

# Mark Andy Inc.: Revamping Their Development Process, Cultural Change

*They're learning from — not just listening to —  
their customers.*

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Paul Brauss and John Howard

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**W**e're finding better ways to hear and then learn from our customers. In turn, we are transforming our product development process — one we found useful in past years. Yet we realized that market leadership — offering more than "me too" products — depended on a more effective approach. In this article, we are sharing our experiences and "lessons learned" in our customer-focused evolution.

## ***From Functional-based to Process-based Approach***

As a process-focused company, we at Mark Andy, Inc. had learned to minimize many wastes in our system. Lean manufacturing and Six Sigma helped us to not only identify and eliminate the waste but to add predictability to our activities. Yet we needed to learn how to effectively apply these principles to our development process. Thanks to our revamped, customer-focused approach, we have found the keys to take theoretical practices and enhance our development process to introduce a series of new-generation presses focused in the packaging market segment.

How did we learn to change our product development ways? Actually, a series of interrelated changes helped us to change from a functional-based engineering regime to a process-driven regime in keeping with our overall organizational approach. By this we mean the design team has to understand the process the new design will be used in.

### **In Brief**

Authors Paul Brauss and John Howard of Mark Andy, Inc. describe how their company is learning how to listen more effectively to — and learn from — customers, and in turn improve their product development process. Thanks to their revamped, customer-focused approach, they are enhancing this process and applying their learnings in the development of a series of new-generation presses for the packaging market.

## About Mark Andy, Inc.

Employees (about 450 worldwide) at Mark Andy, Inc. (MAI) design and manufacture narrow and mid-web printing equipment and accessories for the package printing industry. Product lines include a wide range of web flexographic printing equipment for folding carton, tag and label, and flexible packaging markets; their primary market is pressure sensitive labels. Their brand names include Mark Andy and Comco. The company also sells specialty UV (ultraviolet) curing systems with the UVTechnology brand.

The St. Louis, MO-based company was acquired by Dover in 1995. For more information on Mark Andy, see their website ([www.markandy.com](http://www.markandy.com)).

The first changes had to be in the engineering mindset. We required our highly creative engineers to attend SMED (single minute exchange of die) training. If the engineers were going to design a new press, then clearly they had to understand the press from an operator's vantage point. After SMED training the engineers participated in three, three-day sessions of design for manufacture/assembly (DFMA) training hosted by an external expert. Equipped with a new set of tools, the engineers may have seemed ready to start the next design. But there was a void still to be filled.

## ***Don't Rush to Find Solutions***

Quite often development activity is initiated in response to a competitor threat. Depending on the company's strategy, this could mean copying functions and features. The way that makes sense for Mark Andy is to keep an eye on technology improvements and blend new technologies (based on customer feedback, and proven) with sustaining new innovations. We are more effectively focusing our new product development (NPD) efforts on our customers' requirements and wishes, rather than being driven by the emotion of lost orders or hype around a competitor's product.

Like many companies, we typically thought of NPD as an engineering function driven by input from the market. Understanding what the market wants and needs is very important to an organization focused on innovation and advancement strategies. As a first step to this process there are some very basic questions that must be answered. They are shown in a

simple format and when answered can really help stimulate thoughts around the validity of the project. This format called the Strategic Marketing Plan (SMP) can be referred to as step one in the process for development. (See Figure 1.) It is in fact the step that helps define the expectations of any development initiative. Organizations with multiple project demands can use this tool as a way to put a value on a proposed project. There are some wonderful techniques for involving customers in product development processes. The "Voice of the Customer" (VOC)<sup>1</sup> process insures advantageous information from a customer's and market perspective that help insure the correct focus on future development. There is an art to coaxing information out of customers in a fashion that separates opinions from solutions, identifies ideas from actuality, and defines solutions required to make the design more usable.

VOC isn't new. Books are written about it. VOC-related training courses have been available for years. To prepare our design team (consisting of engineers, sales, product management, and company leadership participants) for this activity, the team was introduced to the art of VOC interviewing. There are subtle nuances to this technique, such as: Do not draw conclusions; ask open-ended questions; let the interviewee take you to the answer. Ask the individual to explain further when casting an opinion. Try to move to tangible answers versus opinions. The interviewer gains an understanding of the words being spoken by the interviewee. What we are trying to accomplish with VOC is making sure we are clear on the markets we serve, and truly hear our customers' voices. We



## Development Priority Review

### Strategic Marketing Plan for (State the Market/Product)

**Market Definition:** Briefly define the market where this product can be applied.

**Product Definition:** Briefly describe the product and which applications this product will satisfy.

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#### Situation Analysis

What's going on now that makes this investment a good activity? Is there a newly realized need, or will this program solve some defined issues? What is the market size, growth, and level of maturity?

