

Innovation In Warehousing

Editor's Note: A special report about business innovation published in the April 24, 2004 issue of the Economist provided the inspiration for this article. To gain an academic's perspective of the process, we studied "The Innovator's Dilemma," by Clayton Christensen, a Harvard Business School professor. Written during 1997, it is considered to be one of the prime sources of business innovation ideas. We also identified and described individuals involved in warehousing, who are, in our opinion, true innovators. Because our list is not intended to be complete, we invite our readers to submit names of additional people who should be added to our list of innovators.
KBA

Conventional wisdom tells us that warehousing is a stodgy business, hardly a fertile field for innovation; yet, ample evidence exists to contradict that belief. That evidence is the focus of this article. Clayton Christensen described several principles of innovation, most of which can readily be applied to the warehousing industry. The following are some examples of those applications:

- Companies depend on customers for ideas and resources. Some of the innovations seen in warehousing were adopted to fit the specific needs of major customers.
- Markets that don't exist can't be analyzed. Warehousing innovations have opened new markets that never existed before.
- An organization's capabilities define its disabilities. Some once great names in warehousing no longer exist today.
- Technology supply may not equal market demand. Great ideas in technology will not always find a market in the warehousing business.

Managing Disruptive Change

Christensen observed that many innovations have resulted from responses to disruptive change. Consider the many disruptive changes that influenced the logistics industries during the past several decades, including these:

- ① Deregulation of common carriers caused the disappearance of powerful, long-established transportation companies, in all modes. Eastern Airlines, Conrail, and Consolidated Freightways are just a few of the 20th-century powerhouses that no longer exist today.
- ② The decline of organized labor as a major force in

warehousing, as well as many other industries, occurred at the same time as deregulation; however, one did not necessarily cause the other. The failed PATCO (Professional Air-Traffic Controllers Organization) strike of 1981, is seen as the turning point for labor unions. Today, the great majority of warehouse service providers are nonunion, while unions were the norm just a few decades ago.

- ③ Change in tax laws, and change in supply and demand, have influenced the attractiveness of investment in warehouse real estate.
- ④ Change in logistics control from manufacturers to retailers has altered the way in which warehousing services are marketed.
- ⑤ The decline of boxcar traffic on the railroads has led to changes in the design and function of many warehouses. At one time, nearly all warehouses had a rail siding, a feature which rarely exists in newer structures.

While some of these changes have been disruptive, others have resulted in new opportunities. The theory of postponement, first suggested by a marketing professor more than a half-century ago, has become increasingly fashionable. Postponement has sparked new interest in the combination of packaging and warehousing, as warehouse operators and their customers seek ways to reduce inventory investment by postponing final assembly, branding or passage of title.

Management of returns is a warehousing specialty that was not dreamed of a few decades ago. Inventory management, transportation management, cross docking, intermodal traffic management, and fulfillment are some additional contemporary warehousing services that were ignored or non-existent.

Capabilities and Disabilities

Some warehousing organizations that were designed to leverage the capabilities of real estate developers, disappeared as the real estate market changed. One example is the sale of Trammell Crow Distribution Corporation to Exel during the 1990's. ProLogis, a real estate investment trust, experimented briefly in the refrigerated warehousing industry, by acquiring several operating companies, and later selling them.

During the 1970s, Eastern Airlines, in partnership with a manufacturing company and an engineering firm, formed National Distribution Services, the ambitious pro-

gram that failed within its first year of operation.

Several warehousing companies developed consolidation programs that were no longer relevant once deregulation allowed reductions in freight rates.

Some companies prospered through the pioneering of information technology, but not all of them survived. One national leader in the use of barcode technology in public warehousing no longer exists.

Most warehousing companies considered the Polaroid camera to be an essential tool in recording cargo damage until digital photography killed Polaroid. A warehousing company that pioneered the use of a standard building design in the construction of new warehouses, went into bankruptcy during the mid-1970's. Innovators, like pioneers, face the danger of arrows in their backs.

Five Examples Of Innovation In Warehousing

Let's consider five outstanding examples of innovation in warehousing. If you know of other good examples, we would like to hear from you!

