

# DataMOCCA



## Data Models for Call Center Analysis

### Project Collaborators:

Technion: Paul Feigin, Avi Mandelbaum

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Wharton: Larry Brown, Noah Gans, Haipeng Shen (N. Carolina),

Students, Wharton Financial Institutions Center

Companies: U.S. Bank, Israeli Cellular Phone (both Aspect-Based), ...

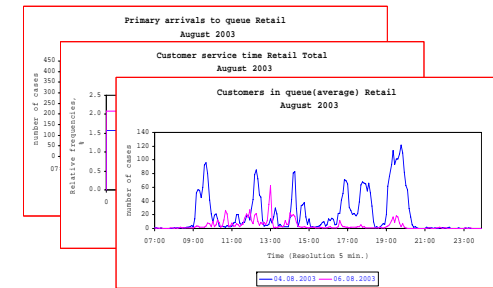


# Project Data MOCCA

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## System Components:

1. Clean databases: operational histories of individual calls, agents and sometimes customers (ID's).
2. Friendly powerful interface: online access to (mostly) operational and (some) administrative data (but no financial data, yet).



## Currently Two Databases:

- US Bank (220/40M calls, 1000 agents, 2.5 years; 7-20GB).
- Israeli Cellular phone company (800 agents, 2.5 years, ongoing).



## Data MOCCA - Interface

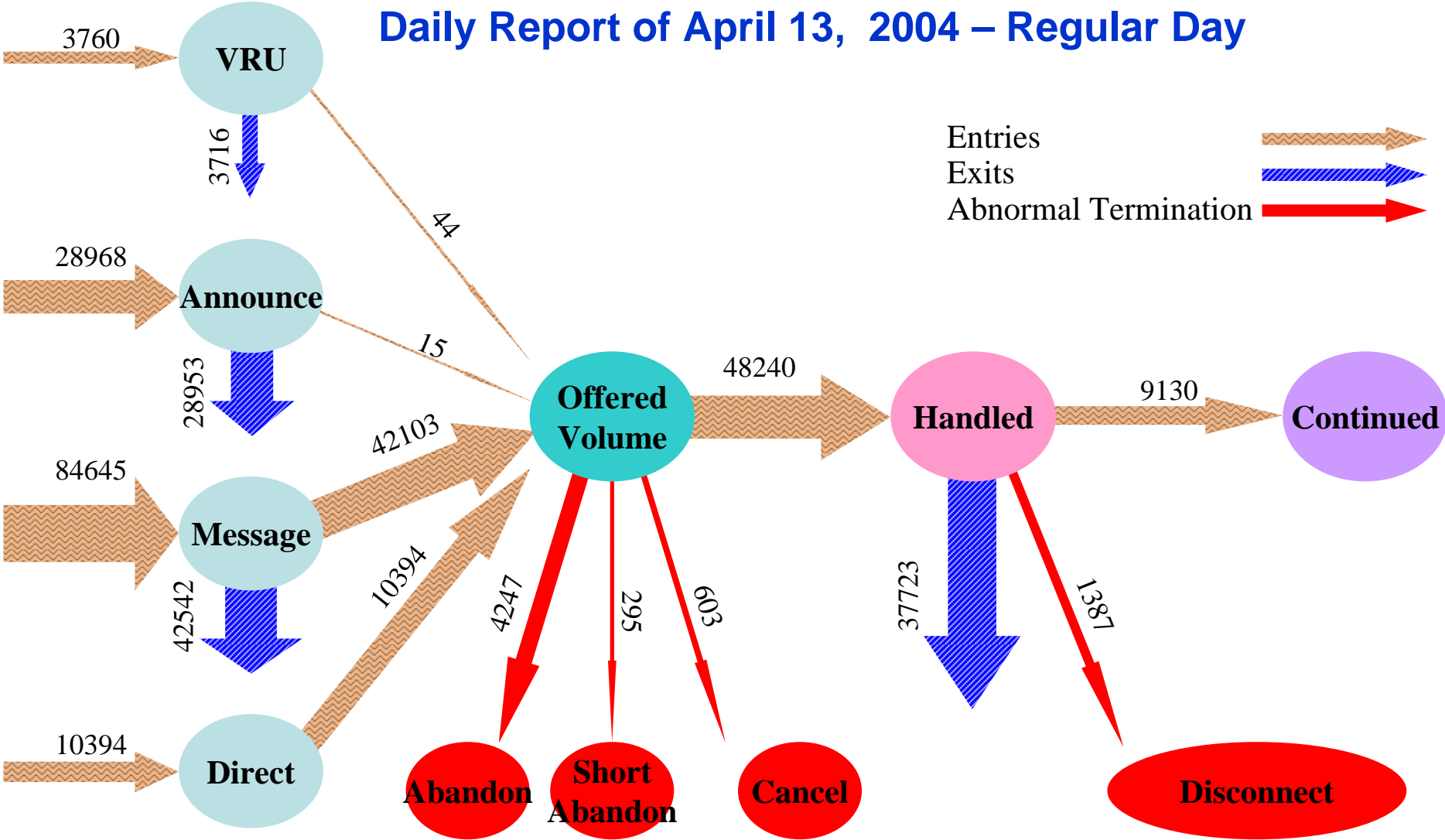
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- **Daily / monthly / yearly reports & flow-charts for a complete operational view.**
- **Graphs and tables, in customized resolutions (month, days, hours, minutes, seconds) for a variety of (pre-designed) operational measures** (arrival rates, abandonment counts, service- and wait-time distribution, utilization profiles,...).
- **Graphs and tables for new user-defined measures.**
- **Direct access to the raw (cleaned) data.**



