

Taking the Mystery Out of Workforce Management

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Goals

In this interactive session you will learn to:

1. Identify the essential elements of workforce management (WFM)
2. Use proven WFM techniques
3. Use Erlang C to calculate staffing needs
4. Interpret the data to make the best staffing decisions
5. Schedule your staff more effectively without buying any specialized WFM software
6. Discern between making people happy versus focusing on the needs of the business



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Agenda

- The Workforce Management (WFM) process
 - Forecasting
 - Staffing
 - Scheduling
 - Daily planning-RTM/exceptions
 - Reporting
- Hiring and training your Workforce Manager

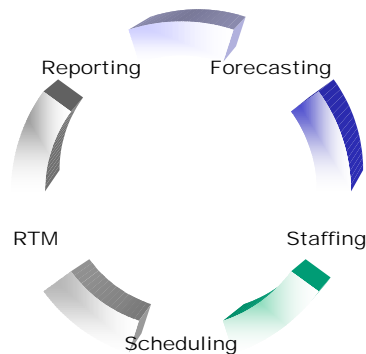
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WFM Process

- Forecasting
- Staffing
- Scheduling
- RTM/Exceptions
- Reporting



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Typical Stages of WFM

Stage	Agents	Systems Used
Small (no WFM)	1-20	<ul style="list-style-type: none"> •Best guess schedules •Using switch reports
Stuck Mid (part WFM)	20-60	<ul style="list-style-type: none"> •Basic forecasting/staffing •Best guess schedules •Using switch reports
Mid (1 WFM)	60-125	<ul style="list-style-type: none"> •Interval forecasting •Basic forecasting/staffing •Best guess schedules •Some call center reporting
Mid-Large (2+ WFM)	125+	<ul style="list-style-type: none"> •Interval forecasting •WFM schedules •Some exception reporting •Others?

Does Not Have to be This Way

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Any Size Center Can...

- Forecast quickly and accurately
- Use Erlang for staffing to the interval level
- Maximize schedule efficiency
- Proactively plan off phone activities
- Create valuable analysis and reporting

Without WFM Software!!!!

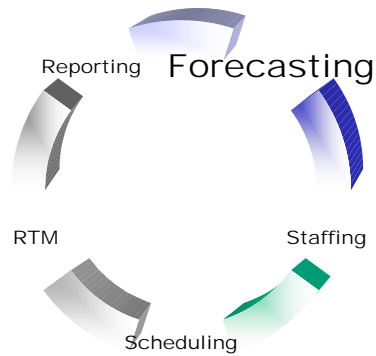
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Forecasting

- Forecasting basics
- 2 easy Excel forecast models
- Other resources
- Measuring forecast accuracy



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Forecasting Basics

- Forecast to the interval level
- Forecast volume AND handle time
- Try different strategies
 - Top down (percent of day)
 - Bottom up (forecast intervals)
- Use different models
- Measure for success

Most Important part of process!!!

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Simple Smoothing

- Most common forecasting method
 - Easy
 - Simple to understand
- Use [Average] formula in Excel

Simple Moving Average									
	Average	Prior Week	P - 1	P - 2	P - 3	P - 4	P - 5	P - 6	P - 7
Monday	5,415	5,646	5,426	5,507	5,322	5,401	5,315	5,488	5,214
Tuesday	4,661	4,732	4,883	4,713	4,587	4,609	4,688	4,595	4,479
Wednesday	4,064	4,133	4,019	4,265	4,075	3,966	4,044	4,031	3,981
Thursday	3,143	3,256	3,047	3,179	3,177	3,193	3,092	3,100	3,102
Friday	3,097	3,180	3,131	3,201	3,146	3,093	2,927	3,065	3,033
Saturday	948	976	1,002	912	986	925	923	971	889
Total	21,328	21,923	21,508	21,777	21,293	21,187	20,989	21,250	20,698

Note: Next week, the data in column P - 7 drops out. Data from the other weeks shift one column to the right, and the most recently completed week's data is added under the "Prior Week"



Multiplicative Smoothing

- Same idea as simple smoothing only you weight the prior weeks
- Use [SUMPRODUCT] of day row/ number of weeks to created this weighted average

