



DataMOCCA



Data Models for Call Center Anal^ysis

Project Collaborators:

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Students, Wharton Financial Institutions Center

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

Project Data MOCCA

Goal: Designing and Implementing a
(universal) data-base/data-repository and interface
for storing, retrieving, analyzing and displaying
Call-by-Call-based data/information



Enable the Study of:

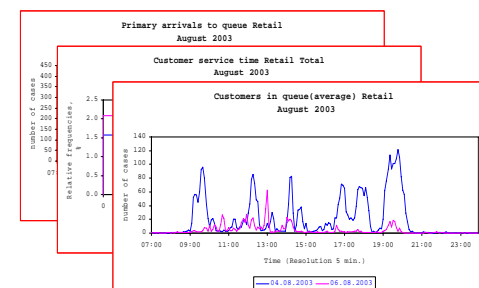
- **Customers** Wait Time, Abandonment, Retrials
- **Service Providers / Agents** Service Duration, Activity Profile
- **Managers / System** Loads, Queue Lengths, Trends



Project Data MOCCA

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).



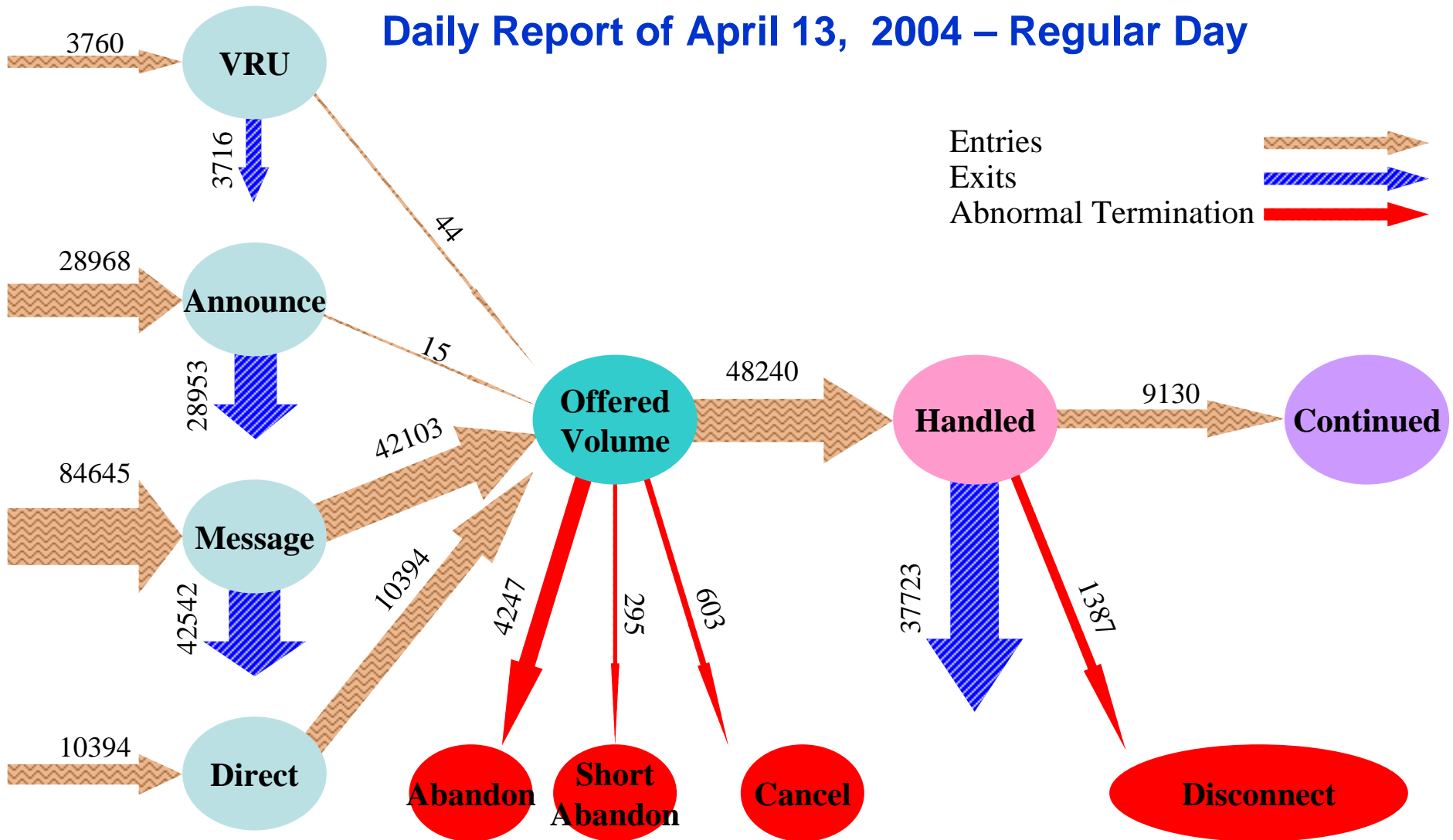
Data MOCCA - Interface

- 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.



