

BUSINESS INSIGHTS

A COLLEGE OF BUSINESS RESEARCH JOURNAL

Volume 8

Spring 2020



In This Issue

- Lean Distribution: Exploring Lean and Six Sigma Methods and Highlighting Their Application within the Distribution Function of Private Industry Supply Chains (5-7)
- Remanufacturing: A Circular Business (9-12)
- Transitioning from One Culture to Another: An Understanding of the Documentary Film *God Grew Tired of Us* (13-16)
- The Application of Lean Concepts in Physical Distribution (17-19)
- Automation in Manufacturing (21-24)
- 3D Printing of Spare Parts (25-28)
- Cultural Characteristics and Their Appearance in *Apocalypse Now* (29-32)
- Lean Six Sigma in Physical Distribution (33-34)
- Diversity Does Not Equal Inclusion: The D & I Value Proposition (35-40)
- Continuous Supply Chain Improvement Using Artificial Intelligence (41-43)
- Logistics Management for Aviation and Aerospace (45-48)
- Personality Traits for Successful Negotiation (49-50)
- Ethical Duty (51-52)
- The History of Unions (53-54)
- Job Analysis: Purpose and Process (55-56)




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Lean Distribution: Exploring Lean and Six Sigma Methods and Highlighting Their Application within the Distribution Function of Private Industry Supply Chains

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ABSTRACT

Geographic market expansions, fostered by technological innovation, have placed global supply chains in a position where they must vigorously compete to maintain profitability, market share, and competitive advantage. In this global business environment, firms can maximize their competitive advantage while minimizing inventory surplus by applying Lean and Six Sigma methods within the distribution and inventory control functions of their supply chains. Six Sigma encompasses a set of management principles and statistical tools used to reduce the variability of processes to the point where defective products are extremely rare; while Lean Production, an integrated socio-technical system based on the principles of the Toyota Production System, utilizes Six Sigma principles within manufacturing operations to eliminate waste by minimizing supplier, customer, and internal variability. Lean and Six Sigma techniques are complimentary quality improvement methods. By committing to the implementation of what is commonly known as Lean Six Sigma, supply chains can reap the benefits of both methodologies: enhanced visibility and control, reduced costs, and increased overall profitability. Successful implementation of Lean Six Sigma methods throughout the supply chain requires establishing trust and open lines of communication between supply chain partners, redesigning supply chain processes, empowering employees, and monitoring progress.

Introduction

Over the last three decades, the world economy has progressed beyond competition between individual firms. Due to technological innovation and increased globalization, entire supply chains now compete against each other to maintain competitive advantage, market share, and profitability (Li et al., 2005). Improved transportation and information infrastructures have allowed firms to source materials and compete for market share in developing economies. As the competitive environment of business becomes increasingly global, firms can maximize their competitive advantage while minimizing their inventory investment by applying Lean and Six Sigma methods within the distribution and inventory control functions of their supply chains.

Lean

Lean production is defined as an integrated socio-technical system, whose main objective is to eliminate waste by minimizing supplier, customer, and internal variability (Shah & Ward, 2007). By striving to eliminate all forms of waste, entire supply chains can improve quality, increase efficiency, reduce inventory investment, and lower total supply chain costs.

Origins of the Lean Philosophy

Modern Lean Theory has its roots in the original Toyota Production System (TPS). Developed by Toyota executives during the post-World War II years, the TPS allowed the Japanese automotive manufacturers to efficiently utilize scarce resources to produce high-quality vehicles at low cost. An emphasis on efficient process design and continuous improvement proved to be Toyota's key to successful

growth and sustainable profitability.

Jidoka and Kaizen: Process Design and Continuous Improvement

The TPS pursues efficient, defect-free production of goods through Jidoka, or "automation with a human touch." Jidoka involves the engineering of processes to enhance safety, efficiency, and visibility throughout the production process. Through Kaizen, or continuous improvement, processes are continually optimized with the goal of eliminating the value added by an individual worker. This allows cross-trained employees to staff alternate stations when required (Toyota, 2019). Since Lean Production was created as a generic version of the TPS system for general use, these terms are often used interchangeably.

Just-in-Time Production

Perhaps the most important component of the TPS is the concept of Just-in-Time (JIT) inventory and production control. The JIT philosophy is based on the concept of delivering raw materials and producing items only when needed. The goal of JIT is to reduce supply chain inventories in order to reduce inventory costs and expose more serious inefficiencies (poor maintenance, inspection, backlogs, etc.) in the manufacturing cycle (Vuppapapati et al., 1995). It is widely accepted that the implementation of JIT principles can improve firm performance (Singh & Ahuja, 2012).

Difficulties in Lean Implementation

Firms that attempt to mirror the TPS are rarely successful. Estimates by Dr. Jeffrey Liker claim the failure rate is over 90% (Liker, 2009). Many professionals claim that this failure

is the result of firms using a top-down approach to implementation that fails to consider cultural differences and the importance of employee development (Zarbo, 2012). By empowering employees to “own” their contribution to the production process and highlight inefficiencies and defects as they occur, an organization can continuously optimize its operations.

Six Sigma/Lean Six Sigma

The Lean Philosophy focuses on efficient process design and continuous improvement. It does not, however, outline specific quantitative methods of process control. Six Sigma was developed as a business strategy used to reduce the variability of processes through the effective use of tools and statistical techniques. It is a rigorous and disciplined program that uses data and statistical analysis to define a problem, measure the process, improve the company’s operating performance (by eliminating defects, errors, or failures), and control the manufacturing, service, and transactional environment (Takao et al., 2017). Six Sigma methodologies are used to reduce the amount of production errors to 3.4 per million opportunities. Six Sigma defines errors as anything that does not satisfy customer desires, allowing the concept to be applied to both production and services (Johnson, 2019).

Origins of Six Sigma

In 1980, Motorola faced significant pressure from successful Japanese firms and needed a strategy to effectively compete. Motorola CEO Bob Galvin challenged his organization to achieve a ten-fold improvement in performance within five years. To achieve this bold goal, Motorola focused on employee development and worldwide benchmarking. Engineer Bill Smith, along with Dr. Mikel J. Harry, pursued the development of a strategy for the systematic application of statistical quality control methods that came to be known as Six Sigma Quality (Six Sigma, 2019).

The Combination of Complimentary Quality Improvement Methods: Lean Six Sigma

Lean Production and Six Sigma quality techniques are complimentary process improvement methods. Lean methodology is not a particularly robust method of evaluating the financial aspect of a process since it focuses on inefficiencies in process flow. Six Sigma is costlier, more complex, and more cumbersome to implement than Lean. The Define, Measure, Analyze, Improve and Control (DMAIC) Six Sigma projects require long periods of preparation and significant dedicated resources to complete (Sharma & Yudavanshi, 2017). Many companies are now combining implementation of Six Sigma and Lean Production programs (Bansod et al., 2012). Manufacturing and services firms alike realize the benefits of implementing Lean and Six Sigma methods at the same time. By committing to the implementation of what is now known as Lean Six Sigma, firms can reap the benefits of both methodologies: enhanced visibility and control, lower costs, and increased overall profitability.

Applying Lean Six Sigma within Distribution Functions of the Supply Chain

Modern supply chains are dynamic networks consisting of several unique business partners working collectively to meet customer needs. The distribution function within a supply chain can be sources of waste or a source of great improve-

ment, depending upon how this function is managed. Each distribution activity—from receiving customer orders to product delivery—can benefit from lean principles which lead to high process quality, minimum levels of waste, cost reduction, and increased productivity (Wang, 2008). Applying lean thinking to individual distribution activities cannot remove the systemic waste in the collective distribution function; all distribution activities should be scrutinized, from order processing back to materials replenishment from suppliers and forward through all the successive activities of packaging, shipping and delivery to the customer (Arisha & Mahfouz, 2013).

Supply Chain Synergy

Implementing a typical Lean Six Sigma program begins at the top management level with training in fact-based decision making and evaluation of a company’s strategic goals (Bansod et al., 2012). Successful implementation of Lean Six Sigma methods throughout the supply chain requires first establishing trust and open lines of communication between supply chain partners. Goecke and Reidenbach (2019) highlight four requirements for maximizing returns from Lean Six Sigma deployments within the distribution functions of the supply chain. First, supply chain partners must recognize their common goal of creating and delivering shareholder value to the consumer. This requires trust and cooperation between entities. Second, distribution channels must align to provide value in the most efficient way. Third, all members must work together to identify end user definitions of value. Finally, a successful Lean Six Sigma deployment requires effective monitoring of key performance metrics to detect changes within the value chain.

Example of a Successful Lean Six Sigma Implementation in Distribution

In the late 1990s and early 2000s, global logistics titan DHL acquired several competing logistics firms. This international expansion resulted in several new companies, with their own unique cultures, being added to the group. DHL quickly realized that they needed to develop a cohesive corporate culture. In addition, as their operations became increasingly global, more efficient processes were needed throughout their expanding warehousing and distribution footprint. In 2007, DHL implemented First Choice, a program designed to make DHL the “First Choice” among new and potential clients. First Choice is rooted in Lean Six Sigma methods, as it seeks to maximize end user value through change management, process mapping, and employee engagement. Not only did DHL implement a pull system within their distribution centers, the firm spent significant time and resources developing their workforce and ensuring that employees understand the importance of their contribution. These measures increased efficiency and effectiveness throughout the supply chain and created a more empowered workforce in all their operations around the world (ATN, 2019).

Another example is detailed by author Mitch Millstein in his 2019 white paper, “Streamlining Warehouse Operations with Lean Six Sigma.” In it, he describes how a distributor utilized spaghetti maps, pareto analysis, and 5S visual management to minimize the labor required to carry out its distribution functions. Spaghetti maps proved to be very useful in mapping the firm’s distribution processes, highlighting inefficiencies, and making the case for redesign of the distributor’s packaging facility. Pareto analysis was also used to analyze how to reduce the move time required to pick, pack, and ship an order.

Pareto charts, named after the Italian economist Vilfredo Pareto, were utilized to determine which products comprise the bulk of orders. This analysis provided a statistical basis for process redesign. Lastly, 5S visual management improved each individual packer's station and increased overall employee picking efficiency (Millstein, 2010).

Conclusion

As supply chains become increasingly global, firms realize that their distribution functions present significant opportunities for cost savings, operational improvements, and increased competitive advantage. By striving to eliminate all forms of waste, entire supply chains can improve quality, increase efficiency, and lower total supply chain costs. The statistical tools that comprise Six Sigma, when applied alongside Lean Production principles, offer very tangible benefits for supply chains. Firms maximize the benefits of Lean Six Sigma methods when they commit to their holistic implementation and recognize the importance of empowering their workforce.

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Remanufacturing: A Circular Business

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ABSTRACT

Remanufacturing is a circular business that provides an inexpensive substitute to brand new manufacturing that can improve both the environment and society by rerouting materials from landfills, reducing carbon emissions, and generating skilled jobs. Remanufacturing has potential to be an exceedingly profitable business, demonstrated by successful industries such as automotive parts, machine tools, and consumer electronics. Original Equipment Manufacturers (OEMs) are commonly motivated by business leaders, environmentalists, and social planners to participate in remanufacturing (Jin, Nie, Yan, & Zhou, 2017). To gain a sharpened understanding of remanufacturing, overviews of industry, processes and flows, and multiple lifecycle products will be conducted.

Remanufacturing: A Circular Business

Remanufacturing is observed as a significant return recovery program to achieve sustainability in production systems. Through the remanufacturing course, an obsolescent product is rediscovered at a component level with deteriorated mechanisms substituted by new ones, and sound mechanisms reused (Shi & Min, 2015). Remanufacturing is one of many return recoveries services as well as refurbishing, repair, recycling, and cannibalization. Refurbishing restores the value of used products and extends their service life. Repair involves updating returns to functional status. Cannibalization reutilizes partial portions from a used product (Zouadi, Yalaoui, & Reghioui, 2018). Due to an increase in producer and client responsiveness concerning remanufacturing outcomes, remanufacturing has exponentially increased within the past two decades. Remanufacturing is utilized across various industries by organizations such as Dell, Hewlett-Packard (HP), IBM, Kodak, Xerox, General Motors (GM), and Goodyear (Radhi & Zhang, 2016).

In addition to environmental influence, businesses from an assortment of industries have introduced the remanufacturing process in their production systems as a result of the underlying profitability. Remanufacturing programs save companies forty to sixty-five percent of the manufacturing cost (Shi & Min, 2015). As the remanufacturing business flourishes, so does the importance of understanding of integrating remanufacturing processes within existing supply chains. Incorporation of forward and reverse supply chain processes is not a simple task and necessitates careful assessment of strategic decision making, supply uncertainty, and revenue management within the industry (Abbey & Guide, 2018).

Strategic Decision Making

At each stage of the remanufacturing cycle, there are important strategic decisions to be made. Collection stage decisions are: Does the OEM, retailer, or wholesaler collect obsolescent product? Are products collected by providing market-driven incentives, or solely waste collection, where quantity or quality of the returns is not controlled? Remanufacturing plan level decisions are: What are the yield rates of the remanufacturing process? Does the remanufacturing process include

component upgrades to improve the specifications of the product, or are they only remanufactured to the specification level of the original product? Does the OEM or third party complete the remanufacturing operation (Kumar & Ramachandran, 2016)? Customer decisions are: Is there a request cannibalization among the remanufactured and new products? Are the new and remanufactured products retailed as one product or distinguished products? How do the development dynamics of new and remanufactured products influence the market demand? How does the nature of market impact the market demand (Kumar & Ramachandran, 2016)? Addressing decisions in all three stages will generate success when implementing remanufacturing within the supply chain.

Supply Uncertainty

The production planning and control of remanufacturing organizations may be a difficult mission. Stabilizing demand and supply decisions is challenging due to quality issues reducing amounts of end products, while overproduction may increase production costs and holding costs. Procuring identical features among new and used remanufactured components and quality inconsistency also affect operations, given the range of quality of returned products (Diaz & Marsillac, 2017). Returned product quality issues hinder supervisor's capability to forecast correct supply capacities on procurement, production decisions, inventory, and disposal management. Remanufacturing supply uncertainties are categorized through uncertainty due to quality issues while defining inventory procedures when stock-outs occur from defective products; calculating the collective component ordering and production conclusions for the organization; a single-period production inventory problem with consistent dispersed yield and demand; and when quality is significantly different in Economic Order Quantity (EOQ) and lot sizing decisions (Diaz & Marsillac, 2017).

Revenue Management

When an organization participates in remanufacturing, revenue management's importance increases due to severe competition in manufacturing, particularly in the consumer goods or hi-tech industry segments. Revenue management in remanufacturing is important to gain cost advantage over competition, maximize profit strategy, and emphasizes demand

management elections, which assist an organization with maximizing its profits. Remanufacturing organizations must review demand management and cost minimization selections together to exploit their profits from new and remanufactured products. The categories of demand management selections comprise of quantity, price, and market segmentation (Kumar & Ramachandran, 2016).

Quantity selections comprise of how to distribute production or capacity to diverse segments of clients, and when to reserve a product from the market to sell at a later point in time so as to capitalize on profits. When producing both remanufactured and new products, demand management is threatened due to either product's ability to cannibalize the other's demand. This cannibalization is unlike any groups of products where the product features are unlike. The client views them as different from a quality perspective, although new and remanufactured products share the same product features. The remanufactured product quality is perceived to be inferior to the new product, seeming to be of higher quality. How much of the new and remanufactured products should be manufactured to take full advantage of profits should be considered for the quantity selection (Kumar & Ramachandran, 2016).

Price selections comprise of how to determine the prices of products across groups and how to price overtime to magnify profits. Manufacturers require distinguished pricing tactics for different sections of new and remanufactured products to determine the supply or availability of cores for remanufacturing in the future. Consequently, a remanufacturer can attempt to primarily skim profits with reduced remanufacturing returns in future periods or reduce new product prices to begin with to sell more of remanufactured products with potential higher margins later (Kumar & Ramachandran, 2016).

Market selections comprise of how to maximize profits by distinguishing product groups or client sectors constructed on their willingness to pay across different groups. When managing both new and remanufactured products, profit maximization includes reviewing the following customer segments: price-sensitive clients who favor remanufactured products and quality-sensitive clients who favor new products. Along with observation differences, product traits such as warranty and guaranteed performance levels could contract between the new and the remanufactured product segments. Since new and remanufactured products share manufacturing resources along with material costs, it is essential to evaluate them together from a cost perspective to provide optimization. Revenue management enables answering these demand management selections in order to gain cost advantage over competition, maximize profit strategy, and emphasize demand management elections (Kumar & Ramachandran, 2016).

Processes and Flows

Production and financial operations are attached in all industries, with remanufacturing as no exception. Therefore, operational and financial procedures are integrated to mitigate the uncertainty of remanufacturing (Sun, Chen, Ren, & Liu, 2017). At a technical level, remanufacturing entails disassembly and cleaning of the returned obsolescent product. After the reassembly, the remanufacturer completes final testing of the rebuilt product to ensure operation meets the specifications of a comparable new product for resale into the market. These operations may transpire at various levels of disassembly: the product level that requires minimal disassembly, the compo-

nent level that requires partial disassembly, and the materials level which necessitates a complete teardown to the most fundamental elements of the product (Abbey & Guide, 2018). Transportation costs, facility production, and timing are important elements to ensure processes and flows are continuously and seamlessly met.

Transportation Cost and Facility Production

If many facilities are managed, the total profit is increased by handling trade-offs between three different costs. First, the larger the transportation cost, the greater the requirement for more facilities to placate various markets demand. Second, if total spending is related with remanufacturing returns and more facilities are operated or opened for remanufacturing purposes, the less is the total spending. With more facilities, the business develops more quality returns from all markets. Third, expensive initial facility costs are associated with the need to aggregate production (Radhi & Zhang, 2016).

The remanufacturing process performance and profitability rest on the dispersal of returns within the quality range. Commonly, the higher quality returns generate more profit. Therefore, if a remanufacturing facility is not producing extremely high returns, then quality is distributed normally and is more desirable than quality distributed exponentially. When investing in a design used to increase reusability or amount of returns, a remanufacturing organization encountering exponential distribution may have inadequate probabilities of success. Consequently, contracting multiple collectors to supply a facility with returns may increase return quality and profitability of the organization (Radhi & Zhang, 2016).

Timing

The properties of remanufacturing, which are the used products, are defined as cores. Since the state of the cores differs in quality and quantity, the discovery timing process is an important part of remanufacturing production. The efficiency of discovery is small. When the core fails, it is occasionally too late for some components to be remanufactured, resulting in difficulty for remanufacturing to be industrialized (Song & Huang, 2015).

Quality variation of returned products is a source of uncertainty in remanufacturing because it introduces imbalance in module inventories. The quality uncertainty has a great influence on the cost of remanufacturing, and whether the product can be remanufactured. First, with returned product, the lifespan of the product is undeterminable. Second, the failure methods of different components are diverse, which lead to different remanufacturing procedures. Third, the failure grades of the same component in dissimilar failure timing are also different. Thus, remanufacturing becomes more complicated than the original manufacturing (Song & Huang, 2015).

Most remanufactured products are in reactive remanufacturing mode, where the products are remanufactured when they are returned at the end of life cycle. The remanufacturing processes are arranged, and products are reinstated based upon the failure conditions of the retired products. Proactive remanufacturing mode occurs when products are remanufactured at a prearranged time prior to retirement. The remanufacturing timing is predetermined by evaluating the service pattern of products (Song & Huang, 2015).