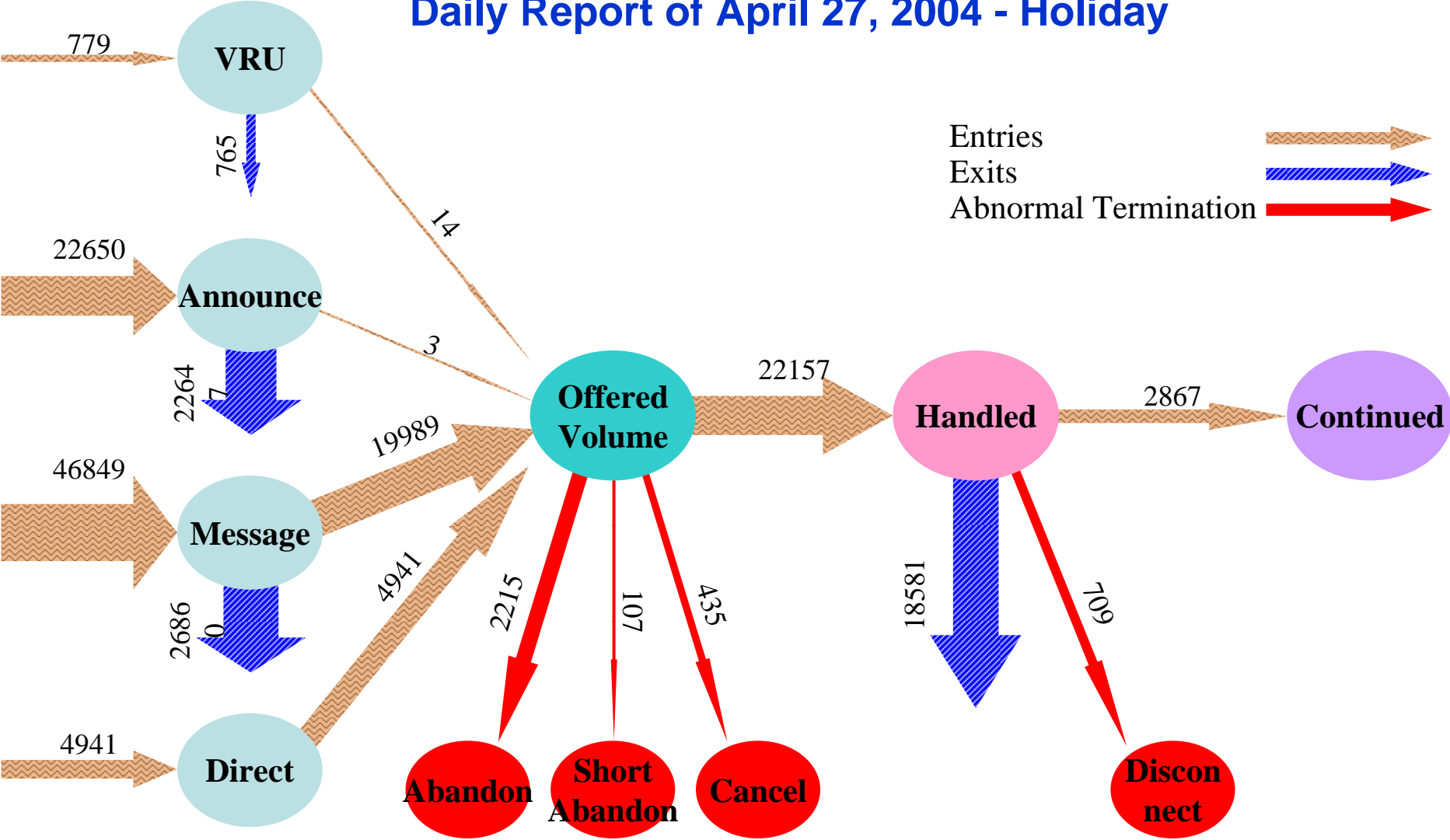
# Data MOCCA - Interface

## Daily Report of April 13, 2004 – Regular Day



