

Hoyt Memorial Lecture

Engage, Empower and Align – The Core of Next Generation Manufacturing

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ABSTRACT

If manufacturing in the United States is to survive the challenges of globalization, it will be because workers and leaders are personally engaged, empowered as teams, and aligned around a strategy that revolutionizes the shop floor. The overall state of manufacturing, specifically our foundry industry, is not good. The industry is plagued by incredibly high turnover; foundry intellectual capital is retiring; only a small percentage of foundries are recapitalizing; and we have a miserable safety record. While the revolution to survive must be inspired by leaders, it will only happen when the molders, core makers, iron pourers, and finishers are individually excited about contributing to customer success. This challenge is made even more difficult by the diversity of our workforce. It is, however, a challenge being met by companies that are preparing for Next Generation Manufacturing.

INTRODUCTION

Do you remember the first time you walked into a foundry? It doesn't make any difference if you were four years old or 40. The experience was transformational. You were either hooked or quickly decided you never wanted to work in such a place. It hooked me – the excitement, the intensity, the workers, the massive equipment, the noise, smoke, and most importantly the liquid metal. But, that was a generation or two ago and I had grandfather and father who loved the foundry industry. What about today's student or worker who is thinking about our industry? What would they learn from a quick Internet search about the foundry industry? This paper will start with the results of that quick search and then move to what we as leaders must do to capture our next generation of workers. And, at the same time, because the two are inseparable, we will examine what we must do to meet the challenge of Next Generation Manufacturing.

As a reference point for this paper, my experience is primarily from the iron foundry prospective. Dotson Iron Castings was founded more than 100 years ago. While we briefly operated both a steel and non-ferrous foundry, today we are 100% ductile and gray iron with in-plant machining. In 2000, our 10-year vision was "*Becoming the World's Most Automated Foundry*," and it has now

been transformed into "*Becoming the World's Most Agile Foundry and Machine Facility*."

THE QUICK FOUNDRY INDUSTRY SURVEY

One of the first facts about our industry is that it is declining in both numbers of foundries and in total capacity. My grandfather started in 1923 when 20,000 iron foundries operated in the U.S. When my father started in 1943, the number had dropped to 6,000. By the time I started in 1972, there were fewer than 2,000. Today, according to the AFS industry census, there are only 466 iron foundries.

What is contributing to this decline? A quick check on the OSHA site shows that iron foundries are a very dangerous spot to work. The 2009 incident rate was 262% higher the average for all manufacturers.

A check with a member of the Casting Industry Supplier Association (CISA) highlights the fact that fewer than 5% of the foundries are spending significant dollars to recapitalize their aging manufacturing facilities.

On the world front, it is obvious that the United States is no longer leading the industry. At the 2010 6th International Foundry Forum in Barcelona, Spain, there were 240 senior managers from 28 countries. Only three participants represented U.S. foundries: Waupaca Foundry, Denison Industries, and Dotson.

Modern Casting magazine's world census reported that just 10 years ago total production of iron castings in the United States and China was about equal (just under 10 million tons each). The 2009 census now shows China producing five times the U.S. tonnage (China at 27.5 million tons or 45% of the world's production). China is also training more than 10,000 skilled foundry technicians annually at 16 centers throughout the country.

This quick search indicates that the career potential in our industry is not very good; indeed, most job-seekers may just skip over the foundry job want ad to apply at another company – perhaps that great high tech company, one in the biomedical field, or maybe even at one of those new "green" jobs.

APPLICANTS STILL APPLY...BUT WHY?

Several months ago, I sat down with three different groups of our employees. The first group included 10 employees who had worked at the company for less than 90 days. The second group of 10 had worked one to three years at the foundry. The third group had approximately ten years of seniority. Several questions and responses from these focus groups provided insight as to why they applied and why they stayed.

All three groups said they were at Dotson because of the pay and benefits. Beyond that, most said they had a friend or family member who had recommended Dotson. What really got to me was the answer to why they stayed. The answers all revolved about these words: people, culture, friends, security, and challenges. In addition, all three groups said, "It's not boring." I think this is a compliment. The *American Heritage Dictionary* defines the word as such: "Boring is monotonous, tedious, irksome, tiresome, and humdrum; these adjectives refer to what is so uninteresting as to cause mental weariness."

Some people in the groups said that it was the fact that every day is different; you never know what is going to happen. Others noted that even if they were doing the same job, there were hundreds of different parts. Some said that things were always changing. A couple even said it was exciting.

Our leadership challenge is to take our companies from boring to exciting. To make this happen, employees must be personally engaged in the company's success; empowered as teams to make a difference; and aligned to the vision.

WHAT IS ENGAGEMENT?

