

## Improving Healthcare: One Patient at a Time

What do a waiting room of patients at a busy Indianapolis healthcare clinic and an assembly line of cars at an automobile manufacturing plant have in common? Both can lead to a host of workflow problems if they aren't handled correctly. That's the assumption of new research by Herbert Moskowitz and Shuresh Chand at the Krannert School of Management at Purdue University in West Lafayette, Indiana. They conducted their research through the Regenstein Center for Healthcare Engineering at Purdue.

Both professors have specialties in manufacturing management, but they became interested in applying their expertise to the healthcare field after hearing Paul O'Neill, former Secretary of the Treasury, speak at the University of Minnesota. As the CEO of the Pittsburgh Regional Healthcare Initiative, O'Neill emphasized the problems with the current healthcare system.

"He said that there was a need for people with skills in operations to help make healthcare systems more efficient and effective," says Moskowitz. "That was a great motivation for me."

When the Indiana University Medical Group (IUMG) approached Moskowitz for help in improving patient flow at the most problematic of its 18 outpatient clinics, he and Chand had the perfect opportunity to apply manufacturing management principles to healthcare. Their work with IUMG is outlined in the paper "Improving Patient Flow at an Indiana University Medical Group Outpatient Clinic: An Application



Krannert School of Management professors Shuresh Chand (left) and Herbert Moskowitz with their computer simulation designed to streamline operations at an Indianapolis health clinic.

of Factory Physics and Six Sigma Principles."

Moskowitz and Chand pinpointed several problems with the clinic's operations. First, patient wait times at the clinic were long and unreliable. Second, inefficient patient processing caused backlogs. Because each medical assistant was assigned to a particular doctor and processed only that doctor's patients, one assistant might be overwhelmed with patients while another might have none at all. Third, patient arrivals were erratic and unreliable. Even though the clinic made appointments six to eight weeks in advance, it experienced a patient no-show rate of a staggering 40 percent.

As a result, doctors often ran late in seeing their patients; or, if a patient failed to show up, they had

times when they weren't seeing anyone. "With that kind of no-show rate, doctors are often underutilized," says Chand. "Long waiting times and uncertainty about when patients will see a doctor only make no-shows worse."

The researchers decided to apply two tools readily available to manufacturing but rarely used in healthcare: factory physics, which targets the behavior of a manufacturing environment, and Six Sigma, the quality improvement methodology used at companies like Motorola and GE. "Right now, most healthcare operations simply don't have a systematic way of scheduling and processing patients," says Moskowitz.

After observing clinic operations, the two researchers created an animated simulation using Extend,

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— Herbert Moskowitz, Krannert School of Management at Purdue University

a simulation software application from Imagine That Inc., a company in San Jose, California. Using the simulation, they recommended that the clinic implement the following improvements:

■ Convert 60 percent of its traditional advance appointments to same-day appointments (those made no more than 48 hours before arrival), which have a no-show rate of only 3 percent.

■ “Batch” patient arrivals so that patients arrived in groups, rather than one at a time. For instance, the clinic would ask nine patients to arrive for 8:00 a.m. appointments. New patients would be asked to come ten minutes early, while old patients would be asked to come five minutes early to spread arrivals. By batching patient arrivals, the clinic could avoid the workflow problems that come with patients arriving late or not at all.

■ “Pool” patients into a single queue in the waiting room, so that patients have equal access to all medical assistants. If one assistant is answering the phone or locating a missing record, another assistant would still be available to help patients in the waiting room.

In the simulation, the changes reduced bottlenecks, improved physician utilization, and improved the no-show rate. The percentage of patients whose wait to see a physician exceeded 20 minutes was reduced from 27 percent to just more than 3 percent. Clinic staff members were so impressed with the simulation that they plan to put these changes into action.

Moreover, Moskowitz and Chand, as well as students who helped with the research, learned a great deal from working with the real-world healthcare environment. “I’m now

more effective in teaching the MBA students in my process improvement course,” says Chand. “By studying the clinic’s operations, we saw many things we don’t often see in a manufacturing environment. Batching, pooling, telephone interruptions—seeing so many elements in a single example is truly rare.”

