

**Demand Driven S&OP:
A Sharp Departure
from the Traditional
ERP Approach**

The Point

By Robert P. Burrows III

Demand Driven S&OP

The On-Point Group

The On-Point Group helps companies begin to grapple with the epic changes required by our society's movement to a demand economy, unlocking hidden value in their demand/supply environments. Using simulation, combined with cost optimization and experience-honed business wisdom, we help companies realize their best supply networks, focusing on value, not merely optimizing costs.

We employ proven business principles in transforming the sales and operations planning processes, from marketing through supply. Our toolkit includes inventory modeling, collaborative procurement, demand balancing, operations strategy and infrastructure rationalization, all orchestrated to demonstrably improve operations.

In this monograph, Robert P. Burrows, managing principal, addresses the urgent need for senior management in supply, manufacturing, procurement and distribution to rework its business model to accommodate the impending demand economy and implement a customer-centric culture throughout the enterprise.

Over the last 25-30 years, Enterprise Resource Planning systems—or ERP systems, as they're more commonly known—have quite literally become the operational nerve center if not the organization's virtual brain in most companies.

As customers demand greater product complexity across ever-growing product lines, asking suppliers to execute deliveries in weeks or even days, suppliers more and more rely on these sophisticated software tools to manage the complex flow of production planning, logistics and payment schedules.

Billions of dollars have been invested in these systems. However, ERP systems have not stood the test of time well and results are increasingly disappointing, if not disastrous. It's no longer unusual to hear reports of companies having spent millions of dollars on an ERP system, only to dismantle it months or even weeks later after finding it useless. Too frequently, we find the ERP system logic and screens are not used to run the business; instead, a loose set of spreadsheets actually does the work.

ERP systems suffer from some fatal flaws. While often technically quite advanced, their central logic nevertheless derives from decades-old economic dynamics that no longer exist. They were built for a supply-centric economy and we now live in a world driven by demand. ERP logic tries to minimize cost and optimize inventory. In the demand world a company must build to customer value and operate to demand.

ERP systems
convert managers
to data minders

The Fatal Flaws of ERP Systems

ERP systems tend to focus only on one element of the complicated make-supply equation—inventory—in an ill-fated attempt to provide good service while looking for perfect forecasts. They rest on the notion that underlying demand patterns have a built-in statistical reliability, which they generally don't. The result is endless forecast changes and updates.

ERP systems are highly insensitive to capacity constraints — so insensitive as to force schedule changes at the speed of the computer's processor making planning and schedules instantly out of date.

However, the biggest flaw is often loss of perspective and control as managers dive into oceans of ever changing data. As technology has allowed ERP systems to triple in size from mega-bytes to giga-bytes and now tera-bytes, the detail becomes crippling. ERP system's answer to the make question is "Stock it and allow a long lead time for delivery". To meet the demand of today's customer "I want something different, and I want it now" ERP expedites with change orders—lots of them.

High priced, well-educated and talented management professionals are reduced to data minders as these systems churn out thousands of schedule changes at the individual SKU level trying to deal with the volatile nature of the demand economy.

The goal, of course, should be a system in which management converges with data that has been converted to easily usable information. When married to a strong understanding of customer values, this combination becomes the real source of any organization's ability to sustain competitive advantage. It's the way a company transforms into a value-delivery enterprise.

The Point –
 a convergence of
 customer values
 and management
 information is required

In White Paper #1, we described why current supply chains—engineered for the old supply economy at a time when the demand economy is in the ascendancy—are now obsolete. In that previous document we noted:

A demand economy looks vastly different from the vanishing supply economy. Customers will insist upon specialized products for unique situations and tastes. Product-line complexity will be broad. Demand variability per product will be higher by orders of magnitude. Seemingly excessive service levels and response times will be the norm.

A more customer-centric form of “networked planning” is required:

Such networked planning can decrease purchase cost, which amounts to half the cost of goods sold. The alternative—staying cost-oriented and supply-driven—plays right into the hands of the super-low-cost production engines in the Far East.

In this document, then, we will discuss the critical first steps towards accomplishing the demand driven, or as we find more appropriate, demand-based transformation of the S&OP process.

A New Demand-Based Approach Is Required

The economic changes with a vastly more powerful set of customers and a much more demanding consumer now requires an S&OP approach driven by demand, not supply economics. (See Exhibit 1.)

