

Stents Versus Drug Therapy

A critical thinking exercise on the topic of health care.

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This is an introductory exercise suitable for the first lecture of a beginning course in Operations Management. No prior knowledge of Operations Management is required. A large component of Operations Management concerns quantitative decision-making. However, quantitative analysis is only successful if the underlying measures or objective functions are aligned with the envisioned outcomes. Thus, a fundamental task before any quantitative methodology is applied (such as forecasting, statistical process control, or optimization) is selecting the measures or numerical quantities to monitor and evaluate.

This task immediately raises questions of mission, strategy, and global social welfare, because some performance measures will react counter cyclically to each other. For example, queue length and server utilization are fundamentally conflicted with one another. Choosing either of these measures as an objective for improvement will likely lead to opposing results in the other.

The discussion topic for this exercise is whether surgically implanted blood vessel stents are better for patients and the health care system than alternative therapy with clot reducing medication. The problem statement is obtained by listening to a National Public Radio news item, "Doctors Disagree About Effectiveness, Cost Of Stents", August 26, 2009, by Chana Joffe-Walt. The audio for the story may be found online at <http://www.npr.org/templates/story/story.php?storyId=112264556>. A transcript of the story may be found at <http://www.npr.org/templates/transcript/transcript.php?storyId=112264556>

Instructions

Open your lecture by explaining that Operations Management frequently concerns quantitative analysis of data, but that analysis is only valuable if the data studied represents the objectives of the firm. A critical first step in problem solving and managerial analysis is then choosing which data measures to study. Emphasize to your class that "measurements" are important factors to choose with care, and that much of Operations Management ultimately is about choosing and evaluating measurements.

Clarify to your class that measurements must be tangible, visible, and "measureable". They can not be feelings or vague desires. Also discuss how measurements must be defined so that there is mutual agreement, so that all parties agree on how the data is collected and what the data means.

Prepare your students to listen to the news story by asking them to answer fundamental questions from the news story:

1. What are the goals and objectives
 - a. Of the doctors
 - b. Of the patients
 - c. Of other interested parties (government, citizens, family members)
2. How should we measure progress to these goals and objectives?
3. What defines “success”?

Play the news story to the students (if presenting live in class).

Afterward, moderate a discussion to answer the questions above, as well as the following questions:

1. Are doctors recommending stents to increase their income?
2. Is one procedure better than the other? Ask your students to explain their decision.

As you question the students, consciously drill them, and analyze their answers. When students give vague answers like “Improve the quality of health care”, ask the student to modify their answer and give some measurable, tangible item. Force students to modify their answers so that they are thinking about real, quantitative measures that can be mutually verified.

A reasonable assertion, both from the story description and for the purposes of discussion, is that both treatments result in equal effectiveness outcomes at the end of their normal treatment time.

Assuming the doctors are unselfish, the goals and objectives are fairly universal for all: longer life expectancy (fewer cardiac deaths), better quality of life (return to work, return to recreation), and access to treatment for all (low cost, or cost within ability to pay).

What are the measures? Note and emphasize that these are all transparently *measurable* statistics.

- Cost of treatment
 - Cost of labor
 - Cost of materials
 - Cost of lost work time by patient
- Cost of failure
 - Cost of death
 - Cost of disability
- Treatment outcome
 - Time to complete treatment
 - Dimensions of blockage in artery (verified by diagnostic scan)
 - Pain, measured by survey or by brain scan
 - Heart rate, blood pressure, other health statistics

What defines success?

- Treatment without errors or accidents
- Patient returns to work, normal life
- Discuss longer life versus quality of life

Final Answer

Ultimately this discussion hinges on the objectives of the two doctors in the story. Their disagreement is fundamentally driven by a lack of awareness of each other's primary objective. Dr. Teirstein's objective is speed of treatment. This is clear from the story's emphasis on the patient's instant relief after insertion of the stent. Dr. Topol's objective is low cost treatment. Neither doctor is "correct" in their assessment, because they do not share the same objectives. Neither doctor is "wrong" in their treatment, because both treatments will ultimately lead to a successful cure.

It is reasonable to claim that Dr. Teirstein is in fact NOT motivated by greed.

Discuss with the class how this is emblematic of the debate over health care nationally. Discuss how later topics in the Operations Management course will demonstrate a hard, quantitative tradeoff between speed and cost (specifically in queuing, but also in other topics). The health care debate is difficult because some parties seek lower cost, some parties seek responsive service, and some parties believe both may be achieved simultaneously. Discuss how currently national health systems like Canada focus on low cost, while the current U.S. health system is motivated more by responsiveness, and thus is more expensive.

This could be tied to Chapter 2 of Heizer/Render, *Strategy*, by including the topic of competitive advantage. Dr. Topol pursues a low cost competitive advantage, and Dr. Teirstein pursues a response advantage.