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Development of standards for fluorescent coatings to improve shipboard tank preservation

NST Center
National Surface Treatment Center

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The U.S. Navy has developed a simple and rugged inspection system that dramatically enhances the visibility of coating defects for visual inspection. The system requires a coordinated specification for an inspection light and for the fluorescent luminance of a coating when illuminated by that light. The Navy is developing consensus standards to rigorously specify and institutionalize this visual inspection system.

U.S. Navy Shipboard Tank Preservation

Since the early 1990's, the U.S. Navy has recognized the preservation of shipboard tanks as its biggest corrosion-related maintenance cost. A recent independent study commissioned by the United States Office of the Secretary of Defense confirmed that preserving tanks and voids is still a top contributor to the Navy's $2,440 million annual cost of corrosion.

High solids coatings promise to greatly reduce that cost by extending ballast tank service life to 20 years. Capturing this savings relies upon a disciplined application process that yields a holiday free protective film. Coating applicators and inspectors deploy a variety of QA/QC tools to apply and verify that this is achieved. Streamlining the coating inspection process could significantly reduce costs and the impact of preservation on ship availability schedules.

Working with suppliers and coating inspectors, the Navy developed a simple, low cost, and rugged coating inspection system that dramatically enhances the visibility of coating irregularities and defects in the field. The system specifies a fluorescent luminance property of a coating in a way that dramatically enhances the visibility of defects when inspected with a specially designed light. The result will be improved coating performance with less oversight and reduced costs and schedule impact.

Enhancing Visual Inspection

Because shipboard tanks are geometrically complex, critical coatings inspections for holidays and under-film thickness are done by visual inspection. Hard to reach areas are inspected using a flashlight and dental mirror.

Fluorescent Coatings

Using fluorescent coatings is an effective way to enhance visual inspection by increasing the contrast of irregularities and defects in the coatings. When illuminated by the correct light source – traditionally a powerful ultraviolet (UV) inspection lamp – the fluorescence is activated and creates a dramatic contrast between the fluorescent coating and any nonfluorescent coating or substrate. This effect enhances irregularities in fluorescing primer coatings over non-fluorescent substrates like steel or concrete, as well as non-fluorescent top coatings over fluorescent primers.

In field trials, experienced coating inspectors report that fluorescent coatings inspection improves their accuracy over traditional flashlight inspections: more and smaller defects can be seen than under traditional white light inspection while shadows and flashlight glare are eliminated. When a topcoat with no fluorescent pigment is applied over a fluorescent primer coat, topcoat holidays are easily spotted by the fluorescent glow of the prime coat.

Field-Friendly Inspection Hardware

U.S. Navy coating specifications require that the primers of high solids coating systems exhibit UV fluorescent properties. Unfortunately, the size and design of the inspection equipment made it impractical to use this technology effectively in shipboard tanks. High power, battery powered UV lamps are heavy and the lamp head is too large to inspect behind the stiffeners and piping that clutter shipboard tanks. The lamp systems are costly (around $1,200), use expensive bulbs (around $350 each) that failed frequently in a heavy industrial environment, and emit levels of UVA light that added overhead to manage worker safety and occupational health.

A new generation of inspection lights addresses these issues so effectively that Navy coatings inspectors report that they prefer the speed and ease of fluorescent holiday detection to the traditional white-light flashlight approach. These are small, rugged, high power flashlights that use violet (410nm) light emitting diodes (LEDs). One example is a 5-watt flashlight with light output comparable to a traditional 35-watt UV lamp, but at 15 cm long and weighing under 200 grams it fits easily into an inspector's hand and can illuminate coatings in tight corners.

Using visible violet light to activate the coating fluorescence addresses worker eye safety concerns. The previously cited 5-watt flashlight is a Class I LED Device, considered "safe under reasonably foreseeable conditions of operation" in the IEC 60285-1 standard for optical safety of LED products. In spite of being visible light, violet inspection light delivers the same contrast enhancing fluorescent effect as traditional UV lamps because the human eye is not very light sensitive in that region.

There are already commercial, Navy-qualified fluorescent tank coatings optimized for visual inspection with these inspection lights.

Institutionalization through Consensus Standards

For fluorescent coatings to enhance visual inspection, the properties of the inspection light must match the fluorescent luminance response of the coating. This requires coordination between products that are developed, manufactured, and distributed by completely different industries. Furthermore, the more consistent the optical performance of the system, the more likely that the system will yield consistent inspection procedures and consistent quality of the visual inspection.

