Dynamic Surgical Smoothing:
Generating Meaningful Short-term Forecasts of Surgical Bed Requirements

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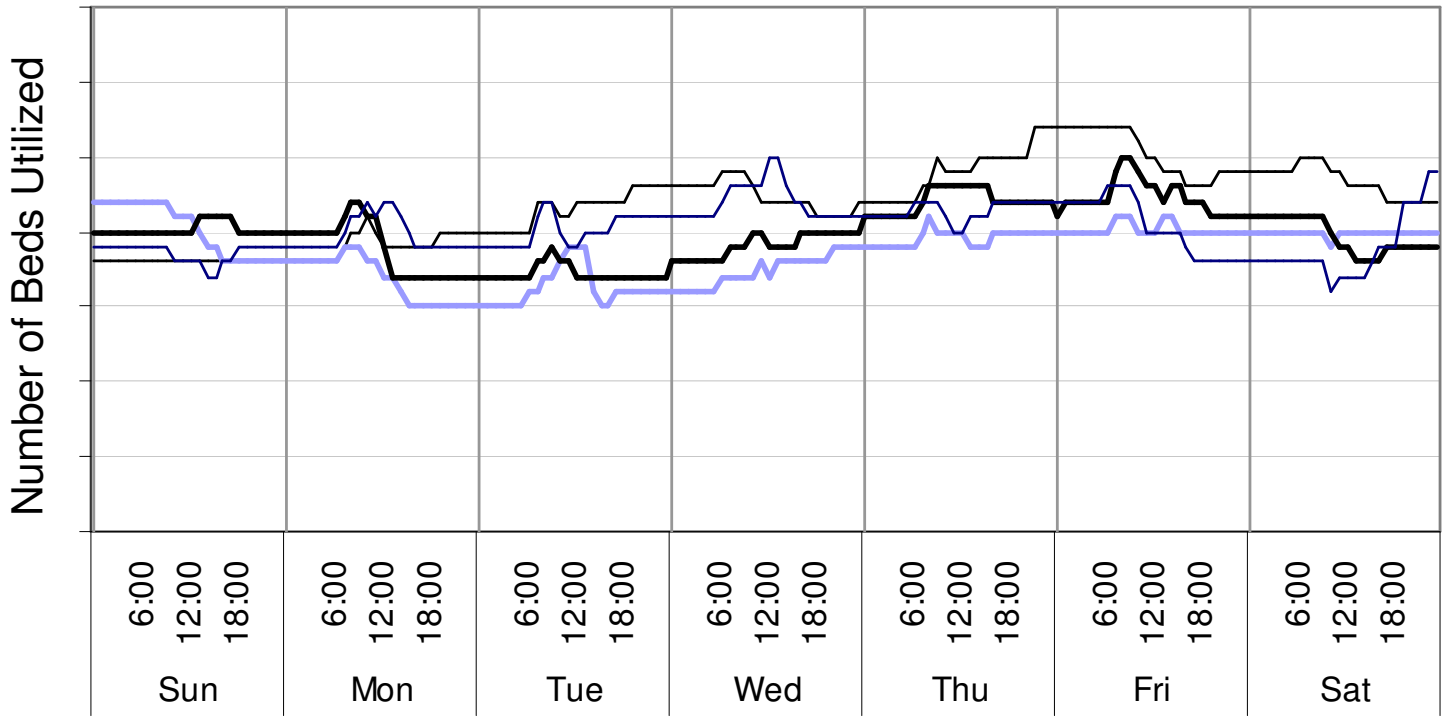
AnalysisWorks

Smoothing of Surgical Inpatient Beds
The Concept

- Surgical bed utilization patterns:
  - Increasing utilization throughout the days of the week
  - Remarkable decreases in admissions and discharges on the weekends
- Patterns driven primarily by the scheduled elective patients
- Opportunity to reduce variability in bed utilization through better planning?