#### Strategic Objective

How does this program tie with the strategic plan? What will be the objective for this program? How does this fit with our existing products or other future projects? Does it fit with our core competencies?

#### Operational Objectives

Year 1   Year 2   Year 3

Market Share %  
Number of Units  
Net Sales Gain

#### Customer Targets

What type of customers are we targeting? List any specific customers in detail.

#### Competitive Targets

Who are the competitors? What is our advantage? What are some of the major features we need?

#### Position Strategy

Where are we in the price/features mix? What strengths will we use to position us as the supplier of choice? What is the compelling reason to buy from us?

#### Pricing Strategy

How are we priced relative to our competition? Our existing products? If a new market, does it require a new pricing strategy? How elastic is the pricing?

#### Product Strategy

Define in more detail which products and services will be offered for this market.

Figure 1. Copyright Paul Brauss.

need to understand not only targeted market segments (small versus large companies, developed or industrial country, revenue level, etc.) but also the characteristics and needs of our individual customers.

We have learned how to use a structured interview process, asking customers what benefits they hope to gain. We record and transcribe notes from our customer interviews, and then pick out comments that point to needs or problems, solutions or target values. When we have a good idea of customer needs (including things they are missing, and why) we still have not asked about particular features. We have learned to lead with probing questions in our cus-

tomers interviews, not looking for an immediate solution. We ask for needs and how these needs are not being satisfied. Later, we may ask them if they have ideas for a solution to any identified problems. After transcribing all of our notes from the interview, we put this information in a matrix of problems and needs. Then we go to a needs hierarchy and determine what needs are subsets of other needs in a QFD (Quality Function Deployment) correlation matrix. (See the box, Quality Function Deployment [QFD].) In this way, suggestions for solutions and outcomes our customers are looking for can be evaluated within a hierarchy of needs. We have a process for weighting these needs. If

a particular need is important to the customer, we want to be better at satisfying that need than our competition. If it is not important to the customer, this finding will affect how much (or whether) we invest in meeting a need. Our quality plan is to design a product that is uniquely superior, and we study the competition in place against our current product.

At this point, we are still not looking at particular design concepts. We are looking at a hierarchy of needs. Key needs can be achievable high speed, print quality, low waste, dependable and easily serviced, etc.

We work with customers we know are willing to share in this process. We are in a pretty intimate market. We explain to them what we are trying to do and how we want to involve them in our design process, and turn it into something fun. We do a design priorities review meeting every six months for projects we're going to start a year from now. We start our next design process when we have the needed resources available.

### ***Customer Interaction Enhanced Through Online Chats***

Recently our customer feedback process was enhanced with the help of the Internet. While working on priorities prior to the next product design launch, our Vice President of Engineering John Howard stumbled upon a web-interactive process called IDEALYST.<sup>2</sup> Using this company and their process, we set up a chat room for a design and asked, "How would you meet this need?"

In this process, approximately 20 customers were provided user access to the chat room and were given user names to insure their anonymous status; IDEALYST acted as facilitator. Ideas about the new design were launched from engineering into the chat room. Customers provided feedback on ideas, added twists to concepts, and threw out ideas of their own. The ideas were nurtured in the dialogue and often enhanced as they moved from customer to customer. These are "techie" people involved, so when one question

would be thrown out for discussion, a customer response would lead to more questions or suggestions. Customers received "points" for participation; the highest number of points can result in that customer receiving a camera or other item.

For example, one question was about the methodology of operating a tool: "Wouldn't it be easier if you set up your plate this way?" A customer would say, "Great, and then if you make that change, we can build on it by making another modification." We left our initial chat room open for two weeks in May 2004, and got many ideas for reducing scrap and other wastes; we set a time limit so the exchange wouldn't get old.

Afterwards, IDEALYST transcribed and put every idea offered in the chat room into a book. All of the participants got a hard copy. Then we went around to 12 customers (some of the original 20 did not participate) to discuss what we'd learned and what we were going to do with that information.

