Sloan School of Management
Massachusetts Institute of Technology
Cambridge, MA 02142

15.871 Introduction to System Dynamics

Fall 2013

Assignment 5

Integrating Systems Thinking and Strategy

Assigned: Wednesday, 9 October 2013. Due: Wednesday, 16 October 2013.
Please do this assignment with a team totaling three people.

Submitting your work: One member of your team should submit your team's report in MS Word. Make sure the write up lists the full names of all members of your team.

Purpose

This assignment gives you a chance to apply your systems thinking skills to a complex real life problem in corporate strategy: the rise and fall of People Express Airlines. People Express was the first airline formed in the wake of US airline deregulation in 1978. People Express was one of the most spectacular business success stories in American history up to that time, growing from its first flight in April 1981 to the nation's fifth largest air carrier in October 1985, with revenues running at an annual rate of about $1 billion at the end of 1985. However, within a year, PE was bankrupt, and on September 15, 1986, People Express was sold to Texas Air for a small fraction of its peak market value. Explaining what happened and what might have been done to prevent its demise is a challenge. In this assignment you will first 'fly' the company yourself through a management flight simulator—a system dynamics model embedded in an interface in which you will make strategic and operational decisions quarter by quarter. You will then draw on your experience running your own People Express to develop a conceptual model of the feedback structures responsible for the dynamics. Finally, you will use your conceptual model and experience in the management flight simulator to recommend policies for the sustainable success of People Express. The assignment provides an opportunity to integrate the skills we've been developing all semester, and exposes you to a management flight simulator as a tool for the development of systems thinking skills and for policy design.

Background

People Express was distinctive for several reasons. It was created and led by the visionary and charismatic Don Burr, who espoused a (then) radical management philosophy: every employee would be an owner, there would be few layers of management and little hierarchy, and everyone would perform both staff and line functions. Burr started a job rotation system in which all employees, except pilots and maintenance technicians, would be known as Customer Service Managers (CSMs) and would split their time between reservations, ticket taking, flight service, and other tasks traditionally assigned to specific individuals in specialized roles. Along with the pilots (flight managers or FMs), the CSMs also did staff work, accounting, and other jobs normally filled by ground-based personnel. The purpose of the job rotation system was to boost productivity by avoiding hierarchy and overspecialization.

Through high motivation, job rotation, ownership, no-frills service, a hub at (then) underutilized Newark airport, and low wages, Burr was able to enter the airline market with substantially lower fares than the other carriers. Typical fares were 40-75% lower than the competition.

The Problem

As a problem in the dynamics of business strategy, PE presents a challenge. It is not sufficient to explain why PE failed. Many businesses fail. The problem is to explain how PE failed after such spectacular success. Most important, were the causes of PE's failure internal (in its own strategy and operating policies) or due to unforeseen changes in the external environment? And what policies could they have adopted to ensure the sustained success of the airline? What lessons do their rise and fall hold for rapid growth startups today?

To address these issues, we will put you in the pilot's seat and give you a chance to run People Express airlines yourself, through the Management Flight Simulator.

Procedure:

I. Flying the company

0. The simulator was developed by John Sterman and is available through Global Strategy Dynamics. Download the simulator software from:

   http://www.strategydynamics.com/microworlds/people-express/

   and install it on your computer, following the instructions on the site (sorry, PC only). Next, unlock the software by entering the instructions and code to unlock the software, which we will provide to you.

1. *Preflight Briefing:* The simulator includes extensive background and documentation. **Before** starting a simulation, be sure you've read the HBS case on People Express. Additionally, the Help menu in the simulator gives you access to detailed descriptions of the simulator and model. These, along with our class discussion, provide you with the information you need to run your company.

2. *Preflight Checklist:* In the Flight Simulator you must make the following five decisions each quarter:

   - Aircraft Purchases (number of aircraft bought or sold per quarter)
   - Hiring (number of people hired or fired per quarter)
   - Marketing Expenditures (the fraction of gross revenue allocated to marketing)
   - Fares (Average fare, in $/seat-mile)
   - Target Scope of Service (will you be a no-frills or full service carrier?)

   Before each game, formulate a five-year plan for each of these decisions. You should use the **Strategy Record Sheet**, which is included at the end of this assignment (make as many copies as you need). An example is also appended to this assignment. NOTE: The purpose of the five-year plan is to get you thinking about your strategy. Keep in mind, however, that the purpose is to survive and prosper over the long haul, not just for five years. In fact, the simulation extends for a full decade, or bankruptcy, whichever comes first.

