

# Agent Shrinkage

The framework and terminology used for shrinkage calculations in the Mitan PhoneCalc Suite.

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## Introduction

Agent shrinkage is a term used for the various time overheads that prevent all of an agent's time for which they are employed being available for actually taking calls. (This document talks in terms of phone calls, but this should be understood to mean also emails, faxes, correspondence, and so on.)

The calculations for shrinkage are in one sense obvious, but it is necessary to have a structure for the calculations, and to define some terminology. The structure and terminology described in this document are used in the Mitan programs such as the PhoneCalc Suite programs. This document refers to V5 of these programs.

## Overview

Shrinkage can broadly be divided into the following four categories, which are explained in more detail below.

- Employment, such as induction training
- Yearly, such as vacation
- Daily, such as meal breaks
- On-phone

## Accounted time

The starting point for shrinkage calculations is the total amount of time for which an agent is employed. This is specified by the "accounted days", which is the nominal working days per year for an agent, together with the average daily shift length, in hours. These overall values should include all the shrinkage components listed below, since those components will be deducted from the total accounted time to arrive at the amount of time an agent is actually available for handling calls.

## Paid or non-paid time

Some shrinkage factors are paid agent time, while some are non-paid. Depending on the purpose of the calculations you are doing, you may wish to work with just paid time or all the agent time. For budgeting calculations it may be that only paid time is of interest, since the essential question is likely to be how much it will cost to provide the required amount of agent time assigned to call-taking. For more general management purposes all of the agent time may be of interest. If only paid time is of interest, then non-paid shrinkage factors should be set to zero, and paid factors specified as paid time not all time. In PhoneCalc you can set up separate scenarios for paid and unpaid time, and easily switch between them.

## Shrinkage components

### Employment shrinkage

A newly-recruited agent will normally undergo some kind of induction training on the particular products or services dealt with by the call centre. Employment shrinkage is specified by the number of days of induction training required. The average length of employment for an agent, in months, must also be specified so that induction training can be converted to days per agent-year.

### Yearly shrinkage

Figure 1 shows the PhoneCalc input panel for yearly shrinkage items. This panel also contains the employment shrinkage items. Yearly shrinkage covers those items that are conveniently measured in whole days per year, and are listed in Table 1.

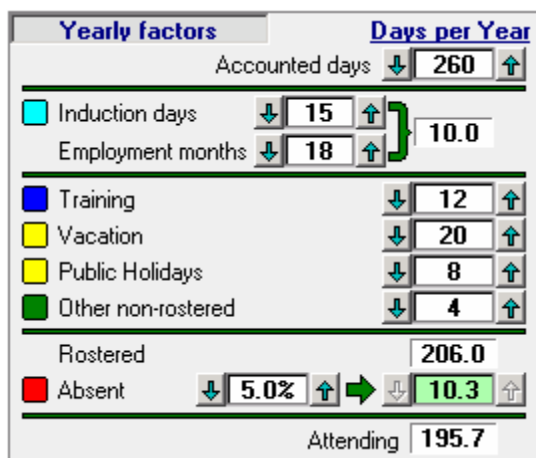


Figure 1. Yearly shrinkage factors

Yearly shrinkage component	Description
Training	Regular training on new products, systems, or procedures. Induction training is treated separately.
Vacation	Annual vacation entitlement.
Public Holidays	Public holidays in addition to annual vacation.
Other non-roster	Days for other, unspecified, activities.
Absenteeism	Unplanned absence for illness and so on. Absenteeism is expressed as a percentage chance that an agent will be absent on a roster day, or as a number of days.

Table1. Yearly shrinkage items

## Daily shrinkage

Figure 2 shows the PhoneCalc input panel for daily shrinkage items. Daily shrinkage is those items that apply to a rostered day, where a rostered day is a day on which the agent is scheduled to be in the call centre primarily for the purpose of answering calls (not training, for example). The items are listed in Table 2.