Multiple Lifecycle Product

After product acquisition, firms must substantially invest in a remanufacturing process by combining the new and remanufactured lines into the same facility. Many procedures for remanufacturing, such as disassembly, inspection, testing, and disposition, are not mandatory for a line devoted to only new product manufacturing. This investment could take years and several generations of products to become profitable, becoming a serious barrier for many firms (Abbey & Guide, 2018). Although, with both product acquisition and remanufacturing methods in place, a firm is preferably positioned to use the remanufactured products, accomplishing larger market saturation through products that can target particular segments. Working in the multiple lifecycle products area can offer significant competitive advantages in multiple areas such as durability and reparability, commercial returns, and third-party remanufacturing. Third-party remanufacturers will seek to obtain products for their own profit opportunities, as there is value sealed into product (Abbey & Guide, 2018).

Durability and Reparability

In the durability and reparability aspect of remanufacturing, focus is directed on selling long lifespans. Rather than sustaining the product through various lifecycles, the emphasis on selling is common in some of the world's largest industries, such as ship building and aircraft manufacturing (Abbey & Guide, 2018). Due to asset depreciations, aircraft manufacturers follow the established custom of retailing the hundred million-dollar products to airlines or private customers. The capital investments in research, development, and design are as significant as those involved in the multiple lifecycle product. The variance is that the aircraft manufacturers, such as Boeing, make strategic focus of selling the high value, multi-decade assets to airlines that provide internal service or use contract service from third parties, such as Delta Airlines (Abbey & Guide, 2018).

The absence of an OEM devoted to a cohesive remanufacturing system offers a significant opportunity and major barriers. Merely changing policies to one that integrates significant product acquisition, remanufacturing capabilities, market portfolio expansion, and asset control is not insignificant. When third parties, such as Delta, retain data, skill, and a market network, establishing a product acquisition management system and a reverse logistics network would be difficult. Including aptitude in processing returned assets requires thorough training of personnel and capital investments for the original product manufacturer to combine the forward supply chain activities with the required reverse supply chain remanufacture process (Abbey & Guide, 2018).

The absence of a clear policy for a remanufacture system stops businesses from reaping the benefits of enlarged market saturation and enhanced profitability in comparison of those operating in the multiple lifecycle product. Businesses operating a healthy strategy with minimal investment in return processes face large barriers for integrating remanufacturing. Barriers exist such as lack of investment in required resources, product acquisition management, remanufacturing process knowledge, and presence in the reuse market. The comprehensive data of remanufacturing processes are left to the third-party remanufacturers, although after purchase support is offered, typically in spare parts for third party repair (Abbey & Guide, 2018).

Commercial Returns

Manufacturers in commercial returns usually design for a single lifecycle without attention for disposal. This approach created a culture that produces unnecessary waste and has caused numerous laws to alleviate the environmental impact. In 2015, though manufacturers should have had an abundant stock of products from consumer returns, equaling over \$260 billion in the U.S. alone, the reverse supply chains proved difficult to manage (Abbey & Guide, 2018). Many OEMs view reuse processes for consumer returns as too troublesome to manage, which afforded third party remanufacturers the opportunity to manage instead. Unlike OEMs, their product acquisition management systems and reuse processes are regarded as a core competence and a central part of their business model (Abbey & Guide, 2018).

An additional challenge affecting remanufacturing commercial returns is the inconsideration from clients to purchase remanufactured products as a practical substitute for the comparable new product, even if the firm intends to reuse the products. Clients frequently express quality concerns when the remanufactured product is priced as to signal possible quality issues (Abbey & Guide, 2018). Supervisors also fear that offering a remanufactured product will cannibalize new product sales. Though many clients often provide recycling materials, many do not choose to utilize products made from the reuse actions. Furthermore, many consumers express concern for the environment and waste created culture, but do not choose to purchase products that would ease the damaging effects (Abbey & Guide, 2018).

Third-party Remanufacturing

Third-party remanufacturers succeed in reusing products that were never intended for reuse, but their actions are not secluded to products designed for a single use. Third parties will readily obtain products when possible, though asset control in the project space is typically controlled by the scale and cost of the products. Third-party remanufacturers rarely have input in the initial product design process, but have control in designing remanufacturing processes to obtain value, enabling them to play the role of the ultimate opportunists (Abbey & Guide, 2018).

The remanufactured auto parts industry has been controlled by third-party remanufacturers, serving the automotive parts industry as a reminder of how relinquishing a reuse system can create a difficult road to reuse later. By relinquishing acquisition control after the initial sale, a firm has little opportunity to repossess the used product market against third parties that have established systems in place. Where many original equipment manufacturers see a layer of additional overhead costs and capital-intensive investments in remanufacturing processes, the third-party remanufacturers see only profit opportunities (Abbey & Guide, 2018).

Conclusion

Overviews industry, processes and flows, and multiple lifecycle products were conducted to clearly understand remanufacturing. The environment is increasingly disturbed by industrialization; consumer awareness, oversight from non-governmental organizations, and legislative pressures have encouraged manufacturers to produce sustainable products, and more manufacturers now institute reverse logistics to recy-

cle used products for remanufacturing. Remanufacturing is a circular business in which used, obsolescent products are restored to new setting and re-enter the distribution system. Remanufacturing processes offer companies an opportunity to improve their profits and serve social responsibility (Wei & Zhao, 2015).

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Transitioning from One Culture to Another: An Understanding of the Documentary Film *God Grew Tired of Us*

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ABSTRACT

The purpose of this paper is to discuss the film, God Grew Tired of Us, and have a clearer understanding of the impact of cultural differences between America and Africa, specifically Sudan. A group of young men are documented during the film while they transition from Africa to the United States. The characters in the film share their journey that entails a difficult time transitioning from their collectivistic culture to the American individualistic way of life. The discussion of the Sudanese Civil War in the paper briefly describes the background of how the young men ended up in a refugee camp, which also explains how they ended up with an opportunity to come to America. The main characters in the documentary seem to struggle, but adjust and flourish very well.

Introduction

God Grew Tired of Us is a 2006 American documentary film written and directed by Christopher Dillion Quinn, narrated by Nicole Kidman, and produced by Brad Pitt. The film won both the “Grand Jury Prize: Documentary” and the “Audience Award” in the “Independent Film Competition: Documentary” category at the 2006 Sundance Film Festival. The film also won “Best Documentary” at the Deauville Film Festival in France and the Galway Film Festival in Ireland. Mr. Quinn was awarded the “Emerging Documentary Filmmaker Award” by the International Documentary Association in 2007 for directing *God Grew Tired of Us* (Pitt & Quinn, 2007).



Figure 1—*God Grew Tired of Us* Official Movie Poster

The film describes the difficult journey of three young Southern Sudanese men, John Bul Dau, Daniel Pach, and Panther Bior, to the United States where they make every

effort to achieve a brighter future. The title of the documentary is a quote from John Dau discussing the anguish he and other Sudanese felt during that country's civil war. During one part of the film, John was discussing his testimony. He expressed that he thought the suffering and killings he saw during his country's civil war may have been the final judgment on the earth spoken of in the *Bible*. John paraphrased, “God was tired of us, tired of the bad things the people were doing” (Pitt & Quinn, 2007).

In the 1980s, a second civil war had broken out in Sudan. A group of about 20,000 boys had walked a thousand miles to Ethiopia to escape their war-ridden homeland. Sadly, the boys were only safe in the Ethiopian refugee camp for a few years. The war spread causing them to flee to Kenya. During their entire time of walking in search of safety, thousands died from starvation, dehydration, bomb raids, and genocidal murder. They were relatively safe in Kenya's Kakuma refugee camp. The traveling group of boys were given the name “The Lost Boys of Sudan” by the aid workers in the camp. It is believed the nickname was derived from the children's story book *Peter Pan* (Johnson, 2007).

In 2001, 3,600 lost boys, including John, Daniel, and Panther, were invited by the United States to live in America. The film documents the three boys as they relocate their lives and once again embark on a journey. The boys are followed as they adapt to the extreme differences of the intense culture of the United States. They dedicate themselves to doing whatever they can to help those they left behind in Kakuma, and to discovering the fate of their parents and family.

Individualistic or Collective Culture

The Lost Boys of Sudan had a very deep collective culture in Sudan prior to the country's second civil war, known as the Second Sudanese Civil War, from 1983 to 2005. Daniel Pach reflects on his life in the pre-war era. He offers a

glimpse of happiness and speaks of his father being a cattle farmer and how he often helped. Cultures in Africa tend to be more collectivistic than those found in the United States of America (Evason, 2018). Just listening to Daniel speak, one can imagine his family and community and how everything was done in support of that collective culture (Pitt & Quinn, 2007).

During the Second Sudanese Civil War, children were unable to sufficiently care for themselves and suffered greatly from the terror. An estimated 20,000 boys from rural southern Sudan fled the area due to the loss of their parents, their need to find food, and the search for safety from the conflict of war. The group fled to bordering Ethiopia and Kenya. The boys traveled by foot, walking thousands of miles to the nearest refugee camps. The children traveled with no possessions besides the clothes on their back. Travel fluctuated from a span of weeks to two or more years. "The Boys" often depended on the aid of villages they passed for food, rations, and treatment of the sick. However, most of their travel was in isolated regions with very little infrastructure. Groups of boys were often organized and led by the oldest boy in the group, who could be a young adult or sometimes as young as ten or twelve years old (Johnson, 2007). John Bul Dau reflected on being a chosen leader amongst boys because of his height. He was only 13 years old at the time. He spoke about having to bury his friends that passed away because of either heat exhaustion, diseases, or attacks by wild animals (Pitt & Quinn, 2007). The boys developed incredibly strong bonds from the horrific terror they encountered. During this travel for survival, they were constantly caring for one another. Their collectivistic culture traits promoted selflessness, and they worked as a group for survival.

The key common goal amongst the lost boys was reaching a safe refugee camp. At first, the boys went to a refugee camp located in Ethiopia. In 1991, the war sent them fleeing yet again to a different refugee site called Kakuma, located in Kenya. It was very difficult for the camps to provide food for the hundreds of boys arriving daily. Since "The Lost Boys" came to the camps without guardians or adult supervision, they immediately required housing and schooling. With many of the boys being so young, most of their childhood consisted of being raised in camps (Biel, 2003). The movie portrays a community sustained by a remarkable spirit of brotherhood while filming in Kenya. Daniel speaks of a group called the Parliament that both he and Panther ran. The Parliament was organized to sing, dance, and play games when the food and water ran out in the refugee camp. They would tell stories to each other to take their minds off hunger and the lack of basic needs (Pitt & Quinn, 2007).

John, Panther, and Daniel were all big advocates of not forgetting their African culture while they were still trying to learn the American way. Even though the Boys would be working two or three jobs at a time, they were still very dedicated to sending money back home to the refugee camp. They were dedicated to easing the awful plight of those left behind. When John finds out that his family is still living, he decides to not go to college so he can dedicate more of his time to working to send money to them. Because the Boys were so used to their collective culture, they often found themselves sad and having a hard time adjusting to America's individualistic culture. In the film, one of the Lost Boys was reported missing to the police because he did not return home. He was later found act-

ing erratically and was sent to a psychiatric hospital. The Boys say this happened to their friend because of the images of the war in his mind; one could also assume that adjusting to the different American culture was a strain on his mental state (Pitt & Quinn, 2007).

High or Low Context

High-context culture and low-context culture are measures of how clear the messages exchanged in a culture are, and how vital the context is in communication. High- and low-context cultures fall on a range that defines how a person communicates with others through their array of communication abilities. This measures a person's gestures, relations, body language, and verbal or non-verbal messages. These concepts were first introduced by Edward T. Hall in his 1976 book, *Beyond Culture*. High context defines cultures that are usually collectivist, highlight interpersonal relationships, stem from less direct verbal and nonverbal communication, utilize small gestures, and read into less direct messages with more meaning. Hall describes high-context cultures as those in harmony and where the happiness of the group is preferred over individual success. In low context, communication must be more overt, direct, and elaborate because individuals are not expected to have knowledge of each other's histories or backgrounds. Communication is not necessarily shaped by established relationships between speakers. The meaning of these low-context messages is more dependent on the words being spoken than on the interpretation of more subtle or unspoken signals (Reynolds, Munter, & Valentine, 2011).

The Lost Boys of Sudan come from a high-context culture. Most African tribal groups, as well as most countries located in Africa, are considered high context. Throughout the film, one could see characteristics that the Lost Boys portrayed as falling into this category. The Boys were very comfortable standing, sitting, and sharing space with one another. In high-context cultures, there is a disregard to personal space. In the film, when the Lost Boys get to their apartment for the first night, one of them asks about sharing the bed. The gentleman showing them their apartment chuckles and points out that you share a room, but only one person to a bed (Pitt & Quinn, 2007).

The Lost Boys struggle throughout the film with how the American culture is low context. Daniel describes that people in America are not friendly. He does not understand why people walk the streets by themselves without talking to one another. Daniel also has a hard time understanding why Americans cannot go to someone's house that they do not know. He said that if you do that, people will call the police. He speaks about the way it was in Sudan prewar era. He describes the Sudanese people as being friendly and willing to help any outsider. He said if you are lost, or if you are new to a place, they can show you where you are and have a conversation. Daniel explains that he wants to ask Americans how they feel when someone from a different culture asks them for help. He said it is difficult because you cannot even ask Americans questions. Daniel states it is because he views them as different people (Pitt & Quinn, 2007).

Cultural Differences on the Attitudes of Time

Different cultures see time in different lights. There are different aspects of time from Africa to the United States, so there is

no surprise that The Lost Boys struggled with the adjustment. In the film, while the Boys are being shown their apartment, the gentleman setting up everything shows them the alarm clock. He tells them that he will help set it up tomorrow, because in America, time is money (Pitt & Quinn, 2007).

Americans view time as linear. Time in America is an entity to be saved, spent, or wasted. Tasks are completed sequentially, and should be completed within a specific time frame. Work, family, and social life should all be kept separate. Time should be maintained by an appointment schedule. Africans, in contrast, view time as flexible. Africans work on multiple tasks at once, nurture the relationships represented by the tasks, and react as the day's events evolve. They also view work, family, and social life as one (Reynolds, Munter, & Valentine, 2011).

Early in the film, Panther talks about the pre-war era in South Sudan. He explains the closeness of the family and the tribe as a whole. His memories portray a flexible time schedule as he talks about his father being a cattle farmer and how he helped him by walking the cows to the water in the evenings. The days Panther reminisces on seem relaxed and not scheduled. While in the refugee camp, time seemingly floats by; there is no structure or specific duties since the boys all thought the war would be ending soon. They never imagined that they would be trapped in a refugee camp for nearly a decade. The Boys participated in a lot of singing and dancing to pass time. The Parliament, or White House, was created by the Boys during the days of not having food. They utilized this time to entertain themselves while they waited for time to pass (Pitt & Quinn, 2007).

The Lost Boys are very excited to start working. They want to be self sufficient, pay back their debts, and send money back to Africa to help their families and friends. After about three months in America, the Lost Boys receive their social security cards, so they can begin working. John begins his first job in a factory and starts to realize the importance of time management. Someone volunteers to drive him to work; and although his shift does not begin until 7:00 a.m., he gets dropped off at 5:00 a.m. After John completes his factory job, he then goes to his second job at a McDonald's. Daniel goes to work at a bank in Pittsburgh. He complains about how difficult it is because everyone has different schedules, different work, and no time for family to be together. He says that he can start work at 4:00 p.m., finish at midnight, sometimes not get home until 2:00 a.m., and then must be up at 7:00 a.m. (Pitt & Quinn, 2007).

Hierarchical or Democratic Power Structure

When the British governed Sudan as a colony between 1899 and 1956, they separately administered the northern and southern provinces. Northern Sudan maintained a culture similar to Arabic-speaking Egypt, so they were prevented from holding positions of power in the south. Southern Sudan was more like the other east-African colonies that were predominantly of Christian faith. The British and Egyptian governments administered south and north Sudan as separate regions. However, in 1956, northern and southern Sudan were merged into a single administrative region without consulting with South Sudan. Because the South did not feel like it was receiving the proper representation and regional autonomy, the First Sudanese Civil War broke out. The war lasted until 1972 when an agreement was reached. The agreement that

ended the first war failed to dispel the tensions that originally caused it. Thus, the north-south conflict reignited causing the Second Sudanese Civil War (Calissendorff, Brosche, & Sundberg, 2019).

The Republic of the Sudan lasted from 1956 to 1969. During this period, the most notable Prime Minister and President was Ismail al-Azhari. He was part of the Democratic Unionist Party and was eventually overthrown by Gaafar Nimeiry. Nimeiry ruled under the Democratic Republic of the Sudan era (1969-1985). He initially pursued both socialist and Pan-Arabism types of policies. In 1972, he signed the Addis Ababa Agreement which ended the First Sudanese Civil War. In the late 1970s, he moved toward Islamism. Nimeiry imposed Sharia law throughout the country in 1983 which spun into the Second Sudanese Civil War. He went into exile in Egypt in 1985 when he was ousted from power. From 1985 to present day, the country has returned to being known as the Republic of Sudan. Starting on August 20, 2019, the Sovereignty Council is the collective head of state of Sudan. The council is composed of five civilians chosen by the Forces of Freedom and Change Alliance, five military representatives chosen by the Transitional Military Council, and a civilian selected by agreement between the two (Calissendorff, Brosche, & Sundberg, 2019).

Sudan has experienced numerous forms of hierarchical structure throughout the years. Most of the ruling has been militarily based and religiously influenced. Due to many disagreements between North and South Sudan, it has become common that a Sovereignty Council must come in and take control. The Sovereignty Councils have been the closest thing to a democratic power structure within Sudan.



Figure 2—Map of Sudan and South Sudan (Courtesy of iStockPhoto.com)

Problems Caused by Language Translation

The Lost Boys of Sudan's native language is Dinka. It is a Nilotic dialect cluster spoken by the Dinka people. There are several main varieties that are distinct enough to require sepa-

rate literary standards. The majority of the Lost Boys speak fluent English. While they were in the refugee camp, Kakuma, most were eager and received some form of education. They attended school daily, sitting along with a hundred or more students in a class. They had very little supplies, such as books and paper. They studied English, math, and science under the instruction of United Nation financed African teachers. The Boys' language skills were a wonderful indication of how they managed to learn quite effectively given the circumstances. "Their thirst for knowledge is so great," says Terry Walsh, vice president for a refugee program run by Catholic Social Services in Lansing, Michigan. "For most refugees, education is important. But I've never met a group more dedicated to it. Education has always been the pot of gold at the end of the rainbow" (Corbert, 2001). Throughout the documentary, there were times when the boys did not understand certain words. The English language is very complex. For example, Daniel was asking the cameraman about bathing. He did not understand the word shower or bath. He only knew it as bathing. In another example, John says he has never heard, met, or seen an apartment. These examples provide a glimpse of the confusion and misunderstandings with their interpretations of English (Pitt & Quinn, 2007).

Cross Cultural Problems in Written Communications

While in the Kakuma Refugee Camp, as stated previously, the boys were given a basic education. The film does not discuss many difficulties that the boys had with written communications. However, about forty minutes into the film, the boys are applying for their social security cards. While a gentleman discusses the importance of the card, he explains that they each must sign their own application with their first, middle, and last name. The camera zooms in on one of the boys who seems to be practicing his signature on a blank piece of paper.

One can assume that the boys are doing well with their writing skills because each attempts to further his education in different ways. Daniel finds it difficult to pay for college, so he enrolls in the Pittsburgh Job Corps. John and Panther both enroll in college and do well. John receives a letter that his family is alive. He reads the letter aloud; although it is written in English, it is broken English. John is very happy that his family is alive, but he is informed that they are not doing well. He decides to put college on hold so he can get multiple jobs to help them (Pitt & Quinn, 2007).

