*ISO 9000: Fundamentals of Quality*

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Process and Quality Improvement

Group 4: Zayra Estupinan, Jeff Jilovec, Cristian Valdez, Casey Walters

Northern Illinois University

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Section 2

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**Executive Summary**

**Intro:** SK Express is a growing organization, and ISO certification has helped lead to the growth and success of the organization. The organization is a manufacturing company that focuses on building electrical products such as wire harnesses for various customers. SK Express has a complex production line, and material is moved through various departments until it reaches finished goods. Through continuous improvement efforts and continual ISO re-certification, SK Express has maintained superior quality of their products and has received high recognition from their main customer.

**Method:** ISO, International Organization for Standardization, was collectively established in 1946 by 25 countries and eventually in 1987 ISO 9000 was formed. The concept behind it directly incorporated aspects from Total Quality Management but dug further into detail with principles. There are eight total principles that all depend on each other, since all must be done effectively to be ISO 9000 certified. The 8 Quality Management Principles are Customer Focus, Leadership, Involvement of People, Process Approach, System Approach to Management, Continual Improvement, Factual Approach to Decision Making, and Mutual Beneficial Supplier Relationship. When companies of production and service perfect all 8 aspects of ISO 9000, they receive a certification for their efforts in continuous improvement.

**Results:** Efforts of ISO implementation are evident throughout SK Express as they have continued to work towards ISO goals at their main facility, as well as their newly opened facility. SK Express has worked towards ISO goals through their control of records, training efforts, control of non-conforming products, risk-based thinking strategies, as well as efforts of preventive maintenance and preventive actions. Through their maintenance of these efforts, SK Express has proven to understand ISO and the value it provides to an organization. In addition to their ISO efforts at the main facility in DeKalb, SK Express has also begun efforts of pursuing ISO certification at their new facility located in Mexico.

**Discussion:** SK Express has shown many strengths and weaknesses in regard to ISO implementation. Some strengths of SK during ISO implementation include understanding the importance of ISO certification, pursuit of ISO certification for all facilities, as well as use of ISO implementation for internal innovation efforts. Weaknesses of SK Express in regard to ISO implementation include some processes being less flexible and understanding the value of ISO at all levels of the organization. Many recommendations have been provided to SK Express such as providing additional training, mirroring their practices at their main organization at their new facility, support more programs for customer feedback, and promotion of kaizen events.

**Introduction**

SK Express Inc. is a wire harness manufacturing facility located in DeKalb, IL. In addition to manufacturing and producing wire harnesses, the organization also produces panels and other electrical goods. The wire harnesses begin in the cutting department where copper wires are cut to various lengths. Once the wires are cut, they are moved to a terminating department where metal terminals are crimped onto the wire ends. In the terminating department, some wires are also spliced together, depending on customer specifications. After the harnesses have the terminals seated on the wire ends, they are moved into the layout/forming department. In this department, harnesses are laid out on large harness build templates. The harness build templates are scale sized drawings which include details on every part that needs to be assembled onto the harness. On these build templates, the wires are routed to different locations, and the wire ends are then inserted into various connectors. Once completed, the harness then moved to braiding department, where the entire harness is covered in a protective braided covering. Next, the wire harnesses are completely built, 100% of the wire harnesses go through an electrical testing to ensure electrical continuity of the products match customer specifications. Once the wire harnesses go through the electrical testing process, they move to a final inspection department. In the final inspection department, 100% of the wire harnesses are inspected by a team of trained quality control technicians, who compare the entire harness and all of its components against the prints and specifications provided by the customer. In order to aid the production staff in building the wire harnesses, SK Express also has an engineering team which provides process instructions, creates and updates production floor travelers (work instructions), creates harness build templates, and evaluates data gathered on the first piece builds of their production orders. SK Express also has a quality assurance team that drives change through continuous audits. The QA team also gathers data on production errors, identifies the root source of the issues, and implements corrective actions to prevent recurrence of the issues. The quality assurance team also works directly with customers and handles any reject claims. Rejected material from the customers may be sent back for re-work or credit.

