

Case Study: Using DSS to Prepare a 5-Year Plan

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Overview

In the current environment of financial uncertainty, healthcare organizations need more than ever to plot out the impact of possible changes that are on the horizon and develop longer-term strategic/financial plans. A DSS can be a powerful tool to aid in developing such plans. The detail and complexity in the DSS, however, can be intimidating. A model must be built that uses a certain amount of detail to ensure the accuracy of the forecast, yet at the same time manages the detail so that it doesn't bog down the process. Jordan Hospital in Plymouth, Mass., recently used DSS to develop a five-year financial forecast for senior management and the board of directors.



Outline

- I. Introduction to Jordan Hospital
- II. Background
- III. Project Timeline
- IV. Forecasting Objectives and Approach
- V. Designing the Model in DSS
- VI. Results

Jordan Hospital

- 139 Bed Community Hospital
 - 114 acute care beds
 - 25 transitional care beds
- Located 40 miles south of Boston
- Located 25 miles from nearest competitor
- Not affiliated with any health care system, or other facility



Jordan Hospital

- FY 2000 Acute Care Statistics
 - 6,667 Admissions
 - 27,736 Patient days
 - 4.2 Average Length of Stay

Jordan Hospital

- FY 2000 TCU Statistics
 - 723 Admissions
 - 6,275 Patient Days
 - 8.7 Average Length of Stay

Background

Senior management recognized the need to prepare for the future beyond the current year budget. Even though the healthcare industry is in a rapidly changing phase, the need exists to have a concrete plan that prepares for this change.

An integrated strategic and financial plan should be flexible enough to be adjusted as changes warrant.

What We Wanted

- Utilize existing systems
 - McKessonHBOC Trendstar (DSS)
 - Sachs (Marketing system)
- Involve hospital staff
 - They know the hospital
- Aggressive time frame
- Cost effective
- Ability to update in the future

HBOC TRENDSTAR Status

- **Clinical Cost Accounting (CCA)**
(Combined billing and medical record data/Patient level)
 - Used extensively by Finance, Strategic Planning, Clinical Systems Integration
 - Inpatient state data base
- **Contract Payment Advisor (CPA)**
(Contract management module/Patient level)
 - Rules written for all contracts
 - Used for annual net revenue budget
 - Used for modeling managed care contracts

HBOC TRENDSTAR Status (cont.)

- Management Cost Accounting (MCA)
(Procedure-level costing/charge code level)
 - Cost accounting standards in place
- Hospital Systems Library (HSL)
(General ledger/department and account level)
 - Used for financial reporting
 - Cost allocation model in place

Project Time Line

- 12/98 - Decision made to do project
- 12/98 - Interviewed potential firms
 - TriNet Healthcare Consultants, Inc.
 - Hospital's CPA firm
- 1/99 - Preliminary analysis and planning
- 1/99 - Began developing assumptions
- 2/99 - Building of model

Project Time Line

- 3/99 - Project completed
 - Final presentation package was done on a Lotus spreadsheet
- 3/99 - Presentation to Senior Management
- 4/99 - Presentation to Board of Directors

Project Time Line

UPDATE

- 2/2000 - Begin update
- 3/2000 - Initial presentation to Senior Management
 - Refine assumptions
- 4/14/2000 - Presentation to Board of Directors

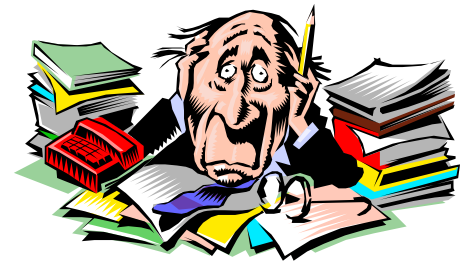
Forming the Team

- Chief Financial Officer
- Director of Financial Planning
- Director of Strategic Planning and Business Development
- Director of Reimbursement and Budget
- Consultant



Objectives

- Build a model that is flexible
- Must have quick turn-around for changes in assumptions
- Show multiple scenarios
- Capitalize on Decision Support System
- Use Marketing System (Sachs)
- Develop accurate net revenue projections
- Don't get buried in detail!



Variables in the Model

- Population projections
- Market share
- Physician recruitment initiatives
- Changes in services
- Volume by service line (product)
- Shifts in payor mix from year to year
- Price increases
- Net revenue assumptions:
 - Medicare inpatient factors
 - Percent changes for selected payors

Variables in the Model (cont.)

