An assessment of factors influencing technician turnover rates in agriculture

by

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ABSTRACT

Agriculture Producers all around the world rely on technicians to diagnose and repair their equipment. Long after the sale, technicians are working with customers to keep their equipment investment operating as it should. Technicians are, therefore, crucial to SmartAg and vital to their long run success. Figuring out how to attract and retain good technicians is a critical strategic imperative for dealership organizations and for their supplier companies.

This study focused on improving understanding about the factors that determined the retention of technicians at farm equipment dealerships. It is an important study because although retention has been studied extensively in many industries, it has not received particular attention in the agricultural equipment industry. Where it has been studied in the industry, the focus has not been on service technicians. The study used data from 87 sample dealerships of a major multinational manufacturer distributed across the United States. The data covered technician related factors over the last 12 months of dealership operations.

Although turnover is normal in any business and in the economy, the study's results showed that the number of technicians quitting exceed the number being hired during August through November. From December through July, the dealerships hired more technicians than lost them. In the United States, demand for technical services increase during August through November when producers are harvesting their crops. This cycle of events suggests a need to reduce the pressure the dealerships experience when they have technician deficits.

The study shows that technician retention is positively influenced by training. As well as Smart Tech Assistance Center Score (STACS), a measure of how well technicians completed their case when seeking assistance from SmartAg, and parts and training credit goal achievement scores, which measure the dealerships' actual to planned training credit hours, all increase retention with statistically significant coefficients. Additionally, increasing average labor efficiency, which is also influenced by training, also reduces technician turnover.

Although salaries and other financial compensations were not considered in this work because they have been shown to have a mixed impact on retention across many industries, this study directs dealerships' attention to enhancing the capacity of their technicians to do their work. And it would seem that by equipping them with the knowledge to do their work, they feel a higher level of commitment and loyalty to their employer, encouraging them to stay longer.

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I thank my wonderful wife who has supported me through it all. You have made this journey truly enjoyable the last few years and has allowed me to chase my dreams. Additionally, my son who decided to join us earlier than expected, you brighten our day. To my parents who have never stopped supporting and believing in me. Thank you for believing in me and through your example taught me that hard work pays off and education is important. You have both been an inspiration and a constant guide in my life. I would also like to thank the Masters of Agribusiness staff - Deborah Kohl, Mary Bowen, and Program Director, Dr. Featherstone for creating and maintaining such an excellent Graduate Program. Finally, I would like to thank Dr. Vincent Amanor-Boadu (Dr. V) for being such a great major professor, the passion and expertise are very evident. Thank you for guiding me and taking my understanding of economic analysis and strategic thinking to a higher level.

CHAPTER I: INTRODUCTION

Technician retention is a constant topic of discussion among SmartAg dealerships because of the impact it has on their business. Finding qualified individuals who can proficiently maintain and work on equipment is vital to these dealerships' long-term profitability and success. But the impact these technicians have extends beyond their employers' profitability. Their ability to troubleshoot and solve the technical problems facing farmers, cattle producers, grain facilities, dairies, construction, orchards, golf courses, and homeowners have a high multiplier effect on the total network profitability. Anyone who purchases a piece of equipment is going to need the help of the service department. Because of this key role technicians play in the business; technicians are in high demand across the country and retaining those that a company has is a critically imperative.

Agriculture dealer organizations compete amongst each other and multiple other industries across the equipment repair sector for technicians. The market domain for technicians includes aviation, oil and gas, food, automotive, trucking, processing, and railway. Retention has been theorized for years to be driven solely by financial rewards. Depending on the industry and experience, a good technician can expect a wage of $25 per hour or more, while a great mechanic could expect an excess of $40 per hour. At these wage rates, a marginal dollar increase could be very high for the technician in percentage terms. For example, increasing a good technician's wage rate to $30/hour is equivalent to a 25% increase in pay, making such an offer very difficult to resist. A decision to leave one organization can have a huge adverse effect on the company the technician left and be very beneficial to the recruiting company.

The costs of a technician leaving can be seen in many areas of the business. Depending on how long they have been with a dealership, when a technician leaves, often they take the tribal knowledge of customers and the customers' equipment with them. When they leave, the dealership can see a decrease in overall profit and efficiency in job completion even when new ones are recruited to replace them. Additionally, the parts department, responsible for supplying the technician with parts to complete jobs, could see a decrease in their volume, leading to lost margins in that department. A technician's departure can, thus, create a void in the shop that can take months to fill depending on their skill level and when they choose to leave. Additionally, when a technician leaves it can put stress on the technicians who stay behind because they must pick up the work previously done by one who left, creating discomfort and loss of morale, and elevating the risk of increasing departures. Determining the factors that contribute to technicians leaving is a valuable input to developing strategies to increase their retention.

1.1 Research Problem and Question

SmartAg dealerships are independently operated businesses, doing what they deem fit with their resources as well as information to achieve their business objectives. Therefore, it is not possible for agriculture manufactures to direct its dealerships in how they manage their technicians. While there are processes in place that allow SmartAg to view its dealerships information, the dealerships have proprietary control over the information and may choose not to share them the data. They also have the responsibility of keeping the information they choose to share up to date and accurate. The benefit of sharing information with SmartAg for the dealerships is that SamrtAg uses the information to conduct research and use the results to provide support to the dealerships, which enhance

their potential for higher profitability. One of such is the contribution this research would make to the dealerships in enabling them to better understand the antecedents of their technician retention or turnover challenges.

The research problem of interest here is improving understanding about retention and applying it to technicians at SmartAg dealership organizations. The operational purpose of the research problem being interesting is that it hopes to provide management of these dealerships with the information to help them develop the appropriate strategies to improve technician retention and reduce turnover. The research question the thesis sought to answer is this: What factors influence the turnover rate of technicians across a sample of SmartAg dealerships? Answering this research question has taken on an urgency in the last few months with the increasing shortage of skilled labor of all kinds. This shortage has increased poaching of such skilled technicians across companies as they prey on each other for their competitors' skilled technicians. Understanding the specific factors that influence technician turnover rates at SmartAg dealership could help the dealerships, which are critical in sustaining SmartAg's value proposition to its marketplace, to manage a critical resource in their ability to produce the necessary service level to ensure and sustain customer satisfaction and loyalty.

1.2 Research Objectives

The overall objective of this research is to identify the factors that influence technician turnover across SmartAg dealerships. The specific objectives are as follows:

1. Describe the nature and distribution of the dealerships included in the study to provide a context for interpreting the results.

2. Develop a model to explain the factors that influence technician turnover across the sample dealerships.
3. Estimate the extent of the response of technician turnover across the dealerships to the factors that were identified as statistically significant in explaining technician turnover rates.