 The company was founded in 1999 in Aurora, IL. With rapid growth, the organization eventually outgrew their small shop and moved to a larger facility in Sycamore, IL. As the Sycamore/DeKalb region is known for their manufacturing, the area was a great location for the facility relocation. As the 2008 recession hit, many organizations began to suffer. Surprisingly, SK Express prospered and grew even more during this time. As the business continued to grow, the company focused on continuous improvement efforts and purchased highly automated machines. These machines cut, strip, and add terminals to wire. They are highly automated, reducing human error and variation while increasing outflow. In addition, the company focused on improving technology. SK Express invested in a new ERP system to improve reporting, efficiency, and overall customer resource management. In addition to a new ERP system, they also adopted CAD systems to provide visual aids in production. These visual aids increase accuracy of product builds and can be provided to multiple workstations, as they are easily duplicated. With the improvement efforts, the company's largest customer, Caterpillar, increased the number of purchase orders, which helped the company’s sales revenue to continually increase. With superior quality and low defect rates, SK Express Inc. began receiving Caterpillar’s bronze supplier award. Eventually, the organization outgrew its Sycamore facility, and moved to a larger facility located in DeKalb, IL. As high-quality products continued to impress their largest customers, SK Express moved on to receive Caterpillar’s silver supplier certification, gold supplier certification, and the platinum level certification. Platinum certification is the highest-level certification that Caterpillar provides their suppliers. To date, SK Express has received the platinum level supplier certification from Caterpillar for 5 years in a row. Over time, other organizations noticed the achievements of the organization, and the customer base began to diversify. SK Express began expanding by doing business with General Electric, John Deere, Navistar, and many other large organizations. With more opportunity for growth and a large market to capitalize, management noticed a need for expansion.

In 2017, the organization opened a new facility located in Monterrey, Mexico. With a lack of experienced operators, the new facility has been struggling to maintain a similar level of quality as the main Dekalb facility. The company has been providing extensive training with the operators of the new facility through Skype videos and phone calls. In addition, many operators from the Mexico facility have been flown out to DeKalb to receive more training in person. Operators from the DeKalb facility have also had the opportunity to fly out to Mexico to give new employees the training they require. Currently, SK Express is pursuing ISO 9000 certification for their Mexico facility. As the facility is still new and employees lack experience, there has been a lot of preparation and planning to make sure the facility can receive its ISO 9001:2015 certification.

**Method**

**ISO History:**

The International Organization for Standardization (ISO) was established in 1946 by a group of representatives from 25 different countries who all met at the Institute of Civil Engineers in London. This was the development of a new organization to enable international coordination and unification of industrial standards. On February 23 in 1947, ISO was officially born and began operations. Since then, ISO has published over 22,300 International Standards in which they cover almost every aspect of technology and manufacturing (ISO, 1997). As of today, ISO has members from 162 different countries, along with 786 technical committees and subcommittees which take care of standards and development (ISO 1997). Over 135 employees work full-time for ISO’s Central Secretariat in Geneva, Switzerland (ISO, 1997). In the creation of ISO, the founders could not decide on a name. Eventually, they decided on ISO, for all the different acronyms in different languages. ISO is derived from the Greek “isos", which means equal (ISO, 1997). Whatever the country, whatever the language, there is an equal standard for excellence in quality.

ISO 9000 was developed around 1987 mainly due to the Automotive industry. This industry played a major role in developing the quality system management. Since 1987, there have been many revisions to better classify quality companies. These revisions happened in years 1994, 2000, 2008, and 2015. All revisions have updated the certification to better evaluate organizations fairly. As of right now the ISO 9001:2015 revision focuses on risks and opportunities related to performance while utilizing a new system the Plan-Do-Check-Act cycle.

**How to Become Certified:**

To become a certified ISO 9000 company, the organization must contact a consultant that will assist in hiring the certification body that will oversee the certification audit (Castka and Corbett, 2013). The audits are run by various types of firms, regardless of if they are global or local. The size of the company looking to attain the ISO 9000 certification does not matter as well, as the committee conducting the audits does not separate small and large companies. To begin internal audit teams of the company will look for nonconformities and there is not a set amount they look for. The goal should be to find as many as possible to change and fix the process that caused the nonconformities. Moving on, the external audit firms who certify companies will also look for nonconformities. Boudreaux (2009) describes the external audit process as not a pail or fast test since they offer you up to 30 days to fix the nonconformities. Depending if the audit team views the nonconformity as a minor or major issue there will be a follow up audit required by registrars on major issues. Once they finally pass there will be periodic audits to keep the companies ISO certificate in good standing. Even though the certification is rigorous, there has still been growth in the number of companies who have successfully completed the certification. Du et al. (2016) supports this with his finding of 1.12 million ISO certified organizations across the world as of 2013. ISO principles are sought out in not just production but also service companies, so audit companies are constantly working on approving certifications.

**ISO Goal:**

ISO 9000 follows total quality management tools to achieve continuous improvement at all levels for products and services. Chen (2016) describes the overall goal of implementing ISO is to increase business efficiency and the customer requirements. By following the eight principles of quality management, any company can seek to obtain this certification.

**Breakdown of the 8 Quality Management Principles:**

1. **Customer Focus:**

The customer’s needs should always be the focal point for a company’s product or service. Chen (2016) emphasized the core intention of ISO 9000 is to provide companies with an *outline* to follow to meet their consumers expectations on a product or service. The importance of focusing on the consumer will translate into a more desirable product or service since the design is narrowed to what is directly needed. By prioritizing the client’s focus, it will directly give them an edge or competitive advantage over competition.

