MBA9009 – Group Assignment

Assignment Requirement

In this group assignment, students are required to prepare and present a submission on the attached case study. Students will work in syndicates as agreed with the lecturer. Presentations will take place at the Week 6 lectures (Wednesday 25 August and Thursday 26 August). A formal submission comprising a copy of the overheads and a brief written submission (500-1000 words) is to be provided to the lecturer at the Week 7 lectures.

Submission Preparation

Each syndicate will be assigned one of the following case study roles:

a  MAS Management
b  MAS Workforce
c  Systemics

The submission should be an analysis of the MASCAD system failure, focusing particularly on the reasons for the failure. In taking on their assigned role, each syndicate should develop the analysis from the perspective of that role. The process followed should combine objective analysis with an element of advocacy. You can assume that the submission you are making would be input to a Board of Inquiry.

NB  “Advocacy” is taken in this case to mean allowing for an honest appraisal of the errors made by your role group, together with a determination that the errors made by other parties should be paid due attention. There is therefore no intention in your role to avoid responsibility for your mistakes, but at the same time you may think it is only reasonable that the responsibility of others should be a primary focus for the arbitrator.

Presentations

Presentations will be made at the Week 6 lecture. Each presentation will be held to a maximum of 10 minutes. Presentations will be in groups of three with one representative for each role. Questions will be allowed for a maximum of two minutes per presentation. Each group may choose to make an additional two minute presentation (no overheads) commenting on errors by other groups. The format is not that of a debate however, and the extra presentation should only be made if you think incorrect factual claims have been made.

Written Component
Each group is required to prepare a word-processed summary of their presentation of 500-1000 words.
Metropolis Ambulance System – Case Study

The major objective of the Metropolis Ambulance Service Computer Aided Despatch (MASCAD) project was to reengineer the provisioning of ambulance support for the Metropolis community. This amounted in practice to the replacement of a number of existing systems, both manual and automated, with a comprehensive new system designed to streamline the assignment of ambulances and to rationalize all recordkeeping functions.

Current System

System Structure

In the existing system, ambulance service support depends heavily on the skill and efficiency of the staff. Each staff member is supplied with a networked PC, and many of the functions have been automated. Though the PCs are networked, several of the systems in use are independent of each other, and there is therefore a requirement for the re-entry of data in some circumstances.

Functions and Processes

1. Call Taking. Emergency calls are received by ambulance control. Control assistants note details of incidents in a standalone database. The location of each incident is identified and the reference co-ordinates recorded. A separate record is established for each incident.
2. Sector Identification. In a separate process, other members of ambulance control review incident details and, on the basis of the information provided, decide which resource allocator should deal with each incident.
3. Resource Allocation. In a third process, the resource allocator assesses the incident, compares the details against information recorded for each vehicle in a separate database, and decides which resource should be mobilised. The status information on each incident is updated regularly from information received via the radio operator. Details of the allocated resource are noted in the incident record.
4. Resource Mobilisation. Dispatchers manage the physical assignment of ambulances on the basis of an incident queue, which is maintained as part of the Incident Management system. They pass mobilisation instructions to the ambulance station, or to the radio controller if an ambulance is already mobile.

Problems

The major problems being experienced derive from difficulties in maintaining accurate information on incidents and the location of the ambulances managed by the system. Data correction has also been a major concern; neither the imposition of tight controls on data correction, nor freeing up the situation was fully effective. In the first
case, the process was too slow and in the second too prone to lead to misunderstandings and disagreements.

**New System**

**System Structure**

In the new structure, operators would be working with a single integrated system, with more complex functionality. More powerful hardware was required, based on purpose-built servers and customised PCs.

**Functions and Processes**

The major difference to the existing set-up was the automation of much of the functionality. The overall functionality including automated processes was as follows;

1. **Ambulance Location.** Ambulance location was to be continuously monitored by system components comprising a GIS (geographical information system) and an automated ambulance tracking function.

2. **Patient Location.** The system was to be able to pinpoint a patient’s location on a map display, and to identify the nearest ambulances.