# Data MOCCA - Interface

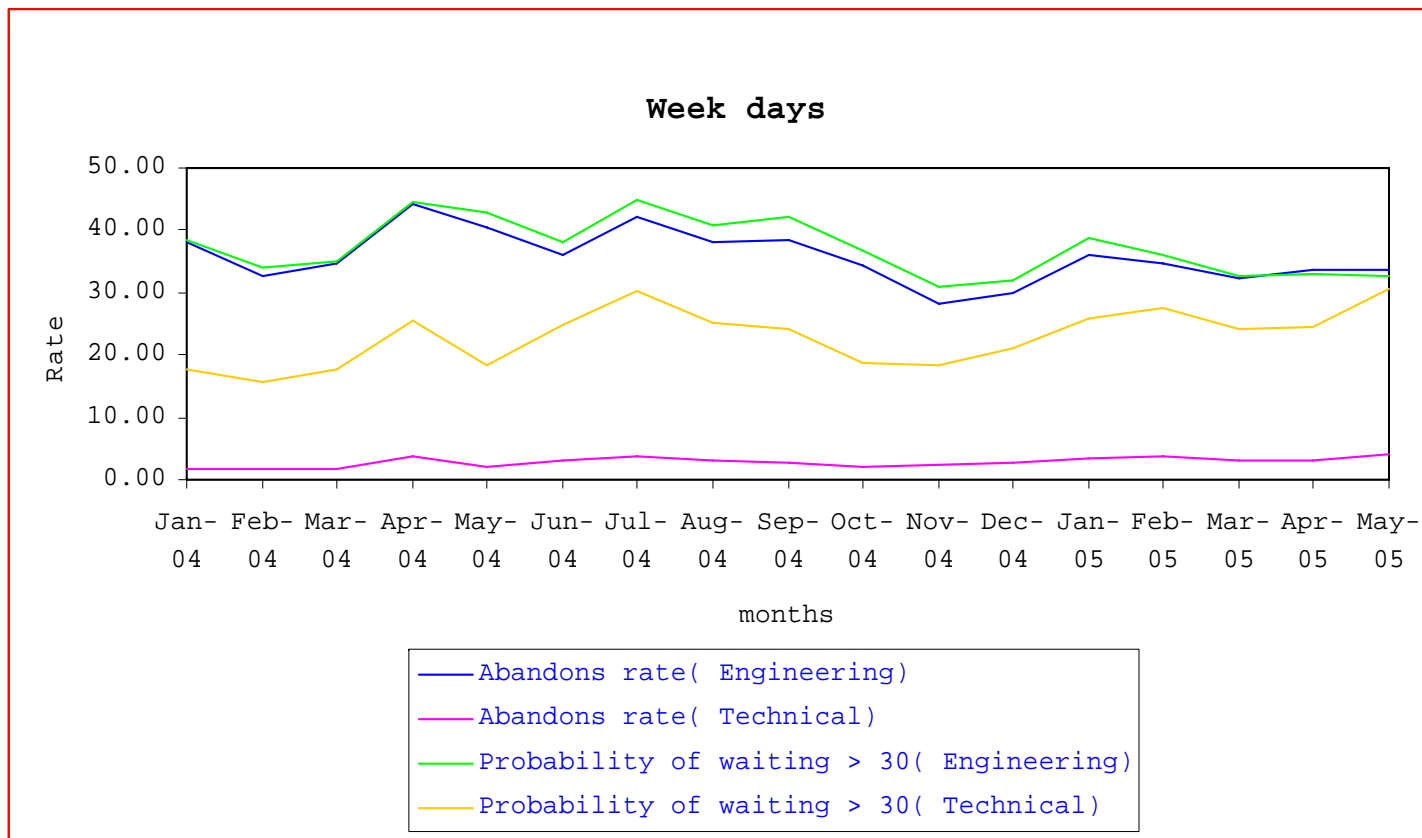
## Daily Report of April 27, 2004 - Holiday