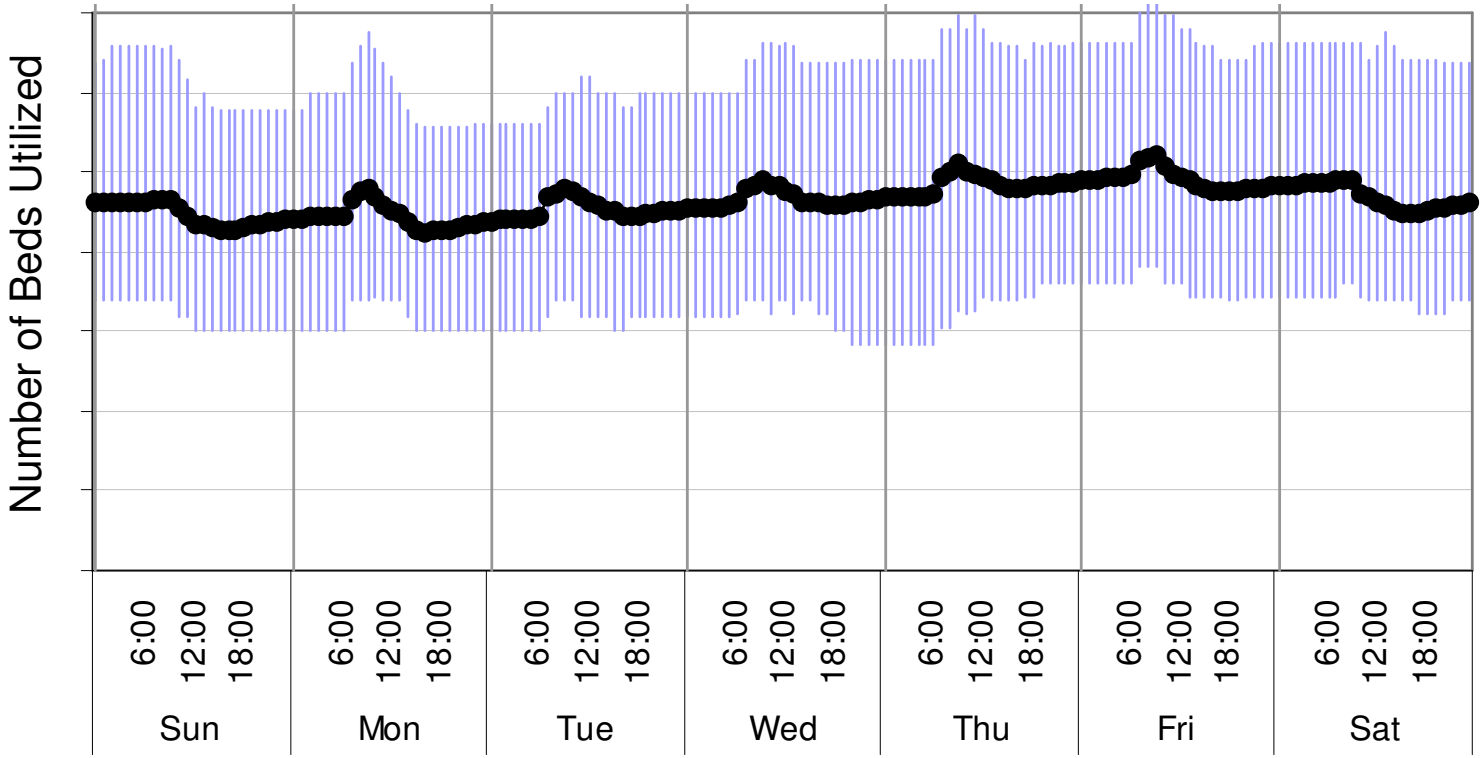
Smoothing of Surgical Inpatient Beds
The Concept

