

## **SIMULATION OF A CANCER-TREATMENT FACILITY**

Melanie Barker  
Rockwell Automation  
111 N Market St #200  
San Jose, CA 95113

Andrew Mayfield  
Founder - Adaptive Strategy Management  
Affiliated Vice President - The North Highland Company  
Atlanta, GA

Darrell Starks  
Rockwell Automation  
13405 Eastpoint Centre Dr #107  
Louisville, KY 40223

### **ABSTRACT**

A cancer-treatment outpatient facility was struggling with operational issues that were affecting both their patients and staff, leading to conditions that routinely delayed patients' appointments and prevented nurses and other staff from leaving at their scheduled shift end time. A simulation model was created of the facility to prove that changes to the operation and scheduling practices could deliver a better experience for both patients and staff. With the simulation as a proof of concept, the processes and schedules at the facility were modified, leading to an estimated 15,000 hours of patient time saved per year.

### **1 INTRODUCTION**

Adaptive Strategy Management (ASM) contracted Rockwell Automation (RA) to create a simulation model of an outpatient cancer treatment facility. The facility was experiencing long waits for patients and high levels of overtime and turnover for their staff. In addition, they were expecting to see an increased demand for their services. ASM was recommending new approaches to scheduling patients and several procedural changes and needed a way to test their recommendations without negatively impacting the patients or staff.

### **2 MODEL DEVELOPMENT AND VALIDATION**

The Rockwell Automation Arena consulting team flew to the facility to meet with ASM and other members of the outpatient facility staff. They spent two days at the site discussing the current processes and what new plans were being recommended. After these discussions, the RA team developed a functional specification defining the processes to be modeled. ASM and the outpatient facility agreed that the specification accurately described their processes and development was ready to begin.

Model development took place over the course of the following three weeks. The model was driven by the patient schedule, allowing the users to test multiple versions and see the impact of different scheduling rules. Several operational changes to procedures were also included in the model as options so that the current and proposed processes could be tested using the same simulation. After the model was completed, one of the RA consultants returned to the facility to complete validation that the model accurately portrayed

*M. Barker, A. Mayfield, D. Starks*

the existing system. Along with the ASM team, RA ran the model with the current schedule. After some minor tweaking of the input data and model logic, the model produced results that were almost identical to the real world metrics. Once the model had passed validation, the team was able to start changing the input data parameters and testing their new plans for the facility.

### **3 RESULTS**

Once ASM had tested their various schedule options, they were able to make a recommendation to the outpatient facility for how to modify the patient and staff schedules. The facility tested the new schedule and procedural options for three days and achieved a 40% decrease in wait times for patients. After implementing the new schedules and procedures, overall patient wait time dropped 65 – 70%. This has resulted in an estimated 15,000 hours of patient time saved per year.

The clinic is now operating on the new schedules and will be applying the analysis done at other clinics within their network. Using the Arena simulation software package, ASM was able to improve the experience for both patients and staff with minimal disruption.