From the management side, employee engagement is proactively cultivating discretionary effort; that is, when employees have choices, they will act in a way that furthers their organization's interests. The goal is to eliminate the "What's in it for me?" mentality. From the employee side, one of the best definitions comes from Wayne Cascio's book, *Investing in People*:

Engagement is a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption. Vigor refers to high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties. Dedication is characterized by a sense of significance, enthusiasm, inspiration, pride, and challenge at work. Absorption consists of being fully concentrated, happy, and deeply engrossed on one's work whereby time passes quickly, and one has difficulty detaching oneself from work.

Confucius had it right with the saying "Chose a job you love and you will never have to work a day in your life."

A simple example of an engaged employee can be seen at the shipping dock. At the end of a long and busy day, an employee could choose to use the last minutes to either leisurely clean up or rush to make sure that one more shipment was loaded for another on-time delivery. The supervisor would not criticize either choice. The engaged employee would commit that extra energy to do what is best.

I had the benefit of meeting a *disengaged* employee very early in my career. 1974 was a boom year for foundries, and we need additional capacity. I was this hot-shot son of the boss (SOB) with an MBA and did all the analyses that showed if we installed an Osborn 3191 molding machine, it would generate lots of profits. We had a high production job that was running on a smaller line, and we could put two-up in a 20x36 flask on the 3191. The machine was purchased and installed. On the first production day, I was there to watch it make money. After several very painful hours, Dick, the molder, turned and said to me, "I could have told you it would never work!" Based on the way we had it set up, it was impossible to get more than four molds an hour, which was far less than 50% of the smaller machine. A couple of lessons for me. First, there is great wisdom on the shop floor. And second, the culture had to change so that employees would speak up.

HOW ENGAGEMENT STARTED AT DOTSON

I must start with a disclaimer. My comments on Dotson's engagement are not to say that we do it best or better than other companies. Instead, they are intended to prompt thought and serve as possible examples.

Our employee engagement journey started 30 years ago when, in 1981, the agricultural and energy markets collapsed. At the bottom, our sales were only 20% of what there were in 1980. Survival was the only thing on our mind. I was very fortunate to realize that I needed to lead the company back to profitability and that the strength of the company was its employees. We asked the union for a wage concession, and they quickly responded by saying "You only tell us the profits when there aren't any." They believed that we had two sets of books and voted overwhelmingly to reject any concessions. The employees were correct – we had not communicated with them. They had no real understanding of the severe financial situation (they were not correct on the two sets of books). We started weekly communication sessions and three months later were able to unilaterally cut wages from \$11.25 per hour to \$5.75 per hour. Our message was simple. "You are worth the full wage, but we cannot pay it. We will however, keep track of the difference and pay it back with interest if we survive." Every employee

OUR BUSINESS PHILOSOPHY

Vision
Becoming the world's most agile foundry and machining facility.

Mission
Where innovation, teamwork, and a desire for excellence combine to delight our customers, provide a rewarding workplace for our employees, and generate profits for stability and growth.

Core Values

1. Integrity, openness, honesty
2. Respect and serve others
3. Excellent execution
4. Hold self accountable
5. Employee engagement
6. Celebrate successes

Our vision is to become the world's most agile foundry and machining facility. For us agility is having flowing processes and engaged employees that quickly deliver great performance to our partners.

Performance

Good → Great

The way to survive in the competitive world market is to be great; with repeatable, controlled processes; very low reject rates, near perfect delivery, and services our customers value.

Recent Accomplishments
North American Foundry of the Year, Casting of the Year Award, fully automated pouring lines, in-line machining, 100% electronic job folders and complete paperless systems, visual real time shop floor instructions, in-stream inoculation.

2010 - 2011 Initiatives

1. Fully engaged and qualified employees
2. Total productive maintenance
3. Aligned customer partnerships
4. Operational excellence

Process

Stop & Go → Continual Flow

Using lean principles to guide waste reduction and process improvement; eliminating unnecessary pauses as we strive for continual flow.

Teamwork

Individual → Engaged

The incredible advantage we enjoy is a well educated workforce. An emphasis on the enjoyment of learning and succeeding together, as an engaged team, will provide better quality of work life and better results.

Quickness

Days → Minutes

Quickness is the ability to give correct responses or deliver product without delay or difficulty; offering our customers a competitive advantage through flexibility and agility.

Relationships

Transactional → Partnership

Our core values are the basis for all interactions with our partners: employees, customers, suppliers, investors and the community.

Key Performance Indicators (KPI)

	2007	2008	2009	2010
Pretax Profit	9.9%	7.9%	2.1%	8.1%
On-Time Delivery	97.2%	96.6%	98.2%	95.9%
Returns - PPM	13,771	12,913	8,622	8,507

Customer Value Proposition

Dotson provides customers higher total value with castings designed and produced collaboratively in our highly automated, quick response foundry and machining facility.

