SCENARIO PLANNING FOR THE AGILE HEALTHCARE ORGANIZATION

by Jay Spence
introduction

Any student of business or the economy is well acquainted with the notion of uncertainty and change. A five year chart of GDP, commodity prices, corporate earnings or, as in the case below, the S&P 500 stock index illustrates the notion of change and volatility.

The shifting sand underneath our feet is particularly problematic for planners. All too often organizations budget or forecast with one economic (or underlying) scenario in mind. Finance organizations often feel a great sense of accomplishment in completing “the budget” or “the forecast”. It’s understandable. The budget process for most companies is daunting. Research conducted by Axiom EPM revealed that 88% of the organizations surveyed stated that their budgeting cycle lasts for more than 2 months. In that time hundreds if not thousands of person hours are consumed completing one budget based on one underlying set of assumptions.

The reasons for this are many. In some organizations it is a cultural issue. Management teams and boards of directors are comfortable taking a singular view. For example, when senior decision makers believe strongly in their prognostications, they unwittingly become too comfortable in their own beliefs about the future – even to the extent that they are willing to bet the future on one set of operating assumptions. The truth is there are many potential futures and well-tuned finance organizations have the ability to quickly model different scenarios giving consideration to how the strategy might be altered if conditions change. Some organizations get locked into one scenario due to the practical shortcomings of their modeling environment. Even if the organization has interest in adopting a scenario-based approach (which many do), it doesn’t have the means. The modeling framework is not established, the enabling technology isn’t in place, the relationships between operational drivers and financial outcomes are not well understood.

What’s clear is that the budget (or forecast) is essentially the financial representation of the interplay between the external operating environment and strategies, tactics, and resources the company plans to position in the coming year. The level of uncertainty around key business drivers for nearly every organization is significant enough to warrant a more thoughtful approach to planning than what many organizations are doing today. As Paul J.H. Schoemaker, Professor at the University of Pennsylvania’s Wharton School, writes, “Scenario planning attempts to compensate for two common errors in decision making – under prediction and over prediction of change. Most people and organizations are guilty of the first error.”

Schoemaker goes on to assert that certain conditions can be strong catalysts in motivating organizations to adopt a more rigorous scenario approach to planning. They include:

- Uncertainty is high relative to management’s ability to predict or adjust
- Too many costly surprises have occurred in the past
- The company does not perceive or generate new opportunities
- The quality of strategic thinking is low (i.e., too routinized or bureaucratic)
- The industry has experienced significant change or is about to
- The company wants a common language and framework without stifling diversity
- There are strong differences of opinion, with multiple opinions having merit
- Competitors are creating advantage by using scenario planning
10 benefits of scenario planning

To most practitioners in finance, the benefits of scenario planning are quite intuitive and easily understood. They include the ability to:

1. Understand and define the key drivers of the organization
2. Quantify the sensitivity to key drivers, creating important organizational knowledge
3. Become more expansive and imaginative in its thinking
4. Eliminate (at least in part) bias or aspirational thinking that is not grounded in reality
5. Test the strength and flexibility of a strategy under adverse or changing conditions
6. Manage risk and uncertainty more effectively by modeling scenarios that break with current trends
7. Treat financials primarily as outcomes rather than inputs in the planning process
8. Produce higher quality strategic plans, budgets, and forecasts that take less time to develop
9. Be better prepared if adverse circumstances should manifest
10. Consider possibilities that would otherwise have likely been ignored

All of these benefits are achievable, perhaps the greatest being the organizational learning that can occur. Imagine a CEO or CFO presenting next year’s plan to a board of directors and having the ability to say, “In front of you is our base case plan for the next fiscal year. Along with the Summary Financials and KPIs is a description of the underlying assumptions as well as our key strategies we intend to execute on in the coming year. Because none of us can predict the future we’ve included two other plausible scenarios for your review - one based on a more pessimistic set of assumptions and the other more optimistic. We believe it is important for the Board to understand how the organization would likely perform under these different operating conditions and how our strategies might change.”

Management teams we’ve worked with typically have had a strong appetite for understanding sensitivities to their hospitals. Many planners over time discover that educating executives on how changing assumptions impact the bottom line is perhaps more relevant than communicating the specifics of any individual forecast. Surely, total revenue or earnings per share are important to get right, but understanding the dynamics that drive financial results is perhaps more important. In the end, financial professionals shouldn’t be called upon to be prognosticators or economists. They should instead be expected to understand the cause and effect relationships that drive the business reflecting those relationships in well-constructed models, plans and forecasts.

overcoming hurdles to scenario planning

In our research with finance organizations around the world we learned that a small percent actually process scenarios frequently. When asked, “What is the greatest inhibitor to processing alternative scenarios in your organization?” we learned the following:

![WHAT ARE THE HURDLES TO SCENARIO PLANNING?](chart)

In reviewing these findings, it was gratifying to see a relatively small percentage of organizations surveyed believe management is the impediment to scenario planning. This finding harmonizes with our experience in working with finance executives. In our view, the survey results translate into six main reasons why finance organizations have struggled to deliver this functionality.