Nonverbal Communication

Nonverbal communication includes facial expression, hand gestures, eye contact, the use of physical space, and silence. People in South Sudan often have a serious facial expression while they are just walking about. It is uncommon to just smile at someone unless you are engaged in a conversation. It is common to greet people with a handshake in South Sudan, and it is considered rude if you do not offer someone your hand. It is basic etiquette to use the right hand or both hands together when making a gesture. It is considered rude to point with a single index finger. People may do it to indicate ill feelings toward a person. One should never make a gesture or pass something with only the left hand. Direct eye contact can be interpreted as rude and a sign of disrespect. It is a sign of respect to divert one's gaze in South Sudan. When speaking to someone of opposite gender, it is best to avoid steady gazes and to make infrequent eye contact. It is best to keep a fair

amount of space from those of a higher status. It is common to see friends of the same gender holding hands and sitting very close to one another. People in South Sudan are comfortable with silence and do not find it rude if someone is not speaking (Evason, 2018).

Analysis

There are drastic variances and subtle differences through all cultures. It should be a requirement for people all around the world to study and make an effort to understand the nuances of cultural diversity. Understanding and accepting things out of one's social norm creates a gateway for inclusion. Inclusion is involvement and empowerment, where the inherent worth and dignity of all people are recognized.

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The Application of Lean Concepts in Physical Distribution

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ABSTRACT

In today's competitive marketplace, businesses are constantly scrambling to maintain a foothold in the ever changing world of commerce. They are faced with considerable pressure to meet customer's expectations, driven by the "I want it now" mindset of today's customers who will not accept anything less. Consumer choices are plentiful, leaving businesses with the daunting task of finding new ways to add value in the eyes of their customers. One option for improvement is the implementation of lean thinking, a philosophy that affects the way a company operates its business and has been proven to effectively increase customer satisfaction (Chapman et al., 2017). These concepts are equally effective within the physical distribution portion of a supply chain. The goal of this paper is to explore ways that lean concepts can be implemented within physical distribution.

Introduction

The lean production management philosophy strives to improve process velocity and product quality by simplifying the value stream (Nayab, 2018). Maintaining a focus on performance and continuous improvement, lean production incorporates the Just-In-Time (JIT) approach (Chapman et al., 2017). The goal of Lean, as it is commonly called, is to identify and eliminate activities and processes that consume resources but fail to add value or purpose to the process. Lean production research has primarily focused on the implementation of this philosophy within the manufacturing activities of a supply chain, but the distribution function can also follow these principles to enhance productivity and eliminate waste.

Lean Production Principles

To successfully implement lean principles within a production operation, a company must fully understand the steps required to implement and maintain the management strategies embodied within it. The main challenge associated with the implementation of Lean is employee acceptance of the changes needed for success. Acceptance must come from all employees; it needs to start with the top-level management and end with the employees on the manufacturing floor. All employees, from top-level management to manufacturing floor personnel, must understand that the objective of lean production is to reduce waste and increase productivity (Amin & Karim, 2013). Lean Production is based on five fundamental principles: value, value stream, flow, pull, and perfection (Womack & Jones, 2003).

The Five Principles of Lean

Value

The application of lean concepts must begin with an understanding of what the customer values, both actual and perceived, in the product being produced. This value, in turn, determines the price that the customer is willing to pay (Womack & Jones, 2003). Therefore, companies should focus on what adds value to the end customer (EnVista, 2016). It is vital to connect and couple value drivers with concrete actions,

so that value is created which is beneficial to both parties (Munksgaard & Frandsen, 2019). Employees must understand the difference in value-added and non-value-added within lean production. Non-value-added is defined as waste. The most common wastes are defects, unnecessary transportation, unnecessary motion, setup time, finished goods inventory, inappropriate processing, failure time, work-in-process (WIP), raw material inventory, and lack of integrated approach (Amin & Karim, 2013).

Value Stream

The value stream encompasses the entire life cycle of a product, beginning from the initial concept stage to the disposal of the product. It is a description of all the activities within the life cycle that add value to the product in the eyes of the customer (Do, 2017). To maintain the goal of lean (waste reduction), there must be a full understanding of the value stream (Womack & Jones, 2003). A value stream map (VSM) is a flow diagram of each step involved in the flow of production and will often reveal waste, or *muda*, (a Japanese term for waste). Value stream mapping is considered by many practitioners to be "a fundamental tool to eliminate waste, reduce process cycle times, and implement process improvement" (ASQ). Hines et al. (1999) applied VSM in the distribution industry using a balanced benchmarking approach and found, for the company evaluated, that improvement in supplier integration significantly impacted order fulfillment timeliness and success.

Flow

Flow is about creating a seamless flow of goods throughout the value chain once the wastes identified in value stream mapping are removed, with no interruptions in the remaining process steps, and achieving a state where each activity is pace-synchronized with all the others (Jansson, 2017). Creating a continuous flow throughout order fulfillment may bring to light additional opportunities for waste reduction (EnVista, 2016). Consistency metrics, such as delivery consistency and cycle time consistency, may be used to benchmark the level of continuous flow achieved within physical distribution activities (Bowersox et al., 2020).

Pull

Inventory represents a significant capital investment for organizations, so efforts to minimize waste in the form of excessive inventory are welcomed in lean systems. Pull systems ensure that nothing is made ahead of when it is demanded (Jansson, 2017), yet enough materials are available to provide a smooth flow of work through the system (Do, 2017). A pull system is controlled through customer orders and dictates when manufacturing will produce inventory or when distribution warehouses will release inventory for transport to final customers. Pull inventory systems, as applied to the distribution channel, also means that inventory is not sent out for distribution until warehouse stock levels drop below acceptable safety stock levels (Bowersox et al., 2020). This type of inventory restocking strategy is particularly important at the retail end of the supply chain, where retailers are tempted to accept the push of seasonal trend inventory in order to take advantage of economies of scale, yet more often than not end up with excessive inventory at the end of the season. A better approach in that situation is a pull system, using point-of-sale (POS) data as input to drive inventory requests while minimizing shortages (Jacquemard, 2016).

Perfection

The pursuit of perfection could be considered the goal of all lean practitioners, since the continuous pursuit of improvement as achieved through the other four lean principles must become part of an organization's culture if it is to be successful in true lean operations (Jansson, 2017). The pervasive use of "lean thinking" by all employees involved is critical as well (Do, 2017). A perfect process is achieved by managing principle by principle through continuous improvements which address the root cause of quality issue and production waste. Ultimate performance in terms of logistics service is commonly referred to as the perfect order, which is an order that is "shipped complete, delivered on time, at the right location, in perfect condition, with complete and accurate documentation" (Bowersox et al., 2020).

The Implementation of Lean Principles

Organizations strive to increase their operational performance by establishing suitable operating practices and by continuously learning how these practices can be improved (Knol et al., 2019). When implementing lean practices, an organization should begin with the focus on building improvement habits and shared problem-solving techniques. This requires that employees demonstrate a holistic and customer-centric view of improvement by cooperating with the various levels of management and across internal business functions, as well as with outside customers and suppliers (Knol et al., 2019). Lean management principles provide organizations with a roadmap to systematically uncover inefficiencies within their organizations and produce a higher valued product for customers. Through the implementation of lean, organizations can increase operational performance by potentially reducing by half the level of human effort required within work cells, required manufacturing space, necessary investment in tools, the number of engineering hours during product development, and the amount of inventory on site (Narayanamurthy & Gurumurthy,

2016). In distribution systems, lean principles have been successfully applied to activities such as milk run (MR) systems, which are "route-based, cyclic material-handling systems that are used widely to enable frequent deliveries of containerized product on an as-needed basis from a central storage area (supermarket) to multiple line-side deposit points on the factory floor" (Bozer & Ciernoczolowski, 2013).

Continuous Improvement

According to Do (2017), lean principles encourage the creation of better product flow in work processes and an overall continuous improvement culture. For an organization to become successful when implementing lean practices, they must continue to focus on process improvement. A strong focus should be placed on performing tasks correctly the first time by eliminating unnecessary motion and waste from a process. To maintain continuous improvement, organizations must provide effective leadership and open communication, as well as encourage a teamwork environment and a focus on the continuous improvement process.

Conclusion

The lean philosophy has been studied and updated for the last four decades with the purpose of improving the implementation of the five principles of lean (Narayanamurthy & Gurumurthy, 2016), so it is critical that researchers continue to develop custom-tailored lean application protocols for industries not yet using these principles. Global, sometimes volatile, markets are exposing companies to new risks; and using lean thinking to focus on value-adding processes and reduce the non-value adding ones is more important than ever (Hoellthaler et al., 2019). In physical distribution, eliminating unnecessary waste in the form of excessive inventory and product transport is key to meeting consumer demands and expectations of "I want it now."

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Automation in Manufacturing

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ABSTRACT

Manufacturing automation is becoming a basic need in the manufacturing sector with the growing market competition that requires high-quality products and mass production. Customer demands, such as customized products with specific shapes, sizes, colors, and branding, can only be realized by automating the manufacturing process. Automation programming assists in producing customized products by merely writing a computer software program. Automation is accomplished by synchronizing the use of computers and robotics and sensors. Different automation spectrums can be adopted depending on the underlying infrastructure. Despite the countless benefits brought by manufacturing automation, there are a few challenges attached to this industrial advancement. This paper focuses on manufacturing automation's pros and cons, the need for automation, the long-term value attached to manufacturing automations, and the challenges it poses.

Introduction

Manufacturing firms are increasingly recognizing the importance of automating their production processes. Increased output, improved quality, flexibility, agility and consistency are among the advantages that pull every manufacturer to adopt automated manufacturing (Altintas, 2012). The benefits associated with automation has made it a popular field in manufacturing. Automation leads to maximum utilization of the available capacity. Automation in manufacturing enables production companies to develop new products using their existing manufacturing processes (Taneja et al., 2012). Integrating automations programming sets the stage for the manufacturers to create new products or improve the current products by simply writing computer software programs.

Notably, there are significant transformations in factory floors that have come about because of automation in manufacturing. There is a co-existence between humans and machines that interact to facilitate the production process. Humans and machines undertake tasks that complement each other in the production process. The automation era is associated with rapid advancements in robotics, Artificial Intelligence (AI), and machine learning, which have outperformed or matched human beings in the execution of various activities. The existence of some life-threatening work conditions makes the use of robots ideal. Application of AI also makes the use of robots more efficient. Automating manufacturing is, however, a threat to human employment as much as it has vast significance to manufacturers.

The Need and Potential of Automation in Manufacturing

The manufacturing process usually involves several methods to produce a single commodity. Maintaining consistency in production requires these processes to be repeated in a number equal to the required units in a manual manufacturing system. Repetition of these processes leads to fatigue and slows down production. Automation in manufacturing significantly reduces workforce fatigue by effectively executing banal, repetitive tasks that most people dislike having to do.

Automated manufacturing systems are well integrated and use advanced sensors that help perform tasks that are unfavorable or unsafe for humans. The use of robotics incorporated with sensors helps identify feed times of any adjustments done during the course of the production process. The actions are executed per the program or simply by pushing a button.

Using robots is time-saving and efficient. In some computer-controlled systems, faults are easily identified by the computer, hence reducing fault diagnosis time. The application of AI makes the robotics more convenient in manufacturing (Ponnambalam, Parkkinen, & Ramanathan, 2012). AI equips robots to make decisions similar to human beings which, in turn, facilitates quality and safety.

Automated systems help prevent probable damages to products and raw materials. Humans are prone to errors that can sometimes end in damages. Fatigue caused by repeating a manual process can be a possible cause of damages. Automated handling of raw material and automated packing of finished products using machines such as fork lifts, cranes, and automated packing machines, can boost product safety (Warnecke, 2014). In pharmaceutical manufacturing firms, blister packing machines were introduced to pack tablets and capsules; the result was a reduction in contamination.

Automated manufacturing systems and processes minimize the manufacturing of products that do not conform to a set standard. Computers have memory and will execute all the due processes set for the machine to perform. If operations were run manually, there is a greater likelihood of delays in the timing or complete omission to adjust devices or add components. Therefore, the output from automated manufacturing systems is uniform in terms of size, color, or shape.

Automation in manufacturing significantly increases manufacturing efficiencies, directly translating to increased productivity (Rogers, 2016). In manufacturing, machines have proven to be efficient when it comes to doing the same job repeatedly. By nature, human beings will not do the same thing in the same way; variations exist every time people do the same thing at different times. Consistency in the execution of repeti-

tive tasks improves efficiency.

Another advantage to automated systems is a reduction of overall manufacturing costs. Adaptors of automated manufacturing systems enjoy significant cost saving due to accurate decisions made based on the data collected from the automated system's regular use. Manufacturing costs are also cut when one machine is employed to carry out multiple tasks equivalently handled by several workers. For instance, an automatic packing machine can pack cartons in one hour; the same operation would require eight hours with human labor. This means that work speed has increased eight times, wages have been saved, and profit margins are increased.

Why Companies Use Automation

Manufacturing firms are increasingly using automation to increase both their throughput and productivity. Automation in manufacturing has an effect of increasing the number of products going through a manufacturing system. Automation not only increases throughput, but is also responsible for keeping the raised throughput levels consistent. With the increased throughput, the chances of doubling or tripling productivity are very high. Production further increases when the end to end automation is adopted in the production lines. Throughput is possible because manufacturing automation is characterized by running equipment for a longer time with minimal maintenance.

Companies are also choosing to use automation to extensively eliminate manufacturing variations. Imagine twenty workers, five workers at every section, charged with measuring and cutting material into pieces for making suits. Five are doing the sewing process; five are buttoning; five are ironing; while the final five are packaging. There are errors in measuring and cutting, and in each phase of the assembly, that accumulate to result in a massive variation in the finished suits. This entire process can be achieved through automated machines with set parameters applicable to every batch; hence, all the finished products will have the same dimensions as per the operating parameters.

Automated systems significantly contribute to improving the quality of the manufactured products (Rogers, 2016). High-quality product output realized in manufacturing automation starts when the employees' levels of focus are boosted, like when they focus on high-level duties that require expertise. Rather than doing tedious and repetitive manual manufacturing, employees can divert their energies on ways of expanding capability of the products, increasing efficiency, and other engaging exercises.

Automation also beats manual production in areas with an inconducive condition for human ergonomics. Quality is also kept high due to reduced contamination, breakages, or destruction of production materials, that can be caused by fatigue. For instance, in the manufacturing of pharmaceutical products, current Good Manufacturing Practices (cGMP) are a must, and automation plays a great role in reducing cross-contamination ("Good Manufacturing Practices," 2020) that would result from a manual process. cGMP are also important for food and beverage manufacturing firms. Automated manufacturing keeps quality standards high by pre-

venting the shipment of non-conforming products. The use of computer programs and robotics in manufacturing can automatically identify non-conforming products that should be removed from conveyors. Increased use of sensors in automated systems facilitates inspection capabilities that tune the systems and enable non-biased data flow.

Automation in manufacturing improves agility and, most importantly, the flexibility of the entire manufacturing process. Agility and flexibility are crucial in following day-to-day changes in the market created by changes in consumers' tastes and preferences. In order to remain relevant in the market, a manufacturer must be committed to fulfilling the changing demands of the customer. Automated systems require little adjustment to programs in order to produce products with the latest qualities demanded by the new consumer preference or taste. This is usually more cost-effective when compared to buying a new machine with features to produce these same new products.

Further, automation in manufacturing improves safety without forgetting ergonomics. Due to automation, employers and employees are less worried about safety, since robots are used to handle the dirtiest or most life-threatening tasks under the supervision of humans controlling robots from a computer system (Carbonero, Ernst, & Weber, 2018). With the application of robotics, workers are less likely to have accidents and are more likely to stay healthy and productive for longer periods. Automated machines also extend safety to the end-users of manufactured products, as in the case of drugs and food substance manufacturing.

Manufacturing Automation-Long Term Value

Manufacturers aim at maximizing the long-term value of automated manufacturing systems. Conversion to an automated manufacturing system can be expensive in terms of installation costs. Therefore, manufacturers need to assess the potential in terms of infrastructure to know which type of automation will realize the best long-term value. Manufacturers must research well before setting up an automated manufacturing system, focusing not only on the costs of purchase and installment, but the compatibility with the existing infrastructure. Cutting-edge automation can cope with technology changes, should be easy to update, and be less costly to operate and maintain. Even if the automated manufacturing system is expensive to install, but is the best fit with regards to the underlying infrastructure, it is considered more economical in terms of the long-term value.

The automation spectrum has four levels: low-maturity, mid-maturity, high-maturity, and best-in-class maturity. The low-maturity level is when the manufacturer's infrastructure for rolling out automation is limited, usually because of the inexistence of robotics, sensors, or systems for data collection (Leitz, 2020). The mid-maturity level is when the manufacturer has significant industrial infrastructure in place, but does not fully utilize it. A high-maturity level is where the traditional automation infrastructure is put to full exploitation in manufacturing, but not cutting-edge automation. The firm does not fully benefit from automating managerial tasks, back office, and support functions. Lastly, best-in-class automation is a level where a manufacturer utilizes full automation potential using up-to-date, cutting-edge industrial tech-

nology in all operations.

In an effort to achieve the long-term value of automated manufacturing systems, manufacturers should check on the level of maturity of their automation spectrum. For example, manufacturers can utilize basic automations between low-maturity and mid-maturity, such as sensing infrastructure, incorporating simple programming and building processes that identify, evaluate, and implement automation. Between mid-maturity and high-maturity, manufacturers should concentrate on full use of traditional automations using wholly sensing infrastructure to obtain top automated processes, investing sophisticated sensing equipment, and promoting programming to optimize routines. An example of advanced sensing equipment to install would be vision systems. Between high-maturity and best-in-class, the manufacturer can install cutting-edge automation. At this stage, manufacturers can explore advanced robotics, detailed automation programming such as AI, and automating indirect functions. Automation is a growing field, and firms have an opportunity to adopt new techniques as they wait for future inventions.

Cutting-edge Automation

All manufacturing firms should aim at having cutting-edge automation to get the greatest long-term value. New inventions are constantly arriving to suit the changing technicalities in the environment. With environmental changes, there comes a need for improvement of existing products to satisfy the customers' most demanding requirements. Competition levels also keep rising following the start of new manufacturing firms. Any manufacturing firm's success in holding the largest share of the market depends on the quality of the manufacturing automation technology used.

Manufacturing firms benefit from extensively utilizing current automation programming in manufacturing systems (McKinsey & Company, 2017). Automation programming enables manufacturers to create different types of products by merely writing a computer software program. Automated programming also facilitates a solution to problems by breaking down complex issues into simpler, easier-to-solve ones. Manual labor is tiresome and requires much time in establishing a correlation in interlinked chains of the manufacturing process. Conversely, automation creates a smooth connection to the different parts of the manufacturing process.

Challenges of Manufacturing Automation

Automation in manufacturing requires expertise and technical skills which many manufacturing firms may not have (Nayak & Padhye, 2018). Running automated manufacturing systems requires a new set of skills that may not be held by a company's existing workforce. Therefore, the company will incur additional costs in training its staff. If a company chooses to hire a new skilled and experienced workforce, the company must be ready to offer higher salaries or wage rates to the modern skilled workforce.

The company's workforce may resist manufacturing automation if they fear losing their jobs. Automation has the reputation of rendering people jobless (Wang, 2016). Due to the

risk to job security, many workers are likely to oppose automation or leave the company to find other employment. Furthermore, most people fear the unknown. They anticipate negative consequences to the point that it becomes difficult to see anything positive on the other side of change. Manufacturers, therefore, must commit to managing the change in such a way as to minimize employee resistance.

Automated manufacturing systems require simulated production/manufacturing environments (Industrial Automation, 2019). Automated manufacturing is much more productive when integrated with simulation. Simulation models offer safe and efficient solutions to real-life challenges through the analytical method that is valid, easy to communicate, and understandable. It offers valuable solutions by giving vivid insights into multiplex systems.

Installing automated manufacturing systems is a costly venture. Initial costs of purchasing automation technology can be expensive for large manufacturing firms. The cost of maintenance and repair of the automated systems can be equally costly, as this requires technical expert services of engineers to manage and track processes with sophisticated workflow techniques.