Employee Value Proposition

Dotson's employees are engaged, innovative, successful and community minded working in an environment where they feel valued, respected, secure, safe and rewarded; their leaders inspire, build trust and empower the organization.

Safety Commitment

Our Safety

Dotson Company
(507) 345-5018
Mankato MN 56001

www.dotson.com

Figure 1. The Dotson Philosophy: Our one-page summary of Dotson Iron Castings

showed up for work the following Monday. Communication has been a high priority ever since.

We tried many different approaches to communication over the years and many different incentive and strategy plans. Gradually, we evolved to using the Dotson Philosophy (Figure 1), which is a one-page summary of what we are, where we are going, and how we are going to get there.

Engagement Steps

Today there are endless books, programs and consultants that will help with a company's engagement journey. At Dotson, we continue to use The Manufacturing Extension Partnership (MEP; www.nist.gov/mep/), a public/private partnership that provides training, tools, and connections to accelerate innovation and has 60 centers located in all states.

We also take ideas from everywhere. Bob Kelleher, one of the thought leaders for employment engagement, visited our foundry and described engagement as a "journey without a destination." Kelleher's 10 engagement steps and comments from his book *Louder Than Words* will be used to highlight Dotson's current position on this journey without a destination.

1) LINK ENGAGEMENT TO PERFORMANCE

Ten years ago, there was a question regarding the return on investment for engagement activities. Today, magazines and research reports are reporting regularly that engagement is good for the customers and for the bottom line. The business reason or goal for engagement is profits (high performance) not employee satisfaction, which is an outcome.

At Dotson, we have just finished our 19th consecutive year of showing a profit. Without question, I attribute this success to our engagement and empowerment efforts. The real payoff has been in years such as 2001 and 2009 when sales dropped significantly, yet we were able to remain profitable without major layoffs.

2) ENGAGEMENT STARTS AT THE TOP

The CEO and the company leaders must own their culture. It is not something that can be delegated. If the organization's culture is not owned actively by the top, others in the organization will define and control it. As you recognize the need to own your culture, there are two excellent books to help you determine what your culture should be. The first is Jim Collins' *Good to Great* and the second is Stephen M. R. Covey's *Speed of Trust*.

These two books provided the foundation for Dotson's first effort to update in our core values in more than twenty years. The new values are:

- Integrity, openness, honesty
- Respect and serve others
- Excellent execution
- Hold self accountable
- Employee empowerment
- Celebrate successes

To own these values also means that the leadership team needs to accept and encourage others in the organization to hold the top accountable for each of the values and to challenge others when they are not living the spirit of the values.

3) ENGAGE FIRST-LINE LEADERS

The CEO normally has five to eight direct reports and everyone else has another manager. The individual's manager has overwhelming influence on the engagement level. This is even truer on the disengagement side. According to a 2009 Sirota Survey, disengaged managers are three times as likely to have disengaged direct reports.

Problem often surface, however, because many supervisors have been in their positions for many years, and this whole engagement thing (the softer side of management) is new to them. A good tool to start conversations with long-time employees is to use 360 degree evaluations. A second comes from Bob Kelleher's leadership summary:

Needs a Leader Must Fill	
Authority	"Someone's in charge."
Security	"Things will probably turn out OK."
Direction	"Someone knows where we're going."
Vision	"We know where we're going."
Structure	"Everyone knows where they fit in."
Clarity	"Someone tells us what's expected of us."
Role Model	"We have someone to look up to."
Reassurance	"Someone's looking after us."
Cohesion	"We're all singing from the same song sheet."
Inspiration	"We feel good about what we're doing."
Recognition	"What I do matters."

Group culture is hard to change, but from my experience, it is often easier to change a group than an individual. If the individual's personal values need more than modest tweaking to align with the organization's values, it is probably better to work out a generous severance package.

4) COMMUNICATION: THE CORNERSTONE

Another best practice is to remember that communication must be "7 times in 7 different ways." The 7 ways could be face-to-face, at a shift meeting, in a memo, from a CEO session, weekly newspaper or perhaps front line to

front line. It is also important to realize the responsibility for making sure the message is received lies with the individual sending the message. At Dotson, we have all the standard meetings (shift, monthly, and quarterly meetings) along with many different committees. In addition, we have a unique communication platform from People Drive Performance (www.pdpsolutions.com), which is delivered via touch screen kiosks throughout the plant.

The weekly digital newspaper (Figures 2 and 3) includes a mix of current happenings, new employee and visitor welcome articles, human interest stories, technical information, and teachable moments such as comments on a safety incident.