Daily factors		Time per Day	
Average shift		↓	08:30 ↑
Meals		↓	01:00 ↑
Breaks		↓	0:30 ↑
Team/coach		↓	0:20 ↑
Non-phone		↓	0:10 ↑
Other		↓	0:10 ↑
Assigned to phones		6:20	
Unaccounted	mins per hour	↓	10 ↑
Available for calls		5:17	

Figure 2. Daily shrinkage items

Daily shrinkage component	Description
Meals	Meal breaks
Breaks	Breaks other than meal breaks.
Team meetings and coaching	Time required per agent per day for team meetings and coaching sessions.
Non-phone tasks.	Time assigned to non-phone tasks.
Other roster	Other unspecified time.

Table 2. Daily shrinkage items

## Assigned shrinkage

While an agent is assigned to the phones, the agent may not be expected to account for 60 minutes per hour of their time, but may be permitted some time (for example 10 minutes) that does not have to be registered as either direct handling of calls (talk and wrap time) or ready for a call. This time may include comfort breaks, some allowance for fetching a coffee, and some time just for taking a short break from calls at the desk. This time is referred to as “unaccounted” or “ad-hoc” time, and is expressed as the number of minutes per hour allowed.

## Levels of Shrinkage

### Introduction

The chart shown in Figure 2 illustrates the levels of shrinkage. At the left we start with Employed time represented as 100%. As we progress to the right, various time overheads are deducted, until in the right-hand column the yellow area represents the percentage of an agent's time that is actually available for handling calls. (Some of this time will in practice be spent waiting for calls). The various overheads are grouped so that shrinkage can be represented as several "levels", which are explained in the next section.

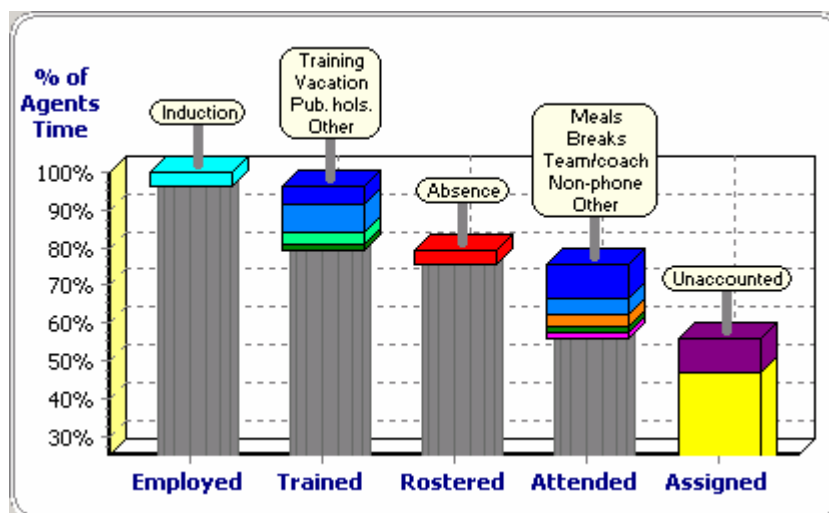


Figure 3. Levels of shrinkage

### Levels of shrinkage

#### Employed

This is the total time for which an agent is employed. This is expressed as "days accounted", which means the number of days per year for which the agent is employed, including vacation, public holidays, absence, and other factors which mean the agent does not actually attend the call-centre, regardless of whether these factors are paid or unpaid time. This is the total number of days per year that the shrinkage calculations must account for, and might be, say, 260 days.

#### Trained

A newly-recruited agent will normally undergo some induction training. How much overhead this represents will depend on the length of employment as an agent. For example the induction training may be 15 days, and the average length of employment might be 18 months. The induction training is annualised to  $10 = 15 * (12/18)$  days per year, so that the one employed agent would contribute  $260 - 10 = 250$  days per year as a trained agent.

#### Rostered

Rostered means scheduled to attend the call-centre primarily for the purpose of handling calls. Roster time therefore excludes vacation, public holidays, other non-roster days.