3. **Ambulance Destination.** The system was to be able to use information on patient location and vehicle location to identify whether the ambulance was going in the right direction, and to issue a warning if a problem was detected.

4. **Ambulance Despatch.** The system was to support dispatchers with information of a patient’s location, and details of the three nearest ambulances including the estimated time each would need to reach the scene. The dispatcher was to be able to choose an ambulance and display patient details on a terminal on the dashboard of the ambulance, and on the control screen in the ambulance depot. If the selected ambulance was in an ambulance depot then despatch was to be confirmed by the depot manager.

5. **Ambulance Crew.** Functionality was required to enable the ambulance crew to confirm the receipt of any messages, and to advise that it was on its way to collect any patient. The system was also to be able to alert the dispatcher if no acknowledgment was received. Other ambulance crew messages were to be to confirm pickup, when the ambulance was on its way to a hospital, and when it was free again.

**Contractual Arrangements - History**

1. MAS had scrapped a previous development at an estimated loss of $25M in October 2001. The project was reported to have started a year late, and to have been scrapped because of a debate over faulty software. The MAS was seeking damages from the contractor for a faulty dispatch module. It was widely accepted that its
hardline stance on penalties with the new contract was a wish to avoid a similar
debacle.
2 Pressure for implementation of a new system, most particularly from
ambulance staff, had been mounting for some time. One of the criteria for system
effectiveness was that the average time for an ambulance to reach an incident be
reduced from 15 minutes to 8 minutes.
3 The requirements specification for the proposed new system was developed by
a team of highly qualified technical experts, plus a representative of MAS
management who was in put in charge of the exercise. Relationships between MAS
management and staff were extremely hostile at the time, and although an invitation
to participate was extended to worker representatives including union leaders, they
refused to become involved. Contact was made with other ambulance services during
the systems requirements process with a view to determining whether existing
packages could be tailored or extended to meet the MAS vision, but it was finally
accepted that the size and complexity of the MAS precluded this type of approach.
4 A new tender was issued and submissions sought for delivery and full
implementation of a new system by January 1 2004. The tender came with the caveat
that the implementation date was absolutely non-negotiable. Draconian penalty
clauses were written into the contract to deal with any slippage. Starting date for work
to commence on the new system (i.e. for the start of the contract) was to be 1 July
2002, allowing 18 months for development and implementation.
5 The tender was issued under Standing Financial Instructions that provided the
regulatory framework within which such procurements may take place. A key
constraint was that the lowest tender must be accepted unless there were "good and
sufficient reasons to the contrary".
6 Following issue of the tender document, several meetings were held with
prospective suppliers covering queries on the full specification and resolving other
potential technical and contractual issues. These meetings were minuted by the
project team and it was recorded that most of the suppliers raised concerns over the
proposed timetable. It was reiterated that this was non-negotiable. A consultant hired
by one bidder described MAS's specifications as "poor" and as "leaving many areas
undefined". The MAS rejected a request that the specification be revised.
7 The successful bid of $60M was considered surprisingly low in view of the
previous experience. The successful bidder was a consortium headed by a small
software house called Systemics using their own GIS software running under
Microsoft Windows. The GIS communicated with Allswell's (part of the consortium)
automatic vehicle tracking system. The system was to run on a purpose-built
infrastructure supplied by Bananas (the third member of the consortium). Systemics,
which managed the bid, had an excellent reputation for quality software in the
computer games industry, but had no previous experience of building dispatch
systems for ambulance services. It was noted that a bid from a leading supplier of
ambulance support systems was for $100M, and that this was the next lowest bid. The
managing director of this competitor afterwards wrote memoranda to MAS
management describing the project as 'totally and fatally flawed'.
8 The Systemics-led bid was the only one that met total MAS requirements,
including timetable and price.
9 There was no specific inquiry into the reason for the discrepancy in bids, nor
any detailed investigation (other than standard references) into other members of the
consortium.
10 Technical evaluation of the tenders was the responsibility of a three-person team comprising an external systems consultant, a management representative with expertise in procurement, and the manager of the previous (failed) project. The project manager’s contract had earlier been terminated, but his expertise was held to be highly relevant, and he was engaged on a short-term contract specifically for the evaluation.

