Accurate Forecasting:
The Heart of Call Center Success
Overview

In times of economic crisis and dwindling profits, it is more important than ever to ensure you are getting maximum benefit from your software investment. One of the biggest threats to a center’s profit margin is wasted labor expense due to inaccurate forecasting. Staffing operational costs account for 70 to 80% of your budget, and can be severely impacted by under- and overstaffing. Unless you are using accurate algorithms you will always be at risk for overstaffing.

Without proper forecasting tools, overstaffing can mean the difference between profit and loss. What causes overstaffing? Simply put, overstaffing is a result of inaccurate forecasting. The importance of accurate forecasting cannot be overstated. Accurate forecasting is the foundation of call center scheduling, and without it, over- and understaffing will occur and impact the profitability of a contact center.

Accurate scheduling is dependent upon the forecast correctly estimating anticipated call volume and determining the number of agents required to meet service levels. How does this affect profitability? In a real life scenario, if call volume is underestimated to the extent that 100 callers out of 1,000 hang up before they speak to an agent in a sales environment where the average order is just $50, $5,000 in lost revenues will occur per day, $150,000 per month, or a staggering $1.8 million per year.

This paper discusses three primary components of accurate forecasting:

- What determines accurate forecasting?
- Variability and Predictability – what the difference means to you
- Advanced algorithms
What determines accurate forecasting?

Providing the required accuracy, by taking into account all the historic and future dynamics, requires a sophisticated forecasting tool. No single methodology is optimal for all circumstances; however, four factors should be taken into consideration:

- **Correlated Forecasting**
  Only the most sophisticated systems can perform correlated forecasting — that is, forecasting for specific events such as catalog drops or other marketing events that cause wide fluctuations in the volume of calls that must be processed.

- **Integrated approach to support multi-skilled issues**
  It is necessary to have forecasting algorithms that directly calculate requirements in a multi-skilled environment, while avoiding repetitive analytical simulations. A single forecasted set of requirements should be generated for all inter-woven skilled activities, regardless of the type of work being offered, such as email, chat, etc. Recognizing secondary skills and accounting for call overflow to available secondarily skilled agents will help eliminate overstaffing. Forecasts that are based solely on primary skills will generally overstaff, since overflow cannot be considered as a factor.

- **Collecting enough historical data**
  It is imperative to maintain detailed data for several years in order to produce an accurate forecast. Many workforce scheduling systems can use only 16 weeks of historical inbound call data to generate a forecast, and most fail to gather information on marketing campaigns, billing cycles or other variables that can affect call volume.
Algorithms that include curve mapping and pattern recognition

In variable environments, Historical Trend Analysis is the only way to ensure proper staffing. It is the only methodology that can incorporate complex historical trends in its calculations. Without pattern matching to predict customer behavior for different events, the risk of over- or understaffing increases dramatically.

Historical Trend Analysis also incorporates pattern recognition for special events like promotional mailings. Each time an event reoccurs, the forecasted volume is adjusted to reflect the increase or decline in incoming work, based on past occurrences.

The scheduling tool should be able to assign agents to multiple skills during the day, each skill associated with different queues, where each queue represents a skill set.

Variability and Predictability

The volume of work arriving in a contact center, including calls, emails, correspondence etc., is quite variable and, some would argue, unpredictable. Indeed, if we looked at a history of work arriving in a typical contact center, this belief might appear to be true. The volume of work does indeed vary over a day, from one day to the next and week on week – facts which may give the impression that accurately forecasting future work is an impossible task. In reality, using the right tools can help eliminate unpredictability.

However, variability should not be confused with unpredictability. How much of this work volume is actually predictable, given the right tools, and what are the consequences of inaccurate forecasting?
Getting it wrong

If the forecasted distribution of work is incorrect, both of these situations could occur within the same day:

<table>
<thead>
<tr>
<th></th>
<th>Forecast too High</th>
<th>Forecast too Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Agents Scheduled</td>
<td>Too Many</td>
<td>Too Few</td>
</tr>
<tr>
<td>Occupancy</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Staff Available Time</td>
<td>Excessive</td>
<td>Scarce</td>
</tr>
<tr>
<td>Agent State</td>
<td>-Distracted</td>
<td>-Overworked</td>
</tr>
<tr>
<td></td>
<td>-Bored</td>
<td>-Agitated</td>
</tr>
<tr>
<td>Agent Performance</td>
<td>-Low Morale</td>
<td>-Low Morale</td>
</tr>
<tr>
<td></td>
<td>-Poor Quality</td>
<td>-Poor Quality</td>
</tr>
<tr>
<td>Abandons</td>
<td>Very Low</td>
<td>Very High</td>
</tr>
<tr>
<td>Retention of Customers / Business</td>
<td>Decent</td>
<td>Lost</td>
</tr>
<tr>
<td>Cost to Your Company</td>
<td>High!</td>
<td>Business</td>
</tr>
</tbody>
</table>

Justification for the cost of a good forecasting tool:

- Average Revenue per Sales Call \times Abandoned Calls = LOST REVENUE!

