



Productivity Improvement through Integrated Business Planning (IBP)

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Outline

- Background: Today's bioanalytical lab
- Introduction of Integrated Business Planning (IBP)
- Demand Planning
- Supply Planning
- Managing demand variabilities
- Implementation of IBP
- Summary

Today's Bioanalytical Laboratories

- Bioanalytical labs face many unique challenges
 - Highly variable and complex processes
 - Highly volatile demand- fluctuation in demand is unpredictable due to the inherent uncertainty in the drug development process. Traditional supply chain processes that rely on historic orders should be thrown out the window.
 - High fixed cost- highly skilled employees and expensive equipment
 - Pricing pressure- More outsourcing is done by procurement rather than bioanalytical scientists
 - Capacity of the labs is also not well understood. Developing capacity measures is challenging due to highly variable, complex processes and highly volatile incoming workload.

Today's Bioanalytical Laboratories

- A highly variable demand combined with highly complex processes and a lack of understanding regarding laboratory capacity makes it extremely difficult to control and manage.
- Laboratory management is always drifting from crisis to crisis and dealing with changing priorities to satisfy clients.
- High stress diminishes customer service.
- Expediting becomes endemic and costs become difficult to contain.

The ultimate result is poor productivity and significant loss of profits

Today's Bioanalytical Laboratories

- Over the last decade significant attempts have been made to improve the productivity and profitability of the bioanalytical labs.
- Most of the efforts have been focused on two main areas:
 - Technological innovation: automation, MS technologies, UPLC systems, and electronic lab notebooks
 - Process improvement tools: Lean and Six Sigma tools

Today's Bioanalytical Laboratories

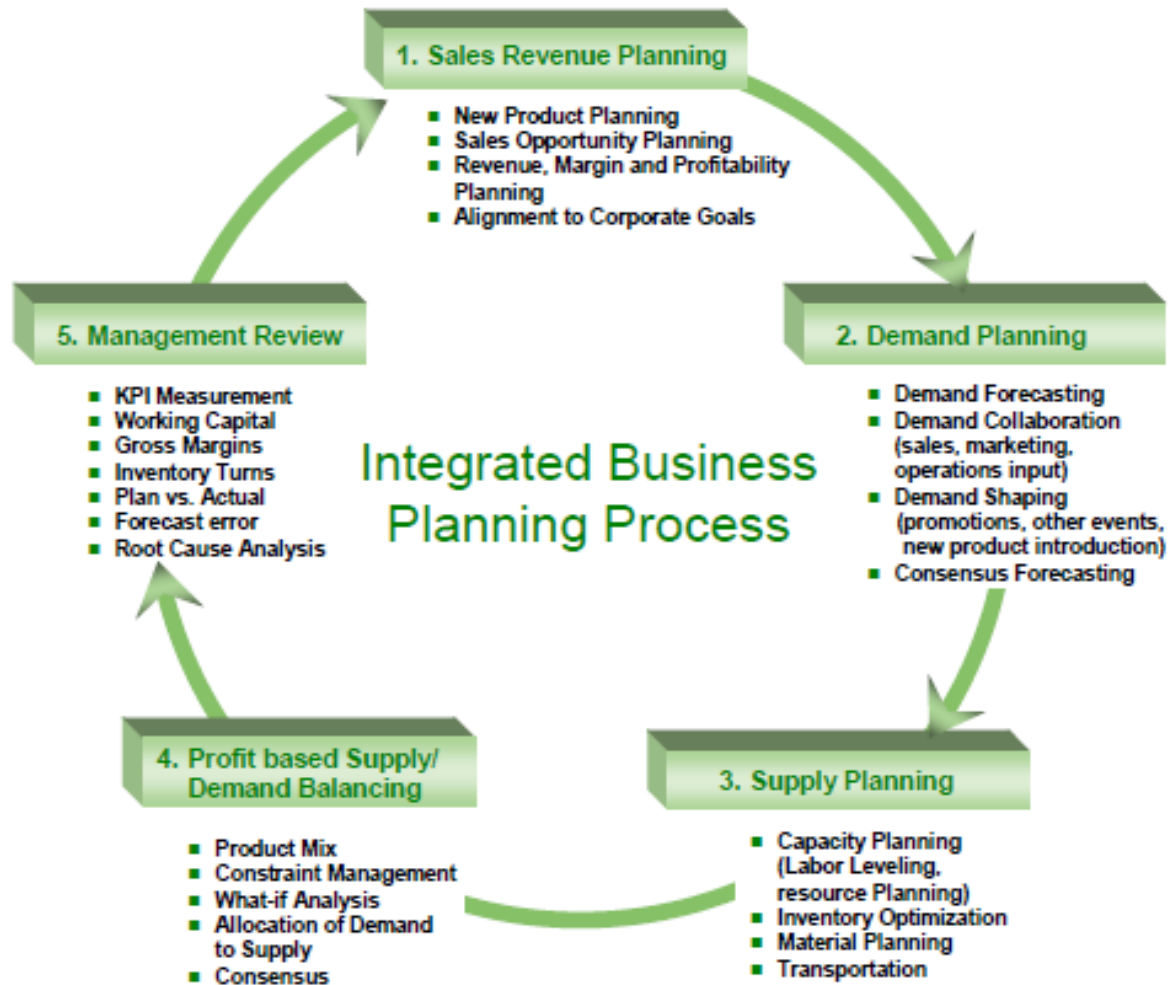
- However none of these solutions are able to predict upturn or downturn in demand (volume/mix).
- Even worse, in most cases, these solutions are designed with an assumption that demand (volume/mix) will be somewhat predictable, level and constant which is far from reality.
- Bioanalytical labs have been unable to realize the full benefit of investments in technological innovations and process improvement tools due to a lack of understanding of demand and its fluctuations.
- We lack the tools and processes to align supply effectively and efficiently to meet changing demand.