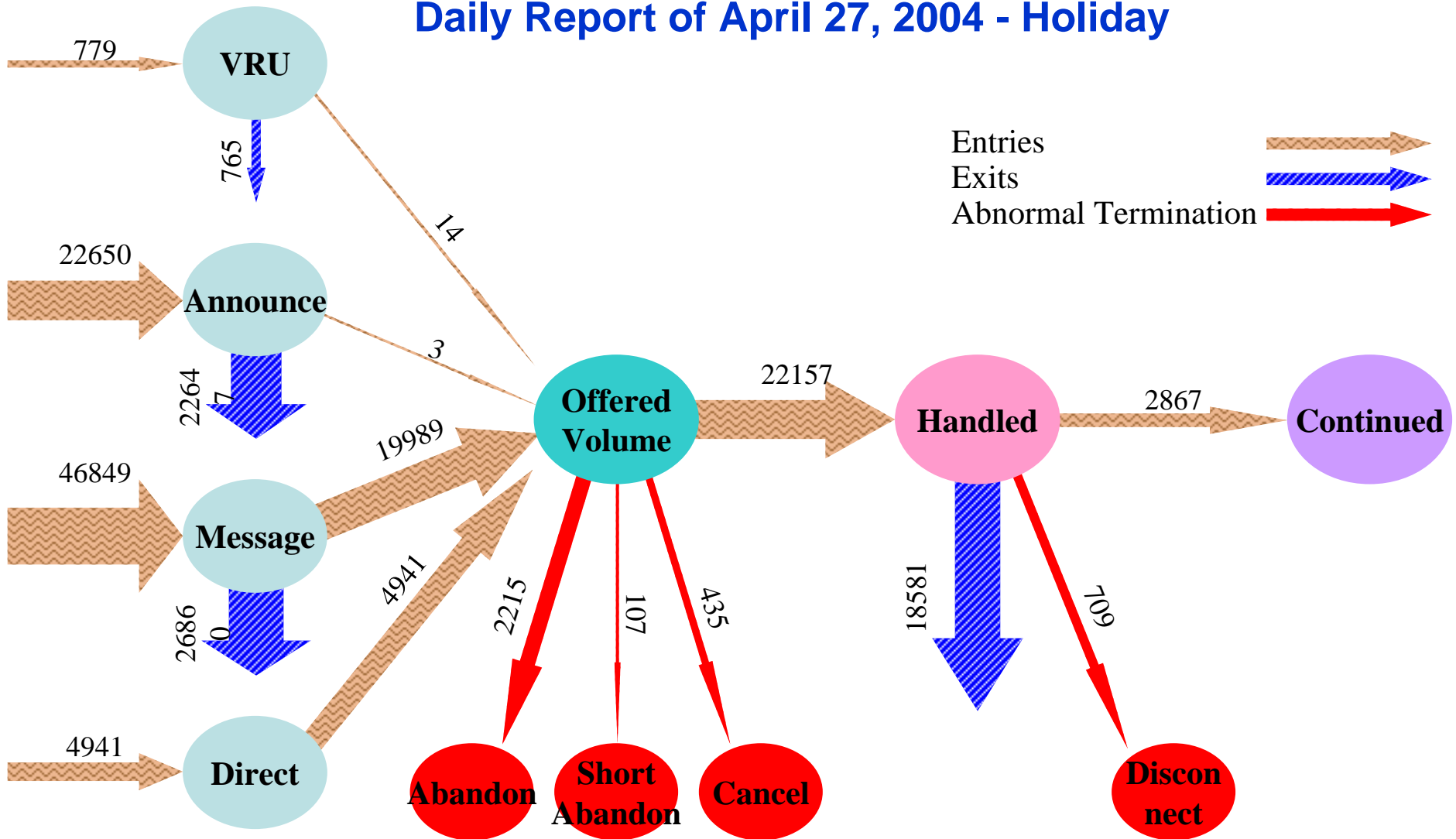
Data MOCCA - Interface

Daily Report of April 13, 2004 – Regular Day