Figure 2. Weekly digital newspaper presented on kiosks throughout the plant or on individual PCs.

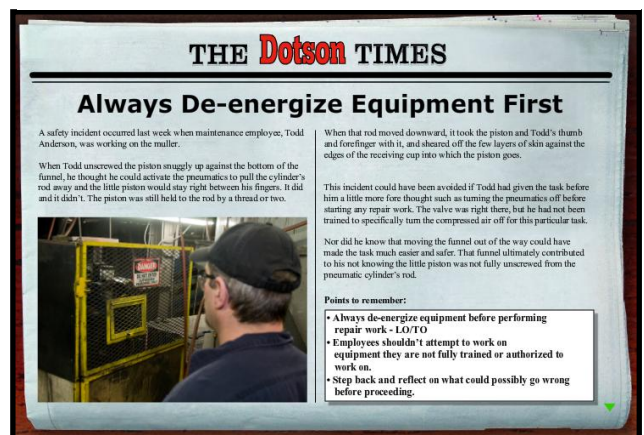


Figure 3. The story page provides a teachable moment on a recent safety incident

5) Individualize Your engagement

Engagement occurs one person at a time. Thirty years ago, getting to that one person used to be easy when the workforce all looked and acted alike. Today, diversity comes in many shades. We not only have diversity in terms of age, gender, race/ethnicity, and religion, but also deal with generational, cultural, educational,

communication styles and many other types of differences. Each requires a modified approach to connect with the individual.

For those of us in management, the biggest change is the Gen Y or Millennials, who are entering the work force. The December 17, 2010 *Kiplinger Letter* provided a good summary of what we should expect.

- They're well schooled
- Culturally aware
- Tech savvy to the extreme
- They're accustomed to working in groups
- Clueless about traditional workplace etiquette
- Use texting; don't see need for face-to-face
- They expect work to be fun and meaningful
- Enterprises that try to do good have appeal
- Personal relationships are paramount
- Time is more valued than money

As a final note on the Millennials, Kiplinger pointed out that they are remarkably optimistic, confident about their futures, eager to take on challenges in life, and are open to change. Just what we need.

Diversity in the workforce is turning out to be a big advantage at Dotson because it brings different ways of thinking to our many teams. One caution, however. As pointed out by Betty Shanahan, CEO of the Society of Women Engineers, we must be aware of the illusion of inclusion. Just because a Hispanic or woman is on the team does not mean that you have diversity. It is very important that individuals are encouraged to bring their true self to the organization and not adapt or conform to the dominate group norms. Only when everyone comes with their true self do you have the benefits of diversity.

6) CREATE A MOTIVATION CULTURE

After 40 years in management, I have come to the conclusion that everything that I thought provided long-term motivation was wrong. Most importantly, I now realize that it isn't money. Pay can, however, be a demotivator if not fairly administered.

One of my favorite books is *Drive*, by Daniel Pink. He clearly and convincingly provides evidence that more money is an incentive in activities that require only mechanical skills. If an activity requires even rudimentary cognitive skills, a monetary bonus will actually produce less. There is a superb video where Daniel Pink illustrates this phenomenon on YouTube (search RSA Animate Drive), which has been viewed nearly five million times.

Pink points out that one of the motivators is mastery of a task. People want to get good at things and to make this

happen, they need education. Dotson started a reimbursement program for any class an individual might choose to take. At minimum, we pay 50% (up to \$1,500 a year). Depending on the class, we will pay 100% and allow the employee to take the class during work time. Our initial fear was that this might cost us significant dollars if everyone took us up on the offer. This concern was quickly offset when we realized what an incredible company we would have if every employee invested \$1,500 in their personal education.

Another motivational realization for me was highlighted in a January 2010 *Harvard Business Review* article on "What Really Motivates Workers." The author's conclusion was this: When workers sense they're making headway, their drive to succeed is at its peak. We know this from our own lives. When we are working on a difficult problem, we feel good when we are making progress. We get excited when new equipment is being installed. The activity around a Kaizen event gets people involved in improvement. The nice thing about understanding this motivation is that as managers, we can provide this motivation by regularly letting people know progress is being made.

7) CREATE FEEDBACK MECHANISMS

It was 1973 and I was new at this game. Bud, a 60-year-old, was in my office for a review. He was now sales manager for our foundry and before his last foundry closed, he was running everything there. Bud impressed me, and I learned something every day from his knowledge of the foundry industry. I went through the review thinking that I had covered all points, but he had one more question. It was a simple one: "Am I doing a good job?" I couldn't believe my ears. Here I was, a young kid, and this very experienced manager needed to hear me say, "You are doing a great job!" It was feedback that justified his extra efforts.