Approximately 90 percent of what we learned through our Internet process was known. Yet the product/process innovation ideas we gained helped us to learn more effectively from our customers about what they need and want. We had been very comfortable on our previous NPD path, but this experience helped us to learn that we had been missing key customer feedback. It resulted in fresh ideas for our current and planned NPD activities, brought us back to obvious customer requirements, and enhanced our customers' feelings about being involved with us.

### ***Looking for "Wow" and "Delighter" Ideas***

We now had three sources of information that will guide us toward NPD priorities: 1) Using our QFD analysis, we evaluated the characteristics of a good solution to a customer need, 2) we gathered a significant amount of information through individual customer interviews (voice tables), and 3) we had results from our Internet chat room discussions. We created a team (marketing, sales/engineering, and service



people) to evaluate the information and then develop solutions based on those three sets of data. The team used a QFD correlation matrix (need on the left axis and design concepts across the top) and reviewed potential solutions by design concept, not by individual customer. The correlation matrix generates a ranking of the designer concepts as to the concepts' contribution to meeting the aggregate of the needs (that is, the total set of needs). As a refinement of the process, the needs could be weighted, with more weight to more important needs.

Next, we gathered our design team (engineers, marketing, and others) together for "concepting." We sorted ideas using a Kano model<sup>3</sup> and indicating already-available or assumed/expected characteristics versus unique/superior "wow" or "euphoric" or "delighter" ideas (like the first time cruise control came out in automobiles). Wow ideas, for example, include suggestions for making a process easier and also eliminating waste. Me-too products generally aren't that successful unless they are 30 percent lower in cost than competitors' pricing. We considered factors that would affect whether the identified need could be met.

Unique and superior characteristics might include, for example, an "intelligent drawer" in our printing process. It can communicate with the press chassis about what process is needed — such as gravure or flexo or screen — so the press can set itself up. Some of its algorithms deal with web dynamics. This intelligence and adaptive responsiveness contribute to meet our customers' needs, such as flexibility and lower waste. Operators may not know how to tell the press how to do these adjustments. When the press is smarter, higher-level operator skills are not as critical.

Another example of product development based on customer demand is our projected 50 percent improvement in register variation on a particular machine. Also, remote diagnostics capability can reduce downtime to minutes instead of days. Another capability is increased process visibility with 50 percent more process capa-

bility and much faster setup on process changes. Incorporating these characteristics in our planned course for this machine and tailoring the design that goes with it to individual customers will require attention for some time.

### ***Functionality First, Then Cost***

When we are evaluating unique and superior design ideas, we first look at the customer's needed functionality, well before cost. QFD experts teach us that you first design your machine to do what you want it to do, and then make it less costly.

In later development stages you build the product you have designed and then ask selected customers to come in and talk about the value proposition for the machine and how well it meets their needs. We learn from their feedback whether we need to make design concept changes. We are then ready to ask our customers whether they are willing to pay for these design enhancements. In some cases, they will. At other times, we hear from customers that the new design costs too much; we can look at ways to reduce cost. People will pay proportional to benefit and uniqueness. The success and growth of the company — market leadership — depend on coming out with unique and superior products that your customers will buy.

### ***Prioritizing Needs and Solutions***

Loaded with all of these inputs, we figure out which requirements will be the lead requirements for a development project. Thinking of the 80/20 Pareto analysis rule (80 percent of the needs answered by 20 percent of the ideas), the key here is to identify the correct 20 percent. Looking for an unbiased approach, we moved to the use of a correlation matrix. For example, can we successfully gain targeted achievable high speeds, shorter setup times, lower waste levels, and dependable/easy servicing through the use of concepts such as a custom paperless proofing system, threading system, auto drying/cutting detection, etc.?

In this process, we identified the mar-



ket needs against the solutions ideas provided by engineering and customers. We ranked the value of needs and then ranked the ability to provide a solution to those needs. The outcome of this process is an overall ranking of the requirements for the product and an overall direction for the design team. The analysis provides the most important solutions engineering needs to identify in a new design. This now becomes the project scope and the handshake between sales/marketing/engineering and manufacturing.

Managing this series of activities is the action of going from theoretical to practical. We use an NPD process map as a clear rendering of these steps. Our NPD process map has been augmented after every new product design launch as Mark Andy has been able to identify "cycles of learning" during each rendering of the process, reflecting our cultural change along the way. Our information-gathering process on customer needs and product offerings, for example, and assessments for strategic fit now reflect our increased understanding about incorporating VOC in new product decision-making.