- Inflation factors for costs:
 - Salary/Wages
 - Fringe Benefits
 - Supply and Expense
- Cost reductions as part of productivity study
- Capital expense
 - Projection available from recent bond issue
- Other
 - Bad debt
 - Uncompensated care pool

HBOC TRENDSTAR Modules Used

- Clinical Cost Accounting (CCA)
 - Market share analysis using State Patient data
 - Product definition
 - Treatment protocols
 - Modeling functionality
- Contract Payment Advisor (CPA)
 - Net revenue calculations
- Management Cost Accounting (MCA)
 - Cost accounting standards
 - Modeling functionality
- Hospital Systems Library (HSL)
 - Cost model (fixed costs)
 - Inflation factors applied
 - Financial reporting

DSS Prerequisites

- Reimbursement rules built for all contracts
- Cost accounting standards or RVU's
- Accurate fixed/variable assumptions
- State patient-level data (Optional)

Project Phases

I. Demand Analysis/Developing Assumptions

II. Review Current Data

III. Designing the Model

IV. The Model

V. Developing Scenarios

**Phase I:
Demand Analysis/
Developing Assumptions**

Phase I: Demand Analysis

INPATIENT

- Massachusetts hospitals are required to submit patient data annually to the Massachusetts Division of Health Care Finance and Policy.
- This patient data is made available by the Massachusetts Health Data Consortium.
- HBOC has interfaced this data into DSS (Trendstar CCA).
- CCA reports were run at the following levels, for the hospital's service area:
 - Product line (Clinical Sub-Specialty)
 - Town
 - Age group
 - Sex

Example: I/P Market Share Report

General Surgery

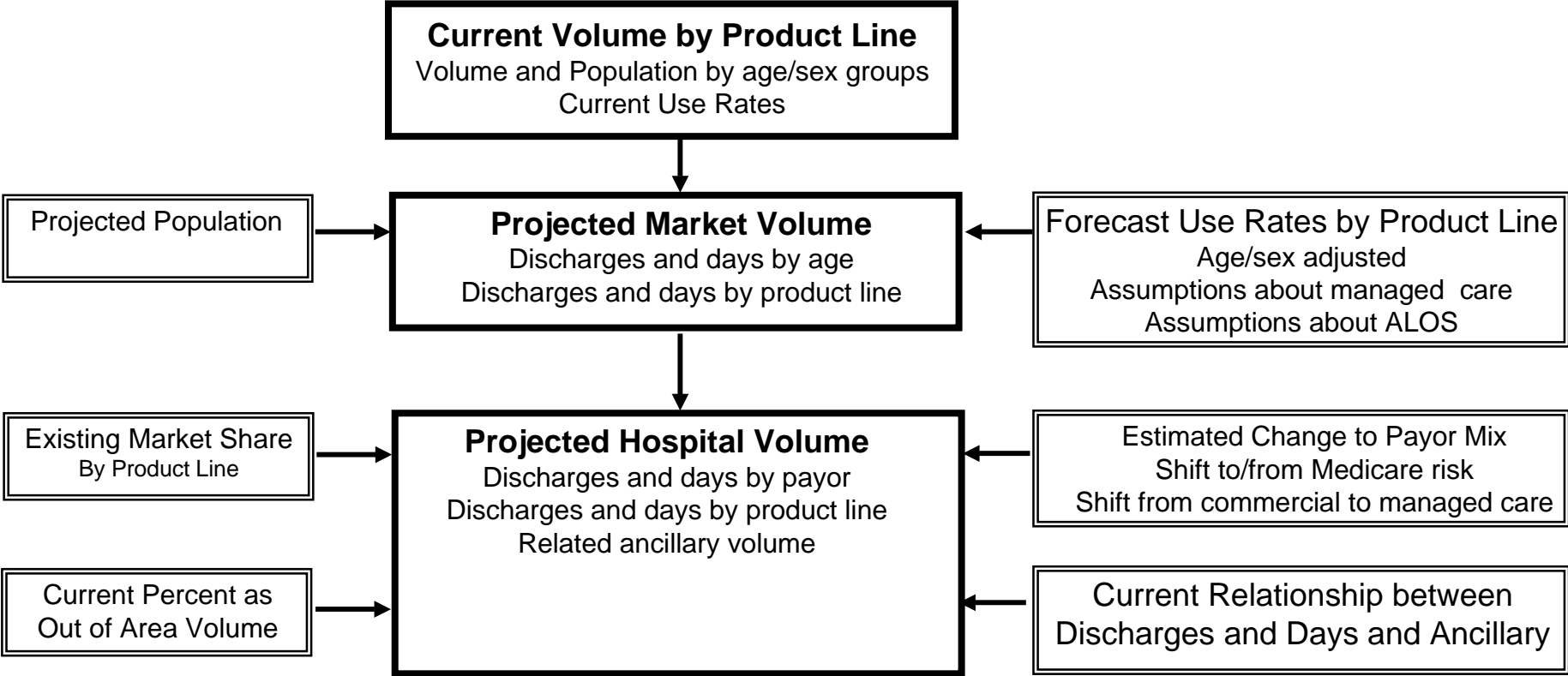
<u>Town</u>	<u>Jordan Hospital FY98</u>	<u>So. Shore Hospital FY98</u>	<u>Brockton Hospital FY98</u>	<u>Quincy Hospital FY98</u>	<u>Milton Hospital FY98</u>	<u>Tobey Hospital FY98</u>	<u>Boston Hospitals FY98</u>	<u>Total Cases FY98</u>
Bourne	21	2	0	0	0	41	47	206
Carver	51	10	5	0	1	1	20	98
Duxbury	35	16	1	3	1	0	32	93
Halifax	10	9	13	1	0	0	12	61
Kingston	55	2	1	0	0	0	23	87
Marshfield	33	63	1	3	2	0	54	175
Middleboro	4	1	8	2	1	5	24	156
Pembroke	19	55	9	3	2	1	37	141
<i>Plymouth</i>	<i>296</i>	<i>14</i>	<i>6</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>101</i>	<i>457</i>
Plympton	4	1	0	0	1	0	5	16
Sandwich	37	1	2	1	1	2	33	170
Wareham	8	1	2	0	0	96	35	172

