Evaluation of a Manufacturer's Sales Representative Training Program

by

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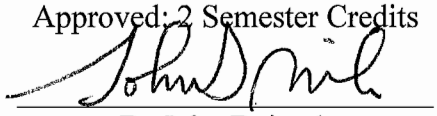

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ABSTRACT

To remain competitive in today's economy it is imperative that a manufacturer's sales representative network be highly skilled sales personnel with advanced technical knowledge. It is the manufacturing company's responsibility to ensure that the sales force is properly educated in product knowledge.

This study will look at the current methods used by a fan manufacturer to educate its sales representatives on product knowledge. Data will be collected and analyzed to identify the most frequently inquired upon topics and compare them to the curriculum and methods currently used. Recommendations will be made to enhance the current curriculum and methods based on the results of this study.

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Chapter I: Introduction

XYZ Corp began in 1947 when two brothers opened a small sheet metal shop in Schofield Wisconsin with annual sales of $35,000 in their first year. Sixty years later, XYZ Corp has grown to employ over 2700 people and has achieved over $480 million in annual sales. With manufacturing facilities in California, Kentucky, Minnesota, North Carolina, Ohio, Tennessee, Wisconsin, Mexico and China, XYZ Corp produces ventilation equipment, architectural louvers, sunshades, air handling equipment, heating and cooling coils, lab exhaust and kitchen ventilation systems. XYZ Corp products help improve air comfort and reduce energy costs by efficiently adding and circulating clean air while exhausting undesirable air in commercial, industrial and institutional buildings. XYZ Corp has become a world wide leader in the development, production and delivery of air movement and control equipment for nonresidential buildings throughout North America, Central America, South America, the Middle East and Asia. (Howard 2008).

Independent sales representatives sell XYZ products around the world under various brand names. While XYZ Corp owns multiple subsidiaries that manufacture various heating, ventilation, and air conditioning (HVAC) components, the core of the company's business is in the XYZ brand name which produces fans, ventilators, air handling equipment, architectural louvers and dampers.

XYZ Corp is divided into multiple business units focused on specific product lines. For this study we will be focusing on the Centrifugal, Vane Axial and Industrial products business unit (CVI). CVI manufactures industrial products which are typically large fans with high horsepower motors. These large fans are designed to move large volumes of air in sometimes extreme applications.

Statement of the Problem

XYZ Corp relies on the technical knowledge and expertise of independent sales representatives to sell XYZ products effectively. The lack of a rep's technical knowledge on specific equipment can result in the loss of a sale or even worse, a misapplication. The costs of CVI products are typically expensive and can exceed $20,000 for one unit due to the size and design of these products. A misapplication may reflect poorly on both the rep and XYZ Corp and can be quite costly to rectify. Since XYZ Corp sells through hundreds of reps at dozens of representative firms it is difficult to make sure that each sales representative is trained to sell XYZ Corp products intelligently.

In addition, HVAC equipment is typically sold in complex engineered systems which include a wide variety of components and equipment. While XYZ Corp manufactures a variety of these components, most HVAC representative firms sell additional products made by other companies. This requires reps to understand a very broad range of products in addition to XYZ products and how they will interact with each other in the system. XYZ Corp does not use any methods to measure a sales representative's technical knowledge on specific products.

Purpose of the Study

The objective of this study is to evaluate the current methods that XYZ Corp uses to educate its sales representatives on product knowledge. We will look at phone conversations between sales representatives and technical support personnel to determine what areas and topics XYZ Corp needs to focus their training efforts on. This study will compare topics that are frequently inquired upon with current training methods and curriculum to see if they are addressed and recommend better practices if deficiencies are found.

Assumptions of the Study

All data collected in this study is real and is only specific to the CVI business unit of XYZ Corp. This study does not apply to other areas of the company or the representative's understanding of those areas. It is also assumed that the data collected from the phone calls logged is a good sample of the population of the study.

Definition of Terms

AMCA- Air Movement and Control Association, an internationally recognized third party test and standards organization that certifies air movement and control products for performance.

Application Engineer- a marketing position which is responsible for product designs, application support and marketing of products.

Business Unit- a focused group within a company which is responsible for sales and manufacturing of specific products.

CAPS- Computer Aided Product Selections, a computer program that speeds up the selection of products based on performance criteria. It supplies pricing, creates submittals and streamlines the ordering of products.

CVI- Centrifugal, Vane Axial and Industrial products, business unit at XYZ Corp, which manufactures industrial fans and ventilators.

HVAC- Heating, Ventilating and Air Conditioning, which is a general term for all mechanical and electrical equipment used to heat, cool and ventilate buildings.

IOM- Installation Operation and Maintenance, manual which is shipped with and specific to each fan.

Pareto Chart- a graphical tool for ranking problems or categories from the most frequently occurring to the least occurring.

Product Specialists- a marketing position which is responsible for quotes, application support and technical assistance.

Sales Representatives- Independent sales representatives that are not employed by XYZ Corp but are contracted to sell XYZ products.

SDR- Special Design Request.

Sure Air- patented air flow monitoring system that was developed by XYZ Corp and offered as an accessory on XYZ fans.

UL- Underwriter's Laboratories, an independent product safety certification organization

Chapter II: Literature Review

There is a direct correlation between the level of investment in corporate training and increased levels of productivity and profitability in an organization (Wick and Granger 2004). Arie De Geus, the head of strategic planning for Royal Dutch Shell once stated the ability to learn faster than your competitors may be the only sustainable competitive advantage. "A company's investment in human capital- the education and training of its workforce- has now become a central component of its competitive strategy" (Pangarkar, 2003, p.37). The high costs associated with corporate training programs make it important that organizations get a high return on their investment in employees. In 2009, US companies spent $56.2 billion on training (O'Leonard 2008) and some research has shown that for every dollar invested in corporate training and development, only between 15 and 50 cents actually makes an impact on the business (Wick 2004). This suggests that huge sums of money are being wasted on ineffective corporate training programs. It is imperative that companies evaluate the effectiveness of their training efforts and make improvements as necessary to make sure that they are getting a healthy return on training investments.