1. **Bandwidth Constraints** (“There isn’t adequate time to create them”): The most frequent response in our survey regarding hindrances to scenario modeling was a lack of time. Finance practitioners who aren’t doing it, don’t envision they have the time to. This can be a self-fulfilling prophecy. In reality however, scenario modeling doesn’t need to be a significant time drain. Well-designed models that couple the right data with modeling logic can rapidly create a new scenario. Sensitivity analysis (the process of altering a single driver assumption at a time) should take only minutes to process. More involved story oriented multi-variable scenarios can take longer to construct with stakeholders, but are still deliverable in days, not weeks or months. Most commonly it is deficiencies in technology, data and the underlying business logic that makes processing scenarios a laborious time consuming process. Improve upon these components makes scenario modeling a fast and efficient process.

2. **Technology Deficiency** (“Our system is not set up to do it”): In some organizations, the underlying technology being deployed was not designed to support the rapid creation and processing of multiple scenarios. Spreadsheets, for example, typically are not a good alternative. Spreadsheet models fall short in managing and incorporating financial...
and operating data. Robust spreadsheet models tend to be brittle with an over reliance on macros developed by one model designer. Other purpose-built planning and forecasting solutions often fall short as well. While many might support a “scenario” dimension to their data structure, they fail to deliver a robust business logic layer that is easy to setup and maintain. At Kaufman Hall, scenario-based planning capabilities have been present from the outset. In early 2013, we greatly enhanced the platform’s capability in this regard by adding new menus, processes, and model attributes to aid planners in the rapid creation of scenarios. In making the process of scenario creation prominent and easy-to-use, we believe more finance organizations will put it into practice.

3. **Configuration Deficiency** (another aspect of “Our system is not set up to do it”): The implementation team (be it internal or external) did not configure the planning application in a manner conducive for processing scenarios. Unfortunately, this is fairly common; the finance organization and/or the external consulting team helping implement the system did not invest adequate time upfront designing models that have robust cause and effect relationships built into the business logic layer of the application. Even if cause and effect relationships (e.g. Forecasted Inpatient Admit * Modeled Payor Mix * Average Net Revenue Per Admit = Expected Net Revenue) are established, planning systems also need to be designed such that the assumptions and the storage of results is dynamic. They need robust business logic as well as the ability to dynamically plug and play assumptions writing versions of results quickly and efficiently. The Kaufman Hall implementation team’s purpose is to configure systems with these capabilities in mind.

4. **Data Deficiency** (“We haven’t created a driver based model”): One of the key ingredients to scenario planning is the inclusion of non-financial data sources into the planning application. As has been described already there are internal and external drivers that represent the independent variables that ultimately influence the dependent variables (financials). We encounter far too many organizations that rely too heavily on general ledger history as the primary data source for planning. These types of planning systems tend to become simple aggregation tools where users input gross revenue and expenses for their respective areas and the tool aggregates the results. Such a construct is a strong inhibitor to scenario planning. Creating alternative scenarios becomes a manual exercise that’s not practical. It is critical that the organization selects operational drivers, both external and internal, that are defined as leading and not lagging indicators in relationship to financial performance.

5. **Lack of institutional knowledge** (another aspect of “We haven’t created a driver based model”): The data deficiency cited above can be due to a lack of institutional knowledge as to what really drives the hospital’s performance. In healthcare, as more and more strategic decisions revolving around the profitability growth of key clinical service lines, organizations are looking to better integrate patient-centric volume, revenue and workload measures into their planning models. In this type of statistically-driven planning model, per case metrics allow planner’s to adjust volume projections and allowing that change to ‘flex’ variable aspects of the reimbursement and operating expense plans. In this type of planning model, one can’t model what one doesn’t understand. Of all the hurdles to scenario planning, the integration of and transparency to this data that allows for impact analysis against a single case change is the most challenging to overcome. Planning teams that do this well proactively engage with the lines of business to better understand the dynamics of what drives patient net revenue and operating costs. They bring visibility to these leading indicators and eventually construct models that properly reflect these cause and effect relationships.