This coordination and consistency of performance will be accomplished by a series of consensus standards that the Navy is developing. The standards will rigorously specify and institutionalize the optical properties of the entire system. Four interlocking standards are being developed sequentially. Each later, higher level standard builds on the components and test methods developed in the earlier ones.

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In This Issue

The nuts and bolts of ERP

By Donna Lampe, Director of Information Technology

Donna Lampe

What is ERP?

Enterprise resource planning software, or ERP, doesn't live up to its acronym. Forget about planning—it doesn't do much of that—and forget about resource, a throwaway term. But remember the enterprise part. This is ERP's true ambition. The software attempts to integrate all departments and functions across a company onto a single computer system that can serve all those departments' particular needs.

Building a single software program that serves the needs of people in finance as well as it does the people in human resources and in the warehouse is a tall order. Each of those departments typically has its own computer system optimized for the particular ways that the department does its work. But ERP combines them all together into a single, integrated software program that runs off a single database so that the various departments can more easily share information and communicate with each other.

That integrated approach can have a tremendous payback if companies install the software correctly.

How can ERP improve a company's business performance?

ERP's best hope for demonstrating value is as a sort of battering ram for improving the way your company takes a customer order and processes that into an invoice and revenue—otherwise known as the order fulfillment process. That is why ERP is often referred to as back-office software. It doesn't handle the up-front selling process (although most ERP vendors have recently developed CRM software to do this); rather, ERP takes a customer order and provides a software road map for automating the different steps along the path to fulfilling the order. When a customer service representative enters a customer order into an ERP system, he has all the information necessary to complete the order (the customer's credit rating and order history from the finance module, the company's inventory levels from the warehouse module and the shipping dock's trucking schedule from the logistics module, for example).

People don't like to change, and ERP asks them to change how they do their jobs. That is why the value of ERP is so hard to pin down. The software is less important than the changes companies make in the ways they do business. If you use ERP to improve the ways your people take orders and manufacture, ship and bill for goods, you will see value from the software. If you simply install the software without trying to improve the ways people do their jobs, you may not see any value at all—indeed, the new software could slow you down by simply replacing the old software that everyone knew with new software that no one does.

How long will the project take?

Companies that install ERP do not have an easy time of it. Don't be fooled when ERP vendors tell you about a three- or six-month average implementation time. Those short (that's right, six months is short) implementations all have a catch of one kind or another: The company was small, or the implementation was limited to a small area of the company, or the company used only the financial pieces of the ERP system (in which case the ERP system is nothing more than a very expensive accounting system). To do ERP right, the way you do business will need to change and the way people do their jobs will need to change, too. And that kind of change doesn't come without pain. Unless, of course, your ways of doing business are working extremely well (orders all shipped on time, productivity higher than all your competitors, customers completely satisfied), in which case there is no reason to even consider ERP.

The important thing is not to focus on how long it will take—real transformational ERP efforts usually run between one and three years, on average—but rather to understand why you need it and how you will use it to improve your business.

What will ERP fix in my business?

There are five major reasons why companies undertake ERP.

1. **Integrate financial information**—As the CEO tries to understand the company's overall performance, he may find many different versions of the truth. Finance has its own set of revenue numbers, sales has another version, and the different business units may each have their own version of how much they contributed to revenue. ERP creates a single version of the truth that cannot be questioned because everyone is using the same system.
2. **Integrate customer order information**—ERP systems can become the place where the customer order lives from the time a customer service representative receives it until the loading dock ships the merchandise and finance sends an invoice. By having this information in one software system, rather than scattered among many different systems that can't communicate with one another, companies can keep track of orders more easily, and coordinate manufacturing, inventory and shipping among many different locations simultaneously.
3. **Standardize and speed up manufacturing processes**—Manufacturing companies—especially those with an appetite for mergers and acquisitions—often find that multiple business units across the company make the same widget using different methods and computer systems. ERP systems come with standard methods for automating some of the steps of a manufacturing process. Standardizing those processes and using a single, integrated computer system can save time, increase productivity and reduce headcount.
4. **Reduce inventory**—ERP helps the manufacturing process flow more smoothly, and it improves visibility of the order fulfillment process inside the company. That can lead to reduced inventories of the materials used to make products (work-in-progress inventory), and it can help users better plan deliveries to customers, reducing the finished goods inventory at the warehouses and shipping docks. To really improve the flow of your supply chain, you need supply chain software, but ERP helps, too.
5. **Standardize HR information**—Especially in companies with multiple business units, HR may not have a unified, simple method for tracking employees' time and communicating with them about benefits and services. ERP can fix that.