Training Methods

There are four training methods that companies typically use today (Gipple, 2009):

The *Instructor-led Classroom Method* is the traditional approach to training which involves a group of personnel in a classroom setting led by an instructor presenting material. This method has been proven as one of the most successful methods of training; however, it requires students to gather at one location for the training. Conducting this type of training can be quite costly; expenses include the training facility, travel to the training facility and the cost of the employee being unproductive during the time spent training and traveling. This method is

also limited to the amount of available trainers- as the number of students increase, the number of instructors and facilities need to increase as well, creating additional cost.

The *Media Based Method* uses videos and print as the training medium. An advantage to this method is that the students can view the media anywhere at any time and are familiar with this type of training as it has been used since early age. Unfortunately, videos and print are sometimes ineffective at engaging the students in learning or keeping their attention and are costly to update and distribute.

The *Synchronous Web-based Method* is a virtual on-line classroom that students can log into at a specific time for class. These live training sessions are similar to the traditional instructor-led classroom training. An instructor presents information to the students who have the opportunity to ask questions and participate in discussions. One of the advantages to this type of education is that materials used in the instructor-led classroom method can be quickly adapted for online delivery. Synchronous web-based training can also be viewed by groups of students in any location via the internet which eliminates the need for training facilities and travel (this cuts down on employees' down time and travel expenses). The draw backs to synchronous web-based training include inflexibility and ineffective discussions. Since the students must meet at scheduled times to participate it lacks flexibility for people with busy schedules and it is sometimes difficult to have effective discussions when you are not in the same room as the other participants.

The *Asynchronous Web-based Method* uses interactive modules that can be accessed by the student at anytime via the internet. They are self paced and typically do not involve instructors or other students. Asynchronous web-based modules can be very convenient for people with busy schedules as they can be taken anywhere at any time. Asynchronous web-

based modules require the most amount of resources and planning to develop, however once completed they can be delivered to an infinite number of students and are relatively easy to update with new information. Interactive web-based modules are typically successful in engaging the student in the learning process and keep their attention.

Effective Training

Several failures can lead to significant waste of training dollars including: trainers who are not qualified to teach, poor presentations and the wrong content or materials. Many companies use their product specialists and engineers to present product features and applications since they are the technical experts. Unfortunately sometimes the technical experts do not have the necessary training on training other adults, which can lead to problems when teaching does not come naturally to them. The theory that if you are good at what you do, you must be able to teach others to do it does not always apply. According to Miner (1998), training designed by technical experts can fail in two ways: basic information is often left out because the technical expert does not recognize what basic means anymore and the technical expert is so excited about their topic they try to include every mundane detail in the presentation resulting in information overload and boredom.

To effectively train adults, trainers must understand the principles of adult learning theory which are different from that of younger students. "Adult learners posses a different self-image, more life experiences, the fear of failure, a greater expectation to immediately use learning, a diminished speed and retention of learning and some basic physical differences that can impact their abilities" (Kennedy, 2003, p.1). In order to effectively train adults, trainers must understand six primary adult learning principles (Miner 1998):

1) Adults have a need to know why they should learn something. A topic should be introduced by expressing to the participants the benefits of knowing the information or the cost of not knowing the information.
2) Adults have a need to be self directed.
3) Adults have a broad range of life experience from which to draw and contribute. An adult's learning experience will not be fruitful if it is strictly a lecture. Adults need the give and take of dialog with the trainer or with other participants in order to link new information to their personal experiences.
4) Adults become ready to learn when their life situation creates a need to know or to be able to perform more effectively. Adults learn best when they voluntarily choose to learn something rather than being told to by their boss.
5) Adults enter into a learning experience with a task-centered orientation to learning. Adults need to see the immediate applicability of the training to their personal or work lives.
6) Adults are motivated to learn more by intrinsic rather than extrinsic motivators such as grades or raises. Adults need to know the benefit to them personally by attaining the new knowledge.

Web-Based Training

Today, companies are starting to minimize the time employees spend undergoing training "off the job", resulting in a decline in formal classroom training and a greater emphasis on web-based and "real world experience" learning (Amble, 2007). Traditional instructor-led training is still one of the successful methods of teaching; however it requires physical classrooms in which everyone must gather at one time. For a company with a national or international representative network this can be time consuming and expensive (Gipple, 2009). Internet technologies offer

the opportunity to deliver quality instruction to students at their pace and convenience in a cost effective manner through web-based modules. The modules create an interactive learning experience for a user by including a variety of media including text, digital images, digital videos, audio and practice exercises linked to specific instructional objectives. "Blended learning," the integration of web-based learning with group instruction appears to be where corporate training is headed. Self paced web-based training combined with traditional classroom instruction helps organizations meet group learning requirements while taking into account individual learning styles and student schedules (Carlivati, 2002). Web-based training offers convenience and availability as well as consistent and standardized content at a lower cost. Additionally, it allows companies to handle spontaneous training on a large scale, for example getting new product information and training out to a large distributed sales force (Gipple, 2009).

Studies have shown that web based modules were preferred by students over the traditional instructor-led instruction in a classroom setting. According to a study done in King County located in Washington, seventy-four percent of Emergency Medical Technicians (EMTs) strongly preferred web-based training as an alternative to its traditional instructor lead classes for continuing education credits (Jerin and Rea, 2005). The web based modules in this study were produced and delivered at a cost of $3 per EMT/module, far less than the costs of traditional instructor lead training ranging from $21 to $82 per EMT/module.

Another advantage to web based training is that the cost per student per module goes down as the number of participants increase since the cost for the development and maintenance of the modules can be spread among all the users. Training costs for traditional instructor led classes tend to go up as enrollment increase due to need for addition instructors. This makes web based modules an ideal format for large populations of students, especially when they are not in

a localized area. Furthermore, the modules can be taken at any time, convenient for people with busy schedules. This makes web-based instruction ideal for sales representatives that are spread throughout the US and have very different schedules. The only drawback to web-based training is that it requires the individual to be more motivated and a self directed learner. In addition some students tend to dislike the lack of interpersonal interaction.