6. **Process Conflicts** (“Our budgeting is zero based”): One of the cited hurdles to scenario modeling was “zero based budgeting” a process for planning where there is no baseline; every line item in the budget must be approved regardless of historical spending patterns. Zero based budgeting is primarily focused on expense control; it requires very little modeling. The focus isn’t on predicting outcomes based on a set of underlying assumptions, but rather the justification of each expense line item. In healthcare today, with so many hospital and health systems needing to adjust their cost structures, the notion of zero-based planning against some categories of expenses (i.e., administrative, discretionary spending) is warranted.
scenario planning in the real world

Scenario planning isn’t a new science. It has been around for decades and even longer if one considers various forms of military planning from the past. In the 1980s, Shell Oil was renowned for the comprehensive scenarios it was evaluating and for a period of time many perceived that it provided Shell a competitive advantage in the marketplace. Types of scenario planning that finance professionals use today:

1. **Single Variable Sensitivity Analysis** – the process of changing one variable at a time while holding others constant and quantifying the impact of that singular change. These types of scenarios are the easiest to process and represent a great starting place for the organization. They can help identify the drivers or model inputs that have the most impact on the organization and deserve the greatest attention. Sensitivity analysis is a great educational tool for management. Its primary criticism is its simplicity – market variables seldom move by themselves, rather there is a considerable amount of interdependency between them. Simplicity aside, sensitivity analysis can be an extremely important organization learning tool calling to attention the impact a change in an underlying driver variable (most commonly volume assumptions) can have upon the organization. The example below highlights the results of simple high-level projections of how changes in key volume drivers (IP Admits and OP Visits) can ‘flex’ operating margins.

<table>
<thead>
<tr>
<th>Plan Drivers (Volume Statistics)</th>
<th>2012 Projected</th>
<th>2013 Base</th>
<th>2013 Optimistic</th>
<th>2013 Pessimistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admissions</td>
<td>22,225</td>
<td>22,936</td>
<td>25,230</td>
<td>20,643</td>
</tr>
<tr>
<td>Average LOS</td>
<td>3,55</td>
<td>3,48</td>
<td>3,51</td>
<td>3,37</td>
</tr>
<tr>
<td>OP Visits ER</td>
<td>185,403</td>
<td>189,853</td>
<td>199,345</td>
<td>176,563</td>
</tr>
<tr>
<td>Visits</td>
<td>54,330</td>
<td>54,058</td>
<td>59,464</td>
<td>48,653</td>
</tr>
<tr>
<td>Gross Patient Revenue</td>
<td>748,689,400</td>
<td>771,150,082</td>
<td>788,115,384</td>
<td>748,015,580</td>
</tr>
<tr>
<td>Contractual Adjustments</td>
<td>494,135,004</td>
<td>516,130,750</td>
<td>524,884,846</td>
<td>498,178,376</td>
</tr>
<tr>
<td>Other Deductions</td>
<td>427,500</td>
<td>404,843</td>
<td>425,085</td>
<td>392,697</td>
</tr>
<tr>
<td>Net Patient Revenue</td>
<td>$254,126,896</td>
<td>$254,614,490</td>
<td>$262,805,454</td>
<td>$249,444,506</td>
</tr>
<tr>
<td>% of Gross Changes</td>
<td>34%</td>
<td>33%</td>
<td>33%</td>
<td>33%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating Expenses</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary and Related Expenses</td>
<td>136,996,008</td>
<td>137,133,004</td>
<td>135,761,674</td>
<td>138,504,334</td>
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<tr>
<td>Medical Supplies</td>
<td>44,507,785</td>
<td>45,843,018</td>
<td>47,676,739</td>
<td>44,467,728</td>
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<tr>
<td>Other Supplies</td>
<td>37,089,820</td>
<td>37,460,719</td>
<td>37,801,945</td>
<td>35,257,583</td>
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<tr>
<td>Purchased Services</td>
<td>12,363,273</td>
<td>12,239,641</td>
<td>13,096,416</td>
<td>11,994,848</td>
</tr>
<tr>
<td>Utilities</td>
<td>7,417,964</td>
<td>7,603,413</td>
<td>7,907,550</td>
<td>7,375,311</td>
</tr>
<tr>
<td>Other Operating Expenses</td>
<td>9,890,619</td>
<td>9,692,806</td>
<td>10,543,400</td>
<td>10,036,505</td>
</tr>
<tr>
<td>Total Operating Expenses</td>
<td>$248,265,470</td>
<td>$249,972,602</td>
<td>$252,787,723</td>
<td>$247,636,310</td>
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<tr>
<td>Operating Margin</td>
<td>$5,861,426</td>
<td>$4,641,888</td>
<td>$10,017,730</td>
<td>$1,808,197</td>
</tr>
<tr>
<td>Operating Margin %</td>
<td>2.3%</td>
<td>1.8%</td>
<td>3.8%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