1.3 Outline of Thesis

The current chapter has presented the background to the thesis problem and defined the research question and objectives. A review of the pertinent literature is presented in the next chapter to contextualize the problem and provide a theoretical foundation for the conceptualization of the problem. The theory, data and analytical processes used to address the research question are presented and discussed in Chapter 3 and the results from the analyses are presented and discussed in Chapter 4. The final chapter presents the summary and conclusions from the research as well as recommendations emanating therefrom. It also identifies some potential for future research.

CHAPTER II: LITERATURE REVIEW

In this chapter, we present a summary of the relevant literature forming the foundation of this study. First, we provide an overview of a SmartAg Dealership organizations' business structure in terms of SmartAg/Dealer relationship and Dealer/Technician relationship. This overview provides a context for understanding the importance of the research problem. It is followed by a review of the literature on employee retention. The purpose of the review is to provide a foundation upon which to develop a model explaining factors influencing technician turnover rates.

2.1 SmartAg Dealer Business Relationship

The composite company, SmartAg, manufactures various agricultural production, processing, and transportation equipment. It distributes its products through service companies who have the responsibility of providing after sales service and support to firms who purchase SmartAg's products. This study encompassed 88 of SmartAg's distributors and dealership organizations across the US and in multiple agricultural industries. They are in grain production equipment as well as soft fruit and vegetable production, supplying production and transportation equipment that till the soil and handles the sorting of table grapes and peaches. SmartAg does not own their own distribution channel and relies on dealership organizations. This model of dealer-owned SmartAg -supported distribution and service centers has served both parties well. There is 50+ independently owned dealer organizations in the United States and multiple more in international markets.

Like most automobile manufacturing companies, mutual insurance, and some national quick service restaurants, using dealerships allows SmartAg to focus on its core strength of researching, developing, and manufacturing equipment, and allowing its dealers to focus on their core strength of selling and servicing the equipment SmartAg

manufactures. It is in SmartAg financial interest to provide support for its dealerships to succeed since this underscores its own success. SmartAg has tools/resources, personnel, and services in place to support its dealerships. However, like the automobile dealership or the restaurant franchise, the independent dealership organization runs and operates their own business, and it is dependent on them to run a strong healthy business.

Because the business relationship is set up the way that it is, dealer organizations are free to engage in business as they see fit, as long as they are meeting the terms of the dealership contract with SmartAg. Dealership organizations recruit, hire, and train, technicians who fit their culture as needed. It is imperative that dealer organizations are keeping top talent in all areas of their business but especially their service shops. The need for highly skilled technicians has become increasingly imperative in SmartAg dealerships because of the increasing complexity of SmartAg products. For example, the company has been increasingly manufacturing and distributing equipment with technology stack, which is the full set of components required to deliver expedient and experiential solutions to the customers. These technology stacks include hardware and devices, their embedded or connected software, data platforms and associated applications and their connectivity. The technology stack on equipment are inherently complex and transition equipment service to a level that many may not recognize. Yet, these changes in enhancing service to customers is what places technicians and their training and capabilities at the center of SmartAg dealership organizations' performance evidenced through unparalleled customer loyalty.

There are tools and services SmartAg offers to its dealerships to help them attract, train, and retain top technician talent. These include marketing campaigns for gaining attention of technicians looking for employment or looking to change their current

employment. The company also targets specific recruiting spaces, such as the US military, which often has well-trained technicians retiring from the military at significantly young age. The sponsored SmartAg Tech Colleges and SmartAg Training facilities offer training after technicians are hired. They also train service managers and leadership of the dealerships, and their human resource professionals who can help develop internal training and capacity building processes and answer questions as they arise within the dealership. This research contributes to the support that SmartAg offers its dealers in an attempt to improve their performance so they can contribute to SmartAg overall performance.

2.2 Two Factor Theory

Herzberg's Two-Factor Theory of Motivation (Herzberg and Snyderman 1959) received significant attention in the industrial organization and management literature in the 1960s and 1970s (Rao 1972, Behling, Labovitz and Kosmo 1968). Webber and Rogers (2018) used the model to explain the satisfaction differences between female and male faculty members in universities. Herzberg's theory hypothesizes that job satisfaction and dissatisfaction are distinct from each other and must thus be managed separately. The literature offers empirical support for this duality perspective, but as Behling et al. ((1968) point out, the singular models have also received empirical support. They show that any differences in the performance of the models result from definitions of the instruments' variables. This means that in explaining how technician satisfaction may be enhanced, the Herzberg model or conventional uniscalar models can work well if their underlying variables are appropriately and accurately defined and measured.

With this perspective as the background, the Herzberg Two-Factor Model is employed here to provide a context for viewing the challenge of motivating employees and, in the process, increasing retention and reducing turnover. Herzberg's model focused on two groups of factors, what he termed Satisfiers or Motivators and Dissatisfiers or Hygiene Factors, to explain employees' overall job satisfaction. Nickerson (2021) depicted the factor groups and their components in the form presented in Figure 2.1. It shows that the Satisfiers are "soft" motivational factors, such as status and growth opportunities, which the Dissatisfiers include "hard" factors, such as salaries and compensation, work environment including the physical space and the policies guiding behavior.

Figure 2.1 Satisfiers and Dissatisfiers Factors

Source: Nickerson (2021).

Figure 2.1 provides management with a way to think about sequentially addressing technician turnover challenges. Nickerson argues that management should first look at the dissatisfiers before looking at satisfiers. The fundamental assumption is that an employee unhappy with their salary may be uninterested in their status in the

company or their opportunities for advancement. This view is not universally true and has been challenged by other research. Additionally, the literature shows that the performance motivators are not static (Klassen and Anderson 2009). With this in mind, a practical approach to dealing with motivation is to address both sides of the Herzberg duality simultaneously.

The Two-Factor Theory model can be organized into a matrix (Value Based Management n.d.) (Figure 2.2) which may be presented as follows:

I. High Hygiene + Low Motivation: Employees have few complaints but are not highly motivated. The job is viewed as a paycheck.
II. High Hygiene + High Motivation: The ideal situation where employees are highly motivated and have few complaints.
III. Low Hygiene + Low Motivation: This is the worst situation where employees are not motivated and have many complaints.
IV. Low Hygiene + High Motivation: Employees are motivated but have a lot of complaints. A situation where the job is exciting and challenging but salaries and work conditions are not up to par.