How do organizations know how well they are doing in living their values? Like employees, we need feedback. Some of the best feedback is from an employee engagement survey (which is very different from an employee satisfaction survey). Many large organizations use the Gallup Q12 survey, but it is very expensive. At Dotson, we used WIPFLi Consultants and their Quantum Workplace survey. It was still expensive, but well worth it to get unbiased results.

We summarized the results of the 35 questions by showing the 11 question areas in which we had fantastic results (Figure 4) and the four question areas in which we scored the lowest (Figure 5). This showed our strengths and where we needed to improve.

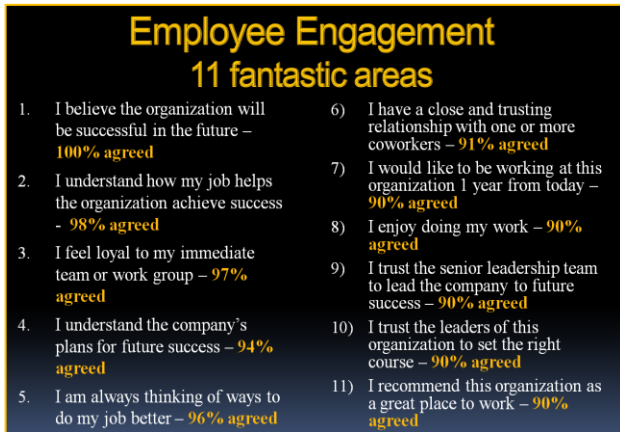


Figure 4. Dotson engagement survey results on the 11 questions with 90% or more of the employees in agreement.



Figure 5. Dotson engagement survey questions that had the least agreement.

An additional significant benefit from the survey was the anecdotal responses where employees could comment about anything.

8) REINFORCEMENT, REWARDS, AND CONSEQUENCES FOR BEHAVIORS

Over the years we had tried many type of individual and group bonus plans along with different feedback approaches. Essentially, every program had unintended consequences and some level of gaming. We have gradually moved to a point today such that 75% of the company-wide bonus is based on profits. The balance is customer focused and paid on parts per million (PPM) rejects and on-time delivery performance. The profit bonus doesn't start until pre-tax profits exceed 5%. The on-time delivery bonus starts at 96.6% and the PPM starts at 10,000.

For annual pay adjustments, we use a matrix that values performance against market salary range. Individuals on the low end of performance receive 0% of the 100% average increase, while those on the high end can receive 200% of the average. This is then offset by where the individual lands in a market salary comparison. The table (Figure 6) shows these relationships.

		Market Salary Range		
		Low End	Median	Upper End
Performance	Exceed Expectations	200%	150%	100%
	Meets Expectations	150%	100%	50%
	Developing or not meeting Expectations	0%	0%	0%

Figure 6. Dotson's matrix for adjusting salary compensation.

Part of the performance value is based on how well the individual is living up to the company's core values. One of the very hardest things to do is let go of a superior performing individual who is not in sync and not living the values. While it is hard to do, the rest of the organization will cheer when it is done and productivity will increase among others to more than cover the loss of the superior performing, but out-of-sync individual.

I recently read that the best procedural worker is about two times better than the average worker, while the best creative person is ten times better than the average. I don't know if there is any research to back this up, but I think it is something to keep in mind when reviewing compensation/rewards for the creative individuals who can lead the company from good to great.

9) TRACK AND COMMUNICATE PROGRESS AND SUCCESS

Back to the *Harvard Business Review* article on motivation, people are most engaged when they are making progress. But where are we going? Once you have engaged employees and you have empowered them, it is essential that all the teams are aligned. At Dotson, we have used a modified form of Hoshin Kanri planning to define the strategy and initiatives that move us closer to our vision. There are six key elements in the planning process as outlined in the November 2007 *Industry Week* magazine:

1. Hoshin planning is driven by the organization's vision, not today's problems.
2. It is a system to translate the vision into tangible and measurable objectives for achieving breakthroughs.
3. Alignment is created by cross functional planning to achieve short-term objectives each year.
4. Hoshin planning fosters learning through the review process. You become better planners every cycle.
5. The Plan-Do-Check-Act cycle of continuous improvement is at the heart of the Hoshin process.
6. "Catchball," (the regular iterations with the shop floor), is the driving force of alignment, clarification, and employee involvement.

Once the strategy is defined there needs to be regular reports regarding goals. Again, at Dotson, we are using the shop floor touch screen kiosks to visually show

progress against goals (Figure 7). The advantages of the touch screens is that with a single touch, different time periods of the data are displayed along with relevant items such as specific late shipments for the period. We also use this same system to report progress on the initiatives using the Plan-Do-Check-Act cycles.