AIRBORNE. Airborne Logistics Services (now merged with DHL) was created to leverage the capabilities of Airborne Express and the former Wilmington, Ohio Air Force base that the company purchased. Ken McCumber, retired Senior Vice President, described how Airborne upstaged its larger competitors in the overnight package delivery business by developing hub warehousing. Airborne collaborated with three real estate developers to construct millions of square feet of new facilities on surplus land along the runways of the airfield in Wilmington, and later in Columbus.

Because the buildings were located at the air hub, the cutoff for shipments could be several hours later than shipments from other origin points. Furthermore, because the origin was at the hub, less air transport was involved, which justified a lower price for freight services.

The combination of lower prices and a later shipping cutoff attracted a variety of customers from firms where rapid delivery is important, such as the distribution of critical parts and health care supplies.

As development progressed, a Foreign Trade Zone was established to provide shelter from state inventory taxes, as well as customs duties. When the expansion of warehousing outstripped Wilmington's capabilities, Airborne moved north to Columbus, with special trucking services to move freight directly to the hub.

Perhaps the distinctive feature of Ken McCumber's innovation is that while other logistics service providers *could* have done what he did, none succeeded in executing a hub warehousing program on such a grand scale.

CASESTACK. CaseStack Inc. is a highly innovative company; in fact, it is the only virtual logistics service provider that we know of. The company offers distribution centers and delivery services from six points in the United States, plus Toronto, Canada, but it does not own a single warehouse or truck. It specializes in logistics outsourcing services, tailored to meet the needs of midsized CPG (consumer packaged goods) companies. CaseStack uses proprietary web based software which allows smaller manufacturers to have a comprehensive in-

formation system at a bargain price. The company also partners with retailers, by allowing buyers to execute multivendor master purchase orders buying truckload quantities from more than one manufacturer.

Dan Sanker is the innovator who created the company. He learned the grocery business as an executive at both Procter & Gamble and Nabisco prior to joining Deloitte as a consultant specializing in software solutions in the implementation of enterprise systems. His experience left him with several strong beliefs: A few manufacturers handle logistics extremely well, while most do it poorly; furthermore, many of the software solutions are too expensive for the middle-market user. Sanker determined that although a critical need exists for the development of a shared information system, the software industry, like computer hardware, does not have a bright future. He believes that software prices are destined to continue dropping with resulting margin pressure. Therefore, he decided to create a full logistics service that includes warehousing and delivery, rather than simply building an information based company.

CaseStack's system is based on the ASP (application service provider) model, and is accessed on the web. The system enables retailers and manufacturers to handle demand planning and inventory management tasks; however, unlike many other software services, Sanker's is successful because it goes beyond information to include logistics implementation.

GAGNON. Prior to the early 1970's, a systematic method for determining the cost of materials handling within the warehousing business did not exist. Tables were available to calculate the cost of storage, based on pile height, but when it came to calculating the cost of handling the warehouse operator was forced to make general estimates, or to seek help by comparing notes with other operators or the customer. Unfortunately, none of these outside sources were reliable, because engineering was not applied to the development of cost calculations.

During 1973, Eugene Gagnon, a professional engineer, collaborated with the American Warehousemen's Association to develop a methodology for calculating the cost of warehouse handling. Gagnon worked with more than a dozen members of the trade association in the application of "master standard data" to a warehousing environment. The Association published a report, *Standard Time Values for Warehouse Handling*, a comprehensive looseleaf notebook that included methodology, data, and forms. Gene Gagnon also developed a comprehensive workshop to teach implementation of the data. In this training session, warehouse operators learned to adapt the notebook content to their own operations.

Gagnon also worked with a number of unionized grocery chains to apply a similar system in their warehouses. These situations required the cooperation of union leaders and workers, as well as management.

Today, a number of software providers offer the blending of master standard data with a productivity measurement system. While other firms have refined the process during the past three decades, Gagnon was the innovator who first demonstrated that engineering data can be applied to warehouse operations.