Quadrant II focuses on the components of the motivators and hygiene that produce the best results. A work environment that provides positive feedback to employees and embraces their non-pecuniary needs while also addressing their pecuniary aspirations offers the best approach to managing for effectiveness. What managers need to avoid is Quadrant III. Any assessment that reveals a work environment and employees are in Quadrant II must immediately be addressed with a significant investment in resources to motivate both a positive work environment and improve employee incentives (Klassen and Anderson 2009).

Figure 2.2: Reconfiguration of the Herzberg Two-Factor Theory

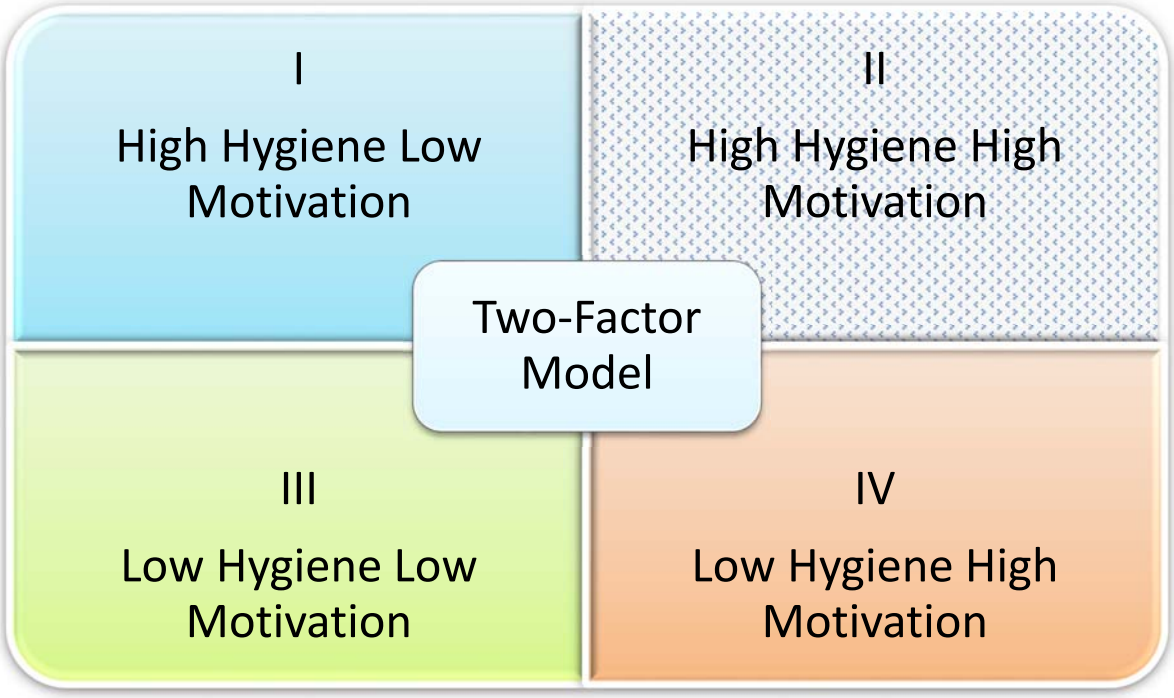


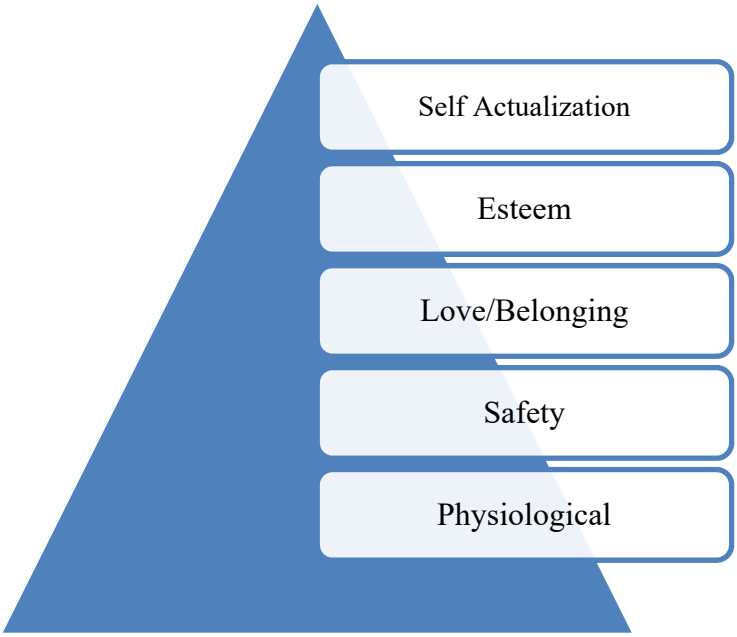
Figure 2.2 suggests the importance of knowing where employees sit in each of the two domains in the Herzberg Two-Factor Theory. This implies management must take regular pulse of their employees, especially when the environment for attracting workers is as tight as it has been in the past year or so (Amanor-Boadu 2022). Understanding one's employees will contribute to being able to fix any retention problems an organization may have. By identifying the dissatisfiers or motivators that are present, managers can turn this situation around. Many technicians may find themselves in this situation. Through constant and concerted efforts, managers can make changes that quickly move the organization into Quadrant II. In Quadrant IV, highly motivated employees are confronted with low hygiene – compensation, poor management, etc. – causing employees to feel out of place and develop a sense of inadequate application of their talent and capability. They will take things into their own hands and consider moving to employment that offer them the hygiene factors commensurate with their motivations. When this becomes visible to

management, they must take it seriously and evaluate gaps, their extent, and their causes to enable them develop the appropriate solutions to avert the potential catastrophe of losing talented and committed, highly motivated employees. Fixing this problem, by default, takes time, but by communicating to the dissatisfied employees and showing them there is a plan and engaging them in the steps are being taken, it is possible to avert loss of talent.

2.3 Maslow's Hierarchy of Needs

Maslow's Hierarchy of Needs is a pyramid that has been debated and discussed for many years (Taormina and Gao 2013). Figure 2.3 depicts the traditional presentation of Maslow's hierarchy about how people's motivations change over time. As individual's psychological needs (food, shelter, and clothing) are met – represented at the bottom of the pyramid, they are able to think about the next important need, i.e., safety. As these lower needs are met, people progress towards a state of homeostasis or towards doing their best work or self-actualization (McLeod 2020). What is implicit in the Maslow model is that it is impossible to motivate people to think about their safety when they are hungry or cold, and they cannot appreciate love and belonging when they feel their physical safety is compromised.