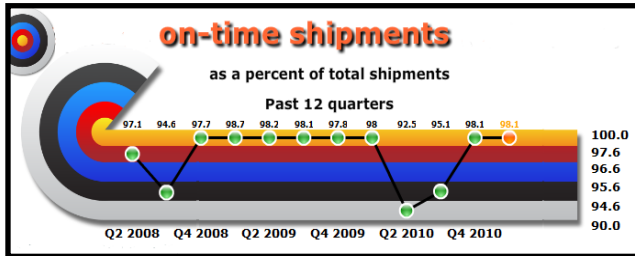


Figure 7. Shop floor touch screen for showing results.

10) HIRE AND PROMOTE ENGAGED EMPLOYEES FOR YOUR CULTURE

Each leader and each organization must own the culture. No two companies are the same. At Dotson, we look at many companies and many programs, try on the ideas, and if they fit, we adopt them as our own. When hiring, it is important to identify the applicant's personal core values and ensure that there is alignment with the company's core values. It is impossible for an individual to have values after work different from values while at work.

How important are values to an organization? This can be illustrated by looking at two companies, Zappos and NetFlix. Both are companies that live their values.

At Zappos, founder Tony Hsieh tells a story in his book *Delivering Happiness*. This is a must-read book that is impossible to put down. The company's ten values drove Zappos to a billion dollars in sales and a billion dollar purchase of Zappos by Amazon.com in just 10 years. Their values are:

1. Deliver WOW Through Service
2. Embrace and Drive Change
3. Create Fun and A Little Weirdness
4. Be Adventurous, Creative, and Open-Minded
5. Pursue Growth and Learning
6. Build Open and Honest Relationships With Communication
7. Build a Positive Team and Family Spirit
8. Do More With Less
9. Be Passionate and Determined
10. Be Humble

My favorite Zappos policy is that every employee participates in a four-week training period. At the end,

they are offered \$3,000 to quit the company. Only a few of the non-committed take up the offer.

The easiest way to understand the culture at Netflix is to Google the "Netflix Culture PowerPoint." You will find a 128 slide deck that is a fast read. This culture slide deck at Netflix is the best example I have seen that explains a company's unique culture. Very quickly, you will understand the seven aspects of their special culture:

1. Values are what we Value
2. High Performance
3. Freedom and Responsibility
4. Context, not Control
5. Highly Aligned, Loosely Coupled
6. Pay Top of Market
7. Promotions and Development

Netflix has high expectations for its employees. It also abides by this practice: "Adequate performance gets a generous severance package."

As I do with Zappos, I have a favorite Netflix policy. The Netflix focus is on what people get done, not how many hours or days worked. The company's vacation policy is simple – there is no policy or tracking.

Once again, for a company to be successful, the leaders must own and live their cultural values. We only have to list Enron's four values (Integrity, Communication, Respect, and Excellence) that were chiseled in marble in the main lobby to make this point.

EMPOWER YOUR TEAMS

Hand-in-hand with engaging the individuals, the organization must empower teams. There are just two very simple rules in this regard: to ask and to listen. While they appear simple, they are very difficult in practice. Many times, results are not what you expected, which means that the leaders don't always get their way.

Recall the disastrous new molding machine story of my first big purchase. Today, Dotson does capital purchases much better. Every time we spend more than \$10,000 for something new or an upgrade, we engage a team of employees that will be impacted by the purchase to research, determine options, go on site visits, set the payback expectations, and sign off that this is what they recommend. We use this same for a \$10,000 purchase or a \$2,000,000 purchase. We have just completed our 149th project (Figure 8).

Figure 8. Dotson’s signed \$10,000 project summary for a forklift purchase.

Another team-building policy at Dotson is our GEMBA trips. GEMBA means go to the “real place” to gather first-hand information. Our goal is that each year more than 50% of the employees will go on a trip to visit a customer, supplier, or another foundry. We have been doing this for many years, and the value really hit me when we had a customer quality person walking through our plant. He said hello—by name—to four of our shop floor workers. On different trips, each of these employees had toured through the customer’s plant accompanied by the quality person.

PEOPLE FIRST... THEN THE VISION FOR NEXT GENERATION MANUFACTURING

Engaged employees and empowered teams are the first essentials for long-term success. Next is using an alignment tool such as Hoshin Kanri for strategy and initiative development. For all this to be successful, however, it requires the inspired leadership to create the vision for the organization; it’s the vision that says “Where are we going?” Not this year or next, but ten years or more from now. It is the “What do we want to be when we grow up?” statement.

In developing this vision, one has to look out at the changes that are taking place in the world economy, specifically what is happening in manufacturing. We should thank companies operating in Mexico, India, China, and other low-cost areas. They have provided the urgency that we in manufacturing need to move us beyond doing business as usual.