There are two simple effects of getting the forecast wrong:

**Forecasting too high**

- you have too many agents scheduled
- which means low occupancy
- which leads to agents getting distracted/bored
- which lowers agent morale and quality work, resulting in
- costing your company money

**Forecasting too low**

- too few agents are scheduled, contributing to
- poor customer service, long waiting times, or
- agents being overworked
- resulting in low morale and poor quality work leading to
- high number of callers abandon – possibly to go elsewhere; which means
- lost business, and
- costing your company money

The amount of lost revenue through callers abandoning can be significant, particularly in a sales environment. Consider the average revenue generated per sales call – then multiply this by the number of abandoned calls you recorded last month. The answer would probably justify the cost of a good forecasting tool on its own!
Getting it right

Validating your historical data

New incoming data should be compared against a previously validated set of historical data. With the right report (Figure 1), you can easily spot inaccurate or missing data for the forecast tool to ignore.

Figure 1: From this graph we can quickly identify problem areas.

Recognizing events

It is important to recognize events which have an effect on the amount, and possibly the pattern, of work arriving in the contact center. For example, Figure 2 shows a drop in call volume on Thursday 12th April 2001, which was likely due to it preceding Good Friday.
Besides holidays, other events may include billing cycles, mail or catalog drops, advertising promotions, new business activity, competitor activity, weather issues, or external factors (TV shows, sporting events, industrial actions, etc.). The lifespan and seasonal trends of each type of event should be given consideration.

Correlating events
In the example of mail or catalog drops, similar events may occur on several occasions, but will affect work differently based on number of letters delivered. The system must have the capacity to identify and appropriately weight these events to plan for future occurrences.

The Forecasting Tool
Keep these tips in mind to maximize accuracy of the forecasting tool.

1. *Beware of averages:* While forecasting averages is a safe bet, it is not likely to be the most accurate.

2. *Give the forecaster some data:* The more data, the better. If the tool cannot process more than a few weeks of data, its accuracy will be compromised.

3. *Have realistic expectations:* The tool’s predictions can only be based on what has happened historically and on what it is told will happen in the future.

4. *Understand how your forecasting tool works:*
   - How much data can it store/use?
   - Can it take account for inflation due to abandoned calls?
• Can it recognize seasonal trends and growth trends?
• Can you input special event information and apply correlation factors?
• How does it accomplish all these things?

A poor forecast can result in high staffing costs and lost customer revenue, but forecast accuracy depends on many factors. The key is ensuring that the forecasting tool has as much information about what happened in the past and what you expect in the future, and that it will allow you to input this information and make proper use of it.

**Accurate Algorithms**

For maximum efficiency, your software algorithms must incorporate busies and abandoned calls. Algorithms should improve upon traditional methods by eliminating the assumptions that queues are infinitely long, callers never abandon the queue, and all calls have to be answered by one group of agents.

Properly developed equations offer the following advanced features:

• Correct modeling of queue sizes - allows for the prediction and limiting of the number and percent of busies.
• Modeling caller abandon rates - allows for the prediction and limiting of the number and percent of abandons.
• Calls handled, a complement of busies and abandons, can be used as a service level type.
• Occupancy is calculated, and caps on it may be taken into account when determining agent requirements.
• The traditional way of expressing a service level as a percent answered within a given time.
• Accounts for indirectly occupied time of agents (bathroom breaks, supervisor queries, etc.).
• Accounts for retries of both busies and abandons.
• Accounts for skill group queue assignments, queue priorities, and overflow.

**A Final Word**

Companies today do not have the luxury of making purchasing mistakes. Ensuring your workforce management system produces accurate forecasts is your most important
consideration. Invest in a system that can perform critical functions, accommodate future needs, and maintain sufficient historical call data to generate accurate forecasts.

**About Pipkins**

Pipkins, Inc., founded in 1983, is a leading supplier of workforce management software and services to the call center industry, providing sophisticated forecasting and scheduling technology for both the front and back office. *WorkforceScheduling.com* is a hosted, low cost, subscription-based solution for managing your call center workforce that allows you to “pay as you grow” with no hardware to install and maintain, no long-term commitment required, and little or no IT requirements. Pipkins’ systems forecast and schedule more than 300,000 agents in over 500 locations across all industries worldwide. For more information, visit [www.Pipkins.com](http://www.Pipkins.com).