

# The Changing Role of Inventory Specialists in Logistics

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## ABSTRACT

This article provides a description of the changing role of inventory specialists in logistics, their competencies, job requirements, training needs, and personality traits. Four key findings for developing effective training options are discussed. The data come from an original research project funded by CSCMP.

**Keywords:** Logistics, Inventory, Training, Competencies, Job Requirements

## 1. INTRODUCTION

The inventory/ material control function is in a period of evolution. Reengineering has resulted in the blurring of the lines between inventory and material control, purchasing, customer service, and warehouse specialists (Cooper and Stephan, 1994; Lawrence, 1999; Lawrence and Varma, 1999). Enterprise resource planning is becoming the standard for controlling inventory throughout the supply chain.

In the past, standard operating procedures ruled. Responses were limited to those that did not deviate too far from standard operating procedures. Time to competence was not important because the primary tool inventory control/material handling personnel needed was their physical strength. Any training that did occur was provided by on-the-job experience or supervised by workers thought to be the best. Performance was measured by the number of units that passed through a particular point (Lawrence and Varma, 1999). In addition, the 1980's and 1990's saw many manufacturers beginning to focus on core competencies and outsourced logistics activities (Daugherty, 2011) with this trend predicted to continue (Hameri and Hintsa, 2009).

Today, the modification of the inventory/material control process is being influenced by a number of factors. Electronic data interface (EDI) allows organisations to examine their inventory management staffing needs and suggest significant changes to procedures as well as link the various parts of the supply chain management system together (Wu, Yenyurt, Kim, and Cavusgil, 2006). The use of information technology (IT) for supply chain management (SCM) is becoming more important in this global and competitive context (Larson and Gammelgaard, 2001; Li, Yang, Sun, and Sohal, 2009). IT provides timely, accurate, and reliable information enabling inventory quantities and locations to be tracked electronically, updating files daily and reducing paperwork. A significant effect of IT on logistics is the development of "separate but linked intermediaries" for processing physical goods and their information (Lewis, 2001).

Inventory's impact on the manufacturing process, warehousing, and transportation costs are measured to identify how changes in inventory levels affect other processes. Literature suggests that supply chain's aim should include both the reduction of costs without negatively impacting customer service as well as service improvement without disproportionately increasing costs (Larson and Gammelgaard 2001; Stank, Keller,

and Closs, 2001.). The reduction of cost base will also positively impact profits (Johnson and Templar, 2011). In fact, research has indicated a significant positive relationship between inventory performance and financial performance within manufacturing (Bhattacharya and Gaur, 2011; Capkun, Hameri, and Weiss, 2009; Hauser, 2003; Hofer, Eroglu, and Hofer, 2011; Stapleton, D., Hanna, J.B., Yagla, S., Johnson, J. and Markussen, D., 2002). Zsidisin (2003) found that purchasing and supply management significantly impacted profitability in the form of money saved in purchased goods and services. The author further suggested that strategically managing the purchasing process will reduce cost and waste.

More recently, time to competence has become much more important because now individuals not only have to master physical activities, but also complex inventory management systems. Performance is viewed at an organisational and departmental level as well as on the individual level (Richter and Král, 2010). Communicating and integrating the goals of both purchasing and inventory management into corporate strategy elevates the function to a strategic level (Zsidisin, 2003).

To better understand the nature of these changes, we undertook a multifunctional, multi-organisational job classification study, the first of its kind. In this study, the researchers used a sample of logistics jobs to establish a baseline for evaluating job changes in the future as well as for current job requirements and training needs. Through interviews and additional surveys, we attempted to put the job classification findings into a broader context. This article focuses on the growth and development of a particular job family, that of the inventory specialist.

The article is divided into two parts. The first part features the methodology used in the study. Next follows a summation of key findings and takeaways. This is followed by a description of inventory specialists, their competencies, job requirements, and training needs. The second part discusses four key findings to consider when developing a training approach, followed by a conclusion.

## 2. METHODOLOGY

To gather data, the Common Metric Questionnaire (CMQ), a descriptive survey of logistics human resources practice, was used along with formal and informal interviews. From 43 logistics organisations, 632 responses to the Common Metric Questionnaire (CMQ) were received. The sample was a selected convenience sample. The 43 organisations included manufacturers, asset-based third parties, non-asset-based third parties, retailers, and

financial institutions. Companies ranged in size from 15 to more than 100,000 employees. The researchers visited 65 sites in 20 states to gather data. They also conducted 35 formal interviews with top managers and more than 200 informal interviews with managers, supervisors, and operating employees. In addition, 192 companies responded to the descriptive newsletter sent to them by the researchers. Competencies were subsequently derived from these interviews and surveys.

