

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

## What-If?

### Getting It Wrong: What is the Cost of Planning Inefficiencies?

By Ric Kosiba, Ph.D., Bay Bridge Decision Technologies ([www.baybridgetech.com](http://www.baybridgetech.com))

## I N S I D E

### [HOME](#)

### [WFM Professional Enjoy Inaugural SWPP Annual Conference](#)

### [WFM Survey Results](#)

### [WFM Survey](#)

### [Evaluating Staff, Cost, and Service Tradeoffs](#)

### [Managing by the Numbers](#)

### [When Workforce Planning Isn't Enough: The Importance of Virtual Queuing](#)

### [What If?](#)

### [Workforce Wizard](#)

### [Spherion Success Story](#)

### [Industry News](#)

### [Events Calendar](#)

### [Bright Ideas](#)

### [Thank You to Sponsors](#)

### [Join SWPP](#)

Visit our website at  
[www.swpp.org](http://www.swpp.org)

### The Best Laid Plans

It was a treat to be at the SWPP Annual Conference this year, surrounded by people who speak our language, have similar career interests, and understand, in detail, the challenges of doing our job well.

But are we all gluttons for punishment? Certainly anyone who forecasts and plans for a living often has their well-laid plans go astray. That is a job hazard of ours.

In this article, we will discuss the key areas of error associated with most contact center planning processes, their potential costs, and the key steps you can take to reduce the risk of "getting it wrong."

### The State of The Art

Contact centers are enormous investments. Our center networks have budgets that can run into the hundreds of millions of dollars. Almost universally, these operations are very complex. And in uncertain environments, developing multiple planning scenarios is more and more important.

So how do we develop these plans? For the short-term, most companies utilize their workforce management tools with high effectiveness. We use these tools to develop schedules and to track trends in call volumes and staff accordingly.

But what about the medium to long term (several weeks to multiple years)? Almost universally, companies manage longer-term plans with spreadsheet models driven by an Erlang calculator. These spreadsheet-based tools require a lot of care and feeding, usually involve multiple "fudge factors," and have often grown large, complex, and unwieldy.

### Erlang Overstaffs

When we ask workforce management folks how accurate their Erlang-based systems are, we almost universally hear: "*I know that Erlang overstaffs.*" Why is this?

Truth be told, very few organizations know the value associated with the implicit overstaffing inherent in Erlang equations. But we need to ask, "What is the cost of these planning inefficiencies?"

All models have assumptions, and the Erlang model that serves as the building block for almost all contact center analysis – and has allowed us to do our job to date – has some whoppers. Erlang assumes your customers will never hang up on you, it assumes that you don't route calls around your network, it assumes that you have an infinite number of phone lines, and assumes that your call customers and agents behave like every other center in the world. Erlang equations were developed in 1917 to allow folks to do call center analysis using an adding machine and a set of tables.

The next question of course is: "*Well, by how much does Erlang overstaff?*"

So how do you get your hands around whether these assumptions are costing your organization real money?

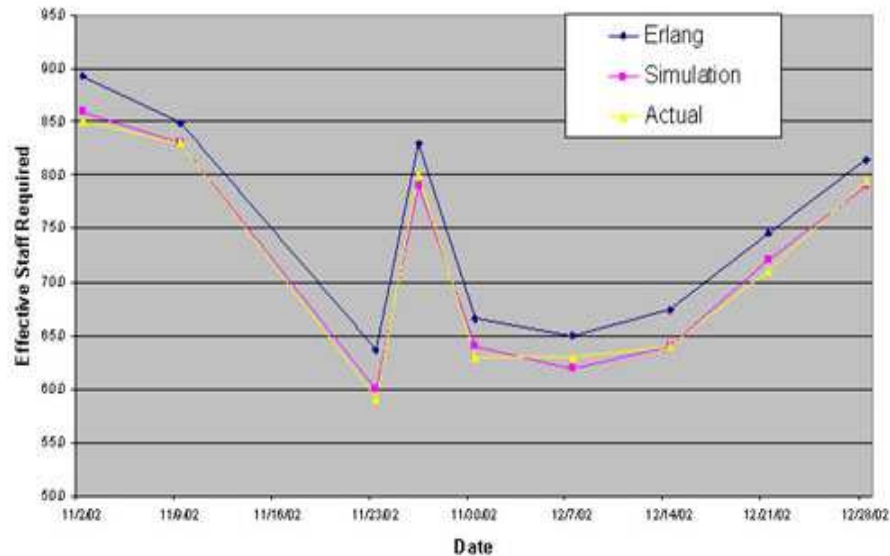
Inside this edition




6508 Grayson Court  
Nashville, Tennessee 37205  
877-289-0004

In Modeling 101, one of the first things you learn is that you must validate your models against reality. To test whether your model predicts the operation well, take data from your history, plug in the known actual call volumes, handle times, and service experienced, and determine if the staff levels (phone plus idle times) predicted by your models mimic the actual staffing that was available.

We often go through the exercise of pitting Erlang against a discrete-event simulation model (our preferred method) of the center and against actual staffing. These graphs typically look like this:



*Erlang Vs. Simulated/Actual Staffing Requirement Across Time*

What we found is that Erlang typically overstaffs by 2-6%, with an average overstaffing of around 4%. That is real money.

### So What? This Pad Helps Me Out!

We often also hear that while planners know Erlang overstaffs, the implicit Erlang pad provides a comfort layer and helps ensure service goals get met if things go wrong in the execution of the plan.