# Data MOCCA - Interface

## Pre-designed Operational Measures: %Abandonment, TSF

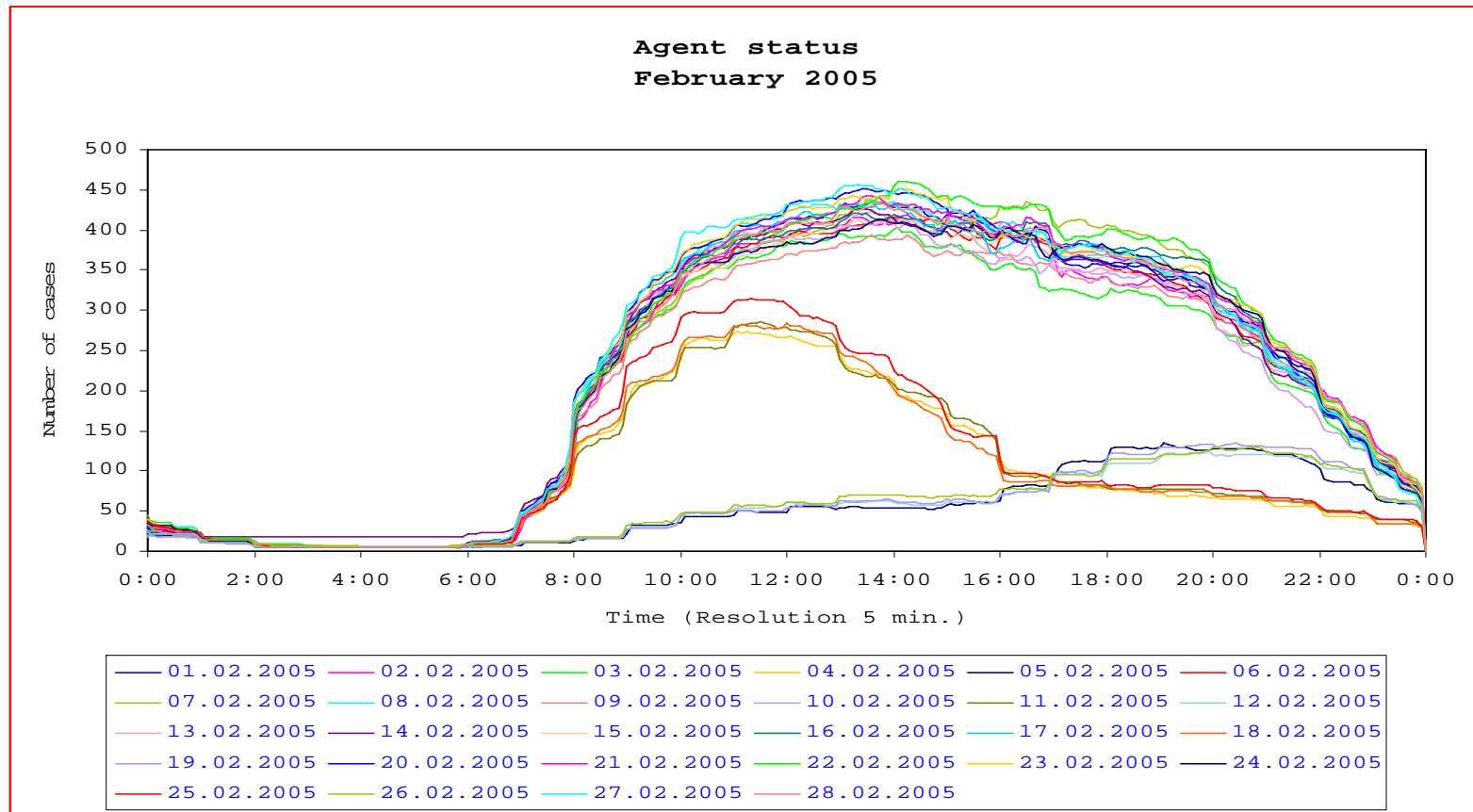
### Time Series



# Data MOCCA - Interface

## Pre-designed Operational Measures: Arrival Rates, 2/2005

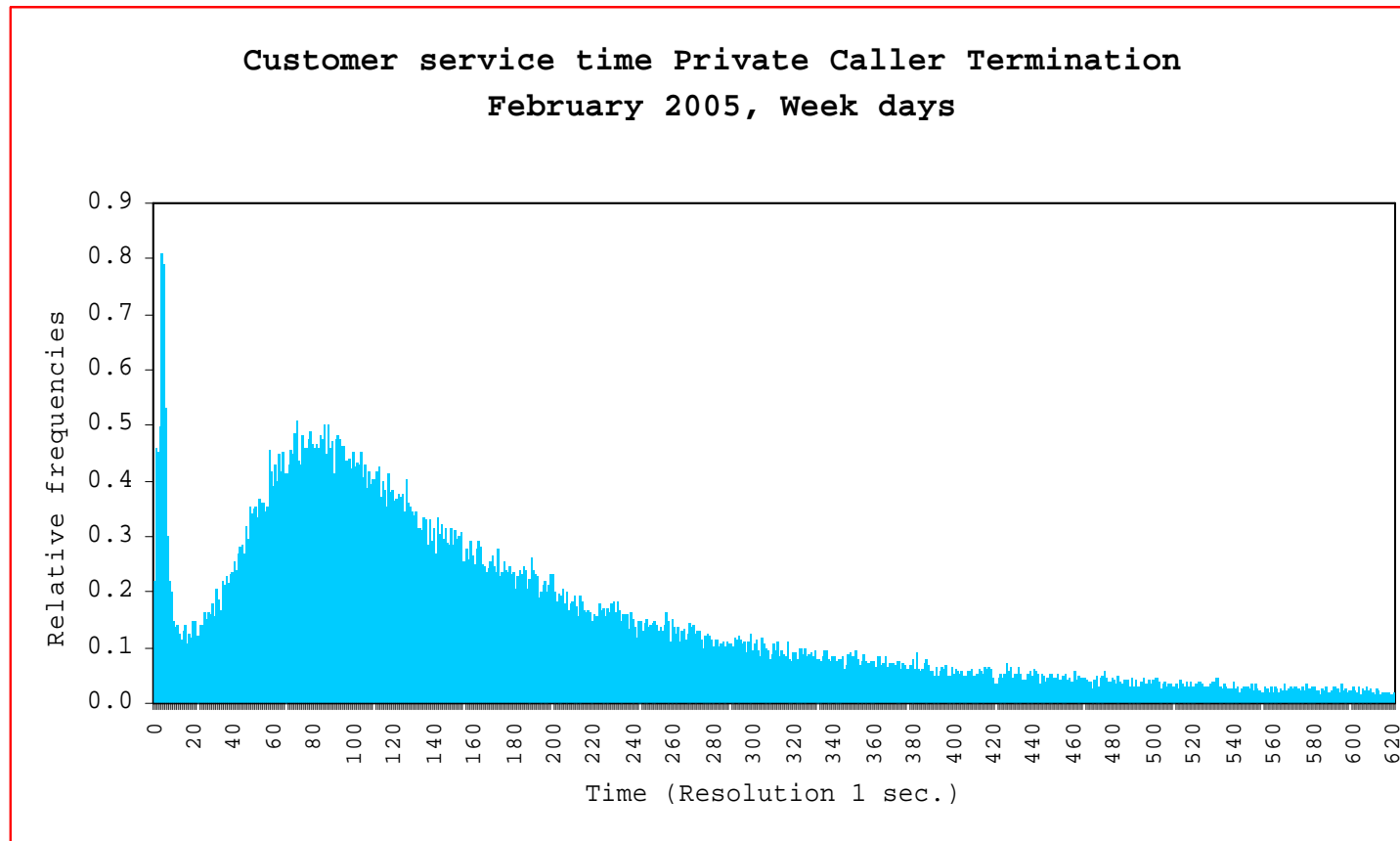