### 2.1 CMQ–Description and Administration

The CMQ boasts a validation database of over 100,000 observations on 8000 job families. The CMQ is comprised of more than 3000 items, although each subject was likely to address only a subset of that total. Responses to the CMQ reveal critical knowledge and skills for job performance, the frequency with which these skills are used, and the ways in which skills and knowledge were obtained. The responses also show job activities, such as attending meetings, lifting heavy objects, and interacting with people inside and outside the firm. These results fall into four domains, 80 dimensions, and 17 second-order factors. This detailed questionnaire helps determine competencies, job requirements, and training needs for each job family in the analysis. Questionnaire items also cover demographics, job basics, and knowledge requirements (Harvey, 1991).

### 2.2 Data Analysis

The data were analyzed using the Common Metric System (CMS), a proprietary system coupled with the CMQ. CMS clusters the data into job families based on the responses the researchers selected for inclusion in the analysis. Initially, seven a-priori job families or clusters were identified: senior management, logistics information systems, warehousing, material and inventory control, transportation, purchasing, and customer service. Three researchers assigned each response to these fields, with a first-time classification interrater correlation of .95. Researchers then worked with the exception responses to achieve consensus, ultimately producing an inter-rater correlation of 1.00.

The pre-classified responses were then included in a cluster analysis by job family. A job was retained in a classification only if its joint correlation with the other responses was .70 or higher. In this way, researchers were able to classify all 632 observations into 22 job families: one for broad responsibility senior management, two for

logistics information systems; six for warehousing, four for transportation, two for purchasing, three for customer service, and four for material and inventory control.

### 3. JOB DESCRIPTION

Wanted: Individual - strong of back, weak of mind. While extreme, this statement represents how some organisations viewed their inventory specialists in the past. Today, not only is physical fitness required, but mental ability is also becoming more important. While computerization and automation reduce both the physical and mental demands, when an exception occurs, reasoning abilities are critical to maintaining operations. Inventory specialists represent the current pinnacle for material handling personnel. They combine physical abilities with computer literacy to assure materials move through the organisation expediently. Integrating the flow of data between customers and suppliers facilitates the task of balancing supply and demand throughout the network (Trent and Monczka, 1998).

Without inventory specialists, the flow of materials through an organisation stops (Sharma and Malhotra, 2012). This position represents the knowledge and skills required by personnel who move materials in, within, and out of the organisation's physical control. The moment raw materials or component parts enter the organisation they are placed under the watchful eye of the inventory specialist. After coming in the backdoor, bar codes are scanned, entering materials into the inventory control information system. This step triggers several processes. First, quantity received is checked against quantity ordered. Second, quality control activities are done and findings communicated with the vendor and co-workers. Third, the inventory control specialist finds out the internal destination. Finally, a receiving report is generated and funds are transferred to the supplier.

Inventory specialists then place the materials on a conveyor system, carry it on their back, or lift it with a hand truck or forklift. No matter how and where it is transferred, at a minimum, they have to tell the inventory control information system that it has left receiving and is in a temporary storage location or on the production floor. Usually this task will require the inventory specialist to rescan the material and scan or enter the material's new location.

They are in constant communication with the firm's information system, identifying when material left and was delivered. As the internal transportation network, they are influenced by bottlenecks, whirlpools, and black

holes. Bottlenecks are locations where inventory flow is slow. Whirlpools represent processes that no one has optimally organized and require more handling than necessary. Black holes represent material that has entered the system, but no one knows what became of it.

### 4. COMPETENCIES

**Apply inventory and record control principles to assure timely delivery of materials according to company policies.** The Inventory Specialist is where the rubber meets the road. Inventory Specialists are responsible for implementing the firm's inventory/material control policies.

In the organisation they are the firm's carrier network. The firm's information system is analogous to transportation's dispatchers. Inventory specialists receive their "shipping manifest," pick up their load and deliver it to its destination. Their task is to assure that material arrives where it is needed, when it is needed, and is not damaged in the process. It's 4 p.m. and manufacturing is a hundred units short of being ready to ship that order today. Several manufacturing stations need raw materials, and effective inventory specialists review manufacturing needs, rank delivery order and start moving materials to where they are needed. Priorities are set according to company policies.