   As you formulate your strategy you need not specify precisely what decisions you propose to make each quarter. Rather it is sufficient to specify, for example, that your strategy requires

you to become a major player in the industry within five years, so you plan to grow at a rate of 80% per year, market aggressively, and price at the lowest possible level consistent with profitability.

It is up to you to decide what constitutes success. You should monitor cumulative profits and the final market value of the firm, and report these on your record sheets for each trial. But you may also measure success by market share, or by other indicators of the human side of the firm, such as the workweek, employee share value, service quality, and so on.

3. *Take off:* Implement your strategy by playing the simulator.

***** IMPORTANT HINT *****

For your first game, ***implement the strategy People Express actually followed*** (the "Don Burr strategy" described on the sample record sheet appended to this assignment). It is extremely illuminating to run the strategy People Express actually pursued to experience their success and stresses. Record the results on the strategy record sheet as you will need to refer to them during the analysis and write-up portion of the assignment.

4. Play the game again, revising your strategy as you see fit. Play the game as many times as you like until you understand the reasons for the failure of the real firm and have formulated a strategy leading to *sustainable* success for your airline.

   Hints:

   a. You will learn more from playing many games quickly than playing a small number very slowly and carefully. Unlike the real world, in the flight simulator you can't hurt yourself, your passengers, or your stockholders—feel free to try things you couldn't or wouldn't dare try in the real world. You can learn a lot from extreme conditions in which you go bankrupt.

   b. One of the advantages of a flight simulator is the ability to conduct controlled experiments. You may find it helpful to vary one aspect of your strategy at a time to identify how different aspects of the business function and interact.

   c. Although the simulator allows you to run the model for more than one quarter at a time, you will find that you should make decisions every quarter, advancing only one quarter at a time. Hiring, aircraft purchases, and perhaps other decisions will need to be changed each quarter to respond to the rapid pace of change in the market and firm.

   d. Think before you play. Don't treat the flight simulator as a video game. Before diving in to a new game, reflect on what you learned from your previous game. Formulate hypotheses about how to succeed in each trial, and ***write these ideas down*** before playing. Prepare a strategy record sheet for each game you play. Afterwards, go back and assess the outcome relative to your hypotheses. Then formulate your next strategy.

II. Analysis and Recommendations

Once you've identified a strategy for success in the simulator, use your knowledge and experience of the game to formulate a conceptual model of the dynamics (in the form of a causal loop diagram). Follow the steps below to keep your diagram simple while still ensuring that it captures the key feedbacks and has a broad enough boundary.

5. Identify the variables and concepts you would need to include in a model of People Express. Your list should be specific: the variables should be quantities that can be graphed over time, which can increase or decrease. For example, instead of "competition" try "competitor fares," instead of "customer attitude towards service quality" try "service quality perceived by customers." Identify units of measure where appropriate, but do not exclude a concept solely because it is difficult to measure. *Keep your list in the neighborhood of ten variables.* A useful model must be simple enough to understand and communicate your ideas to the decision-makers who must take action. A good way to find the proper level of aggregation is to brainstorm all the variables you think are relevant then make a second list in which you aggregate similar concepts together where appropriate. You may aggregate parallel activities together, or variables whose dynamics seem to be similar. For example, you should aggregate overbooking, lost baggage, delays, and similar dimensions of the flying experience into an aggregate "service quality" construct.

6. Develop a reference mode for each of the variables you identified in §5. That is, sketch a graph showing the dynamics of your concepts over the historical period from 1981 to 1987. Don't spend time getting exact values for the data. The qualitative character and consistency of the dynamics are much more important than the precise numbers. Variables measured in the same units should be presented on the same graph, e.g. People's fares and competitor fares are both measured in $/seat-mile and should appear on the same graph.

7. Develop a causal loop diagram that relates the variables identified above and explains the rise and fall of PE. Your diagram should include all the variables you identified in §6 **and any additional concepts you need so that your diagram is sensible and complete.** That is, your causal map will contain more variables than those you identified in §5. Show stock and flow structure if it is important to communicating your dynamic hypothesis. *A good diagram will be simple.* Remember, the purpose of a causal diagram is to communicate the essence of the structure, to highlight the most important feedbacks responsible for the dynamics of the organization. Your diagram must fit on a standard 8 1/2 x 11 inch page and should be neat and legible. Hints: Be sure to identify the polarity of every link and all the important loops. Arrange the variables so that the major feedback loops are easily identified.

8. Using your diagram and experience in the game, provide an account of People's rise and demise. List the policies/strategies they followed which you believe to be responsible for their failure. Using your diagram, explain in a few paragraphs how these policies brought about the rise and fall of People Express. A good explanation describes which particular feedback loops are responsible for their success and growth, and which loops then became dominant and caused the collapse. Your explanation should be presented in terms a senior manager can understand.