What are the hidden costs of ERP?

Although different companies will find different land mines in the budgeting process, those who have implemented ERP packages agree that certain costs are more commonly overlooked or underestimated than others. Armed with insights from across the business, ERP pros vote the following areas as most likely to result in budget overrun.

1. Training—Training is the near-unanimous choice of experienced ERP implementers as the most underestimated budget item. Training expenses are high because workers almost invariably have to learn a new set of processes, not just a new software interface.
2. Integration and testing—Testing the links between ERP packages and other corporate software links that have to be built on a case-by-case basis is another often-underestimated cost. A typical manufacturing company may have add-on applications from the major—e-commerce and supply chain—to the minor—sales tax computation and bar coding. All require integration links to

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BUSINESS TECHNOLOGY SECTION

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ERP. You're better off if you can buy add-ons from the ERP vendors that are pre-integrated. If you need to build the links yourself, expect things to get ugly. As with training, testing ERP integration has to be done from a process-oriented perspective.

3. Customization—Add-ons are only the beginning of the integration costs of ERP. Much more costly is actual customization of the core ERP software itself. This happens when the ERP software can't handle one of your business processes and you decide to mess with the software to make it do what you want. You're playing with fire. The customizations can affect every module of the ERP system because they are all so tightly linked together.
4. Data conversion—It costs money to move corporate information, such as customer and supplier records, product design data and the like, from old systems to new ERP homes. Although few CIOs will admit it, most data in most legacy systems is of little use. Companies often deny their data is dirty until they actually have to move it to the new client/server setups that popular ERP packages require. Consequently, those companies are more likely to underestimate the cost of the move. But even clean data may demand some overhaul to match process modifications necessitated—or inspired—by the ERP implementation.
5. Data analysis—Often, the data from the ERP system must be combined with data from external systems for analysis purposes. Users with heavy analysis needs should include the cost of a data warehouse in the ERP budget—and they should expect to do quite a bit of work to make it run smoothly. Users are in a pickle here: Refreshing all the ERP data every day in a big corporate data warehouse is difficult, and ERP systems do a poor job of indicating which information has changed from day to day, making selective warehouse updates tough. One expensive solution is custom programming. The upshot is that the wise will check all their data analysis needs before signing off on the budget.
6. Consultants ad infinitum—When users fail to plan for disengagement, consulting fees run wild. To avoid this, companies should identify objectives for which its consulting partners must aim when training internal staff. Include metrics in the consultants' contract; for example, a specific number of the user company's staff should be able to pass a project-management leadership test—similar to what the consultants have to pass to lead an ERP engagement.
7. Replacing your best and brightest—It is accepted wisdom that ERP success depends on staffing the project with the best and brightest from the business and IS divisions. The software is too complex and the business changes too dramatic to trust the project to just anyone. The bad news is a company must be prepared to replace many of those people when the project is over. Huddle with HR early on to develop a retention bonus program and create new salary strata for ERP veterans. If you let them go, you'll wind up hiring them—or someone like them—back as consultants for twice what you paid them in salaries.
8. Implementation teams can never stop—Most companies intend to treat their ERP implementation as they would any other software project. Once the software is installed, they figure the team will be scuttled, and everyone will go back to his or her day job. But after ERP, you can't go home again. The implementers are too valuable. Because the implementers have worked so closely with ERP, they know more about the sales process than the salespeople and more about the manufacturing process than the manufacturing people. Companies can't afford to send their project people back into the business because there's so much to do after the ERP software is installed. Unfortunately, few IS departments plan for the frenzy of post-ERP installation activity, and fewer still build it into their budgets when they start their ERP projects. Many are forced to beg for more money and staff immediately after the go-live date, long before the ERP project has demonstrated any benefit.
9. Waiting for ROI—One of the most misleading legacies of traditional software project management is that the company expects to gain value from the application as soon as it is installed, while the project team expects a break and maybe a pat on the back. Neither expectation applies to ERP. Most of the systems don't reveal their value until after companies have had them running for some time and can concentrate on making improvements in the business processes that are affected by the system.
10. Post-ERP depression—ERP systems often wreak havoc in the companies that install them. In a recent Deloitte Consulting survey of 64 Fortune 500 companies, one in four admitted that they suffered a drop in performance when their ERP system went live. The true percentage is undoubtedly much higher. The most common reason for the performance problems is that everything looks and works differently from the way it did before. When people can't do their jobs in the familiar way and haven't yet mastered the new way, they panic, and the business goes into spasms.