Phase I: Demand Analysis (cont.)

INPATIENT

- Market share data was then applied to population and use rate projections available from the hospital's marketing system, Sachs ("Astro Sachs", Sach's Internet-based product).
- San Diego Bellwether: Use rates assumed that the market will move 20% of the way to San Diego use rates, one of the more aggressive managed care markets in the country.
- Result: baseline projection of cases by inpatient product line.

Methodology for Inpatient Projections



Phase I: Demand Analysis

OUTPATIENT

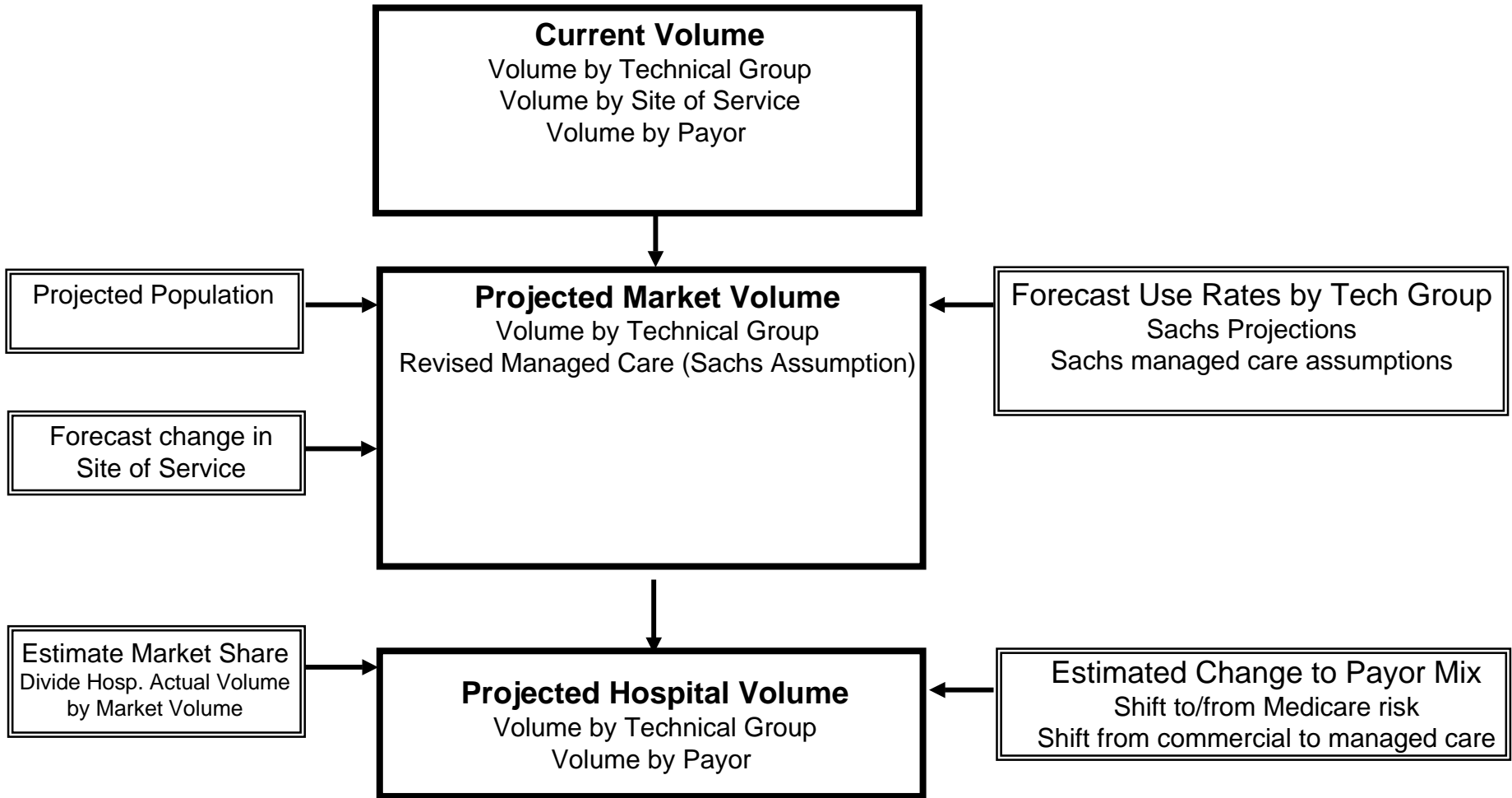
- Detailed patient data from the state is not available for outpatient.
- Market share was determined by dividing Hospital volume (from DSS) by Market volume performed in a hospital setting (from Sachs).
- Forecast: Used a blend of Sach's two methods for outpatient forecasts:
 - Base Forecast
 - Managed Care Forecast