### Daily Reports



## Data MOCCA - Interface

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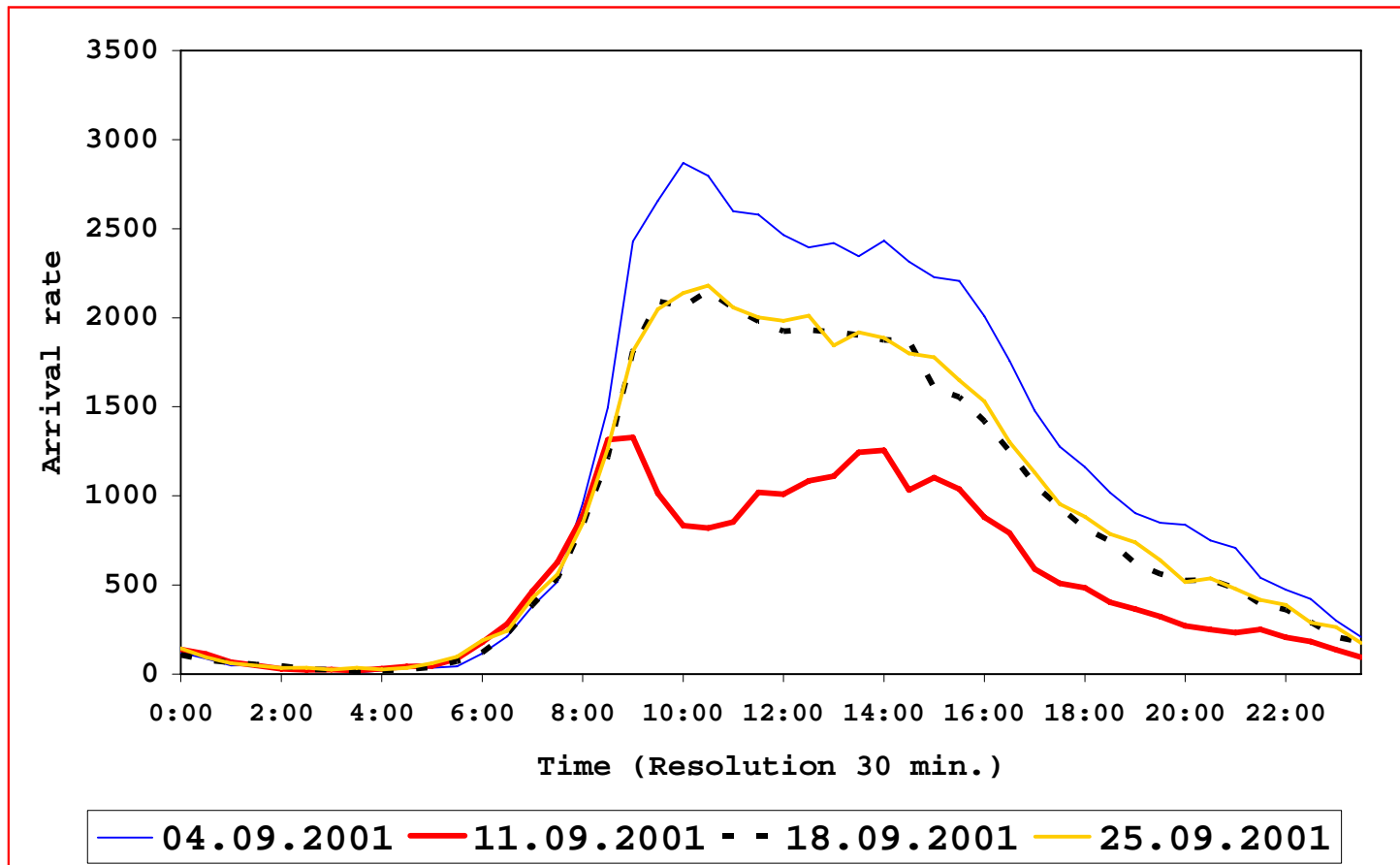
### Pre-designed Operational Measures: Service Times Histograms





