

Voice of authority

Extensions wring value from enterprise data

MSI presents an interview with Robert P. Burrows III, president of On-Point Consulting Group, Hudson, Ohio. The interview was conducted by MSI Editorial Director Kevin Parker. On-Point has manufacturing-related expertise in three areas: strategic development, executive decision-making, and forecasting and demand management.

Kevin Parker: Robert, I know yours is a long and varied career, but recently you had told me that you actually bought a manufacturing company to use as a test bed, as it were, for the strategies you use in advising manufacturing companies on how to increase productivity. Tell us a little bit about your background, and about that experience in particular.

Robert Burrows: I've been in consulting for half of my business life, starting with Booz, Allen & Hamilton for 10 years, and now with my own firm. The other half I've spent in line and general management, as president of two corporations: Rawlings Sporting Goods, the largest team sports manufacturer in the U.S., and Automatic Sprinkler Corp., a high-tech fire protection contractor and device manufacturer.

Those two profit center management experiences, and my work at Booz Allen, have shaped a lot of my views. I know what it means to have to deliver the numbers each month, and I have worked for three remarkably profitable companies that provide excellent value to their customers. At one time, my wife and I did run our own electronics man-



Robert P. Burrows III

ufacturing company. We trained some of our consultants in manufacturing techniques, and the realities of manufacturing, within that company.

The main thrust was to use manufacturing systems to enhance a time-advantaged strategy that brings significant value to customers working with very short lead times, and looking for very fast responsiveness on design and other time-critical value drivers. Sometimes people confuse time-advantage with good customer service, but

they're not strictly related. You can have seemingly good customer service by internal measures and not be time-advantaged in the customer's eyes. The airlines and the auto industry prove this point every day.

Parker: We also talked the other day about the next steps for the many manufacturing companies that already have installed ERP [enterprise resources planning] systems. The industry is using the term extended ERP or ERP II to indicate the addition onto those systems of extensions that might include advanced planning and scheduling, customer relationship management [CRM], or e-Business. You indicated that much of the work On-Point is doing is based around that—ensuring that companies get the return-on-investment [ROI] from ERP.

Burrows: As manufacturing executives, we've gone through three distinct waves: MRP in the '70s, MRP II in the '80s, and ERP in the '90s. ERP provides the core infrastructure for managing data, but it typically fits a business only to the extent of around 50 to 70 percent of the actual day-to-day busi-

ness functions. Often in manufacturing, our consultants find that the formal ERP system doesn't actually run the day-to-day operation of the business, so at On-Point, we do several things. One is to help clients understand how to configure the decision-making techniques inside of ERP to fit their businesses, and in some cases that requires some add-on software to the ERP system.

Probably the most common problem resides with companies that have installed an ERP system for a discrete manufacturing operation, but they find out they're actually a flow business. Flow businesses typically are found in pharmaceuticals, food production, paint, assembly, and others that want to become "just-in-time" or "time-advantaged." We're not talking about operations where one item is produced continuously, but rather, where a variety of products flow across work centers. In general, ERP systems have a terrible time managing flow operations, even with repetitive functionality. In flow, the top-level planning is difficult to tie down to shop-level execution. Planner BOMs (bills of material) do not address the issue. One of the biggest problems on the shop-floor level is the lot control that we get into with food production and pharmaceuticals, for instance. For lot control to work as customers need it to work, finished goods lots and specific supplier lots must be readily tied together.

Improvements or add-on software normally are required to tailor the ERP systems to work better in a flow manufacturing environment. We find that the most critical area is with the demand-management process, as defined recently in an AMR report. On-Point's view of demand management was developed through about 18 successful implementations. We've found it useful to contrast demand management with the conventional S&OP [sales and operations planning]. Demand man-

agement identifies the customer-driven values that the business must provide to be very profitable, and then identifies metrics to manage the customer value creation process.

S&OP is very forecast-driven and cost-based. Demand management is demand-driven, and based on customer values, not just manufacturing costs.

Demand management is fact-driven. S&OP is a consensus-driven process with little actual communication happening between marketing, manufacturing, and sales—and even less accountability.

