

A d v a n c e d T o p i c s

The Big Picture Optimizing Your Long-Term Staff Plan

By Ric Kosiba, Ph.D. , Bay Bridge Decision Technologies

Wow, has it ever been an up and down few years. It certainly hasn't been an easy time to get our call volume forecasts right. However, there probably hasn't been a time when getting the yearly staffing plan right would pay such great dividends as right now.

The Treadmill

When we speak of a "staffing plan," we are speaking of the long-range hiring/firing, overtime/leave plan. While we all spend the majority of our time focusing on the tactical and scheduling aspects of our job, it is arguably more important that we get the long-range staff plan right in the first place. The argument is: if you don't have enough people trained and in the door, you can't optimally schedule them, and then you must jump through hoops getting overtime to cover your calls.

We have spoken to many companies that are currently paying the price associated with staffing too conservatively in the first part of 2003. These companies had hiring freezes (note: executive-level decisions) enacted during the first months of 2003 only to see their businesses skyrocket in the latter half of the year. Now that the economy has turned around, these companies find themselves on a very difficult treadmill:

- They need to hire like crazy.
- They are forced to be a tad less selective in their new hires.
- They are cutting back new hire training to get agents on the floor.
- They are requiring a lot of overtime.
- Their occupancy is too high.
- They are losing many experienced agents from burn-out related attrition.
- They are providing poorer customer service and sales performance.

So how do you get off the treadmill? Or better yet, how do you avoid the treadmill altogether?

The Answer: Save Your Execs From Themselves

To avoid this treadmill, you simply have to explain to your senior management what is going to happen if they make the wrong hiring and budget decision. And convince them to do the right thing. That's all.

So how do you do this? I've tried just blurting out "I think you're wrong" to the VP at a budget planning meeting with little analysis in my back pocket. Trust me, it doesn't work well. But what does work well is a systematic approach to developing multiple planning scenarios and letting your management choose those scenarios that are considered most likely.

When discussing future planning options, it is important to take both the most likely scenarios and the most pessimistic or troublesome scenarios, develop staffing plans for each and cost them all out (both financial costs and operational performance). This implies agreeing on the scenario assumptions (e.g., call volume forecasts and growth assumptions, revenue per call forecasts, handle time forecasts, fixed and variable cost assumptions, etc...) and having the tools available to quickly develop a staffing plan (or multiple staffing plans per scenario) that results in acceptable operational and financial performance. Or it is possible that the growth scenario is well understood and accepted, but the staffing plan is being debated. Again, all likely planning scenarios must be considered (e.g., hiring to service standards vs. delaying hiring for several months vs. hiring freeze).

In other words, you need to produce many versions of the budget, but with different starting assumptions. For example, one scenario might be "Most Likely Scenario," while the next might be "Moderate Growth Scenario" where call volumes increase modestly throughout the year above those of the "Most Likely Scenario." The trick is to cover all of your bases and have arguments for the possibility for each scenario. Sounds simple, right?

Then There is All the Work You'll Need To Do

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[The Big Picture](#)

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Of course, what we’ve described is an awful lot of work for most call center analysts. Our planning spreadsheets are slow, inflexible, and inaccurate (although we tend not to highlight this during budget meetings). Putting together one planning scenario is tough enough, let alone multiple scenarios.

But we are starting to see a trend in call center planning. Analysts are beginning to automate many of the planning functions (or purchase simulation tools) in order to make strategic center planning easier and more accurate. The planning process, even ignoring the issue of avoiding planning mistakes, has become more important as our business environments change more often.

But what do you need to do to automate the planning process?

Develop an Interval Model of the Call Center

The first thing that you need to do in order to automate your planning process is to develop an interval (hourly or half-hourly) model of your call center environment. By interval model, I mean a model that allows you to plug in a handle time, a call volume, and a staffing level, and that will tell you what service level, speed of answer, abandon rate, and occupancy you could expect at your call center.

There are basically three technologies that can help your with this.

1. Erlang or Queuing-based Equations: A closed form equation that approximates the staffing level required to meet service goals given handle times and call volumes.
2. Regression Modeling: A modeling technique that uses historical data to develop trends and relationships between pertinent inputs (e.g., call volumes and staffing) and outputs (service levels, ASA’s, etc...).
3. Discrete-Event Simulation Modeling: A modeling technique that mimics your exact operation and performance based on actual center call arrival distributions, handle time distributions, and customer patience.

There are, of course, plusses and minuses associated with each technique. The table below gives an overview of each.