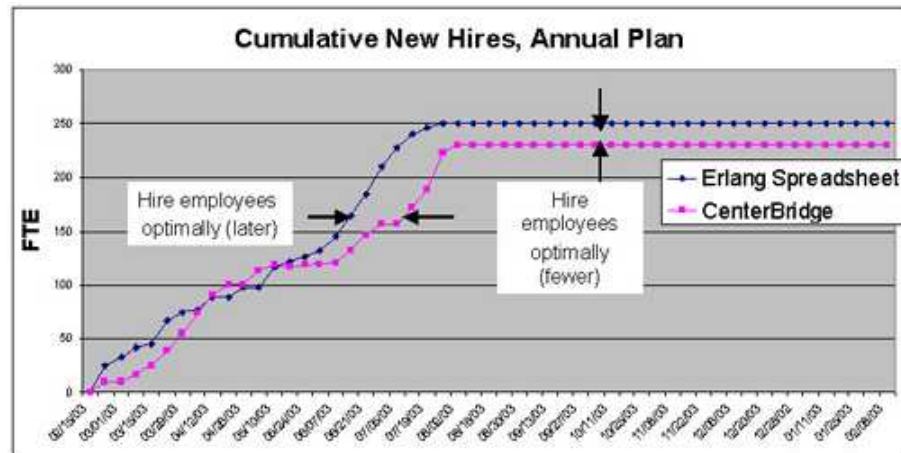
We believe that pads are fine, but that they should be explicit and known. For example, if you think that you need to add a pad to shield the organization from a service failure, do some sensitivity analysis (see the Winter '03 edition of *On Target*), and determine an appropriate percentage. Or if you do not require a pad and want to bank these savings, manage these inefficiencies away by going to a more accurate model (for example, discrete-event simulation) and staffing accordingly.

### Optimize The Long Term Staffing Plan

Among the biggest wins in finding efficiencies in workforce management during the last decade was the application of mathematical optimizers to developing work shifts. Shift optimization, which is available in all workforce management tools, has made a huge impact to the operational and financial performance of our centers. Those of us who have tried to build efficient schedules by hand or by using a spreadsheet would never dream of giving up our shift optimizers and going back to the old days.

But in developing budget-length staff plans (i.e., hiring, termination, overtime, and leave plans) by hand we are doing almost exactly the same thing that we used to do in schedule planning. The peaks and valleys of our hourly call arrivals are directly analogous to the seasonal peaks and valleys you manage when developing a long-term staffing plan. The same technologies used to develop shift bids (e.g., linear or integer programming) can be brought to bear on the problem of managing your hiring and terminations.

So how optimal are our staff plans? In order to determine this, we typically build a linear programming model to optimize the development of hiring, termination, overtime, and leave plans and compare this to current plans. Optimization models like the linear program we employ have one very unique property. That is, they are guaranteed to produce the mathematically provable least-cost staffing plan that meets our service constraints and work rules. In other words, the hiring plan that pops out of the linear program will ensure that we bring all of our new hires out of training on exactly the day they are needed on the phones, not a day early or a day late. Using a tool like a linear program will enable us to determine how much efficiency there is left to capture by hiring and terminating more optimally, as well as optimally planning overtime and leave.



*Cumulative New Hires Against Time, Simulation/Optimization*

### Model Against Erlang Spreadsheet

In this graph, we have plotted the cumulative number of hires from our Erlang-based spreadsheet and compared that with a simulation and linear programming based plan. While your benefits will vary based upon your attrition and other specifics of your center, we generally find terrific improvements in the plan by utilizing these more accurate and mathematically-optimal technologies. The net result is a savings in staff required (4%) and new hire work hours required over the course of the year (5%-12%). This is because the optimal linear programming-based plan tends to hire later and terminate earlier. Again, this is real money.

### The Cost Of The Credibility Gap

There is one other cost, which while normally hidden, can be quite important – the cost of the credibility gap. By providing Erlang/spreadsheet plans that are still known to have inaccuracies, we build in risk to our own reputations and costs to our business. Add to that the long turn around time associated with providing a planning scenario, and the situation gets worse.

The business cost manifests itself, for example, in delayed or inaccurate decisions. By using slow spreadsheet-based processes, important business decisions get delayed, or important scenarios do not get analyzed. The risk of making a wrong (and in our business, large cost) decision is very real.

### What Can You Do?

There are four key steps you can take to reduce the costs of "getting it wrong."

- **Work on your accuracy.** You can move to a more accurate center modeling technique, like discrete-event simulation (see last year's summer edition of On Target), or develop regression models based upon your actual center history. Certainly collecting and storing more data, including call-by-call data, will help you with both of these types of models. Make sure you validate your models against actual call center historical data.
- **Optimize your plans.** Developing an optimization model to be used in long-

term planning will allow you to capture the benefits associated with staffing at the right time and in the right way.

- **Automate your planning process.** It is almost a cliché that planners never have the time to really improve their own processes – they're much too busy building plans and doing what-ifs. But by automating the planning process, algorithms, and reports, not only will you have more time to do real analysis (instead of spending your time producing spreadsheets), you'll add a lot of credibility to your function.
- **Advertise your accuracy.** The best planners always include the history of their own accuracy with their plans and forecasts. By advertising your own performance, you lend credibility to your plans.

### What Are Potential Benefits?

We've summarized the value that we've seen to date achievable by improving the planning process.

- Save 50% to 70% of annual planning and analysis hours.
- Reduce time to market and make better contact center decisions.
- Save 2% to 6% of agent staffing costs.
- Achieve a higher ROI on capital and budget expenditures.
- Increase management confidence in plans and forecasts.

We all know that improving the planning process has real, tangible value. While our job and the planning process will by its nature will always have uncertainties and challenges, if we arm ourselves with analytics, we do not need to be gluttons for punishment any more.

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

Copyright ©2003 Society of Workforce Planning Professionals. All rights reserved.