Practitioner's Commentary: Modeling Aircraft Departures

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All of the participating schools are to be congratulated for their fine efforts. Although all of the teams approached the problem in a slightly different manner as far as particulars are concerned, they all captured the three essential components of the problem: Each of the teams specified the *anatomy of the system*, developed an *objective function* to be optimized and presented a *method of solution*.

All teams recognized that the method of operation should have the essence of *multiple queues*, i.e., the control tower (dispatcher) should be able to choose which aircraft in the queue should leave first. The North Carolina School presented specifics, in a graphical manner; Drake only alluded to the fact; and Harvey Mudd limited the queue to only three aircraft, while leaving the remaining aircraft (if any) at the gate—hardly an operational solution!

All teams recognized that priorities must exist. Harvey Mudd recognized the possibility of making up lost time in the air and presented an analysis for the optimal velocity; other teams did not come close to this realism.

Harvey Mudd was the only team that used a linear-programming formulation for the determination of which eligible aircraft should depart first; all other teams essentially evaluated the objective function for each plane and optimized overall satisfaction.

All teams spent much more effort modeling customer satisfaction than airline satisfaction. There was greater

diversity in customer satisfaction from team to team than in airline satisfaction.

Dayton used real data, gave the best references, and gave the best description of statistical details. North Carolina presented the best graphics (though some presentations were unclear). Ohio State had the most analytical formulation for customer satisfaction. Drake presented the best effort in sensitivity in the dispatching area as applied to customer satisfaction.

The effort and accomplishment that these teams achieved *over a single weekend* is remarkable. None of the teams' efforts and accomplishments was dominated by any of the others'.

About the Author

Irwin W. Kabak is a consultant in business policy and corporate development and in measurement, evaluation, and performance improvement. His clients have included AT&T, A&P, and the US Army, and he has served as an expert witness regarding financial valuations and statistical analyses. Dr. Kabak received his bachelor's master's and doctoral degrees from the NYU Dept. of Industrial Engineering and Operations Research, where he is currently professor in the Department of Statistics and Operations Research. Formerly he was employed at Bell Telephone Laboratories, Esso Research and Engineering, and Mergenthaler Linotype. Prof. Kabak was a judge for the Aircraft Queueing problem.