



# London Ambulance Service

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## System Failure 1992

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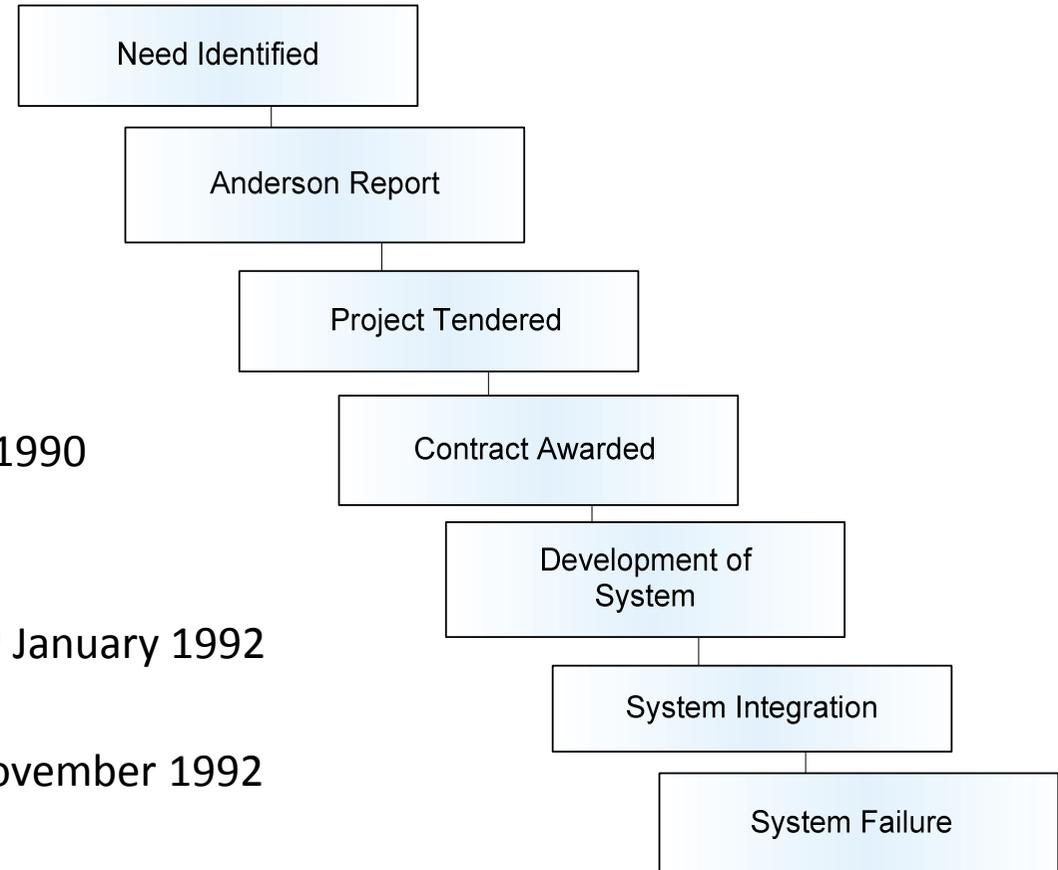
# Overview

- On 26<sup>th</sup> October 1992 the London Ambulance Service started using a new Computer Aided Dispatch system.
  - Aims:
    - Improve efficiency
    - Control resources efficiently
    - Decrease personnel requirements
- The system failed:
  - The system could not cope with the load placed on it by normal use;
  - The response to emergency calls was several hours;
  - Ambulance communications failed and ambulances were lost from the system.



# Time Line of Events

1. Need Discovered – Early 1980's
2. Anderson Report Produced – Autumn 1990
3. Project Put to tender - 7 February 1991
4. Contractor decided – August 1991
5. Project Development – June 1991 -> 8<sup>th</sup> January 1992
6. System Integration - October 1992
7. System Fails – 26<sup>th</sup> October 1992 – 4<sup>th</sup> November 1992





# London Ambulance Service

LAS

- Largest Ambulance Service in the world
- Around 4,000 staff at over 70 stations
- Carries over 5,000 patients every day.
- Receives 2,000-2,500 calls each day
  - Only 1,300 to 1,600 are emergency calls
- Area covers 620 miles<sup>2</sup>





# Manual System

- Call taking
  - Recorded on form
  - Location identified on map
  - Form sent to central collection point
- Resource identification
  - Form Collected – duplicates removed
  - Passed onto region assigned resource allocator
  - Resource allocator decides on crew to be mobilised
  - Form updated – passed to dispatcher
- Resource mobilisation
  - Dispatcher contacts ambulance station
  - Or passed onto radio operator if ambulance is already mobile
- Whole process meant to take < 3 minutes