Scenario Planning for the Agile Healthcare Organization
2. **Multi Variable Narrative Based** – scenarios that go beyond more simplistic single-driver models but incorporate a concept of both independent and dependent drivers. As an example, these models are often referred to as multi-level in nature that have a series of independent drivers, such as volume and growth assumptions which then cascade down to ‘impact’ downstream dependent drivers such as Department Workload. By design, these models often incorporate more detailed analytics to more accurately represent the ‘cause & affect’ of an assumption. As an example, a growth assumption modeling a 10% increase in Inpatient volume might not be appropriate if the volume is coming only in OB/Newborn cases. In this approach, the model has some intelligence related to the expected impact of that global change on downstream revenue and expense plans, but allows for adjustments to ‘per case rates’ or ‘intensity’ factors. While this approach is more involved, computations can better represent operational realities.
3. **Initiative Based Scenario Planning** – scenarios that package different sets of initiatives together into a composite plan or strategy. Stakeholders of the business can develop various self-contained initiatives (e.g. hospital expansion) inclusive of a full set of financials. Management can then layer various combinations of initiatives on top of a baseline – ultimately managing to the overall goals and operating constraints of the organization.

**Base Case**
*Given current trends, what is our financial outlook in 3–10 years?*

**Initiatives**
*As we prioritize growth or cost containment initiatives, what is the incremental impact?*

**Scenarios**
*What is the impact on our baseline projections given the initiatives we’ve proposed?*

**Forecasting Methods Include:**
- Statistically-Driven Modeling
- Payor Mix and Revenue Forecasting
- Labor Rate & Efficiency Targets
- Cost Modeling

**Examples:**
- Re-Design ER, Flow Thru Implications
- Expand Cardiac Cath Lab
- Open an OP Urgent Care (Northside)

**Analysis Contains:**
1. Income Statement
2. Balance Sheet
3. Cash Flow
4. Key Ratios

4. **Stochastic Modeling** – typically refers to a computer simulation model that employs random number generation processes (e.g. Monte Carlo) against a key variable or variables for the purpose of deriving probability distributions of outcomes. Rather than a discreet scenario with a discreet outcome, stochastic models generate hundreds, even thousands, of scenarios enabling the planner to evaluate a distribution of outcomes. “Our expected revenue after processing 250 scenarios is $812M and we have a 95% confidence level that revenue will be above $778M.” Stochastic modeling is most prevalent in financial services and is used in a variety of ways including modeling interest rates, commodity prices, exchange rates etc. It is particularly useful in managing risk.
five structural elements for scenario planning

Scenario Planning requires both process and technology. According to our research the technology or underlying model is a weak link or inhibitor for many. The key elements that are needed to support successful Scenario Planning are illustrated below.

1. **Driver Assumptions** – Well constructed scenario planning models have identified the key drivers to the business (internal or external). In a standard cause and effect relationship these are the independent or causal variables. Unlike spreadsheet models, these variables should be extracted from the business logic and stored independently so that they can be viewed and easily modified. Tracking and keeping a historic trend of these drivers is recommended and the ability to clone and alter driver assumptions as versions is critical as illustrated above.

2. **Business Logic Layer** – The interplay between driver variables and financial outcomes is the heart of any scenario planning model. The goal of the business layer is to define algorithms that best emulate the dynamics of the organization. The business logic layer should be transparent; planners need easy access for the purpose of tuning their models. Back testing is a standard approach for tuning. Planners can compare forecasted results with actuals; they can input actual known driver values and compare the calculated results to the latest actual results, modifying the business logic to harmonize the two. Kaufman Hall has a unique approach to creating and managing business logic in a manner financial staff will appreciate. We have purposely avoided moving the business logic directly into the database (in the form or script logic) as some have. This makes it far easier to manage and maintain.

3. **Collaboration Inputs and Overrides** – The results of any driver-based process typically require the ability for subject matter experts to review and make additional subjective judgments regarding expected results. In our view, the best scenario planning model enables robust computations but also allows users to make adjustments. This can potentially be a large stakeholder community for which embedded workflow logic can shepherd this stage of the plan so that the appropriate stakeholders can have access and input to their respective domains or departments.