**Attended**

Attended time is the number of days an agent is rostered, less absence. Absence for illness and so on is assumed to impact rostered time. Vacation, public holidays, training and so on, are assumed to be mandatory, so that, for example, a day of training lost through absence would have to be made up by taking a day from rostered time. Absence is expressed as a percentage chance that an agent will be absent on a rostered day. This is the same as the average percentage of rostered days on which an agent will be absent. Alternatively, the number of days of absence can be entered directly.

**Assigned**

An agent attending the call-centre will require time for meals, other breaks, team meetings, and coaching. Assigned time is attended time less these daily overheads.

**Available**

An agent assigned to call-handling might not be required to account for 60 minutes of every hour as talk time, wrap time, or ready for calls. An allowance of, say 10 minutes “ad-hoc” time per assigned hour may be given for comfort breaks, getting a coffee, or just taking a short respite from calls. Available time is assigned time less unaccounted time.

**Shrinkage ratios**

Ratios of different categories of agent time are displayed in the shrinkage panel of the PhoneCalc Suite shrinkage calculator, which is shown in Figure 4. The user can “fix” and category as the basis for the ratios. In the example shown, in order to have one agent hour “available” (that is actually available for call-handling, meaning talk time, wrap-time, or ready for a call) requires 1.7 hours of rostered time, or 2.14 hours of employed time. These figures depend, of course, on the particular input values used to produce the illustration.



Figure 4. Shrinkage ratios

## Detailed Calculations

### Introduction

Users sometimes wish to understand exactly how calculations are done, in order to reconcile the calculations with their own reports or terminology. The purpose of this chapter is to provide the detailed information that may be necessary for some users.

### Preliminary calculations

Induction training must first be expressed as an annualised number of days.

$$(\text{annualised induction days}) = \frac{(\text{total induction days}) \times 12}{(\text{average employment months})} \quad (1.1)$$

### Calculate trained and roster days

Now we can calculate the average number of trained days and rostered days per agent per year, simply by deducting the yearly components.

$$(\text{days trained}) = (\text{days accounted}) - (\text{annualised induction days}) \quad (1.2)$$

$$(\text{days rostered}) = (\text{days trained}) - \left[ \begin{array}{l} (\text{days training}) \\ + (\text{days vacation}) \\ + (\text{days public holidays}) \\ + (\text{days other nonrostered}) \end{array} \right] \quad (1.3)$$

### Calculate absent days

Absenteeism is expressed as the percentage chance that an agent will be absent on a day for which they are rostered. The average number of days absent is therefore calculated as follows.

$$(\text{days absent}) = (\text{days rostered}) \times \frac{(\text{absenteeism percentage})}{100} \quad (1.4)$$

$$(\text{days attending}) = (\text{days rostered}) - (\text{days absent}) \quad (1.5)$$

### Calculate time assigned and available

Now we calculate the number of minutes per attended day that an agent is assigned to call-taking.

$$(\text{mins per day accounted}) = (\text{average shift in minutes}) \quad (1.6)$$

$$(\text{mins per day assigned}) = (\text{mins per day accounted}) - \left[ \begin{array}{l} (\text{mins per day meals}) \\ + (\text{mins per day breaks}) \\ + (\text{mins per day team/coaching}) \\ + (\text{mins per day non-phone}) \\ + (\text{mins per day other rostered}) \end{array} \right] \quad (1.7)$$

Unaccounted time is specified as minutes per hour while assigned to the phones, so now that we have calculated the time per day assigned to the phones, we can calculate the unaccounted time per day.

$$(\text{mins per day unaccounted}) = (\text{mins per day assigned}) \times \frac{(\text{mins per hour unaccounted})}{60} \quad (1.8)$$

Now we can calculate the time available for handling calls per attended day by deducting the unaccounted time.

$$(\text{mins per day available}) = (\text{mins per day assigned}) - (\text{mins per day unaccounted}) \quad (1.9)$$