EXHIBIT 1

Comparison of Supply View to Demand View of the Economy

	Supply View	Demand View
Customers	Demographics	Value factors
Demand	Linear, simple	Volatile
Products	Few, commodities	Exploding variety
Operations	Reactive	Simulated
Finance	P&L Focused	Balance sheet focused
Organization	Functional silos	Collaborative teams

Modernize your
 S&OP process to
 demand-based

Advanced thinkers are wrestling with how to focus on demand. Among them AMR (Advanced Manufacturing Research) has been developing the conceptual framework for a demand driven approach with their DDSN construct. We like the AMR concepts as far as they go.

However, a practical application is needed. We go beyond the concepts and describe how to modernize your S&OP process.

The Demand-Based S&OP will be Vastly Different and Much Better

However, we are not going to tell you to throw out your entire ERP system. We are only going to put in a new planning process and inventory management logic. The demand-based approach is called Demand-Based Supply or DBS™. DBS is a customer-value delivery system which enables complexity, conserves capacity and maximizes throughput. DBS uses simulation rather than simple linear programming to set policies for inventory, network and deployment. DBS changes operations from a chain that is yanked by customers to a network which is orchestrated to manage demand. (See exhibit 2)

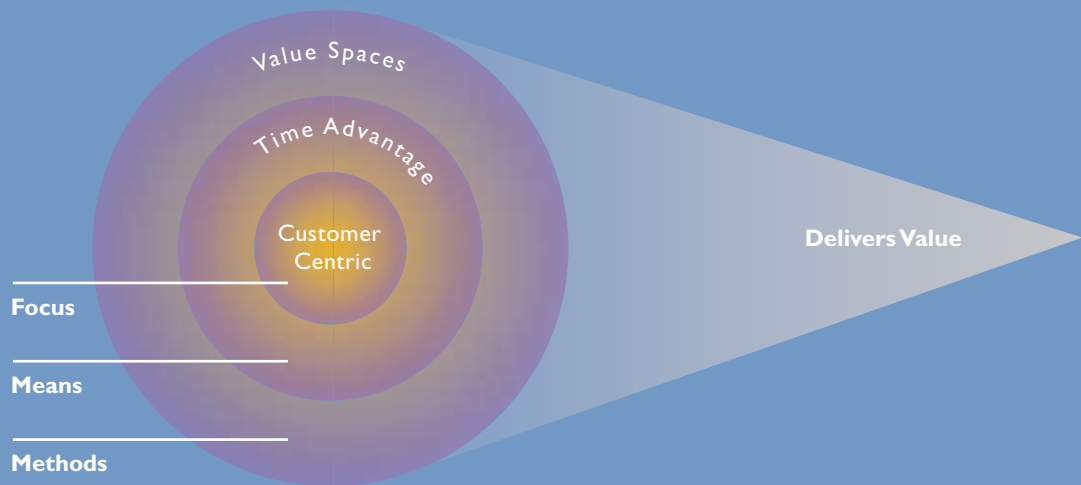
Demand-Based S&OP Is Externally Focused

Becoming demand-based starts with a definition of demand in customer value terms. The forecast of demand is only one element of the demand plan at the beginning of S&OP.

DBS uses value spaces and time advantaged operating strategies to achieve customer-centricity and deliver value.

EXHIBIT 2

DBS Approach to Supply Chain Management



DBS is Founded on Five Fundamentals to Achieve the Point

Each of the five principals work together to accomplish the overall point of the demand-based process, which is to deliver customer value while maintaining good operating economies.

Five Fundamentals of DBS (See exhibit 3)

1. Value Spaces Define Your Competitive Edge. Defining value in customer terms requires a value-based segmentation. The value segmentation process is significantly different from the segmentation process almost universally applied by marketing. It goes well beyond the traditional market segmentation approach and defines the needs, behaviors attitudes and services which customer groups absolutely must have and which palpably characterize how the customers “go to market”. (See exhibit 4)

EXHIBIT 3

Five Fundamentals of DBS™

Fundamental Principle	Improves
Value spaces	Competitive edge
Customer centricity	Goal setting
Families	Communication
Throughput	Performance metrics
Rates of demand	Planning

The new segmentation can likely be done with data available internally or readily available in the minds of the sales people and from simple internet research.