GENCO. Herbert S. Shear is CEO of GENCO, one of the nation's major logistics service providers. Until the late 1980s, GENCO was a Pittsburgh company having nearly all of its operations in western Pennsylvania. GENCO's most significant innovation came at the request of a local drug chain, which needed a program to handle store returns. The company had no method for handling the customer returns that clogged the distribution center. In addition to physical handling, the customer wanted a software program for processing returns. At that time, GENCO had no bar code scanning capabilities, and very basic warehouse systems; however, Herb Shear recognized the opportunity to solve a customer problem. The development of reverse logistics as a specialty created a unique value proposition. He seldom was bidding against other logistics service providers, because the only competition was the "do-it-yourself" option.

Once it had solved the customer return problem of the drug chain, GENCO sought other retail customers for its software. One retailer indicated an interest in the software, but also requested that GENCO develop a team to physically handle returns at a nationwide returns center. Shear considered his primary product to be software, but the customer wanted more than that. The new operation was quite successful, and GENCO's demonstrated skill in handling store returns became Shear's springboard for developing return centers for other customers.

Not all customers were retailers. One customer, a manufacturer of cosmetic products, had a policy of destroying any product that was returned for any reason. Working with GENCO, it was determined that many of the returns were salable and procedures were developed for repackaging or relabeling in order to create a market for returned merchandise. GENCO also developed systems for disposition of obsolete product overseas and even a procedure for selling unwanted merchandise.

As the company expanded rapidly during the 1990s, Herb Shear recognized that additional skills in software were needed, so he acquired a designer of warehouse management systems, Alpha & Omega. This enabled GENCO to design software systems that could be installed in all of its operations.

Shear recognized that the next step was to use his base of returns centers to offer conventional warehousing services, which was accomplished through a merger with Cumberland Warehouse Services, a major logistics service provider based near Harrisburg, Pennsylvania. By combining reverse logistics with conventional warehousing skills, GENCO grew at an even faster pace.

All of this success has not deterred Herb Shear's creativity. The company currently is developing a software program to control parcel delivery costs. The program has the potential to save significant amounts of money for parcel delivery users. Typically, these same retailers are potential customers for GENCO's reverse logistics programs.

Shear's newest innovation is a maintenance program for private fleets, and common carrier truckers. This is both a software and a conventional maintenance service, which likely will lead GENCO to establish truck maintenance centers at key points throughout the United States.

LEANLOGISTICS. Craig T. Hall, founder and chairman of LeanLogistics, (www.leanlogistics.com) is a significant innovator in the warehousing and logistics industries. As early as the 1970's, he developed a prototype warehouse management system for his father's public warehousing business, Taylor Warehousing. During the 1980's, he converted the system into *Tinman*, an acronym for "Total Information Management," and began to sell the warehouse management system (WMS) to other warehousing companies. *Tinman* was the first WMS to offer terminal access, a feature that permits the customer direct access to data in the computer, without compromising security. In other words, each customer can see only his own account, not data belonging to others.

Subsequently, Craig changed Taylor Warehousing into Total Logistic Control, also known as TLC. Under Craig's leadership, the company offered a "three-legged stool" based on warehousing, transportation and information management. TLC handles both refrigerated and dry warehousing. In marketing its services, TLC emphasized *total* cost, rather than the individual cost of any of these three elements. In order to sell its total cost package, the marketing effort was aimed at Chief Financial Officers, and other "C level" executives. A major distributor of diet food products that used TLC to manage inbound freight, work in process, and finished goods, stimulated rapid expansion of TLC to other regions of the country.

After selling his interest in TLC, Craig Hall pursued other activities focused on the use of information technology. During 1999, he founded LeanLogistics, a software service designed to help companies manage their carriers. Craig believes that LeanLogistics has redefined the way in which transportation is managed. Instead of merely searching for the cheapest price, transportation is recognized as a perishable commodity because unsold space in a moving trailer can never be sold again. By matching excess capacity from over 1500 motor carriers with the immediate needs of a group of clients, "on-demand" information service is available that can save both money and time for the shipper, while at the same time revealing new revenue sources for the carrier. AMR Research interviewed three users of this service and reported that "all cited the speed of getting started, the ease of use and implementation, and the fact that the operation paid for itself immediately," as strengths of the service.

