

# Optimizing Staffing Levels for IT Services Using Simulation Tom Lubeck, Redha Bournas, Brian Eck & David Northcutt



Global Technology Services, IBM Corporation

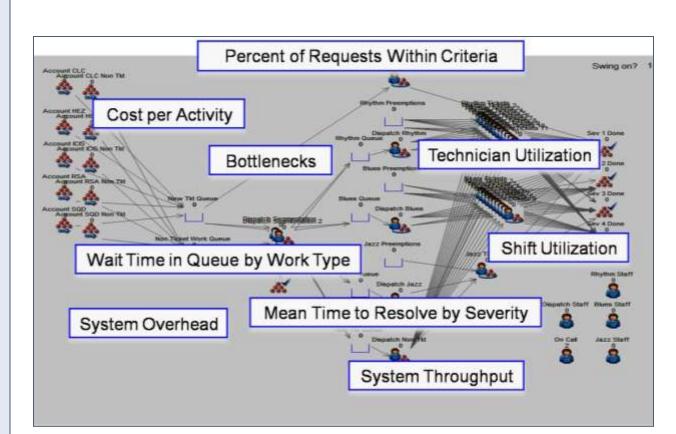
#### **BACKGROUND**

Q: If you have thousands of teams delivering hundreds of services worldwide, ... How do you know that you have the correct staffing level in each team to meet your customers' needs?

#### A: You don't,

... Unless you can use the power of simulation to model those teams and determine the right staffing levels.

Simulation Models Give Us Insights into Many
Team Performance Characteristics



The Global Delivery

of delivery practices,

the world's premier IT

services provider by

solutions at the most

competitive prices.'

Standardize delivery

**Objectives** 

IT services

Framework (GDF) is a set

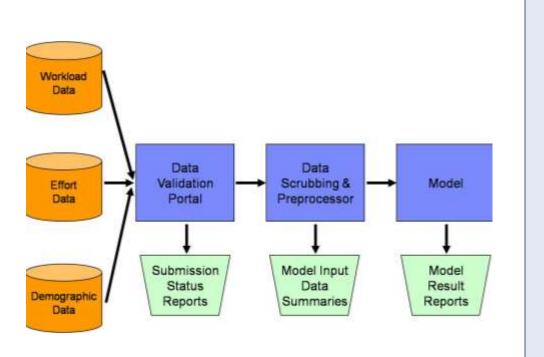
referred to as components,

and designed to support the

delivering the highest quality

Deliver best-in-class quality

IBM's GTS strategy to "be



Data Flow: Each Model Deployment

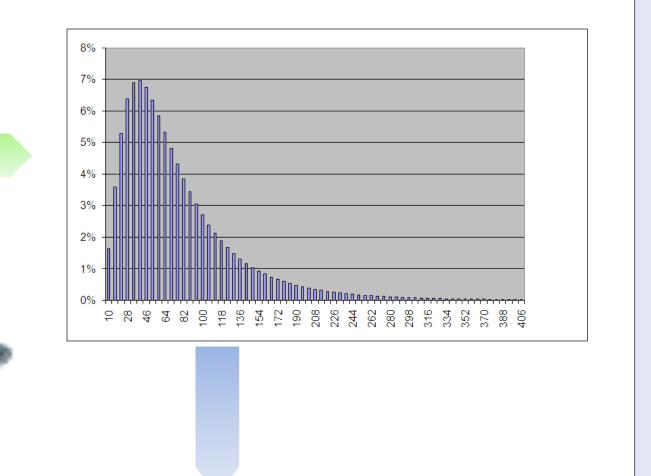
#### DATA COLLECTION & VALIDATION

Each Service Line Component (like Unix & Intel, or Web & Middleware Enablement) has its own standardized Delivery Catalog of services

Volumes come from ticketing systems, but these have only open and close, but not "time on task."