EXHIBIT 4

Value Spaces

Traditional Approach

Value Approach

Business Type

Retail
Food service
Club

Need States

Growth
Mature

Firmographic

Size
Region

Behaviors

Business practices
Cash flow approach

Products/Services

Full line
Broker
Specialty

Attitudes

Attitude toward the
consumer

Product/Price

Services they relish
Metrics most dear

Value spaces improve
competitive edge

For instance, the entire sales force probes for actionable intelligence on customers and shares that information in a timely manner with its marketing counterparts in the DBS team. For most companies, the process requires becoming more of a learning environment, one open to more conversations, including the kind that often help get the real work accomplished: those accidental conversations around the company water cooler, over lunch or simply before or after sales meetings.

Knowing the value space design, at least in its basic form, from internally generated research will help define value solutions for each customer group using the DBS tools.

2. Customer-Centricity Converts Values Into Operating Goals And Solutions. DBS can be developed to cater to the specific requirements of major customer groups as defined in the value spaces.

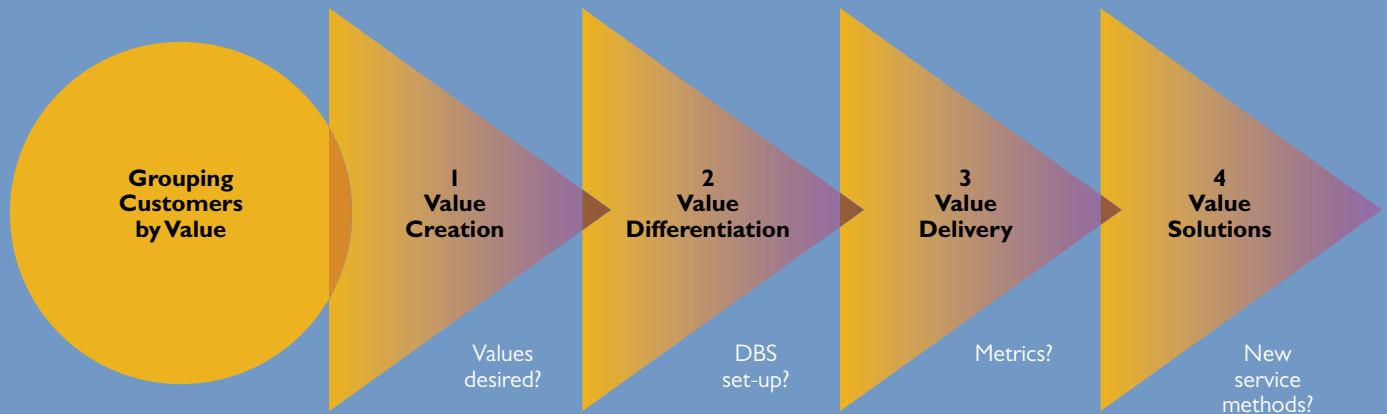
Customer-centricity inside S&OP means setting the value derived performance metrics and the critical operational imperatives which form an overall solution for the customers.

It is the solution design which sets the proper framework inside which S&OP will thrive and accomplish value delivery to demand. (See exhibit 5)

Customer-centricity
improves goal setting

EXHIBIT 5

Customer-Centricity
Operational goals are set and communicated in a four step process



3. Families Communicate Customer Values At An Operational Level. Families within value spaces are defined using the principle of the 3 M's, commonality of market, manufacturing and materials. The principle of the 3 M's uses the 80/20 rule to define meaningful differences.

Families of products are made up of SKU's but are not built from the SKU detail. Let's take the example of a manufacturer that stocks 2,600 recognizable SKUs. Using our methods, these 2,600 products at specific stocking locations can typically be grouped into about 30 major families or groups of products and some 20 or so minor families. These groups are determined by three main characteristics (the 3 M's):

- They come from the same source (manufacturing or supplier)
- They are derived from the same raw materials (major components or ingredients)
- They serve the same markets

Families increase
communication

Of critical importance to a value delivery enterprise which is demand-based is that families are:

- Very easily remembered by both practitioners and senior management
- Significantly increase cross-functional communication
- Naturally more predictable, simply as a result of aggregation

Goals, metrics, value definitions, patterns of demand, production resource constraints and all other key factors can be defined in these homogeneous groupings and just as importantly can be readily managed.