Data MOCCA - Interface

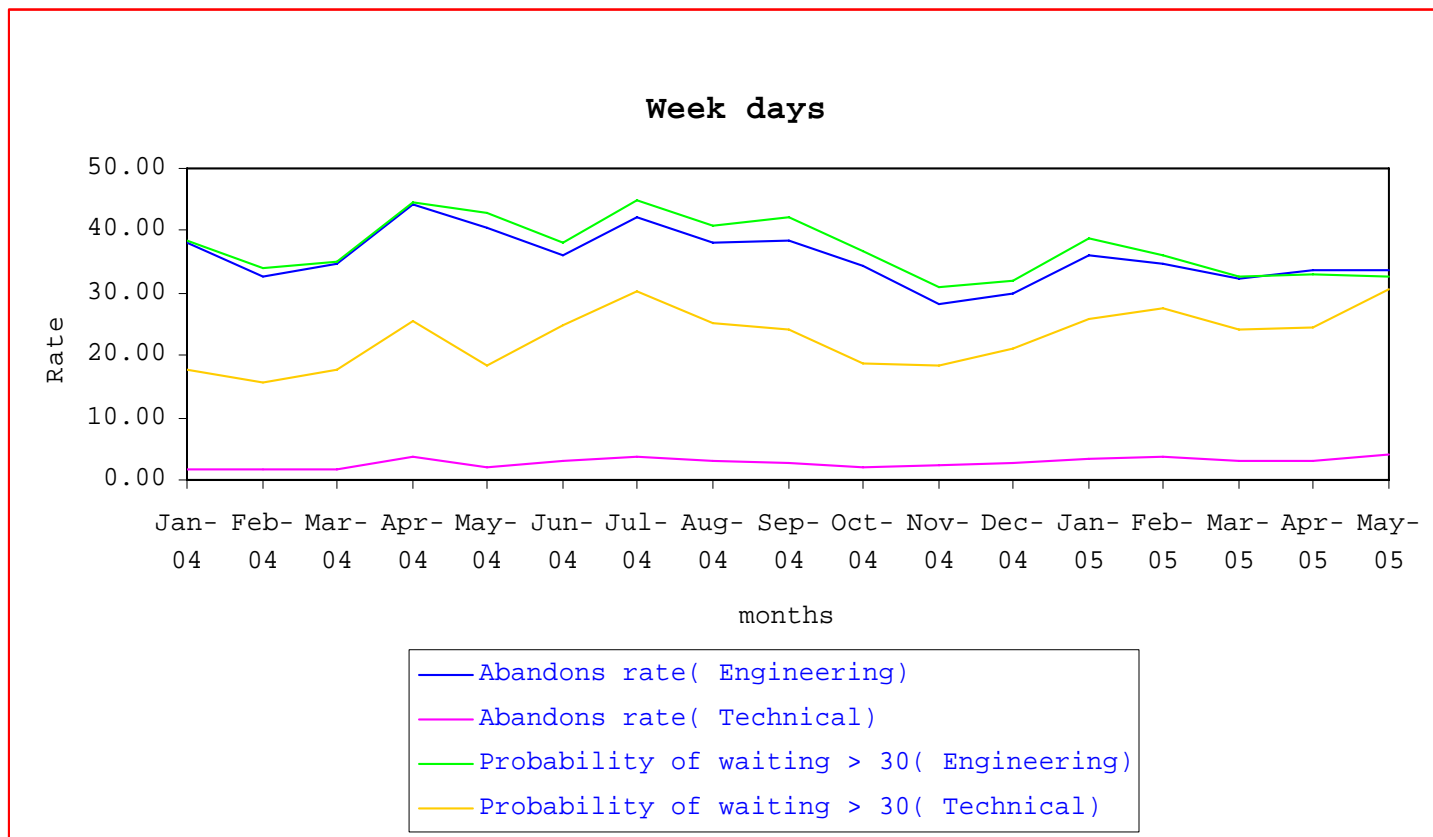
Daily Report of April 27, 2004 - Holiday



