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DESIGN MANAGEMENT

The Neglected Time-To-Market Factor: Four Techniques For Speeding Product Definition

When you hear people talk about reducing their product development cycles by huge percentages, don't necessarily believe everything they say. It's not that they're likely to be dishonest, it's just that most manufacturing firms do an incomplete job of measuring the time-to-market cycle. "Few companies benchmark and measure the time it takes to define new products," argues Brad Goldense, president of The Goldense Group, Inc. (GGI-Cambridge, MA), a management and technology consulting firm specializing in product development and engineering. The period from concept approval to production is what is generally measured. What's left out is consideration of all the time and resources that went into defining the concept in the first place.

GGI's experience indicates that product definition time — hearing the voice of the customer and translating it into a feasible product architecture — usually equals or exceeds the post-definition, "product development" stage (Sub-assembly, Bread-board, Alpha Prototype, Pilot, Beta Prototype, and First Production Run). This means that the neglected area of product definition is ripe for significant time savings, which will reduce the true, overall product introduction cycle.

Another problem that is running rampant, especially among larger companies, is the failure to integrate the 'front-end'

business functions (i.e., sales and marketing) with the lessons learned from 'back-end' functions, such as customer service, product support, warranty, repair, and reliability functions.

Goldense's strategy says that the best way to solve these two problems — poor cycle measurement and lack of upstream-downstream coordination — is to deal with them in tandem. One thing that's important to remember, before we move on to GGI's four-part analysis process, is that some companies are "market creators." That is, they do not use the customer as the primary source of information when defining product concepts for full-scale development. When a company is working with a cutting-edge technology or completely unanticipated product type, it stands to reason that the customer has not even conceived of the product, and therefore has little information worth gathering. The strategy that follows is not for the market creator companies. It is for the vast majority of companies that put most of their emphasis on tracking and responding to subtle shifts in customer needs and preferences, but who need a faster and more effective way of doing it.

A Four-Part Analysis Process

This four-part analysis process really has a fifth part: Quality Function Deployment. An established yet still evolving tool, QFD continues to pose new problems for concurrent engineering teams. Consequently, QFD is dealt with separately in the article that begins on page 8. The outline below has been used by GGI with both large and small companies.

I. The Value Added Chain

"Most companies only look one level above their level (i.e., their customer) to define products," says Goldense. "If your customer is not the end-user, this may be a lethal decision. It assumes that your customer has a robust product definition process and knows the ultimate user's needs." Needless to say, this is not always the case. Understanding what functions and attributes are needed by downstream customers may help you to open up new business opportunities that can alleviate some of the cost constraints that tend to hamper design efforts.

One company that did well by taking this approach was a plastics business. This manufacturer makes ABS-type plastic, the standard material found on phones and computer terminals, and is way down near the bottom of the value-added chain. They sold essentially to distributors and not to end customers. The DFM team determined through an analysis of the actual market demand of the end user that it made sense for their company to open up its own, no-frills distribution outlets.

"Eventually, they realized that through a system of low-overhead warehouses they could sell 50-pound bags of this stuff directly to injection molders," Goldense recalls. And to avoid jeopardizing critical relationships with their regular distributors (their immediate customers) they limited their small-scale wholesaling business to less-prominent markets that were traditionally ignored by the mainstream distributors.

II. Relationship Analyzer

Companies tend to leave it to the sales and marketing people to find out about the customer's needs. By the time the information gets back to the concept generation group, however, it is usually watered-down to the point where no substantive decisions can be made about product definition. What would make a lot more sense would be to have the people who are actually responsible for various aspects of product definition (cost, specific performance attributes, aesthetic considerations) go out and get involved in customer analysis.

Figure One illustrates the dynamics of the the relationship analyzer. This is a "multi-functional to multi-functional approach" that will result in a marked upgrade in the quality and depth of data forwarded to the product definition team.

The idea is to focus on the sub-set of relationships that could be realistically maintained over time. Ask yourself, which pipelines of information are going to yield consistently reliable ideas? Goldense says that it is absolutely necessary to pass each bit of information off to a working group of the main team right away, or else it will languish in obscurity. The ultimate goal is continuous product/process improvement. "You don't just want to update a market research study every year," Goldense says. "You've got to stay on top of customer needs as they are evolving."

A $25 million per year instrument manufacturer is currently using this technique. As always, it is the company's particular circumstance — for instance, are there standards organizations that must be dealt with? — that largely determines how the "relationship analyzer" concept plays itself out in practice. This instrument manufacturer is in a market crawling with small players. The average instrument cost is only between four and five thousand dollars. They are in a niche market, so most of the competing firms are constantly struggling to come up with what will at best be an incremental innovation.