4. Throughput Is The Key Performance Goal Of DBS. Throughput is the critical difference between DBS and other manufacturing strategies such as MRP or Lean.

Throughput is using capacity now to make just what the customer is demanding no more and no less. In DBS we want to maximize throughput. In a make to stock business, some inventory will be built. However, the inventory management objective changes significantly in DBS from what is used in ERP.

In DBS inventory is balanced across all the SKU's in a family each time the family comes out of production. Note: out of the manufacturing process not into planning process as is the case in ERP.

Inventory in unpredictable families, those that represent 20% or less of demand, will be high to reduce the frequency of production and to conserve capacity for the higher volume and predictable demand items.

The Pareto approach to inventory classification is eliminated in DBS and replaced by predictability measures and manufacturing constraint management. Also, the stratification of inventory is not done at an SKU level but at a family level only. All items within a family will have the same inventory class and be manufactured together. In DBS, A's are the most predictable families not just the highest volume.

5. Rates Of Demand Improve Planning Accuracy. In DBS we build to an order rate not to an order. ERP systems with their safety stocks will respond to an individual customer order as it unexpectedly forces recognition of a safety stock violation. The requirement to produce will therefore be thrust upon manufacturing or a supplier without any respect for critical manufacturing constraints. Thus, the famous ERP axiom "build to infinite capacity".

Rate-based planning inside DBS balances inventory among all SKU's in a family and allows operations to continue to produce predictable families to the demand rate until a very significant shift in demand is realized. The typical ups and downs in demand are not considered. DBS will change the rate of production to match the rate of demand in organized steps. The use of simulation to match the production rate and the demand rate is an essential element of DBS.

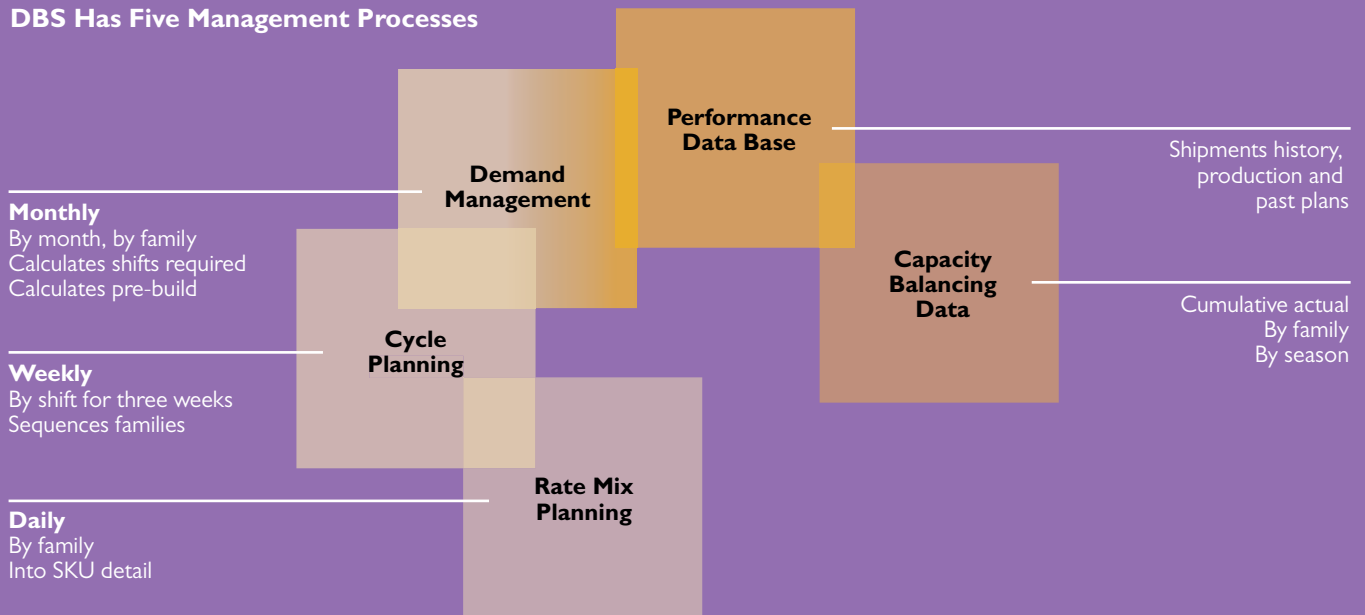
The systems required to implement the rate-based planning approach are discussed in the following section.