- Utilization by time of day and day of week for 4 sample weeks



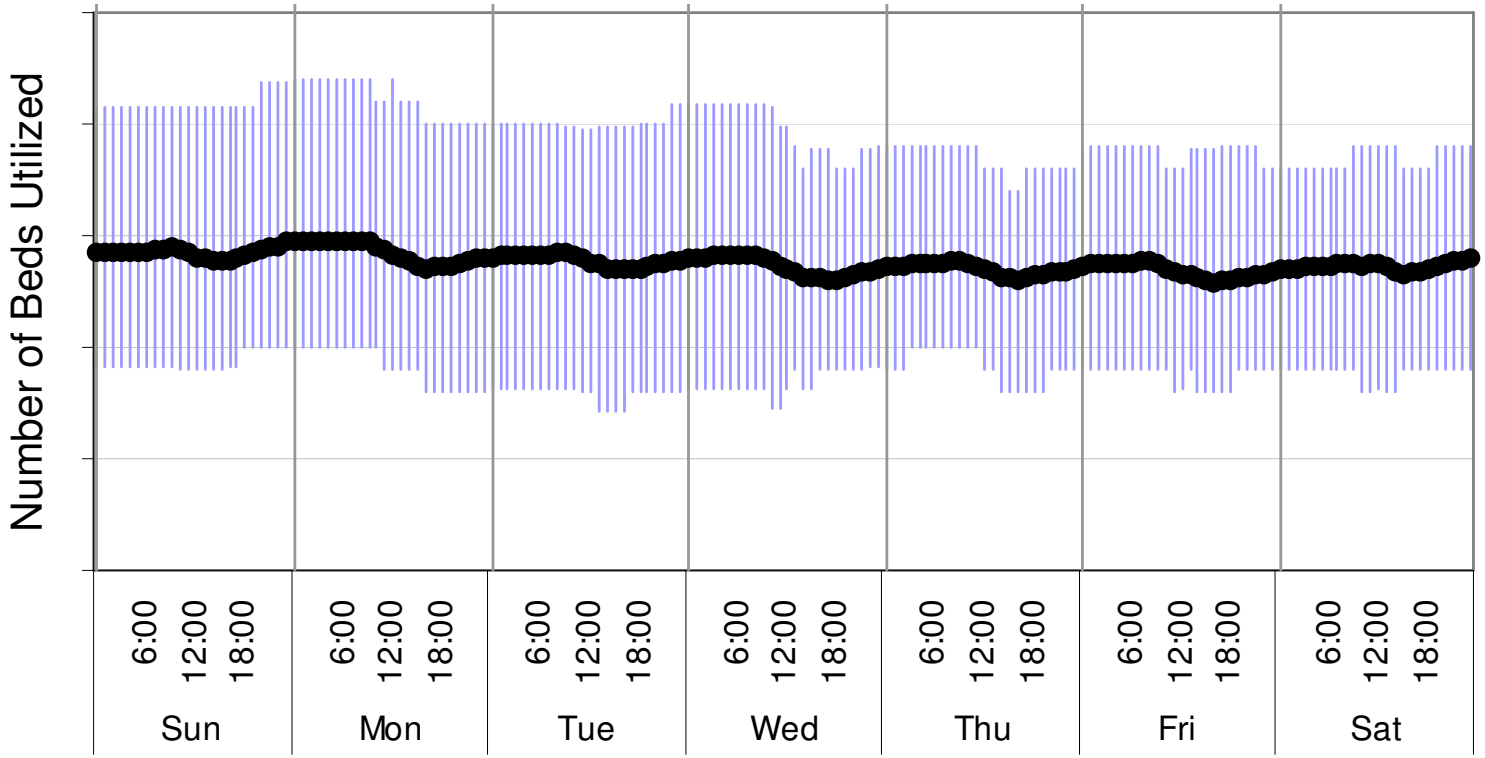
Smoothing of Surgical Inpatient Beds
The Concept

- Utilization by time of day and day of week (many weeks)