Finally, the environment should be accommodative of the new technology being introduced in manufacturing. Creating an enabling environment and incorporating simulation to maximize production may be a challenging exercise to most manufacturing firms.

Conclusion

Automation in manufacturing enables production companies to develop new products using their existing manufacturing processes. With the integration of Computer-Aided Designs and Manufacturing systems (CAD/CAM), designing and testing new products is made easier. CAM is used to develop and control production and analyses steps needed to manufacture the product and automatically transfers the information to the automated machines to execute the manufacture of the designed product within a reasonable time frame. Flexible and Computer Integrated Manufacturing Systems (FMS) blend computers, robots, devices, materials, and computers into one operating system. FMS offer an efficient platform for manufacturing automation to sprout.

Manufacturing firms benefit extensively by utilizing current automation programming in manufacturing systems. Making the right choice of an automated manufacturing system enables manufacturers to realize the long-term value through the buildup of a consistent workflow and the ability to keep track of production progress. Integrating automation programming in manufacturing breaks the limits of all that can be accomplished in regards to increased production, flexibility of design, increased safety, quick problem-solving, and quality control, all of which will help the company remain relevant and maintain its profit margins.

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3D Printing of Spare Parts

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ABSTRACT

The paper discusses the concept of 3-Dimensional (3D) Printing Spare Parts. 3D printing is an additive manufacturing technology that makes 3D solid objects from digital files. 3D printing enables one to come up with complex shapes with fewer materials than the conventional manufacturing method. There are rising applications and purposes of 3D printing. The recent popularity around 3D printing has brought about a massive range and types of 3D printers and 3D printing materials, thereby significantly widening the potential uses and purposes of 3D printing. 3D printers act as powerful prototyping and one of the most efficient communication tools and instruments. Currently, most designers focus on the concept to support all the elements linked to communicate the designer's intention. 3D printing has also solved all the potentials of additive manufacturing.

3D Printing of Spare Parts

3-Dimensional (3D) printing is an additive manufacturing technology that makes 3D solid objects from digital files. The process of creating a 3D printed object is done through an additive process. During the additive process, an object generates by developing successive material to an extent whereby an object is then created (O'Neill & Williams, 2014). Each of the successive layers comes up as a sliced horizontal image of the final object. 3D technology is termed as the opposite of subtractive manufacturing, which entails hollowing out metal or a plastic object with the help of a milling machine (O'Neill & Williams, 2014). 3D printing enables one to come up with complex shapes with fewer materials than conventional manufacturing methods. Therefore, in 3D printing, the ultimate design of the object is developed with software. A printer piles layer upon layer to an extent where the final object is constructed. The object is created from various printing materials such as powders, paper, filaments, and plastics.

Purpose of 3D Printing

There are rising applications and purposes of 3D printing. This has brought about a massive range and types of 3D printers and 3D printing materials, significantly widening the potential uses and purposes of 3D printing. Its purposes range from 3D airplane spare parts to clinical devices (Jordan, 2016). 3D printing has made it possible for manufacturers to create a light and practical spare part at lower cost and time than conventional methods (Short, 2015). Some industries that use 3D printing technology include aerospace, automotive, medical, dental, consumer goods, and manufacturing (Horvath, 2016). Although the purpose of 3D printing tends to vary from one industry to another, some of the typical applications and purposes of 3D printing are rapid prototyping, modeling, customization of part, production of spare parts, and in jigs and mixtures (O'Neill & Williams, 2014).

Problems Solved by 3D Printing

3D printing is known to solve big problems linked to design. Designers and manufacturers have placed high expectations on 3D printing ("Publisher Correction to 3D Printing in Medi-

cine," 2019). A single group provides a guide and instructions to the printing of corn shellers (Benson, Triulzi, & Magee, 2018). These applications demonstrate an essential development of future technologies operating in underserved areas. Albeit, designers and engineers have recorded huge setbacks with using these 3D printing machines to improve their work. For example, there have been mixed outcomes in manufacturing prosthetic limbs.

3D printers act as powerful prototyping and one of the most efficient communication tools and instruments (Ritland, 2018). However, people do not perceive it as a scalable manufacturing technique. When used in conjunction with the generative software, 3D printing helps manufacture products that are deemed smarter, lighter, and more durable in the long run (Short, 2015). Most designers currently focus on the concept to support all the elements linked to communicate the designer's intention. 3D printing has also solved all the potentials of additive manufacturing.

3D Printing in Aerospace

3D printing influences the aerospace industry. The four main sectors in which the concept is used in the aerospace industry are jigs and fixtures, surrogates, mounting brackets, and prototypes. The aerospace industry uses a 3D printing concept to print multiple fixtures, templates, and gauges (Benson, Triulzi, & Magee, 2018). This concept has helped the industry lower its cost by 60 to 90 percent. In terms of a surrogate, the aerospace industry uses placeholder parts to produce components and materials used during aerospace parts' final assembly (Bhargav, 2017). For instance, NASA and various air force bases use surrogate elements frequently. In terms of mounting brackets, the aerospace industry uses 3D printing to manufacture metal brackets that house lifesaving components to the aircraft's inner walls. This component is vital because it ensures safety for all persons on board. In terms of a prototype, 3D printing produces a prototype that enables designers to have a detailed understanding of aerospace parts before commencing the production process ("Publisher Correction to 3D Printing in Medicine," 2019). Prototyping is essential for aerodynamic testing because the prototype usually represents the final part. The concept can also help manufacture all the interior components of aerospace like door handles and cockpit

designs. Additionally, in the aerospace industry, 3D printing can make lighter and efficient engines, plane seats, and drones.

Prototyping 3D Print Spare Parts

Prototyping using 3D printing is a universal application that provides the flexibility of speed and material selection. The concept enables manufacturing of cheaper performance objects, but it is not suitable for mass production (Bhargav, 2017). Prototyping is an iteration process through which manufacturers and designers manufacture prototypes and make small changes to improve those prototypes. Conventional prototyping methods such as injection molding need weeks and months to develop each iteration ("Publisher Correction to 3D Printing in Medicine," 2019). With the help of 3D printing, designers and manufacturers are now able to carry out rapid prototyping using different materials with varying properties like durable nylon, highly resistant acrylonitrile butadiene styrene (ABS), and slightly cheaper Polylactic Acid (PLA). Different prototyping types are using 3D printing: Fused Deposition Modelling, Stereolithography, and Selective Laser Sintering (Kluska, Gruda, & Majca-Nowak, 2018). The concept of Fused Deposition Modeling uses thermoplastic filaments, which melt in the form of layers. Stereolithography is comprised of a printer that has a tank that is filled with resin. The resin slowly sinks, while at the same time, Ultraviolet light hardens each layer (Kluska, Gruda, & Majca-Nowak, 2018). The process will then repeat itself until the three-dimensional model is complete. The third prototyping is called the Selective Laser Sintering, where the 3D printer uses powder which is then sintered (coalesced) using a laser to the extent that a robust model is formed. Using all of these processes, 3D printing is useful for prototyping in designing jewelry, creating architectural models, engineering mechanical parts, and manufacturing other types of functional consumer products.

Prototyping and Supply Chain

3D printing and additive manufacturing are two of the most interesting technologies that have been developed to date. Additive manufacturing has become a crucial element in nearly every aspect of the supply chain landscape (Koffler, 2019). According to experts, rapid prototyping seems to be remaking all of the manufacturing and handling of spare parts of a product. Such rapid prototyping helps in bringing in and assembling all the spare parts products faster than before. Rapid prototyping is perceived to be slightly faster than 3D printing (Bhargav, 2017). The prototyping concept is essential when working with many materials for manufacturers and later on to transform the work setting for all the employees. Prototyping helps to maintain a shorter product design pipeline (McFarland & Antunes, 2019). This advantage happens from operating prototyping in house versus outsourcing those functions to a third party (Short, 2015). This results in the pipeline between the product design and end product getting shorter and shorter. Prototyping is an ultimate time-saver for most manufacturers (Hernandez, 2015). It enables product designers to undergo product testing simultaneously for various spare parts. Additionally, the

rapid prototyping approach has shortened the time needed to link the healthcare facilities and lifesaving spare parts of health care materials (De La Peña, De La Peña-Brambila, Pérez-De La Torre, Ochoa, & Gallardo, 2018). Such implications tend to focus on a single element, whereby it can be implemented simultaneously with multiple materials.

Prototyping in Aerospace Industry

The prototyping process can be used with various materials. This means that manufacturers and designers can manufacture a vast range of models with limited applications. Apart from being a prototype builder, it can serve as a real solution within the manufacturing and aerospace industries. The fact that rapid prototyping can inexpensively perform multiple changes makes it an attractive option (Koffler, 2019). In most cases, this is because it can validate products before full-scale manufacturing. In the aerospace industry, such methods and techniques allow the crafting process of complex assemblies at a lower cost and on a minimized time scale. Such intricate and innovative designs are essential in the industry, as aircraft turn out to be smaller and more efficient (Short, 2015). Therefore, without rapid prototyping, it would be challenging to assemble all the components that are needed in the aircraft. The element of rapid prototyping that enables low volumes is also essential. This means that smaller volume trials of new materials can be carried out. This seems to be a revolutionary way of advancing the aerospace industry allowing it to be controlled and guided by precision, innovation processes, and quality control.

Gains, Benefits, and Advantages

Prototyping 3D printing has brought many gains; and since its inception, the additive manufacturing industry has grown (Hernandez, 2015). Compared to earlier methods, printing spare parts is now possible with multiple and more diverse materials than before. Additionally, 3D printers can build vast and large items. 3D printing has expanded the production possibilities across other industries, leading to everything ranging from manufacturing to assembly (De La Peña, De La Peña-Brambila, Pérez-De La Torre, Ochoa, & Gallardo, 2018). A major benefit of prototyping 3D printing spare parts is that it improves the freedom of shaping. Manufacturers and designers can print spare parts of enormous geometric complexities. There are few technical constraints during the process, thereby opening up a myriad of possibilities for designers and manufacturers (Koffler, 2019). As a result, there has been an emergence of different 3D design techniques and methods. 3D printing has contributed to on-demand production. A common advantage of prototyping 3D printing spare parts is the ability of mass customization. Custom made pieces are constructed with the help of 3D modeling software. Apart from making parts, it is perceived to be a versatile and economical technique. One final advantage is that 3D printing can provide a manufacturer with another option to reduce stocking-related problems.

3D Cost Advantages Related to Efficiency

3D printing cost advantages have improved the efficiency of

the aerospace business. It has brought workability ease and reduced waste. Over the years, exotic metals act as the main element behind the aerospace application. Such materials are not easy to work with under normal and conventional processes (Hernandez, 2015) and had not been integrated into additive manufacturing processes. The additive nature of such printing has significantly lowered the waste when compared to conventional subtractive methods. Although material integrated into additive processes seems to be more expensive, the reduced materials tend to compensate for the higher material cost (De La Peña, De La Peña-Brambila, Pérez-De La Torre, Ochoa, & Gallardo, 2018). When the material suppliers start penetrating the markets, the cost tends to reduce further. The reduction in cost has led to a rise in the additive manufacturing application. The process has turned out to be more sustainable for the aerospace industry. This element has also managed to control prototyping and reduce manufacturing of the spare parts (Gordon, 2015). Additively built systems need few pieces, low assembly parts, and faster steps than before.

Cost Benefits in Research and Design

Costs and expenses linked to research and development (R&D) have been on the rise through the 3D vertical market. This rise in price ranges from the 3D printing manufacturing process to the end-user client (Lipson, 2015). Although an increase in 3D design software seems to be affecting small and mid-size businesses, there is a huge range of manufacturers who have incorporated 3D printing in the markets (Fell, 2016). Table 1 shows the growth in research and development investment for two 3D printing companies.

The advent of 3D printing has facilitated the credit of approximately 13 percent of the eligible expenditure for new and improved processes. This credit happens due to new and enhanced operations, improvements in technology, elimination of waste, removal of uncertainty, and an increase in the experimentation process (Lipson, 2015). The elements have made it possible for the relevant companies to reduce their eligible costs for employee salaries and wages, supplies, testing, research, and expenses linked to developing patents. Manufacturers around the world are using 3D printers in a capacity to reduce the research and development cost for companies (Fell, 2016). Thus, the rapid expansion of innovative technology has incentivized businesses that use 3D printers to be eligible for tax credits linked to R&D.

Cost Benefits in 3D Printing

When used correctly, 3D printing saves costs. According to research, approximately 40 percent of respondents stated that cost saving is one of the essential benefits of 3D printing, especially for those manufacturers and designers who need complex volume components. When comparing conventional to additive manufacturing, one of the most profound benefits of 3D printing is zero tooling costs and expenditure (Lipson, 2015). One can start with a 3D printing Computer-Aided Design (CAD) model that designers and manufacturers can find relatively easy to update with multiple geometries. 3D printing has no set-up or mold expenses, which tends to eliminate all tooling expenses (Gordon, 2015). Many manufacturing processes, like metal injections, are known to justify the high cost of tooling by putting higher volume blankets through a process called the Minimum Order Quantities (McFarland & Antunes, 2019). Minimum Order Quantities can lock clients into a specific design, and over time amortizes tooling expenditure.

Design Challenges

Design is one of the critical stages of the product development process. However, it faces the challenge of providing means of testing and validating all the spare parts before the manufacturing stage. 3D printing offers a faster and cheaper approach to design and production of spare parts. Since the need for tooling is removed, the product teams now face the challenge of accelerating the product development stages and cycles. Another challenge is that the ability to speed up the design process tends to give the designers limited flexibility in testing all of the different design options. Thus, 3D printing forces the designers to come up with slow-paced changes and alterations within a shorter period which involves creating complex geometries. With many spare car parts needing complex geometries such as the internal channels, thin walls, and fine meshes, the designer faces the problem of coming up with complex parts that are characterized as lightweight and durable.

Ability to Take Risk

3D design is not without risk. Despite the uncertainty, firms are looking forward to the design technology for purposes of rethinking processes and improving the business operations (Fell, 2016). Some of this risk includes copyright infringement.

Company	2010 R&D Expense	2010 Employees	2011 R&D Expense	2011 Employees	2012 R&D Expense	2012 Employees
3D Systems	\$ 10,700,000	484	\$ 14,300,000	714	\$ 23,200,000	1,010
Stratasys	\$ 9,800,000	414	\$ 14,400,000	530	\$ 16,250,000	1,100

Table 1—Growth in Research and Development (Source: Fell, 2016)

ment, compromised supply chain, global public safety, and getting exposed to ultrafine particles (McFarland & Antunes, 2019). There are multiple piracies of digital design files that are everywhere and are very difficult to police in regards to copyright infringement. In terms of a compromised supply chain, there is a risk of companies manufacturing products that are defective and being held liable for damages (Gordon, 2015). Also, ultra fine particles pose a risk whenever there are printers that do not have proper ventilation and where operators of the printers are more likely to be exposed to these particles that are released during the printing of designed parts. Inhalation of these particles can lead to health problems such as stroke and heart disease.

Conclusion

Even though there are risks involved with 3D printing, the benefits seemingly outweigh the risks. As 3D printing grows more prominent, new design features should be developed that will further improve their use and increase the safety and cost benefits for those companies who are willing to invest in this additive manufacturing technology. It may be more accurate to say that companies who do not invest in the technology will be taking the greater risk.

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Cultural Characteristics and Their Appearance in *Apocalypse Now*

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ABSTRACT

The world is a diverse place where people are taught from an early age what is “right and wrong.” Even though there are many different viewpoints, people who travel around the world must adapt and respond to various cultures’ definitions of right and wrong. To fully understand the numerous cultural characteristics and successfully travel abroad, a person must know things such as when to use certain types of communication channels, how to properly greet someone, and what type of power structures exist within different cultures. This paper goes into great detail regarding different cultural characteristics, what parts of the world they are practiced, and how Apocalypse Now displays many of them throughout the film. Francis Coppola created a story of a washed-up American soldier sent into the Vietnam jungle to kill a rebel Colonel who is threatening the Americans within his own militia. Captain Willard is faced with many challenges throughout his journey and eventually completes his mission—but at what cost?

Introduction

The film *Apocalypse Now* takes place in Vietnam around 1969. Captain Willard, who is a stir-crazed Special Forces officer, is sent into the jungle with top-secret commands to find and kill “renegade” Colonel Kurtz who has set up his own militia in the jungle. Captain Willard is gradually overtaken by the jungle’s entrancing powers and combats insanity that surrounds him as he enters deeper into the jungle. His drug-addicted boat company is slowly killed off one by one. As Captain Willard endures his journey, he becomes more like the man he was sent to execute. A film review on Common Sense Media stated the movie “illustrates the horror, the absurdity, and the futility of war, but most importantly it portrays war’s damaging psychological effects. A descent too far inward thus becomes a descent into hell—a hell brought on by the metaphorical journey upriver” (Reviews for *Apocalypse Now*, 2014). This paper will outline many different cultural aspects that could potentially lead to cross-cultural communication issues, and it will describe how the movie displays many of those different aspects.



Figure 1—Theatrical Release Poster by Bob Peak for 1979 Movie, *Apocalypse Now*

Individualistic or Collective Culture

It should first be explained what the differences are between individual and collective cultures. Where people are born or where they grew up can play a major role in whether they prefer working on projects alone or in a group. Cultures might instill independence, self-appreciation, and personal goal attainment as the method of life; cultures could contrarily cause people to view teamwork, reward-sharing, and harmonization as the custom. It is a person’s duty to understand each type of culture and adjust his or her own to thrive within it. Just because people grow up in a culture that preaches something is “right” does not mean they cannot acknowledge, respect, and adapt to other environments.

Individualistic Cultures

Individualistic cultures are characterized by emphasizing the importance of individuality, privacy, and competition (Reynolds & Valentine, 2011). Those who believe in individuality encompass having their own rights, responsibilities, and goals—separate from their team or organization. Individualistic cultures view privacy as a necessity, and they carry their desire for privacy everywhere they go. Competitiveness is considered to be fundamental in creating success and achieving goals throughout life.

Collective Cultures

Collective cultures are characterized by establishing relationships, practicing collaboration, and viewing time as flexible. Collective cultures tend to focus on relationships as being the number one priority in both business and personal life. While individualistic cultures set out to find answers single-handedly, collective cultures believe decisions should be made by a team or group. They believe this provides better results; plus, they do not want to be seen as self-centered. Collective cultures view time as flexible, not able to truly be measured, and as being much less important than creating and maintaining relationships.

Apocalypse Now: Collective or Individualistic?

This film has examples of both collective and individualistic cultures. The majority of the movie shows the lives of United States military men, who are taught to be collective in contrast to the average American's individualistic nature. For example, the military is taught to work as a team and "never leave a man behind." The viewer also watches Captain Willard display individualism throughout the film since he is solely focused on achieving his mission.

High-Context and Low-Context

For good examples of the contrasts between high-context and low-context social frameworks, one can look at their respective business practices. Low-context cultures rely on clear verbal messages, and they place less importance on the context of communication. Business people in these low-context cultures tend to make decisions based on individual benefits, rely heavily on facts and statistics, and place high importance on contractual agreements. On the contrary, high-context cultures use more non-verbal messages and indirect styles while communicating. Business people in high-context cultures believe group benefits should outweigh personal benefits. They feel their agreements and relationships should be built on trust, and they use "gut feeling" more often than statistics and facts in decision making.

Apocalypse Now: Cultural Context

Similar to the previous section, the film mostly shows the low-context culture of American soldiers who place high importance on contractual agreements and following commands. The American soldiers certainly trust each other, but they ultimately need facts and statistics when communicating orders. Later in the film, the Vietnamese militia is shown performing rituals and gatherings—something common in high-context cultures because they share common values and assumptions.