9. Imagine that it is 1981. You are the CEO of People Express. What policies/strategies would you propose to ensure the sustainable success of your firm? Be specific. For example, "I would maintain service quality" is not a policy but a goal – if you want to maintain service quality, explain specifically what steps you would take, what procedures and policies you would implement, to ensure that service quality would remain high. Explain why your preferred strategy works using your causal diagram (that is, explain in terms of the feedback structure of the system). Could Don Burr have followed your strategy in the real company? What implementation issues would arise?

Submission Guidelines:

Upload your report to the class website. Your report should be a single Word file containing your responses to questions 5-9 above.

Include in your report the strategy record sheet and performance measures at the end of the simulation for your preferred strategy. You can include a picture of the strategy record sheet if you have used hard copies during running the game (make sure it is legible).

Also copy and paste the User Decisions table (accessible in the Tables menu) for your preferred strategy into your report.

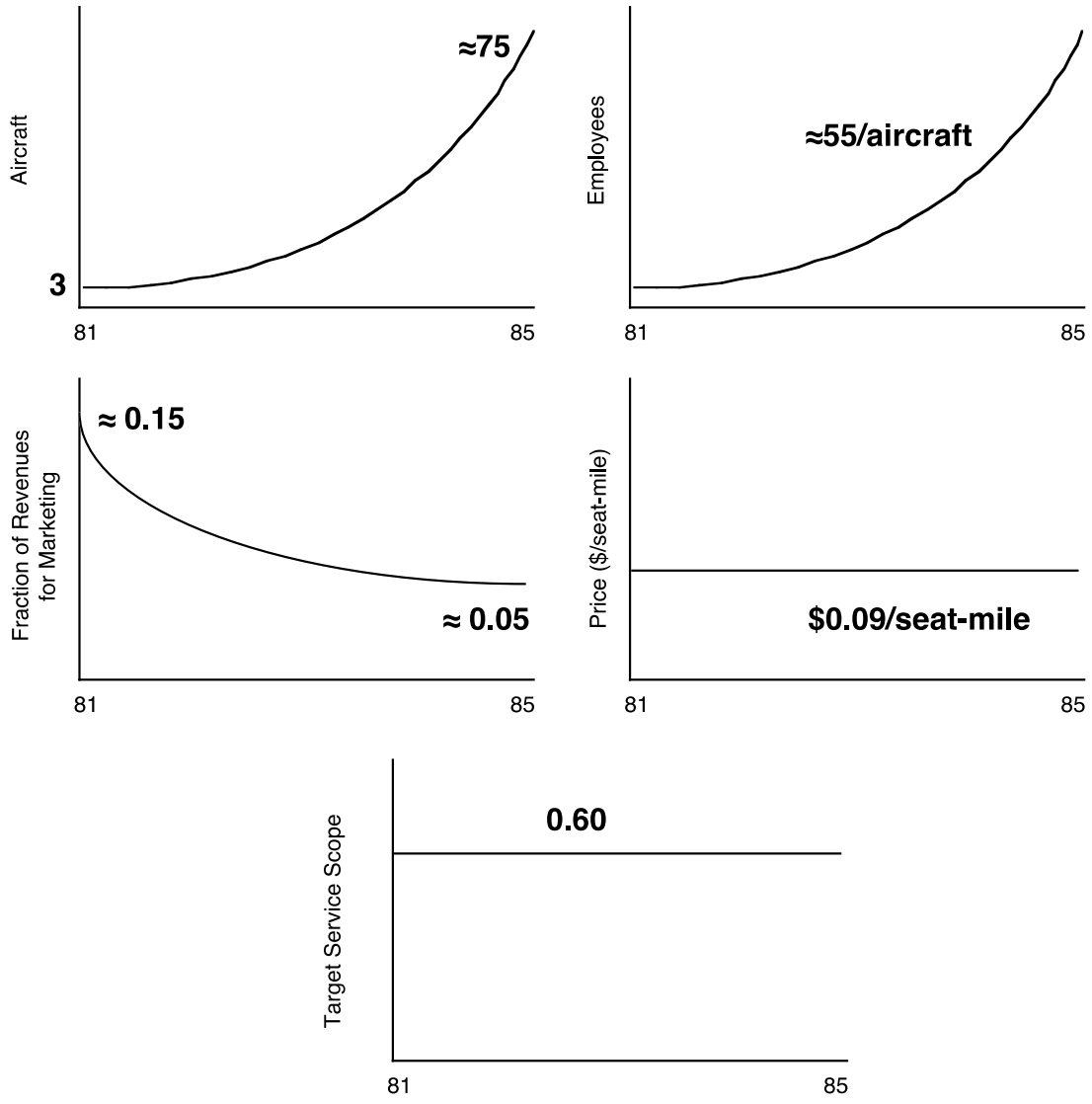
Finally, record the final (year 10 quarter 4) value of cumulative profit, and the final value of your firm's market value.