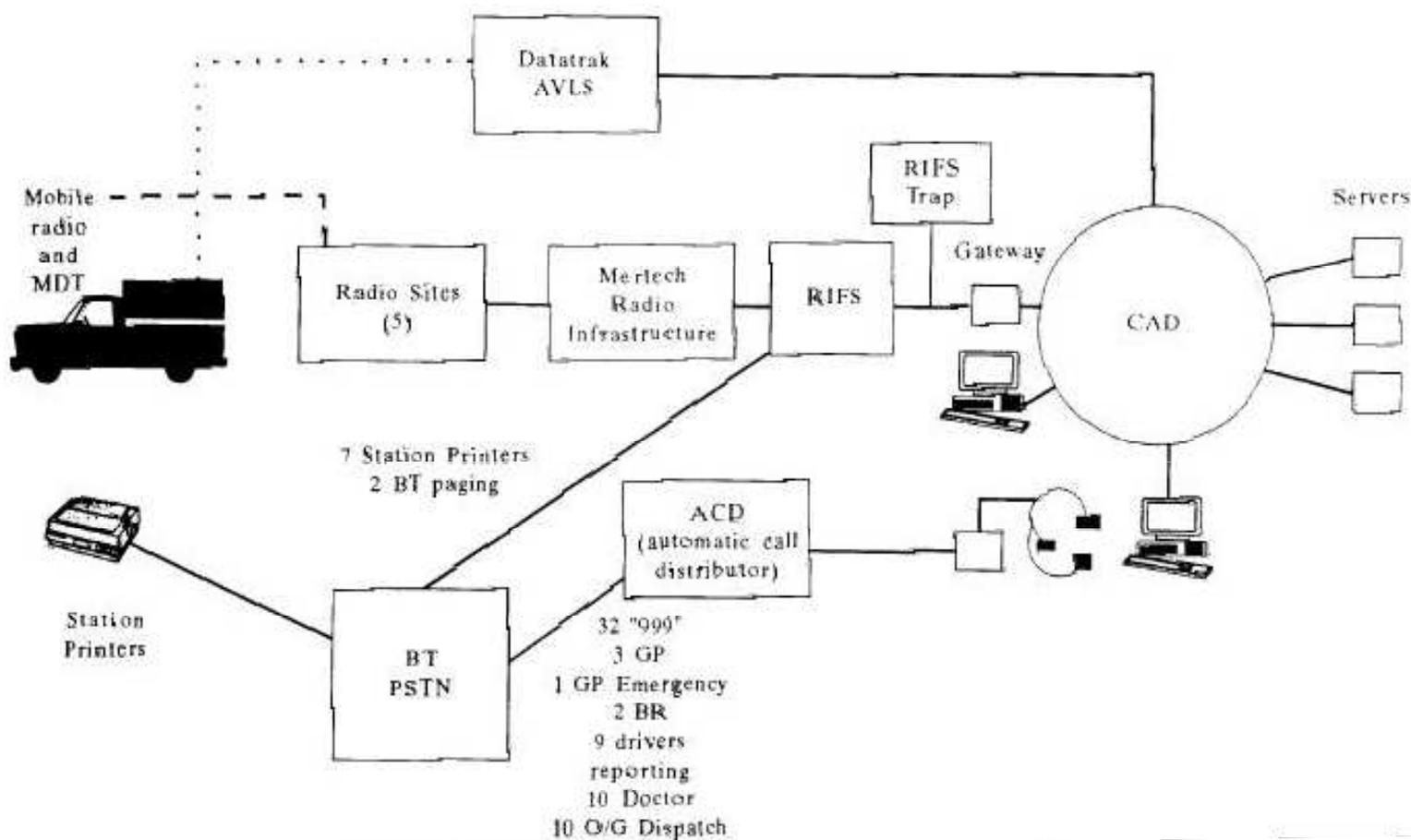
# Computer Aided Dispatch

- Existing systems dismissed as inadequate and impossible to modify to meet LAS's needs
  - Intended functionality was more than manual system could cope with.
- Desired system:
  - To consist of Computer Aided Dispatch; Computer map display; Automatic Vehicle Location System (AVLS);
  - Must integrate with existing Mobile Data Terminals and the Radio Interface System.
- Success dependent upon:
  - Near 100% accuracy and reliability of technology;
  - Absolute cooperation from all parties including CAC staff and ambulance crews.



