PLENARY TALK

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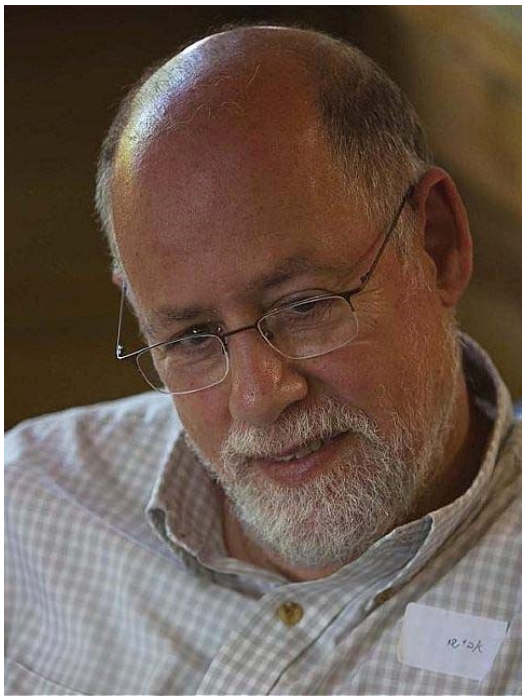

Avishai Mandelbaum
Technion – Israel Institute of Technology
Industrial Engineering and Management Dean
Professor of Service Engineering, Operations Research and Statistics

Theompirical Research in IE/OM/OR: Theoretical & Empirical Journeys through Service Systems (Hospitals, Call Centers, Banks…)

Abstract: I shall describe a personal research journey through service systems (e.g. telephone and chat centers, hospitals, banks,…). I view these systems through OR/OM/IE lenses, often more specifically as a queueing scientist (e.g. "enjoying" congestion and flows), and sometimes using operational characteristics as surrogates for financial, psychological and clinical performance.

The theory of queueing is ideally suitable for capturing the operational tradeoff that is at the core of any service: quality vs. efficiency. Three cases in point are the Erlang-A, -R and -S models: the first has become a common call center model, by accommodating the choice that customers enjoy, namely wait for service or abandon; the second arose from emergency departments, in which returns to service are prevalent; and the third captures operational symmetry between servers and customers. All three models, or their (asymptotic) fluid or diffusion counterparts, parsimoniously yet valuably portray complex realities. Here value is tested against real service systems, which is in contrast to prevalent OR/OM/IE practice. (In that practice, models are often remote from data, and the value of fluid/diffusion models is judged by its accuracy relative to alternative models.)

My ultimate goal is automatic creation, in real-time, of data-based models for service operations—analytical and simulation. The latter will serve as a validation ground for the former, and both will be universally accessible for applications by researchers, students and ultimately

practitioners. Prerequisites include, first and foremost, measurements of individual events (e.g. patient-physician transactions), which then support inference of model primitives, structure and protocols. The above goal is pursued at Technion IE&M Faculty, with data-support by its SEE Laboratory (SEE = Service Enterprise Engineering).

Short Bio: Avishai Mandelbaum is the Benjamin & Florence Free Professor and Dean of the Faculty of Industrial Engineering and Management, Technion, Israel. He has a B.Sc. in Mathematics and Computer Science and an M.A. in Statistics, both summa cum laude from Tel Aviv University. His Ph.D. is in Operations Research, from Cornell University. After graduation, in 1983, he joined the Graduate School of Business at Stanford University. He then left the U.S.A., in 1991, to assume a position at the Technion. Prof. Mandelbaum is an INFORMS fellow. He was an associate editor of the leading journals in his field, and his research and teaching have enjoyed various prizes, in particular the Yanai Prize for Academic Excellence at the Technion. His research has covered stochastic models (analysis, asymptotics, control) and statistics, with applications to queueing theory/science and service systems (e.g. tele-services, hospitals).

Prof. Mandelbaum is a founder and the director of the Technion SEE Laboratory. This lab has been collecting and maintaining a unique rich repository of data from service operations. Data granularity is at the level of the individual customer-server transactions (event logs). And through its data, the SEELab has been supporting worldwide research and teaching of Service Science, Engineering and Management.