Since the relationship analyzer helped the team to figure out which internal discipline (design, analysis, manufacturing, etc.) corresponded with what customer and other outside groups, the company finally got the right people together and generated some valuable product definition information. Up until then what had been missing was technical depth on the part of the sales people. To fully synthesize and convey the customer's needs and then translate them into a spec for engineering to act on was simply beyond the competence of the sales and marketing personnel. Sales and marketing, in the end, did much more work on usability, packaging, and product line integration and life cycle issues.
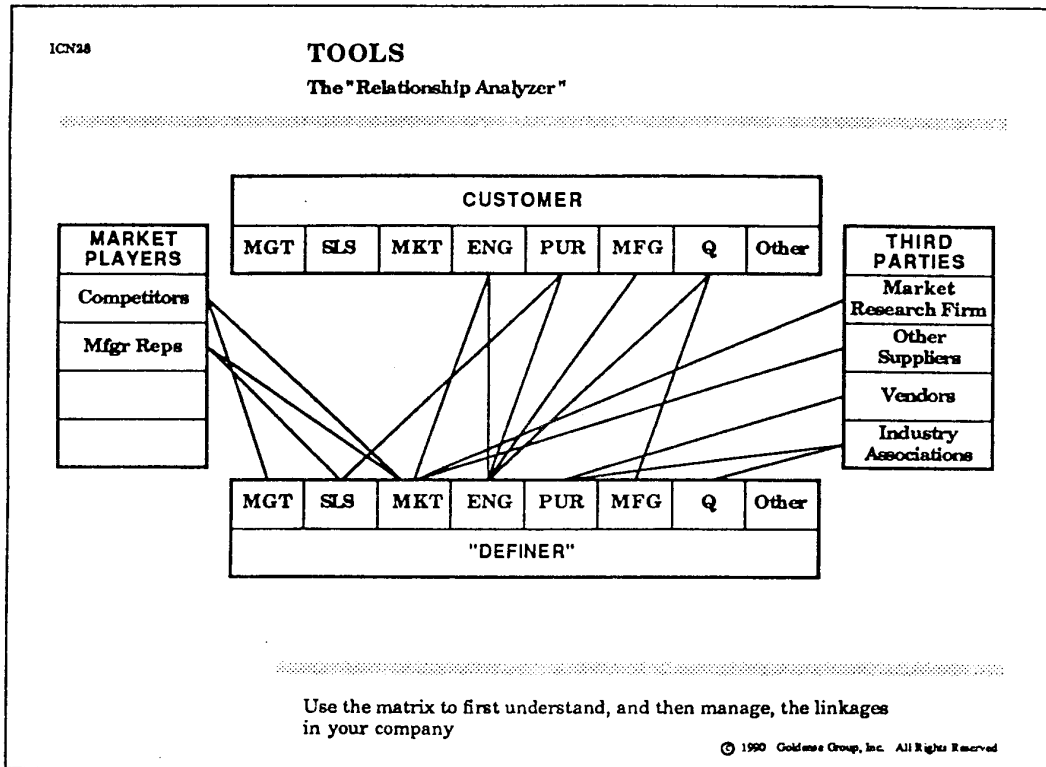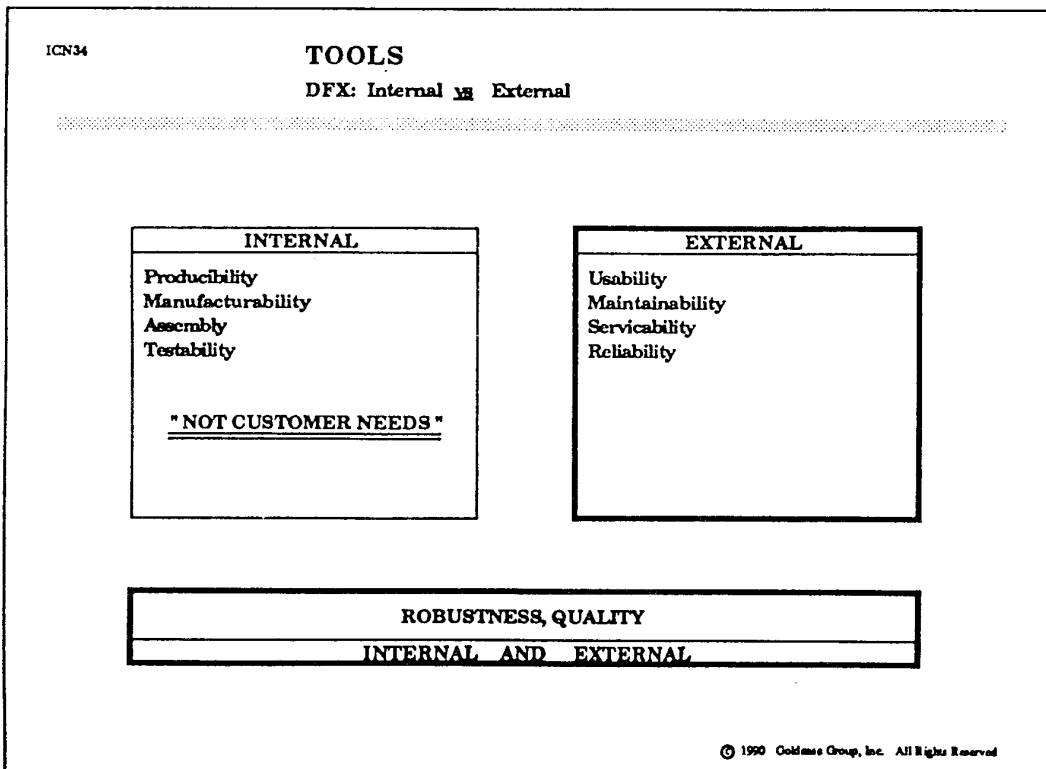
Figure 1