Phase I: Demand Analysis

Outpatient Projection

<u>Technical Group</u>	<u>Market Volume</u>	<u>% in Hospital</u>	<u>Market In-Hospital Volume</u>	<u>Jordan Share</u>	<u>Jordan Mkt Area Volume</u>	<u>Hospital Out of Area Volume</u>	<u>Total Hospital Volume</u>
Major Surgery	17,155	56.3%	9,658	55%	5,283	792	6,075
Minor Surgery	54,145	10.5%	5,685	70%	3,997	608	4,605
Medical Therapies	106,634	8.6%	17,771	separate calc	48,287	4,201	52,488
Medical Diagnostics	126,065	18.8%	23,700	21%	4,906	72	4,608
Major Invasive	14,152	64.7%	9,350	33%	3,048	299	3,347
Minor Invasive	6,480	22.4%	1,452	36%	517	59	576
Major Imaging	22,134	70.3%	15,560	87%	13,491	1,686	15,177
Visit/Consult	790,732	10.7%	84,608	28%	23,860	3,603	27,463
Minor Imaging	166,409	50.7%	84,369	53%	44,716	5,902	50,618
Labs	602,717	10.5%	63,285	separate calc	347,370	63,569	410,939

Methodology for Outpatient Projections



Data Sources

- Population (Marketing system)
- Projected Discharges for County by Age by Product Line (Marketing system)
- Covered Lives by Payor (Marketing system)
- Projected Volume by Technical Group (Marketing system/Our estimate)
- Current Outpatient Site of Service (Marketing system)
- Current Market Area Volume by Product Line (DSS)
- Current Inpatient Market Share by Town (DSS)
- Current Payor Mix (DSS)
- Relationship between Discharges and Ancillary (DSS)
- Current Outpatient Volume by Technical Group (DSS)
- Current Hospital Volume by Town (DSS)

Phase II: Review Current Data

Phase II. Review Current Data

Used DSS to produce a series of “Financial Performance Reports”:

Report Categories:

- Reconciliation from DSS to Financials
- Payor Reports
- Departmental Reports
- Clinical Reports
 - Summary by Clinical Subspecialty
 - Detail by DRG

Phase III: Designing the Model

Phase III. Setup Steps

1. Define inpatient products:

- Based on Clinical Subspecialties as defined in marketing system (Sachs)
- Defined by DRG groupings, with exception of Transitional Care Unit, which is defined by a department
- Steps in DSS:
 - DRG groupings were already set up in a table for reporting.
 - Define product lines using these DRG groupings, and apply to data base.

Phase III: Setup Steps (cont.)

2. Define outpatient products

- Use Sachs “Technical Groups”
 - Major Surgery
 - Minor Surgery
 - Major Invasive
 - Minor Invasive
 - Medical Therapies
 - Medical Diagnostic
 - Major Imaging
 - Minor Imaging
 - Visits/Consults
 - Labs
- Used descriptions to derive groupings of CPT’s or departments

Phase III: Setup Steps (cont.)