Our response at Dotson was to look at *The Toyota Way* and adopt many of their lean principles, especially waste reductions, kaizens, continual improvement tools, and the strategy planning approach. These are only aids for short-term improvements, however, and don’t really help determine the vision.

The Wisconsin Manufacturing Extension Partnership (WMEP) has defined six attributes for industry’s future success. Their belief is that America’s manufacturers must achieve world-class performance in at least one key attribute and achieve parity with leading competitors in all others. These six concepts are a good basis to begin the vision planning. Google “WMEP Next Generation Manufacturing” for the full report and the success benchmarks for each attribute:

1. Customer-Focused Innovation
2. Advanced Talent Management
3. Systemic Continuous Improvement
4. Extended Enterprise Management
5. Sustainable Product and Process Development
6. Global Engagement

At Dotson, our vision is “Becoming the World’s Most Agile Foundry and Machining Facility.” The important emphasis here is on the word *becoming*. Much like our journey for engagement, our vision is a journey. It has a planned destination, but it is always being revised. For us, agility is having flowing processes and engaged employees that quickly deliver great performance to our partners. Dotson’s strategy to meet this vision falls into five areas.

1. **Process** – from stop and go to continual flow. Using lean principles to reduce waste and improve processes; eliminating unnecessary pauses as we strive for continual flow.
2. **Quickness** – from days to hours. Quickness is the ability to give correct responses or deliver product without delay or difficulty; offering our customers a competitive advantage through flexibility and agility.
3. **Performance** – from good to great. The way to survive in the competitive world market is to be great; with repeatable, controlled processes; very low reject rates, near perfect delivery, and services our customers value.
4. **Teamwork** – from individual to engaged. The incredible advantage we enjoy is a well-educated workforce. By emphasizing the joy of learning and succeeding together, as an engaged team, we will provide a better quality work life and better results.
5. **Relationships** – from transactional to partnership. Our core values are the basis for all interactions with our partners: employees, customers, suppliers, investors, and the community.

Visions are not created easily and certainly cannot be done in a few brief sessions. The vision must challenge the organization and at the same time create a feeling of pride among employees that we are all taking this journey together.

MANUFACTURING RESURGENCE: IS IT HAPPENING?

The answer is absolutely yes. My 40 years of experience convinces me that the next 10 years will be some of the best years for manufacturing, specifically for the U.S. foundry industry. One of the most positive signs is that people and our governments are once again talking about the importance of manufacturing to our economy.

According to an article in the January 19, 2011 *Wall Street Journal*:

As the economy recovered and big companies began upgrading old factories or building new ones, the number of manufacturing jobs in the U.S. last year grew 1.2%, or 136,000, the first increase since 1997, government data show...The economists' projections for this year—calling for a gain of about 2.5%, or 330,000 manufacturing jobs—won't come close to making up for the nearly six million lost since 1997...After a steep slump during the recession, manufacturing is “the shining star of this recovery,” says Thomas Runiewicz, an economist at IHS. “Manufacturing is going to be a significant source of job growth over the next decade,” says Mark Zandi, chief economist at Moody's Analytics. He says U.S. manufacturers that survived the brutal 2008-09 recession are now very competitive, with much lower labor costs and debt burdens, and so can afford to expand. While they will keep building factories overseas to address demand in emerging markets, they also will invest in U.S. plants, Mr. Zandi says. He expects manufacturing job growth to average about 2% a year through 2015.

Likewise, the January 14, 2011 *Kiplinger Letter* reports that 76% of cars sold in North America were made in North America, up 2 points from 2009.

Reshoring expert Harry Moser believes that “Reshoring is bringing back work, parts or tools that will finally be used in North America.” His easy-to-use, total cost of ownership tool (www.reshoringmfg.com) uses 30 factors from freight to end-of-life costs to come up with the true cost of offshore purchasing.

Even the foundry industry is starting to purchase new equipment. In the past year we have seen more and more stories such as these, which headlined in *Modern Casting* magazine:

- LA Aluminum Casting, Hayden, Idaho, adds perm mold and machining capacity and announces in Jan 2010. Cost \$1 million.
- GM Defiance, Defiance, OH, announces \$59 million investment in precision sand casting in Feb. 2010