The Innovation Dilemmas

Christensen observed that the pace of progress does not always follow the pace of technology.

In at least one of the examples described, the innovation was stimulated by a customer need, rather than a new technology. The innovator who relies on methodology that can't be sold in the marketplace, eventually will fail.

Innovation requires resource allocation. Great ideas require money, and not every innovator can attract the capital needed to turn a dream into a reality. Some capabilities may be too specialized. The talent is available, but the market does not need it.

In spite of all the roadblocks, there is ample evidence that innovation is alive and well in the warehousing and supply chain management businesses.

WAREHOUSING TIPS

Temperature Control And Space Productivity

Intelligent use of space is important in every warehouse, but it is critical in frozen or chilled warehousing. The cost of building and maintaining each cubic foot of temperature control space can be five to 10 times the cost of dry (unrefrigerated) warehousing. Furthermore, the cost for maintaining empty cold storage space is as high as the cost for storing refrigerated product.

Yet, we frequently see substantial amounts of wasted space in coolers and freezers. The wasted space can be substantially reduced through the use of very narrow aisle lift trucks and storage equipment designed for high-density, coupled with careful storage planning, to ensure that a minimum number of cubic feet are wasted. While creative space planning is important in every warehouse, the reward for improving space utilization in a freezer is several times higher.



Hiring With Your Gut

While human resources experts suggest the use of tests and complicated procedures to improve the hiring process, intuition often is the best guide in making a decision to hire. After completing an interview, ask yourself the following questions:

- Do I really trust this individual?
- If I were a customer, would I react in a positive way to this applicant?
- Is he/she a good listener?
- Did the applicant spend the time to learn about our company?
- If I were removed from my job, could this person take over for me?

Depending on the job description, you may not need to answer “yes” to all of these questions, but if you cannot say yes for most, your gut is sending you danger signals.



The Top Concerns

Thomas Regional© published its top concerns for wholesale distributors. All of them also would apply to warehouse operators. They are listed here:

- Doing more with less
- Saving space
- Improving inventory control
- Consolidating warehouse networks
- Tracking merger and acquisition (M&A) activity
- Improving customer service
- Introducing new technology
- Tracking the trend of increased use of logistics service providers (LSPs)
- Controlling labor costs
- Promoting team effort

The Absenteeism Issue

A leading Japanese auto manufacturer makes tardiness and absenteeism prime issues in deciding whether or not to retain probationary employees. We find that the issue of absenteeism frequently is ignored or overlooked in evaluating warehouse workers, with few companies maintaining statistics on punctuality and absenteeism. The Japanese auto manufacturers emphasize the obvious fact that cars cannot be built when employees are absent.

Nearly all of us have experienced poor service in a restaurant because it was shorthanded. Even when the cause of the delay is obvious, our annoyance at receiving slow or inattentive service usually is not reduced. Warehouses experience a similar problem. Our customers expect the shipments to go out on time, and they expect the inbound product to be received promptly and accurately. They have no more patience with the problem of absent workers than do restaurant customers.

Do you maintain records on punctuality and attendance for your hourly employees? Are the results for 2004 better, or worse than last year? If they are worse, what are you doing to correct this problem?



Effective Exit Interviews

High employee turnover is a sign of trouble in any company, so it is worthwhile to determine why any good worker decides to leave. Exit interviews are a very important method for learning why people are leaving. Several rules always should be applied to exit interviews. The interviewer should be alert for potentially damaging complaints. Any discussion of harassment or discrimination must be taken very seriously. Steer clear of any illegal personal questions, such as age or illness. Careful note taking should be used to record the comments of the interviewee, and the interviewer should remain neutral and professional. For example, this is not the time for the interviewer to express opinions about the company. Finally, the exit interview should be scheduled at a time convenient to both parties, and allow ample time for discussion. Squeezing the interview in as the employee is leaving will not achieve the desired results.