Our success lies with an approach of evolutionary improvements rather than revolutionary, guided by our vice president of engineering. This fundamental approach

has helped put things into perspective along with the task of then implementing a fast-paced NPD process. The burden is broken into small pieces, thus allowing the organization to change momentum.

For example, we were looking at nine-month cycles instead of the previously several years' cycle for NPD. To focus our activity more clearly, we developed a prioritization model including an economic payback, a strategic importance review, and a resource allocation. Along with the strategic marketing plan, they became the tools to measure our success. We used this method to limit the starts and focus resources on conclusion.

### ***Risk Assessment***

Another way that we have become more proactive in the up-front NPD process of the company is to complete a risk assessment. Let's put this in perspective. Near the end of a fiscal year, sales and marketing begin to formulate their sales projections for the next year.

A proactive activity is to take this information and assess risks to achieving the projection. The objective is to establish a risk abatement process that identifies risk early, assess its severity potential, and then formulate abatement programs. Risks can be classified into a couple of definitions (see Figure 2).

## **Evaluating Risks Using Failure Mode and Effects Analysis (FMEA)**

A Six Sigma method called Failure Mode and Effects Analysis (FMEA) is used at Mark Andy. This is just a structured thinking process that first lists out the outcomes that represent a successful project. For each outcome, a series of risk assessments is made: what process defect might cause a failed outcome, potential negative effects, what might be potential causes of failure, and are there processes in place that could detect the potential causes if they do exist. The failure effect, the frequency at which potential causes are likely to exist, and the detection capability are each given a measure from one to ten and then all are multiplied to generate a "risk priority number." The higher numbers, then, represent higher risk and abatement measures can be developed for them.

*Figure 2.*



Once the definition of the risk is understood, then the risk elements can be separated and abatement programs implemented. This exercise should be part of all sales/order projections for the coming year. Through this evaluation, we can better understand hindrances to successful new product launches and manage our development process more effectively.

### ***Moving On, and Lessons Learned***

All of these interwoven elements, processes, and disciplines help us to continue our cycles of learning. So what is next with regard to our NPD activities? To us it is about "time" and "quality." We have several projects identified and in queue, but we will not begin these projects until we have completed what is in front of us. We call this controlling our AIP's (Actions in Process). Our philosophy is to complete few projects quickly before launching others. When we have too many started, we dilute our attention and elongate the time to market.

We recognize that our process needs improvement and completing each project provides that opportunity. We are getting better at talking with our customers — ask-

ing better questions and sifting ideas. So a lot of what we are doing is helping us to engage customers more successfully and creating stronger bonds with them. A major cultural change for us is that we are learning not to start some projects too soon; we first ask our customers about their needs and then prioritize development work. We are also learning how to extend this understanding. For example, a customer in California sent us a drawing for a drying improvement and asked for our help; we knew that this process would be good not only for that customer, but would also help us to serve other customers more effectively in NPD. A process can be transferable, but in different applications — such as printing labels for one customer versus packaging for another.

Through our continuous improvement (CI) process, we benchmark all along the way. Harley-Davidson and a local design firm are among companies we've benchmarked.

Now that we more openly share information across functional lines and with our customers, traditional differences debates between engineering, manufacturing, and marketing are replaced by cross-functional teamwork.

We will use the IDEALYST Internet-based VOC approach again. Right now, the development pipeline is filled up.

Our development time cycles are shortening. Before, we struggled to get a new product out every three years. Now we launch one or two a year (see Figure 3). (We do receive differing customer feedback about time-to-market from various regional markets, and respond accordingly.)

"Don't rush to the design or solution" is a key learning, however. We realize that the time frame from the point when you have an idea until you bring it to market should flex according to our VOC evaluation and related planning. How we feed that design time is most important — a cultural change for us. Now we are a process-driven engineering group and our outcome is much better, from our customers' perspective.

### **Quality Function Deployment (QFD)**

Quality Function Deployment, or QFD encompasses the use of various tools to help an organization most effectively evaluate/analyze and plan its product and service offerings based on the voice of the customer (VOC). Among the QFD tools are the analytic hierarchy process (AHP), the correlation matrix, the Kano model of product quality, the customer voice table, the customer segment table, the customer segment matrix, the quality planning table, the demand-quality/quality characteristic matrix, and others.