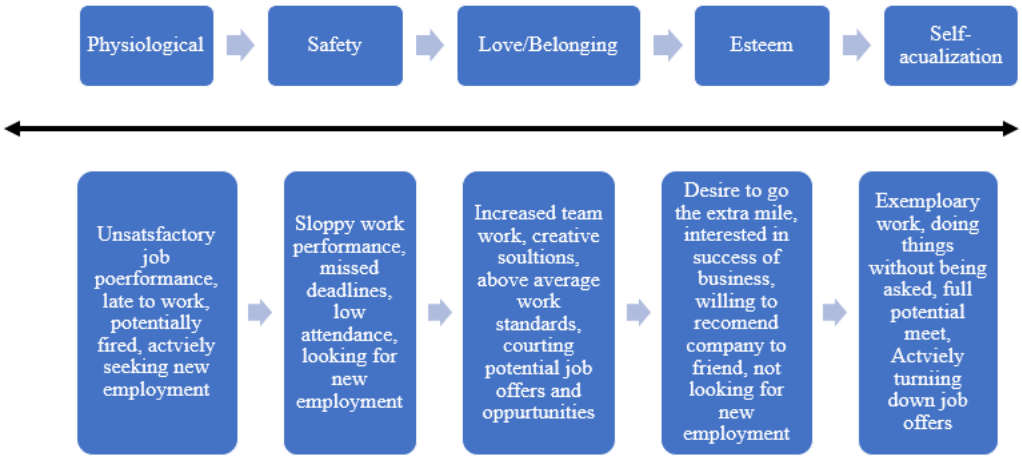
Figure 2.3 Maslow's Hierarchy of Needs



This model may be utilized to understand how employees engage their employers and their workplace. To be at maximum effectiveness at work, i.e., to operate as a self-actualized individual, the employee must have all four prior needs met. If the workplace is unsafe, indicated by the number of physical or psychological injuries, such as discrimination and assault), then employees are unable to migrate up the hierarchy to love what they do and feel a sense of belonging with the organizations. When employees trust their employers to provide them with good wages and a safe working environment, they feel a belonging which contributes to their self-esteem working for the organizations, eventually leading to an improved employee effectiveness. We define this as their ability to do their most effective work of which they are individually and collectively proud (Schrag 2001). Some common traits displayed by employees when their most basic needs are not met are illustrated in Figure 2.3. As employees progress from meeting their psychological needs to feeling safe and so on, so does their job satisfaction and a higher willingness to turn down job offers coming to them from outside the organization. Looking at the

hierarchy of needs linearly clearly displays the need for constant concerted efforts by management to create a safe environment for all employees.

Figure 2.4: Maslow's Hierarchy of Needs as Flow of Activities and Outcomes-



Presenting the Maslow's hierarchy horizontally as presented in Figure 2.3 overlays some of the results of achieving each one of the five tiles. If an employee at work is not meeting minimum physiological needs, then they are certainly looking for outside employment. As one moves across the scale there are various results or consequences from achieving each need. If esteem is being achieved, the employee may not be actively looking for new employment, but if it comes their way, they may decide to take the opportunity. If an organization has great employees and is treating them well, one should expect a certain level of movement, it is when technicians are leaving early and dissatisfied that is concerning. Finally, self-actualization occurs when all the employee's needs are being meet. This is when an employee can be their best self at work and contribute above and beyond for the team and employer. In this stage, the employee is not looking for new employment and is actively turning down any job offers that may be coming their way.

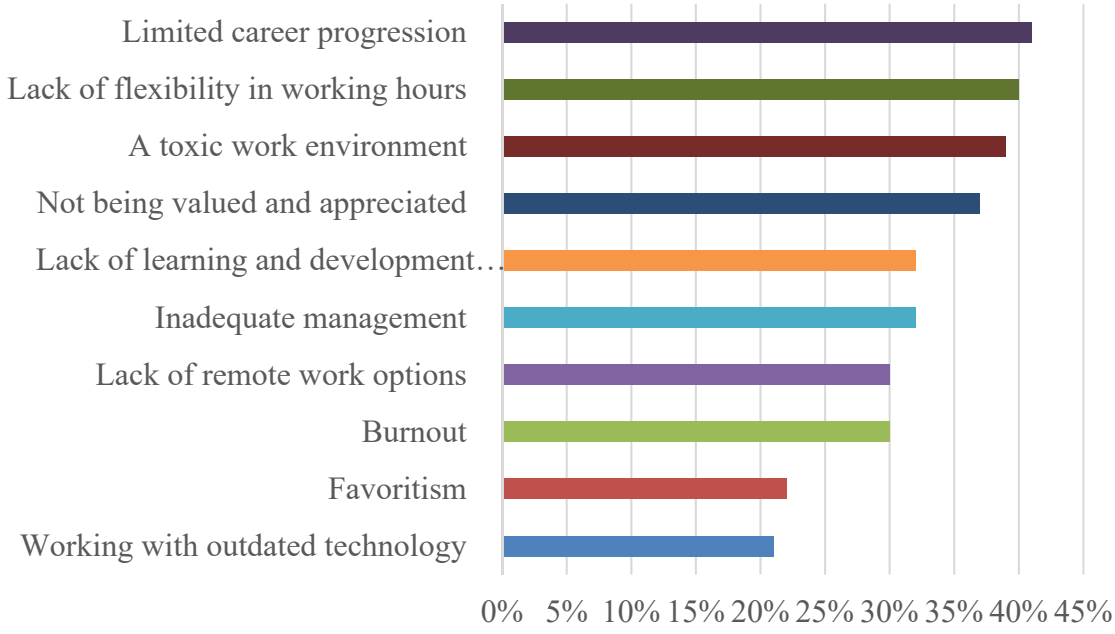
This employee is loyal to the employer because all their needs are being meet in the workplace. Dealerships that create the environment for their technicians to get to this point of their needs hierarchy, where all four lower rungs in the hierarchy have been met would foster the emergence of self-actualization that connects technicians to the dealership, effectively eliminating the retention problem. It's important to note, that each technician's situation is different, their unique needs and situation needs to be understood by management. This requires the technician to be open and honest with themselves and management to ensure that they are progressing through the hierarchy of needs.

2.4 Technology Industry compared to Agriculture Technicians

TalentMS surveyed 1,200 employees in the in tech/IT/software departments of the US technology sector and the results revealed that seven out of 10 of them were considering career change within a year of the survey (Robinson 2021). While the survey respondents may be in a different industry from SmartAg technicians, both industries are fixing and troubleshooting problems, working with their hands and minds, and both sets of employees are highly technical. A similar and earlier study by DataQuest (2015) found similar levels of dissatisfaction. Surveying 5,000 technology industry employees, it found that 36% of them felt trapped in their current employment situation without any visible advancement path while 17% felt strongly under-appreciated. The study found a strong relationship between how valued an employee feels at work and their likelihood of staying in that job. These surveys support the importance of focusing on employees' level of satisfaction if turnover is to be effectively managed. The foregoing reasons are similar to the list developed by Robinson (2021), presented in Figure 2.5. For example, 41% of respondents identified limited career progression as a major source of their dissatisfaction,

similar to the DataQuest study six or seven years earlier. What is interesting is the top contenders identified in Figure 2.5 all fall under the Satisfiers group of the Herzberg Two Factor Theory. This might suggest a need to think seriously about how to ameliorate technician turnover at SmartAg dealerships.