**Maintain data integrity by updating data files routinely.** Once a load is delivered, a competent inventory specialist updates or downloads inventory location files. Depending on the set-up, this may require placing a hand-held computer into a docking station, swiping a bar-code radioed to the network or following the directions on their printout or LCD screen. They exercise diligence, because forgetting to scan a location or material, downloading data at inconsistent intervals, or not precisely placing material reduces operating effectiveness.

**Effectively communicate with fellow employees to assure materials get to where they are needed when they are needed.** Drafting an award-winning proposal is not the inventory specialists' strength. However, their communication abilities are no less critical to their performance. Effective inventory specialists can defuse potential time bombs before they have a chance to detonate. It's 4 p.m. and several manufacturing stations have placed requests for materials. Each request is presented as more urgent than the one before. Through their interpersonal skills, effective inventory specialists contact manufacturing stations to discover present inventory levels. This information is used to

establish delivery priorities. They then have to tell their delivery schedule to the various manufacturing stations clearly. Two factors make this interaction difficult. First, inventory specialists do not have authority and are not supervised by the people relying on their service. Second, from the manufacturing person's perspective, their needs are more critical than other manufacturing stations' needs.

**Operate material handling equipment to reduce material damage.** Competent inventory specialists safely operate material-handling equipment assigned to them. This requires training, skill, and patience. Training provides the rudimentary knowledge they need to operate the equipment. Skill allows them to maneuver their equipment at top speed, yet maintain control to not jeopardize co-workers. Patience tempers recklessness. Patient inventory specialists realize that taking extra time at critical junctures – when sliding forks under a pallet or capturing a slip sheet – saves time and reduces the potential for material damage. Properly operating material handling equipment allows inventory specialists to maintain delivery and manufacturing schedules. Safely operating forklifts reduces material damage and employee injuries. Inventory specialists need a thorough understanding of the equipment they commonly use.

**Safely lift, carry, push, or pull material.** While inventory specialists' physical ability is not as important, they still have to lift, push, pull, or carry material for short distances. Employing proper lifting techniques means individuals can do the same volume of work at 5 p.m. that they can do at 8 a.m. Competent inventory specialists realize that a secondary factor affecting their ability to lift safely is pacing. When weight trainers are "maxing out," they will sandwich three to five minutes of rest between lifts. These rest periods give the body time to recuperate. Competent inventory specialists will sandwich short periods of inactivity between periods of physical exertion. Thus, they will pace themselves allowing their bodies time to recuperate and maintain a peak physical performance over a wider period.

## 5. JOB REQUIREMENTS

Inventory specialists must possess the knowledge and skills that will allow them to perform their jobs competently. These job requirements are precursors to competence. They come from the job classification questionnaire and include the knowledge and skills that the respondents say are widely used and absolutely critical to performance.

Inventory specialist positions are labour intensive. First,

and foremost, people in these jobs move materials through the organisation. While forklifts reduce the physical intensity, these individuals need to push, pull, lift, and carry 10-50 lbs. almost constantly. They have to be able to evaluate their hold on objects by using their sense of touch. Awkward packaging may cause individuals to strain, extend or twist, and challenge their ability to maintain their balance. Inventory specialists have to be masters of basic mathematical skills. They could not fulfill their record and inventory control responsibilities without basic mathematics skills. The importance placed on machine operations knowledge at first glance might seem out of place, but without this knowledge, inventory specialists would be like mice running on an exercise wheel. They use their machine operations knowledge to help them set delivery priorities to their manufacturing customers.

## 6. TRAINING NEEDS

Examining inventory specialists' responses about critical activities, knowledge, skills, and their method of learning those skills identified training needs. Production delays or shutting down a plant is unacceptable if it can be traced to poor execution resulting from personal incompetence or ignorance.

At a minimum, formal training is needed to teach inventory specialists how to access data and communicate electronically. While inventory specialists do not need proficiency in designing computer networks or computer operations, knowing how their information affects network operations enhances their diligence for maintaining data integrity. After the initial training session, computer training should focus on processes that are the exception rather than the rule. Training sessions may start with how to handle one or more exceptions followed by a discussion of routine processes. Reinforcing routine processes first results in fatigue; by the time exceptions are discussed, individuals have lost interest in the topic. By focusing on those processes less commonly used, IS personnel reduce the likelihood of receiving a phone call when inventory specialists encounter these exceptions.