Moskowitz and Chand will continue to use simulations to experiment with new approaches to improving patient flow—thereby reducing cost—in healthcare environments. They are now pursuing funding to study the use of radio frequency identification (RFID) technology to streamline patient processing.

With healthcare costs on the rise, companies in all sectors are eager to find ways to make the healthcare process more efficient, says Moskowitz. “A significant portion of the cost of any product pays for employee healthcare. By making healthcare operations more efficient, physicians, staff, and patients, as well as the patients’ employers, all benefit. It’s win-win-win,” he says.

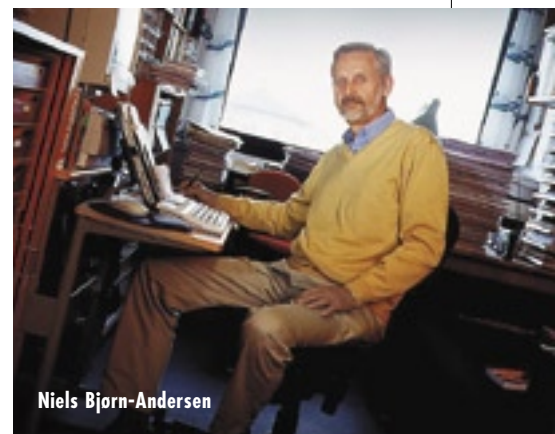
To read more about this and other research at the Regenstein Center, visit [www.purdue.edu/discovery/park/rche/index.php](http://www.purdue.edu/discovery/park/rche/index.php).

## ■ The Death of the Printed Page

A recent study by Niels Bjørn-Andersen, a professor at Copenhagen Business School’s Department of Informatics in Denmark, predicts the demise of the printed page may come sooner than many think, as it loses ground to electronic transmissions of information. At a recent CBS conference, the “eMedia-Nordic Seminar on eBusiness and Media,” Bjørn-Andersen noted that big players

like Google, Amazon, and Wikipedia are likely to win the media wars in the coming years.

E-business, says Bjørn-Andersen, is growing at 30 percent to 40 percent per year. This means that traditional publishing companies are being threatened by companies like Vodaphone, Nokia, Microsoft, Google, and Amazon, as they begin to deliver content via PDAs and mobile phones. Printed information sources like the Encyclopedia Britannica are also threatened by the new



electronic sources, such as Wikipedia, a popular online encyclopedia.

Furthermore, Bjørn-Andersen points out that while consumers are quite happy to receive information on the Internet, very few Internet users are actually willing to pay for online content. “It is very difficult to create a sustainable revenue flow from Internet publishing,” says Bjørn-Andersen on his Web site. “E-media is not stealing the business away from newspapers. It is simply eroding the current business models.”

Finally, Bjørn-Andersen notes that, in the future, users will increasingly personalize content for their individual consumption. “It is no longer a question of a ‘push’ strategy, where

a media editor will decide the content,” he says. “Rather it is a ‘pull’ strategy, where each of us will decide for ourselves one way or the other what we are interested in receiving.”

For more information about the eMedia project, visit its Web site at [uk.cbs.dk/forskning\\_viden/konferencer/emedia](http://uk.cbs.dk/forskning_viden/konferencer/emedia).

## Mind Over Marketing

Physicians have long seen the placebo effect with their patients—that is, if patients *believe* a pill will make them feel better, it often does, even if the pill contains nothing of medicinal value. Ziv Carmon, associate professor of marketing at INSEAD in Fontainebleu, France, and his colleagues Baba Shiv, associate professor of marketing at Stanford University, and Dan Ariely, professor of management at MIT, wanted to discover whether or not the placebo effect also held true for marketing messages. Could consumers’ beliefs about a product affect how well it worked? In a paper recently published in the *Journal of Marketing Research*, the researchers found that factors such as price and marketing message can actually increase or decrease a product’s effectiveness.

“It has been highly documented that consumers believe that higher prices tend to reflect higher quality,” says Carmon. “We wanted to see if consumers’ seemingly baseless beliefs about a product may be self-fulfilling.”