We use the Delivery Catalog for a subset of activities and track these with a desktop stopwatch, in order to build service time distributions.





#### MULTIPLE MODELS Models were created for each Service Line Component, to capture important differences in their operations Service Line Components Aspect of Operating Environment Unix/Intel ProdCtrl Service Level Agreements - X% in Y hours, by Account & Severity Arrival process + nonhomogeneous Poisson, by Account Work Types incidents, changes, maintenance, etc. Ticket Severity Service Time distribution Dispatching logic coverage, random time, respect affinities Page Out (on call) Breaks/Lunch forced after current job Sickness/Vacation **Agent Affinities** W work type s severity

Automated Report Generation

Sev 3 Target Time (hr)

Sev 4 Target Time (hr)

Sev 1 Attainment %

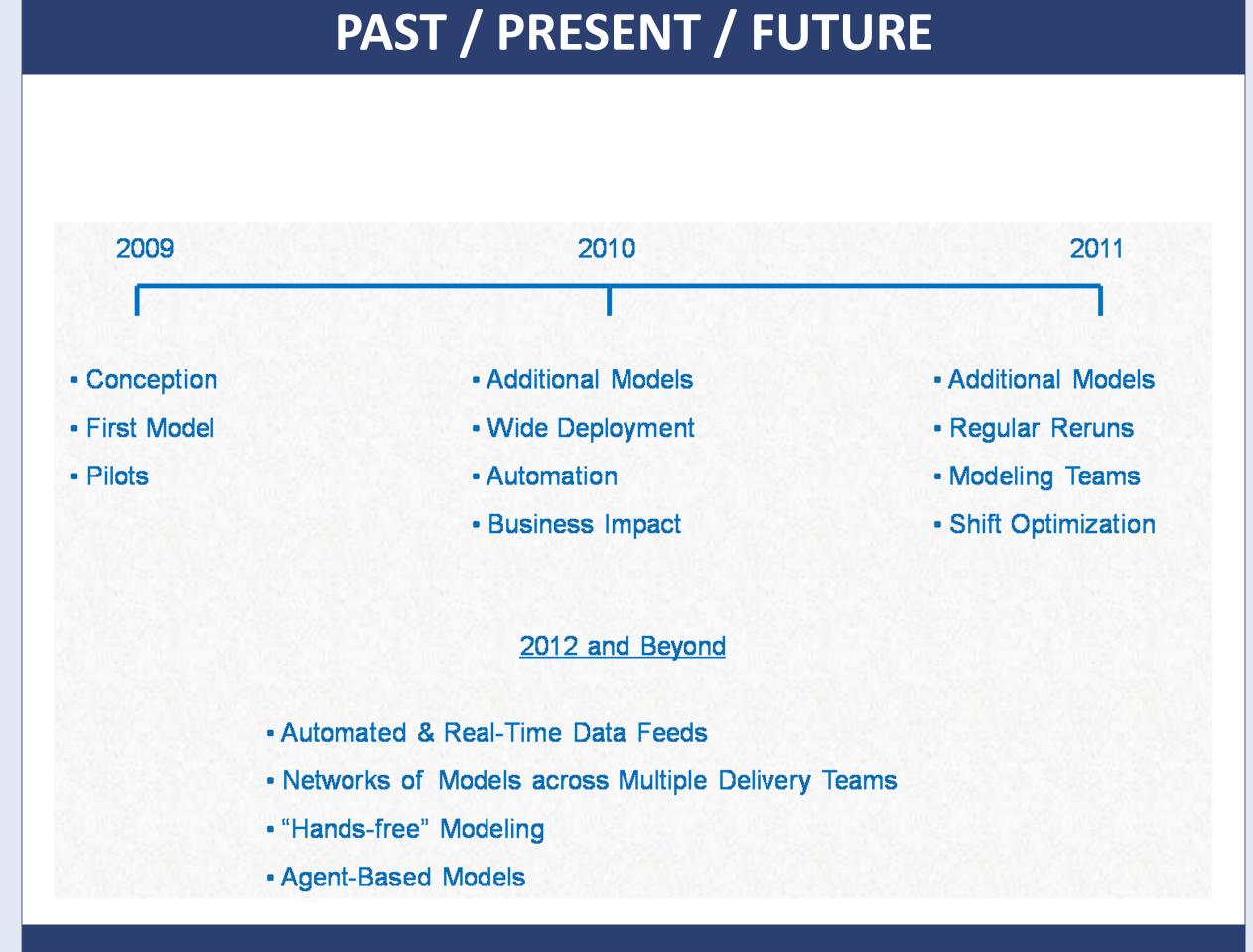
Sev 2 Attainment %

Sev 3 Attainment %

Sev 4 Attainment %

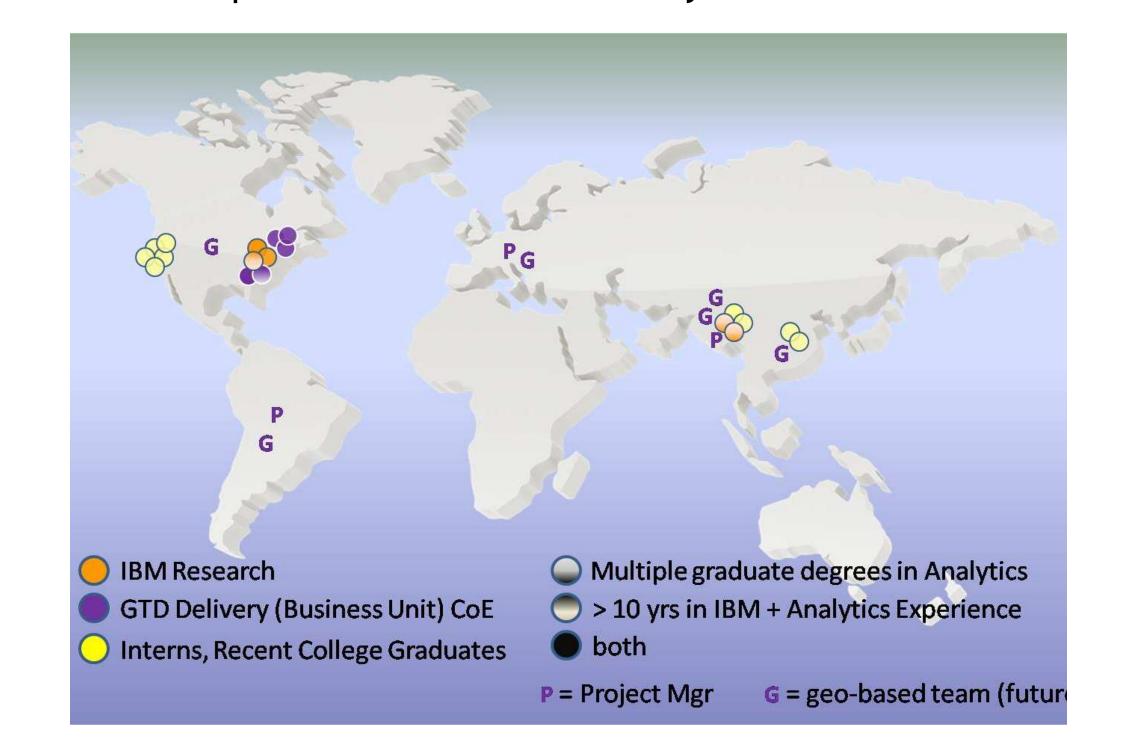
Service Level Agreement (SLA)

Source: Customer Contracts



#### THE TEAM

The team spans a wide range of organizations, academic degrees, and tenure/experience in IBM and in Analytics.