Training Evaluation Methods

Evaluation of training programs can be quite costly and require significant resources to conduct, so the method of evaluation (and extent) needs to be determined based on how much money is spent on training each year. Training program that require significant resources should be evaluated more thoroughly than less expensive training programs. Many training programs fail to deliver the expected outcomes and benefits to an organization however, a well-structured evaluation system can determine where the problem lies. On the other hand, if the evaluation system can show a significant benefit to your organization from the training, it can help gain additional resources for the training program from upper management.

There are several methods of evaluating training programs that range from simple methods which require very few resources to in depth analysis of the training and how it contributes to the bottom line of an organization. Simple evaluation methods such as surveys used to collect student's opinions on a course or written tests designed to measure the students' retention of the presented material require few resources to conduct. However, these evaluation methods will not present the in depth analysis that the more comprehensive training evaluation methods would.

One of the oldest and most comprehensive methods of evaluating corporate training programs is the Kirkpatrick method developed by Donald Kirkpatrick, a leader in the training

and development field in the late 1950s. It has since been adapted and modified; however, the basic structure is still the same. The model consists of four levels, evaluation always begins with the first level and then as time and budget allows, should progress through levels two, three and four (Winfrey, E.C 1999). Each level serves as a base for the next level and each level is a more in depth and precise measure of the effectiveness of the training program. According to Kirkpatrick training should be evaluated at these four levels:

1) *Reaction*- level 1 measures how the participants reacted to the training program. The participants can simply be asked did they like the training. Although a positive reaction does not guarantee a learning experience, a negative reaction almost certainly reduces its possibility.
2) *Learning*- level 2 measures the knowledge acquired by the learner. It often involves tests conducted before and after evaluation.
3) *Transfer*- level 3 measures the transfer of knowledge that has occurred in learner's behavior. Are the new skills and knowledge being used in everyday life of the learner?
4) *Results*- level 4 attempts to assess the training in terms of business results. This level measures what the training has contributed to the bottom line of the business. Have sales or productivity improved as a result of the training?

In a 2000 study, the American Society of Training and Development reported that only 3% of training programs reached Kirkpatrick's level 4 of training where there is a measured impact on the organization (Dwyer, 2007). A further breakdown showed that 95% of training reached level 1, 37% of training reached level 2 and only 13% of training reached level 3.

The Kirkpatrick Model has been used for over fifty years and is a great tool for measuring a training program's effectiveness; however it requires extensive resources in order to conduct. Most companies are not willing to spend the money and resources required to conduct this analysis unless it is for a large or expensive training program. Some companies choose to use shortened versions of this method or evaluate their training programs at only the first two levels of the Kirkpatrick model.

In this study we will be utilizing a Pareto chart to highlight some of the most frequently inquired upon topics by XYZ Corp's sales representatives. It is assumed these topics are the least understood topics and this is a base line analysis to determine if these topics are covered in the current XYZ training programs. The Pareto chart was named after Vilfred Pareto and is a graphical display of the 80/20 rule. Pareto, during the study of the Italian economy, found that 80 percent of the wealth in Italy was held by 20 percent of the people, thus the 80/20 rule (Summers 2003). Since the development of the Pareto Chart and the 80/20 rule, both have been applied to a wide variety of situations. The phrase "80 percent of my problems are created by 20 percent of my customers" is derived from the Pareto chart. Pareto charts can be a useful tool in problem analysis because it forces people to focus on the most frequently occurring issues rather than the most recent or memorable ones (Summers 2003). This type of analysis will quickly illustrate areas that XYZ Corp needs to focus their future training efforts. This is the first step in a full evaluation of XYZ Corp's training program.

Chapter III: Methodology

Introduction

The CVI business unit's marketing and sales department is structured with Application Engineers and Product Specialists reporting to a Product Manager. It is the application engineers and product specialists' responsibility to both educate the sales representatives thru training sessions and assist the representatives with day to day technical support under the direction of the Product Manager. The Application Engineers and Product Specialists both have other job responsibilities in addition to training the reps.

Each business unit at XYZ Corp has an 800 phone number provided to sales representatives for technical assistance. This 800 number calls are fed to Product Specialists and Application Engineers that are logged into the "phone system". The phone system is designed to have three to four people logged in at any given time and will distribute the incoming calls evenly among the support personnel in a rotating manner. Since XYZ Corp does not have dedicated technical support personnel, this system is designed to distribute the calls equally among Application Engineers and Product Specialists while they perform their other day to day responsibilities without overburdening one individual. At the same time, this phone system provides a phone number for technical support throughout the day that the representatives can call and reach an available person. It is assumed that if there are four people logged into the phone system each person will get 25% of the calls, unless they are on the phone for extended periods of time and get skipped.

Data Collection Procedures

For this study, one technical support person logged every call they received for a four month period including the date, sales representative, representative firm and the topic of the

call. This call log can be viewed in Appendix A. The data was sorted by topic and then used to create a Pareto chart to determine which topics were inquired upon most frequently and by whom.

The curriculum and teaching methods used in XYZ Corp's current training initiatives were also gathered, analyzed and compared to the data obtained from the phone calls. It is assumed that the topics that are most frequently inquired upon through phone calls are the topics that the reps do not fully understand. The most frequently inquired upon topics were also compared to the curriculum to see if those topics were covered.

Data Analysis

195 phone calls were logged and sorted by the subject of conversation and it was determined that each phone call would fall into one of fourteen categories:

1) *Accessories*- These calls were questions on what accessories are available on each fan, the purpose, advantages and limitations of the accessory. Most of these questions could have been answered by looking at a product catalogue.
2) *Application*- This category is specific applications questions on what fans to use in certain applications.
3) *CAPS*- This category covers all questions regarding our Computer Aided Product Selection program.
4) *Construction/Specifications*- These calls were questions on the construction of fans, available materials, gauge thicknesses, physical properties and specifications of the fans.
5) *Cross Reference*- This category covers all questions about which one of XYZ products would be the best replacement for a competitor's product that has been specified on a job.