Attitudes Toward Time

How people view time has been separated into monochronic, cyclical, and polychronic classifications. Monochronic individuals take everyday life one event at a time; polychronic individuals tackle several tasks at once; and cyclical individuals view time as circular and repetitive (Reynolds & Valentine, 2011). The article "Everything Is about Time: Does It Have the Same Meaning All Over the World?" illustrates time differences between cultures. The article emphasizes monochronic versus polychronic because they are the most dissimilar. It first mentions an instance where a British businessman is becoming somewhat frustrated because his Saudi Arabian partner typically makes him wait extremely long times for an appointment, frequently has interruptions, and habitually talks on the phone with a client in the same room. The monochronic business person naturally perceives time as money, while the polychronic business person perceives time as somewhat irrelevant if it means creating a better relationship. In another instance, the author suggests polychronic individuals might have a hard time working in a monochronic environment. "Eskimos working in a factory in Alaska could not cope with the factory's whistle that alerted them to break times, etc." (Duranti & Di Prata, 2009). In the Eskimo's culture, the sea tides determine

when breaks take place and how long they might last.

The Movie's Attitude Toward Time

Just like the other cultural aspects, a little bit of each viewpoint of time is shown during the film. Captain Willard's attitude toward time is first monochronic because he is determined to complete his orders as soon as possible; but his view of time gradually changes throughout the journey when he shifts his focus to other things. The Vietnamese understanding of time and history is different than Americans. For a Vietnamese, except when influenced by Western society, time is cyclical.

Hierarchical and Democratic Power Structures

Different power structures are common around the world—the United States is democratic, while China is hierarchical. Some might say the democratic style could lead to confusion over "who is to answer to important questions," but the free flow of communication style is typically the better approach since it allows more ideas to generate throughout the organization. To provide a better understanding of each of these types of power structures, more detailed analyses are provided.

Hierarchical Power Structure

Hierarchical power structures are common in countries such as China and Korea. Countries that use this organizational structure prefer to know who is in charge; so harmony is more likely to stay intact because there is no question who should be answering the questions. The *Guide to Cross-Cultural Communication* also suggests hierarchical power structures are set up to preserve face, which is defined as "personal dignity" (Reynolds & Valentine, 2011). Lastly, cultures who use this type of system normally have beliefs that advocate rankings are a necessity because there are unequal relationships that should be honored.

Democratic Power Structure

Democratic power structures are the norm in countries such as the United States and Australia. Western societies tend to be advocates of equality, which is evident through the free flow of information as shown in businesses' organizational charts. Reynolds and Valentine (2011) mention how a professor from India had a somewhat difficult job transition to the United States from India, because India has a much more hierarchical culture, even in classrooms. Graduate students in the United States often challenge teachers and provide their own input, but the Indian professor was accustomed to his students remaining silent and never challenging his points. Unlike hierarchical power structures, democratic structures allow flow of information from bottom to top, as well as from top to bottom.

Power Structure throughout the Movie

The United States military represents a version of a hierarchical power structure; but at least within it, there are leaders who coordinate to get more of a consensus. Kurtz became a supreme leader in Vietnam, almost like a dictatorship. His followers adhered to everything he said—whatever Kurtz declared was final. The movie explores hierarchies and how humans react to trauma based on their position within that hierarchy. At the end of the film, Captain Willard executes

Kurtz, so the militia then views him as the new “king.”

Problems Caused by Language Translation

The same word often has many meanings across languages. Whichever language is being spoken or written, a person must be sure to use and understand the most common meaning for the target audience. This can be quite difficult since many words have multiple meanings; but doing so will reduce the chances of misinterpreting the message. A person may not realize how powerful words can be, but it is important to recognize the recipient’s communication style and avoid using phrases and words that might belittle others. Following are a few examples of companies’ slogans that were “lost in translation” and might have caused unintended backlash or confusion.

Kentucky Fried Chicken

In the early expansion of Kentucky Fried Chicken, the company wanted to make a good first impression. However, they ran into a slight issue with their grand opening of the Beijing location. The famous restaurant’s “Finger lickin’ good” slogan translated to “Eat your fingers off” (Schooley, 2019). The company had major success in China eventually, but this is a classic example of common mistakes a company can make while marketing in an unfamiliar culture.

Electrolux

Next there is an example of a more hidden issue that differs from culture to culture: slang. Electrolux is a Scandinavian company whose advertising campaign did not go over well in the United States. Their ad read, “Nothing sucks like an Electrolux,” which has a negative connotation in the United States (Schooley, 2019). The company was attempting to promote its high-powered vacuums, but Americans were not fond of the terminology. Not only should companies be aware of translations, they must also be aware of that country’s slang.

Ford Motor Company

Another great example, noted in Schooley’s article in *Business News Daily* (2019), mentions when Ford Motor Company introduced their brand in Belgium. Ford’s launch included an ad campaign that said, “Every car has a high-quality body.” The word for “body” translated as “corpse.” Most Belgium residents would probably not be interested in buying a vehicle with a dead body inside.

Lost in Translation—*Apocalypse Now*

There is one particular part of the movie that well illustrates translation issues. It is when the boat crew floats up to a Vietnamese family on the water to search them and their belongings. Since the American crew lacked a translator, they ultimately misidentified the family for the enemy and shot them. Only later did they discover the family posed no danger to the Americans.

Cross Cultural Problems in Written Communication

Written communication across diverse cultures may seem like simple insignificances upon first glance, but not understanding how others may receive a message or writing style can prove

to be far more damaging later. Not only is it important to be aware of the different styles of communication, it is also important to understand when to use the appropriate style. The *Guide to Cross-Cultural Communication* provides illustrations of how different channels, directness, and immediacy can lead to miscommunications among different cultures (Reynolds & Valentine, 2011).

Different Channels

First, communication channels are essentially the medium used to convey a message. Americans are known to use new technological advancements as soon as they are available, while many other countries may prefer to use more personal methods. The *Guide to Cross-Cultural Communication* uses an example of American business people who commonly use the phrase “please call if you have any questions” as a tag line in business letters. Such a request is likely to be viewed as dismissive in relational cultures such as found in Nigeria (Reynolds & Valentine, 2011). Tips for using technology to communicate across cultures include using headings and avoiding the use of abbreviations and acronyms that may be unfamiliar to those of other cultures.

Directness

Next, how direct a message is constructed should vary between cultures because of high-context versus low-context norms. For example, high-context cultures use communication that relies heavily on context and relationships, while low-context cultures use clear and explicit verbal communication. Reynolds and Valentine mention an example of the personal tone and indirectness in a high-context culture:

A letter from a health organization in Sao Paulo, Brazil, to a U.S. business that donated funds for a dental clinic began as follows: “Dear Honored Sponsor, we will offer manifest feelings of appreciation for the financial support you have provided to our dental clinic. Many lives here will be touched by your generosity” (2011).

For those more accustomed to a direct communication style, it is wise to try using a more personal opening and providing more context when communicating with people from different cultures.

Immediacy

Lastly, a culture’s communication can vary with the immediacy a message is given. Most English-speaking writers are prone to write immediately about an issue because they do not want to waste time or worsen a situation. Other cultures might view time differently and delay a message to allow time to reflect on an issue or diffuse a situation. When traveling internationally, people should be cognizant of how the recipients view time, since the immediacy or lack of immediacy of a message could cause harm to the relationship.

Written Communication in *Apocalypse Now*

Written communication was common during war times among infantrymen, commanders, and family members. Letters would be sent back and forth between soldiers and their friends or family that relayed how everything was going as well as random things happening around them. A scene in the film shows

Chef writing a note mentioning the part of the movie where he and Willard were almost eaten by a tiger when they left the boat. One of the final scenes of the movie shows Captain Willard slaughtering Kurtz, seeing a book filled with his writings, and then reading the words he had previously heard on a recording of Kurtz saying, "Drop the bomb, exterminate them all" (Coppola, 1979).

Non-Verbal Communication

Non-verbal communication is just as important as, if not more important than, verbal communication in both business negotiations and everyday conversations. With that in mind, it is imperative international travelers and those who work in culturally diverse organizations understand how to use different non-verbal communications. There are three major non-verbal communication methods: eye contact, personal space, silence and rhythm.

Eye Contact

Eye contact is one of the most noticeable non-verbal communications someone uses. Americans are generally taught that using constant eye contact while speaking and listening shows they care about the conversation and that they are not nervous. Eye contact differs across the world in many ways: eye behavior while speaking instead of listening, the cultural differences using direct and indirect eye contact, and the role social hierarchy plays in the use of eye contact. Mirroring the culture's use of eye contact and asking questions when in doubt are great rules to follow when dealing with diverse employees or business acquaintances.

Personal Space

Personal space is another non-verbal communication that is highly noticeable and might cause discomfort when used with someone with a dissimilar preference. The conversation distance that follows a greeting is sometimes difficult for Americans to figure out and adjust to when communicating with someone with a different cultural understanding and preference of personal space. A culture that believes being very close is a proper conversation distance could come off as aggressive to another; while cultures that prefer large distances might make the other person feel disrespected. The best tip for meeting and speaking with different cultures is to stand still and allow the other person to adjust the distance. Do not be offended or disturbed when it is different than usual.

Silence and Rhythm

Silence and rhythm of language is used in several different ways across the world. The major difference between cultural interpretations of the silence and rhythm of language is that one views silence as negative, and the other views silence as positive. Americans tend to speak with a certain rhythm that keeps conversations flowing smoothly without long pauses or speaking over one another. Euro-Americans view long pauses as confusion or misunderstanding, and they are offended when the other person tries to speak over them. Asian cultures treat pauses differently than Americans. They use pauses to allow time to reflect and weigh the benefits or problems with the message. To prevent issues with the differences of this non-verbal communication a person must understand how the other culture views time and silence, listen to them as they speak, and adjust the pauses of a message.

The Film's Non-Verbal Communication

Throughout the movie, there were many forms of non-verbal communication displayed. One of the scenes showed Lieutenant Colonel Bill Kilgore taking out a deck of cards from his pocket and putting "death cards" on the bodies lying around—this presentation was to show Kurtz who killed all of the innocent Vietnamese during their air attack and provide warning. Another major scene in the movie is the Playboy Girls putting on a show at one of the military bases on the river. The girls danced on a stage to the accompanying band to boost morale, but the show ultimately led to a brawl between many of the military men fighting over the girls' autographs and attention.

Final Analysis

The world is gradually becoming more globalized, which means people are interacting with different types of cultures more often. Globalization can be a good thing if people learn to respect others' cultural characteristics and adapt to their surroundings. *Apocalypse Now* provides great examples of different cultures and their norms, as displayed through the American soldiers and Vietnamese people they encountered.

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Lean Six Sigma in Physical Distribution

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ABSTRACT

This paper introduces lean concepts in distribution and inventory management, including the Total Quality Management (TQM) and Six Sigma philosophies, as well as a newer mixed idea sometimes referred to as Lean Six Sigma. Although these concepts originated in different countries and employ different approaches to process improvement, they both have the end goal of increasing productivity and improving quality. Current trends in lean distribution and management will also be discussed, including employee factors, the fusion of Lean Production and Six Sigma Quality into the current Lean Six Sigma management philosophy, and the use of enterprise resource planning (ERP) systems to facilitate the real-time monitoring and control of distribution activities. Finally, the philosophies of lean management in physical distribution will be explored, from their beginnings in Japan to their growth and application in companies around the world.

Introduction

Lean concepts have become a key factor in physical distribution and inventory management today. The term “lean” was first used by John Krafcik (1988) in an MIT Sloan Management review article, but it came into popular use after the publication of *The Machine that Changed the World*, which detailed an MIT study on the difference between the Japanese and American auto industries (Sinha & Matharu, 2019). Lean concepts were taken directly from the Toyota Production System (TPS), which originated in Japan and has been emulated across the world. Six Sigma is another production improvement philosophy which emphasizes reduction in process variation to improve performance. These techniques were developed at Motorola (Muraliraj et al., 2018). Current trends in the lean production approach include the combined techniques of Lean Six Sigma, the use of enterprise resource planning (ERP) systems to monitor and control key processes, and employee rewards programs. Lean management also plays an important role in physical distribution, from its origins in Japan to its current applications today in countries across the world. Other lean tools have been developed in various countries, as well, to help reduce waste and increase efficiency.

Lean Production Concepts

Lean production originated in Japan with the TPS during the post-World War II era when Japanese manufacturers realized they did not have the money to rebuild factories destroyed during the war (Bhamu & Kuldip, 2014). By focusing on quality, Toyota rose to create a company that would dominate the automobile industry using its Toyota Production System, characterized by lean production methods and a continuous improvement philosophy. Competitors around the world tried to emulate their lean techniques with similar programs such as Total Quality Management (TQM) and Just-In-Time (JIT) manufacturing. TQM is a management philosophy that focuses on customer satisfaction through the commitment and continual improvement of every staff member and employee in the company, while JIT production reflects the key tenets of TPS by focusing on the delivery of materials and parts just when need-

ed to reduce transit time as well as carrying costs. While lean concepts are now used in almost every industry, they are most prevalent within the automotive industry, due to their origins in Japan with Toyota (Bhamu & Kuldip, 2014).

Six Sigma is a concept that originated within the United States at the Motorola Research Center and focuses on eliminating the sources of defects that increase process variability and reduce quality (Spasojevic Brkic & Tomic, 2016). It incorporates a method called DMAIC, which stands for the steps in the continuous improvement cycle it embraces: define, measure, analyze, improve, and control. Some argue that lean alone does not foster statistical control, while Six Sigma alone cannot significantly reduce processing time or inventory investment (Muraliraj et al., 2018). The move toward a combination of the two, Lean Six Sigma, has begun in many industries since the utilization of these two management approaches separately does not necessarily facilitate the level of improvement needed in many situations. Lean Six Sigma combines the best of both methods in a way that can get things “done faster, better, cheaper, safer, and greener” (Muraliraj et al., 2018).

Current Trends

Current trends in lean inventory management and distribution include the use of Lean Six Sigma, ERP systems, and employee factors in lean concepts. Lean Six Sigma was first proposed as an idea in the early 2000s and has gained popularity since then, especially during the last decade. The goal and purpose of Lean Six Sigma is to “maximize shareholder value by improving quality, speed, customer satisfaction, and costs through both concepts tools and principles usage” (Spasojevic Brkic & Tomic, 2016). One criticism of the blending of Lean and Six Sigma management principles includes conflicts of interest, since Six Sigma is typically implemented by a few individuals within a company, whereas Lean requires the commitment of every employee within the organization. To resolve this conflict, as well as other potential problems in Lean Six Sigma implementation, training is required for all employees, especially in the principles of Six Sigma. This training can be expensive and is, as yet, unstandardized, which is an imped-

ment to Lean Six Sigma success. Despite these drawbacks, this combined process improvement philosophy has been shown to produce great results including “increased profits and financial savings, increased customer satisfaction, reduced cost, reduced cycle time, improved key performance metrics, reduced defects, reduced machine breakdown time, reduced inventory, improved quality, and increased production capacity” (Muraliraj et al., 2018).

The use of Enterprise Resource Planning (ERP) systems, which provide a software platform meant to integrate information flow throughout a company, is another current trend in lean distribution and inventory management. Lean concepts and ERP systems have both been popular choices for companies looking to improve their performance. However, combining the two ideas is a recent trend that has not been without criticism. Traditionally, ERP systems have been considered a source of waste in lean production with the claim that they encourage large on-hand inventories and slow production (Powell, 2013). Many argue, however, that this is not the case and that ERP systems are meant to provide higher level planning, which is perfectly compatible with lean methods. Lean production and ERP systems are both utilized to obtain a competitive advantage, which ERP can create by replacing complex and outdated methods of planning with new and more efficient information technology. For ERP systems to be used successfully in lean management, they must be properly implemented with clearly defined goals and complete commitment from management, the organization, and its employees. Research suggests that it is possible to efficiently use ERP in lean management by “combining lean production principles with contemporary ERP systems, integrated throughout the supply chain with the support of the internet and other information technologies” (Powell, 2013).

Employee factors also play a large role in any distribution or management system, and this idea has recently gained attention in research on lean concepts. Satisfied employees are found to be beneficial to the outcome and results of a company, and several factors have been identified that play into employee satisfaction in lean management systems. A reward system for employees that recognizes great achievement with incentives such as bonuses or prizes is highly beneficial to employee satisfaction. Another important aspect in lean systems is regular training for employees, which focuses on quality and the constant updates and changes in things such as materials (Spasojevic Brkic & Tomic, 2016).

Applications in Physical Distribution

Lean concepts originated in production and manufacturing and have been applied to almost every other facet of the supply chain, including distribution. Lean management focuses on the removal of waste in every aspect of a process and this concept can be applied effectively in distribution warehousing where waste is often seen as an accepted part of the process due to the sheer number of operations performed (Abushaikha, Salhieh, & Towers, 2018). Lean methods can be applied to warehouse operations to reduce waste and non-value adding activities in an effort to maximize the efficiency of distribution activities. A relatively new term used to describe the use of lean concepts in the distribution end of the supply chain is “lean warehousing,” which refers to running warehouses with a lean management philosophy. Areas that have been identified in warehousing as causes of waste include overproduction, unnecessary transportation, overprocessing, waiting, and defects. Identifying the causes of waste in the

warehouse allows for the removal of this waste and makes it possible to streamline the warehouse’s operations. Once the warehouse has been optimized, a company should focus on creating a well-organized transportation schedule so that once the produce is removed from the warehouse, no waste is created during transportation to the product’s final destination. Studies have shown that implementing lean concepts and reducing waste levels “has a significant positive impact on warehouse operational performance and distribution performance” (Abushaikha et al., 2018).

Conclusion

Lean management is a concept that originated in Japan with Toyota and the automotive industry and, due to its effectiveness, has since expanded across the world into almost every industry. Lean focuses on the reduction of waste in every process, where waste is seen as any activity that does not add value to the final product. Another concept that looks to promote the overall efficiency of the company is Six Sigma Quality, which aims to reduce variation in every aspect of a process to reduce defects. Recently, these two concepts have been combined into a management philosophy known as Lean Six Sigma, which attempts to use both ideas to create the most effective possible strategy. There have been criticisms of Lean Six Sigma, but overall the philosophy has been found to be very successful. Current trends in lean management, in addition to Lean Six Sigma, have included the integration of ERP systems and a focus on the importance and benefits of satisfied employees. Recently, lean management has also been applied to distribution that has led to the concept of lean warehousing. Lean principles have been shown to be effective in every step of the supply chain, including distribution.

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Diversity Does Not Equal Inclusion: *The D & I Value Proposition*

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ABSTRACT

*There are many who use the terms 'diversity' and 'inclusion' interchangeably. However, each means something distinctly different. Diversity and inclusion represent both a socially responsible approach to managing organizations, as well as a vital key in unlocking a firm's competitive advantage. There is a growing body of research that supports a corollary between effective diversity management and organizational performance. To fully culminate this, workplace diversity and inclusion must be embraced at the highest levels within organizations. This involves exploring existing barriers and how to create conditions where a culture of diversity can thrive. Key questions will be considered: **Why should organizational leaders be concerned with diversity and inclusion? How do organizational leaders discover these advantages? What does the looking glass reveal about the gaps between present and desired state? Are today's places of work ready to embrace both diversity in the workplace and inclusion in the way individuals collectively work and organizations navigate their operations?***

Introduction

Diversity and inclusion (D & I) continues to remain an often misunderstood set of topics. However, the realities in today's workplace indicate they represent both a socially responsible approach to managing organizations, as well as a vital key in unlocking a firm's competitive advantage. A value proposition exists. Together, diversity and inclusion represent employees that more intimately understand and reflect client needs, actively engage in and voice decisions that favorably affect all stakeholders, and collaborate toward collective outcomes that truly matter for individuals, groups, and organizations. To embrace their potential advantages, it is essential to first unpack existing barriers and explore how to create conditions where a culture of diversity and inclusion can thrive.

