

Call Center Simulation Enhances Planning and Performance

by Vijay Mebrotra

For years call centers have made crucial changes — modifying call routing and priorities, creating new queues, scheduling and cross-training agents, consolidating sites, adding outsourcers — without using effective analysis tools to assess the impact on customers.

Recently, simulation (aka. “discrete event simulation”) has been identified by many call center managers as an important tool for operations planning and analysis. However, the concept of simulation remains mysterious to many call center professionals. In addition, many managers are still confused about the differences between simulation and workforce management (WFM) software.

This article will help provide a clear understanding of what simulation is, how it is fundamentally different from traditional WFM software, and how it can be valuable for your call center operations.

What Is Simulation?

To understand simulation, think of your call center as a system. In this system, telephone calls are processed by many different types of resources — trunk lines, queues, agents — that interact with one another dynamically. Managers evaluate the performance of this system by examining metrics such as service level and abandonment rate.

A simulation model is a computerized representation of a call center system. Simulation analysis is the process of creating this model, running it under different conditions, and studying the results to help make solid decisions about the future.

Once created, this computerized model can be modified easily and run quickly on a desktop PC. In just a few minutes, you can “simulate” call center operations for specific hours, days, weeks, and months. This provides two advantages:

1. It allows you to make different adjustments to your call center and to quickly see the impact of these changes on performance.
2. It enables you to analyze operational changes without treating your customers as human guinea pigs.

“The introduction of call center simulators gives management a tool that allows for trying out all new ideas in a laboratory setting,” says Martin Prunty, a leading industry analyst and consultant. “This takes the risk out of evolving call center technologies and allows managers to make informed decisions.”

Old Concept New to Call Centers

Simulation is not really something new, rather an established technology that just happens to be new to the call center industry. Simulation has been used since the 1950s to design and analyze production facilities in the automotive, steel, and aerospace industries. In the past two decades, simulation has become widely used in many service industries as well, including transportation, field service, health care, and fast food.

There are several reasons why simulation has emerged recently in the call center industry:

1. Increased complexity of call center operations. Technical innovations such as skill-based routing, networked call centers, CTI, and call blending have made the routing and handling of calls more complicated than ever. In addition, the broad business trend towards “mass customization” has led to an ever-wider range of products and services being developed, marketed, sold, and serviced via call centers. The result: today’s call centers are more complex than ever to manage.
2. Growing strategic value of call centers. As customer service becomes an increasingly important differentiating factor among companies, corporate executives are finally starting to understand that call center operations provide customers with a primary view into the company. As a result, call center design and management must be done with more careful analysis because of the direct impact that these decisions have on the customer experience.
3. Industry-specific software tools. In the past, creating a simulation model was a cumbersome task that required expensive programmers and analysts working for months at a time. The time and costs kept simulation from being a viable option for most call centers. Today, however, several commercially available simulation products that are tailored specifically to the call center indus-

try provide a much cheaper and faster pathway for managers to benefit from the results that simulation models can deliver. For example, Systems Modeling's Call\$im, released in 1997, has a user interface built around call center terminology and includes features such as out-of-the-box integration with Visual Basic, animation, and customized output to spreadsheets. All of this shields the user from the underlying programming, greatly simplifying the process of building call center models, importing data, conducting experiments, and analyzing results.

The Difference between WFM and Simulation

Some confusion still exists about how WFM software and call center simulation tools relate to one another. Some of the most frequently asked questions include:

- "What's the difference between simulation and scheduling?"
- "Will simulation take the place of my scheduling system?"
- "Should I plan to integrate my WFM software with some kind of simulation?"

While this confusion is natural, it can be paralyzing. Let's discuss the similarities and differences between these two valuable and

complementary technologies.

Simulation tools and WFM systems both work by creating a computerized model of call center operations. Both technologies require input about historical call volume, average handle time, agents and shifts. However, there are two fundamental differences. Taking service goals (i.e., service levels, average speed of answer objectives, occupancy levels) as inputs, WFM systems are based on algorithms that assign agents to shifts in an optimal manner, with these agent schedules as the key outputs.

In building schedules, WFM tools make several simplifying assumptions about factors such as call routing, agent skills, call priorities, off-phone activities, and customer abandonment. In contrast, simulation tools take agent schedules and call forecasts as inputs, along with detailed information about trunk lines, call routing, and priorities, including IVR logic, overflow, skills-based routing, and call blocking. Simulation also treats customers' tolerance for waiting as an input into the system; the longer a customer waits, the more likely he or she will abandon. Simulation's outputs are detailed and accurate predictive information about service level, average speed of answer, agent occupancy, and abandonment rates.

Thus, in essence, a WFM system is an operational tool for creating agent schedules, while making several significant simplifying assumptions in the process. Simulation is a strategic analysis tool that provides more detailed and accurate results about how the call center will perform under different conditions.