6) *Drawings*- This category covers all requests for submittal, CAD and Rivet drawings. It also includes inquires on dimensions of parts not included in the submittal drawings.
7) *IOM*- This category covers all installation, operation and maintenance questions that are covered in our IOMs.
8) *Motors*- This category covers all questions on motors used in fans.
9) *Miscellaneous*- This category is for any question that does not fit into any of the other categories and is considered insignificant.
10) *Replacement Parts*- This category includes all questions on how to order replacement parts.
11) *Spark Resistant Construction*- This category covers all questions regarding AMCA's definition of spark resistant construction, applications and materials used. This category is very important for applications where volatile airstreams are of a concern.
12) *Sure Air*- These calls were questions specific to our Sure Air flow monitoring system.
13) *Terminology*- This category covers all questions on definitions and terms
14) *UL*- This category covers questions regarding UL listings on fans.

Analysis of XYZ Corp's current training methods showed that the following training methods are used to educate sales representatives:

1) Week long training seminars (instructor-led classroom method) which are held quarterly and are limited to thirty representatives per quarter. The representatives must travel to the corporate headquarters in central Wisconsin for the training. The week is structured so that each business unit has one day to present on their products. See Appendix B for CVI curriculum used during the CVI product day.

2) Engineering updates (media method) which entails engineering and product literature sent out quarterly to the representative offices. Topics discussed include applications, new product designs and solutions.
3) Sales calls during which application engineers will visit representative offices to give product presentations to the reps, specifying engineers and contractors.
4) Webinars (synchronous web-based method), product support personnel will give power point presentations over the intranet to reps, specifying engineers and contractors. The advantage of a webinar is that no one has to travel for the presentation. See Appendix C for webinar and sales call topics.
5) Factory visits, representatives can bring specifying engineers and contractors to corporate headquarters for product presentations and factory tours by product support personnel. See Appendix D for material covered during factory visits.
6) Day to day technical support through phone calls.

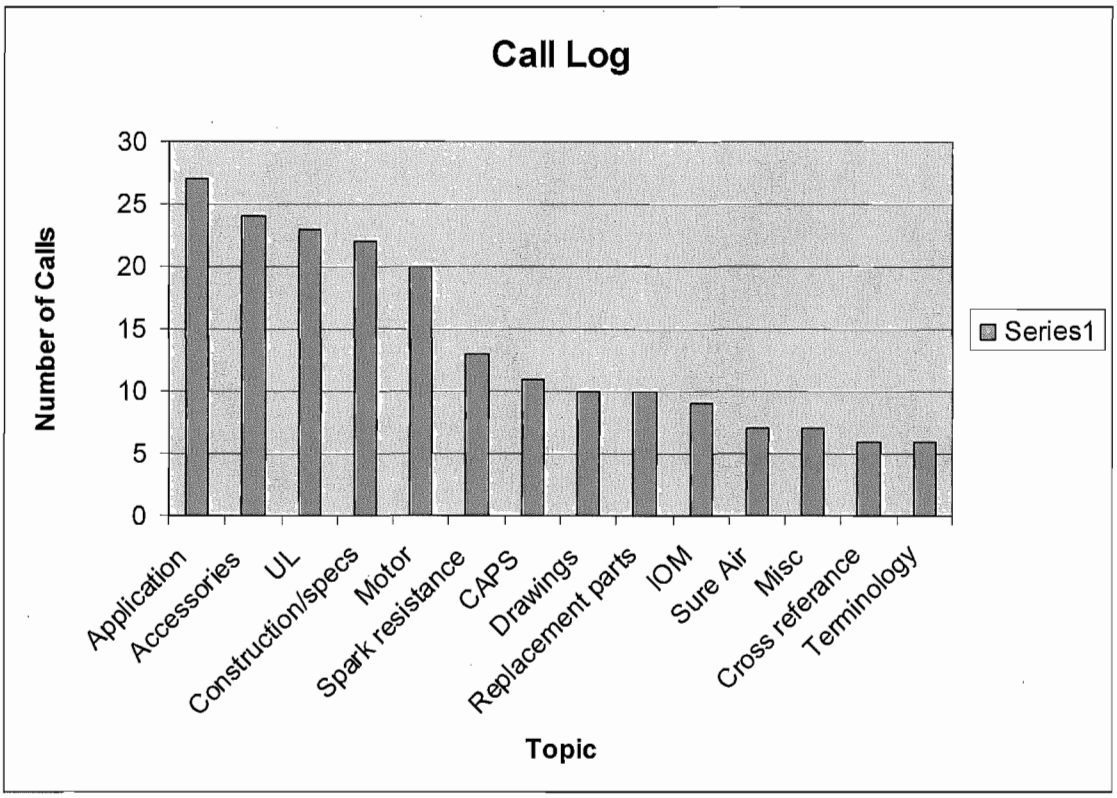
Limitations of the study

This Study is limited by the amount of available data. The data was collected from phone calls received by one of four support personnel for the CVI business unit at XYZ Corp for a period of four months, July 2009 to November 2009. The data is specific to CVI products and does not represent the sales representatives' knowledge of all product lines. This study focuses on an individual's technical knowledge in CVI products which is a moving target, as technology advances education must follow. A current area of difficulty for a sales representative now may be learned and then a new challenge will present itself.

Chapter IV: Results

A Pareto chart (figure 1) shows the data sorted from most frequently inquired topics to least inquired topics. Of the 195 phone calls logged from July 2009 to November 2009 Applications, Accessories, UL, Construction/Specs and Motors were the most frequently inquired upon topics and accounted for 59% of the calls.