Demand management, we've found, adds enormous value to what the ERP system basically was structured to do. And we find huge ROIs—10 to 20 times the implementation costs—upon putting in demand management.

In general, demand management puts the senior management people in control, *not the system*.

Parker: When you implement these kinds of solutions, I'm assuming there's an information technology component, as well as a consulting component, in the strictest sense of the word?

Burrows: There is a software tool or technology tool required that bolts onto, or interfaces with, ERP. The demand management software needs to be customized every time we put it in. It stands alongside ERP, and is operated by the planners in the business—the people who use ERP data.

The add-on is necessary if the company wants to generate remarkable profit and cash flow. It's just not good enough to find out whether an operation hits a forecast. It's important for us to know whether or not customer value is being created. The metrics in demand management are by business segment—predictive, performance-accountable measures. Most of the time, customer service must be

expressed in terms other than the standard internal method, and inventory must be measured against strict definitions of customer expectations for order fulfillment.

Parker: What types of ERP systems, in terms of vendors, have you integrated your software with?

Burrows: Systems from J D Edwards, SSA, and Oracle, to name a few. We are starting an SAP project, and we have looked at Baan applications. But it doesn't make a difference what ERP system it is. We extract the data from the ERP system through the object-oriented database, based on standard data formats. We design what the data has got to look like going into demand management, including segment definitions, capacity definitions, and inventory splits. So, when we extract the data out of ERP, the object-oriented database attaches business rules to the data and then places it inside demand management very efficiently. It's that extraction through the business rules in the object-oriented database that makes it so potent.

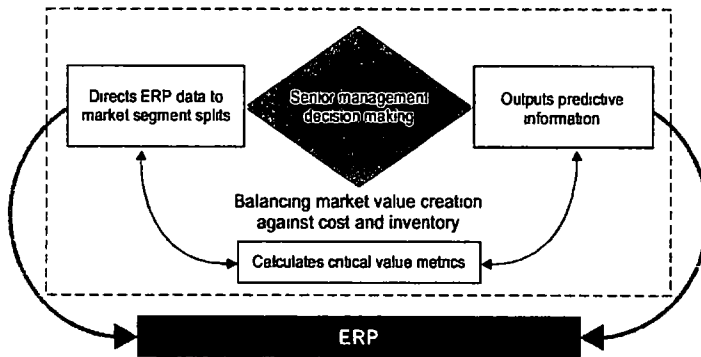
Parker: At this point, what industries are particularly interested in those kinds of solutions?

Burrows: Complex manufacturing businesses and some distribution businesses, particularly those with multi-plant operations. Both make-to-order and make-to-stock businesses should use demand management. However, the ones that should be very interested are within the classic flow industries—especially pharmaceutical, food production, and other complex process-industry businesses.

Some think flow only is applicable to discrete assembly operations, but we've found flow economics can be had by a wide variety of operations. Flow operations have various product families that run across the same equipment. You see that in fabrication, device

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Demand Management



Source: On-Point Consulting Group

Demand management, an ERP add-on, puts the emphasis on creating customer value in each market segment, directly linking to the MES so senior management is in control.

manufacturing, pharmaceuticals, and food production, to name a few

Demand management is essential to proper implementation of collaborative planning processes with suppliers and customers since it segregates capacity into "outsider"-recognizable pieces, and puts both metrics and bounds around the capacity and inventory data. The collaborative planning piece is critical to flow companies. With demand management, we know the few suppliers that impact each production line, or we *should know* who they are. It's old-fashioned to think that every time we try to run production we're going to try to knock the price down on every raw material by a penny, or a quarter of a penny.

The biggest benefits for manufacturing and cost control come from having an in-depth collaborative plan between manufacturers and upstream customers. The idea is to become a company that is very responsive to customer values, and this requires maximum flexibility in manufacturing. At On-Point, with demand management, we typically are talking about manufacturing master schedules that are only two or three days forward, and on day four, we're able to pick different items to make, or different warehouses to ship to. Therefore, we provide maximum

responsiveness to customer demand, and Pull objectives become reality.