Balancing demand and supply is critical to the success of a bioanalytical business.

Integrated Business Planning (IBP)

- It is a decision making process that ensures that tactical plans in all business functions are aligned and support the business plan. This is also known as Sales and Operational Planning (S&OP).
- The objective of IBP is to reach consensus on a single operating plan that allocates the critical resources of people, capacity, materials, time, and money to most effectively meet the market demand in a profitable way.
- IBP has emerged as an essential management tool in this age of rapid changes, increasingly demanding customers, and global complex supply chains.

Integrated Business Planning (IBP)



Source: Aberdeen Group, July 2006

Demand Plan: Developing Forecast

- The core of the S&OP process is the **reliable demand plan** that will enable operations and logistics to synchronize internal and external resources, and make them available in a **just in time (JIT)** basis to execute work in timely manner.
- **Develop “ONE” forecast:** It is important to develop one set of consensus forecast, in both units and dollars, that the sales organization can execute, the supply organization can deliver, and finance can synchronize to the business plan.
- Forecasting data should be presented in both **aggregate** and **in detail**. Data should be presented in aggregate format for long term planning and in detailed format within **Operation’s Planning Fence (OPF)**.

Demand Plan: Developing Forecast

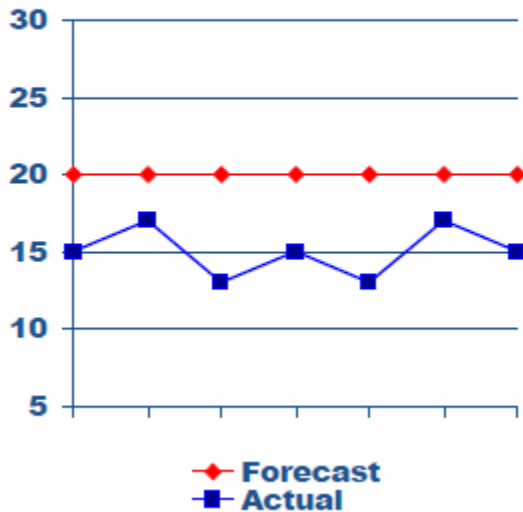


Demand Plan: Forecast Accuracy

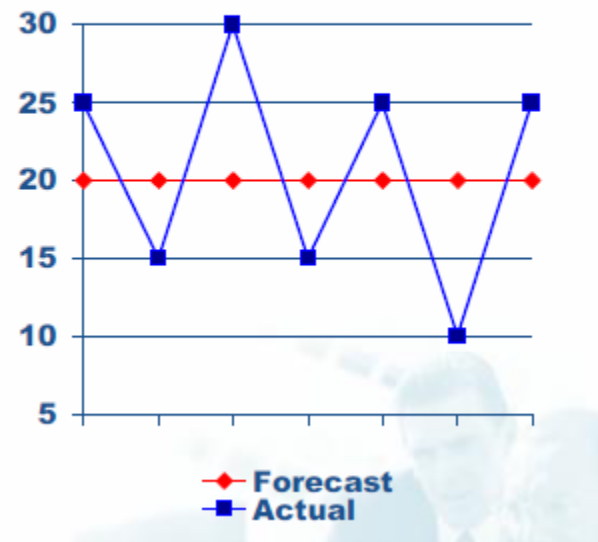
- One thing guaranteed about forecasting is that it will change. It is difficult to measure the accuracy of something that is designed to change constantly.
- However a certain level of accuracy is required in forecasting to improve productivity and profitability.
- Forecast accuracy should be measured at different aggregate levels at different time points.
- The focus should really be on measuring forecast accuracy routinely and continue to revise assumptions behind the forecasting to improve it.
- Within OPF, the target accuracy should be **greater than 90%** in order to achieve optimal resource utilization.

Forecast Accuracy

Product A



Product B



- Which one is more accurate?
- Which one is easy to manage?
- Which one is more desirable?

Supply Plan

- One of the key components of the IBP process is the supply plan which determines the supply capability to meet the demand. The goal is to develop a plan that will include the total supply chain's ability to meet client deliverables and maximizing resource utilizations while minimizing inventory carrying time and overall cost of service.
- ***Rough Cut Capacity Planning (RCCP)***: the process of translating the demand plan into resource utilization. RCCP should only be done with high impact resources as opposed to a master scheduling which should be used for planning all resources including high impact resources.

Supply Plan

- ***Rough Cut Material Planning (RCMP)***: This is a very similar concept to RCCP. The purpose of RCMP is to develop material resource planning for high impact materials. For a bioanalytical lab that will include reference materials, internal standards, analytical columns, SPE plates and ELISA kits. Similar to the RCCP, this should be performed in aggregate. The detail material planning should be integrated with the master schedule.
- ***Key Performance Indicators (KPIs)*** are quantifiable measurements that indicate the performance and/or progress of a specific function.

Supply Plan: Key Performance Indicators

Demand KPIs	Supply KPIs
Forecast vs Budget target vs Actual- (\$) Aggregate	Utilization rate- High impact resources
Forecast vs. Actual; for current year vs. previous year- (\$) Service Line	Cost of goods for generating revenue (COGR)
Forecast vs. Actual; for current year vs. previous year – (Units) Service Line	Inventory days on hand or equivalent
Forecast accuracy – (Units) Service Line	% On time delivery
Weighted Forecast accuracy – (Units) Aggregate	Quality metrics: Assay pass rate, re-work rate, Number of deviations, Out of specifications, Incurred sample reanalysis (ISR) failures etc.

All metrics should be accompanied with assumptions, any changes to assumptions, explanation of major deviations, risks and opportunities to facilitate decision making.

Supply Plan: Key performance Indicators

- The KPIs should be detailed enough to uncover valuable trends.