4. **Scenario Storage** – After subject matter experts have had a chance to give their input, scenarios need to be efficiently stored in the model repository. Naming, storing, and retrieving scenarios should be straightforward for planners to manage. It is important that all data, metadata, user input, and calculations are stored for each scenario, ideally with easy-to-understand English names defined by the Plan Administrator. Kaufman Hall leverages a unique BLOB (Binary Large Object) enabled relational database structure to support scenario planning. This unique structure allows every element and aspect of the scenario to be saved and easily retrieved.

5. **Scenario Presentation** – The creation and efficient storage of numerous scenarios requires an equally competent approach to presenting the results. Whether in reports or dashboards, it is vital that side-by-side comparisons can be easily constructed including the key drivers along with the financial information. Narrative around the contents of the scenario is also important. Those reviewing scenario results need to be able to quickly see the detail, and on occasion, review the business logic that’s driving the results. It is important that the planning model isn’t a “black box.”
getting started

Scenario content is typically of two main varieties: 1) externally oriented scenarios that focus on such things as demographic shifts, competitors entering or exiting the market, partnerships, etc. and 2) internally oriented scenarios that might focus on new service lines or specialties, reimbursement rates, changes in productivity, workforce growth expectations, hospital expansion, etc. It is not uncommon for organizations to blend both types together — recognizing that change in the external operating environment is often a catalyst for internal change.

As a planner, a great way to get started is to conduct workshops with key stakeholders to begin shaping the most relevant scenarios. These can be based on identifying the key drivers of the business and ranking them in order of their impact or influence upon the organization. Secondarily the scenario team can rank those drivers or influences in order of their level of uncertainty. Drivers that are both influential (high impact) and relatively uncertain typically represent the best opportunities for scenario development. In the diagram below, Quadrant 2 presents three key driver variables (#3, #6, #8) that are both high impact and highly uncertain. They are great candidates to be included in a sensitivity analysis or more comprehensive multi-variable storyline scenario (provided they’re determined not be mutually exclusive).

Beyond identifying the key variables to the model, planners should automate as much as possible the sourcing of nonfinancial driver information, storing a minimum of 12 months of history, but preferably 24 months or more. As a first step, planners can begin reporting these key variables along with financial results. There is a surprising amount of benefit from just presenting external or internal market and operational data together with the financials. Consumers of the information will begin to naturally correlate how the former is impacting the latter. Having history will also allow a planner the chance to create business logic and test the logic against past experience. Back testing is an important tool for model builders and planners. “How did the actual change in patient volume impact the hospital’s net revenue last month?” Having a proper technology foundation in place coupled with the right nonfinancial drivers, including the necessary business logic creates a strong path forward.
conclusion

The concept of scenario planning is not new, and yet, a relatively small percentage of healthcare provider organizations have incorporated this approach into their strategic planning, budgeting and forecasting processes. The reason most organizations have yet to adopt a scenario approach to planning isn’t a lack of interest or perceived value, but rather that there are deficiencies in the planning framework. These deficiencies are either technology related or modeling related; modeling being defined as “the interplay between market and operational drivers with resulting financial performance”. While virtually all performance management vendors claim to support scenario planning – the details of how that’s executed often proves too inefficient to put into practice. Kaufman Hall has made a concentrated effort in its technology to support both driver- and scenario-based planning. These two go hand-in-hand. The benefits of scenario planning are numerous whether it involves a simple sensitivity analysis or a more formalized storyline-based scenario. It is a powerful organization learning tool, shedding light on assumptions and biases that are otherwise hidden, as well as expanding the scope of what’s possible with regard to the organization’s strategy. It can reveal areas of exposure and opportunity when it is thoughtfully and imaginatively deployed.

about Kaufman Hall

Kaufman Hall offers a comprehensive and integrated platform of solutions that efficiently and effectively addresses all of a healthcare organization’s financial and operational planning, performance management and decision support needs:

- Long-range Planning
- Capital Planning & Management
- Debt Management
- Budgeting & Forecasting
- Cost Management
- Cost Accounting
- Decision Support and Analytics
- Management reporting & dashboards

about author

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Jay is responsible for the evolution and development of Kaufman Hall’s enterprise performance management solutions. He has over 20 years of practical industry experience, using performance management technologies to improve financial outcomes in financial planning, budgeting, service line cost and profitability measurement, and productivity monitoring.

Prior to joining Kaufman Hall, Jay served as Finance Director for Queen’s Medical Center in Honolulu, the senior practice manager for Eclipsys Corporation’s Business Solutions Consulting Group and the senior director of healthcare solutions for SAP BusinessObjects.