## Data MOCCA – Interesting Scenarios

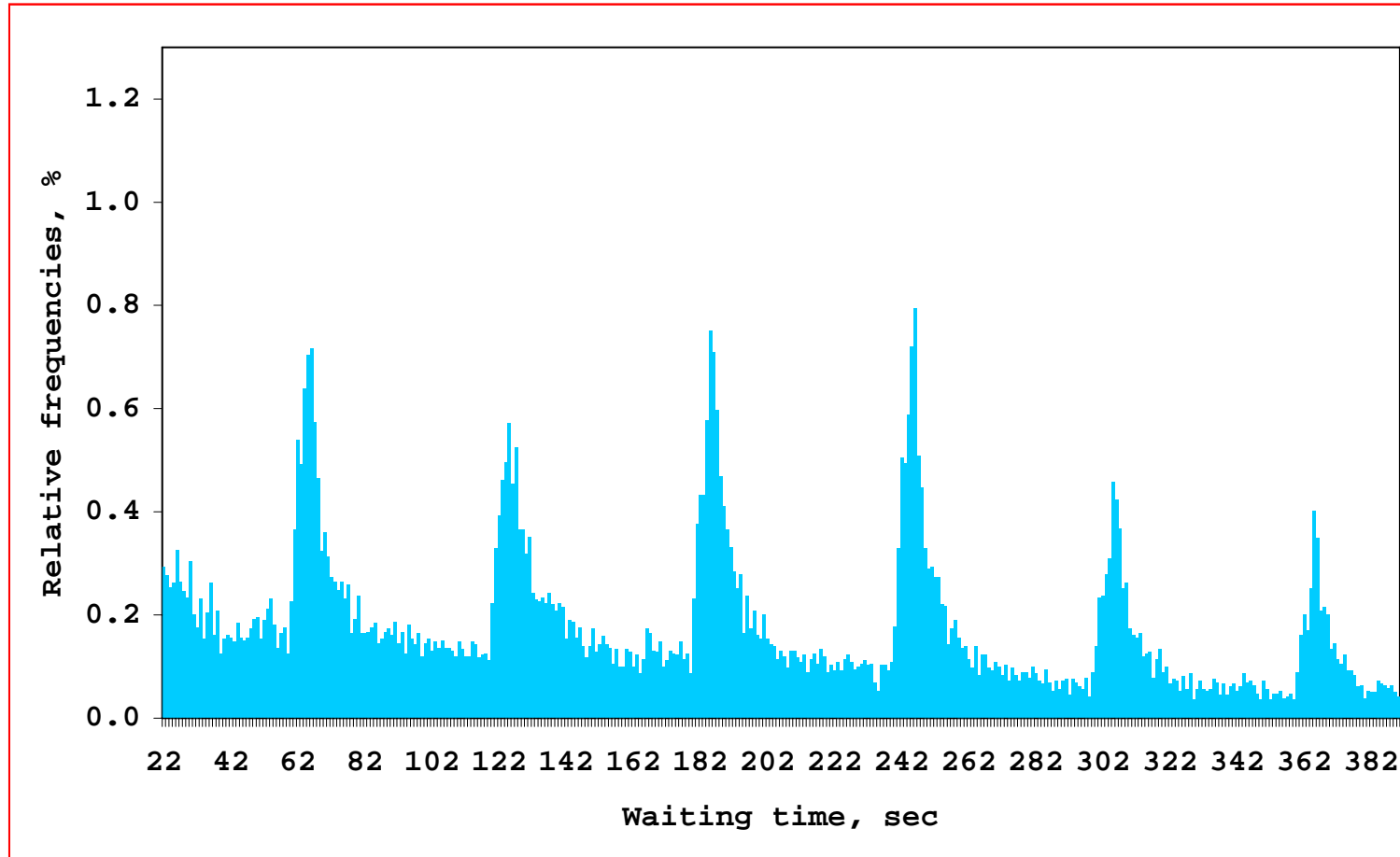
### US Bank: Arrival Rates on Tuesdays in September