Moving Weighted Average									
	Average	Prior Week	P - 1	P - 2	P - 3	P - 4	P - 5	P - 6	P - 7
Weight		20%	18%	16%	14%	11%	9%	7%	5%
Monday	5,449	5,646	5,426	5,507	5,322	5,401	5,315	5,488	5,214
Tuesday	4,696	4,732	4,883	4,713	4,587	4,609	4,688	4,595	4,479
Wednesday	4,084	4,133	4,019	4,265	4,075	3,966	4,044	4,031	3,981
Thursday	3,155	3,256	3,047	3,179	3,177	3,193	3,092	3,100	3,102
Friday	3,122	3,180	3,131	3,201	3,146	3,093	2,927	3,065	3,033
Saturday	957	976	1,002	912	986	925	923	971	889
Total	21,463	21,923	21,508	21,777	21,293	21,187	20,989	21,250	20,698

Note: Next week, the data in column P - 7 drops out. Data from the other weeks shift one column to the right, and the most recently completed week's data is added under the "Prior Week"



Other Options

Platform	Vendors	Pros
Excel Add In	MS Excel Analysis tool pack	Price-Free Just install it
Other Excel Add Ins	EZ Forecaster	Price \$200-\$500 Work right in Excel Easily works with a lot of data Has all the statistics
Statistics Software	Minitab, Forecast Pro, SmartForecasts, SAS, DecisionTime, Procast	Price \$1,000- \$5,000 More robust forecasting Import from Excel
Simulation Software	Simul8, CC Prophet, Arena, and Bard	Price \$5,000 + Unparalleled accuracy Highly complex models

2 Formulas For Accuracy

- **Forecast/Actual % (+/-)**
- **MAPE (Mean Absolute Percent Error)**



The Standard

Date	Fcst Vol	Act Vol	+/- %	Abs % Error
Sun	467	324	-44.1%	44.1%
Mon	2,501	1,863	-34.2%	34.2%
Tue	1,043	1,444	27.8%	27.8%
Wed	1,567	1,354	-15.7%	15.7%
Thu	1,468	1,334	-10.0%	10.0%
Fri	1,127	1,433	21.4%	21.4%
Sat	985	1,393	29.3%	29.3%
Total	9,158	9,145	-0.1%	26.1%

- Forecast/Actual % (+/%)

(forecast - actual)

actual

- A weighted average of forecasts over time
- Misleading because it does not reflect what the call floor experiences

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More Meaningful

- Mean Absolute Percent Error (MAPE)

(Abs(Mon +/-)+Abs(Tue +/-),...)

Number of forecasts

- Average of daily forecasts performance
- Better reflects what the call floor experiences

Date	Fcst Vol	Act Vol	+/- %	Abs % Error
Sun	467	324	-44.1%	44.1%
Mon	2,501	1,863	-34.2%	34.2%
Tue	1,043	1,444	27.8%	27.8%
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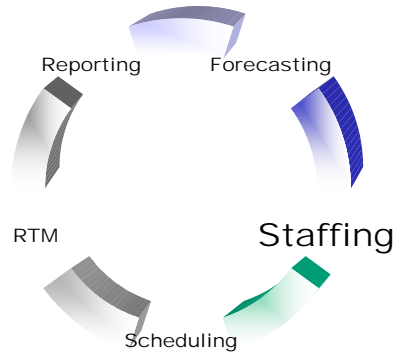
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Staffing

- What is Erlang?
- Interval staffing
- Components of long term staffing



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What Is Erlang?

- Developed by A.K. Erlang in 1917 to predict the number of agents needed to handle randomly arriving phone traffic.
- Inputs:
 - Service level seconds
 - Volume by half hour
 - AHT

Erlang C

$$P(>O) = \frac{\frac{A^N}{N!} \frac{N}{N-A}}{\sum_{x=0}^{N-1} \frac{A^x}{x!} + \frac{A^N}{N!} \frac{N}{N-A}}$$

A = Total traffic offered in erlangs
 N = Number of servers in a full availability group
 P(>O) = Probability of delay greater than 0
 P = Probability of loss - Poisson formula

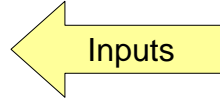
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Sample of Erlang Calculator

Average Talk Time (Sec.) : 240
 After-Call Work Time (Sec.) : 45
 Calls per Half-Hour : 225
 Service Level Objective (Sec.): 20