	Erlang	Regression	Simulation
Ease of Use	Very Easy	Moderately Easy – Models need to be developed and coded into the planning tool	Not Easy – Models require statistical analysis up front to develop customer behavior distributions (such as “patience”)
Data Requirements	None – Models are not custom to your center	High – Requires over a year of interval data	Low – Requires minimum of one month’s ACD interval data
Accuracy	Low – Erlang is known to staff 3-6% too high	High and Low – Accuracy is very high when the model is within the bounds of your call center experience. Accuracy is low when the what-if is new	High – Models are extremely accurate on all important metrics
Assumptions	Very limiting assumptions, e.g.: No abandons No call routing	Assumptions are not limiting, unless your what-if scenario is beyond the call center’s experience	No limiting assumptions
Limitation on Analysis	Analysis is limited to developing staffing “requirements.” Multiple fudge factors, such as schedule inflexibility are required.	Analysis is limited to what-ifs around your current center experience. If, for example, your center will grow to a size greater than your experience, the model will likely fall apart.	None – There are no limitations on the analysis you can do with simulation
Metrics Supported	Staffing requirements only	Service level, ASA, abandons, revenue, cost,	Service level, ASA, abandons, revenue, cost,

		profit	profit
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The goal of this modeling exercise is to have an accurate technique that will allow you to predict service metrics, given staffing, call volumes, and handle times. You must spend a fair amount of time validating that your models are accurate. To do this, you simply plug in historical interval information — your staffing levels, your handle times, and your call volumes, and see if your models predict what actually happened (in terms of service metrics) at your call center for that hour. You can look at the error rate between what was predicted in your model and what actually happened in your call center.

Once you are happy with the accuracy of your interval model, you need to roll these models up to a daily, weekly, or monthly view of the center.

Develop a Week over Week Model of the Call Center

Being able to predict the center’s hourly performance given call volumes and staffing levels is nice but it won’t help you put together a budget. That is, unless you roll the call volumes to a week over week view of the center (see example).

One very nice common trait in (almost every) call center is that the distributions of inbound call volumes can be considered constant throughout the year. What this allows us to do is to allocate expected weekly calls to each hour in a predictable fashion. At the same time, we also know employee schedules and the distribution of staffing across a day.

By knowing these distributions of schedules and call volumes, you can enter a weekly call volume and staffing level, and use your hourly models to determine the resulting weekly service that you can expect.

At the same time, if you build into your week over week model the effects of employee attrition, shrinkage, and the lead time to train new employees, etc... you will have a fairly robust model of your year’s performance.

	01/01/03	01/04/03	01/11/03	01/18/03	01/25/03	02/01/03	02/08/03	02/15/03	02/22/03	03/01/03	03/08/03	03/15/03	03/22/03	03/29/03
Full-Time Staff	107.0	106.9	106.7	106.5	106.3	110.4	110.2	109.9	109.7	109.4	109.1	108.7	108.4	108.
# of Transfers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
# of Terminations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
# of New Hires	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Peak # in Learning	0.0	5.0	4.7	4.6	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Payroll FTE	106.9	111.6	111.2	110.9	110.6	110.3	110.0	109.8	109.5	109.2	108.9	108.5	108.2	107.
Planned AWOP FTE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Planned OT FTE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Attrition FTE	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.
Attrition Rate [%]	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.
Holiday Hours per FTE	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
Call Performance [Total]														
FICO	36,264	62,044	62,290	62,537	62,785	63,033	63,282	63,532	63,783	64,034	64,286	64,539	64,793	65,04
AHT [sec]	170	170	170	170	170	170	170	170	170	170	170	170	170	15
Revenue per Call [\$]	5.83	5.83	5.84	5.85	5.86	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.8
Memo Revenue per Call [\$]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Financial Performance [Total]														
Revenue [\$]	212,156	450,037	463,804	470,311	473,639	475,967	477,779	478,832	479,693	480,742	481,570	482,489	483,307	488,01
Memo Revenue [\$]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cost per Call [\$]	3.34	3.60	3.38	3.33	3.31	3.54	3.53	3.52	3.51	3.28	3.27	3.26	3.25	3.2
Total Cost FTE	121,600	277,544	268,314	267,747	267,376	268,730	268,494	268,251	268,014	269,513	269,216	268,915	268,747	271,24

Example of a Week over Week Staffing Model

Let’s Get Rid of Our Workforce Management Tools and Schedule By Hand

Just kidding.

How many of us remember what it was like to have to develop and manage our schedules by hand? Do you remember the great efficiencies we got when we first started using the schedule optimizers? Would you like to go back to scheduling by hand?

The answer, of course, is no way! But I'd like to point to another area of our business where we have yet to take advantage of optimization technologies- long range staff planning.

When developing a long-range staff plan, we do virtually the same thing by hand that we used to do with putting together employee schedules. We try and fit blocks of workers (agents) to blocks of work (calls) over time. If you think of your week over week seasonal call volume demand as the call arrival distribution, then you have virtually the same problem we had when we put together schedules by hand.

The good news is that the same mathematical techniques we use to build schedules (e.g., linear programming) can be brought to bear on the long term staffing problem. And we'll get similar improvements in efficiency that we saw when first implementing optimal schedules.

These techniques have one very cool property; they will return the mathematically provable least-cost hiring (and overtime, leave, and termination) plan that meets our service goals. They'll hire on exactly the right day (considering training and attrition), not a day early or a day late. If you embed these techniques into your planning tool, you'll see tremendous cost savings.

Also, they are much faster than developing the hiring plans by hand.

Roll It Out

Once you've taken time to build or acquire your planning and what-if tool, you will have the ammunition to help in any planning meeting. Once automated, changing your assumptions is a matter of just changing a few numbers. Developing new scenarios takes minutes rather than weeks. When you approach your VP, you'll do it with a stack of scenarios, a laptop, and all the answers. And you will be able to keep your executive team from putting you on that treadmill.

Ric is a charter member of SWPP. You can reach him at EDK@baybridgetech.com or (410) 990-1079.

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