Figure 2.5: Proportion of Technology Sector Workers Responding to Issue Being Important to Explaining their Dissatisfaction with Their Work



Source: Robinson (2021).

While differences exist between SmartAg and tech sector workers, the similarities in responses could be very high. For example, remote work may not currently be applicable to SmartAg technicians since they have to be in the shop or at a customer's job site to work on equipment. However, a scenario that could accommodate remote work is allowing a technician to work on a project or job that they are highly interested in that may not be a high priority, like an old tractor rebuild requested by a customer (Verlinden n.d.). This "passion project" may be enough motivation for the technician to not consider seeking

another employer. On the flip side, working with outdated technology can and should absolutely be addressed. Other items to consider can be special tools, adequate shop space, laptops that allow for quick and effective access to needed sites for troubleshooting, and other implementation of new and innovative systems and tools designed by SmartAg to increase technician efficiency.

Many technicians have experienced job burnout. By recognizing that this is an issue in today's fast paced, high intensity SmartAg technician's lifestyle, processes and incentives can be developed to address it. For example, a crop farmer may be harvesting their crop for a month without a large window of flexibility. The technician supporting the combines is working with multiple farmers within the same time frame, creating significant stressors for the technician if multiple machines should go down in different locations within the same period or close to each other in time. Dealerships cognizant of this pressure may alleviate the burnout risk by working with technicians during harvest time and implement mandatory time off at the end of harvest. Making it mandatory ensures the technicians use the time for their mental and physical health management. This allows them to pick up the next round of harvest stressors and planting stressors with a higher level of resilience.

Another way to reduce burnout and fatigue is through celebrating collective successes (Seppala and King 2017). Celebrating the little wins that are experienced through the busy season may create a culture of inclusion and be enough of a boost to get technicians through this demanding time. Ideally this may increase the loyalty to one's organization reducing technicians seeking other employment options. Processes should be

custom to the size of dealer organization and geography, then implemented to enhance technician effectiveness and reduce stress and burnout that can lead to lose of key talent.

2.5 Management

Meretz et al. (2007) evaluated employee responses to surveys measuring employee engagement and support. The researchers focused on two indicators: Perceived Organization Support (POS); and Perceived Supervisor Support (PSS). It found that when POS is low, a supervisor can increase employee commitment to the organization because supervisors are often with the employees day in and day out. On the other hand, when PSS is high, it blunts the effect of low POS because it creates relationships often valued by employees. For instance, supervisors engendering high PSS provide employees with regular good assignments, flexible work schedules, feedback, recommendations, and recognition (Maertz, et al. 2007). Supervisors providing high level of support can create high level of commitment and trust from their direct reports, making them more capable of positioning themselves before their employees' consciousness as the primary provider organizational support. (Maertz, et al. 2007)

When both PSS score and the POS score are low, employees may feel a higher motivation to leave an organization. When an organization no longer fills an employee's need beyond financial satisfaction, i.e., psychological needs on the Maslow's Hierarchy, then that employee becomes vulnerable to enticement from organizations that promise the potential of meeting their higher needs. For a time, PSS can be low, and an employee can lean on POS. This may allow the organization to get some extra mileage out of the individual. If the problem is not corrected quickly at the PSS level, then employees,

including supervisors, will find the incentive to change employment very attractive. The cost to the organization as a result of this decision exceeds replacement and training costs.

2.6 Coaching

Traditionally, management has been expected to have good answers to employees' questions. They achieved a management position because of the tenure they put in with an organization. If one can trust new leaders who may not have been with the company for years and years to come in, understand the business, and then be a leader, this can reinvigorate an organization. There are three items that any manager can focus on when in conversations with their employees: Ask, Listen, Empathize (Batista 2015). By following these three items, managers can provide a place for employees to engage them with a sense of appreciation and attention. By asking the right questions to begin a conversation, such as "What you would like to discuss?" or simply inviting the employee into conversation by saying "The floor is yours", employees can feel welcome to engage. Managers in their listening, asking and empathizing roles are helping employees to come in and open up, but more importantly, ensuring they know they have the manager's full attention.

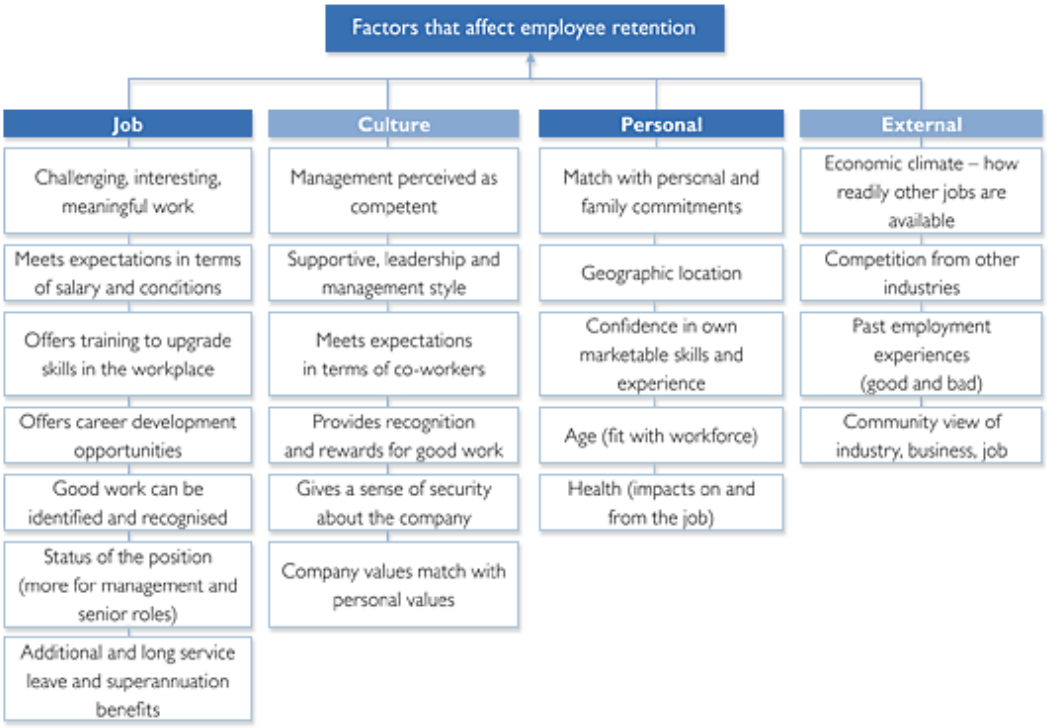
Empathy is crucial in understanding and comprehending another's point of view as well as experiencing their emotions through them and with them (Batista 2015). When employees express their emotions, frustrations, and struggles, and managers are empathetic with them in these expressions, they position themselves to make the employees feel affirmed, and enable them to ask better questions that help the employees find solutions to problems they might have hitherto thought insurmountable. Managers must, therefore, be trained to develop empathetic skills to make their employees feel they are important and what disturbs them is important to the manager too.