ICN28

TOOLS

The "Relationship Analyzer"

	CUSTOMER							
	MGT	SLS	MKT	ENG	PUR	MFG	Q	Other

MARKET PLAYERS

Competitors

Mfgr Reps

THIRD PARTIES

Market Research Firm

Other Suppliers

Vendors

Industry Associations

	MGT	SLS	MKT	ENG	PUR	MFG	Q	Other
				"DEFINER"				

Use the matrix to first understand, and then manage, the linkages
in your company

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Figure 2

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TOOLS

DFX: Internal vs External

INTERNAL	EXTERNAL
Producibility	Usability
Manufacturability	Maintainability
Assembly	Servicability
Testability	Reliability
"NOT CUSTOMER NEEDS"	

ROBUSTNESS, QUALITY

INTERNAL AND EXTERNAL

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III. Customer Service Life Cycle

Which brings us to the next step in analyzing and managing your product definition process. It is called "The Customer Service Life Cycle." It is a tool to help you to examine "the major phases of customer relationships that occur around products," explains Goldense.

The same instrument manufacturer provides an example to illustrate the worth of this mode of thinking. "When people start to think about de-fining the product, they think about the product — not how they are going to get it into the customer's possession, nor how the customer will be able to understand it and get started," Goldense argues.

The software portion of the instruments in question is very important, so ease of set-up and calibration were major concerns. The company fell into the practice of sending high-priced technicians into the field to help customers install the units.

"What they needed to do was marry the product with the delivery and service systems that support it," says Goldense. "If they could do a quality set-up-and-install manual, they could save both money and lead time." If, on the other hand, you were a software company selling finite scheduling packages, you would take exactly the opposite tack: You would look to expand your profit potential by soaking up any collateral consulting business.

In addition to installation and documentation, other opportunities for product definition that are examined, include: Education; maintenance/repair; replacement/upgrade; need expression; pre-sales support; ordering; and configuration delivery.

IV. DFX: Internal v. External and Grow Reliability

The last thing to consider in tuning up the product definition process is the way DFX tools are used in your company.

Following two simple guidelines with regard to these tools could help cut precious days, weeks, and months off your "time-to-approved-concept" cycle.

The first is the need to separate internal from external DFX initiatives (see *Figure 2*). "The point to be made here is that some DFX initiatives are more self-serving than others," Goldense remarks. "The primary emphasis of the 'internal' DFX tools is to enhance competitive position as opposed to enhance customer satisfaction. The 'external' DFX initiatives are more geared to customer satisfaction. These are the tools that should be emphasized in product <u>definition</u> efforts. Product <u>development</u> should incorporate both external and internal DFX."

The logic behind this sequence — external DFX before internal — is that the external variety offers the best hope for high-value innovations. But success ultimately rests on the degree of flexibility found. "For instance," says Goldense, "there ought to be some mechanism in place that enables you to pick up a design person working on a soon-to-be released product and have him go into the product definition team that's just starting for the next generation or for a sister product and tell them what is working and what isn't. There's no reason for delaying until three months after the first product is released."

The second point about DFX is that 'back end' business functions need to be skilled in the same type of optimization methods that are emphasized for 'front-end' managers. The ability to understand the significance of various field failure rates and the appropriate trade-offs that should be taken is a good example. Imagine, for instance, what went into deciding what kind of connectors to specify to link two wires under a car's dashboard. All such "friction-fit" connectors have a little plating on them to assure better electrical contact. In the grand scheme of automotive design these are cheap components.

"But suppose someone decided to save .05 of a penny per unit, because they get them

in volume," Goldense speculates. "So they go with one with plating that's only 2 mil thick. It corrodes in less than a year, and customers start getting short circuits under their dashboards. But for another .05 of a penny you could have gotten a connector with a 3 mil plating to avoid the cost of customer dissatisfaction and service. These are the kind of decisions that aren't major design specs, but that you must embed into the product definition process, or else they get out of control."

In Summary

Managing the product definition process often gets bogged down in details. By employing the four techniques outlined above, you can reduce the time it takes to get to the actual product development process, which cannot begin without an approved working concept. The Goldense Group has worked with such companies as United Technologies, Texas Instruments, Ford, and Borg-Warner Chemicals. For more information on the manufacturing and technology consulting services they offer, contact: Brad Goldense, 617/876-6776 (phone) or 617/876-6766 (fax).

Editor's Note: Brad Goldense will give a presentation on continuous feedback and will be on-hand for informal discussion at the Executive Briefing on Competitive Benchmarking and Performance Measurements, to be held May 20-21, 1991 in Berkeley, CA. For more information, contact: Kristin McCarthy, Management Roundtable, 800/338-2223 (inside Mass. it's 617/232-8080).