CASE STUDY | TRIZ on Triage

We've all been to the emergency room at one time or another, so we know how stressful it can be from the patient's perspective. Take the case of a girl who visits the emergency room (ER) after breaking her arm in gymnastics: Although she is in pain and crying, her parents have to make sure all the paperwork is completed before she gets treated for her injury.

Of course, the girl isn't the only one in the ER; many others are there too, each with their own injuries and illnesses. And the hospital is obligated to see each and every one of them, regardless of their insurance status or ability to pay. Even those who might end up referred out are at least seen and evaluated.

The process of checking patients into the ER is called triage, and it exists for a number of reasons. One, it determines the nature and severity of a person's injury as soon as possible after arriving. Two, it determines the insurance status of the patient and/or their ability to pay. Three, it helps determine the order in which patients are treated, considering their needs and available resources.

BMGI had the privilege of analyzing a triage system for a major hospital network in the Boston area. The network had determined triage problems and inefficiencies were compromising the quality of patient care, as well as the hospital's ability to cost-effectively meet its own business needs.

BMGI had the privilege of analyzing a triage system for a major hospital network in Boston. The triage problems and inefficiencies were compromising the quality of patient care and the hospital's ability to run itself efficiently and cost-effectively.

The front end of the triage process is typically bottlenecked by a lot of paperwork and fact checking. Patient name and address, phone number, insurance card and information, who to contact in an emergency, a description of their injury or illness and other information.

This Boston facility was not unlike others in that processing all this paperwork took time, while patients waited with their needs, which were all serious or they wouldn't be there. Nevertheless, there is legal documentation that must occur; a connection with an insurance company has to be made; a hospital has to do what it has to do before treating a suffering patient.

Initially, this hospital felt it could improve patient wait time and also help itself by automating the patient sign-in and insurance-verification process. Doing so, it thought, would make the process faster and more error-free. After implementing an automated system, the process did run faster – but errors were not improved as expected. In the new automated system, initial data was only entered (and therefore checked) once, whereas before it was checked multiple times by virtue of different people handling the same set of physical papers.

The Theory of Inventive Problem Solving (or TRIZ)

TRIZ is a Russian acronym that, translated, means "theory of inventive problem solving." The roots of TRIZ go back to the mid-1940s, when Russian engineer Genrich Altshuller initiated extensive research into the world's database of patented inventions.

Forty years and 1500 person-years of research later, Altshuller had probed into more than two million globally distributed patents, and had discovered that innovation isn't a random process. Rather, it's governed by certain objective principles and follows certain well-worn patterns, and all this can be taught to anyone.

As a result of his investigative and analytical work, the Russian and his colleagues codified 11 evolutionary principles, 40 inventive principles and 39 generalized parameters for solving engineering contradictions, which lie at the root of all innovation problems.

If you understand these universal principles, you can resolve the contradictions of nearly any innovation problem, whether it exists under a microscope, in outer space or anywhere in between. Thinking analogically with Altshuller's contradiction matrix, you can locate the inventive principles that will guide you to a successful solution and innovation.

Because of Genrich Altshuller and TRIZ, the ability to spawn something new is no longer a function of happenstance or enigmatic breakthrough. What was once the property of geniuses is now the property of all.

Now the hospital still had a problem on its hands. "Paperwork" errors still existed, and patients still had to wait for medical triage. "We found out faster whose insurance pays for what, but many of our patients still had to wait in long queues," said the ER director.

Therefore, there was a second problem to solve: patient waiting time, the improving feature of a technical contradiction that was abstracted to TRIZ Problem Parameter 39, productivity. The degrading feature of the contradiction was the increased risk of misdiagnosis or error (as the time to perform triage gets shorter). This degrading feature maps to Problem Parameter 27, reliability.

Using the contradiction matrix, the nexus of these two parameters yielded inventive principles 1 (weight of a moving object), 35 (parameter changes), 10 (preliminary anti-action) and 38 (strong oxidants). Principle number 35, parameter changes, led the project team to a solution.

Learning about parameter changes, the project team discovered this can mean changes in the flexibility of a system, material, part or person. While staff doctors and nurses have little flexibility in their schedules, interns do. They are available before and after their rounds to assist in the logistics of processing patients and to perform certain triage functions.

After a little bending and stretching of the intern's schedule and commitments, a new triage process was installed that took a major step toward patient satisfaction. The formerly serial activities of administrative and medical triage were now simultaneous, and patient wait times dropped. In addition, diagnostic reliability rose as a result of the intern's involvement.

After new triage process was installed, administrative functions were streamlined, diagnostic reliability rose, patient wait times dropped and patients were more satisfied

This case study was excerpted with permission from Insourcing Innovation, an Auerbach Publications book, the lead author of which is BMGI's CEO David Silverstein.

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