Choosing technician supervisors or the service manager for a location is a task that has been completed traditionally in some organizations as a hierarchy, or next in line (DeVaro and Morita 2013). At times the oldest technician in the shop got to be the next service manager if there was a vacancy. This makes sense if the service manager is supposed to help technicians diagnose and fix equipment. If a service manager's main task is to develop department processes, ensure customer satisfaction, timely job completion, create service department yearly goals and budgets, provide coaching, conflict resolution, schedule service and technicians, train, and advocate for technicians, then there needs to be a renewed focus on choosing the right individual for the job and not placing the next in line. Technicians leaving can be attributed to lack of leadership from their service manager. Poor leadership and management has been found in other industries (Robinson 2021) (Seppala and King 2017). If promotion must occur from within, then one way to curb the technician turnover problem is by training the right person to be a leader in the service department.

As millennials are replacing older generations in the work force, a 2016 Gallup poll of millennials found that almost 90% of them valued "career growth and development opportunities," but less than 40% felt strongly that they had "learned something new on the job in the past 30 days" (Finkelstein 2019). Understanding the various generations that are employed in the organization is very important. What one generation thinks as important may not be what another generation thinks is important. When coaching each technician truly listening will ensure that they are getting what they need out of you, to feel appreciated at work.

Not all factors that influence technician retention can be pinpointed and addressed immediately. Naturally employees in any industry will make a change that is right for them and their circumstance. That goes beyond technician retention and into individuals' choice, factors that affect employee retention. Figure 2.5 illustrates that there are a four main factors and various cascading reasons why employees decide to seek employment elsewhere.

Figure 2.5: Factors that affect employee retention



Source: Dairy Australia (2006).

2.6 Incentives

Incentives may be divided into financial and non-financial. Their impact on motivating retention differ across people. Although important, they fall under the dissatisfiers column of the Herzberg Two-Factor Theory, and have not shown up in the

literature are critical in managing turnover. When the other factors that provide and support employee satisfaction are absent, then the inadequacy of incentives gets exacerbated (Robinson 2021, Maertz, et al. 2007, Herzberg and Snyderman 1959).

Although little work on factors influencing technician turnover has been conducted in the equipment service industry, studies from manufacturing and the technology industry, from education and the health industry provided indicators to support the construction of a theory of factors that could explain the turnover rate across SmartAg dealership organizations. We turn our attention to the development of this theory and also the description of the data used to test the theory so developed.

CHAPTER III: DATA, THEORY, AND METHODS

In this chapter, the theory supporting the research is presented along with the data and methods. They each form a subsection of the chapter in a sequential order.

3.1 Theory

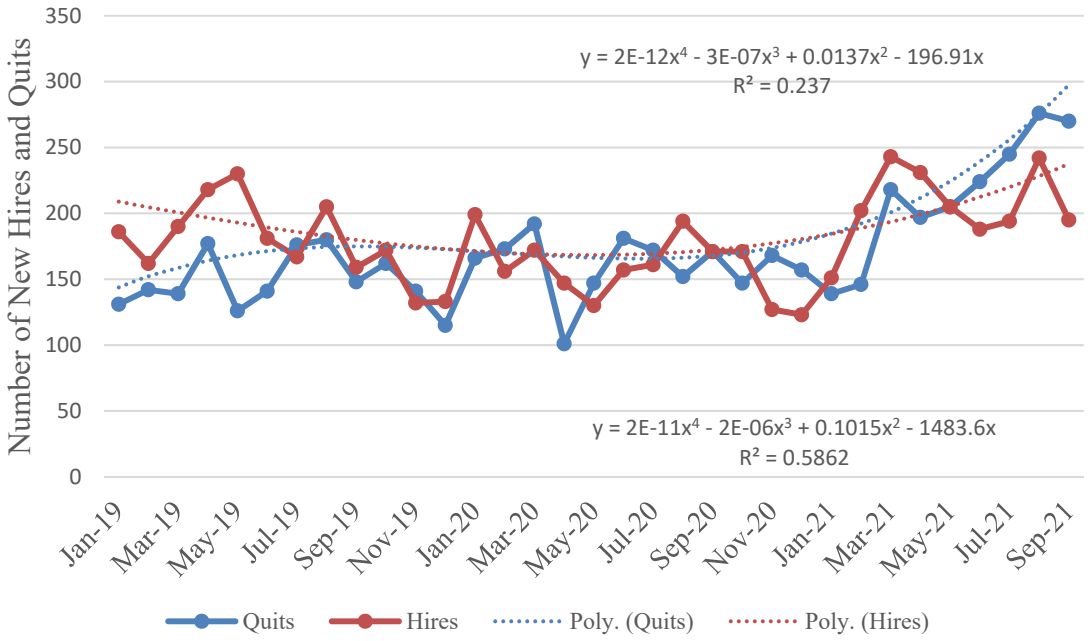
Various SmartAg dealerships are finding it harder to find qualified technicians. Many technicians may start out at a SmartAg dealership and leave sometime over the years – sometimes months – to take the skills they learned at SmartAg elsewhere. The impact of technician turnover is more than the loss of a technician. It also includes loss of a technician who understands SmartAg's service operations and its customers as well as a team member at the dealership. The research focuses on assessing the factors that are hypothesized to influence technician turnover rates. It uses data from SmartAg to test the hypotheses undergirding the research. The U.S Bureau of Labor Statistics' job outlook from 2020-2030 projects an increase in technician positions by as much as 8% (STATISTICS 2021). SmartAg dealerships need to be actively recruiting and attracting key talent to fill their shops with qualified technicians.

Naturally technicians are going to decide that they are going to seek outside employment. Understanding why a technician decides to leave the organization is important when analyzing if an organization has a technician retention problem that needs to be addressed.