Training material handling personnel about manufacturing operations may seem counter-intuitive. The increased adoption of enterprise resource planning systems assures that materials arrive only when they are needed. Inventory specialists that receive machine operations training will do a better job of prioritizing their schedule of activities. For example, an inventory specialist is scheduled to deliver loads to three different stations, and he or she

receives an exception request for materials at another station. By knowing each station's machine operations, inventory specialists can rank their delivery schedule to reduce overall downtime. Thus, instead of dropping everything and delivering the exception, they may deliver one or two of their scheduled deliveries first, to reduce machine inactivity.

### 6.1 Inventory Specialists' Personal Characteristics

Within inventory/material control personnel, inventory specialists have the highest neuroticism, agreeableness and conscientiousness scores. Their extraversion and openness scores are similar to the average. These scores mean inventory specialists are calm, achievement oriented, friendly, and conservative, and they like people. They do not have to understand how or why something works to feel comfortable with using or doing the activity. In business situations, inventory specialists take actions designed to satisfy and retain customers because they do not perceive their firms to be market oriented.

### 6.2 Inventory Specialists Summary

Inventory Specialist positions represent materials handling jobs' pinnacle of evolution. Not only are these individuals expected to transport material throughout the firm, they are expected to record vital information. The old adage of 'strong of back and weak of mind' is no longer relevant here. Inventory specialists' physical abilities are enhanced by their computer proficiency.

## 7. DEVELOPING A TRAINING APPROACH

Logistics organisations usually train inventory specialists through on-the-job experience (OJE). The responsibility for training is given to someone who is considered 'good' at the job, but not necessarily to someone who is good at training. Also, training is often missing from the trainer's job description. Regrettably, OJE yields uneven results because of its informality and lack of structure. It can lead to weak job knowledge and poor work practices, first because the 'trainer' may take little time from his or her own job to train the new person, and second because the 'trainer' may teach practices that are inefficient, outmoded, or unsafe. The 'trainer' may know too little, or even know the wrong things. These findings echo those of Lau (2010), who found that companies tend to

adopt on-the-job experience for purchasing and supply management staff, but lack a systematic purchasing and supply management training approach.

OJE may translate into good job performance if it takes place in the context of structured training, training where knowledge and performance outcomes are tested and measure. In 1976, a field experiment found that structured training cut the time to competency for operations workers by 72% (Collen et al., 1976, p. 13). As the job of inventory specialist becomes more complex, structured training is likely to produce even better results.

### 7.1 Best Practices: Key Skills to Develop

Two outstanding firms in this research rely heavily on structured training programs. They systematically reinforced OJE with formal, classroom training and measured on-the-job training. They developed these training programs over time and have thoroughly incorporated a training mindset into their organisational cultures. Their sustained approach helps keep even experience workers from falling behind.

These organisations stressed communications and interpersonal skills in training inventory specialists, just as they did with other logistics employees. This makes sense because logistics jobs require more interpersonal communication than many of those found in the CMQ database.

This training helps supervisors maintain their skills, but it also helps to prepare operating employees for promotion to supervisory positions. Within the context of inventory specialists, this is particularly pertinent as the next step in the organisation is that of inventory supervisor.

Many logistics organisations fail to provide such training at the supervisory and operating levels, or offer it inconsistently. Many firms assume that a college degree in business includes training in supervision, but most degree programs give supervisory skills little or no attention. Job experience may teach and reinforce bad supervisory practice as readily as it teaches and reinforces good practice.

Best-practice organisations in this research made training in communications, supervision, and interpersonal skills available to employees early in their employment with the firm and required it when promotion was imminent.

## 7.2 Making It Work: A System Wide View

The best practices firms also followed a principle stressed in this research: they distributed a shared, consistent view of the logistics system to all employees. One firm distributed large maps of their logistics system to each employee. These maps resembled the maps commonly found in shopping malls, clearly showing each employee where his or her job fit into the logistics picture—literally, “You are here” in this picture. This kind of shared view helps to foster conversations about the structure of the system, but does not preclude differing perspectives. A variety of perspectives can be valuable to the development and improvement of logistics systems, but employees should see the same system and work from a common set of facts about the system.