**2. Leadership:**

With any major organizational change there must be full support from top management to implement all the other seven quality management principles of ISO 9000. Tanase (2015) concluded that leaders must create and continue to provide the right internal environment that will allow these principles to be successful and grow within the organization. If the wrong learning environment is in place, it will create the wrong culture to accomplish all the principles that are necessary for certified ISO 9000 company.

**3. Involving People:**

All departments within the organization must contribute and adopt all the principles required to successfully become ISO 9001 certified. Training is extremely important; you must invest in all the company’s staff to properly give them the tools needed to accomplish a high-quality product or service. Tanase (2015) emphasized the importance of positive feedback along with financial and professional development support. This is key for any implementation of a quality management system, but especially ISO 9000, which has multiple steps that all need to be effectively implemented.

**4. Process Approach:**

This principle is detrimental in the successful completion of all the other principles since it relies on a developed strategic plan of all resources. The process approach allows management to remove focus on the finished product and place more focus on to the actual step by step process of how it is made. (Castka and Corbett, 2013). This approach can be the most difficult to implement since there is a strong possibility that the whole process of a product or service can be updated and changed. However, this revision of processes allows management to pinpoint errors in their past system. Saizarbitoria (2011) emphasized the effect of a successful process approach will create a more efficient structure for the product or service. It's evident that with a clear process structure you can expect to have a more productive quality system.

**5. System Approach to Management:**

Relating to the previous process approach principle their also needs to be a laid out precise system approach to management. Tanase (2015) came up with three main objectives for management such as, Identifying, Understand, and Manage processes. The common way to do this is through a System Map that incorporates all aspects of the product or service’s full process. Management will now be able to pinpoint errors more accurately by utilizing these important System Maps. The overall goal of the principle Systems Approach is focused on improving the organization’s efficiency to reach continuous improvement.

**6. Continual Improvement:**

The foundation of most quality management systems is the importance of continuous improvement, which ISO 9000 also utilizes. Continuous improvement should always be a constant goal that is not limited to one principle but carried into all other principles. Starting from lower level staff, to middle management and all the way through to top management, the focus on continuously improving quality in all areas should be a priority. Although continuous improvement can be a broad term, there are ways to incorporate measurements and feedback. Tanase (2015) has emphasized the necessity of creating monitoring and assessment tools that will lead to management being able to measure it correctly. Without these assessment tools it would be almost impossible to determine if continuous improvement is being performed correctly.

**7. Factual Approach to Decision Making**

ISO 9000, just like any other total quality management system, is based off factual data. Statistical data is the best way to measure whether improvements are being made to meet ISO standards. Tanase (2015) explains the need for management to utilize data and information analysis from quality assurance systems. By doing so, it offers the company tangible goals and a better understanding of errors and where they are coming from.

**8. Mutual Beneficial Supplier Relationships**

Achieving a relationship that benefits both the company and its supplier is the last principle to meet ISO standards. The organization needs to prioritize being beneficial to their supplier in more ways than just financially. Both ends should complement each other since they both have a direct role on the overall quality of the product or service. For example, when focusing on a product, the supplier of raw materials must deliver a high-quality material, and the organization should help in any way they can to ensure correct delivery. This example describes how the importance of quality in ISO standards is not only limited to the said organization but to their suppliers as well.

**Results**

James Glowiak is the Quality Assurance Manager at SK Express, and has an extensive background in the manufacturing industry. He has been specifically working in Quality Assurance for the past 6 years and has brought his knowledge and background to the organization with a drive for change and improvement. He has earned his Bachelors of Science in Industrial Engineering from Southern Illinois University, and continued to learn and grow throughout his career. During an in-person interview at SK Express, Casey Walters, Zayra Estupinan, Cristian Valdez, and Jeff Jilovec wanted to understand how he values quality in his life and work, and he was asked if quality is a personal value that he holds. It was evident that quality was a personal value of his as he responded, “Yes, quality is a personal value of mine. It is a matter of doing things correctly throughout the entire organization.” Not only does he believe quality must be held at a personal level, but he believes that an entire organization must be committed to the concept of quality in order to achieve organizational goals.

In order to understand how SK Express has implemented and maintained their ISO certification, there was a need to understand some of the strengths and weaknesses the organization has faced in the process. When asked about the successes ISO implementation has brought to the organization, James mentioned that the ISO certification has helped the organization expand and grow their customer base. He went on to elaborate, “Many companies will not do business with you if you are not ISO certified. ISO certification provides customers with evidence that processes are in place, followed, and maintained throughout the entire organization.” An output that ISO implementation has provided to SK Express is forcing the company maintains regular management reviews. As a part of the new ISO standard includes responsibility of top management, the management reviews were essential in achieving ISO certification. In addition to management reviews, the ISO implementation has helped drive continuous internal audits for sustainability and improvement. Regarding the weaknesses faced regarding ISO implementation, James mentioned that one of the largest was promotion of formal documentation. When further questioned, he mentioned that many small to midsize organizations often have informal documentation. An additional challenge for ISO at SK Express was creating awareness of the value of ISO certification throughout the organization. James explained that some people view it as extra work and don’t understand the importance of the ISO goals.

