. Delayed response times resulted in patients waiting for hours for an ambulance, which led to some deaths. The failure also caused chaos and confusion among dispatchers, and many emergency responders were unable to access the system, leading to a breakdown in communication. The incident resulted in a loss of public trust in the LAS and a significant negative impact on its reputation.

**Economy** - The financial consequences of this incident were not particularly significant in comparison to other reported software failures as it was estimated to have cost between £1.1 and £1.5 million. In contrast, problems with the UK Taurus stock exchange program cost £75-£300 million. The US CONFIRM system incurred losses in the region of $125 million.

**Recommendations:**

To avoid similar incidents in the future, several recommendations can be made. Firstly, the system should be thoroughly tested and evaluated under realistic conditions before its launch. Secondly, there should be sufficient training for dispatchers and emergency responders on how to use the system. Thirdly, the system should be designed with a focus on usability and reliability. Lastly, there should be a backup plan in place in case of system failure, and a protocol for managing emergency response during such incidents.

**What have we learned?**

The London Ambulance Service case study highlights the importance of proper planning, testing, and implementation of technological systems in critical service industries. It also emphasizes the need for effective communication and collaboration between technical and non-technical personnel, as well as the importance of having contingency plans in place to handle unexpected failures.

The case study serves as a reminder that rushing into implementing new technology without thorough planning and testing can have serious consequences, especially in industries where human lives are at stake. It also underscores the importance of investing in ongoing training and support for employees to ensure they are equipped to handle new technologies and systems.

Overall, the London Ambulance Service case study provides valuable insights into the challenges of implementing technology in critical service industries and highlights the importance of taking a careful, measured approach to technology implementation to ensure the safety and well-being of the public.

**Conclusion:**

The London Ambulance Service Failure of 1992 was a catastrophic event that highlighted the importance of proper testing, training, and system design in the implementation of critical systems such as CAD. The failure resulted in a significant loss of public trust and reputation for the LAS. However, the incident also led to significant improvements in the system, including the development of new protocols, increased training, and system redundancies. It is essential to learn from past incidents to improve the effectiveness and reliability of emergency response systems.