Five Systems in DBS

DBS Uses Five Systems to Achieve the Point.

EXHIBIT 6

DBS Has Five Management Processes



Three of the five systems form the full rate-based S&OP process. Demand Management is used to balance capacity to demand. Performance Data Base is used to correlate data from many different systems including ERP, Forecasting and others into demand information. Capacity Balancing is used in the S&OP process to interpret demand. In addition, inventory standards, which are a critical element of the system, are used as a measure of demand pressure inside the S&OP process as well as in the other two DBS systems for inventory deployment. (See exhibit 6)

1. The Demand Management System Makes S&OP Operational. The goal is to manage to demand not to manage demand. Demand Management aligns the demand plan with all its uncertainties and variables with capacity using a production cycle plan and inventory strategy. The Demand Management System replaces the traditional ERP capacity planning, master scheduling and inventory management to maximize throughput and deliver value. (See exhibit 7)

In the demand-based system of S&OP the critical balance between demand and supply can be planned, and S&OP can become the one place where marketing and supply-chain operations can and should talk and strategize. But that conversation and strategizing must center on how to create (and measure) value for customers, not how to hit internal metrics of interest only to its own operations. The supply plan must be flexible enough to adapt to demand while maintaining appropriate economics.

The demand management meeting among senior management, supported by DMS is where the value delivery conversation should be conducted but has rarely previously been focused. Marketing talks about customers by region or demographics, by size and product preferences. Supply chain talks about products, warehouses and production lines. And the procurement operation speaks about key suppliers and sourcing strategies. There's little common language between these silos, no standard currency that allows them to exchange mutually useful information, let alone measure the effectiveness of their joint operations in delivering value to the customer. They all talk, or not, but no one functional area or senior executive can really listen and respond constructively to the others. DMS is the solution.

EXHIBIT 7

Comparison of Demand-Based to ERP Based S&OP

Function	DMS*	Benefit	Current Approach
Demand planning	Families	Relates demand and supply in events	Focuses on forecast for demand only
Trend analysis	Capacity balancing	Stabilizes production using rates	Not related to production
Production	DMS	Balanced to demand within constraints	Assumes capacity is available immediately
Inventory deployment	Inventory standards	To demand rates using simulation	To statistical forecast at an SKU detail
Inventory management	Simulation	Allows inventory to float in a range	Safety stocks which act as hard floors

*Demand Management System™

Demand Management
is the senior
management plug-in

2. DBS Systems Work Because of A Performance Data Base. The Performance Data Base is not another place where alternative forecasts and plans reside. The Performance Data Base is built directly from the active data generated by various functional organizations. Data from all sources is first screened and mapped into value spaces and families. The original data integrity and traceability is strictly maintained but new or missing data is found before the DBS systems use the refreshed data.

The major reasons traditional S&OP systems fail are eliminated using the Performance Data Base. The reasons for failure in the past have been:

- S&OP participants bring conflicting data to meetings
- Marketing data is not coordinated with operational data such as capacity and inventory investment
- Key performance metrics are not relevant to overall business strategy

The Performance Data Base in DBS will resolve data conflicts, provide coordinated data by organizing data into families, and provide standard feedback on the value space defined performance metrics as well as throughput.