**Maintenance and Control of Records**

A major part of ISO certification includes maintenance and control of important records. To gain further understanding on how SK Express practices control of records, James was asked how the organization controls their records and if examples could be provided. He said that records are controlled “Through the network. The SK server contains departments and file names that everyone has access to.” He noted that SK Express maintains matrices to control various records and that they are regularly maintained. Some examples of matrices he provided include a calibration record matrix as well as an employee/training matrix. James displayed how the calibration matrix provides a list of all measurement tools throughout the company, and how there are flags in place that notify select personnel when certain tools need to be re-calibrated. In addition, he presented the employee training matrix, which included a list of all employees that are active and inactive at the company, as well as the departments and workstations they are trained on. He further explained that they must maintain physical paperwork as evidence that employees are trained in these areas. Another way SK Express practices their control of records is through their print control team. When product prints have a new revision level released, the print control team provides new copies to each department and removes the old prints from the production floor, so they can no longer be used. James explained this ensures that products are being built to the latest specifications which reduces the opportunities for non-conformance.

**Control of Non-Conforming Products**

Control of non-conforming products and materials is another key criterion in order to reach ISO certification. To gain understanding on the methods SK Express utilizes for the control of their non-conforming material, James elaborated on the methods and practices they have in place. James described, “the first step we take is to inspect and reject any non-conforming product provided by suppliers.” He informed that they have receiving inspection procedures in place where their receiving department inspects new parts and identifies if the product is good or bad. Non-conforming product from suppliers is sent back for replacements or credit. When faulty products are received, they add the parts to a “Critical Parts List” where the same material will be inspected in detail for the next three shipments. Regarding non-conformances during product build, James explained they track errors through their error tracking database. All errors are reviewed, root cause analysis is performed, and appropriate corrective actions are taken. When non-conformances are identified, the company also utilizes reject carts and reject storage locations to isolate the bad product. In addition, the company has a formal NCR process flow which is posted throughout the facility so that all employees are aware of the steps to be taken when non-conforming product is identified.

**Risk Based Thinking**

With the ISO 9001:2015 certification SK Express recently received, a major part of the new ISO upgrade includes risk-based thinking. In order to understand how SK Express identifies risks, James was asked how the Quality Management System at SK Express supports risk-based thinking, and what were the major risks the organization currently faces. The method SK Express utilizes to identify risks is through SWOT analysis. Before the ISO upgrade at SK Express, the organization did not utilize SWOT analysis. James said that the SWOT analysis identifies current risks and allows the company to prioritize which risks are most pressing to address. Some of the specific examples that he provided on current risks the organization face includes managing customer orders and expectations. With an array of customers, the company faces challenges on managing specific customer requirements as they vary from customer to customer. Another risk that SK Express faces is from the expansion and growth to their new Mexico facility. James explained, “With the opening of the new facility in Mexico, operators do not have the training and experience that our operators have at our facility here. Training and bringing the Mexico facility up to speed is important to the organization as they are taking over production of our high-volume products.” James also mentioned that with their future ISO audit upcoming in the future, they needed to get up to speed in order to pass their audit.

**Preventative Maintenance and Preventative Actions**

Another factor critical for the organization to meet their ISO goals is use of preventive maintenance and preventive actions. In order to gain further understanding, James provided an example of how they control and maintain preventive maintenance at SK Express, and how the company implements corrective actions once issues are identified. He explained that every machine used in production has a preventive maintenance schedule, and that the maintenance department routinely makes sure the machines are working properly. In addition, he expressed that operators are required to do small maintenance procedures on machines at the beginning of their shifts. “...This ensures that machines are working properly and efficiently, and helps reduce variation in the process,” James said. Once issues are identified, SK Express utilizes fishbone diagrams, 5 why analysis, and 8D reports to identify and correct any issues. Once issues are identified, formal processes are practiced ensuring the issues do not continue to recur. See figure 1.1 below of an SK Express fishbone diagram.



Figure 1.1: SK Express Fishbone highlighting causes of a production downtime problem.