Justifying The Warehouse Management System

Vendor advertising sometimes provides clues about the metrics needed to justify your WMS. As with most advertising claims, a conservative approach is to divide by two, assuming that the marketing staff has not exaggerated by more than 100 percent. One advertisement makes the following predictions: Inventory will be reduced by more than 50 percent over a three-year period; labor savings should run between 20 and 40 percent; indirect staffing should be reduced 15 to 25 percent; space utilization will be 10 to 20 percent more efficient; and costs of conducting a physical inventory will be reduced by 75 percent. If you determine that these claims seem to be reasonable, they provide a starting point in justifying the acquisition of new software.

KEN'S COMMENTS

Never Say No Or Can't



Not long ago, we contacted three airlines by telephone for information. The responses were an illuminating study in good and bad customer service. The application for warehouse customer service is evident.

After hearing my questions, the immediate response of the first airline representative was "We cannot do that; we no longer have those fares." Only after further questioning, did she finally tell me what they can do. The initial response, and my reaction, was quite negative: Don't use that airline if you can avoid it. The second representative said, "We don't serve that city, but let me tell you which airlines do." Clearly that was a positive response, and one which encourages us to use that airline in the future.

The third telephone call was answered with a recorded: "We apologize for the delay.....". Yet, it was less than a minute until an agent answered the phone. Our reaction was that this airline usually is screwed up, but today we were lucky.

Nobody likes to hear "no" or "can't", and apologies are not always helpful. If you must describe what you can't do, start out by telling what you can do. If you are forced to say "no" try to offer some options. If an apology is appropriate, always describe what you will do to keep this from happening again. In other words, train customer representatives to emphasize the positive.



Meetings

Every time I attend a poorly run meeting, I remember how much time is wasted by unnecessary or badly organized business meetings. Yet, meetings are an essential part of our work. Humans are social animals, and are more comfortable with their decisions when they are endorsed by a group. Furthermore, creative ideas can be generated by the give and take of a good meeting.

Frequently, meeting time is non-productive. The reason could be that the meeting is longer than necessary either because a few talkative people dominated the meeting with unnecessary chatter, or because the meeting was not well-organized. It is important to remind ourselves of the hallmarks of a good meeting:

- It starts on time, and it also ends on time.
- An agenda is prepared before every meeting.
- The most important agenda items are at the beginning of the list.
- The meeting chair controls discussion to limit filibuster attempts.
- The only people invited are those who have something to contribute.
- Sometimes participants can be excused after they

complete their portion of the agenda.

- One person is appointed to take minutes, which are distributed within two days of the meeting.
- Before leaving the meeting, everyone present knows what he or she is supposed to do next.

It is important to consider communication methods that can eliminate meetings. E-mail is one alternative since it is easy to send multiple copies of an electronic message, and for each receiver to respond to the sender and other recipients. Telephone conferences are another meeting option, but, like face-to-face meetings, they work only when tightly controlled.



Logistics Companies On A Collision Course

Last winter we were shocked to learn from an executive of National Association of Wholesaler-Distributors, that their group views itself in head-to-head competition with logistics service providers. I was in the logistics service business for more than two decades, and also have provided management advice to both wholesalers and logistics service companies. We have never seen evidence of this competitive pressure.

After reading, *Facing the Forces of Change*, a study created for NAW, and having a long phone conversation with its author, Dr. Adam Fein, it is easier to understand why the "collision course" is described in this book not once but repeatedly throughout the text. The primary distinction between a warehouse service provider and a wholesaler, is who holds title to the inventory. Technically, the logistics service provider (LSP) can do many of the same things that the wholesaler does. In some cases, the best LSP may outperform some of the less efficient wholesalers. Furthermore, at a time when UPS and others have mounted a giant advertising campaign to sell supply chain services, it is natural for some wholesalers to believe that they are under pressure.

There is one development that supports Dr. Fein's thesis. Within the past year, a number of warehouse service providers have told us that clients are asking them if they will take title to the inventory, in effect converting them to wholesalers. The operators who told this to us really do not want to own the merchandise, and they always negotiate a guaranteed buyback so they are not speculating with their customers' inventory.