Agents	P(0)%	ASA	DLYDLY	Q1	Q2	SL%	OCC%	TKLD
36	92.7	704.3	760.0	88.0	95.0	10	99	118.0
37	75.1	155.6	207.3	19.5	25.9	32	96	49.5
38	60.2	72.2	120.0	9.0	15.0	49	94	39.0
39	47.7	40.3	84.4	5.0	10.6	62	91	35.0
40	37.3	24.3	65.1	3.0	8.1	73	89	33.0
41	28.8	15.3	53.0	1.9	6.6	80	87	31.9
42	22.0	9.8	44.7	1.2	5.6	86	85	31.2
43	16.5	6.4	38.6	0.8	4.8	90	83	30.8
44	12.3	4.2	34.0	0.5	4.3	93	81	30.5
45	9.0	2.7	30.4	0.3	3.8	95	79	30.3
46	6.5	1.8	27.5	0.2	3.4	97	77	30.2
47	4.6	1.1	25.1	0.1	3.1	98	76	30.1
48	3.2	0.7	23.0	0.1	2.9	99	74	30.1
49	2.2	0.5	21.3	0.1	2.7	99	73	30.1
50	1.5	0.3	19.8	0.0	2.5	99	71	30.0

QueueView by Incoming Calls Management Institute

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Where Are They?

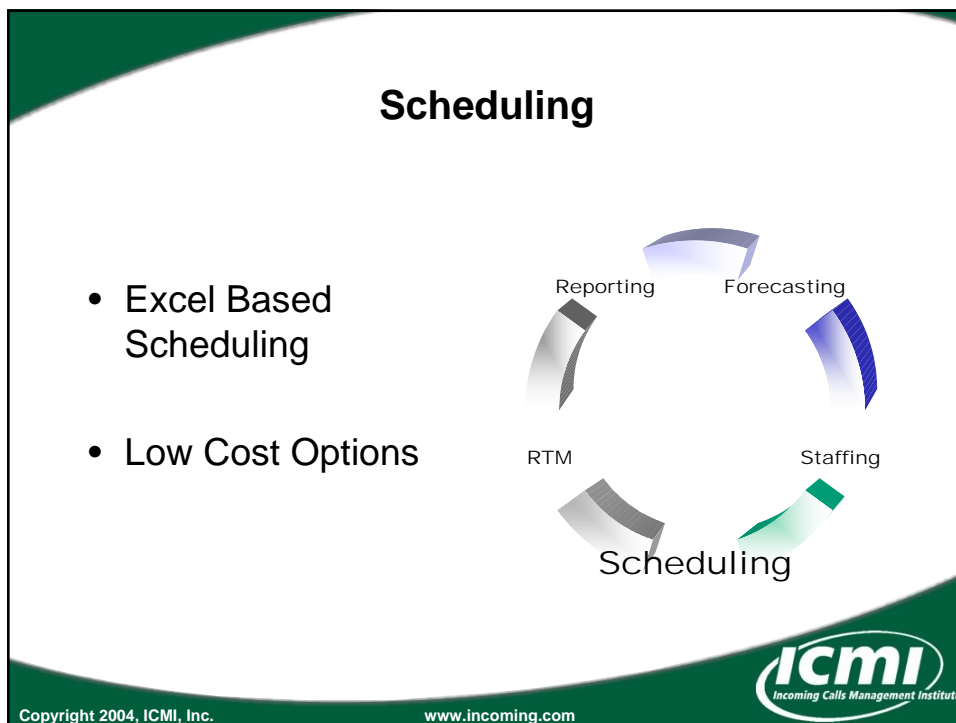
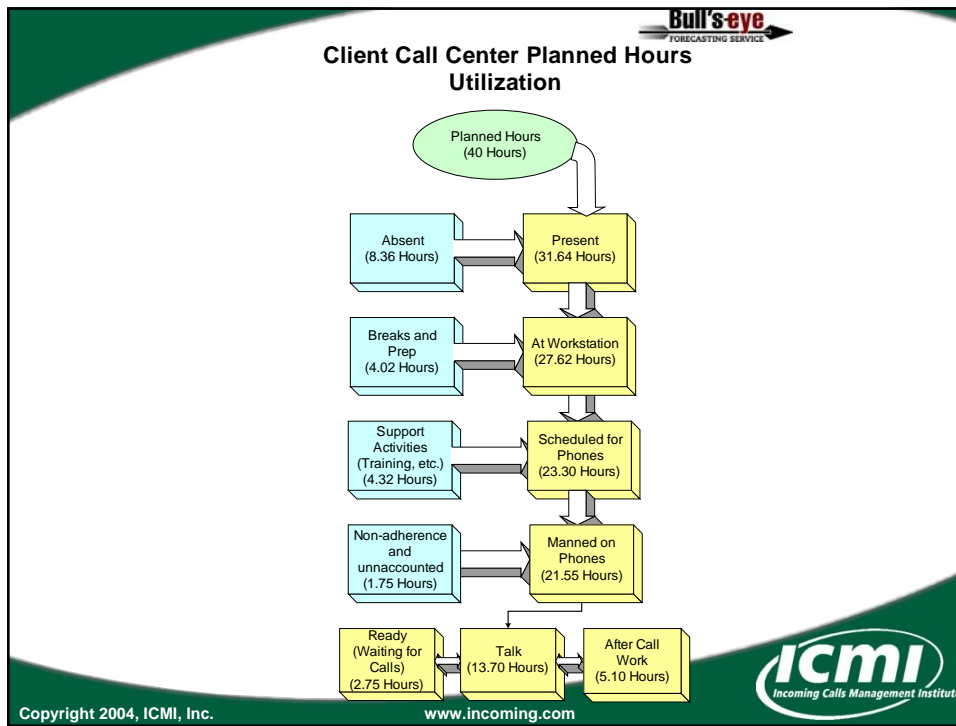
- www.incoming.com - Queueview and EasyStart Call Center Scheduler
- www.erlang.com - Ansapoint on-line version and downloadable version, plus an Erlangs to VoIP Bandwidth Calculator
- www.portagecommunications.com - Advanced tool (Call Center Designer) with graphs, financial impacts, etc.