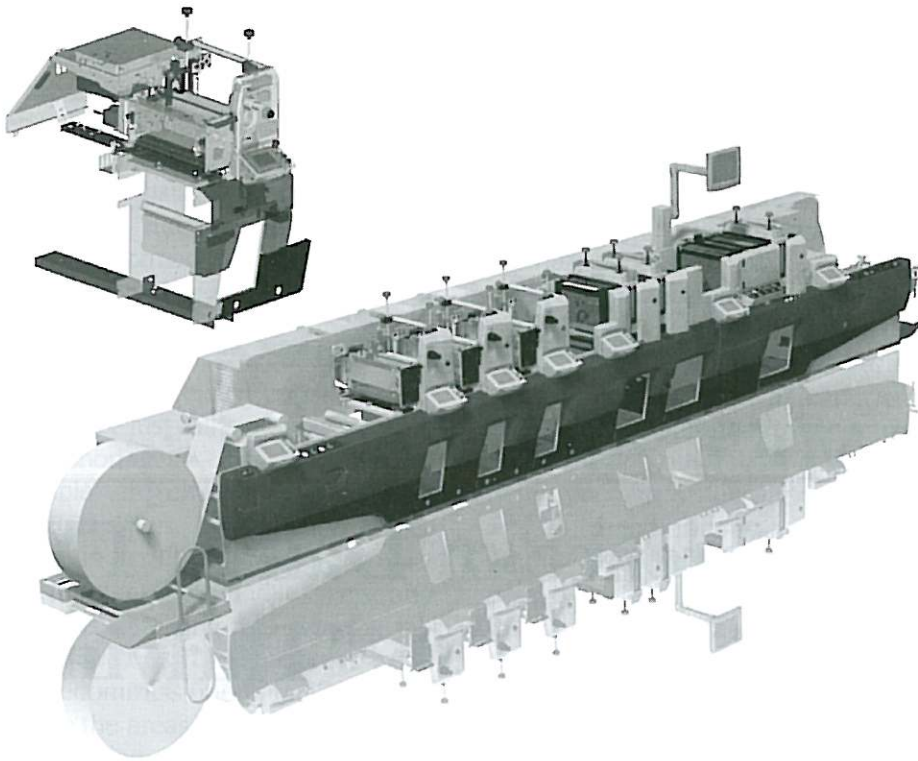
Many books, educational courses, and other resources are helpful in understanding QFD and its application. We suggest:

\*QFD Institute provides training in QFD; contact Glenn Mazur (email) at [Glenn@Mazur.net](mailto:Glenn@Mazur.net)

\**Total Quality Development* by Don Clausing, ASME Press, New York, 1994.

\**Four Practical Revolutions in Management* by Shoje Shiba and David Walden, Productivity Press, Portland, OR, 2001.

## Development Strategies - XP Design



- The XP product is an extension of the LP platform for label presses.
- The design expands market opportunity with capabilities for higher end label production
- The electrical architecture is the backbone for the Comco C2 as well
- This servo press features remote diagnostics and is running well in two facilities.

Figure 3.

*Paul Brauss is president of Mark Andy, Inc. He has a BS degree in industrial engineering from Washington University and an MBA from Washington University.*

*John Howard is vice president of engineering at Mark Andy, Inc and has a BS degree in engineering science from Colorado State University.*

### Footnotes

1. Mark Andy employees worked with Applied Market Science in its training for customer interviews (mechanics such as leading with probing questions about their needs, asking which needs are not being satisfied, inquiring about a solution they liked, etc.; responses are noted as opinion or fact and are later categorized for brainstorming sessions and creation of a correlation matrix) as part of its VOC process.

2. "IDEALYST" is the product of Applied Marketing Science of Waltham, MA. It is a threaded bulletin

board facilitated by AMS that structures brainstorming by enlisted participants (in Mark Andy's case, customers). Participants get points for starting an idea or building on an existing idea. Prizes are given out at the end to the highest-point participants (website [www.ams-inc.com](http://www.ams-inc.com)).

3. Professor Noriaki Kano developed a model in the 80s that maps customer reactions to product features or benefits into three categories: 1) attributes that must be present — that is, they are assumed; 2) attributes that are performance-driven and directly correlate to customer satisfaction; and 3) unexpected delighters — these are real product differentiators and drive very high customer satisfaction. The Kano model is a great visualization and discussion facilitation tool that helps stakeholders understand if the concepts are "unique and superior" or just "me too."

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