## Data MOCCA – Interesting Scenarios

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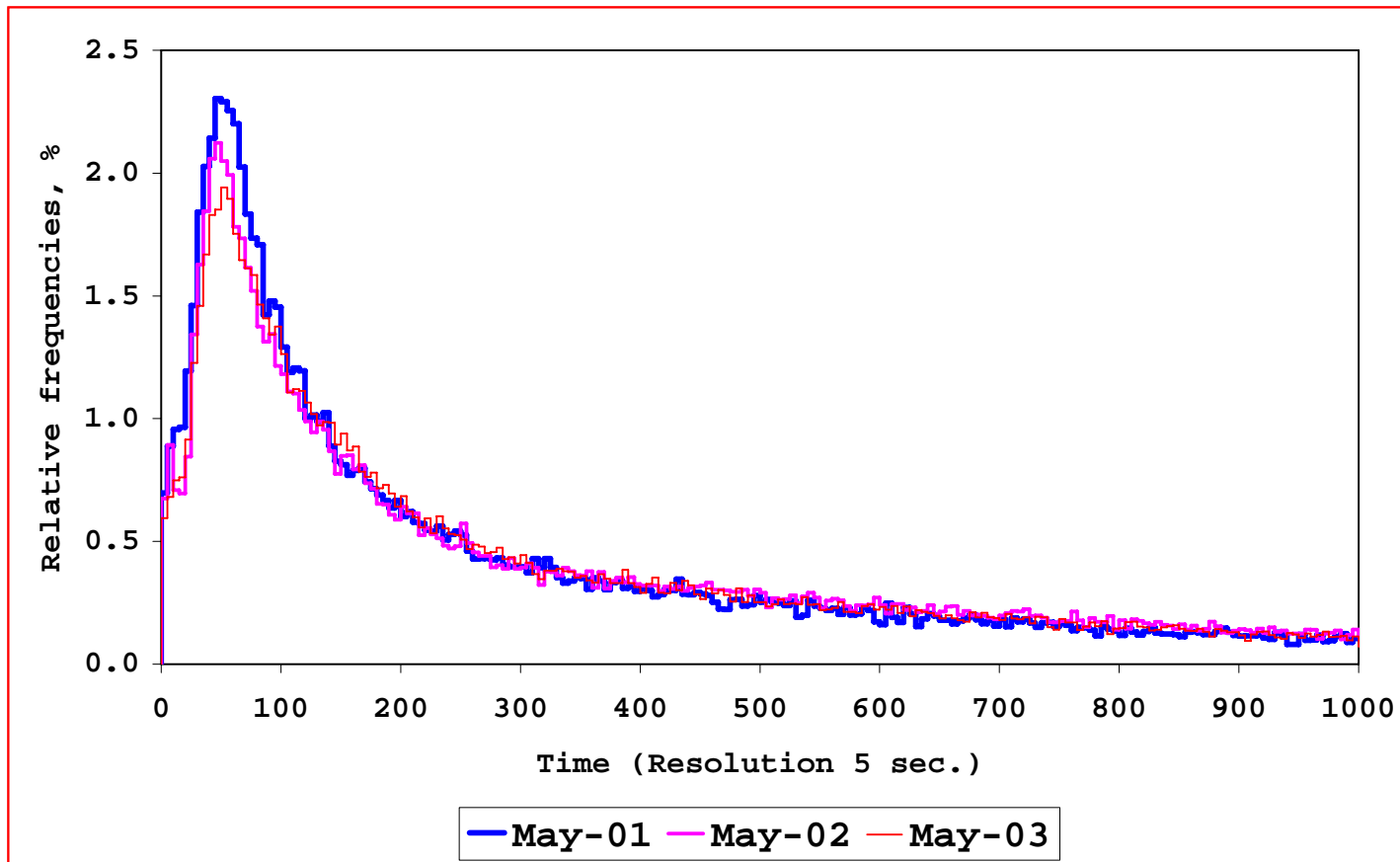
### Israeli Bank: Histogram of **Waiting Time**



## Data MOCCA – Interesting Scenarios

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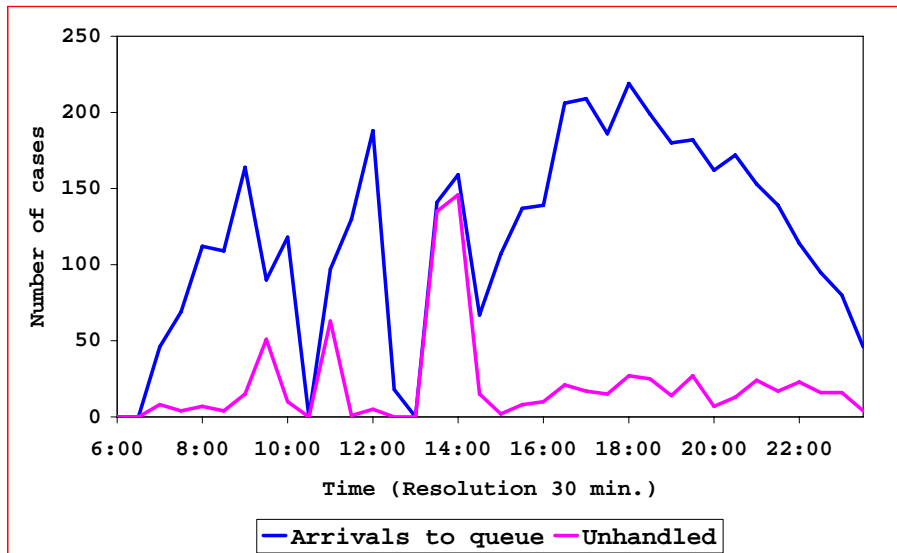
### US Bank: **Service Time** Histograms for Telesales, 2001-3