**Discussion**

**Strengths**

One of ISO 9000’s many strengths is the ability to give an unbiased evaluation of a company’s commitment to quality. Many companies seek to obtain the ISO certification for a variety of reasons. According to Du, Yin, and Zhang (2016), “...SMEs are more likely to seek ISO certification in order to conform to international norms and expand international market shares (Du, Yin, and Zhang 2016).” Since ISO 9000 is an international certification, other countries recognize the certification and can make business decisions knowing the company is committed to quality. This is a reason many international companies seek the ISO certification. With a group of ISO certified companies globally, organizations that want to produce quality products will highly consider doing business with other ISO 9000 certified organizations. It appeared that SK Express understood the importance of ISO and how maintaining these standards can lead the company to obtain a greater global market share.

Additionally, the certification helps company's performance. After doing numerous statistical tests, Du, Yin, and Zhang (2016) concluded, “the results indicate that ISO certification is positively associated with growth performance (Du, Yin, and Zhang 2016).” Companies looking to improve their performance should strongly consider getting ISO certified, which is known to positively correlate with growth performance. This was another strength of SK Express, as they understood the need for ISO in order to grow and improve. Within less than a year of opening their new facility in Mexico, SK Express had already undergone plans to begin the ISO certification process for the new plant.

ISO Certification can also help companies with internal innovation efforts. Wang concludes from his findings, “external quality management practices can enhance internal innovation efforts (Wang, 2014).” While ISO certification helps companies improve their quality and business processes, it can also positively affect internal innovation projects. This is extremely helpful for companies that are not only focusing on quality efforts. SK Express has proven to be innovative is through their CAD designed harness build templates. The engineering team re-designs CAD files to meet customer specifications. The engineering team frequently has open communication with the production floor in order to understand the optimal orientation of their harnesses.

**Weaknesses**

One of the weaknesses of the firm's approach to ISO implementation is the poor communication of the concepts of ISO throughout the entire organization. SK Express did attempt to confirm that the entire organization understood the importance of the concepts, but due to language barriers within the organization, many employees did not understand the importance. As English is not the first language of some of the employees at the organization, having translations of ISO standards and practices could be useful in helping all employees understand its importance.

With any kind of international certification comes weaknesses. Some companies dislike ISO 9000 due to its specific rules that disable a once flexible process. According to Allur, Heras-Saizarbitoria, and Casadesus (2014), “implementing ISO 9001could lead to loss of flexibility as its rigid documentation requirements may hamper the organization’s ability to make quick changes (Allur, Heras-Saizarbitoria, and Casadesus, 2014).” ISO 9000 needs to be strict to ensure that every unique company that acquires a certification is a quality organization. In order to do this, guidelines must be put into place, leveling the playing field for all companies. This can cause organizations to shy away from getting ISO 9000, especially ones in unique industries that need flexibility.

Another issue with ISO 9000 is that after getting certified, many companies don’t see much benefit. Allur, Heras-Saizarbitoria, and Casadesus (2014) explain that “most surveyed ISO-certified organizations respond that the system provides no benefits once ISO 9001 certification is complete.”(Allur, Heras-Saizarbitoria, and Casadesus, 2014) Organizations often put a lot of time and effort into getting certified, only to fall back into their old processes. Therefore, companies need to be recertified every few years.

There are many reasons a company may decide to get ISO certified. There are also reasons to voluntarily decertify, which are highlighted by Candido, Luis, and Ruben (2016) in *The Financial Impact of a Withdrawn ISO 9001 Certificate*:

“...Some firms want to be certified because they perceive a quality benefit. Yet, Others may want to achieve a preferred supplier status, or simply want to fulfill their costumer expectations. Complying with regulations and requirements is another reason to seek ISO certification. Decertification may also be due to different reasons. For Instance, companies may decide not to renew their certification because they believe they have already internalized its benefits. Similarly, voluntary decertification may occur if the firm considers that certification is expensive or simply perceives that its benefits are lower than its costs. (Candido, Luis, and Ruben, 2016)”

Recertifying under ISO is long process. When a company already believes they fixed their quality issues, it seems redundant to have to recertify just a few years later, especially with a recertification cost. This exhaustive process causes companies to reevaluate their need for an ISO certification.

**Implementation**

To implement ISO 9000, a company must nurture the right company culture. Du, Yin, and Zhang concluded in *How Innovativeness and institution affect ISO 9000 adoption and its effectiveness evidence from small and medium enterprises in China* that “Innovative SMEs(Small/Medium Enterprises) usually have a supportive culture for dynamic organizational change and thus are prone to accept new management models and innovations and acquire resources, knowledge and skills necessary for the adoption and implementation of ISO certification”(Du, Yin, and Zhang 2016). By creating this culture that supports change and new management, ISO will be easier to implement at the Mexico facility. Specifically, there is a need for open mindedness, which was echoed by Du, Yin, and Zhang (2016) when they concluded, “...innovative SMEs embrace a more open minded and dynamic culture, and therefore are more likely to accept new processes and procedures by ISO 9000 certification.” When a company needs to implement a new change, it is always easier to do so with flexible, positive employees that are supportive of the change.