Data MOCCA - Interface

Pre-designed Operational Measures: %Abandonment, TSF

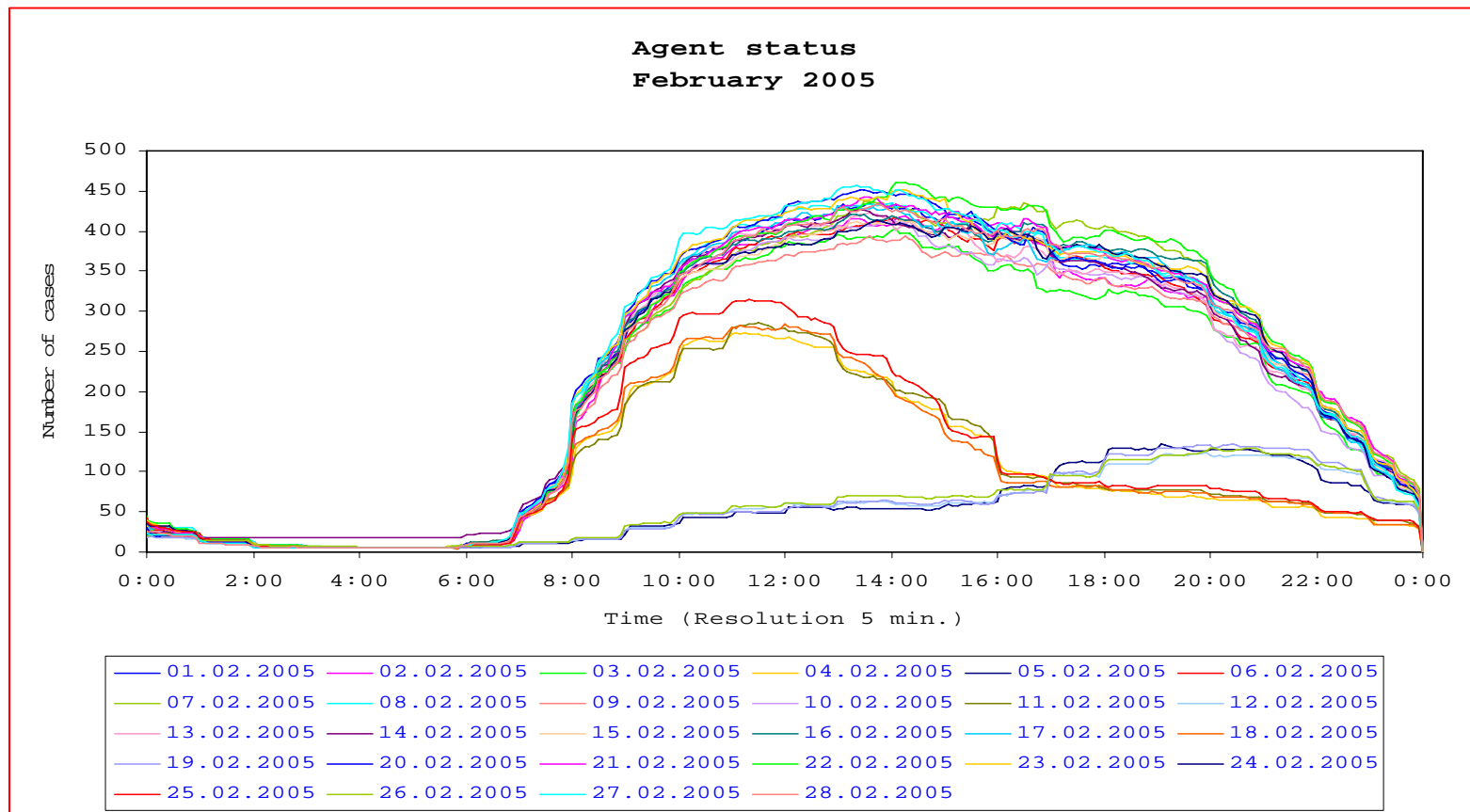
Time Series



Data MOCCA - Interface

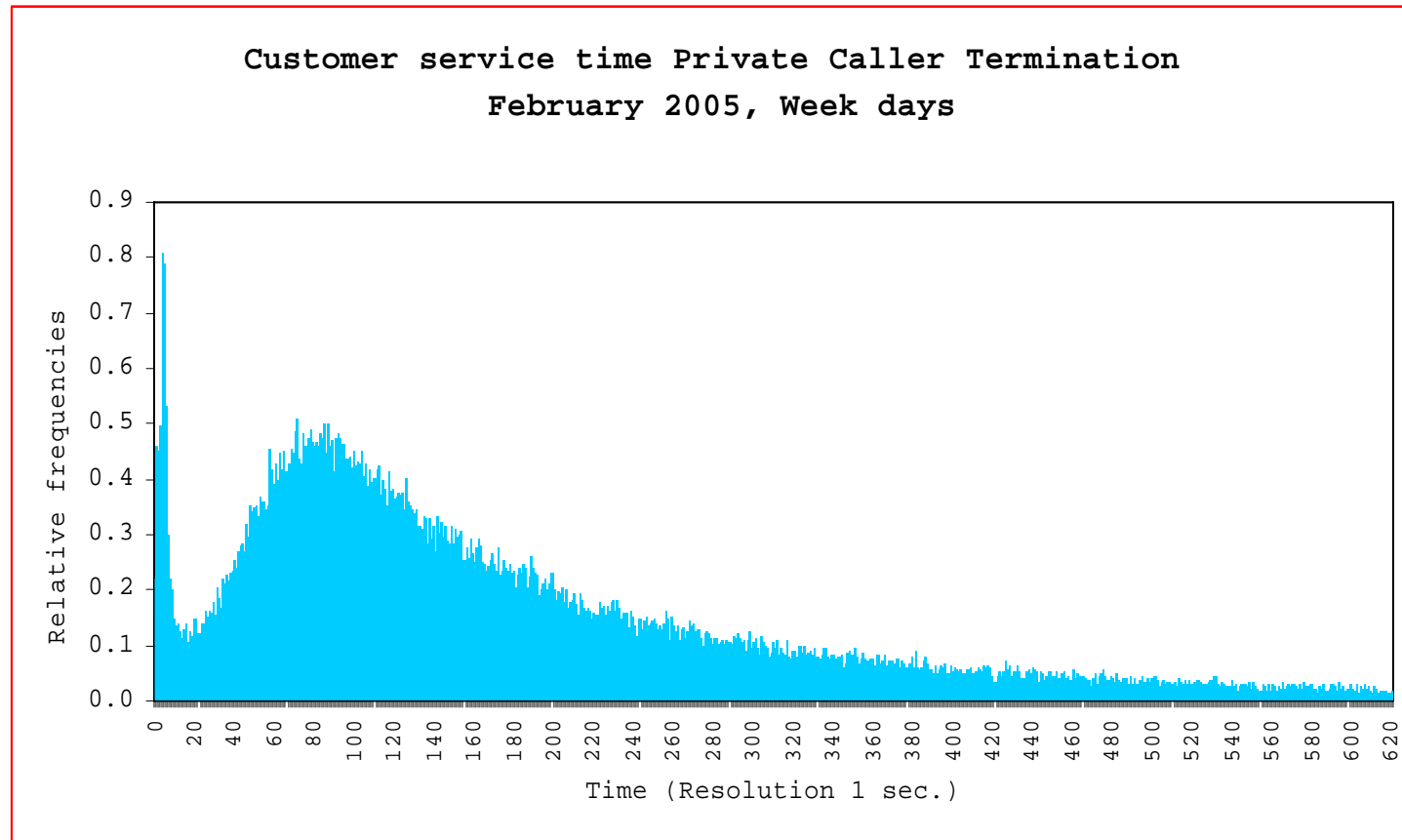
Pre-designed Operational Measures: Arrival Rates, 2/2005