First you have to look at customer demand, hopefully tied into the CRM system, and forecasting, promotional planning, or demand planning. The second step involves passing down data to a cycle-planning system or production-frequency schedule, which normally is difficult to find in most ERP planning functionality. Cycle schedules allow suppliers to plan 90 percent of raw materials in a highly stable environment inside collaborative planning processes.

The third step is to step down to individual SKU [stock keeping unit] scheduling. SKU break-outs from families should be done at the last possible moment prior to committing raw material, so as to maximize inventory replenishment or backlog fulfillment flexibility, and minimize the risk of stock-out or late deliveries—even with last-minute order entry. The SKU breakdown is accomplished at On-Point by rate mix planning. The key is rate, not order, and mix, not minimum. With rate mix planning done one day, or one shift prior to raw material commitment, we try to achieve a balanced inventory, not an arbitrary replenishment to maximum.

Using this three-step process, companies are less dependent upon the

sales forecasts to be correct. What we're doing in demand management is reducing reliance on the forecast by having the most finite or SKU decision-making done so close to the order fulfillment as to act like a demand-pull philosophy, where customer requirements make the final decisions.

Parkor: You have said companies don't always make full use of all the functionality within an ERP system. Would it be fair to say that they use it for planning materials, but not for master production scheduling?

Burrows: They use it for master production scheduling in a strict academic sense—that is, the identification of a piece of paper that says "master schedule" on it. Where disconnects come in—where spreadsheets come out—is in defining the relationship between scheduling and the capacity planning. We can do capacity planning—there might even be a subsystem inside an ERP system that does capacity planning—but there usually is nothing in the execution system that requires us to use the capacity as it was originally intended. The disconnect between the execution system and capacity planning is seen in the existence of an informal system that actually manages execution. The result is gobs of excess capacity and costs as plant managers are forced to put cushion in their staffing plan, overtime plan, and capital budgets.

Many people fight the MRP systems. In a recent client assignment, we asked the scheduler, "What do you do every day?" The answer is he's scheduling a plant of 1,000 people, and every day, he gets 300 to 400 order action notices out of ERP! There are so many that he can't deal with all of them, so what he actually does is listen to calls from salespeople and daily production meetings—whatever the superintendents are telling him—and picks the order-action notices that seem to match what everyone's screaming about. That's what they make next.

The problem is the data isn't bal-

anced It says, "Here are all the different SKU's MRP says to make today," because of small differences between forecast and actual demand, and the difference between actual production and scheduled production, or whatever It's nearly impossible for ERP to screen out the importance of one minor change versus the other If you talk about a company that's got 1,000 SKUs, you know that 800 of those SKUs have very little impact on the company If you follow the 80/20 rule, which is usually pretty accurate, 80 percent of the items make up only about 20 percent of the business Yet in the ERP system, every one of those items has the same weight So the little guys swarm to overwhelm the big guys, and massive schedule changes result with little actual benefit to the customer

At On-Point, we find the three-step, top-to-shop planning and execution process—using demand management, family cycle planning, and rate mix planning—is the key The process reduces schedule changes and eliminates the nuisance order-action notices We make decisions only when we must, and then at the last possible minute What we try to do in our executive decision-support system is sort out the difference between the important items and the ones that aren't so important, and bring balance back into the decision-making We emphasize those things that have the greatest impact on customer values

Parker: Who typically is the person who recognizes he has shortcomings in those areas? Is it a plant manager, or the vice president of manufacturing?

Burrows: Often it's a senior-level executive, the president of the company, or the profit-center manager What's characteristic is that there's a constant battle between marketing and manufacturing. We never seem to have a meeting of the minds, and meetings turn bloody from time to time So why is that? Who's right, who's wrong?

The vice president of manufacturing or

operations says, "We just aren't working on the same set of rules between manufacturing and marketing " Sometimes it's the CFO who says, 'I don't have enough cash to support the inventory we're forced to carry to match the economics of manufacturing and the service requirements In fact, many times the inventory goes up and service goes down '

Many times it's a cash flow issue I talked to one VP of manufacturing in a fairly good-sized company just a couple of weeks ago and he said, "We just put in this big ERP system and, gee, we spent a lot of money, but service is getting worse, not better "

We're going to do a diagnostic review and pinpoint two or three things that are most important to that company to get it back on track The ERP system is a data management system ERP needs to be configured, but many times also enhanced to set the rules for replenishment decisions, or to establish a proper planning and execution process so the format—not informal—systems actually run the factory

Parker: How can the interests of an operational group and the marketing group be diametrically opposed?