The company will also have more success if the reasoning behind getting ISO certified comes from within. In *The influence of motivations and other factors on the results of implementing ISO 9001 standards*, it is explained that “...the results of the model seem to indicate that when the motivations for adherence are mostly internal, a higher level of positive effects is achieved. (Del Castillo-Peces, et al, 2017)” when a company is interested in getting ISO certified, they should consider why they are considering the certification. When the push for ISO certification comes from inside the company,

To implement ISO 9000 effectively, the company should consider when they would like to be certified. Gray, Anand, and Roth (2016) concluded, “Our research shows plants obtained ISO 9000 certification, on average, outperformed similar pants that did not under two conditions. First, the plants were early seekers of certification. Second, the plants were recently certified, as their heightened level of process compliance appears to be rather short lived, on average.” This means that if a company wants to get ISO certified, they should consider doing so as soon as possible. Second, there will be a period, after getting certified, where the company will have heightened quality awareness.

Additionally, aiming high while attempting ISO certification helps companies in more ways than just quality. Huo, Han, and Prajogo describe their research “confirms the importance of aiming at a higher level of ISO 9000 implementation to achieve more operational benefits (Huo, Han, and Prajogo, 2014).” By attempting to surpass instead of meeting the quality goals of ISO 9000, a company will reap organizational benefits as well.

**Recommendations**

SK Express should first instill a company culture at their Mexico facility that is open minded, flexible, and accepting of change. This is important for the facility to do now because the facility is new, and it will be easier to promote this culture now than to have to adjust later. With this new company culture, the process changes that need to be made will be easier to implement, making the ISO certification more attainable.

It is important for SK Express to make sure to highlight their internal motivations. While there are lots of added bonuses to getting the ISO certification, including preferred supplier lists and customer satisfaction, SK Express should explain to internal stakeholder the importance of the ISO certification for their own interests in quality. By doing this, SK Express can expect to see a higher level of achievement.

SK Express should consider when they want to get the ISO certification completed. Since early seekers and recently certified companies scored highest in performance, SK Express should set up their ISO audit and keep recertification going, to make sure they are performing at their highest ability.

Another recommendation that would be beneficial to the growth of the company is the practice of kaizen events. As James mentioned, this is not a practice currently done at the organization. Kaizen could help identify additional areas throughout the organization which could use improvement. James also said they do not use any tools for value stream mapping. This is another tool that can be used at the organization that could provide insight for more continuous improvement activities.

SK Express should gain a further understanding of customer satisfaction from other customers, other than Caterpillar. James recalled that SK Express gets extensive feedback from CAT regarding their performance, but the feedback they receive from other customers is not as informative. It would be beneficial for SK Express to provide feedback surveys to all their customers to understand how organizations other than Caterpillar view their quality and their overall levels of customer satisfaction. By getting additional feedback from their customers, SK Express can identify new areas throughout the organization that can use improvement and drive change.

In order to achieve the same level of success at their new facility, SK Express should mirror their practices at their main facility in DeKalb with their new facility in Mexico. Since they have already proven their ability to conform to ISO specifications at their home facility, mirroring these activities and processes will help them better prepare for their upcoming ISO audit at the Mexico facility. SK Express should also continue to provide as much training to the new facility to ensure they have a full understanding of the importance of ISO.

SK Express should instate annual training/re-certification to ensure employees are doing their tasks effectively. It is important to know if various employees are continuing to do their jobs correctly. By providing additional training to their employees, they can increase the overall quality of their products as operators will have a better understanding of their duties. This may also lead to their employees having additional suggestions or feedback on ways the company can improve. A lot of insight on improvement can be obtained by talking to the operators directly.

When providing our insights to SK Express, it seemed like they were interested in some of our suggestions, but others did not seem to provide much excitement. With the idea of providing surveys of customers to gain a further understanding on customer’s perception of the company, SK Express mentioned this was a topic that was recently discussed, and that they have plans to get this implemented. Another suggestion that seemed to interest SK was the concept of providing additional training to employees and potential re-certification after certain periods of time. It seemed as if the company understood the importance of training programs, as the employees are the foundation of the business.

**Future**

SK Express plans to increase their market share through their expansion of the new facility in Mexico. The additional market share they can obtain currently rests on the success of the new facility. With SK Express’s current plans and goals of helping the new facility prepare for their own ISO audit, the company is pouring their resources into making sure the new facility is successful. Not only is it important for the new facility to have ISO certification for increased market share, it is critical for the facility to have ISO recertification to ensure processes are in place, followed, and controlled.

The organization has plans to open more facilities in various locations. Some of the plans include opening a new facility in Morocco, in order to further expand market share into European and Asian countries. There have been plans to open a warehousing facility in Houston, Texas for better storage and delivery of their products to their customers. With the company's plans on opening additional facilities, each facility will need to prepare for its own ISO certification. It requires a lot of resources and support for a new facility to obtain its ISO certification, but if done successfully, it can help the organization continue to grow and further expand their market share.