3. Define net revenue assumptions

- Enter expected changes to Medicare PPS factors;
 - Labor and non-labor rates for each year
 - Wage area index for each year
- Current reimbursement rules were used (no multi-year contracts currently in effect), but modeled rules could be set up in DSS (contract management module).

Phase III: Setup Steps (cont.)

4. Cost prep: Run cost model (same model that is run monthly on *Actual*) on *Budget* to develop:
- Budget fixed costs (by dept/expense account)
 - Budget variable cost per unit
 - Variable portion of the budget is allocated to the charge code level, based on the cost accounting standards
 - Result is budget variable cost per unit, at the charge code level
 - Purpose of this step is to synchronize the cost standards with the current budget

Phase III: Setup Steps (cont.)

5. Create “Model” data base using DSS Modeling functionality:

- Purpose: More efficient processing, since modeling of scenarios does not need to run on the fully detailed patient data base.
- Data base created at the following levels:
 - Product
 - Patient type
 - DRG
 - Payor
 - Month

Phase III: Setup Steps (cont.)

6. Create Model Definitions storing assumptions for each year:

- Percent changes for volumes
 - All inpatient products
 - Outpatient surgery products
(remaining outpatient groups handled separately)

- Payor mix assumptions

Phase IV: The Model

A. Volume Forecast

B. Expense/FTE Forecast

C. Gross and Net Revenue Forecast

D. Offline Steps

A. Volume Forecast

1. Apply volume assumptions (percent changes) to current cases:
 - Result: forecasted cases for each year, by product
2. Calculate treatment protocols by product from patient data
 - For each product: Units per case, at charge code level
3. Apply projected cases to protocols to determine projected volumes
 - Charge code level
4. Forecast volume for remaining outpatient technical groups:
 - Volume assumptions were entered by department



TREATMENT PROTOCOL SECTION

PRODUCT 15 GENERAL SURGERY

DEPARTMENT 7040	PROCEDURE CHARGE CODES	PROCEDURE NAME	STANDARD UNITS
	-----	-----	-----
	70401020	OR TIME CAT. A IN MINU	31.621019
	70401040	OR TIME CAT. B IN MINU	47.678344
	70401060	OR TIME CAT. C IN MINU	3.554140
	70401080	OR TIME CAT. D IN MINU	19.826433
	70401120	SET UP CHARGE-CAT A	0.257962
	70401140	SET UP CHARGE-CAT B	0.285032
	70401160	SET UP CHARGE-CAT C	0.014331
	70401180	SET UP CHARGE-CAT D	0.202229
	70401260	ENDOSCOPIC LAPAROSCOPY	0.229299
	70404240	*I NERVE STIM-ENT	0.003185
	70404320	BAKER TUBE	0.003185
	70404340	GASTRO-JEJU TUBE	0.004777