# Communication Infrastructure

Diagram 3.1  
LAS Communications



\*Taken from Report of the Inquiry Into The London Ambulance Service



# What Went Wrong?

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- When the system was adopted several issues arose from its first use:
  - Ambulance locations were incorrect or not shown
  - Call taking created exceptions which created a greater work load
  - Ambulance response time became unacceptable
- Many reports have been produced on what went wrong:
  - From its conception to its integration the project management and process were doomed to fail.



# Project Assignment

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- How it was done
  - The project was put out to tender.
  - Report by Arthur Andersen
    - Suggested budget of £1.5Million and time-frame for development & testing 19 months, longer if a consortium was given project.
    - Report was mostly ignored
      - Cheapest bidder chosen
      - Consortium given strict deadline of 6 months development
        - » Significantly less than the 19 months set as industry standard



# Project Assignment

Continued

- A consortium consisting of Apricot, Systems Options and Datatrak given the project
  - Their proposal of £937k was £700k cheaper than next bidder
    - No questions were asked as to this figure.
  - Systems Options were to develop the CAD software
    - Previous experience of emergency service systems was limited to an administrative system
    - No experience of high integrity systems
  - There was no official designation of who were to manage the project.



# System Design

- System requirements:
  - Need for 100% reliability
    - System was never 100% reliable.
    - Strict deadline meant testing was unacceptable.
    - Fail safe measures never tested.
  - Must be able to cope with unexpected events/data
    - System never expected incomplete information
      - Exceptions when this occurred took up vital computation time
    - Exceptions were not prioritised and took up vital processing
  - Efficiency is key to system
    - System could not cope with volume of traffic
    - Never tested to full capacity
      - Failed to achieve suitable level of performance for normal work load



# System Design

Continued

- Must be able to de-duplicate calls
  - System failed to identify duplicate calls
  - More traffic within the system caused:
    - resource allocation issues
    - Processing performance diminution
- Communication of information is vital
  - Communication channels expected to be 100% reliable by system
    - Passed back incomplete information which system failed to handle correctly
  - Poor interface between Ambulance crew, MDTs & the system
- Must be easy to use for staff
  - Staff were used to old system and had to be trained to use new system



# System Implementation

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- Problems:
  - Time-frame too short
    - Developers saw deadlines as rigid
      - Rush to complete software liable to generate problems
    - Testing time was inadequate for critical system
    - Development team had doubts on feasibility of system
      - They did not reflect their feelings onto management



# System Integration

- Problems:
  - Adoption too soon
    - Users not ready
      - Changed control room layout confusing to staff
      - Complete change from original system without significant training
      - Two groups of users:
        - » Separate training left users unsure of each others roles
    - System not ready
      - Backup server not tested properly.
      - Inadequate full load testing
      - Data transmission problems
  - Staff
    - Opposed to new system
      - Unwilling to learn/use new system
      - Lack of trust in new system
    - Not consulted over the new system
      - Development missed out on meeting staff needs.
      - Limited involvement in testing therefore testing of typical use not fulfilled



# Project Management

- **Problems:**

- Break down in relationship between staff and management following new initiatives introduced
  - Lack of trust in any new system.
  - Little communication between management and staff meant issues were unresolved
- Contractor
  - Board of management were misled into the lead contractors ability and past experience of emergency service systems
  - High risk by management in offering project to small software house company with little experience of high integrity systems.
- project management throughout the development and implementation process was inadequate and at times ambiguous.
  - A major systems integration project such as CAD requires full time, professional, experienced project management. This was lacking;
- Scale of change and speed of change were too aggressive for the circumstances



# Project Management

Continued

- Poorly defined Management structure
  - No party took ownership from start
    - Systems Options assumed to be responsible
    - Became too busy and London Ambulance Service management took over
  - Executive Directors took control of minor problems
    - Should have been left to lower level management
  - Evaluation team:
    - Systems Manager – Ambulance crewman with many years experience: No IT knowledge
      - » Replaced by IT expert – too late
    - Analyst – Contractor with 5 years experience with LAS
  - Structure inflexible from structure before project lead to problems in communication



# Project Management

Continued

- Lack of defined communication channels
  - Concerns Raised at meetings never followed up
  - Staff unable to reflect issues on to management
  - Development team issues unresolved due to strict deadlines



# Assignment To Integration

What Should Have Been Done?

