



15.879 Advanced System Dynamics Modeling

Spring 2025

Exercise 9- Modeling Growth of a Professional Field

Submit your model to the shared dropbox before the class on Friday 4/18/2025

Professional fields of practice, such as subcommunities within consulting, medicine, or coaching, serve potential clients based on specialized professional skills built over long periods of training. They usually have concrete sets of tools and methods, coherent communities of practice, and regular conferences or meetings. The skilled work involved creates much heterogeneity in the quality of the work produced, especially absent standardized training and certification processes. In this modeling assignment you will focus on capturing the growth (or decline) of a professional field, such as consulting for Total Quality Management, data science, or even System Dynamics modeling.

Your model considers the generation of demand and supply for the professional services in question. On the demand side, you note that demand is bounded by the total need for the type of service in question (not every person needs to consult SD models to live their lives), and is regulated by the recognition and reputation of the professional field. Recognition grows as more clients are served, projects are completed, and artifacts such as papers and reports generated. A reputation for quality is built when that work is done professionally and with good quality. On the other hand, poor quality work erodes reputation and may repel potential clients who learn about the field. Quality reputation is hard to build but fast to erode.

On the supply side, new practitioners join the field when they see clients with demand for those professional services. These novice practitioners may focus on learning the trade, but also some of them may engage in serving the clients. Novices turn into experts after sufficient training time, at which point they produce much better-quality work in serving their clients. Both novices and experts may leave the field of practice, especially if the promise of profession seem to be declining and client demand is weak. Given the specialized investments by experts, the novices are more sensitive to signals of softening demand than experts are.

Based on this description, build a simple model that captures the dynamics of growth, and decline, of a professional field. Given your familiarity, you may use System Dynamics as a concrete example.

Bonus 1- Add the dynamics for on-the-job training of novices: when there is plenty of demand, novices may get more exposure through working with experts in larger teams, and build their skills faster. Absent that, novices don't learn as fast.

Bonus 2- Consider a few policy levers, spanning training methods, certification, and better matching of clients with experts, and their effects on the success of the field.

Submission Instructions

Put your Vensim model(s) in the shared dropbox folder under session 9. Please name your model submissions as: S09-<Last Name>-FieldGrowth.mdl
for example, "S09-Rahmandad- FieldGrowth.mdl".

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