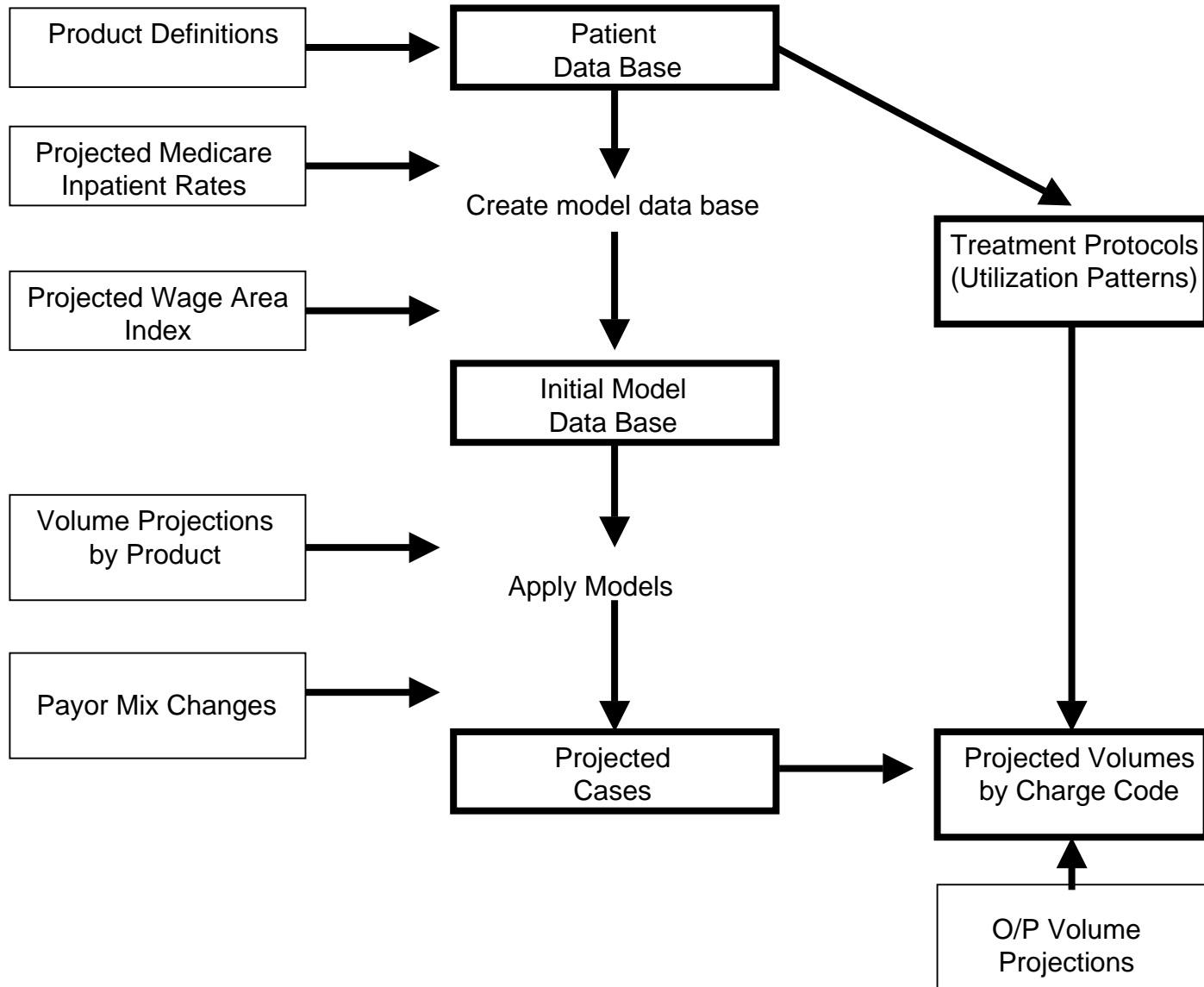


PROJECTED VOLUME (FROM CCA TREATMENT PROTOCOLS)
FY2001 PROJECTION : INPATIENT

DATE/TIME :
MCA DATA BASE :

	PROJECTED VOLUME
DEPT 7040 OPERATING ROOM	
70401020 OR TIME CAT. A I INP	81,661
70401040 OR TIME CAT. B I INP	124,861
70401060 OR TIME CAT. C I INP	10,988
70401080 OR TIME CAT. D I INP	52,792
70401100 OR TIME CAT E. I INP	106
70401120 SET UP CHARGE-CA INP	881
70401140 SET UP CHARGE-CA INP	843
70401160 SET UP CHARGE-CA INP	38
70401180 SET UP CHARGE-CA INP	551
70401260 ENDOSCOPIC LAPAR INP	185
70401280 KIDNEY LITHOTRIP INP	6
70401290 BIOPSY OF BREAST INP	1
70401400 CONTIGEN IMPLANT INP	1
70401420 CONTIGEN IMPLANT INP	2
70404160 *I DRILL-DENTAL INP	39
70404180 *I DRILL ENT INP	11
70404220 MYRINGOTOMY-ENT INP	2
70404240 *I NERVE STIM-EN INP	6

Volume Model



B. Expense/FTE Forecast

1. Apply cost standards (budget variable cost per unit, at charge code level) to projected volumes to derive variable costs.
 - Repeat for hours
 2. Add fixed costs at department/account level.
 - Result of running cost model on the Budget
 3. Apply inflation factors and cost adjustments.
 - Use DSS
- Forecast for each year;
 - Available at cost center level
 - Volumes and FTE's in addition to expenses