Overall Statement of Objectives:

To become a major airline within two to three years by aggressive growth, the highest quality of service, and the lowest possible fares.

Initial Product Positioning	People Express	Competitors
Fares	0.09	0.16
Scope of Service	0.60	1.00
Target Quality	1.00	0.70

5-Year Plan (sketch planned decisions)



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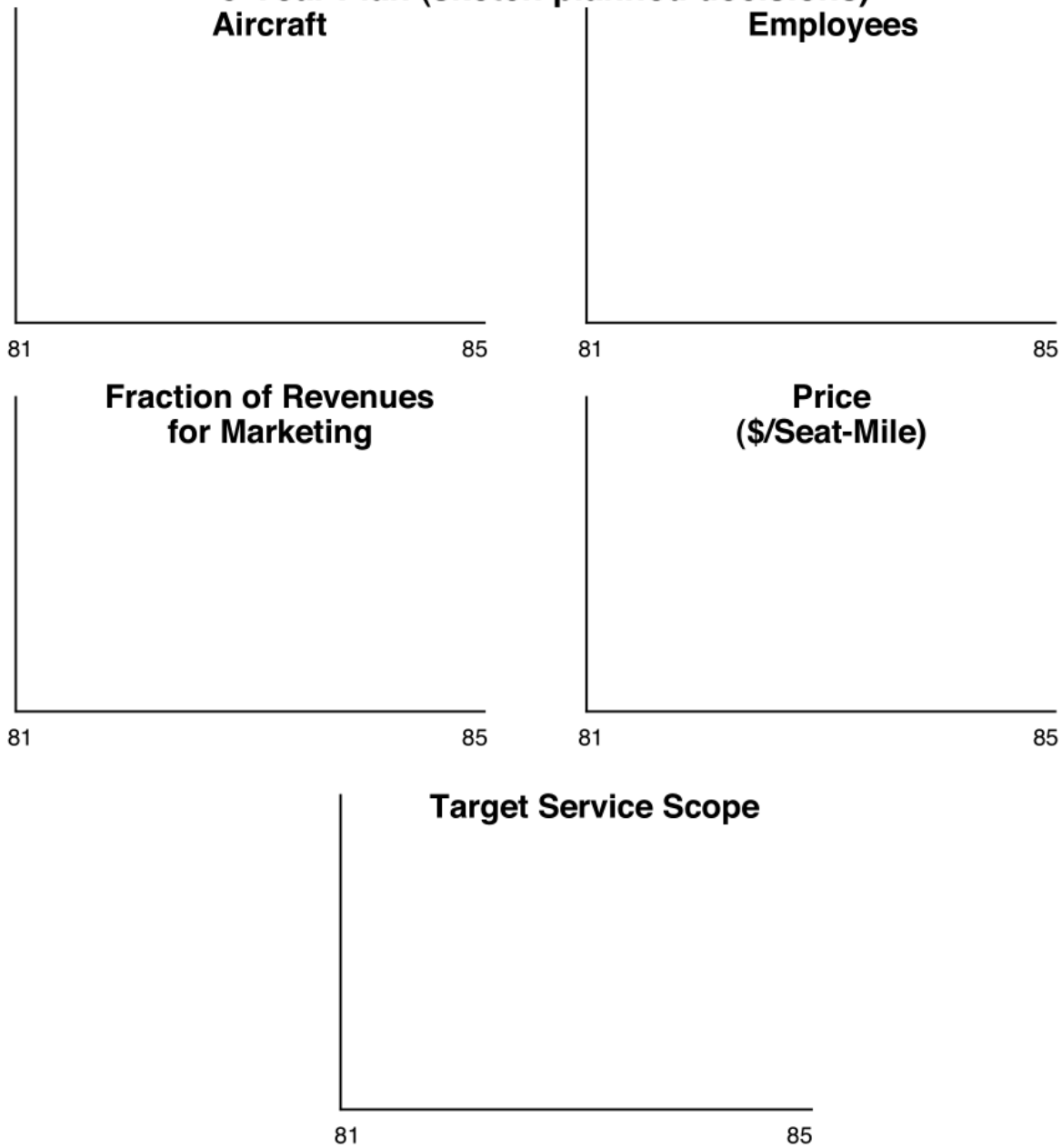

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