Figure 3.1 illustrates the trend in monthly quit and hire numbers from January 2019 through September 2021. The figure shows that hires have exceeded quits for most of the duration under consideration, suggesting that the dealerships have been growing their service programs. A further analysis of the two activities shows that hiring is less seasonal

than quitting. The trend line equations show that when the number of technicians quitting is regressed on time in a quartic polynomial model (using Microsoft Excel Add Trendline macro), with the intercept set to zero, the coefficient of determination is 0.59 compared to a similar model for hires, which produced a coefficient of determination of only about 0.24. These results indicated that the variability in the quartic time variable explains 2.5 times the variability in quits as they do hires. This supports a conclusion as well as perception in the industry that quits are seasonal compared to hires.

Figure 3.1: Trend Analysis of Hires and Quits Across SmartAg Dealerships (January 2019-September 2021)



Harvest for technicians is a long taxing time, with many technicians recording 80-hour weeks for multiple weeks to ensure farmers are able to get their crops out of the field. This demanding time not only occurs during harvest but can also occur during planting. Technicians who are experiencing burnout and seeking reprieve from the demanding schedule may quit prior to planting or harvest in an attempt to avoid the experience.

From the literature review, it was found that employee turnover rates are influenced by satisfiers and dissatisfiers (Herzberg and Snyderman 1959, Robinson 2021). The empirical evidence suggested that satisfiers were identified more frequently as factors influencing employee satisfaction than dissatisfiers (Behling, Labovitz and Kosmo 1968, DataQuest India (DQIndia) 2015). With this model and results in mind, it was hypothesized that technician turnover rates, **TTR**, is influenced by various forms of technician capacity development programs that enhance technicians' confidence in their ability to do their job with satisfaction (satisfiers). Four of these capacity development programs are defined here:

(1) SmartAg Technical Assistance Center Score (**STACS**):- To assist Dealer Organizations and ensure uptime for customers, SmartAg has for each product line what is called SmartAg Technical Assistance Center (STAC). It is staffed by individuals who answer questions from technicians unable to solve technical problems and need assistance in repairing SmartAg equipment. Dealer technicians can place cases when they need assistance with diagnosing or fixing SmartAg equipment. These cases that technicians place is given a grade to determine how well the technician did prior to reaching out to STAC and asking for assistance. If the technician does not follow the steps necessary to fix a problem prior to submitting a case, they are given a poor grade on the STAC case. This often happens when the technician is not competent enough to know the necessary steps to solve a problem or just ignorant about the solution. In either case, it is evidence of poor or inadequate training. This leads to lower STACS, which is hypothesized to increase technician turnover. If technicians are unfamiliar with what it takes to

solve their problems and have to go to STAC all the time, they are going to feel inadequate and incompetent and feel unsupported in the shop. This feeling is what is expected to motivate exit considerations are they look for employers who would provide a work environment that affirms their capability through effective training and support.

(2) Average Technician Efficiency (**ATE**): When a SmartAg technician opens any given job for a customer, they are graded on how quickly they complete the task. Often a well-trained and experienced technician can complete a task faster the expected time needed to complete the job due to experience and knowledge. Since it takes time for new technicians to gain the requisite experience, it is expected that they will be less efficient than experienced technicians. This is one reason why high turnovers have adverse effect on dealership performance even if recruiting and hiring can be done as fast as the quitting. ATE compares the time technicians expend to complete tasks versus time billed to the customer. For example, a technician who opens a job for 10 hours, but the service department could only bill the customer for seven hours would record technicians' efficiency of 70% while an open job for seven hours and billed for 10 hours would record technician efficiency of about 143%. Lower average technician efficiency is evidence of lack of experience, lack of training, lack of motivation, or some combinations of them. It is, therefore, hypothesized that a higher ATE would lower technician turnover because it would indicate the factors under the satisfier's column in the Herzberg Two-Factor model are more prevalent.

(3) Headcount (**HC**): All things remaining unchanged, a larger service shop would have a lot more opportunities for people to help each other. Therefore, headcount – total number of technicians, measured on a 12-month rolling average – is hypothesized to have a negative influence on technician turnover. Novice or experienced technicians would have access to a larger support network to help troubleshoot issues, provide guidance, mentor, and provide all the satisfiers which have been deemed critical for satisfied technicians.

(4) Service Manager Turnover Ratio **(SMTR):** Service Managers manage the service department. They ensure that technicians are completing tasks in a timely manner. They are the voice of technicians to management, and spend time creating positive supervisor support that can morph into positive organizational support. It is expected that a high turnover by service managers would create knowledge gaps and confidence deficit in the service department, leading to higher turnover among technicians.

(5) Service Manager Tenure (**SMT**): The duration that current service manager has been in the position. The longer the tenure of a service manager, the greater the leadership experience in the shop, and the more stable the relationships technicians will have with them since it takes time to build trusting relationships. Therefore, it is hypothesized that longer service manager tenure reduces technician turnover rates.

(6) Technician Tenure (**TT**): The average number of years technicians have been employed at a dealership. The larger this number, then longer the average tenure of technicians. Longer average tenure for technicians implies a lower likelihood that

they will quit. Therefore, TT is hypothesized to have a negative effect on technician turnover rates.

Based on the foregoing, technician turnover in SmartAg dealerships is hypothesized to be influenced by TACS, ATE, SECR, SMTR, and HC. Mathematically, it is presented as follows:

$$TTR = f(STACS, ATE, SMTR, SMT, TT, HC) \quad (3.1)$$

Table 3.1 provides a summary of these variables and their hypothesized relationship with technician turnover ratio. In each of the cases, the null hypothesis describes the expected sign on the coefficient for the row variable. For example, the sign on TACS is expected to be negative while that on SMTR is expected to be positive. This a priori expectations are compared with the regression results to test the rejection or failure to reject these hypotheses.

Table 3.1: Independent Variables Hypothesized to Explain Technician Turnover

Variable	Definition	Null Hypothesis
TACS	Technical Assistance Center Score – measures the preparedness of technicians about cases prior to getting support from the STAC.	-
ATE	Average Technician Efficiency – Billed time divided by actual time taken to complete the job	-
SMTR	Service Manager Turnover Rate – measures the average proportion of service managers leaving the dealership on a 12-month rolling average.	+
SMT	Service Manager Tenure – the number of years that current service manager has held the position	-
HC	Headcount – Number of technicians in the dealership organization.	-
TT	Technician Tenure – the average number of years technicians have been employed at a dealership.	-

3.2 Data

Data were collected from various SmartAg databases and key stakeholders. As a result, the majority of the data used in this research is proprietary to SmartAg.

