Andrew J. Ryan October 12, 2000

PaperTitle: *Improved Information Sharing: A Step Towards the Realisation of Collaborative Decision Making*

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Improved Information Sharing: A Step Towards the Realisation of Collaborative Decision Making seems like the poster child for why Collaborative Decision Making (CDM) is a necessary step for successful implementation of the next generation Air Traffic Management (AMT) system. The authors focus on the "information gaps" which are present within the current paradigm, and offer areas for improvement. In their won words, the purpose of the paper is to: " . . . report on the results of a recent investigation and analysis of the requirements of European aircraft operators and airport organizations for the improvement of information distribution amongst ATM service providers and the user community" (1). At the core of this statement is the search for effective sharing of knowledge. The knowledge area, or knowledge management, has gained considerable notoriety in recent years precisely because of problems such as this. The ability to synchronize information and make it readily available for users in real-time (or as close to it as possible) is a challenge to nearly every organization. In response to this challenge, the authors conducted interviews with thirteen airlines and several Air Traffic Control (ATC) organizations. The remainder of the paper will summarizes their findings.

Airline Operational Aspects

The author's promptly began to look for similarities within the airlines. They realized splits between hub and spoke airlines and point-to-point (shuttle) airlines. Also, they noticed that most smaller airlines outsource their fleet management and dispatch services while larger airlines had large in-house operations. This plus other differences made it easily recognizable that an effective CDM system must be accessible by all parties, not just an elite subset.

For example, airlines use varying operating concepts (hub and spoke or shuttle primarily), delay is perceived differently in each model. In a hub and spoke model, a carrier with connecting flights in close proximity to a feeder flight which has been delayed will have to either absorb the delay or have their passengers miss connections. Even if they try and hold the departing flights, it

them puts a strain on the ground crew to transfer the baggage in a timely manner. In a point-to-point (shuttle) model, the departures are more spread out and such scenarios are less frequent.

In response to a delay which forces missed connections, the airline must still continue with its schedule, attempting to rebook passengers on their next flight (in some cases flying half-empty as opposed to booking passengers on a competitors flight). When questioned on the importance of receiving more information, airlines interviewed emphasized that faster more accurate information was necessary to enable better responses to disruption situations.

Airline Information Gaps

There were two areas where airlines believed they would benefit from receiving more information: *Airport and ATC Status Information* and *Flow Management Information.* Airport and ATC Status Information involves airlines receiving more information from airports about:

A. Airport Capacity
B. Airport gates and parking
C. Terminal, local, and regional transport system problems
D. Coordinated airport and flow management slots
E. Expected holding times

Flow Management Information deals more with the inclusion of information about what they *can* do, as opposed to what is forbidden. For instance, instead of a user's display containing a map of constraints, it should list available slots. Another area of concern was the reasoning behind delays. Airlines noted they would like to know *why* as opposed to *what.*

Airport Authority Operation Aspects

In terms of airport operations, the author's found it difficult to find a "typical" European airport. There exists major international airports, regional

airports, hub airports, and airports that are not hubs. Going back to the knowledge management principle of providing accurate, fast information, another dimension is added: the end users domain. The system must be able to accommodate the demands of the different organizations and requirements. Another factor to be cognizant of is the varying roles that exist within an organization. While Enterprise Resource Planning (ERP) is now gaining popularity, in 1998 (the publication date of this paper) it was barely a catch phrase. Consequently, operations are fragmented with responsibility spread out across various operations. As a result, situations often occur where a given item of information will be held by different parties at different airports and used differently depending on the culture of the party concerned. Providing a uniform snapshot will help everyone see the full picture and hence be able (agents) to react in an optimal manner.

Airport Authority Information Gaps

The primary focus of the airport authority information gaps came from a lack of information sharing from airlines. As a result of airlines not providing accurate information (including changes), airports underutilized resources when it came to stands, ground resources, gates, and runway allocation (for departures).

Air Traffic Control Provider Information Gaps

ATC providers (particularly tower control) demanded more information on estimated time of arrival (ETA) and/or Actual Time of Departure (ATD). By knowing this information, it would be a significant step to allowing ATC to improve arrivals sequencing and stack management. Secondly, overall schedule information from airlines was also believed to be needed by ATC. By knowing schedules, ATC could improve planning for optimizing both arrival and departure schedules.

Outstanding Issues

At the time this paper was written, there were many concerns about CDM. Included were cost, safety and reliability, confidentiality, and standardization. It seems like a moot point to discuss these as the subsequent implementation of CDM in the US has solved these issues for the user. It is interesting however, to see cost as an issue. With all of the money airlines lost before CDM, you would think they would be more eager to save money via some new method, as opposed to keeping with the status quo.

Personal Comments

As a precursor to CDM being implemented in the US, this paper provides an excellent look at *'how it used to be.'* It takes conclusive stands on various issues and provides definitive information to back up its claims. There is not much to complain about in this effort. This paper, and others like it, aided in the creation of the CDM system that we have in place now (it is also partly responsible for my current employment).