Figure 1



Review of the curriculum currently used during the representative training sessions (Appendix B) show that Applications, Accessories and the Construction/Specs topics are covered during the Inline and Centrifugal presentations. UL topics and Spark resistance are covered in the General CVI presentation. Motors are not covered in the presentations at all. It is noted that an entire week of training with one full day dedicated to CVI presentations suggest that retention

of the presented material is limited. There are 147 slides in the four Microsoft powerpoint presentations that are presented on CVI products. Fortunately, binders containing all of the power point presentations are provided to the representatives for future reference.

Review of the Webinar and sales calls topics showed that Applications, Accessories and Construction/Specs are covered in some of the presentations but not all. UL and motors are not covered in any of the webinar presentations.

Presentations given at the factory visits are similar to the inline/axial and Centrifugal presentations given at the representative training sessions, including Applications, Accessories and Construction/Specs. UL is briefly mentioned during the presentation but not as extensively as it is during the representative training presentations. Binders with power point presentations are not provided for future reference, so information that is not retained from the presentation during the visit is lost. Motors are not discussed during the factory visits.

Day to day technical support calls covers any topic that is inquired upon and would cover all categories listed as this was the source of all data collected.

Chapter V: Discussion

Conclusion

Applications, the most commonly inquired upon topic unfortunately can be too large of a topic to cover in training. This topic covers a wide range of questions that are usually application specific and sometimes require an intimate knowledge of a product that may be beyond what is expected of a sales representative. Most of these questions are truly what a technical support phone number is designed for; product experts with extensive technical knowledge in a specific product line that can help with higher level technical questions. These types of questions can only be answered by someone who focuses on specific products and learns them intimately. Thus, this category would be difficult to fully educate every representative on.

Accessories, UL listings, Construction/specs and Motors are finite topics and should be focused on in XYZ Corp's future training initiatives.

In this study, it was found that of the 195 calls logged in the four month period, 150 of them (77 percent) were made by different representatives. This data shows that many different representatives are inquiring about the same issues and suggests that training methods should be designed to reach a larger population of the representatives. Most of the training methods currently used at XYZ Corp for example the representative training seminars, factory visits and sales calls are limited training opportunities. The representative training seminars only occur four times a year and are limited to thirty representatives. This means that only 140 reps would be trained annually which is less than the number of representatives (150) that called for technical support within a four month period. The factory visits and sales calls are also limited to those selected to attend due to travel costs.

Recommendations

Based on the data presented, I recommend that XYZ Corp focus on training a larger population of representatives with methods such as web-based modules, webinars and distribution of literature. Since such a large amount of information needs to be acquired; I do not believe it is effective to present all the information in a one day session such as the representative training seminars. A training program that divides the curriculum into smaller lessons and has them available at the representative's convenience would be much more effective than throwing a large quantity of information at the representatives to see what sticks. XYZ Corp already has a lot of the curriculum already developed; it just needs to be delivered by a different method.

I recommend that the current Centrifugal and Inline/Axial fan power point presentations (in Appendix A) be reviewed and condensed into two different levels of web-based modules: "XYZ Centrifugal and Inline/Axial Basics" and "XYZ Centrifugal and Inline/axial Advanced" and these 2 courses will serve as an entry level course for all the representatives. Following the completion of the basic and advanced modules, additional modules should be offered on specific topics such as:

1. Construction/Specifications of Fans
2. Accessories
3. UL listings on products
4. Spark Resistant construction
5. Motor Basics
6. Advanced Motor Applications

These courses should be web based so that representatives can log in at their convenience to take the course. It should be encouraged by the representative firm's management that all

representatives take these courses to enhance their product knowledge. This information should also be sorted by topic and placed into binders which can be sent to all representative offices. These binders can then be used as reference materials when the sales representative has a question since it is reasonable to assume that not all of the information from the power point lessons will be retained. By having reference binders available, it would be faster for a representative to look up a question in the binder than call the XYZ Corp support line. At the same time it would reduce the amount of in comings calls to the support line.

It is further recommended that Webinar topics be reviewed, evaluated and scheduled. The Webinar schedule should be posted on XYZ Corp's website, showing the topic, date and time so that representatives can log into Webinars that are on topics of interest to them.

More focus also needs to be placed on motor education. Motors aren't covered in any of the current training methods, yet it is the fifth most frequently inquired upon topic in this study. Motor training tools already exist thru the motor manufacturers and should be utilized by XYZ Corp in their training initiatives. Motors should be included in both the web-based modules and webinar topics. XYZ Corp should leverage the motor manufacturer's expertise and have them provide a motor expert to appear on motor webinars with XYZ representatives.

Further analysis should be done after the deployment of these training tools to measure the sales representative's satisfaction and the effectiveness of these new methods.

References

Amble, Brian. (2007). *The Changing Face of Corporate Training.* Retrieved December 30, 2009 from http://www.management-issues.com/2007/4/4/research/the-changing-face-of-corporate-training.asp

Calivanti, Peter A. (2002 June). E-learning Evolves. *ABA Banking Journal,* 49-54.

Dwyer, Kevin (2007). *Why Training Fails.* Retrieved November 29 2009 from http://www.changefactory.com.au/articles/article_002.shtml

Gipple, Ed. (2009). *The Building Blocks of Successful E-training Program.* Retrieved Dec 2009 from http://www.icslearninggroup.com/whitepapers/Elearning%20Building%20Blocks%201.2.pdf

Howard, Kirk E. (2008). *The Values We Share.* Wausau, WI: Kinziegreen Marketing Group

Jerin, John M., Rea, Thomas D. (2005). Web-Based Training for EMT Continuing Education. *Prehospita Emergency Care,* 9 (3) 333-337

Kennedy, Ralph C, (April 2003). Applying Principles of Adult Learning, The Key to Effective Training Programs. *FBI Law Enforcement Bulletin,* 72 (4) 1-5

Miner, Nanette (2002). *The Best People Make the Worst Trainers.* Retrieved November 29 2009 from http://www.trainingdr.com/articles.htm

Miner, Nanette (1998). *Why Training Doesn't Work.* Retrieved November 29 2009 from http://www.trainingdr.com/articles/whytraining.htm

O'leonard, Kathy (2008). *The Corporate Learning Fact Book 2009: Benchmarks, Trends and Analysis of the U.S. Corporate Training Market.* Retrieved November 30 2009 from http://www.breitbart.com/articlephp?id=prnw.20090123

Pangarkar, Ajay., Kirkwood, Teresa. (2003 December/January) Systematic Strategies. *CMA Management,* 36-38.