A number of logistics service companies have their roots in wholesale distribution, and Fein's advice to the worried wholesaler is: "If you can't beat 'em, join 'em."

During the 21st century, supply-chain management has blurred the distinctions between wholesalers and service providers, between truckers and warehouse operators, and between packaging and logistics. As the business of managing materials becomes more complex, shippers are looking for new approaches to the business of bringing product from field to factory, and finally, to the consumer. Within the 21st century supply chain world, contract packagers, warehouse service providers, common carriers, wholesalers, and even staffing services, may all be in competition for the job of managing materials.

Facing The Forces Of Change

By Adam J. Fein, Ph.D., Pembroke Consulting, copyright 2004 Distribution Research and Education Foundation, 187 pages, www.naw.com.

Described in this study, written for wholesaler-distributors, and commissioned by their trade association, are the opportunities and challenges facing the wholesale distribution industry. Included within are reviews of customer self-service, strategic sourcing, fee-based pricing, logistics and fulfillment, and emerging trends. The primary focus of this text is the fear that logistics service companies represent a competitive threat for wholesalers.



Funding Growth In An Age Of Austerity

By Gary Hamel and Gary Getz, *Harvard Business Review*, July-August, 2004, pg. 76.

Real growth depends on innovation, and creating an innovation friendly company need not be expensive. The authors measured innovation potential with the following ratios:

- Raise the ratio of innovators to total number of employees
- Raise the ratio of radical innovation to incremental innovation
- Raise the ratio of externally sourced innovation to internally sourced innovation

Several approaches to testing and experimenting in the workplace are described.



Hybrid CTO

By Krishna Rupanagunta, *APICS*, February 2004, pg. 45.

While written for the manufacturing field, this article should be of interest to any warehouse operator who includes final assembly as a value added service. The two traditional manufacturing strategies are make-to-stock (MTS) and configure-to-order (CTO). The author suggested a hybrid, in which a substantial amount of nearly finished product is produced through MTS, with some final touches added to customize the product. That final customization frequently can be completed within a distribution center.



Rethinking Recycling

By Tom Andel, *Material Handling Management*, May 2004, pg. 35.

Recovery of waste and damaged merchandise is a growth business. During 2000, 30% of residential and commercial waste was recovered, compared to 16%, 10 years earlier. The refurbishing/remanufacturing market is a growth industry with \$53 billion revenue, 73,000 firms and 350,000 employees. Suppliers include some companies in the warehousing industry.

Lean Supply Chain

By Tom Craig, *World Wide Shipping*, July/August 2004, pg. 14.

In this article, the principles of lean manufacturing are adapted to supply chain management. A number of specific ideas for developing lean management techniques are presented. The best of them are listed here:

- Understand “lean” as an ongoing, continuous improvement approach.
- Analyze the total supply chain process, not just part of it.
- Drive for root causes, not symptoms. For example, freight cost can be a problem or a symptom.
- Ask customers how effectively your supply chain operates.
- Assess where standardization is feasible, and where customization is needed.
- Involve your staff.
- Investigate reasons why product does not flow in a consistent manner.



Voice Technology Emerges

By Ron Hounsell, *Operations & Fulfillment*, February 04, pg. 12.

Provided in this short article is a useful update on implementation of voice technology in the warehouse industry. Names of companies applying this technology in the grocery industry are recited, and sources are provided for both hardware and software. Although cost of this technology is falling, no prices are cited in this article.



Consolidation Means More Stress

By Alex Koleszar, *Material Handling Management*, February 2004, pg. 53.

When two companies merge, a frequent next step is to consolidate the warehousing program. Frequently planners underestimate the space challenge, resulting in too much product for the space available. The best warehouse operators will anticipate this problem and be sure that the space requirements are calculated carefully in advance.



Many Safe Returns

By John R. Johnson, *DC Velocity*, July 2004, pg. 28.

Concentrating on the reverse logistics problems of high-end merchandise, such as electronics, the article emphasizes the problems of controlling customer returns. Obsolete and returned product must be handled in a way that insures it does not leak back into the market. When product is destroyed, a certificate of destruction must be obtained.