How do companies implement ERP projects?

Based on my observations, there are three commonly used ways of installing ERP.

The Big Bang—In this, the most ambitious and difficult of approaches to ERP implementation, companies cast off all their legacy systems at once and they install a single ERP system across the entire company. Getting everyone to cooperate and accept a new software system at the same time is a tremendous effort, largely because the new system will not have any advocates. No one within the company has any experience using it, so no one is sure whether it will work. Also, ERP inevitably involves compromises. Many departments have computer systems that have been honed to match the ways they work. In most cases, ERP offers neither the range of functionality nor the comfort of familiarity that a custom legacy system can offer. In many cases, the speed of the new system may suffer because it is serving the entire company rather than a single department. ERP implementation requires a direct mandate from the CEO.

Franchising strategy—This approach suits large or diverse companies that do not share many common processes across business units. Independent ERP systems are installed in each unit, while linking common processes, such as financial bookkeeping, across the enterprise. This has emerged as the most common way of implementing ERP. In most cases, the business units each have their own "instances" of ERP—that is, a separate system and database. The systems link together only to share the information necessary for the corporation to get a performance big picture across all the business units or for processes that don't vary much from business unit to business unit. Usually, these implementations begin with a demonstration or pilot installation in a particularly open-minded and patient business unit where the core business of the corporation will not be disrupted if something goes wrong.

Slam dunk—ERP dictates the process design in this method, where the focus is on just a few key processes, such as those contained in an ERP system's financial module. The slam dunk is generally for smaller companies expecting to grow into ERP. The goal here is to get ERP up and running quickly and to ditch the fancy reengineering in favor of the ERP system's "canned" processes. Few companies that have approached ERP this way can claim much payback from the new system. Most use it as an infrastructure to support more diligent installation efforts down the road. Yet many discover that a slammed-in ERP system is little better than a legacy system because it doesn't force employees to change any of their old habits. In fact, doing the hard work of process reengineering after the system is in can be more challenging than if there had been no system at all because at that point few people in the company will have felt much benefit from the new software.

For additional information about ERP, contact Donna Lampe at DLampe@mttc.org or (502) 638-4410.

Leadership and self-deception

By Angel D. Jones, Organizational Consultant/Trainer

Important organizational issues, such as leadership, motivation, teamwork, and accountability are often viewed as separate problems. Often, however, they are symptoms of a common, deeper problem. Consequently, attempts to effectively solve these surface problems are thwarted. Of great concern to an organization's leadership is one's inability to see his/her role in a problem. Such self-deception can be detrimental to an organization in a variety of ways.

To manage self-deception in an organization it is important to understand the nature of self-deception and implement strategies to avoid it.

Leading from "inside the box" is the method by which self-deception becomes prevalent in an organization (The Arbinger Institute, 2000). Leading from "inside the box" means putting one's own needs above the organization and those they lead. Others are viewed as objects as opposed to people with similar needs. A leader who leads from "outside of the box" sees others' needs as equal to his/her own.

Leaders end up "in the box" through self-betrayal. Self-betrayal occurs when one acts contrary to the way one feels they should in a given situation. Thus, it becomes necessary to perceive the situation in a way that justifies the self-betrayal. A self-justifying world distorts one's view of reality. This distorted view causes us to inflate others' faults, our own virtues, and the value of things that justify the behavior, and also causes us to blame others. Over time these boxes become characteristics of who we are and this provokes those we lead to be "in the box". We invite mutual mistreatment and provide excuses to stay in the box.

The organizational results from leading "inside the box" are lack of commitment, reduced engagement and motivation, trouble-making, conflict, back-biting, poor attitudes, mistrust, lack of accountability, poor teamwork, and communication problems (The Arbinger Institute, 2000).