Summers, Donna C. (2003). *Quality* (3RD ed). Upper Saddle River, New Jersey: Prentice Hall

Wick, Carl., Granger, Kathy (2004 November/December). Six Ways to Shorten the Learning-Doing Gap. *Electric Perspectives,* 61-64

Winfrey, E.C. (1999). *Kirkpatrick's Four Levels of Evaluation.* Retrieved December 5, 2009 from http://coe.sdsu.edu/eet/articles/k4levels/start.htm

Appendix A: Call Log

Date	Name	Rep Office	Subject	Category
18-Oct	Cory	Brucker	are isolators the same when using mounting rails	Accessories
18-Oct	Bob		backdraft damper selection	Accessories
18-Oct	Rodger	h and h	inlet vanes vs VFD, which is better.	Accessories
16-Oct	rodger	h and h	motorized damper on taub	Accessories
16-Oct	Dave		shaft grounding prices	Accessories
15-Oct	Mike	Mechanical	can customer relocate 4X disconnect	Accessories
13-Oct	Pablo	Weaver	is there a motor slide base on arr 9	Accessories
13-Oct	Pablo	Weaver	motor cover for arr 9	Accessories
12-Oct	Angelo	ADe	inlet vane dampers on Qei	Accessories
12-Oct	Tony	RL Craig	selecting hanging isolators for VAD	Accessories
8-Oct	Joe	Hoffman	can we provide filters on inlets of fans	Accessories
5-Oct	karl	Michigan	grease trap for an SWB	Accessories
28-Sep	Mike	Stienbaugh	sound attenuation on QEID with silencers	Accessories
23-Sep	Joe	Air Tech	bisw access door locations	Accessories
21-Sep	Dan	Buckley	weather hood on arr 9	Accessories
15-Sep	Robert	Hoffman	motorized damper on taub	Accessories
15-Sep	Bob	Hoffman	weather hood on arr 9	Accessories
1-Sep	Lynn	Delren	filters on TCB	Accessories
31-Aug	Keith	Vyron	how to size back draft damper on existing BISW	Accessories
24-Aug	Rodney	Underwood	epoxy coating- liquid or paint	Accessories
10-Aug	Dan	Air specialty	what is lab coat	Accessories
6-Aug	Shawn	ADE	4 or 6 isolators per BISW?	Accessories
3-Aug	glen		damper guard on IP fan	Accessories
3-Aug	Adam	Nsw	split on qep	Accessories
16-Oct	Steve	CFM	tcb upblast with hood	Application
12-Oct	Greg	CG Woods	changing performance on ax fan by pitch	Application
12-Oct	Gary	Tms	tbi-ca for paint and sandblast material	Application
9-Oct	Bill		how far should on inlet damper be from an inlet	Application
8-Oct	Dean		Seismic isolators	Application
1-Oct	Tony		qei roof mount	Application
30-Sep	Scott	ADE	do we plan on making plastic fans	Application
16-Sep	Neal		differences between fan classes	Application
16-Sep	Mike	Buckley	Highest operating temp on BISW 1000F	Application
15-Sep	John	Bartos	drive change to speed up fan	Application
15-Sep	Jason	Eap	drive change to speed up fan	Application
9-Sep	Mike	Riscoe	can a tcb be rotated from A to C	Application
4-Sep	Laura	ADE	VAB application questions	Application
2-Sep	Steve	Cfm	what are the high temp options for an AX	Application
1-Sep	Mark	ADE	can an SWB do 450F	Application
31-Aug	Robert	Brucker	AFDW with alum for wet environment	Application
28-Aug	Neil	Climate	QEI verticle on roof installation	Application
24-Aug	Joe	air control	app question, curb reducer or SDR curb cap	Application
21-Aug	don	Michigan	can we do integral curb cap	Application
19-Aug	Hugh	NSW	qei verticle base mount 1" isolation	Application

Appendix A: Call Log (continued)