Daily Reports



Data MOCCA - Interface

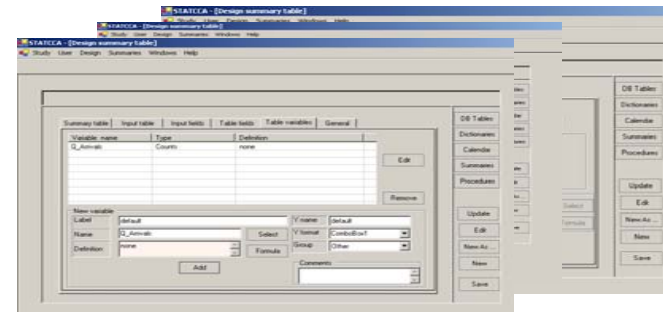
Pre-designed Operational Measures: Service Times Histograms



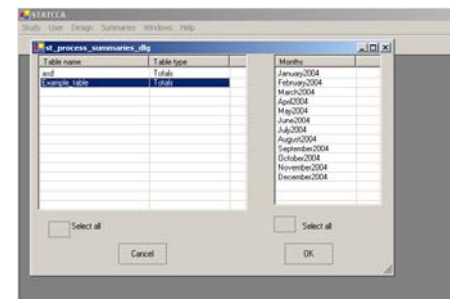
Data MOCCA – Customized Interface

New User-Defined Graphs

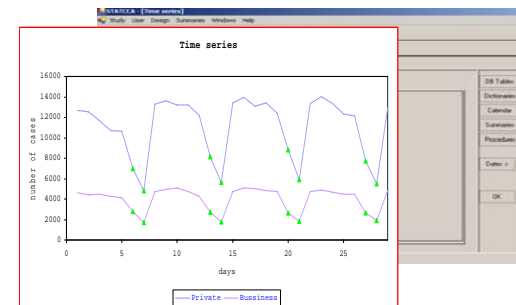