Similar or Different?

Defining Clear Differences between Diversity & Inclusion

There are many who use the terms 'diversity' and 'inclusion' interchangeably. However, considering these one in the same suggests a lack of understanding as to what each truly represents since each means something distinctly different. Organizations can have a diverse workforce composition, but a non-inclusive culture; or be more homogeneous, but inclusive. The former conditions can lead to ethnocentrism, greater employee disengagement and unrest; the latter to a propensity for group think. Only organizations that have a diverse workforce and inclusive culture can create the conditions for cultural relativism and give rise to conditions for optimal business impact. Diversity represents our unique perspectives, but inclusion is the demonstrated action of actively seeking out, valuing and leveraging those vantage points. Sherbin and Rashid (2017) contend "diversity equals representation, while inclusion provides the connections that entice diverse talent, encourage participation and innovation, and lead to business growth." Comparably, Verna Meyers (2020), inclusion strategist and author of *Moving Diversity Forward: How to Go from Well-*

Meaning to Well-Doing, portrayed this in the metaphor, "Diversity is being invited to the party. Inclusion is being invited to dance." Therefore, it is logically clear that diversity and inclusion are separate, but completely interdependent conditions for positive change.

Diversity presents itself in many ways. Primary, secondary, organizational, and cultural dimensions of diversity can lead to robust perspectives to synthesize actions. Primary factors of diversity can include national origin, ethnicity, affinity orientation, race, gender, social class, age, and physical/mental ability. These are typically inborn, influence socialization in early life and throughout one's lifetime, as well as are grounded on different life chances based on them. Comparatively, secondary dimensions of diversity include other differences one can acquire through life that shape one's self image and world view, such as level of education attained, spiritual preferences and religious beliefs, cognitive and communication styles, inclusive of language accent, working style, geographic location, marital status, military experience, political views, and appearance. One can elect to discard or modify any of these secondary conditions based on unique choices. Organizational dimensions of diversity are framed by attributes surrounding one's workplace experience. Factors in this dimension include industry, division/department, location, union affiliation, job role in the company, level in the organization, tenure, management status, engagement/work experience, and social/professional network. Finally, cultural dimensions of diversity include traits, behaviors, preferences, or values shaped by culture to include body language, conditions of competition or cooperation, preferences for conflict resolution, traditions and observances, personal space orientation, flexible or structured work, individual or team-based approaches, views of time itself, levels of engagement, and existing power and authority and how it is utilized (Figure 1).

Collectively, primary, secondary, organizational, and cultural elements constitute our own self-identity. Together, these for-

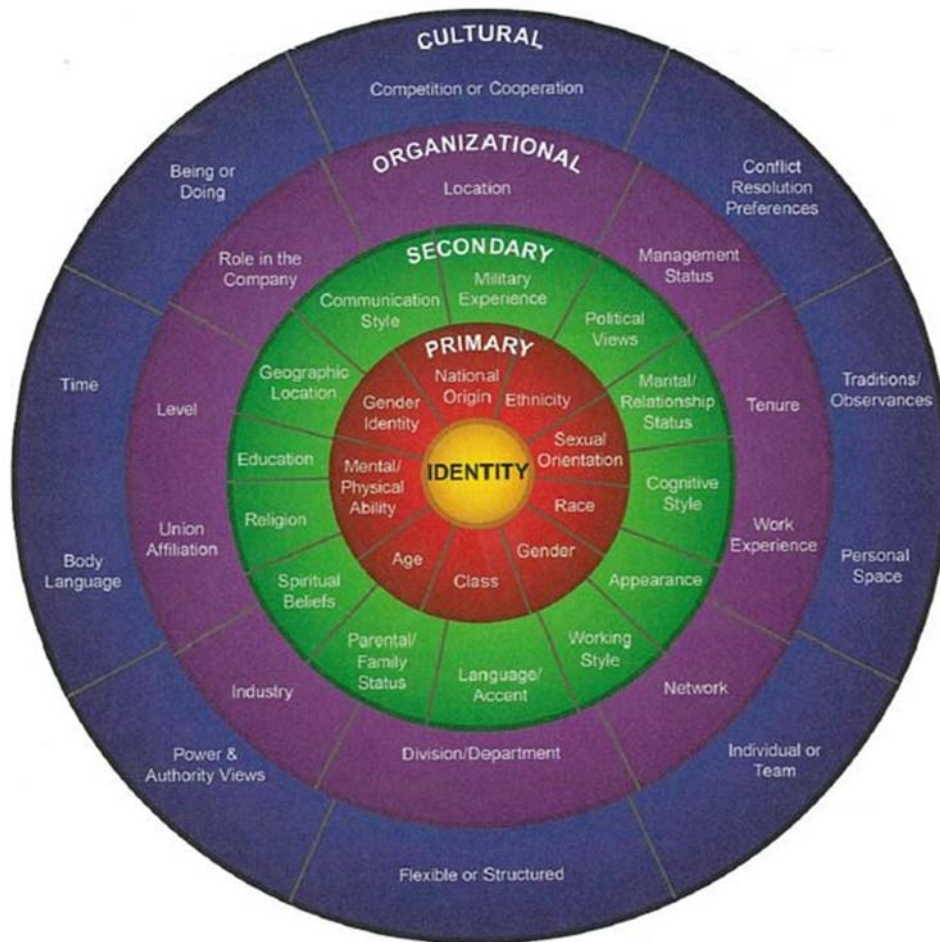


Figure 1—Dimensions of Diversity

Source: Adapted from *Workforce America!* By Marilyn Loden and Judy Rosener, 1991; *Diverse Teams at Work* by Lee Gardenswartz and Anita Rowe, 2003; and *Global Diversity Puts New Spin on Loden's Diversity Wheel* by Kimberley Lou and Barbara Dean, 2010

multate a sense of self. It also portrays how individuals see each other. At its core, diversity and inclusion represent authentic differences, solidifying a sense of voice and belonging, connectedness of people, valued collective strengths, and cultural competence (Chen & Tang, 2018). Dr. Cecillia Orellana-Rojas, Vice-President of Strategy and Research, National Diversity Council (NDC) (2019), has assimilated ten cultural competencies that serve as an engine for inclusion in the workplace:

1. Cultural self-awareness
2. Awareness of one's self-World view
3. Knowledge of other cultures
4. Curiosity
5. Empathy
6. Open-mindedness
7. Tolerance of ambiguity
8. Cultural flexibility or adaptation
9. Cultural humility
10. Collaboration

Cultural competence can create an expansive set of conditions to allow employees to interact effectively and appropriately for desirable business impact. ***What intentional actions promote diversity and inclusion in our places of work? How can it be operationalized?***

Personal Circle of Trust: Implicit Biases and Building a Diverse and Inclusive 'Circle of Trust'

In creating preeminent conditions for diversity and inclusion, organizational leaders not only need to be enabled to visualize the route from Point A to Point B, but also have a clear idea of what it will look like when they get to Point B. This journey often must begin with an assessment of individual biases. Implicit bias suggests that virtually all individuals unconsciously hold attitudes or associate stereotypes toward others that affect interactions. Longstanding scientific findings by leading researchers from the field of cognitive psychology have provided an abundance of grounded empirical findings that have been extensively replicated and purport that people can and do possess attitudes, stereotypes, and prejudices in the absence of intention, awareness, deliberation, or effort (Jost, Rudman, Blair, Carney, Dasgupta, Glaser, & Hardin, 2009; Banaji & Greenwald, 1995; Banaji, Hardin, & Rothman, 1993; Devine, 1989; Dovidio, Evans, & Tyler, 1986; Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Fazio, Jackson, Dunton, & Williams, 1995; Fazio, Sanbonmatsu, Powell, & Kardes, 1986; Perdue & Gurtman, 1990; Rudman & Borgida, 1995; Stangor, Sullivan, & Ford, 1991). Implicit biases can present themselves either favorably or unfavorably based on one's individually held belief system. When implicit biases

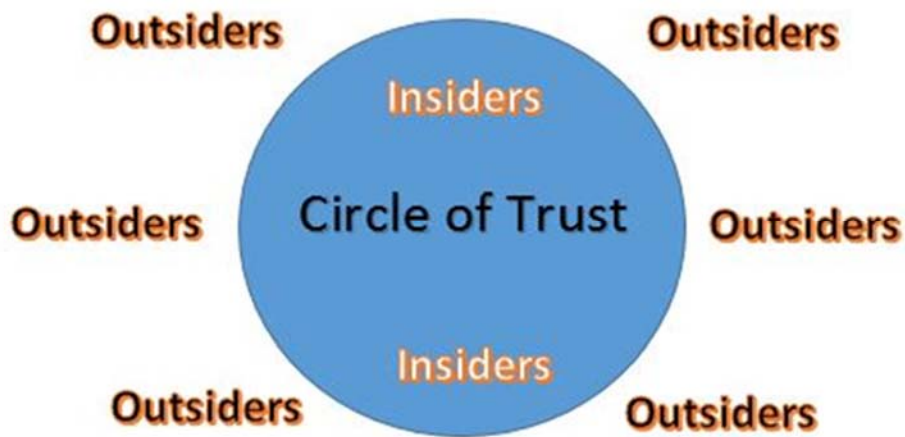


Figure 2—Circle of Trust

lead to unfavorable views with respect to race, gender, age, social class (primary dimensions of diversity), political views, level of education, religious beliefs, appearance, language (secondary dimensions of diversity), industry, union status, role with a company, tenure (organizational dimensions of diversity), ethnicity, nationality, gender, social status or power and authority, body language, traditions/observances (cultural dimensions of diversity), they can lead to exclusion. As Allport (1954) maintained, “Prejudice is not the invention of liberal intellectuals. It is simply an aspect of mental life that can be studied as objectively as any other” (p. 516).

A Circle of Trust (Figure 2) can provide a guide for where individuals may begin. In all social constructs, individuals form and act upon one’s defined Circle of Trust. If one wants to explore the limitations one may have in embracing diversity and inclusion, it can begin by an examination of who is and who is not in one’s Circle of Trust. Questions to explore can include:

1. In consideration of the four dimensions of diversity, how homogenous is one’s Circle of Trust?
2. Are there individuals in the Circle of Trust that are outside of one’s family?
3. Are there individuals inside that think, act, and behave differently?
4. What is causing homogeneity in the Circle of Trust, and what can be done to broaden it?

Circles of Trust become a leadership imperative to be modeled. Unless leaders engage in intentional actions to develop an environment where employees trust that conditions are safe enough to work hard, collaborate and take risks, then creating a fully engaged and inclusive environment is likely not possible. Sinek (2014; 2017) and Keijzer (2016) assert that organizational leaders must create a “Circle of Trust” (Figure 3) where direct reports believe their leader respects, knows, protects, and supports them as individuals no matter the composition of their diverse identity, and seeks out and actively encour-

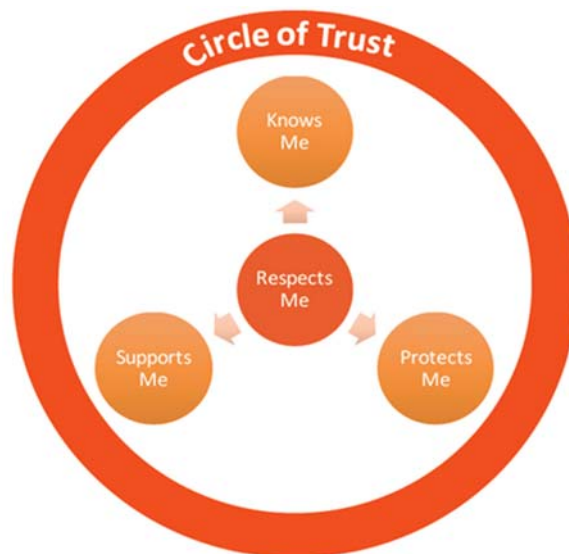


Figure 3—Leadership Circle of Trust

Source: *Why You Need to Create a Circle of Trust*, Keijzer, 2016

ages and values individual ideas, social constructs, and work product contributions.

Sinek (2017) suggests that the most effective leaders draw direct reports into their Circle of Trust. These researchers clarify that leaders can garner respect by exemplifying fairness, integrity, courtesy, and concern for subordinates; demonstrate knowledge of employees by understanding individual drive, motivation, and aspirations, seen as a bedrock of protection when they create an umbrella of safety from internal politics and/or heavy-handedness of other co-workers or other leaders, and support and implement decisions that hold direct reports best interests in mind, while providing clear expectations, needed resources, and continuous feedback.

To allow for diverse and inclusive Circles of Trust to come to full fruition, individuals and organizational leaders must self-assess their own Circles of Trust and determine *who is* and *who is not* within its radius and build a strategy to expand their make-up. ***Reflectively, what do our own personal Circles of Trust look like? Do they reflect a personal agenda of valuing diversity and inclusion?***

One Proactive Option: Employee Resource Groups (ERGs)/Associate Resource Groups (ARGs)/Affinity Groups

With the rapid diversification of today's global workforce, organizations are attempting to influence the speed and adoption of diversity and inclusion by taking proactive measures to increase employee involvement. One such mechanism becoming popular in today's culture is Employee Resource Groups (ERGs), Associate Resource Groups (ARGs) or Affinity Groups. These are employer-recognized groups of employees who share concerns of a common race, gender, national origin, sexual orientation, common interest, identity or theme. Today we are seeing an increase in ERGs, as they are typically called, including veterans, people with disabilities, LGBTQ+, and single/working parents. They are led by the employees themselves and participation is voluntary. Originally, they were called "Workplace Affinity Groups" and were created in response to the racial troubles of the 1960s. Eventually, upper management began to view these ERGs as instrumental to the success of their business.

In order for ERGs to be successful, they generally have buy-in from senior leadership and often even have executive representation or sponsorship. Typically, an assessment determining which diverse groups are represented or underrepresented in the organization helps to determine the ERGs that are needed. Is the company having trouble recruiting women? Are we looking to attract Hispanic or African American workers? Are we having difficulty with retention issues surrounding millennials? Groups typically start small and are supported through internal company advertising. The whole point of the ERGs is to give underrepresented voices an opportunity to communicate with each other and management. Fostering communication between ERGs ensures that all participants are working towards the same goals as well as keeping the company in alignment. Often they are facing similar obstacles, and thus have common goals.

Research suggests these aforementioned groups benefit employers and employees alike (Arnold, 2006; Bye, 2003; Friedman & Holtom, 2002; Cross et al., 2018). These groups have been shown to positively affect work engagement (increased

vigor and feelings of connectedness) and work place inclusion (feeling valued/respected and increased sense of belonging) (Cenki, Zimmerman, & Bircan, 2019). These groups provide an internal community for employees, providing them with opportunities in networking, mentoring as well as exposure to executive leadership, all while providing employers better retention rates, larger qualified applicant pools, and, by most studies, increased productivity (Friedman & Holtom, 2002; Higgins & Kram, 2001; Cross et al., 2018). Formation of these ERGs, ARGs, and Affinity Groups can be one proactive step that organizations can take to increase diversity and, more importantly, increase inclusion.

Framing the Business Case: Trends for Diversity and Inclusion

Collectively, the U.S. workforce is getting older and more diverse. Workforce demographic projections through 2020 have shown non-white, minority population in the workforce doubling, increasing from 18% to 37% over the past 20 years. During the same period, anticipation of parallel and concomitant decreases in the white working population from 82% to 63% (Goldberg et al., 2019). Data informed predictions by the U.S. Bureau of Labor Statistics suggests that this pattern of growing workplace diversity will continue to show sustained increases with even more ethnically diverse groups and older workers who present a broader range of skills, experience, and expertise (Grissom, 2018). Defined as a "New Wave of Diversity," today's multigenerational workforce represents nearly 100 million workers age 40 or older and slightly greater than 55 million workers under 40. For the first time in the nation's history, 50% of children under age 5 are minorities and 20% have a foreign-born parent. By 2044, it is projected more than half of the U.S. population will be people of color and no racial or ethnic majority (National Diversity Council, 2019). Critics suggest the diversity explosion will facilitate a prosperous nation, making it more inclusive and globally connected. However, present challenges remain. For example, women presently account for 48.9% of the labor force, yet represent only 20.2% of the Board of Directors of Fortune 500 companies. People of color trail even further, holding only 14.4% of comparable seats at the table (Grissom, 2018). With today's current great divide between 'diversity' and 'inclusion,' organizational leaders will need to adopt more comprehensive human capital management strategies that allow companies to fully glean the benefits of a diverse workforce and inclusive culture (LaFevor, 2017; Teimouri, Jenab, & LaFevor, 2018).

There is a growing body of research that supports a corollary between effective diversity management and organizational performance. These advantages include:

1. Broader pool of applicants and talent
2. Better retention
3. Broader service to a range of customers
4. More innovative and creative solutions
5. Increased workforce productivity and job performance
6. Increased competitiveness and profitability (Goldberg et al., 2019)

As noted, diversity has been found to be both a benefit and business necessity. Businesses are 35% more likely to outperform national averages based on the diverseness composition. Furthermore, research indicates that an employee with the same ethnic background as a client increases an accurate assessment of clients' needs by 152%. Yet another study

determined that for every 10% increase in racial and ethnic diversity in senior executive composition, earnings before tax and interest tax rises 0.8%. Similar companion research on inclusion by Ernst and Young concluded that groups with the best levels of engagement show a 7% increase in retention, 10% growth in revenue, and 6% improvement in gross margin (Goldberg et al., 2019).

To summarize, Dennis Kennedy, Founder and CEO National Diversity Council, states, "Diversity keeps organizations competitive by building effective global relationships, increasing innovation and creativity through varied perspectives, enhancing brand awareness, and improving customer relations. This is why diversity is always a win-win." ***With this data-informed knowledge, how will we shape our D & I agenda to best leverage this competitive advantage?***

Conclusion

Workplace diversity and inclusion stands to be an unparalleled competitive advantage for employers who choose to intentionally enfold it. However, to fully culminate this, it must be embraced at the highest levels within organizations, fully deployed and operationalized. To successfully foster the needed changes, there is an exigency for inclusive leaders, diverse and inclusive cultures, and complementary human capital strategies. This necessitates establishing a true north to guide the D & I agenda, which will require setting aside familiar paradigms. As Simon Sinek (2017) cautioned, "In the military, medals are given to those who sacrifice their lives so that others may gain. But in the business world, we are often quick to hand out a bonus to someone willing to sacrifice others so that we may gain." These old scripts must be replaced with an acknowledged value placed on the value proposition of diversity and inclusion and how together, collectively, organizations can find the fuel to thrive.

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Continuous Supply Chain Improvement Using Artificial Intelligence

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ABSTRACT

The supply chain concept is evolving thanks to innovative technologies such as artificial intelligence (AI). Many of these technologies, such as the Internet of Things (IoT), machine learning, and cloud-based information systems, are already utilized. When these applications are combined, supply chains greatly benefit. In particular, the use of AI in the supply chain will help to increase efficiencies and improve decision-making. Supply chain managers strive for visibility, connectivity, and efficiency within the chain; and advanced technologies such as these help them achieve the highest visibility, connectivity, and efficiency. Merging AI with advanced technologies, the cloud, and automation will help the supply chains become self-thinking. The goal for the future of supply chains is for them to be self-thinking and capable of handling any issues before they become a significant problem.

Introduction

There are many tools that can be used within a supply chain to improve business processes and create a climate of continuous improvement. One of these tools is artificial intelligence (AI). AI is fast becoming a way to gain efficiencies and improve decision-making within the supply chain. Other efficiency improvements can be gained through advanced technologies, the use of demand forecasting to reduce the bullwhip effect, process automation, and cloud-based technologies. Companies must consider the total effect that AI and these other tools will have for them; if they choose not to implement them, they risk getting left behind.