Fortunately, there are several techniques that we can use to help us get "out of the box". One way is to enthusiastically focus on results, rather than on particular processes or duties. It is also important to help others achieve results. Another technique is to actively learn from and teach those around you. Always seize learning or teaching moments. A third technique is to focus on solutions to problems, not on the problem or who is to blame. Looking for someone to blame is counterproductive when dealing with a problem. Take constructive criticism easily. Look at it as a way to grow and better yourself, not as an attack on who you are. Hold yourself accountable, take responsibility and acknowledge your mistakes. No one is expected to be perfect and you will earn more respect and people will better relate to you when you acknowledge your shortcomings. Lastly, inspire trust in those you lead. There is nothing more important in any relationship than trust.

The bottom-line is when we are "in the box" we can't focus on organizational results because we are too busy focusing on ourselves. The "box" is a metaphor for how we resist others. Regardless of how a leader acts outwardly, followers can sense incongruence between a leader's actions and his/her true attitude. Given time, people can always detect hypocrisy and they come to resent it. When we are in the box we are self-deceived; blind to the truth. Although we may never stay completely outside of the box our success in an organization and leading others comes from those times that we are completely leading from outside of the box.

For more information on this and other leadership topics, email Angel Jones at ajones@mttc.org or call (502) 638-4463.

Start low, no dough. Start high, money to buy.

By Jeffrey Gitomer, Guest Columnist

I got a one-line e-mail the other day:

"How can I get around a lower-level person (without making them mad)?"

Ever been blocked before?

It's a pretty common problem in sales. It occurs for 2.5 reasons:

1. You get an inquiry from a lower-level person directed by the boss to go on a scouting mission, find facts and prices, and report back to daddy.

2. You make a sales call on the lower-level person only to find out that they're an influencer, not a decision maker—and they won't let you talk to their daddy.

2.5 You finally get to the person you think is a decision maker, only to find out that this person is not the decision maker. Bigger problem: You don't even know who their daddy is.

The lower-level person has this mission: To protect (keep you away) the boss from salespeople.

The goal of the salesperson is to make the sale, even if he has to climb Mount Everest.

The goal of the boss is to find the best solution and the best opportunity with the least amount of direct connection or hassle.

So, how do you get around this lower-level person?

OBVIOUS ANSWER: Never go to the lower-level person.

The higher you start, the easier it is to get to a real decision maker. Salespeople go to a lower-level person because they think it's an easier level of entry, when in fact, it complicates everything.

Sometimes you get to the higher-level person, only to find that the higher-level person wants to get rid of you. As a result, you get dropped down to the lower-level person. The reason? They have no interest in buying what you're selling. And you're offering no help. No value.

Think about this at the higher level: Does the big boss want to buy a copier, or does he want his people happy because the copier is capable of providing high productivity and a great image? That's what a copier does. Bosses are not "features and benefit" people. They're "big picture" people.

If you do get around the lower-level person to a bigger boss, once you get there, you better not be giving them a sales pitch. You better have something of value to offer. Otherwise, they'll send you back to the basement where you belong.

If you have made the mistake of "going lower-level" and need to move up the ladder, say to the lower-level person, "I have a list of half a dozen questions that I would like to ask you and Bill (or you and your boss), and I was wondering if it would be possible to set that meeting within the next few days."

BETTER ANSWER: The easiest way to get around the lower-level person is to include them. This way they don't feel threatened.

WORST CASE SCENARIO: The lower-level person is blocking you from getting to the higher-level person. This is common in spineless, corporate, political environments. In other words, the lower-level weasel that you're talking to is refusing to do the best for his company. Instead, he is doing whatever he can to maintain his meager, political presence.

BEST ANSWER: (And my recommendation) Get to a higher-level person by using higher-level information. You can't get to a higher-level person with the same information you presented to the lower-level person. You have to go in with lots of ideas that positively impact your prospect's productivity and profitability. You have to go in with an article that you just wrote for their industry-related publication. You have to go in with critical information. Critical information that doesn't interest the lower-level person, but that is crucial to the higher-level person.

NOTE: This technique can also be used for getting around a purchasing agent to the boss.

IMPORTANT NOTE: Don't throw the lower-level person under the bus (even though it's tempting). Just say that you have information that you consider crucial to the higher-level person, and that you wanted to deliver it personally. When you meet with the higher-level person, close the sale as fast as you can because I guarantee you that the lower-level sniveler will do everything he or she can to puke all over your birthday cake.

Want to know what a higher-level person would consider to be crucial, critical information? Go to www.gitomer.com, register if you're a first time user and enter HIGH LEVEL into the GitBit box.

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