Step 1: Entering Variable Definition



Step 2: Processing information from the desired dates

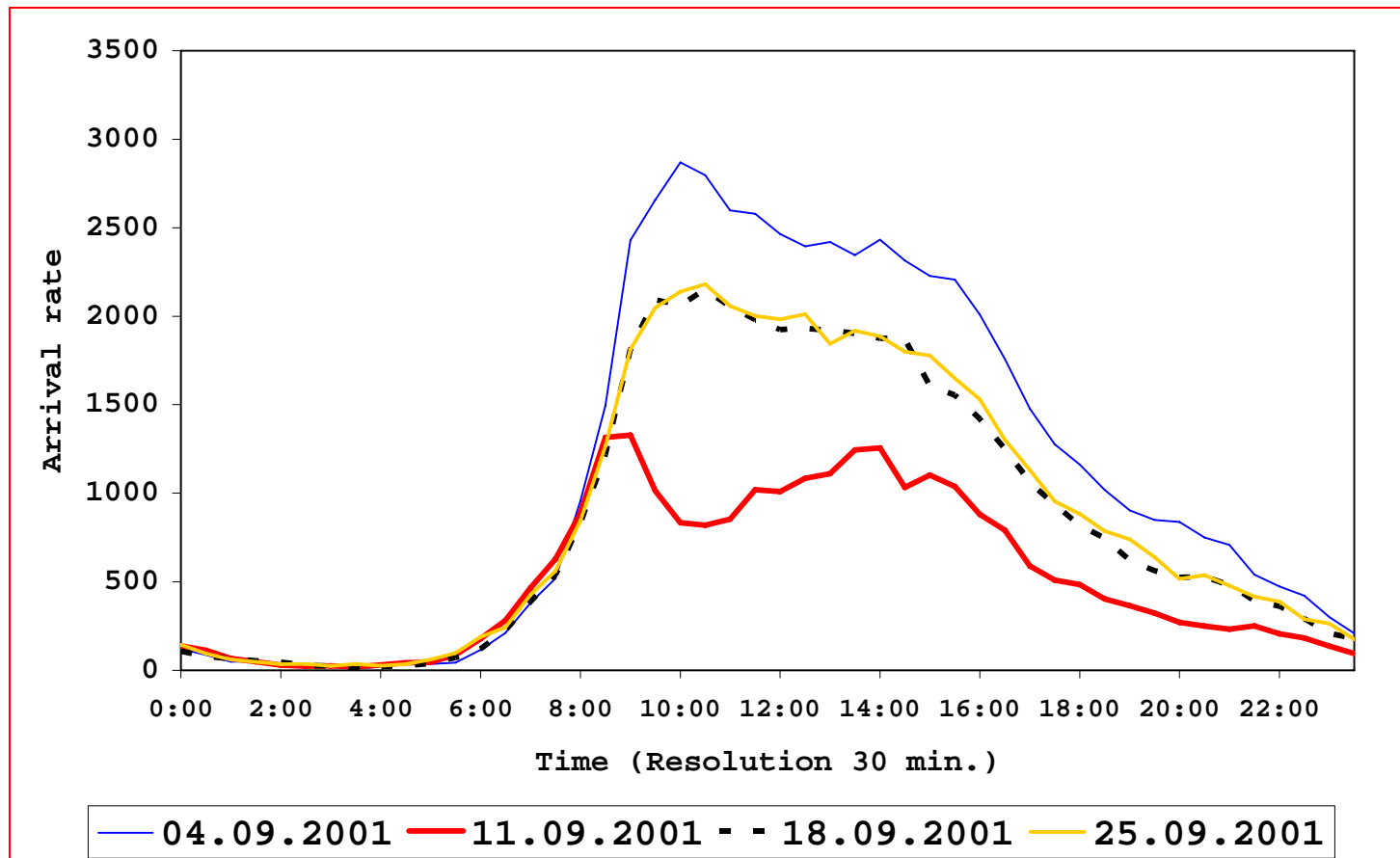


Step 3: Creating desired graphs and tables



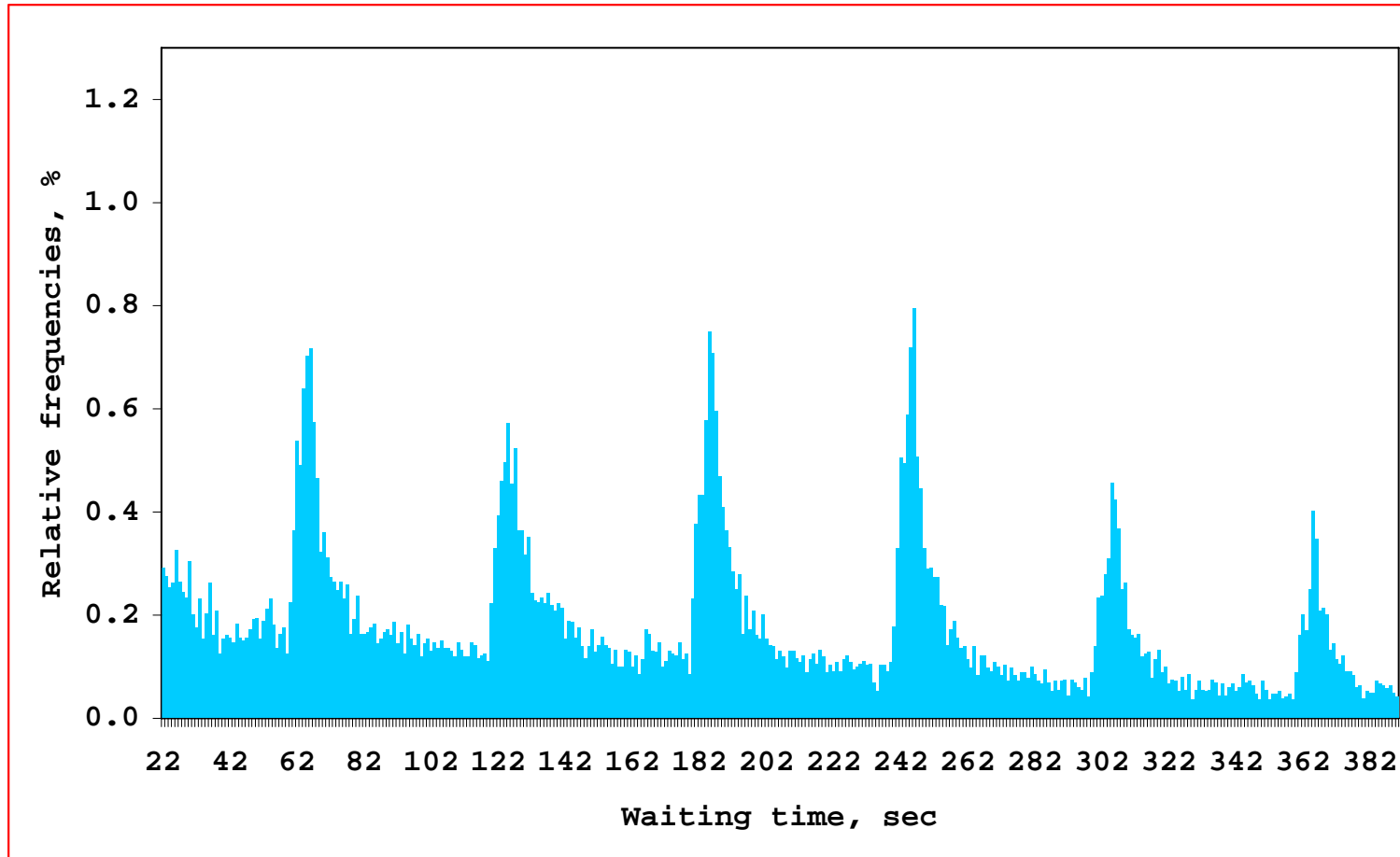
Data MOCCA – Interesting Scenarios

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