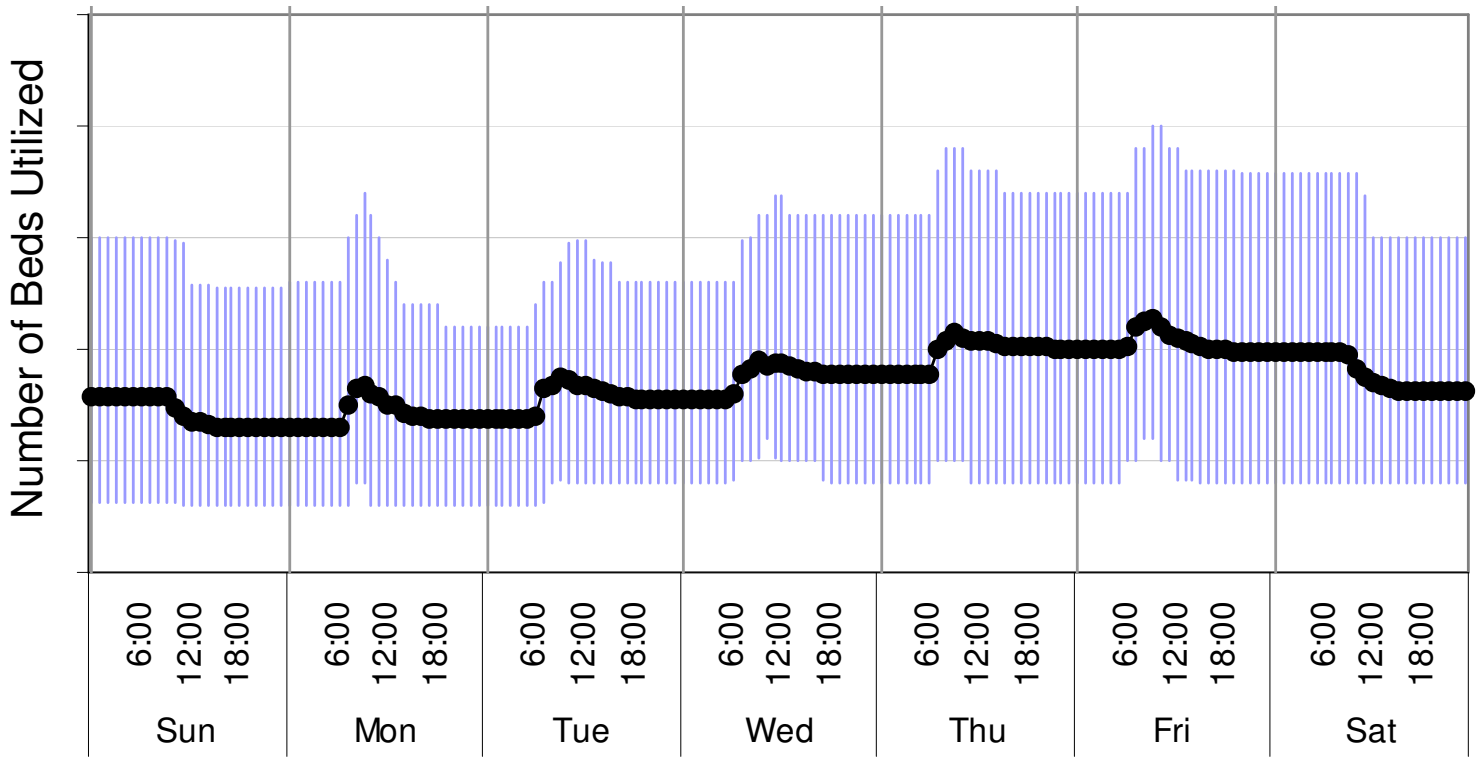
Smoothing of Surgical Inpatient Beds
The Concept