- GM announces in April 2010 another \$115 million investment for blocks and crankshafts to Defiance plant, plus \$111 million in Bedford, Indiana for cylinder heads
- Chrysler announces \$43 million investment in Kokomo plants, including Kokomo casting, for transmission components in May 2010. In June, the firms announced \$300 million for same plants, some to casting.
- In June 2010, John Deere, Waterloo, Iowa, announces \$100 million investment into foundry for molding and other investments
- URV facility in Michigan for wind castings announced in July 2010. Greenfield foundry to produce 80,000 tons.
- Lethbridge Iron Works, Lethbridge, Canada, competes \$9 million molding expansion in August 2010
- In August 2010, Chrysler announces \$27 million investment in Etocicoke casting plant in Toronto for front and rear cross members.
- Chromalloy—New investment casting plant, \$27 million, opened in 2010
- Manitowoc Grey Iron Foundry, Manitowoc, WI, completes \$0.5 million energy efficiency investments in August 2010
- In October 2010, Waupaca announces \$36.5 million investment in Tell City, Ind. Plant for melt and automation improvements
- In November 2010, Fort Recovery Industries announces \$4.5 million expansion at new die casting plant in Portland, Indiana.
- In December 2010, Chrysler announce another \$843 million expansion at Kokomo plants, including casting.
- In Dec 2010, GM announces another \$12 investment in Defiance, Ohio plant for block and crankshaft production
- In Dec. 2010, Chromally announces addition of \$5 million ceramic core room to new casting plant.

Most of these are very large companies, but the smaller foundries, according to CISA members, are requesting quotes on new equipment purchases, which should soon turn into improvement projects.

BREAKTHROUGH NOT INCREMENTAL

An advantage that Japan had after World War II and that China has today is that new plants are being built that take advantage of the best and most productive engineering available. *Industry Week/MPI Census of U.S. Manufacturing* reported that 50% of the plants in China are less than 10 years old (22% are less than 5 years old) while in the U.S., only 10% are less than 10 years old and 70% are more than 20 years.

More than 350 years ago, our foundry industry was responsible for the breakthrough in manufacturing in North America. In 1647, the Saugus Iron Works started as the new world's first successful integrated manufacturing facility. The Saugus Pot (Figure 9) was the first commercial casting produced in North America.



Figure 9 The Saugus Pot is the first North American casting

Since then, existing plants have been improving, but it is only on an incremental basis. True breakthrough or game-changing improvement needs to come from greenfield facilities that have no pre-existing constraints.

For the past year, I have been involved with a project to create a new foundry facility. To capitalize on our industry's history, we are calling it Saugus2. The vision is to create an integrated greenfield iron foundry and machining facility that is agile, has a game-changing philosophy, and will set the standard for small-scale, Next Generation Manufacturing. We expect that this plant will pour iron in 2013, and it is based on ten game-changing philosophies.

1. An investing consortium of partners (customers, suppliers, governments)
2. Customer-focused lean enterprise
3. Optimized for a single production line
4. Flow – one touch exchange of dies
5. Collaborative Process Automation Systems
6. Labor about equal to shipping and labor from Asia
7. Safety designed into the culture
8. A highly-engaged and empowered workforce
9. Strong emphasis on sustainability
10. First of many plants in U.S. and around the world to support key customer needs

Our concept/design team of customer, supplier, and technology experts will be meeting every month during 2011 to evaluate the best of the best to be included in the Saugus2 facility.

What will be very exciting for our industry is when there are many projects, from many companies such as our Saugus2 that are building greenfield foundries. I am convinced that this will happen during the next 10 years.

CONCLUSION: FROM BORING TO EXCITING

The employee focus groups at Dotson said the reason to stay with the company is that "It isn't boring." It's hard to get the best of the best to work in our industry if that is what we say about it. Our challenge as leaders is to make it exciting.

To do this, we have to bring our personal excitement to the company. We have to believe that there is a great future for our industry and specifically our foundry. We have to define—in an inspiring way—the visions of our future. We have to own and live a culture that engages employees. We have to empower and align teams to our vision. And then, we have to let go. Our job at this point is to take down barriers; recognize, encourage, and celebrate successes; and occasionally work out the necessary generous severance package for those out of sync.

Having a bit of the teacher in me, I cannot stop without making sure that there are some worthwhile takeaways from this paper. Therefore, here are my top 10 recommendations:

1. Sponsor GEMBA trips.
2. Subscribe to the *Harvard Business Review*.
3. Start a \$10,000 capital purchase program.
4. Conduct an engagement survey.
5. Get "1-click" at Amazon and read lots of books.
6. Watch the Daniel Pink *Drive* video.
7. Set higher expectations for new hiring.
8. Attend at least three conferences every year.
9. Embrace the concept of generous severance.
10. Own your culture.

Finally, my first visit to the foundry was exciting. For me, every time I walk into any foundry it continues to be exciting. I am excited whenever I am around foundry people. I will continue to be excited as I proceed to a leadership role in the American Foundry Society. And, I am truly honored to have had this opportunity to present the 2011 Charles Edgar Hoyt Memorial Lecture.