Every four years the organization will need to be re-certified making sure their ISO practices are still maintained. As SK Express got its ISO certification this year, they will need to maintain all their ISO practices to ensure they will receive their re-certification four years from now. In addition to their re-certification every four years, external auditors come in for yearly reviews to ensure SK Express in maintaining their ISO practices. This will require teams at SK Express to preform continuous audits ensuring these practices are followed and maintained.

**Lessons Learned**

For ISO standards to be implemented at an organization, the support of all employees, from top management to individual production staff, is required. This was evident at SK Express as top management drove the change for ISO implementation, but took the support of various engineering, quality assurance, and production staff to implement and control the changes needed to prepare for their ISO audit. Without the support for top management, the company would have struggled to reach their goals. Not only did it require support of the entire organization, but it required all employees to work together as a team to prepare for their ISO audit.

With the new ISO standard focusing on risks and opportunities, it is important for an organization to identify these factors in order to maintain their ISO certification and continue to expand. With proper identification of risks, an organization can better prepare in the case of an emergency when something goes wrong or fails. It is vital for an organization to have plans in place in order to react to any potential failures. It is also critical for organizations to recognize opportunities for growth and expansion. By identifying different opportunities, it allows organizations to make better decisions for continuous improvement. Within any organization, continuous improvement efforts need to be maintained as an organization should never stop trying to improve. As the market place is constantly changing and evolving, it is critical for a company to recognize opportunities, so they can continue to compete and grow.

**References**

Allur, E., Heras-Saizarbitoria, I., & Casadesús, M. (2014). Internalization of ISO 9001: a longitudinal survey. *Industrial Management & Data Systems*, *114*(6), 872–885.

Beshah, B., Kitaw, D., & Alemu, N. (2013). Significance of ISO 9000 Quality Management System for Performance Improvement in the Developing Countries. *KCA Journal of Business Management*, *5*(1), 44–51.

Boudreaux, Miriam. (2009). What Happens if You Fail Your Audit. Accessed Oct 30, 2018

Cândido, C. J. F., Coelho, L. M. S., & Peixinho, R. M. T. (2016). The financial impact of a withdrawn ISO 9001 certificate. *International Journal of Operations & Production Management*, *36*(1), 23–41.

Castka, P., & Corbett, C. J. (2013). Management Systems Standards: Diffusion, Impact and Governance of ISO 9000, ISO 14000, and Other Management Standards. *Foundations & Trends in Technology, Information & Operations Management*, *7*(3/4), 162.

Chi-kuang Chen, Anchecta, K., Yuan-Duen Lee, & Dahlgaard, J. J. (2016). A Stepwise Iso-Based Tqm Implementation Approach Using Iso 9001:2015. *Management & Production Engineering Review (MPER)*, *7*(4), 65–75.

Del Castillo-Peces, C., Mercado-Idoeta, C., Prado-Roman, M., & del Castillo-Feito, C. (2018). The Influence of Motivations and Other Factors on the Results of Implementing ISO 9001 Standards. *European Research on Management and Business Economics*, *24*(1), 33–41.

Du, Y., Yin, J., & Zhang, Y. (2016). How innovativeness and institution affect ISO 9000 adoption and its effectiveness: evidence from small and medium enterprises in China. *Total Quality Management & Business Excellence*, *27*(11/12), 1315–1331.

Gray, J. V., Anand, G., & Roth, A. V. (2015). The Influence of ISO 9000 Certification on Process Compliance. *Production & Operations Management*, *24*(3), 369–382.

Huo, B., Han, Z., & Prajogo, D. (2014). The effect of ISO 9000 implementation on flow management. *International Journal of Production Research*, *52*(21), 6467–6481.

International Organization for Standardization, and Central Secretariat. “The Founding of ISO.” *Friendship among Equals: Recollections from Iso's First Fifty Years*, International Organization for Standardization, 1997, pp. 1–94.

Tanase, G. I., & V, M. (2015). Education Quality Management through the Implementation of Quality Principles „ISO”. *Valahian Journal of Economic Studies*, *6*(1), 53–58.

Wang, C.-H. (2014). A longitudinal study of innovation competence and quality management on firm performance. *Innovation: Management, Policy & Practice*, *16*(3), 392–403.

**Appendix A**

**Interview Questions**

1. **How long have you worked in Quality Assurance? What is your educational background?**

Bachelor of Science in Industrial Engineering from Southern Illinois University. Work experience includes 37 years in manufacturing and 6 years in Quality Assurance.