Burrows: Marketing guys talk about the specific market segments Manufacturing guys talk about production resources—production lines Sales guys talk regions or specific customers And many times it's impossible to relate the three, because it's rarely 100-percent clear what segments are serviced by what production lines Regions and customers can cross production lines and even market segments Communication does not happen Demand management sorts the data so the problem is corrected and significantly tied into the execution process Top management is in control The first requirement is a proper definition of market segmentation Then market segments and capacity must be correlated. Then communication, not just consensus, can commence

To illustrate, ask yourself what are the

five major market segments that you serve? I'd say a large percentage of our clients could identify the major segments Sometimes they have a problem, but usually they can do it Then we ask what are the key values? Now it gets a little harder

The next question is, "What specific manufacturing capabilities do you employ to provide those values?" I've never met anyone who can answer that Once we finish the market and manufacturing analysis, we can identify the direct link between manufacturing and marketing, and boy, does that make life easy All of a sudden, marketing and manufacturing can talk to each other A company is then managing to a disciplined set of values and everyone knows what's expected

Another way of seeing the opposition between marketing and operations is in their approach to forecasting. In marketing, forecasts often are seen as necessary, but not important, elements of their jobs Fre-

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quently operations executives believe a "perfect forecast" down to the SKU level is necessary to run the business A detailed SKU-level forecast is run off the software, and a meeting of the minds is not likely

Both are looking at the situation parochially Accurate marketing forecasts are required, but at a much higher level of aggregation than SKU Marketing's upside and downside estimates are very valuable After all, it's the marketing guys who can really talk to customers and assess market conditions For operations executives, I have a news flash detailed SKU forecasts over anything longer than three or four days have very little accuracy for 80 percent of the items For example, you've got 1,000 SKUs, yet we find that there will be less than 100

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that actually can be forecasted with a statistical system to a reasonable confidence interval. The other 900 are either random or chaotic statistical patterns, which cannot be dealt with by the conventional "normal distribution models" and linear mathematics used in ERP systems. Oh yes! You will get an answer from the statistical forecasting system, but the confidence limits must be understood. For the bottom 80 percent of the SKUs, it is not uncommon to find the forecast confidence range is -80 percent to +80 percent. Or a forecast of 100 units for next month means demand actually will be between 20 and 180. However, not many people ever look at the confidence interval. Try to find a confidence interval metric that is even in your ERP system, let alone that is in use or even known to the forecasting and planning people.

At On-Point, we recommend using a business simulation model rather than

statistical forecasting. Simulation deals with the balance between demand and supply, not simply demand alone. We want to do this at the highest level of aggregation possible without making the answers meaningless. Normally at the family or production group levels, the data is relevant. We seek to balance the demand realities—which could be very erratic—with the supply realities. Through simulation, we set inventory standards or backlog levels, which will provide practical cushions against variations in demand such that production and supply plans can be held stable 95 percent of the time. When implemented, we have found simulation is a useful tool inside an overall demand management process.

PORTER: How can companies get the best value from working with a consultant?

Burrows: Do a diagnostic study to define issues and benefits. Structure

shorter rather than longer assignments. Have detailed plans of work and hold timely progress meetings. Make sure benefits are clearly identified in designs and clearly achieved in implementations.

First you need to know who it is the consultants will bring in. With some of the larger consulting firms, the business is sold by one guy, and the people who actually show up to do it don't really know what they're doing.

On-Point is a principal-driven business. I run the assignments in our business. I have a staff that does a lot of the work, but I'm on-site. I run the jobs. I also think clients receive the best results when strong client teams are part of the solution development, as well as implementation and operation. The consultant should be like the composer of an orchestral production. The consultant provides the creative work, the client directs and plays the piece. ■