Some of the results are required as hours per day rather than minutes per day, so we convert.

$$(\text{hours per day assigned}) = (\text{mins per day assigned}) / 60 \quad (1.10)$$

$$(\text{hours per day available}) = (\text{mins per day available}) / 60 \quad (1.11)$$

### Calculate percentages of a year

These are all percentages of a year, taking account of annualised induction, so they are percentages of employment.

$$\begin{bmatrix} (\text{pct induction}) \\ (\text{pct training}) \\ (\text{pct vacation}) \\ (\text{pct public holidays}) \\ (\text{pct other non rostered}) \\ (\text{pct absent}) \end{bmatrix} = \frac{100}{(\text{days accounted})} \times \begin{bmatrix} (\text{days induction annualised}) \\ (\text{days training}) \\ (\text{days vacation}) \\ (\text{days public holidays}) \\ (\text{days other non rostered}) \\ (\text{days absent}) \end{bmatrix} \quad (1.12)$$

### Calculate percentages of a day

These are percentages of an attended day.

$$\begin{bmatrix} (\text{day pct available}) \\ (\text{day pct meals}) \\ (\text{day pct breaks}) \\ (\text{day pct team/coach}) \\ (\text{day pct non-phone}) \\ (\text{day pct other rostered}) \\ (\text{day pct unaccounted}) \end{bmatrix} = \frac{100}{(\text{mins per day accounted})} \times \begin{bmatrix} (\text{mins per day available}) \\ (\text{mins per day meals}) \\ (\text{mins per day breaks}) \\ (\text{mins per day team/coach}) \\ (\text{mins per day non-phone}) \\ (\text{mins per day other rostered}) \\ (\text{per day unaccounted}) \end{bmatrix} \quad (1.13)$$

### Calculate ratios

$$(\text{ratio trained to accounted}) = (\text{days trained}) / (\text{days accounted}) \quad (1.14)$$

$$(\text{ratio rostered to trained}) = (\text{days rostered}) / (\text{days trained}) \quad (1.15)$$

$$(\text{ratio attended to rostered}) = (\text{days attended}) / (\text{days rostered}) \quad (1.16)$$

$$(\text{ratio assigned to attended}) = (\text{mins per day assigned}) / (\text{mins per day accounted}) \quad (1.17)$$

$$(\text{ratio available to assigned}) = (\text{mins per day available}) / (\text{mins per day assigned}) \quad (1.18)$$

$$(\text{ratio rostered to accounted}) = (\text{ratio rostered to trained}) \times (\text{ratio trained to accounted}) \quad (1.19)$$

$$(\text{ratio attended to accounted}) = (\text{ratio attended to rostered}) \times (\text{ratio rostered to accounted}) \quad (1.20)$$

$$(\text{ratio assigned to accounted}) = (\text{ratio assigned to attended}) \times (\text{ratio attended to accounted}) \quad (1.21)$$

$$(\text{ratio available to accounted}) = (\text{ratio available to assigned}) \times (\text{ratio assigned to accounted}) \quad (1.22)$$

### Calculate ratios as percentages

$$(\text{pct trained}) = 100 \times (\text{ratio trained to accounted}) \tag{1.23}$$

$$(\text{pct rostered}) = 100 \times (\text{ratio rostered to accounted}) \tag{1.24}$$

$$(\text{pct attended}) = 100 \times (\text{ratio attended to accounted}) \tag{1.25}$$

$$(\text{pct assigned}) = 100 \times (\text{ratio assigned to accounted}) \tag{1.26}$$

$$(\text{pct available}) = 100 \times (\text{ratio available to accounted}) \tag{1.27}$$

### Convert percentages of a day into percentages of a year

Daily overheads apply only to attended days, so that to get percentages of all agent time, and adjustment is required for the percentage attended time.