1. **Please tell us a little about the company. (background on size, location, history, leadership, objectives, products/services)**

(Unanswered)

1. **What are your quality objectives? What plans have been put in place to achieve those quality objectives?**

Create awareness of quality standards and promote training to ensure understanding of customer expectations. Promotion of continuous improvement programs.

1. **How do you manage change at your organization? When changes in processes are made, is it difficult to maintain those changes? Do employees often resort back to** Written documentation in native languages. Regular audits to ensure sustainability. People do tend to resort back to old habits.
2. **How would you describe your leadership style?**

(Unanswered)

1. **Who are your interested parties and what are their requirements?**

EPA, OSHA, labor board, local NIU interns, customers, and suppliers. Their own set of standards, local laws, business agreements.

1. **Is quality a personal value of yours? Is quality a value of all employees throughout the organization?**

Yes, quality is a personal value. It is a matter of doing things correctly throughout the organization. It is a matter of strength of work ethic and pride. Some people don’t care and do a poor job but other do care.

1. **How has the QMS been integrated into the organization’s business processes?**

ISO certification because it is required. Continuous improvement programs like 6S to get people involved. Error tracking to force identification of issues.

1. **What risks and opportunities have been identified, and what are you doing about them?**

Mexico facility – with expansion of new plant, efforts to train/coordinate/assimilate them to current standards. Broadly identify risk to business (ie. Competition, breaking technology, supplier-based stability, etc.)

1. **Does your QMS system support the process approach at your organization? What efforts does your organization practice in efforts of process improvement**?

(Unanswered)

1. **How do you promote continuous improvement within your organization? What kind of improvements have you seen as a result of these efforts?**

6S audits for improvement. Promotion o kaizen events (even though there are none that are done here) as well as value stream mapping (also not done here). Error tracking / Root cause analysis to identify and correct issues. Plant layout changes, addition of new tables and workstations.

1. **What challenges have you faced while implementing ISO 9001 standards within your organization?**

Mostly with the New Mexico facility. To promote formal documentation. Small to midsize organizations often have informal documentation. Creating the awareness of the value of ISO, some people view it as extra work.

1. **What are the successes within your organization as a result of ISO 9001 implementation?**

Regular management reviews and promotion of audits for sustainability.

1. **When did you begin the process of becoming ISO 9001 certified, and when did the company officially receive this certification?**

Process was started at SK 7 years ago. Upgraded to 2015 in August 2018. Attempting to certify New Mexico facility this year.

1. **How do you interact with/support different employees at your organization to meet your quality goals?**

Team meetings, customer meetings, supplier meetings.

1. **How does your QMS support risk-based thinking at your organization? What major risks does your organization currently face?**

Use of SWOTT (note\* 2nd T is trends) analysis for risk analysis and prioritization. Managing customer orders and expectations. Training and bringing Mexico facility up to speed.

1. **How does the entire organization support quality goals and work towards continuous improvement efforts?**

Assignment and participation in continuous improvement events. Progress reporting and promotion of practical metrics.

1. **How do you monitor and control non-conforming product within your organization? What procedures are in place when non-conforming material is identified? Can you provide examples?**

Receiving inspection, critical parts list, error tracking, designated containment areas, and formal NCR process.

1. **How do you control and maintain important records within your organization? How are documents controlled within your organization? Can you provide examples?**

Through the network – departments and file names that everyone has access to. Use of matrices to control and monitor records. Print control for providing new print changes and removing old prints from the production floor and use of revision blocks.

1. **How do you motivate employees in your organization to meet your productivity standards?**

Error tracking and 6S scorecards to post results of audits so the entire organization is aware of current issues.

1. **What kind of training do employees receive within your organization? Are there training re-certification practices in place? How do you maintain records of employee training? Can you provide examples?**

Training matrix. No recertification practices in place, however, key testing requirements are re-certified yearly.

1. **What kind of preventive actions and preventive maintenance does your organization utilize? How does your organization implement corrective actions when issues are identified? Can you provide examples?**

Preventive maintenance at machine work centers. Promotion of safety standards. Non-conforming reports. Use of 5Why, 8D, and fishbone diagrams.

1. **How do policies, procedures, and processes of your organization meet the needs of your company as well as its customers?**

Creation of standardization and customer surveys. CAT portal tracks our progress and provides reports.

1. **How does your company maintain its efforts on customer focus? Does your company receive feedback from its customers on levels of satisfaction from your products and performance?**

Regular customer meetings. Conference calls. Video skype meetings. CAT portal sends performance. Platinum certification 5 years in a row shows our quality. Poor feedback from other customers than CAT.

1. **Do you have any other information/comments regarding ISO 9001 that you think would be important or useful for us to know?**

Investigate nature of different standards. There are different types of ISO standards based on different industries. ISO 9001 is generalized.

There is increasing focus on risk management.

There are always minor changes in ISO upgrades, but risk management was a major upgrade.

*Thank you for your time!*