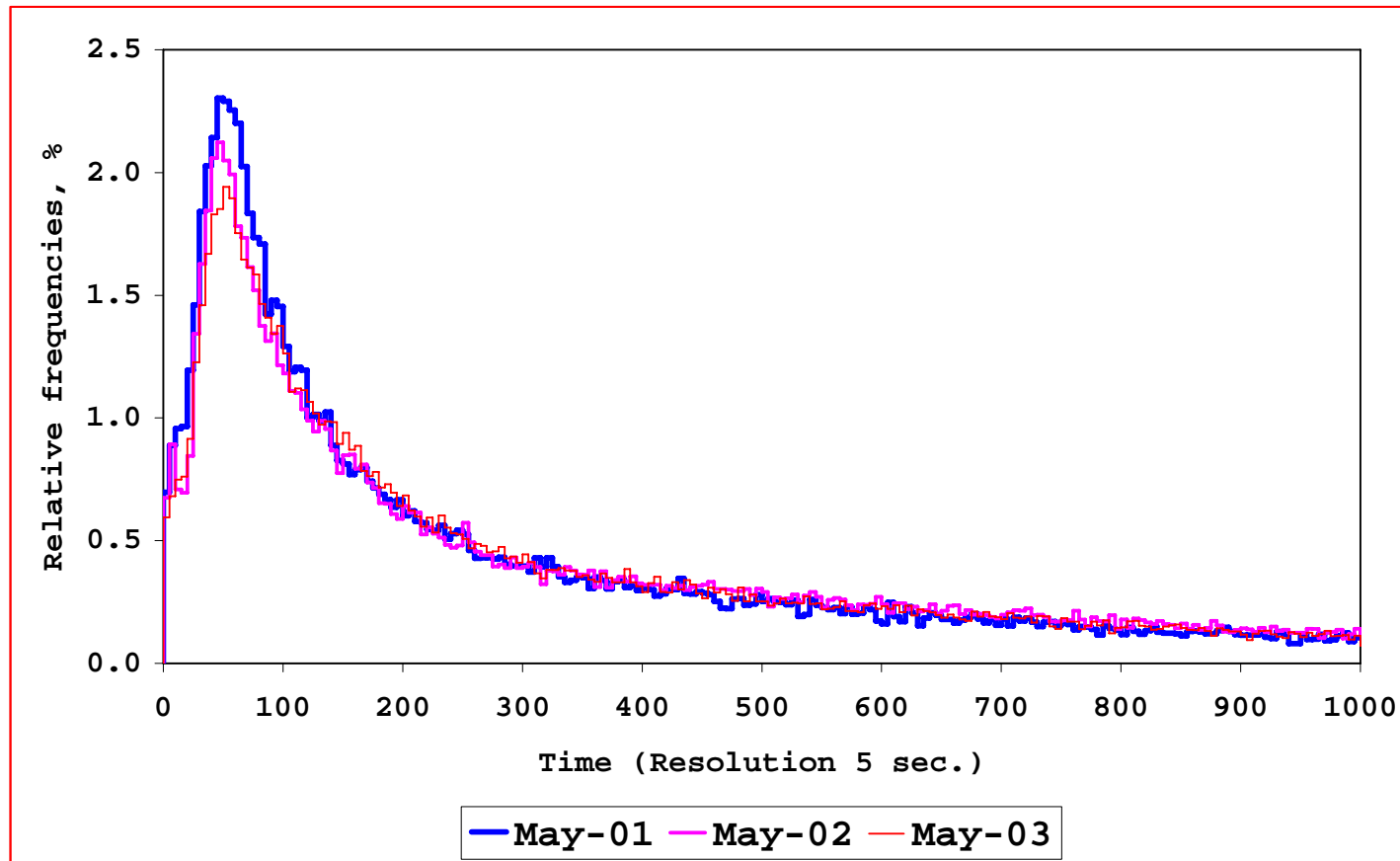
Data MOCCA – Interesting Scenarios

Israeli Bank: Histogram of **Waiting Time**



Data MOCCA – Interesting Scenarios

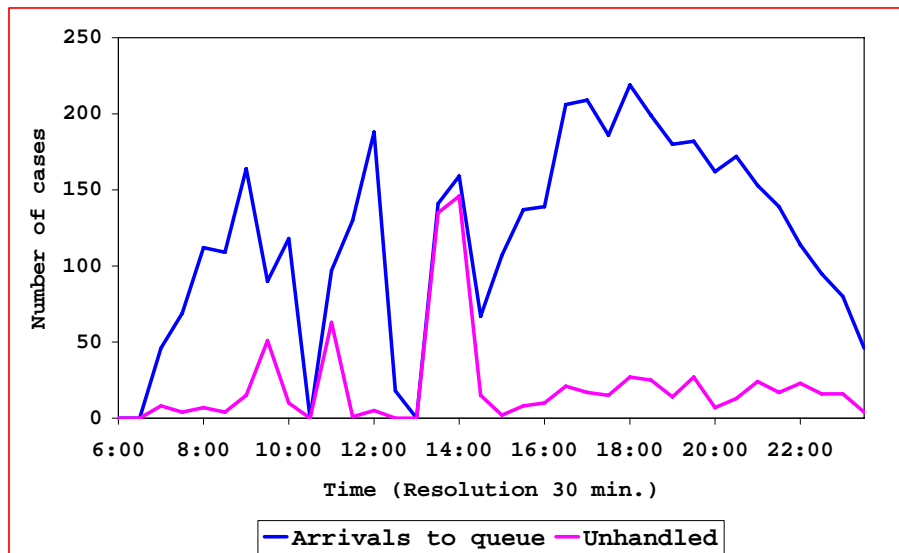
US Bank: **Service Time** Histograms for Telesales, 2001-3