- Assignment
  - The project should have been assigned to a consortium or company with prior experience
  - Lowest cost should not have been deciding factor
  - More attention should have been made on Anderson report.
- Implementation
  - Timetable should have been better calculated
  - Testing should not have been passed by
  - Independent testing should have been carried out
  - Development teams concerns should have been raised earlier
- Integration
  - Training should have been more focused
  - Mixed training (i.e. users from all parts of process) should have been carried out
    - Highlight the role of different teams so user knows the whole system
  - User issues never addressed.
  - Backup should have been tested
  - Manual fallback system should have been in place.



# Project Management

What Should Have Been Done?

- Project Management
  - Management and staff issues prior to the new system development should have been resolved to gain staff's trust and support
  - Communication channels should have been setup between staff and management.
    - Staff delegate to raise concerns of staff
  - Better definition of project ownership
    - LAS should not have to own project as they have little experience of system development
  - Project management should have outlined to development teams that deadlines were not strict in the interest of better system
  - Formal recording of concerns should have been used
    - Concerns should be followed up.
    - Delegation of ownership of concern to member of management would ensure concern is addressed
    - Problems not given thorough analysis.



# Project Management

What Should Have Been Done?

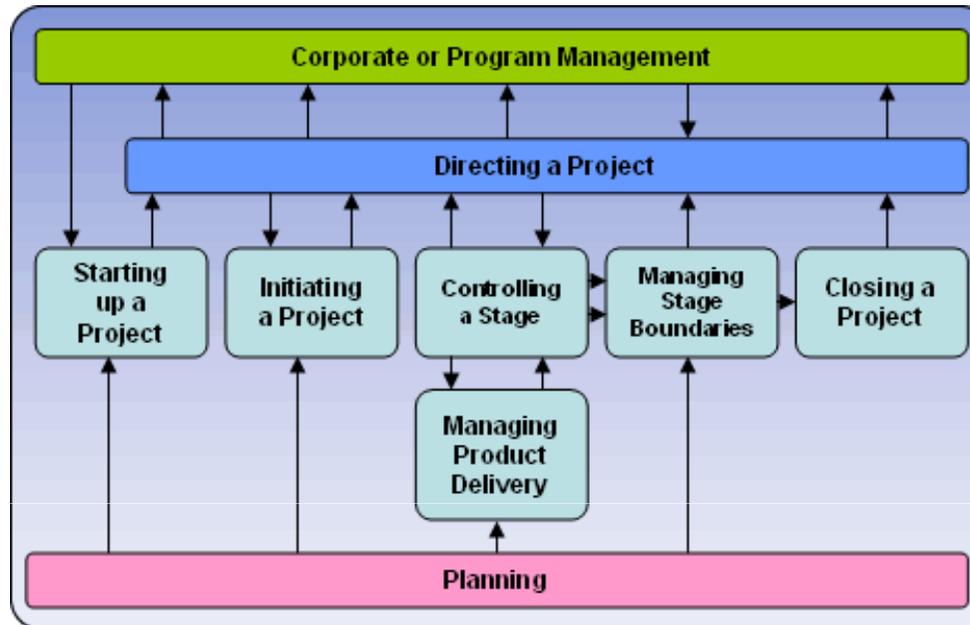
- Project should have been split into phases instead of a single process
  - Ensure that each phase is complete before next is begun
  - Creates quality assurance at each stage
  - Clearly defined structure more likely to achieve system targets.
- An IT manager should be appointed to sit on LAS board
  - It is their role to coordinate between LAS board and the system development contractor
  - Experience in IT is essential to allow good project management and communication between non IT board members and the project team.
  - Separate Executive Directors from the project team to restrict interference.
- A report should have been commissioned to be completed before adoption which could have outlined the problems before they occurred.



# Project Management

What Should Have Been Done?

- LAS Board failed to follow PRINCE Project Management method
  - Projects in Controlled Environments
  - Shows Corporate and Project Management separation.



- Management had little/no training over the years to prepare them for such a project.
- Ambiguity over project management
- High Integrity system projects should have full-time professional management.



# Summary

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- Project was doomed from the start:
  - Assignment of project to contractor was riddled with issues
  - Development of the project was too aggressive and quick for the circumstances
  - Integration of the system was unstructured and completed too soon.
- Management Problems
  - Management was unstructured
  - Too ambiguous at every level
  - Communication channels were unclear
- Many issues could have been avoided through better project management.
- Questions.



# References

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- Report of the Inquiry Into The London Ambulance Service - Anthony Finkelstein
- A Comedy of Errors: the London Ambulance Service case study – Anthony Finkelstein
- Overview of LAS Failure – Ian Sommerville
- CAD Failure LAS – ambulance.freeuk
- Software failure: management failure – Stephen Flowers