In too many firms, training consists of little more than new employee orientation. Long term employees may lose sight of their role in the system as it changes or even lack skills that are important to the changing system. If employees are to adapt to new systems, then firms must help them to maintain a concrete, fact based view of the system. This is clearly an internal responsibility; the firm cannot rely on outsiders to teach its own employees about its own systems. Outsiders may facilitate creating a common view, the organisation cannot itself avoid responsibility for keeping the content of training current.

Comprehensive training serves three main purposes: 1) creating a foundation for other training; 2) easing communication; and 3) recognizing the important tasks associated with each job. The system itself will often dictate training needs, but the people who develop training need a comprehensive understanding of those needs. This comprehensiveness helps employees to discuss the system in a language that they all share, so the amount of miscommunication will fall. This approach to training also helps employees realize the importance of the tasks they perform on the job. This confirms prior research suggesting the importance of coaching and training in logistics and warehouse employee performance (Ellinger, Ellinger, and Keller, 2003; Thomas and Mizushima, 2005).

## 7.3 Training Sources and Partnerships

Logistics managers cannot devote all of their time to training, but they can help to foster a culture of training in their organisations. They can also help to develop partnerships and other relationships with organisations that may become sources of training expertise. Logistics

managers will certainly retain direct responsibility for training, and need to maintain their own levels of expertise, but institutionalizing training in the organisation is crucial to long term success.

Logistics organisations should offer training to their inventory specialists through many sources. These sources may include community colleges, universities, training firms, web-based training, associations, and consulting firms. The organisation can create a training mix that uses these sources, plus its own resources to help training become part of the work life of employees at all levels.

Training programs can vary greatly in cost, time, content, and instruction. They should be evaluated in the same way that logistics organisations evaluate other suppliers. Their results should be measured. Feedback should help to improve the programs. In short, they should be held accountable for their results. The goal should be to help build stronger training partners, better training programs, and more effective training systems.

## 8. CONCLUSION

Changes in warehousing jobs are driven by technology, economic conditions, and the nature of the workforce. The description of the inventory specialist is changing from being focused on just the physical to needing interpersonal skills and the ability to interface with technology. Inventory specialists tend to be calm, achievement oriented, friendly, conservative, and in general, like people. They do not see their organizations as market focused. As a result, they make efforts to fill the gaps they perceive to exist. Proper on-the-job training is needed to bridge these gaps. Several options for organisations have been discussed but the key is an organisational shift in the view of this position and the role of training. Unfortunately firms still tend not to make the investment.

## 9. LIMITATIONS

This research has some specific limitations. First, companies chose to participate in the research, so the research used a convenience sample. While it includes responses from 43 companies, that is only a few of the thousands of companies that could have participated. Second, it was a survey and interview study that took place at each company on a specific day; it was not longitudinal, so respondents could answer differently on some other day. That is in the nature of any ‘snapshot’ research. Third, the qualitative portion of the research--

the interviews--was conducted by four researchers. While every effort was made to eliminate researcher bias, it may still have found its way into the results. None of these limitations is unique to this project; rather, these limits apply in general to research of this type. These limitations may restrict the degree to which the results should be generalized, but they take nothing from its value.

## 10. MANAGERIAL IMPLICATIONS

The key implication from this research is the need for the organisation to shift their mindset from minimizing expenses to optimizing performance as it relates to training. Training needs to be viewed as an investment not an expense. This has resulted in a general lack of systematic training programs vs. OJE. Regardless of how long the company thinks the employee will stay, the investment needs to be made. Better trained employees tend to be more satisfied and, within the companies in our study, this tended to result in employees remaining with the company longer. This in turn lowers costs associated with replacing employees while optimizing the performance of the organisation.

The second key implication is the realization of how much this job is changing. No longer is it based on strength and working from point to point in the warehouse. This job now requires good interpersonal skills and the ability to interface with the technology that is prevalent today. Lastly, it shows a deeper view of the personality of those in this job family, one that may be significantly different than the stereotype.

## 11. FURTHER SCOPE OF STUDY

Further research is needed to develop a similar profile on each of the 22 job families identified and to report out on such. Additional research should be pursued to look at the correlation between personalities and how it impacts performance and receptiveness to change, especially as it relates to the introduction of new forms of training. Lastly, a deeper understanding of the employees' negative perception of the organisation's market orientation could yield results that illuminate areas for human resources and management to focus on in the development of and optimization of the organisation.

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