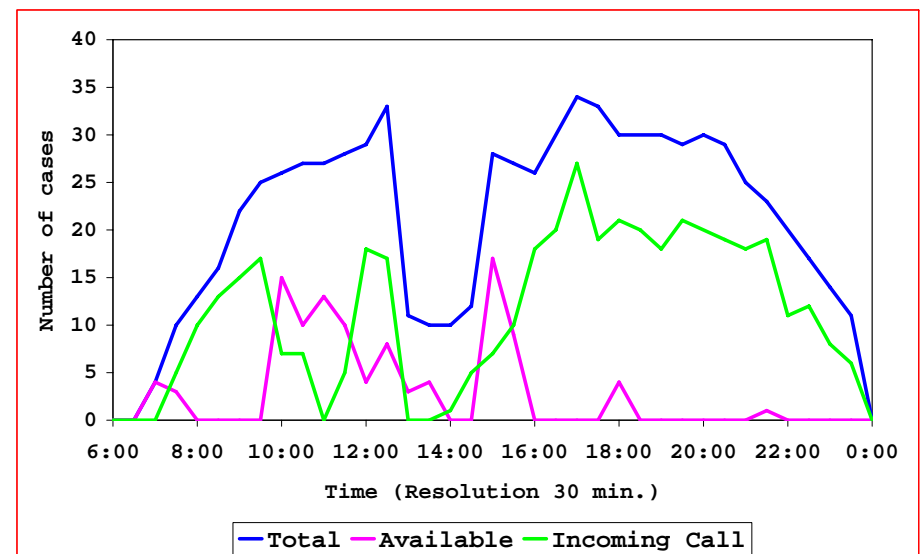
Data MOCCA – Interesting Scenarios

Israeli Call Center: Technical Service – Scenario Analysis

Unhandled Calls on May 24th, 2005

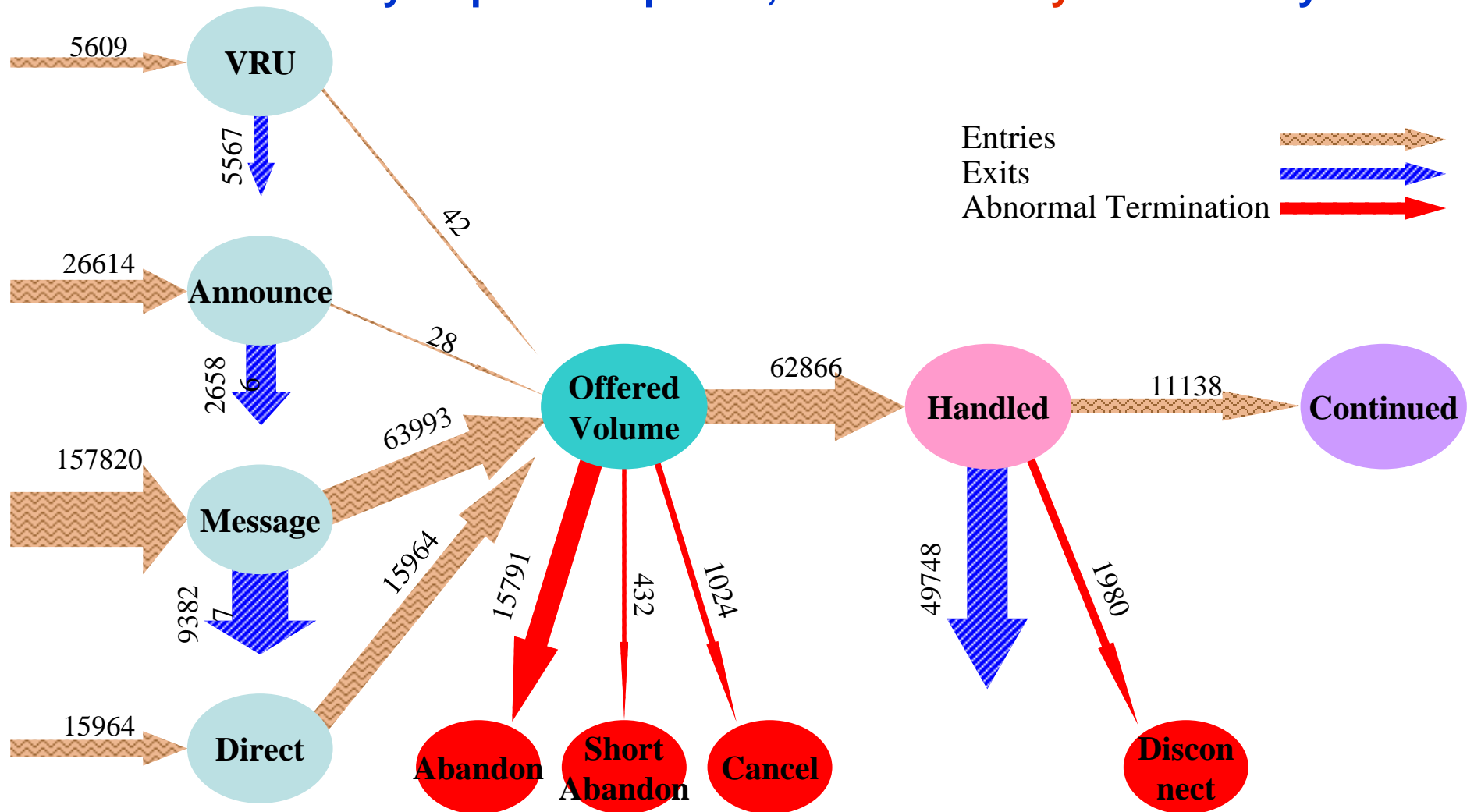


Agents Status on May 24th, 2005



Data MOCCA – Interesting Scenarios

Daily Report of April 20, 2004 – Heavily Loaded Day



Data-Based Research: Must (?) & Fun

- 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).