#### CONTACTS



Tom Lubeck

<u>Lubeck@us.ibm.com</u>

919-264-9522



Brian T. Eck

BrianEck@us.ibm.com

845-894-8234



Redha Bournas

Bournas@us.ibm.com

919-254-1368

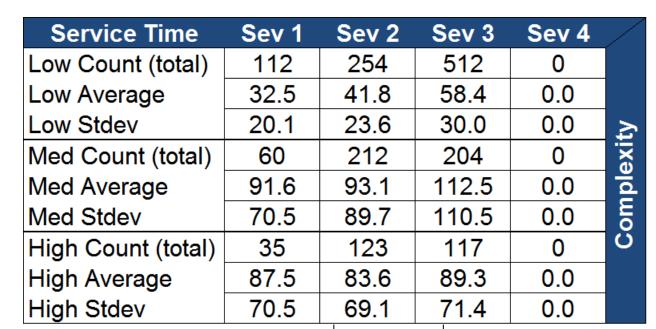


Processes globally
Execute with industry leading efficiency
Implement defect prevention processes

### Model Input Spreadsheet

		Workload	Account#1	Account#2
Ma	<b>.</b>	Arrivals per Hour	2.13	3.49
Non- Ticket		Average Work Time	46.4	39.5
		Stdev Work Time	5.7	1.3
	ity	Low %	73.8	90.9
	Complexity	Med %	26.1	8.7
		High %	0.2	0.3
		Misroute %	0.0	0.0
	Severity	Sev 1 %	13.8	11.3
		Sev 2 %	66.2	8.9
		Sev 3 %	20.0	79.8
		Sev 4 %	0.6	10.8
		Business Hour Start	8.5	0
		<b>Business Hour End</b>	17.5	24
		Ticket Count (per week)	412	698
		Interarrival Average (min)	24.5	14.4
et		Interarrival Stdev (min)	0.0	0.0
<b>Ficket</b>	es)	Monday0		
F	nte	Monday1		
	<b>Jin</b>	Monday2		1560.00
	$\leq$	Monday3		795.00
	/als	Monday4		30.00
	İ.	Monday5		6.50
	A L	Monday6		2.31
	ee	Monday7		3.68
	etw.	Monday8	37.14	4.04
	Ğ	Monday9	21.08	3.26
	me	Monday10	33.19	3.80
	Ϊ		40.00	4.42
	Avg. Time Between Arrivals (Mir	Sunday22	37.73	520.00
	⋖	Sunday23	35.45	

Workload Volume and Arrivals
Source: Historical Ticket Data
where it exists, else Timing Study



Ticket Service Times
Source: Timing Study

## AnyLogic Simulation OptQuest Optimization

#### **Model & Optimization Parameters**

- 1. Enable Swing
- 2. Enable Sev 2 Page Out
- 3. Guided Search
- 4. Contract vs. As Is SLA's

<u></u>	στορ	MON	TUE		THU	FRI	SAT		Low	Med	High	٠.
On Call		24:00	24:00	24:00	24:00	24:00	24:00	24:00	0	1	1	Staff
0 0-11	start	0:00	0:00	0:00	0:00	0:00	0:00	0:00				JE.
Shiit4	stop	8:30	8:30	8:30	8:30	8:30			0	1	U	C
Shift4	start	1:30	1:30	1:30	1:30	1:30			0	1	0	Counts
SIIIIS	stop	1:30	1:30	1:30	1:30	1:30			1	I	1	
Shift3	start	17:30	17:30	17:30	17:30	17:30				1		þ
Silitz	stop			17:30	17:30	17:30	17:30	17:30	1		2	Canability
Shift2	start			8:30	8:30	8:30	8:30	8:30		2	2	u C
Shift1	stop	17:30	17:30	17:30	17:30	17:30			<u>'</u>	ı	4	ij
Chi#1	start	8:30	8:30	8:30	8:30	8:30			1	1	4	>

Shift Structure Source: Pool Team