$$\begin{bmatrix} (\text{pct meals}) \\ (\text{pct breaks}) \\ (\text{pct team/coach}) \\ (\text{pct non-phone}) \\ (\text{pct other rostered}) \\ (\text{pct adhoc}) \\ (\text{pct available}) \end{bmatrix} = (\text{ratio attended to accounted}) \times \begin{bmatrix} (\text{day pct meals}) \\ (\text{day pct breaks}) \\ (\text{day pct team/coach}) \\ (\text{day pct non-phone}) \\ (\text{day pct other rostered}) \\ (\text{day pct adhoc}) \\ (\text{day pct available}) \end{bmatrix} \tag{1.28}$$

### Calculations for the shrinkage diagram

In the PhoneCalc shrinkage calculator, a diagram is provided showing the 6 levels of shrinkage, as in the table below. The user may choose to fix any of the shrinkage levels to 100% and a specified number of agents. The calculator then works out the percentages and numbers of agents that correspond to each of the other shrinkage levels.

Levels of shrinkage	Employed
	Trained
	Roster
	Attended
	Assigned
	Available

Table 3.

First we calculate the Employed percentage, by applying the appropriate ratio to the 100% at the level that the user has chosen to fix, as shown in the Table 4. Note that only one of these calculations is performed, the purpose being to establish the Employed percentage that corresponds to 100% at the level the user has chosen to fix. A parallel calculation provides the number of Employed agents that corresponds to the number of agents specified by the user at the shrinkage level fixed by the user.

Shrinkage level fixed by user	Calculation of corresponding Employed percentage	Calculation of corresponding Employed agents
Employed	(fix employed pct) = 100	
Trained	(fix employed pct) = $\frac{100}{(\text{ratio trained to accounted})}$	(fix employed agents) = $\frac{(\text{fix trained agents})}{(\text{ratio trained to accounted})}$
Roster	(fix employed pct) = $\frac{100}{(\text{ratio rostered to accounted})}$	(fix employed agents) = $\frac{(\text{fix rostered agents})}{(\text{ratio rostered to accounted})}$
Attended	(fix employed pct) = $\frac{100}{(\text{ratio attended to accounted})}$	(fix employed agents) = $\frac{(\text{fix attended agents})}{(\text{ratio attended to accounted})}$
Assigned	(fix employed pct) = $\frac{100}{(\text{ratio assigned to accounted})}$	(fix employed agents) = $\frac{(\text{fix assigned agents})}{(\text{ratio assigned to accounted})}$
Available	(fix employed pct) = $\frac{100}{(\text{ratio available to accounted})}$	(fix employed agents) = $\frac{(\text{fix available agents})}{(\text{ratio available to accounted})}$

Table 4. Calculations for shrinkage ratios

Now we have established the percentage and number of agents for the Employed level, and we can straightforwardly calculate the percentages and number of agents for the other shrinkage levels.

$$\begin{bmatrix} (\text{fix trained agents}) \\ (\text{fix rostered agents}) \\ (\text{fix attended agents}) \\ (\text{fix assigned agents}) \\ (\text{fix available agents}) \end{bmatrix} = (\text{fix employed agents}) \times \begin{bmatrix} (\text{ratio trained to accounted}) \\ (\text{ratio rostered to accounted}) \\ (\text{ratio attended to accounted}) \\ (\text{ratio assigned to accounted}) \\ (\text{ratio available to accounted}) \end{bmatrix} \quad (1.29)$$

$$\begin{bmatrix} (\text{fix trained pct}) \\ (\text{fix rostered pct}) \\ (\text{fix attended pct}) \\ (\text{fix assigned pct}) \\ (\text{fix available pct}) \end{bmatrix} = (\text{fix employed pct}) \times \begin{bmatrix} (\text{ratio trained to accounted}) \\ (\text{ratio rostered to accounted}) \\ (\text{ratio attended to accounted}) \\ (\text{ratio assigned to accounted}) \\ (\text{ratio available to accounted}) \end{bmatrix} \quad (1.30)$$