And many, many others....some are free downloads

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Components of an Excel based schedule

Tuesday's Schedule

Vol Fcst:	4,168
SVCLVL	80% 20
Interval	7:00 7:30 8:00 8:30 9:00
Vol	30 57 114 153 223
AHT	284 302 311 307 303
Req Staff	7.2 12.8 24.0 30.9 43.1
Act Staff	7.0 7.0 24.5 41.5 42.0
OVER/UNDER	(0.2) (5.8) 0.5 10.6 (1.1)
Agent	Start Stop
Agent 1	7:00 3:30
Agent 2	7:00 3:30
Agent 3	7:00 3:30
Agent 4	7:00 3:30
Agent 5	7:00 3:30
Agent 6	7:00 3:30
Agent 7	7:00 3:30
Agent 8	8:00 4:30
Agent 9	8:30 5:00

- Done at the interval level
- Uses Erlang to calculate staff on phones
- Has ability to count breaks/lunches
- All the basic functionality of WFM software

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Challenges of an Excel based schedule

Tuesday's Schedule

Vol Fcst:	4,168
SVCLVL	80% 20
Interval	7:00 7:30 8:00 8:30 9:00
Vol	30 57 114 153 223
AHT	284 302 311 307 303
Req Staff	7.2 12.8 24.0 30.9 43.1
Act Staff	7.0 7.0 24.5 41.5 42.0
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Agent 4	7:00 3:30
Agent 5	7:00 3:30
Agent 6	7:00 3:30
Agent 7	7:00 3:30
Agent 8	8:00 4:30
Agent 9	8:30 5:00

- Maintaining your roster
- Changes
- Multiple skill
- File becomes big and complex fast
- Optimization done by hand
- Better Excel skills gets you better results

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Don't want to do it yourself?

- www.kooltoolz.com-CC Modeler ~\$70
- www.ICMI.com-Easy Start ~\$299
- www.portagecommunications.com
AgentTime Scheduler~\$5,000

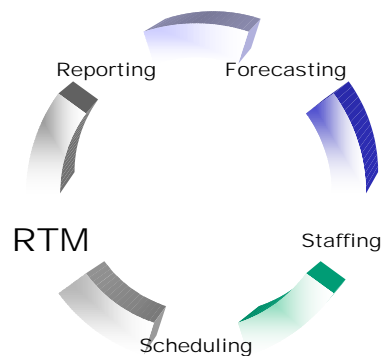
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RTM/Exceptions

- RTM strategies
- Planning for meetings/trainings and other off phone time



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Real Time Management (RTM)

- Two strategies
 1. Proactive Planning
 - Everything scheduled in advance
 - 1 resource coordinates
 - Systematic capture of off phone data
 2. Reactive Engagement
 - “Watching the queue”
 - Supervisors make independent decisions
 - Overstaffing to “make up” service level

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Off Phone Time planning

- Use your scheduler to minimize the effects of off phone time:
 - Meetings
 - Trainings
 - Breaks
 - Vacations/Sick
 - LOA
 - Etc.
- Create vacation and training calendars
 - with your long term (monthly plan)
 - Determine amount of vacation and training you can allow in a month
- Measure to check success