EXHIBIT 8

Performance Data Base



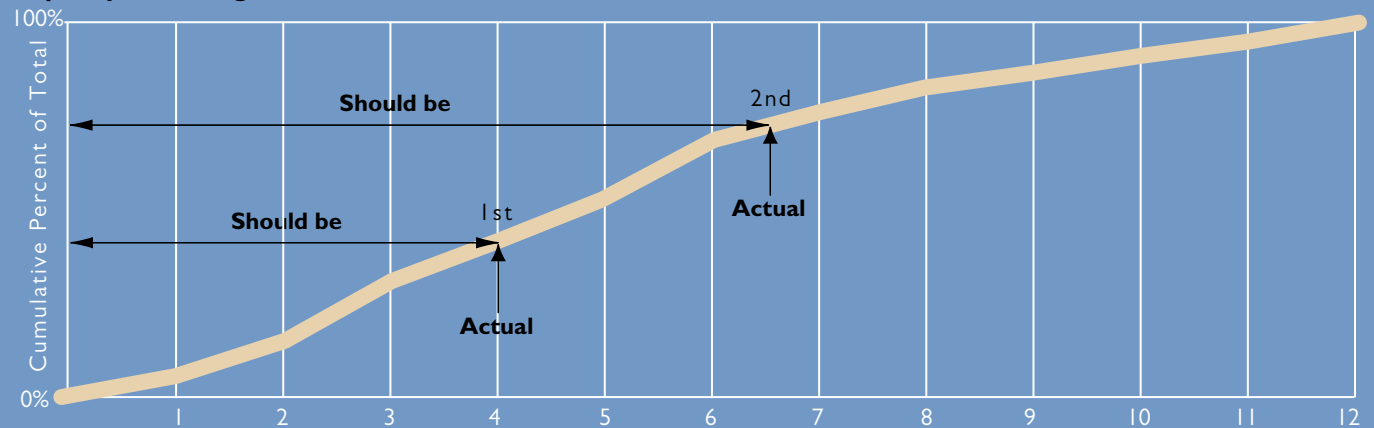
3. Capacity Balancing Charts Interpret Demand Actual. One of the most significant tools in the demand-based S&OP process is the use of Capacity Balancing Charts.TM

Capacity Balancing Charts correct production plans to actual demand as the rates of demand become known. The corrections are made at critical points along the demand plan as key demand variables appear.

The work is done at the family level where predictability is greatest and the actual capacity plan is functional.

EXHIBIT 9

Capacity Balancing ChartTM



Goodbye safety
stocks, hello
inventory standards

Capacity Balancing Charts are enhanced by use of a “Par Book” which keeps records of the timing of historical events such as major promotions or price increases or new product introductions which alter the shape of the demand curves.

Safety stocks could well be the one most significant reason why ERP systems continue to perform so very poorly and have even failed. Safety stocks defy master plans, defy rational responses to demand, defy logic and are founded on statistical error compounded by error in anticipating demand. Of keen interest to the demand-based planner is the fact that in DBS we do not use safety stock at all, ever.

Inventory standards are one of the techniques which allow master schedules to retain integrity and allow inventory to logically move in response to demand variation. Inventory standards are built upon the advanced operations research technique of simulation. Using simulation, inventory standards can be tested against common demand and supply variables, and as a result a range of acceptable inventory can be determined. Inventory standards become a barometer of demand replacing the hard, unforgiving and splintered floors of safety stocks.

The end result of S&OP in a make-to-stock manufacturing or distribution process is inventory deployment. Inventory standards inside DBS will preserve planning integrity and balance inventory to demand.

EXHIBIT 10

Inventory Deployment in DBS vs. ERP

- Optimizes inventory deployment
- Uses new inventory standards
- Safety stock is eliminated

DBS™	ERP
Deploys AFTER production	Deploys BEFORE production
To demand	To forecast
Balances all SKUs in family	Treats each SKU separately
Forward looking	Backward looking
Starts at general (family)	Starts at detail and moves up
Planned	Reactive

Inventory standards
are a barometer
of demand

DBS keeps the operations running on the sunny side. Inventory standards provide a warning when demand is indicating a change from pre-planned levels. The warning gives the DBS planner time to make a well considered schedule change which least disrupts the rhythm of production.

When Greater Complexity Threatens Customer Relationships

Let's bring this back from the theoretical realm and into the only context that really matters in business: the tension between suppliers and their customers and the continual dance between their interests.

With the rise of demand-based systems, and the greater negotiating leverage the customer now holds, producers are being asked—forced, really—to get out of their comfort zones, change their cultures and operate more effectively. To retain existing customers, let alone land new ones, producers are being asked to do what once might have seemed impossible: achieve greater supply complexity, narrower delivery windows, and all without raising prices. These requirements will be viewed with trepidation by many in the organization. However, the economy is forcing the issue—resistance will be costly.