11 A paper entitled “Operational Method of Working (Revised)” was produced in parallel with the tender, describing the new jobs for systems support staff and the ambulance crews. Again the poisonous working relationship in place meant there was little involvement from staff, and although complaints about the job descriptions were privately voiced, there was no formal response from the staff groups.

12 The MAS was operating in an economic climate where funding cuts were frequent, and Government pressure to improve performance was intense. Part of the reason for sour management-staff relations, and for the severity of the contract process, was a perceived need to meet external stakeholder expectations, including those of the Treasury.

System Development

1 Developments of the various components of the end system were separately managed. Overall management of the entire project rested with MAS senior managers, including the CEO, drawn from various parts of the organization.

2 Systemics was the dominant member of the successful consortium, and took responsibility for delivery of the automated system.

3 MAS management appointed their own project manager to organize working arrangements including training of the staff.

4 The early stages of the development process revealed some major gaps in the requirements specification, and revealed to Systemics the need for some slack to be cut. Systemics felt sufficiently strongly about the issue to threaten to walk away and “let the courts work it out” if no relief was granted.

5 Despite their original stance, the Steering Committee finally recommended a two-month contract extension, with implementation now expected on 1 March 2004. This was approved by the CEO, with the proviso that Systemics sign a “no withdrawal” clause.

6 Systemics struggled with the software development. They felt that the extra two months was less than the minimum required. On the other hand they believed that the way the original tender was framed meant that the MAS was expecting a system that was “less than optimal” (“quick and dirty” might be another interpretation). They therefore decided that their primary goal was to deliver a “working system”, and focused on getting something up and running.

7 The contract did not mention any requirement for parallel running.

8 Systemics produced working software and performed a system cutover on the weekend before 1 March. The system was fully tested at the program level, but no live system testing or user testing was conducted.

9 Training in the new procedures was organized throughout the system development period. Many ambulance crews and support staff refused to attend on the grounds that they had not been adequately consulted on the new requirements, and that they were contemplating industrial action.
The Government declared industrial action in the ambulance service and other public services illegal two weeks before the system launch, announcing very severe penalties for non-compliant unions.

As the software had been fully tested, and most workers had been trained in the new procedures, the system launch on 1 March was approved by the CEO on advice from the Steering Committee.

Implementation

The system was lightly loaded at start-up. All staff were rostered on to ensure that any problems, (such as ambulance crews pressing the wrong buttons, or ambulances being radioed in blackspots), could be effectively managed.

As the number of ambulance incidents increased, there was an increase in the rate of data entry errors. A particular problem was some incorrect detail on ambulance allocations, which had a knock-on effect. In some cases, multiple vehicles were sent to the same incident, or the closest vehicle was not chosen for dispatch. In effect the system “lost” a number of unallocated ambulances.

As a consequence, the system had fewer ambulance resources to allocate. The system also placed calls that appeared to provide incorrect data on a waiting list, and generated exception messages for those incidents for which it had received incorrect status information.

As the number of exception messages increased, the backlog of unresolved incidents increased beyond the system limit. This possibility had not even been considered by the system designers with the result that some incidents were also “lost” by the system.

Calls began to come in regarding incidents that were no longer in the system and had to be re-entered as high priority tasks. But with fewer resources to allocate, the waiting list continued to grow. Several incidents were re-entered more than three times.

The increased volume of calls, together with a slowing system and an insufficient number of call-takers, contributed to significant delays in answering calls that, in turn, caused further delays to patients. With ambulance crews under increasing pressure, their error rates increased, and they started to make their own decisions about which vehicles should go where.

A communications bottleneck developed, while the number of ambulances “disappearing” from the system continued to increase.

The lack of a formal contingency plan was a problem. Late on the first day of operations, the system was decommissioned and people were brought in to run an ad hoc paper-based system for a few days.

It was later claimed that a significant number of people, more than 30, had died as a result of ambulance delays. At the height of the disaster the average waiting time for an ambulance had gone from 15 minutes to 50 minutes. In one case where the patient subsequently died, the incident was reported four times and the ambulance arrived more than three hours after the first report.