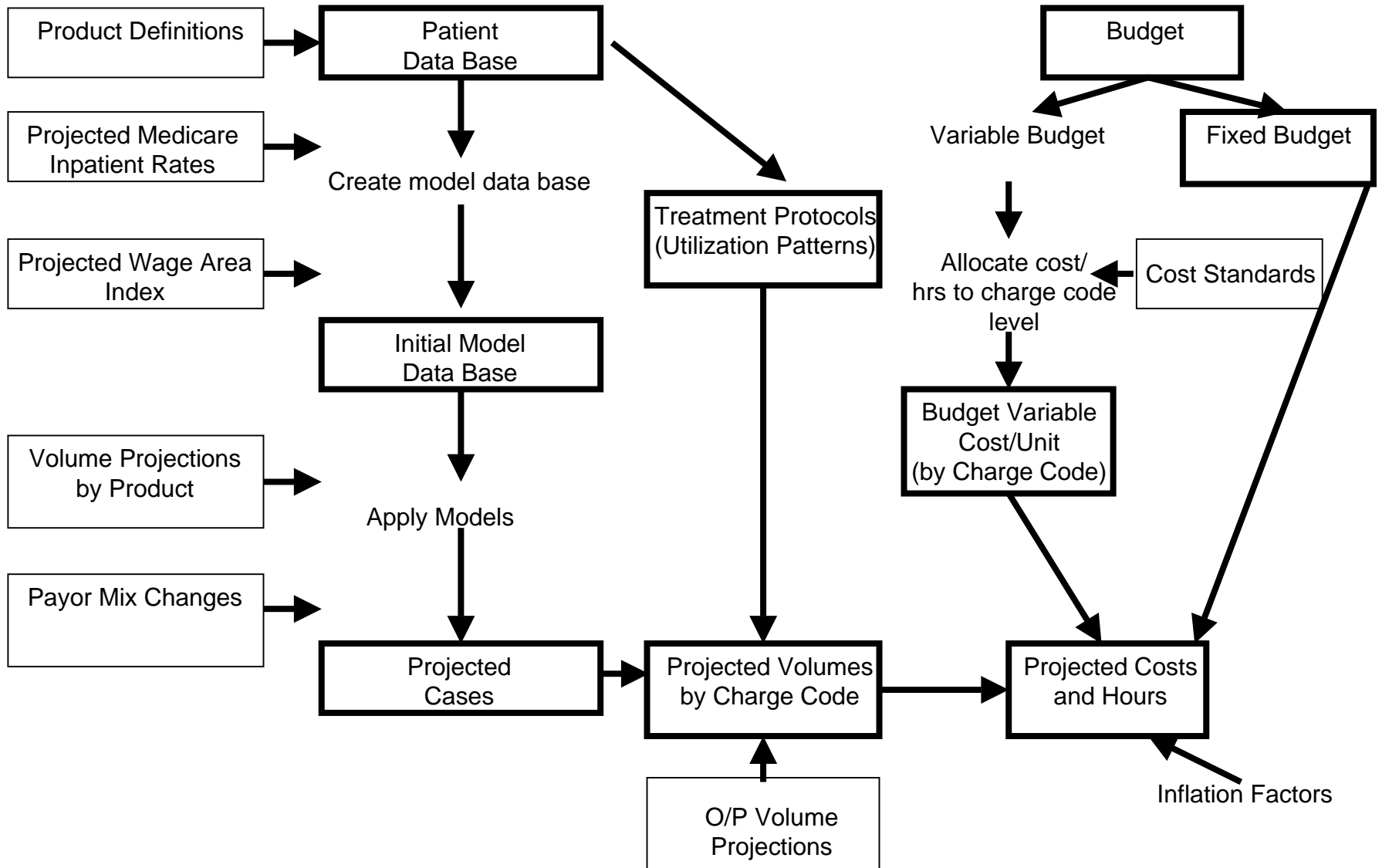




COST AND FTE FORECAST - BY COST CENTER
After Inflation

	FY2000 PROJ	FY2001 PROJ	FY2002 PROJ	FY2003 PROJ
7040 OPERATING ROOM				
Expenses:				
Salaries and Wages	1,241,163	1,354,358	1,447,690	1,492,384
Supplies and Expense	3,948,659	4,439,275	4,774,822	4,924,503
Total Expenses	5,189,822	5,793,633	6,222,512	6,416,887
FTE's	26.15	28.22	29.71	29.84