In a preliminary study, the researchers gave 38 members of a fitness center an energy drink, Twinlab Ultra Fuel, before their workouts. One group of participants was told the drink was purchased at its regular price of \$2.89; another group was told that the regular price

of the drink was \$2.89, but that it was purchased at a discounted rate of \$.89. After their workouts, each participant was asked to rate the intensity of the workout. The researchers found that those who believed the drink was discounted reported feeling more fatigued than those who believed the drink was purchased at full price.

This study, however, measured only the participants’ *perceptions* about product efficacy. The researchers wanted to see whether marketing factors could actually *influence* a product’s effectiveness. Therefore, they set up another series of experiments to see what effect price and marketing have on product efficacy. In each experiment, groups of students consumed an energy drink



Ziv Carmon

called SoBe Adrenaline Rush, a drink that claims to improve mental acuity, and then solved a series of puzzles.

For example, one experiment focused again on product discounts. Some students were told their university billing accounts would be charged full price, or \$1.89, for the SoBe drink; others were told that the product’s full price was \$1.89, but that they would be charged a discounted price of \$.89. Both groups then consumed the drink and, after ten minutes, solved a series of puzzles. A control group solved the puzzles but was not told about the drink and did not consume it.

In another experiment, researchers studied the power of marketing messages on product efficacy. In

## UPCOMING & ONGOING

### NEW RESEARCH COMPETITION

The International Finance Corporation (IFC) and the *Financial Times* (FT) have launched their first annual research paper competition to promote private sector development. The competition, “Business and Development: The Private Path to Prosperity,” invites research papers targeted to the international financial community. “A healthy private sector is a critical element of long-term poverty reduction,” says Thomas Davenport, manager of IFC’s Foreign Investment Advisory Service unit. “Exciting new paradigms are emerging, and we hope this competition will help bring them to light.” Awards include one Gold Award of \$30,000, two Silver Awards of \$15,000 each, and three Bronze Awards of \$10,000

each. For information and an entry form, visit [www.ifc.org/competition](http://www.ifc.org/competition). Deadline for entries is set for June 30, 2006.

### NEW CENTER TACKLES GLOBAL ISSUES

The University of Warwick’s Centre for the Study of Globalisation and Regionalisation has been awarded €5 million by the European Commission to create an international network of more than 250 scholars. The network will provide research to help governments devise responses to global problems such as terrorism, disease control, gender inequality, and the environment. The Network on Global Governance, Regionalisation and Regulation (GARNET) will be directed by Warwick professor Richard Higgott. Its advisory board will be chaired by Pascal Lamy, director-general elect of the World Trade Organization.

**"MARKETING MAY BE MORE POWERFUL THAN COMPANIES REALIZE."**

—Ziv Carmon

this experiment, before consuming the drink and solving a series of puzzles, a group of students read a marketing message that included the statement, "drinks such as SoBe have been shown to improve mental functioning, resulting in improved performance on tasks such as solving puzzles." A control group solved the puzzles without consuming the drink or reading the message.

In both cases, researchers found that the placebo effect holds true for marketing as well as medicine. In the first experiment, students who believed they were paying full price solved more puzzles correctly than either those who believed they were paying a discounted price or the con-


trol group. In the second, students who read the marketing message solved more puzzles correctly than those who did not.

Such studies as these could change the way companies view their marketing and discounting practices, says Carmon. "Companies need to think more carefully about whether price discounts are the best way to promote sales," he says. Because of the placebo effect, discounts may actually make a product less effective.

At the same time, the study also raises interesting ethical dilemmas for marketers, who could use the placebo effect to make false claims or raise the price simply to improve its effectiveness in the marketplace. "Even mod-

est placebo effects may make false claims legitimate," the researchers write in their paper.

In the future, Carmon and his colleagues plan to study whether the country where a product is said to be made may also produce a placebo effect; or whether an unbranded, but otherwise identical, medication may result in less effective healing. In each of these situations, says Carmon, "marketing may be more powerful than companies realize."

To read the entire study by Shiv, Carmon, and Ariely, "Placebo Effects of Marketing Actions: Consumers May Get What They Pay For," visit Carmon's Web site at [faculty.insead.edu/carmon/cv.html](http://faculty.insead.edu/carmon/cv.html). 

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