10-Aug	Chris	Hoffman	2 operating pointson 1 fan? Application question	Application
7-Aug	Lane	Mechanical	questions on FPB fans	Application
6-Aug	Steve		taub for high heat	Application
5-Aug	Sam	Delren	can you rotate a VAB 180 degrees	Application
3-Aug	Tim	NSW	motor fit problem on bisw	Application
31-Jul	Will	Nsw	what cvi units are siesmic certified	Application
28-Jul	Theresa	ADE	can you rotate a TCB	Application
26-Oct	Chris	NSW	QEI selec for increase perform down the road	CAPS
15-Oct	Nevide	ADe	how to select a sound vault in CAPS	CAPS
14-Oct	Ken		Entering airstream temp in CAPS	CAPS
14-Oct	Bob		how to select 50 cycle in CAPS	CAPS
12-Oct	Joe	Hoffman	direct drive QEP selections	CAPS
12-Oct	Mary		QEI fan selection	CAPS
6-Oct	brandon	Ward	direct isolation on 54 BISW arrangement 10	CAPS
19-Aug			how do you select short casing on AX fan	CAPS
7-Aug	Brian	Ade	how to select split housing on afsw	CAPS
6-Aug	Theresa	RL Craig	fan selection question at 2 performance points	CAPS
31-Jul	Tim		fan selection question	CAPS
21-Oct	Scott	ADE	maximum operation temp on QEI	construction/specs
21-Oct	John	Buckley	ss is it 304 or 316	construction/specs
19-Oct	Mike	air control	SS IPW fan	construction/specs
13-Oct	Dave	Tms	can we do TCB in SS	construction/specs
12-Oct	Mike	Tms	is SS entire everythign on the fan	construction/specs
11-Oct	Brad		shaft size 25% below first critical speed	construction/specs
30-Sep	carlos	ADE	selecting split housing on afsw (need series 41)	construction/specs
30-Sep	Scott	ADE	tcb direct drive	construction/specs
18-Sep	Jonette		does SS entire mean stainless steel	Construction/specs
16-Sep	Laura	ADE	"air tight" shaft seal	construction/specs
1-Sep	Joe	Airtech	do we press fit shafts	Construction/specs
31-Aug	Scott	Ade	2 belts for VP and 3 for fixed why?	Construction/specs
27-Aug	Sandy	Ade	2 motors on 1 fan	Construction/specs
27-Aug	Randy	Bartos	do we air balance fans	Construction/specs
26-Aug	Scott	ADE	does performance change with SS construction	Construction/specs
25-Aug	Mike	Colby	can we do alum QEI	Construction/specs
24-Aug	Rodney	Underwood	can we do QEI 9 or 12	Construction/specs
21-Aug		air control	SS on QEID	construction/specs
10-Aug	Chris	Hoffman	can 100% wheel replace existing 80%	Construction/specs
5-Aug	Brian	Hoffman	is there bearings on arr 4 and 8	construction/specs
4-Aug	rial	Bartos	taub-ca in alum? (sdr)	Construction/specs
29-Jul	Lindsy	Sales	what type of SS do we use 304 or 316	Construction/specs
23-Oct	Josh	EAP	cross Cook's CPA	cross reference
12-Oct	Les	Brucker	crossover for 9-QMXU	cross reference
10-Oct	cherlette	air specialty	does our competition do VAB"S"	cross reference
3-Sep	Jerry		twin city NFC-SW crossover	cross reference
31-Aug	chuck	Bartos	crossover for CVD- tcb	cross reference
6-Aug		eh price	cross referance for buffalo fan	cross reference
5-Oct	jimmy		CAD drawing	Drawings

Appendix A: Call Log (continued)

5-Oct	john	Hoffman	need rivet drawing	Drawings
24-Sep			damper submital for BISW	Drawings
24-Sep	Scott	ADE	inlet box submittals	Drawings
23-Sep	Joe	Air Tech	submittal for HB 120 damper on bisw 21	Drawings
18-Sep	Aaron	Buckley	isolator locations on submittals	Drawings
15-Sep	Donna	NSW	Shaft diameter on BISW	Drawings
10-Sep	Tony	RL Craig	flange demensions on a ipa	Drawings
7-Aug	Matt	RL Craig	CAD drawing on QEP	Drawings
5-Aug	Walt	Pittsburg	demensions on inspection section	Drawings
14-Sep	Vincent	Al	need total eff of fans	Fan Performance
8-Sep	Curt		what is a fan's minimum FRPM	Fan Performance
24-Aug	Tony	RL Craig	can QEID do 302 CFM @ .3"	Fan Performance
1-Oct	Paul	Buckley	TCB ordered horizontal, can it go verticle	IOM
29-Sep	Scott	Ade	how to lift a VAD	IOM
21-Sep	karl	Michigan	how to mount belts in the field	IOM
16-Sep	Cameron	NSW	motor locations on arr 1	IOM
10-Sep	sherry	air alliance	universal mount vs flange mount	IOM
9-Sep	Mike	ADE	how do you lift a vad	IOM
2-Sep	Becky	Nsw	how do mounting rails on QEIs work	IOM
10-Aug	Jason	Eap	qei overlap/start-up check list - look in IOM	IOM
7-Aug	gozer	Delren	afsw installation questions	IOM
14-Oct	Dan	air specialty	can we do a factory vib test on site	misc
8-Oct	Ed	cors-air	calc bearing life	misc
4-Aug	Eric	Johnson	calc moment of inertia vs Bhp	misc
31-Jul	Mike		outlet cone angle	misc
16-Oct	Glenn	Air systems	motor bearing life on arr 4	Motor
16-Oct	John	CG Woods	VFD, SF and shaft grounding on a motor	Motor
12-Oct	Greg	air specialty	115 v space heaters in motors	Motor
11-Oct	Mike	hd grant	MOP on 100 HP motor	Motor
8-Oct	Neil	Climate	motor wieght on 40 hp	Motor
5-Oct	Joe	Hoffman	FLA, MCA and RLA on 7.5 hp	Motor
28-Sep	Jose	ADE	is SDR motor Standard on TAUB	Motor
28-Sep	Mike	Riscoe	what is shaft grounding	Motor
22-Sep	Kevin	Michigan	1.15 SF with VFD	Motor
22-Sep	Dave	Dennison	FLAs on TCF	Motor
15-Sep	Tony	RL Craig	selecting a SF on a motor	Motor
9-Sep	Norm	Airtech	ipa selection with 40 hp motor	Motor
27-Aug	Chris	cors-air	explain the min starting hp	Motor
24-Aug	Chris	NSW	how does our motor warrante work	Motor
10-Aug	Ken	NSW	selecting an EXP motor in CAPS (need PE)	Motor
6-Aug	Patty	hc sharp	1.15 SF with VFD	Motor
6-Aug	wayne		over amping motors	Motor
30-Jul	Neil	Climate	motor plate sizes on QWEI	Motor
29-Jul	Pablo		motor FLA, MCA, MOP	Motor
28-Jul	Tony	RL Craig	motor question, FLA vs airflow	Motor
15-Oct	Mary	hd grant	I parts ordering	Replacement parts
9-Oct	jeff	Products	i-parts quote	Replacement parts
6-Oct	Chris	mechanical	field installing drain connection	Replacement parts

Appendix A: Call Log (continued)