- Utilization for unscheduled cases



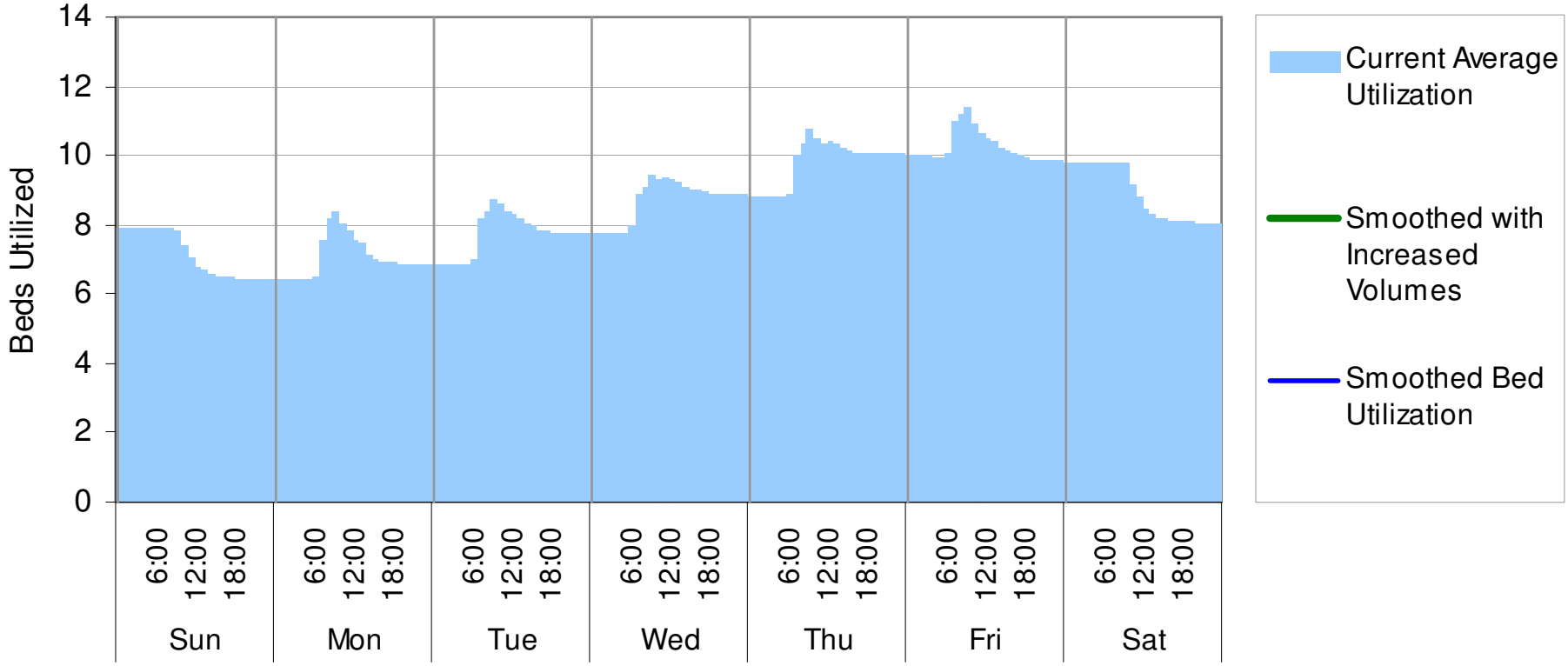
Smoothing of Surgical Inpatient Beds
The Concept

- Utilization for scheduled cases



Smoothing of Surgical Inpatient Beds
The Concept

- How it's supposed to work



Note: Animated slide

Real Life Issues

- Surgical bed smoothing has limited impact
- Modest opportunities for gains
  - Schedule different services and surgeons on different days of the week
  - Adjust scheduled case mix
- Smooth the average pattern …
  - But not this week's outcome, not next week's outcome
- Significant variation remains in the system

Real Life Issues

If every week is different …

- Slates, services, surgeons, case types

The relevant question is:

- Based on the planned slate,
- And historical patterns for surgeons, case types on the slate, and the current beds …

What does will this week look like?

(and what should we do about it?)

Project Objectives

Primary objectives

- To simulate the effect of the planned surgical slate on inpatient beds on an operational basis

Secondary objectives

- To simulate the effect of the planned surgical slate on surgical day care beds, operating room time, post-anesthesia recovery

Dynamic Smoothing of Surgical Inpatient Beds

Model Overview

What it does:

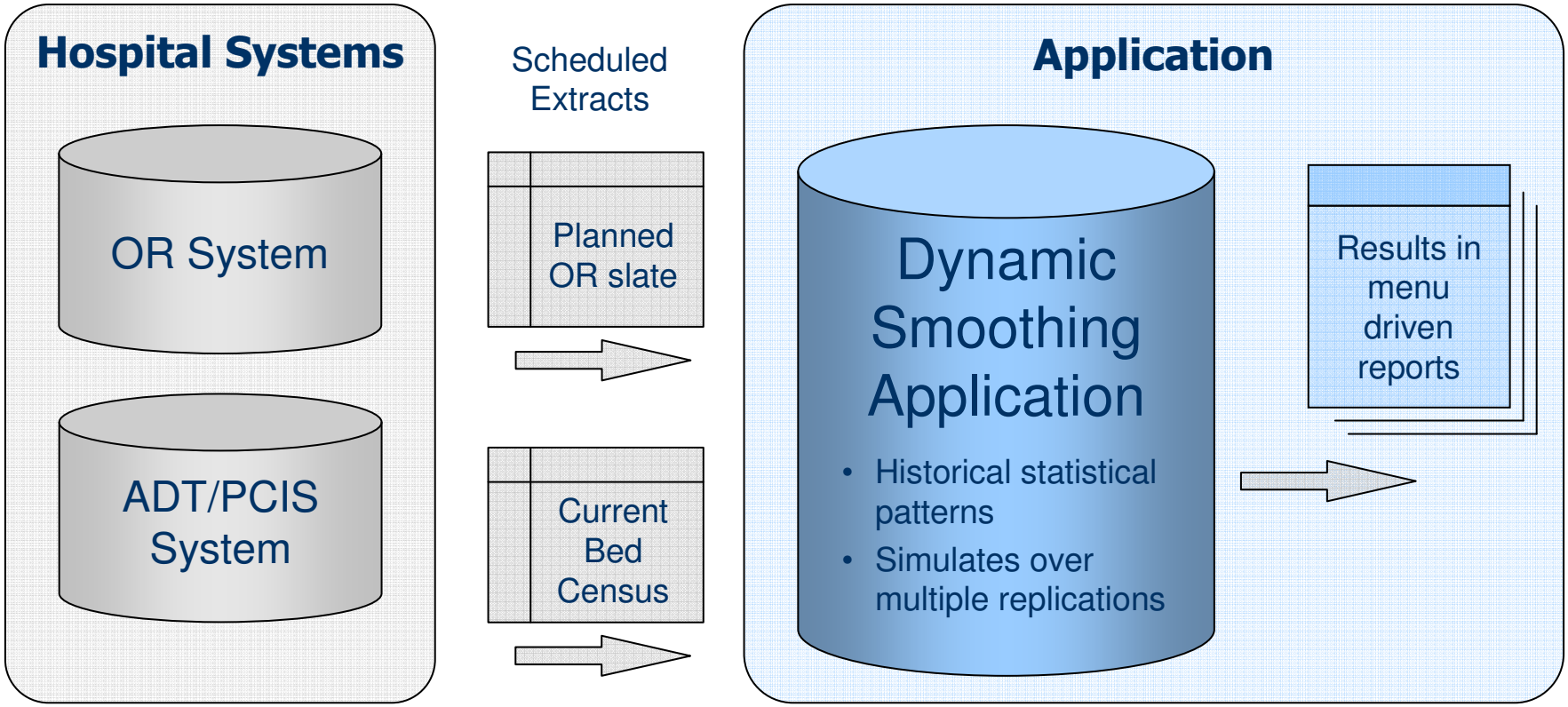
- Identifies peaks and valleys in inpatient bed usage over the upcoming two weeks

Managers use the information to:

- Proactively adjust cases on the planned OR slate
  - Use available capacity
  - Avoid cancellations on the day of surgery
- Identify services with discharge opportunities
- Plan ahead for staffing levels