WFM vendors have recently been talking about the "simulation capability" of their products. However, the "what-if" capabilities of scheduling software — also referred to as "static" or "analytic simulation" — do not deliver the accurate and detailed performance results that the discrete event simulation models discussed in this article do.

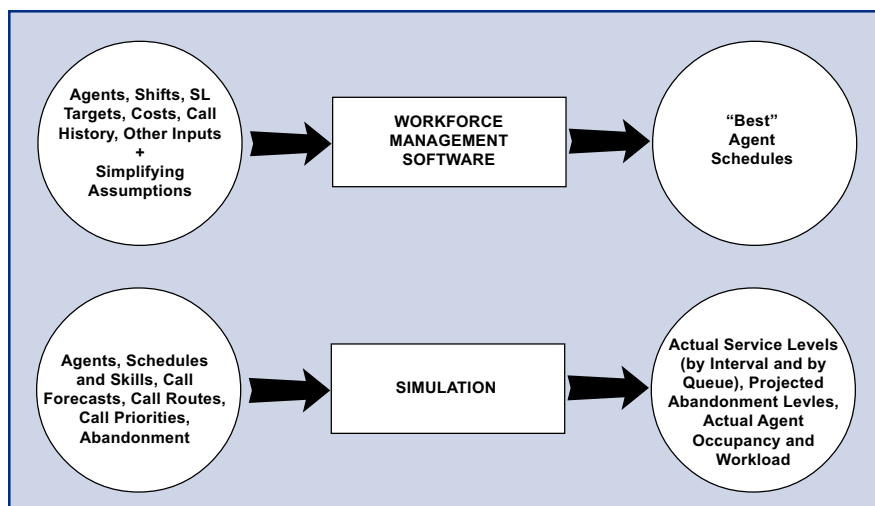
How Simulation Is Used in Call Centers

To use call center simulation effectively, it is essential to understand the business questions that you are trying to answer. Within the call center industry, simulation has most commonly been utilized by managers to address the following types of decisions:

- Capital equipment purchases
- Call routing and agent skill-set/training identification
- Management of diverse workflow (inbound, outbound, e-mail, etc.).

Capital equipment purchases. Today, the breadth of technology that can be deployed in call center operations is amazing. From simple IVR units to complex CTI technology, managers face many decisions about new technologies, which are typically expensive propositions. Such major purchases are too-often made without a solid understanding of how the capital investment will translate into better service levels and/or lower costs.

Simulation has frequently been used to help call center managers quickly understand how technology purchases will



— or will not — pay off. For example, one major government agency using simulation was able to make a strong cost-justification case for funding the purchase of new CTI hardware and software. In building and analyzing a Call\$im model, the management team was able to see the dramatic impact in service quality that would result from the implementation of this CTI solution.

Conversely, another company with a multi-site call center operation saved over \$500,000 by NOT purchasing new ACD equipment that featured advanced routing capability. Simulation analysis revealed that the impact of this new routing on service was actually quite limited, given the company's customer-base and call volume mix.

Call routing and agent skill-set/training identification. Not long ago, most call centers received one type of call that could be handled by any agent. However, today's ACD and CTI solutions allow for sophisticated call routing, including features like multi-skilled agents, call overflow, call priorities, and call transfers across multiple sites.

Managing all of this can be bewildering when you are trying to stick to (or define) a budget and meet service level commitments. For example, I recently worked with a company that wanted to introduce a priority-service program for customers who were willing to pay an additional fee, with a money-back guarantee for customers who had to wait more than 60 seconds. Simulation was used to determine the number of

agents that needed to be cross-trained in order to meet this guarantee and to understand the impact of this ACD logic on the rest of its customers.

Another client, a financial services organization providing several different types of services to a diverse customer base, has used simulation models over the past few years to understand the implications of different agent skill-sets (and associated training requirements) on customer service levels.

Other organizations have used simulation to determine how to consolidate a number of call centers into a single site, to examine the implications of different inter-site routing logic, and to support decisions about how/when to deploy outsourcers.

Management of diverse workflow. Today many traditionally inbound call centers are now contending with e-mail, fax, and Web-based traffic, while other centers are creating "blended" agents who handle both inbound and outbound calls. These trends are expected to accelerate significantly over the next few years.

For managers, the challenges of workflow planning and capacity management are even more acute when they are required to provide service and support to customers across multiple types of media. Fortunately, simulation models enable analysts to examine different schedules and work rules and to see the impact of management decisions on service levels for different customer types.

A Powerful Tool for a Dynamic Business

To be successful, call center managers must make many important and unique decisions. In the past, these decisions were based on back-of-the-envelope calculations, spreadsheets, gut feel or tradition. But the call center business has changed. Today, such strategic decisions are more complicated — and more important — than ever before. Simulation serves as a powerful analysis tool, enabling managers to understand the implications of different decisions on the overall performance of the call center system. The result: better decisions, better service and lower costs.

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