29-Sep	hank	Buckley	is iparts pricing net or list	Replacement parts
11-Sep	kelley	Price	how to order a weather hood in I parts	Replacement parts
9-Sep	Mike	Riscoe	how to use I parts	Replacement parts
8-Sep	Vincent	Bartos	can we expedite parts thru Iparts	Replacement parts
5-Aug	matt	Brucker	do parts quotes include freight	Replacement parts
3-Aug	dale	Nsw	how to get touch up paint for hi pro	Replacement parts
29-Jul	chris	NSW	parts question, how to order a comp flange	Replacement parts
15-Oct	mike	air control	diff between amca a and aluminum airstream	Spark resistance
14-Oct	janet		what is spark b construction	Spark resistance
11-Oct	sam	Hoffman	arr 4 with spark b construction	Spark resistance
11-Oct	dave		tbi-fs ss and TAUB exp proof construction	Spark resistance
1-Oct	Ron		spark c and heat fan package on IPA	Spark resistance
29-Sep	Nelson	Holden	spark b on a vab	Spark resistance
11-Sep	lee	Michigan	spark a on a qei	Spark resistance
3-Sep	tony	ADE	what is spark c construction	Spark resistance
2-Sep	Brent		what fans are explosion proof	Spark resistance
20-Aug	Art	Hoffman	is tbi-ca spark B construction	Spark resistance
4-Aug	Jay	Hoffman	what is spark b construction	Spark resistance
3-Aug	tim	Nsw	AMCA spark B on BISW or SWB	Spark resistance
28-Jul	Dennis	NSW	AMCA spark B on BISW 54	Spark resistance
16-Oct	Scott		min diameter of 36 BISW inlet cone	Sure Air
10-Oct	John		question on flow probes	Sure Air
29-Sep	Aaron	Johnson	can we put sure air on flakt woods fan	Sure Air
24-Sep	Hugo	ADE	sure air for TCB and VAD	Sure Air
23-Sep	Joe	Air Tech	Sure air questions	Sure Air
8-Sep	Sue	Price	sure air electronics equation	Sure Air
4-Aug	Neil	Climate	sure air specs	Sure Air
16-Oct	matt	Bartos	what is a compainion flange	Terminology
10-Oct	bob	Hoffman	is TCB a tube centrifugal	Terminology
1-Sep	Scott	ADE	how to read bearing descriptions	Terminology
19-Aug	will	NSW	1.5 x belts how many belts is it?	Terminology
10-Aug	ryan	Jorban	is outlet guard considered birdscreen	Terminology
6-Aug	dustin	Holden	tcf nomenclature 24-tcf-3-1	Terminology
21-Oct	don	Weaver	UL 762 gasket for comp flange	UL
15-Oct	john		ul 762 on qei upblast	UL
12-Oct	Mike	CG Woods	qei roof mount with HT-UL	ul
12-Oct	Julie	Ward	ul 762 on TCB vertical	ul
11-Oct	adam	NSW	qie ul 762 on roof upblast	ul
8-Oct		Nsw	ul 762 on TCB selection	UL
5-Oct	Bryan	Hoffman	ht-ul on a TAUB	UL
1-Oct	tony	mechanical	selecing HT-UL on QEID	UL
30-Sep	Bruce	Eei	ht-ul on QEI, cannot select in CAPS	UL
30-Sep	carlos	Ade	ul 762 on qei upblast	UL
29-Sep	Mike		tcb w/ ul 762 motor position 7:00	UL
23-Sep	matt	Bartos	QEI 9 with UL 762	UL
22-Sep	Erin	TMS	QEI 9 with UL 762	UL

Appendix A: Call Log (continued)

21-Sep	mark	Hoffman	can we do ul 762 on tcb vertical	UL
16-Sep	Murry	Underwood	is VAD UL listed	UL
31-Aug	Lynn	ADE	AFSW for kitchen exhaust UL 762	UL
26-Aug			what cvi units are UL smoke control	UL
7-Aug	Mark	Hoffman	HT-ul on TCB	UL
6-Aug	Mike	Stienbaugh	ul 762 on verticle tcb	UL
3-Aug	lee	Buckley	selecting a heat package on IP fan	UL
3-Aug	rick	Commercial	ul 762 on qei- wrong motor position	UL
31-Jul	Mike	CG Woods	, looking up listings on ul website	UL
28-Jul	Steve	NSW	ht-ul on QEI, cannot select in CAPS	UL

Appendix B: CVI Curriculum for rep training

Centrifugal Fan Presentation (38 slides)

- Nomenclature
- Construction/Specifications
- Applications and performance capabilities
- Accessories
- UL listings
- Bearings
- Sure Air demonstration

Inline/Axial Fan Presentation (73 slides)

- Nomenclature
- Construction/Specifications
- Applications and performance capabilities
- Accessories
- UL listings
- Sound

General CVI Topics Presentation (22 slides)

- UL listings
- AMCA Spark resistant construction
- Motor shaft grounding
- Seismic certifications

Paint presentation (14 slides)

- Applications
- Capabilities
- Warrantee

Factory Tour

- Manufacturing processes and capabilities
- Paint processes
- Vibration tests and specifications

Appendix C: Webinar and sales calls presentations

- XYZ Corp's advantages
- Bearing presentation
- Two-coat paint system
- Seismic certifications
- Motor shaft grounding
- Sure air flow monitoring system
- Inline/axial fan presentation
- Centrifugal fan presentation
- Sound and vibration presentation
- Fan fundamentals
- System effects presentation

Appendix D: Material covered in factory visits

Centrifugal Fan Presentation (no slides, this is a "walk thru" presentation of the product center)

- Nomenclature
- Construction/Specifications
- Applications and performance capabilities
- Accessories
- UL listings
- AMCA spark resistant construction ratings
- Bearings
- Sure Air demonstration

Inline/Axial Fan Presentation (no slides, this is a "walk thru" presentation of the product center)

- Nomenclature
- Construction/Specifications
- Applications and performance capabilities
- Accessories
- UL listings
- AMCA spark resistant construction ratings.
- Sound

Factory Tour

- Manufacturing processes and capabilities
- Paint processes
- Vibration tests and specifications