Examples of Advanced Information Technologies

Advanced information technologies in the supply chain are rapidly evolving. These technologies can help in supply chain administration and within logistics/transportation. Advanced information systems have the capability to be able to pull data needed in order to make good decisions. Instead of people manually collecting and entering data for reports, enterprise resource planning (ERP) central databases can be mined automatically. Decision-making software included within ERP modules can run different scenarios in order to determine the best solution for a particular supply chain problem (McCrea, 2019). This capability provides opportunities for significant time savings and reductions in human error. For example, JAGGAER, a cloud-based spend management software, offers to deliver a simplified approach to procurement from the source to pay. The software producer's website introduces a solution called JAGGAER ONE that provides a full digital transformation across the procurement process. The goal of this system is to help customers make better decisions by providing useful data (McCrea, 2019).

The new automated data collection and analysis systems provide a better way for companies to deal with data. They allow them to look in the past to help predict the future by building forecasting models with the data collected. For instance, if a trucking company wants to see which shipping method results

in the highest shipping costs, data analytics of previous shipments could be used to compare methods. Then, the company would be able to make better shipping decisions.

Using Advanced Information Technology for Improvement in the Supply Chain

Demand Forecasting

One of the ways that advanced information technology can improve the supply chain is in the area of demand forecasting. Feizabadi and Shrivastava (2018) predict that demand forecasting aided by AI and machine learning will be one of the most sought after applications in the near term. This technology will be able to use past experiences to analyze data and identify complex factors that influence demand. This allows companies to plan for production and inventory instead of reacting to seasonal peaks or market turns. Many companies are using traditional forecasting methods, but by improving forecast accuracy using machine learning, these companies will be better able to predict demand patterns in situations where significant uncertainty exists. Feizabadi and Shrivastava (2018) used inventory turnover, forecast accuracy, and cash conversion cycle (CCC) as indicators in their research to determine if AI-enabled forecasting improves supply chain efficiency. The first two measures represent operations performance, while the CCC reflects capital performance. For their research, AI-enabled forecasting software build demand forecasts based on prior year performances (specific to specific years) that included sales volume, quarterly inventory levels, accounts receivable and payable, costs of goods sold, and revenue. The results showed that demand forecasting improved by 6.4% using machine learning capabilities (Feizabadi & Shrivastava, 2018).

Demand forecasting using AI and machine learning is still relatively new, and more research is needed to develop these capabilities to their full potential. For example, fast-fashion and electronics markets do not use AI-enabled forecasting at present. Demand forecasts for their products, which are characterized by short life cycles and erratic demand patterns, are

typically based on expert opinion more than scientific data analysis. However, for companies where demand is not seasonal, applying the use of machine learning can mitigate the bullwhip effect. In order to keep this from happening, there has to be clear communication across the supply chain (Feizabadi & Shrivastava, 2018).

Curtailing the Bullwhip Effect

Another way advanced information technology can improve the supply chain is by curtailing the bullwhip effect. Many things can create the bullwhip effect—inventory inaccuracies, natural disasters, and customer demand—increasing inventory and inaccurate demand forecasts. Spikes in demand or overproduction can also cause the bullwhip effect, which creates a ripple effect up and down the supply chain. Aggarwal and Dave (2018) used three sources of past internal data to build a new modeling process for curtailing the bullwhip effect. The three internal data sources used were historical data (from previous orders, production, and inventory), historical life cycle knowledge, and any previous information that was used to reduce the bullwhip effect. As part of their work, they noted the importance of recognizing the impact of product life cycle characteristics on bullwhip tendencies. All products go through life stages that all vary in length. The introductory stage is for new products that hit the market; the growth stage is for a steady increase in demand, but decreases as the product hits the maturity stage; and the decline stage is when the demand falls off or even stops completely. The product life cycle was essential to this analysis because it determines which stage a product is in and can project future demands (Aggarwal & Dave, 2018). Furthermore, misjudging the stage of a product's life cycle could create unnecessary stockpiles of inventory. One particular model may not solve the problem, but combining and creating hybrid models may wipe out the bullwhip effect altogether. These models would give an accurate picture and allow for information to flow to the other stages (Aggarwal & Dave, 2018). The future of AI in demand forecasting is promising, as indicated by Dash et al. (2019), who found that AI is helping businesses achieve almost 100% accuracy in demand projections.

Automation of Business Functions

AI can also be used to automate aspects of business functions as part of an effort to improve the supply chain. According to Dash et al. (2019), AI has been helping businesses increase manufacturing with lower cost and higher quality, helping with promotion, and providing a better customer experience. AI tools can use templates and fill-in-the-blanks to create unique content on its own, which gives the impression that a person created it. These tools can also make recommendations based on customers' personal choices (Dash et al., 2019). For example, AI data mining applications can use web searches for websites for clothing to push related ad posts with links on the searcher's Facebook feed. Other AI applications can track buying trends and determine a more competitive price for a product (Dash et al., 2019). This dynamic pricing approach offers customers different prices based on their spending habits.

AI also plays a huge role within manufacturing and distribution. Within production facilities, AI applications use production data to analyze process performance and suggest modifications that streamline assets and processes. Its advanced analytics capabilities are also used to suggest quality and reliability im-

provement protocols, as well as maintenance scheduling for downtime prevention (Dash et al., 2019). Smart Manufacturing applications link machines and humans by synchronizing their work, allowing them to work side by side. These machines communicate their status through barcodes. These barcodes allow the machine to communicate operational status or available supply inventory back to AI tools, which decide when to replenish parts or shut down for repair (Dash et al., 2019). This "smart monitoring" fosters the repair of many machines with minimal downtime. Within distribution warehouses, AI-enabled robots are equipped with cameras that can recognize empty shelves and feed that information back to warehouse management system software, which use this information to optimize order picking, loading, and unloading, and the delivery of stock to human packers. For example, Amazon uses CYBORGS that roam the warehouse using codes on the floor to know where they are. They pick stock from the shelves and deliver it to a human packer to prepare for shipment. Advanced technologies will allow the supply chain to become a self-thinking machine.

The Future of Advanced Information Technologies

The future of the supply chain is for it to become self-thinking. Advanced technologies will allow the supply chain to think for itself and require minimum human interaction (Calatayud et al., 2019). The supply chain will be able to analyze millions of data points that have been generated by different functions within the chain, forecast and identify potential risks, and mitigate those risks before they happen. The supply chain will then be able to learn from this knowledge and use it to make future decisions. The supply chain will also be able to respond quickly to demands, especially for those items that have a short lead time and unpredictable demand. In addition, AI is being used to help with risk management, enabling supply chains to sense high-risk activities and react accordingly. Finally, AI is being used to increase prediction accuracy with regard to appropriate asset maintenance scheduling, which reduces or eliminates the number of equipment failures during production runs (Calatayud et al., 2019). The impact of advanced technologies in the supply chain will be unparalleled. These advanced technologies will assist the supply chain by providing a quality product to the right customer at the right time and the right cost. Along with using advanced technologies, supply chain AI applications are also available that are cloud-based, also known as web-based. Cloud technology will be able to provide supply managers with real-time data from various machines in various locations (Chiang, 2017). Other management capabilities enabled by AI include transportation management, where transportation managers will be able to receive updates on traffic delays in real time, so shipments may still arrive on time. Both in-house ERP packages and cloud-based solutions allow supply managers to see warehouse activity globally and to see when a machine is not operating to its full capacity (Chiang, 2017).

Conclusion

In conclusion, many AI technologies are already being used by supply chain managers, such as the Internet of Things (IoT), machine learning, and cloud-based information technology solutions. AI is either becoming or has already become a main priority for most supply chain managers. Many companies have already made the transition and are using AI in significant parts of the supply chain (Dash et al., 2019). Successful companies recognize the importance of centering their sup-

ply chains on visibility, connectivity, and efficiency; advanced AI technologies will allow them to achieve these objectives. Using AI has helped these companies eliminate many manual procedures such as pricing, promotions, and demand forecasting (Dash et al., 2019). Once the supply chain becomes self-thinking, it will be able to address many of the supply chain challenges (Calatayud et al., 2019). Using AI in the supply chain helps gain efficiencies through advanced technologies, demand forecasting to include the bullwhip effect, automation, and cloud-based technologies. As mentioned earlier, AI is becoming a way of the present and future. Companies that do not want to integrate their supply chain with it will be left behind because they will not be able to keep up with their competitors.

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Logistics Management for Aviation and Aerospace

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ABSTRACT

Logistics management for the aerospace and aviation industry is one of the industry's most sensitive and complex issues. Notably, aerospace is a capital-intensive industry that needs efficient and timely delivery of resources to prevent losses during the production process. The supply chain process involves multiple parties within the company and numerous suppliers outside the aerospace industry. Therefore, there is a need to observe various measures to avoid delays which could lead to financial losses. During the production process, the manufacturer and supplier of raw materials have to observe quality standards and regulations. This process increases the time and cost of production. However, various strategies reduce the cost of the aerospace supply chain. Adopting modern technology is one of the ways the aerospace companies can employ to reduce costs. For example, 3D printing could ensure that there is a timely and adequate supply of repairable parts. Also, the industry can eliminate human errors by deploying accurately programmed robots to retrieve materials from warehouses.

Introduction

Aviation and aerospace logistics are broad terms that deal with obtaining and transporting supplies for different stages of aircraft products. The aviation industry is also involved in moving supplies and people from one place to another around the globe. The supply chain is composed of a network of different organizations with downstream and upstream linkages in the processes that produce products with value. The supply chain process in the aerospace industry could use different methods to reduce the involved costs. One strategy is to use "just in time" (JIT) techniques, which facilitates the delivery of materials before they are required (Vieira, de Melo, & dos Santos Silva, 2019). Today, the aerospace industry has evolved to meet customer needs and demands. For instance, the industry has adopted advanced technology to increase the rate and quality of production while reducing costs. Some of the emerging trends in the aviation and aerospace industry include the use of robotics, the Internet of Things (IoT), automation, and 3-dimensional (3D) printing. Noteworthy, these technologies are expected to drive the industry a notch higher by improving the competitiveness and the market share.

Quality Standards in Operations

Cost of Quality

The cost of quality is the amount incurred for failing to create a conforming item or service. Most people misunderstand it as the price of developing a perfect item or service. In most cases, the cost of quality arises from rework. A good example is reworking of a manufactured product, rebuilding a tool, correcting a bank statement, or retesting an assembly. In logistics and supply chain, rework is costly when there is a product recall, especially in the aviation and aerospace industry (Vieira, de Melo, & dos Santos Silva, 2019). Notably, developing a specific product in the aerospace industry encompasses a multifaceted situation which requires increased and accurate integration so that final cost of an item conforms to the corporate plan. A more significant percentage of the total cost of production is determined in the product development phase. However, since at this stage production is subject to errors of

quality conformity, there are high chances of making errors that trigger reworking in the process.

It is crucial for an aerospace company to develop and critically assess the product development chart such that margin of error is kept at an insignificant figure or zero (Vieira, de Melo, & dos Santos Silva, 2019). For instance, the execution of engineering processes may occur concurrently, which creates room for possible errors if ultimate care is not followed. Besides, during the product development phase, the technical documentation and product details are not frozen; this creates room for flexibility and changes. However, if these errors are not managed, there is a possibility of creating defective products, hence initiating a process rework. These changes can be costly, and aerospace should implement strict adherence and conformity procedures to minimize the cost of quality.

Supply Chain

Emerging technologies and changing customer demands are essential in creating a competitive strategy for an aerospace company. Supply chain management is one of the areas that needs to be addressed to increase profitability and create a large market share (Vieira, de Melo, & dos Santos Silva, 2019). A noteworthy supply chain deals with sourcing and transportation of raw materials such as aluminum, steel titanium, and copper. There is no single country that has a monopoly on producing these materials. Therefore, aerospace companies need to get their materials while considering transportation modes, delivery timelines, and material specifications.

Another critical aspect of supply chain management in the aerospace industry is the emerging technologies and modernization. Standardization, robotics, and automation are increasingly becoming a reality in all aspects of life. The aerospace industry struggles to keep up with modern technology, since the produced aircraft have to match the fast-changing technological advances (Vieira, de Melo, & dos Santos Silva, 2019). The production of aircraft has to meet high standards and pass numerous regulation measures, which involves multiple suppliers and departments to oversee the final product. It is important to note that the aerospace supply chain has become

more global and complex than ever before. Therefore, aerospace needs to adopt a resilient and agile supply chain process to guarantee its profitability and efficiency.

Emerging Quality Management Technologies

Automation and Human Resources

In a competitive business environment, such as the aviation industry, flexibility becomes a critical strategic capacity for businesses. A company can be better positioned to achieve a competitive advantage if it becomes flexible in its operations (Rezaei Somarin et al., 2018). Although flexibility is a broad term applied in various contexts, it can apply when dealing with human resources and business automation. The significance of flexibility is the ability to respond efficiently and quickly to customers' changing demands.

In the aviation industry, flexibility comes with the automation of the processes. Automation enables the company to re-supply the required material immediately. Therefore, automation increases responsiveness and reduces operational costs (Rezaei Somarin et al., 2018). Flexibility through automation of supply processes enables the airline operational managers to respond to uncertainties proactively. Finally, automation allows the business to react to perceived technological and machine performance uncertainties.

Notably, earlier models of inventory in the supply chain primarily focused on achieving performance measures for basic inventory control policy. However, recent business is concerned with developing sophisticated strategies that exploit technological advances. The current technologies include interconnected logistic services, physical internet, and additive manufacturing technology. These automated processes address the ever-changing environment of global supply (Rezaei Somarin et al., 2018). The aviation industry utilizes the capabilities of emerging technologies to gather real-time data and respond immediately to the existing market changes.

Critical industries like the aviation industry should work with minimum delay. Therefore, operations such as the timely fulfillment of repairable parts and efficient MRO operations are crucial (Rezaei Somarin et al., 2018). Processes such as procurement and logistics have to be conducted electronically to reduce the delays. When paying for the repairable parts and maintenance, the airlines have also invested in modern technology to reduce unnecessary delays.

Human resources are another issue of concern in the aviation industry. The industry has to hire a dynamic and skilled workforce to deal with changing customer needs. As such, the workers should be able to work with the evolving technology to reduce delays and inefficiencies in airline companies. Hiring top talents and those who will be willing to adapt with the changing needs and requirements is one of the ways to keep up with the current ever-changing business environment.

Cybersecurity

Cybersecurity has become a significant issue of concern, one that calls for increased efforts by corporates to develop

measures that could effectively prevent or neutralize cyber threats. However, the rapid and progressive evolution of cyber threats has become an impediment to inaccurate assessment of risks and hinders the development of effective and updated cybersecurity policies. Most cyber attacks are intended to defraud the corporation. Hence, it is essential to look at cybersecurity measures from a financial perspective (No & Vasarhelyi, 2017). The continued use of the traditional audit model is a considerable risk because it does not fit into the development of high-risk assurance automated processes, which would be useful for current and future corporate ecosystems. Besides, adequate security measures in traditional financial reporting require the incorporation of other non-financial elements like supply chain, brand, human resources, and intellectual property (No & Vasarhelyi, 2017). This information is integrated into automated systems such as enterprise resource planning systems, an approach that creates financial statements which are not only used for reporting compliance, but also enable management decision making, risks assessment, and policy development.

This development can only be achieved if there is proper implementation of the new generally accepted accounting principle that emphasizes the protection of information. Companies must use technologies that facilitate the protection of their assets and preserve the interest of stakeholders (No & Vasarhelyi, 2017). Since technology plays an integral role in maintaining the organization, security companies should adopt automated technologies that provide a single point of defense mechanisms. They can easily detect and remediate cyber attacks. Though self-defense automated systems are essential to detect cyber threats, continuous cybersecurity audit is necessary (No & Vasarhelyi, 2017). However, auditors should have proper training on cybersecurity issues to conduct a proper and thorough security assessment and make appropriate recommendations.

Digital Technology

Technological trends have revolutionized the supply chain management in the aviation industry. The current improvement in technology has led to innovations such as robotics, 3D printing, and drones. 3D printing technology is likely to change the aerospace and other critical industries. Manufacturing practices through 3D printing technology is increasingly gaining ground in today's world and is opening other opportunities in the manufacturing sector (Attaran, 2017). Consequently, logistics and supply chains are also expected to make a new turn. Today, manufacturers can make the computer-aided design of various materials and sizes. For instance, technological advances have enabled companies to print using materials such as metal, plastic, and ceramics (Vieira & Romero-Torres, 2016). The logistics, automotive, and aviation industries can benefit from this digital technology. For instance, companies can make a large number of spare parts through 3D printing, which would increase the demand for logistics services. As this technology continues evolving, 3D printing will reduce the cost of production of high-quality materials. Therefore, transportation costs will become non-existent as the spare parts could be produced quickly through 3D printing.

Similarly, the evolution of robots has changed the handling of materials in aviation and other industries. Today there is a need for less human workforce as compared to earlier

days. Combined with artificial intelligence, robots could replace the need for humans by taking up warehouse jobs (Vieira & Romero-Torres, 2016). Notably, warehouse automation is slowly eliminating human labor as intelligent robots can learn how to carry out processes with little or no human intervention.

Technological innovations have also led to the emergence of drones. Drones could be used to deliver materials from one place to another. It is projected that drones could eliminate other means of transportation as they can even transport people from one place to another (Vieira & Romero-Torres, 2016). Companies such as DHL, Deutsche Post, and Matternet are working on routes that could help their drones deliver products in the future.

Solutions in Combatting Quality Management Issues

Addressing quality management issues is fundamental toward ensuring the continuity of the business. Excellent quality management enables a company to produce the best products and services in the industry. The processes of product development in the aerospace industry has increasingly become interconnected with the operational environment. In a very dynamic product environment, the process is subjected to many changes along the development path (Staack, Amadori, & Jouannet, 2019). The operations are not only affected by technical, but also non-technical distresses, especially in the supply chain. For instance, in the aviation aerospace industry, the company's growth is highly dependent on the quality of service offered. The rationale is that quality management is an effective strategy that enables an organization to build brand reputation, reduce costly customer complaints, and reduce recall of products (Vieira, de Melo, & dos Santos Silva, 2019). One of the most effective solutions to solving quality management issues is to control the supply chain as it enables an organization to manage purchases. It is important to note that the supply chain is a reliable, yet potentially weak link in a company. Each link in the supply chain should be secure and reliable. The purchasing links are always present and pervasive at every point in the global supply chain.

An organization must assess and evaluate their suppliers to determine their short- and long-term capacity. New suppliers are increasingly becoming huge risks (Vieira, de Melo, & dos Santos Silva, 2019). Having a periodic review of the suppliers is important because some suppliers tend to change the process and interfere with the quality, which may go to manufacturing undetected. Therefore, it's paramount to have an effective supplier oversight policy to ensure consistency in quality supplied. Regular checking of the conformity to standards is of great importance. As such, each process should be tested and validated through the quality management process. Such validation measures subject the material supplied to an intense evaluation process to ascertain they meet design and quality standards every time (Vieira, de Melo, & dos Santos Silva, 2019). If not well checked, a single point of the supply chain can compromise the entire process. Finally, paying attention to client feedback is vital to resolving unnoticed quality issues in the product or service. As such, the company's quality management systems should support a comprehensive analysis and investigation from complaints launched by clients.