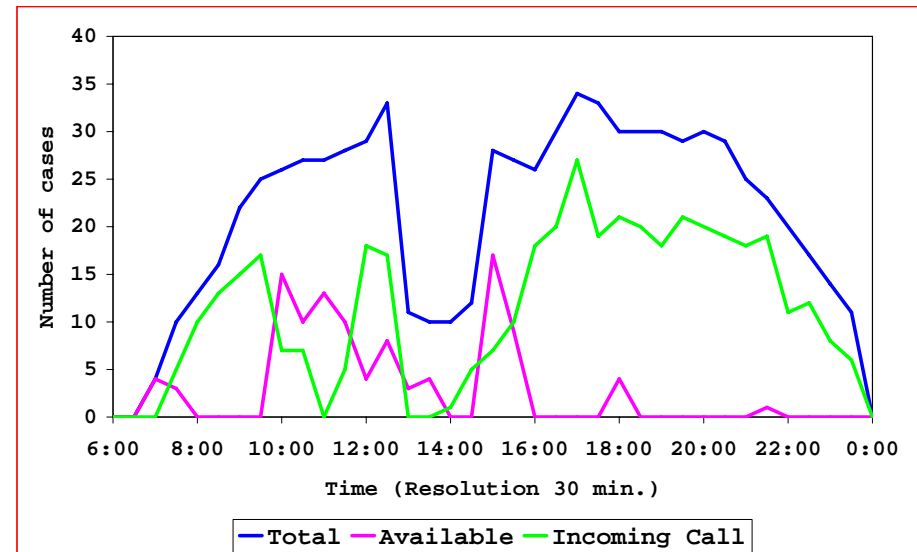
# Data MOCCA – Interesting Scenarios

## Israeli Call Center: Technical Service – Scenario Analysis

### Unhandled Calls on May 24<sup>th</sup>, 2005

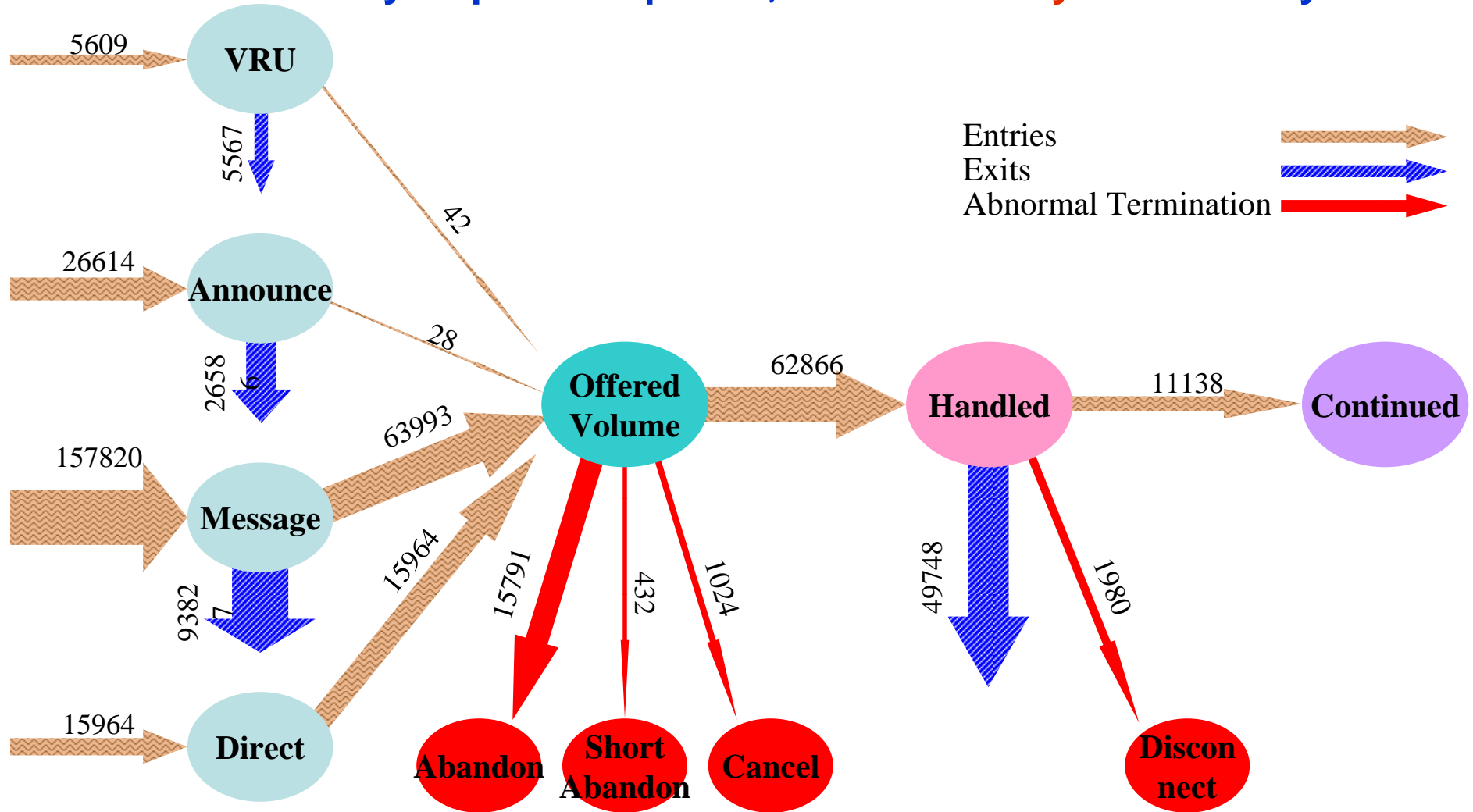


### Agents Status on May 24<sup>th</sup>, 2005



# Data MOCCA – Interesting Scenarios

## Daily Report of April 20, 2004 – Heavily Loaded Day



## Data-Based Research: Fun & Must (?)

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- Contrast with “EmpOM”: Industry / Company / Survey Data (Social Sciences)
- Converge to: Measure, Model, Validate, Experiment, Refine (Physics, Biology,...)
- Prerequisites: OR/OM, (Marketing) – for Design; Computer Science, Information Systems, Statistics – for Implementation.
- Outcomes: Relevance, Credibility, Interest; Pilot (eg. Healthcare). Moreover,  
**Teaching:** Class, Homework (Experimental Data Analysis); Cases.  
**Research:** Test (Queueing) Theory / Laws, Stimulate New Models / Theory.  
**Practice:** OM Tools (Scenario Analysis), Mktg (Trends, Benchmarking).