Dynamic Smoothing of Surgical Inpatient Beds
Model Overview

➢ Systems operation

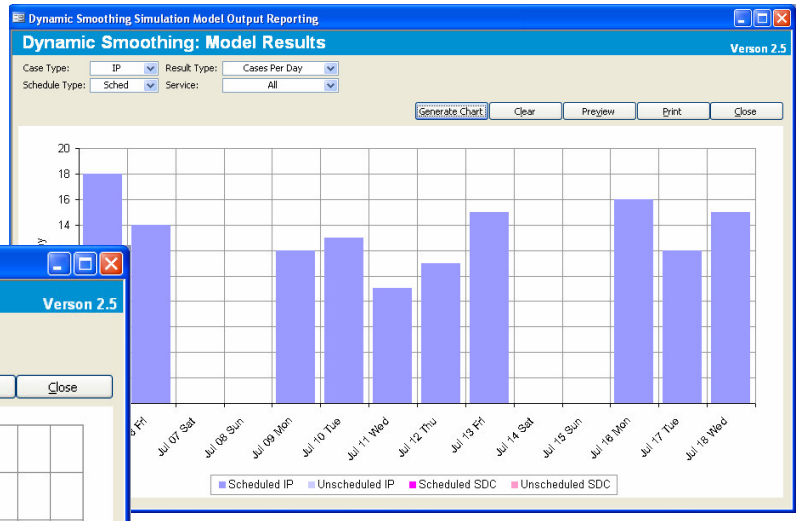


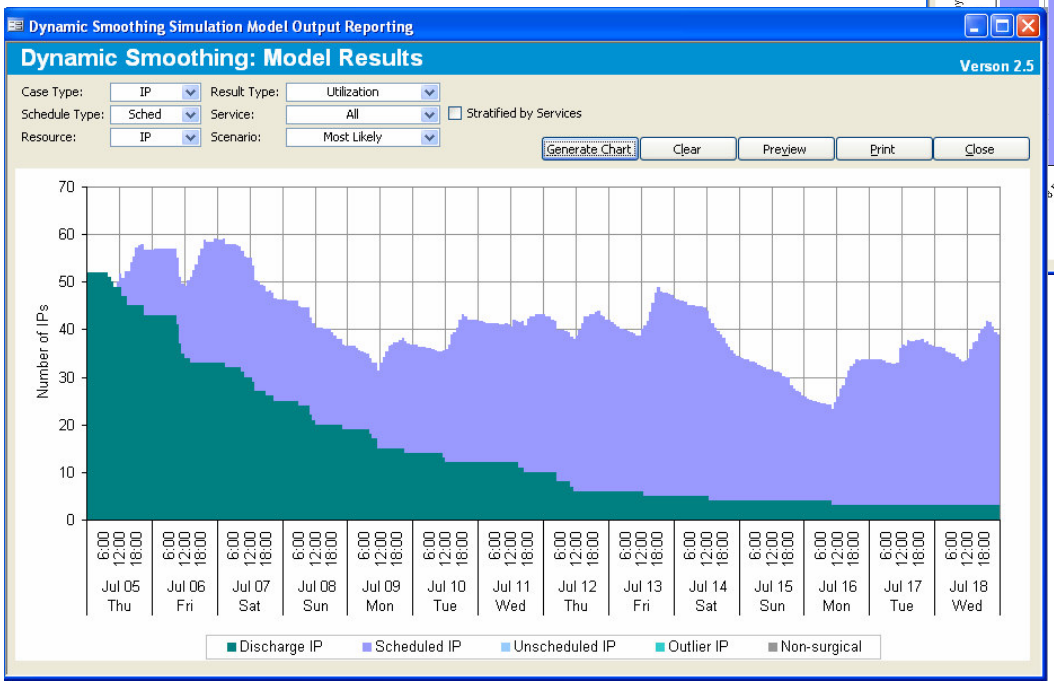
Model Calibration

- Based on OR system data linked to hospital discharge data
- Duration patterns
  - Operating room, pre-op, post-anesthesia recovery, inpatient LOS, intensive care LOS
  - Surgical service, Surgeon, admission type, priority level
- Utilization and discharge patterns
  - Surgical service, Surgeon, priority level

Dynamic Smoothing of Surgical Inpatient Beds
Interactive Reporting

- Resource utilization
- Cases per day





Ability to select

- Resource type
- Surgical Service
- Case type
- Scenario

Dynamic Smoothing
Real Life Issues

Take away messages

- Some simulation tools need to be part of the operational decision-making process to be useful
- Custom-programmed simulations in a database application can be the right tool for the job