Sustainability in Aerospace

Process sustainability is essential for any organization that is determined to keep up with the dynamics of the business environment and stay competitive in the market. However, these processes can be costly to maintain; therefore, it is essential for organizations to conduct a cost-benefit analysis to help them adopt the most effective sustainable process (Chakravortya & Hales, 2017). In aviation and aerospace, in particular, the process improvement is highly expensive. There have been increasing concerns over the sustainability of process improvement programs. Studies show that the primary benefits of these programs disappear over a short time. As such, there is a need for companies in aircraft manufacturing and distribution operations to understand the cost implication and long-term sustainability of the improvement process (Chakravortya & Hales, 2017). Studies show the most effective and sustainable process improvement program is the use of events applied to experiential learning models. The use of models helps in making improvement decisions, especially in the early stages of product development. Notably, these stages are very delicate, complex, and involve expensive technologies; any mistakes could cost the company heavily (Bertoni et al., 2020). Therefore, engineers need to rely on well established and practical models that would design and subsequently improve the decision-making process.

These models give players in the aviation and aerospace industry the opportunity to develop a real experience for a reasonable period, reflect on the observation made, and allow for abstract conceptualization and the development of active and sustained implementation. Nonetheless, aviation and aerospace companies must learn ways to sustain their process improvement programs. This is an essential aspect of consideration because every company would want to recover the investment and improve the processes to stay ahead of their competitors. Since most of the cost accrued is based on the workflow process and organization, a company should adopt an improvement model such as six sigma that focuses on several process improvement areas (Chakravortya & Hales, 2017). Evaluation of this process is highly essential to unnecessary procedures and improves the outcomes. Any procedure that compromises quality adds to total cost and should be removed. Also, the arrangement of processes in sequential order would reduce inbound logistics costs, reduce time wastage, and improve efficiency.

Conclusion

In conclusion, effective management of logistics and supply chain processes in the aviation and aerospace industry is of great importance. It ensures conformity to and improvement of quality standards and reduction of cost. However, achieving perfect logistic and supply chain operations requires the integration of efficient technology, a high level of processes organization, automation of processes, and legal compliance in different aspects of product development. Aviation and aerospace companies should focus on continuous process improvement while paying attention to regular assessment and evaluation of the improvement program adopted.

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Personality Traits for Successful Negotiation

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ABSTRACT

When a union gains exclusive recognition in an organization, or when a collective bargaining agreement comes up for renegotiation, the management and union parties must choose a bargaining team. During the process of compiling a team of individuals for the bargaining table, both parties should look for personalities that can work together on the topics up for discussion. While no one individual has all the desired characteristics, a few key traits to look for are high self-efficacy, extroversion and agreeableness, high self-monitoring, cognitive ability, and perception. A variety of these characteristics makes a smooth negotiation process for both sides.

Introduction

When a union gains exclusive recognition in an organization, or when a collective bargaining agreement comes up for renegotiation, the management and union parties must choose a bargaining team. This team must be able to work together at the bargaining table. While compiling a team of individuals for both parties, personalities should be taken into consideration. It is imperative that the personalities of these individuals can work together on topics such as formatting the proposal, analyzing contract language, considering the effect of prior arbitration decisions, and ethical considerations in collective bargaining. Both parties should look for the following personality traits while compiling their negotiation teams: high self-efficacy, extraversion and agreeableness, and high self-monitoring, cognitive and perceptual abilities.

Desired Characteristics

High Self-Efficacy

The characteristic of high self-efficacy is beneficial for a negotiating team for several reasons. An individual with high self-efficacy has confidence in his or her own negotiating ability. This is important for counteracting the negative effects of negotiation anxiety. This individual would help keep the negotiation on track to completion. High self-efficacy would be a crucial personality trait to have at the negotiation table.

Extraversion and Agreeableness

Someone possessing extraversion would be beneficial for their ability to help others around them feel energized and excited about the negotiation process. Their willingness to start conversations can help address issues that typically might not be brought to the parties' attention. The trait of agreeableness has benefits such as interest in other people and empathy for others. Having an interest in other people would help focus on the members of the union, not just the organization as a whole.

Being empathetic enables a person to understand how others would feel about the changes being made within the union.

High Self-Monitoring

An individual who possesses high self-monitoring is also beneficial to the negotiation team. "High self-monitors easily blend into social situations, knowing what to do or say with each person. They appear more friendly and less anxious to observers, and are sensitive to social cues and likely to vary their behavior from situation to situation" ("Self-Monitoring," 2004). This makes an individual less likely to give away the other parties' ideas.

Cognitive and Perceptual Abilities

According to Wolters (2017, p. 275), "For complex, multi-issue negotiations, cognitive ability and perspective-taking ability were valuable for helping both sides achieve good outcomes." Having someone on both sides of the negotiations who can



understand the other's viewpoints can help an agreement be reached more easily. When both parties hold this skill, it helps lead to a win-win outcome for all involved.

Conclusion

Selecting the appropriate bargaining members for their teams is a very critical decision for union and management negotiators. As Ian Newall wrote,

“A skilled negotiator is not just someone who can make deals; a skilled negotiator is someone who can make deals that can be implemented. Skilled negotiators anticipate implementation issues before the deal is agreed. Less skilled negotiators make deals that others find difficult or impossible to implement” (Wolters, 2017, p. 275).

This supports the idea that it is critical to have a variety of personalities on the negotiation team. Having a mix of these personalities will help negotiations go smoothly and result in fewer leaks of information to the other parties. A variety of these characteristics can lead to a smooth negotiation process for both sides. Since no one individual can possess all these characteristics, it is beneficial to consider personality traits when building a group or team for negotiations. “Clearly, negotiations depend on personality, experience, cognitive skills and abilities, as well as situational characteristics” (Wolters, 2017, p. 275).

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Ethical Duty

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ABSTRACT

Ethical standards are established by businesses in order to protect the consumers from any wrong doing. Reaction to ethical issues seems to vary by the business or industry and also drives how they respond to the issue at hand. This report looks at three different industries and how ethical principles played a role in how they handled consumers or stockholders to protect investments. The reader will be able to see the publicized issues and understand if companies handled themselves ethically to mitigate the problems while still remaining concerned for the consumers.

Introduction

Recent negative publicity on the lack of ethical standards in some companies has served as a wake-up call for many organizations to take a more active role in establishing standards of ethical conduct in their daily operations. Most organizations have some sort of code of ethics to follow at work. Some are simple action statements, while others require training and certifications that employees must pursue and to adhere. Manufacturers have ethics codes that require them to recall products that have failed or have the potential to fail in the hands of consumers. The food industry must follow high ethical standards in their plants so that consumers do not become ill or die from what they consume. Companies that are traded publicly on the stock market must practice ethically sound financial practices.

Automotive Manufacturing

In vehicle recall operations, "There's no certainty that potentially dangerous cars, especially those in the used car market, are being caught and fixed. Many are overdue for a repair that could mean the difference between a safe car and a potential death trap" (Cohen, 2014). Even if consumers are attentive in pursuing the repairs, the manufacturers may not fix the problem at that moment. For example, when Toyota's Takata passenger airbags were found to be defective, the company sent out cards to let owners know they were impacted. The information was posted by the dealers and received a lot of press coverage. Toyota ran out of the airbags, leaving owners going months without the fix being done. If this was the only vehicle a person owned, the only logical solution was to have no passengers in the passenger seat of the car so no injury would occur in the meantime. Toyota's resolution was to send out financial impact recall cards asking if customers were impacted by the Takata airbag replacements, which included loss of the vehicle for repairs. If consumers were impacted by loss of life, the only resolution would be to seek legal help to resolve the matter. The company handled it ethically, but not to the highest standards, since they knew they had millions of impacted

vehicles on the road and ran out of airbags to fix the consumers' cars.

Food Industry

Ethical standards are also critical to the food industry. The Food Safety and Inspection Service (FSIS) protects the public's health by ensuring the safety of meat, poultry, and processed egg products (United States Department of Agriculture, 2020), while the Food and Drug Administration (FDA) recommends how companies should handle processing fruits and vegetables (United States Food and Drug Administration, 2008). Consumers make conscious decisions every day when they purchase food items, never thinking that the manufacturers would sell items that are bad or could even be fatal. Recent recalls in the news include pieces of metal in King Command's meat, listeria in Blue Bell ice cream, and salmonella in McCain vegetables. Manufacturers have come a long way in packaging products to let consumers know if their products contain allergens such as nuts or are produced in a plant where cross contamination may occur. Ethically, this is the correct thing to do; because even if a product does not contain an allergen, like peanuts, a person who is allergic can have a reaction to peanut dust from other items being produced in the plant. However, there is no way to let consumers know there is metal, listeria, or salmonella in the food at the moment of production. Manufacturers usually recall food quickly when there is a problem. The major issue comes from consumers who have already consumed the product before the recall. Companies can uphold their ethical standards by rapidly recalling the product, letting the public know immediately about the issue, and not being secretive about the details surrounding the need for the recall. Blue Bell, for example, handled the listeria contamination issue well. The company was the primary source to all the news outlets. This allowed them to keep their long-time consumers, even though people did get sick and a few deaths happened from the contamination. The consumers stayed with them because the company was forthcoming with information. Blue Bell determined the location of the contamination and the products contaminated and was quick

to remove them from stores. The company held itself to a high ethical food standard and tried to protect the consumers before more damage could be done.

Wilbanks, D. (2016). The Sarbanes-Oxley Act. *Professional Safety*, 61(2), 23-25.

Publicly-Traded Companies

Companies traded on the stock market also must practice high ethical standards. Ever since the WorldCom and Enron scandals, investors are very cautious about investing every cent they have into companies. It is up to these publicly traded companies to deliver accurate forecasts and projections of their sales so investors can determine if they want to invest. These companies promote and encourage ethics training. Many employees of public companies have retirement plans and 401ks based on company stock and want to know that the individuals they work with are holding themselves to standards that not only protect the company, but also the investors. Employees who “cook the books” or practice other unethical behavior have no place in these companies. The only way to ensure this does not happen is to hire and train individuals to know from the beginning what are considered illegal and immoral work ethics. Today, businesses are required to follow the Sarbanes-Oxley Act of 2002, which contains sweeping auditing and financial regulations for public companies (Wilbanks, 2016). This legislation protects shareholders, employees, and the public from accounting errors and fraudulent financial practices. This, along with other federal regulations, will hopefully ensure companies are practicing ethically strong operating standards in the future.

Conclusion

Ethical standards are not just for businesses. Consumers also must utilize their own ethical and moral compasses, realize there is an issue, and act to fix it. When an automobile is recalled, contaminants are found in food, or employees are not looking out for the customers' best interests, it is up to consumers to report problems and unethical treatment. The more businesses focus on doing the right thing for consumers, the more likely it will be that the industry or business establishes higher ethical standards. In addition, the more consumers report issues to the company's customer service department, or blow the whistle on fraud, the better chance there will be that both consumers and investments are protected. Ethical standards have come a long way, but there is still room for improvement in protecting consumers' lives and financial well-being.

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The History of Unions

Angela Miller

Human Resource Management Major

ABSTRACT

Unions were developed because of a need to protect workers. Before unionization, working conditions were often hazardous and very poor. Many employers had no regard for the life or safety of their workers, as evidenced by the 1911 Triangle Shirtwaist factory fire in New York. This paper illustrates the need to improve working conditions for workers and hold employers accountable. It also shows the history of unions from the small guilds created by craftspeople to the major labor organizations of today, including AFL-CIO and UAW. Despite many trials and setbacks in the early days of unionization, unions still produced better working conditions for employees. Because of unions, there are government regulations, a standard work week, and minimum wage pay.

Introduction

Unions exist in many organizations as a means to protect the employees. Unions were birthed out of the need to provide certain rights to the labor force. Small guilds, joint associations of employees and craftspeople, were the birthing stations of labor unions as we know them today. There were not many government regulations and protections for the workforce. With the onset of the industrial revolution in the mid 1800s, there was a greater need for organized labor. During the Civil War, many skilled and unskilled workers were employed under the same roof. This situation helped spur the need for organized labor (Holly, Ross, & Wolters, p. 45).



Figure 1—Child Laborers in Macon, GA, 1909
(public domain image)

Benefits of Unions

Prior to unions, there were no minimum wage rates or overtime compensation laws in the United States. Most workers were powerless to fight against their employers. Unions came along to give a collective voice to the voiceless and power to workers and hold management and employers accountable for safe workplaces and livable wages. In 1911, the Triangle Shirtwaist Company fire in New York shined a national spotlight on poor

working conditions for employees. This fire killed 146 people, mostly teenage immigrant girls. The deaths were largely preventable—most of the victims died as a result of neglected safety features and locked doors within the factory building (<https://www.history.com/topics/early-20th-century-us/triangle-shirtwaist-fire>).

An organization can practice union avoidance by treating their employees well and by paying a competitive and decent wage. Treating employees well means having an open-door policy and giving employees buy-in to the work processes and some decision making. Another way an organization can practice union avoidance is to create a team approach and servant-leadership management culture. SHRM (Society of Human Resource Management) states in 2017 Learning System that

The appeal of unions can be blunted by addressing the major reasons why employees consider joining unions—by offering competitive wages and benefits, cultivating trust and mutual respect, making sure employees are treated fairly and with transparency, maintaining a safe working environment, and fostering two-way communication with employees. It is important to communicate why the organization prefers to remain union-free (p. 196).

The Unionization Process

Unionization requires a process. The first step in unionization is initiating the organizing drive or garnering interest in forming a union. It would be hard to have a union of one. It is the employees' responsibility to start the talks with other interested individuals. Both the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) and National Labor Relations Board (NLRB) suggest speaking with a union organizer as the next step. A union organizer can provide the group with much needed information on how to legally proceed in forming a union. This is also the employees' responsibility (<https://www.nlr.gov/what-we-do/conduct-elections>; <https://aflcio.org/formaunion/4-steps-form-union>).

The next step after speaking to a union organizer is to build support throughout the organization for unionization. Informational meetings can be conducted as long as they do not interfere with productivity and create an atmosphere of workplace violence or intimidation. This is also the responsibility of the

employee or employers seeking to unionize. During this process, the union organizers or employees will collect signatures or A-cards to show support for the union.

The next stage is to hold an election. However, before the election can be held, an election process petition and associated documents must be filed with the NLRB. The employer must post Notices of Election in conspicuous places containing all the details regarding the election. The NLRB will oversee the election. Unless there are special circumstances, fifty percent or more must vote in favor of the union for the organization to become unionized.

Conclusion

A union's effect will vary according to the industry. In some cases, the union has been able to create job security and improve wages. The union has also helped with productivity and greatly improved safety for its members. The union can become a communication portal to management regarding working conditions and processes. When unions partner with management, great things can come from this relationship.

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Job Analysis: Purpose and Process

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ABSTRACT

An effective job analysis process allows businesses to provide detailed job descriptions, enabling a company to hire well qualified employees. Job analysis is the process of retrieving information about what employees do in different jobs. The information gathered from a job analysis is used to create job descriptions and specifications and determine the proper wage compensation for the job. This paper focuses on the importance of a job analysis when attempting to hire the right person for a specific job. It will also explore the positives and negatives of the job analysis process.

Introduction

Job analysis is the process of retrieving information about what employees do in different jobs. These analyses often include interviews, monitoring, self reports, or questionnaires/surveys. Information is collected from primary and secondary sources. Primary source information is collected from supervisors, while the secondary source information is obtained from anyone other than the supervisor. Job analysts are usually human resource managers or compensation department staff. Job analysis is used to track the level of difficulty and importance of the job and calculate the pay for the job. According to Holley (2017) in *The Labor Relations Process*,

Management often prefers to conduct its job evaluation independently of the union. Management may prefer not to share its weightings of job factors, particularly when it believes certain factors (such as training, skill, and responsibility for equipment) should receive more compensation than others. Excluding union participation in the job evaluation process may reduce the time required to complete the process; however, subsequent application of job evaluation results may generate grievances that then must be resolved on a case-by-case basis. Some companies seek to encourage union participation in the job evaluation process, both to benefit from the insight of workers who actually perform different jobs and to increase the acceptance of the results of job evaluation by bargaining unit members (p. 330).

Importance of Job Analysis

It is extremely important when assigning employees to jobs that an employee is educated on what tasks will be performed. The information gathered when performing a job analysis is used to create job descriptions and job specifications. A job description summarizes the duties and responsibilities one achieves on the job. Job specifications are the requirements (licenses, personality characteristics, degrees, etc.) an employee must have or earn to be hired or to continue work on the

job. Managers use descriptions and specifications when recruiting new talent to the team. Due to new technology always being created, job analysis is crucial in developing and keeping job descriptions up to date. Job descriptions that are vague can result in problems.

Job analyses and accurate job descriptions also can prevent employees from being overworked. Holley (2017) stated,

Unions favor specific, written job descriptions and a right to refuse to perform work outside those specified job descriptions. Management typically prefers increased flexibility in making work assignments, provided by a more general job description that includes phrases such as able to "perform related duties" and "make minor repairs." Companies implementing a team-based production system have been successful in getting unions to agree to more cross-functional training and broader multi-skilled job descriptions that provide greater flexibility in assigning job duties to team members (p. 404).

Advantages and Disadvantages of a Job Analysis

Some advantages of job analysis include the following: providing first-hand job-related information, helping create the right job-employee fit, establishing effective hiring practices, guiding thorough performance evaluation and appraisal processes, helping analyze training/development needs, and determining the compensation package for a specific job. Although these are great advantages, there are also some disadvantages. Disadvantages of job analysis include time consumption, personnel biases, limited sources of data, human efforts, failure by job analysts to retain specific skills, and the lack of ability to observe mental abilities (Juneja, 2015).

Some union leaders feel that collective bargaining is limited due to job evaluations, while other union leaders believe job evaluation enhances their strength in negotiating wages. These union leaders also find it easier to explain the negotiated wages to union members. To ensure the external environ-

ment is noted in the job analysis process, wage surveys are conducted. Wage surveys include comparable wages from competitors. Surveys are performed through phone calls, questionnaires, and sometimes visits, and include job titles, labor grade, points/importance, and the starting wage rate.

Conclusion

Job analysis encourages new technology and flexibility, both of which can assist the organization in operating efficiently. An effective job analysis process allows businesses to provide detailed job descriptions to employees and new recruits, enabling the company to hire well-qualified employees and to implement training programs that improve the skills of current employees. Regardless of the differing opinions of union and management, the main goal of job analysis is to develop a realistic wage structure. Through strategic management, negotiations, and efficient job analysis, businesses can better achieve their goals.

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Contributors



Michelle Alban currently works in finance in Huntsville, Alabama, a field in which she has worked the last 20 years. Michelle graduated in Summer 2020 with a Bachelor's of Science in Management with a minor in Acquisition and Contract Management. She believes that it is important to understand Business Ethics while working any job, especially with a publicly traded company. Michelle handles her professional career with high standards by being compliant to all federal guidelines and by following the ethically sound principles set forth by her company. Michelle is the mother of two wonderful children.



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Dillon Campbell earned his A.S. from Calhoun Community College and is now completing a B.S. in Management of Technology with a minor in International Business. His goal is to obtain a leadership position that ultimately helps companies and customers adapt to the fast-paced world in which we now live. Eventually, Dillon plans to start his own business. He has been employed at Polaris Industries in Huntsville, Alabama, since 2015 and currently holds the position of Rework Technician. He enjoys traveling the world, trying new foods, and experiencing new cultures.



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Contributors



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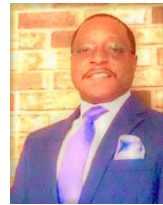


Angela Gary Miller, originally from Charleston, Missouri, is a student at Athens State University and is pursuing a B.S. in Human Resource Management. Angela is active in her church and enjoys reading, traveling, cooking, and spending time with her family. She has four adult daughters and five siblings. She is known for saying, "I have the best family in the world." Angela currently works as a district HR manager and owns the consulting firm MillerHR. After graduation, she plans to attend law school.



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Business Insights

A College of Business Research Journal

Business Insights: A College of Business Research Journal is an annual publication of the College of Business at Athens State University. Athens State University's College of Business is nationally accredited by Accreditation Council for Business Schools and Programs (ACBSP).

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