On-time delivery= 86%

Dealing with demand variability

- Despite best efforts, it is a reality in the bioanalytical business for the demand forecast to vary significantly due to inaccurate assumptions, clinical schedule uncertainties and changes in client priorities.
- Demand variabilities can be managed using “chase demand” or by “level capacity.”
- Level capacity requires keeping the capacity of the lab constant and influencing demand to match capacity through an effective sales and marketing plan. These marketing strategies have very little impact on bioanalysis demand and usually not effective. This leaves bioanalytical operations managers to only “chase demand” effectively.

Chasing Demand

- There are several strategies that can be used to chase demand. The following strategies are relevant to bioanalytical lab operations.
- **Flexible Resource Allocation Strategy:** An effective flexible resource allocation strategy requires an investment in an employee cross-training plan and a culture where employees get rewarded for broadening their skill sets.
- When done correctly this can be a **win-win solution for the employee and employer**. The employer gets more freedom to strategically utilize the workforce and the employee benefits from increasing their skill sets.

Fast tracking system

- It is important for a lab to have a clearly defined fast tracking system to expedite requests. Process improvement tools like Lean or Six Sigma methodologies should be utilized to develop a robust fast tracking system.
- In order to make the fast tracking system work effectively, only a small portion of work (10%-20%) should be designated for the fast tracking system at any time.
- The most common reason of failure of fast tracking system is the system overload.
- A better demand management strategy or process re-engineering is required to improve overall turnaround time instead of routinely assigning large volume of samples to fast tracking system.

Proactively chase demand using “What-if” Scenarios

- In a bioanalytical lab, sometimes there is a significant amount of unscheduled or “on hold” work due to various reasons (e.g. uncertainties about clinical trials, studies on hold or there is not enough information from client to schedule the work)
- The supply team can use “what if” scenarios to simulate the impact of a study to coming off hold at various time point and evaluate its impact on capacity, utilization of high impact resources and materials planning. This will allow the supply team to respond to the client requests promptly and effectively. The simulations may also allow the lab to approach the client with financial incentives to perform analysis during a timeframe that is advantageous (i.e. maximize resource utilization) for the lab.

Proactively chase demand using “What-if” Scenarios

- It is important to note that for successful “what if” scenario simulations, it requires a collaborative work environment where all team members can discuss all the possible scenarios, even conflicting ones, openly.
- In the end, all the pros and cons should be discussed systematically, key opportunities and risks should be identified, and the decision should be made with a primary focus on maximum resource utilization and margin.
- Bioanalytical labs that use “what-if” scenarios as part of their IBP process are better equipped to handle unexpected events and last minute requests from a client.

Implementation Challenge

Integrated Business Planning is not a difficult concept to understand

Real Implementation Challenge

is

Behavior Change

changing the way we do our jobs

Discipline

Accountability

Teamwork

Conflict resolution

Technology to enable implementation

- 78% of companies say that technology is either critical or very important for their IBP process.
- Technologies are essential to support IBP due to complex data requirement from multiple sources, multi-dimensional goals and views, dynamic business processes, more decision parameters etc.
- Examples: Sharepoint, Spotfire, Electronic lab notebook, Electronic real-time dashboard etc.

Summary

- In today's global economy, the client demand for speed, competition and pricing pressure is only going to increase.
- Only the companies that have a better understanding of a client's demand and can align their supply to match the demand will survive.
- An effective IBP process can lead to a better understanding of the relevant marketplace, improve resource utilization, decrease inventory levels, decrease the cost of generating revenue and improve profitability.

Summary

- Understanding customer demand better allows labs to meet the demand more frequently resulting in increased customer satisfaction and improved relationship with clients.
- Greater employee satisfaction comes from improved communications, greater opportunity to learn new skills and better predictability of work load.
- The IBP process combined with technological and process improvement tools can give any lab significant competitive advantage.
- In today's global economy, the IBP process is ultimately the strategy for survival.