Expense/FTE Model

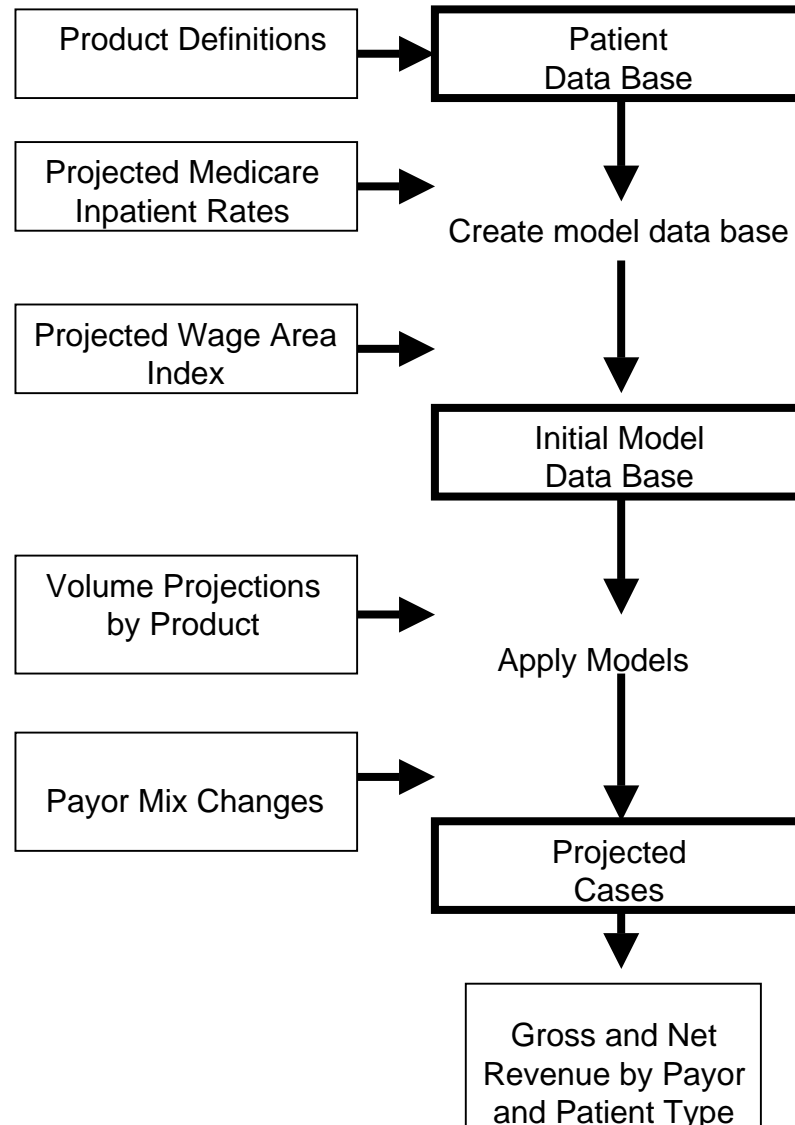


C. Gross and Net Revenue Forecast



1. Apply case forecast (same used in cost/volume model)
2. Apply assumptions about shift in payor mix
 - Each year builds on previous year
3. Price increases applied as part of revenue model
4. Report on gross and net revenue projections by year:
 - By product
 - By patient type
 - By payor

Gross and Net Revenue Model



D. Offline Steps

- Not feasible to complete 100% of the forecast in DSS:
 - Have to use what works
 - Consider presentation
 - Not all corporations are set up in DSS
- After running model in DSS, download the following:
 - Reports containing forecasted gross and net revenue by;
 - Inpatient/Outpatient
 - Payor Group
 - Year
 - Forecasts then “flow” to P&L formats
- Balance Sheet forecast was completed offline.
- Capital/debt schedules forecasted via spreadsheet model.
- Projections for other corporations completed offline.



Phase V:
Develop
Scenarios

Phase V: Develop Scenarios

Three scenarios were developed:

- Baseline
 - No physician initiatives (demographics and use rates only) with exception of;
 - New physicians already under contract
 - New services already in the plan
- Moderate Implementation of Strategic Objectives
 - Additional PCP's in each year
 - Limited number of additional specialists
- Aggressive Implementation of Strategic Objectives
 - Same as moderate plus;
 - Additional specialists

Develop Scenarios (cont.)

To set up multiple scenarios:

- Copy tables containing volume assumptions and modify percentage change factors for each product
- Set up a model (“batch”) for each scenario, which creates separate tables and data bases.
- Create reports on each scenario:
 - Gross and net revenue by payor
 - Volumes by department
 - Cost and FTE forecast

The Final Product

- Reports Presented to Sr. Management and Board
- Statement of Operations
- Statement of Financial Position
- Statement of Changes in Net Assets
- Statement of Cash Flows
- Ratio Analyses
- Utilization Statistics: Inpatient and Outpatient
- Gross and Net Revenue by Payor: I/P and O/P
- Operating Expense Detail
- Capital Expense Detail



Impact of Financial Plan



Short term impact:

- First look at current projection
- Basis to begin planning for next year's budget

Long term impact:

- Foundation for next year's strategic plan
- Guideline for physician recruitment initiatives
- Marketing tool

Other impact:

- Base for managed care contract negotiations

Conclusion: Key Factors

- Invest the time upfront in setting up the structure the right way.
- Automate wherever possible.
- Document, document, document!
- If using data from external systems, you'll have to work to get the data in sync, and you'll still have to analyze the data for comparability.
- Updating model is easier if done every year. (Don't skip a year!)

Questions?

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