12.8	24.0	30.9
7.0	24.5	41.5
(5.8)	0.5	10.6
7:30	8:00	8:30
X	B	X
X	X	B
X	T	T
X	T	T
X	X	X
X	X	X
X	X	X
X	X	X
	X	X
		X

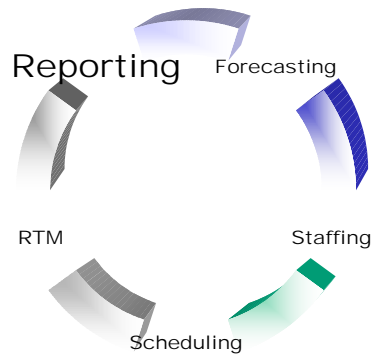
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Reporting

- Info v. Data
- Basic reports



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Info v. Data

- **Too much data but not enough information!!!**
- **Call Center needs a trained resource to make sense of the data and communicate it**
- **WF Manager needs the data to be accurate in order to plan**
- **WF Manager is already analytical**

Marriage made in Heaven



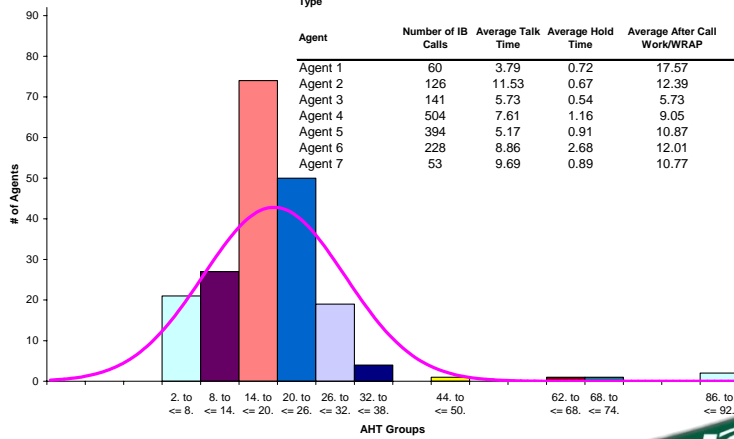
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Data v. Information

Normal Distribution
 Mean = 19.274
 Std Dev = 11.176
 COPC Improvement Fctr-3.4



Agent AHT

Applicable Traction Type	IB Calls	IB Calls	IB Calls	IB Calls	IB Calls
Agent	Number of IB Calls	Average Talk Time	Average Hold Time	Average After Call Work/WRAP	Average Handle Time (ATT+HOLD+WRAP)
Agent 1	60	3.79	0.72	17.57	22.08
Agent 2	126	11.53	0.67	12.39	24.59
Agent 3	141	5.73	0.54	5.73	12
Agent 4	504	7.61	1.16	9.05	17.82
Agent 5	394	5.17	0.91	10.87	16.95
Agent 6	228	8.86	2.68	12.01	23.55
Agent 7	53	9.69	0.89	10.77	21.35

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Basic Reports

- Daily Call Handling
 - Service Level
 - Forecast Accuracy
 - Interval Call Stats
 - % in forecast
 - % in service level
 - Schedule Adherence
 - Other call stats (AHT, etc)
- Weekly
 - Attendance
 - Break and lunch adherence
- Monthly to Budget
 - Vacation Time
 - Meeting Time
 - LOA/FMLA



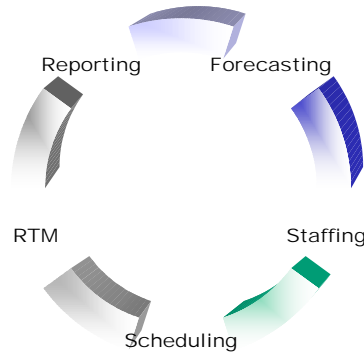
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Your Workforce Manager

- Who should you hire?
- Must have tools and training
- Accountabilities



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Ideal Workforce Manager



- **Management skills**
- Excel skills
- Analytical skills
- Background in Stats- can be taught!!!
- Deadline oriented
- Understands technology

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Tools and Training

Tools

- MS Excel (at least)
- Forecasting model
- Erlang Calculator
- Interval staffing model
- Monthly staffing model
- Reporting Templates

Training/Texts

- Excel for Dummies
- Basic business stats text
- WFM overview class
- Call Center Management texts

WFM Accountabilities

- Forecast Accuracy
 - Volume
 - AHT
 - Staffing
- Schedule Delivery
- Scheduled to Requirements %
- Report Delivery

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