Conclusion

But there is more than enough good news here, at least for the discerning. The changes we've outlined require more of a shift in internal organizational culture than it does demand deeper structural changes. Orchestrated planning calls for liberation from stilted thinking and overprotection of turf rather than re-engineering the physical plant and the organization chart. Done well, it allows a company to manage itself in a more streamlined fashion, where good decisions flow naturally from solid information, coming from various sources, both external and internal. Value is aligned with performance, cost-centered thinking is eliminated, and production capacity is conserved for making what customers are actually buying now.

Don't underestimate the potentially transformative power of this more effective way of planning. As one major company president put it, "Now I can finally understand the business and how it all comes together. Before, things happened, but I couldn't necessarily see how all the constituent parts related to one another."

As we mentioned in the earlier document, the benefits of executing these improvements also include more than the normal claims.

- Enhanced market share
- Better service
- Lower costs and improved margins
- Inventory reductions of 40-50 percent
- Cuts in overhead expenses of 30-40 percent
- Liberated cash flows of 20-30 percent

The last item on the list, though, is the most important of all. Institute these changes, and you just may get to remain in business. Do it right, and you're likely to not merely survive, but thrive.

At On-Point, we have actually managed businesses using these DBS principles, with documented high performance as a result, and we have implemented these principles achieving the claimed benefits.

Call us ...

We offer a nine module executive education program on Demand-Based Supply which has proven to be effective in convincing management at all levels of the necessity for change and the veracity of the DBS solution. Participants find “it is not just talk, it is the process which makes the difference.”

Business Simulation Games

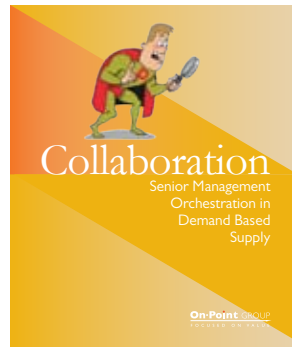
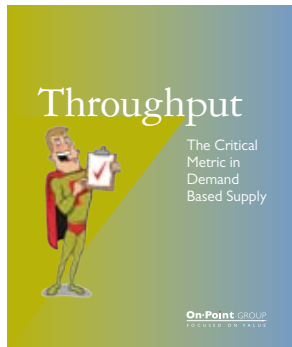
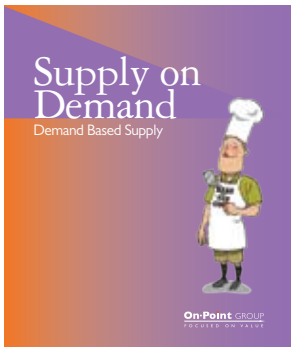
Facilitated Discussions

Demand Management Game™



Cycle Planning Game™

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About the Author

Robert P. Burrows founded the On-Point Group and is its managing principal. He is a leading-edge thinker and sought-after consultant in the areas of operations strategy, demand management, inventory management and collaborative procurement.

Bob spent 15 years as a strategic business unit head with Figgie International Corporation, in turn leading its Automatic Sprinkler Corporation of America division, a fire-protection device manufacturer, and Rawlings Sporting Goods, Figgie's consumer products manufacturing division.

Bob started his career in the operations management practice of Booz, Allen & Hamilton Inc.'s Cleveland office, where he consulted to dozens of Fortune 100 international manufacturing companies over a decade.

Bob served on the board of trustees of Covenant Theological Seminary for nine years while the institution became one of the top five Christian seminaries in the United States. Bob also served on the American Management Association's General Management Council for Growth Enterprises.

He holds a master's degree in business administration from Case Western Reserve University and a bachelor of science degree in engineering from Iowa State University. He emphasized operations research at both institutions.

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About The On-Point Group

The On-Point Group was established in 1994 to help companies create value for their customers, leveraging every aspect of operations. We apply the quantitative science of operations research to supply-chain management problems to help companies generate significant value in their markets. We serve clients throughout all sectors of the manufacturing economy, from food and consumer products to technology, automotive and heavy industry.

On-Point's approach melds business savvy with the rigors of scholarly pursuit. Our people are seasoned professionals with strong quantitative skills, deep operations experience and demonstrated leadership in industry and academia. Our talent, wisdom, experience and high integrity allow us to deliver breakthrough solutions most efficiently and effectively.



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