Service Engineering, Science and Management

(or: Queueing-prone Service Networks)

Contents & Assignments

Class 1

Logistics and "some rules of the game"; Who can/should attend this course; Why study Services in IE&M?
Introduction to Service Engineering.

Introduction to Service Engineering

- Review and Preview of some Readings: On Services, and The Service Economy.

- Introduction to "Service Engineering".

- Service-nets = Queueing-nets: via examples (consulting) and I.E. projects (production of justice, queues of ships, operating rooms).

- (Optional) Service Engineering of a Call/Contact Center.

Recitation: Introduction to databases.

HW 1: Reading and Executive Summary
Assignments are both handed out in class and are downloadable from the course's web site.

This first assignment has several goals: first, to ensure the formation of study-groups as soon as possible; second, to help you start a weekly procedure of "division of work", which typically culminates in the weekly group assignment (the readings can be divided among group members and then, in a joint meeting, each one can summarize one's material for the others); thirdly, to get you acquainted with our text-sources and web site; and finally, to help you start the course with the conviction that "Queues in Services are Here to Stay", in fact enough so as to deserve the attention that they are going to get. **All 3 parts of the assignment are due next class.**

1. **Form a study group (3 students).**

2. **Read** the Hebrew syllabus of our course, downloadable at
   `http://ie.technion.ac.il/serveng2014W/Hebrew_syllabus_2014W.pdf`

   Read Hall (**H**): Chapter 1, pages 1–18: Introduction.
   (There are 13 copies of H at the IE Library, and 5 at the Central Library. My goal is to have each group check-out a copy on a permanent loan for throughout the semester.)

   Read Fitzsimmons J. and M. (**FF**): Chapter 1, pages 1–18: The Role of Services in an Economy. (There are 7 1994-edition copies, 2 2nd-edition and 2 3rd-edition copies.)

   Read "diagonally" the article "Innovation in Retail Banking", by Frei, Harker and Hunt, downloadable from `http://iew3.technion.ac.il/serveng2011W/Lectures/Retail.pdf`
   Focus on pages 13-18 (PC Banking) and if time permits pages 18-28 (Re-Creating a Bank).

Also read pages 33-37 (The "New Age Industrial Engineers", namely the integrators of Management, Science and Technology.)

All reading materials are also available at the course site
http://ie.technion.ac.il/serveng2014W.

3. **Submit**, based on the readings, and your personal experience, a *typed* Executive Summary (**all future assignments will be typed, unless specified otherwise**), under the title

   "The Future of Queues in Service Systems".

   The first (cover) page should have the title. Below the title, on that same page, list the names of all group members, accompanied by the following details: Faculty or department, degree and year of study, concentration and fields of interests; relevant academic experience (Probability, Stochastic Processes, Programming Languages); work experience (past and present); a telephone number and e.mail through which each member can be reached.
   The second page should start with an Introduction to the report and then, in bullet-point plus text format, the report itself – brief yet informative. It should be based on a variety of significant service examples, from both the public and private sectors, with **at least one from IE&M or Technion**. In these examples, queues (single or networks) either play, or should have played, an important role. For each example, assess whether and how long this importance is likely to prevail, what redesign or technology would take to eliminate queueing, etc. If possible, try to quantify the amount of waiting involved/saved (in hours/days/months/years, whatever is most appropriate). Make sure that you have at least one example (the more the merrier) of a service *network*, in which queues are either "here to stay" or they are amenable to creative reduction or elimination.

   <u>**Readings 1**</u>: *Service Engineering*

   - "Service Engineering of Stochastic Networks Background, with a focus on Tele-Services", Mandelbaum A.
   - Industrial Metamorphosis (on Services and Manufacturing), October 2005: The Economist.
   - H. Bullinger, K. Fahnrich, T. Meiren, "Service Engineering", Technical Report, The Fraunhofer Institute for Industrial Engineering, Stuttgart, Germany. (The second source for the terminology "Service Engineering". In Germany, though, it is used in a design-context while our use is operations-driven.)
   - Service Science: IBM's Proposal for a New Academic Discipline.
   - "Queueing for Toilets - Estimating the Required Number of Toilets Using Queueing Theory", McNickle D.
   - "Innovation in Retail Banking", Frei, F.X., Harker, P.T., Hunter, L.W., Report 97-48-B, Wharton Financial Institutions Center, 1998.
     (Defines the *New-age Industrial Engineer*, and the *Integrator* of Mangement, Science and Technolgy (my wording), within the context of developing new banking products.)
   - Mevaker Hamedina Report 53B, Year 2000.
   - Service Operation: an Example (Bank of America).
   - Federal Consortium Benchmarking Study Report. USA, February 1995
   - Queueing Methods (Hall), Chapter 1.
   - Service Management (Fitzsimmons) Chapter 1
   - "From books on my shelves" (see "Readings for Introduction to Service Engineering" on the course web site).