The data collection was opportunistic because it focused on dealership organizations and their stores with data that would allow us to address the research question. This exercise of selecting dealership organizations to support availability of the required data resulted in 87 dealership organizations. This implies that the dataset used for the analyses has more than 87 individual dealership locations (stores).

Various data points were requested had so few data points that their value was lost for the type of questions that the research needed to answer. This is because dealers own their data and have the responsibility of keeping them complete, accurate and updated. For example, the literature indicated that compensation is critical variable motivating employee satisfaction. Indeed, the effectiveness of other motivators under the satisfier's column become effective only when a threshold of compensation has been overcome. However, due to privacy reasons, compensation data could not be pulled from the "data lake" and were, therefore, not included in the analyses. The use of "available" data limited what could be done in this study, and these challenges are discussed later in the final chapter.

3.3 Methods

The data were analyzed using Microsoft Excel and STATA 17.0. The former was used to conduct organize the data from the various sources and to develop some preliminary understanding of the data. The latter was used for the econometric analysis to identify the factors that influence technician turnover at SmartAg dealerships.

When a dealer organization hires a new technician into their organization, that new technicians is given a distinct employee identification number. Once created, the employee

number becomes a distinct identifier for that individual as they work for the specific SmartAg dealer. If the technicians leave the organization, it is the dealership's responsibility to deactivate their employee number. If the individual starts working for a different dealership organization, they get a new employee number. The various employee number was used to track hiring and quitting at different dealerships over time.

CHAPTER IV: ANALYSIS AND DISCUSSION

The analysis and discussions of the results are presented in the chapter. The chapter is organized in subsections 4.1 and 4.2. Subsection 4.1 presents a summary of the data variables utilizing the 87 dealerships in the United States. Subsection 4.2 presents the regression results.

4.1 Summary Statistics

The data used to test the study's hypotheses were obtained from 87 SmartAg dealerships. The summary statistics of the relevant variables are presented in Table 4.1. It shows that the average technician turnover was about 20% across the sample, with a standard deviation of about 9%. The turnover was as high as 45% and as low as 1% with a median of about 18%. It is a little surprising that the summary statistics for service manager turnover is not very different from those of technicians. The average service manager turnover is 18% with a standard deviation and median of 15% each. A test of equality of the means showed that they are not statistically different from each other.

Table 4.1: Summary Statistics of Relevant Variables

Variable	N	Mean	SD	Median	Min	Max
Technician Turnover Ratio	87	0.20	0.09	0.18	0.01	0.45
Average Number of technicians	88	99.72	53.56	88.00	23.00	241.00
Well Prepared Count (TACS)	88	0.88	0.04	0.88	0.80	0.96
Service Manager Turnover Rate	88	0.18	0.15	0.15	0.00	0.61
Average Labor Efficiency	72	0.97	0.11	0.94	0.77	1.48
Training Credit Goal	88	2,320	1,211	2,040	540	5,460
Training Credit Actual	88	2,925	1,673	2,628	493	7,111
Technician Tenure	87	8.52	2.04	8.26	4.96	15.57
Service Manager Tenure	87	11.57	4.02	11.16	4.95	24.34
Labor Sales/Tech	87	201,825	41,506	206,634	116,895	297,027

The average number of technicians on a 12-month rolling was about 100 with a standard deviation of 54, a median of 88 and a minimum and a maximum of 23 and 241. This range of technicians illustrates the size of distribution of the dealerships. The SmartAg Technical Assistance Center Score (STACS) variable averaged 88% with a standard deviation of about 4%. This implies a high and consistent preparedness of technicians in dealerships based on how the STACS evaluated technicians' preparedness prior to contacting them. On average, dealerships are billing about 97% of the hours technicians are recording it took them to complete work. The standard deviation of average labor efficiency is about 11% and the maximum is almost 150%.

Table 4.2 shows the pairwise correlation results for a selection of the variables based on the summary statistics. For example, the correlation coefficients between technician turnover on the one hand and STACS and labor efficiency on the other are both negative and statistically significant at the less than 1% level and 5% level, respectively. As expected, the correlation between service manager turnover and STACS is negative and statistically significant at the less than 1% level. This is to be expected as high turnover in service managers would imply lower capability of leadership in the shop, causing technicians to depend on the support at STACS, leading to lower scores. Finally, it is not surprising that turnover of technicians and service managers are positively correlated and statistically significant at the less than 1% level.

Table 4.2: Pairwise Correlations for Select Variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) Technician Turnover	1.00					
(2) STACS	-0.33*	1.00				
(3) Service Manager Turnover	0.38*	-0.35*	1.00			
(4) Labor Efficiency	-0.25**	0.10	-0.10	1.00		
(5) Technician Tenure	0.11	-0.04	-0.03	0.01	1.00	
(6) Service Manager Tenure	-0.01	-0.06	-0.01	0.07	0.43*	1.00

** $p<0.01$, ** $p<0.05$*

4.2 Regression Results

The regression analyses were conducted using Stata 17. The model, recall from Equation 3.1, regressed technician turnover rate on the 12-month technician headcount, Technical Assistance Center, Average Technician Efficiency, Service Manager Turnover rate, Service Manager Tenure, Technician Tenure. The results are presented in Table 4.1. The table shows that the F-value is 6.67 with a significance level at less than 1%, suggesting that the model is a good representation of the problem. The R-squared is approximately 0.43, suggesting that the variability in the independent variables together explains about 43% of the variability in technician turnover rate. Given that cross-sectional is being used for the analysis, this coefficient of determination is acceptable and indicates a good fit. Table 4.1 shows that of the six independent variables, three are statistically significant at least the 5% level. For example, holding all other variables constant, an increase in STACS by one unit will decrease technician turnover rate by 1.23% ($p < 0.000$). Likewise, an increase in average labor efficiency by 1 percentage point is predicted to decrease technician turnover by 0.16 percent point ($p < 0.04$), ceteris paribus. A percentage point increase in the service education ratio increases technician turnover rate by 0.18 percentage points ($p < 0.000$), holding all other variables constant. The coefficients of the other independent variables were not statistically significant.

Table 4.3: Linear Regression Tech Retention

Technician turnover Rate	Coef.	St. Err.	t-value	p-value	Sig
Tech Headcount	0.044	0.017	0.260	.796	
STACS	-1.232	.268	-4.600	0.000	***
Service Manager Turnover	.086	.063	1.37	.175	
Technician Efficiency	-.158	.075	-2.10	.040	**
Training Credit Ratio	.183	.036	5.03	0.000	***
Service Manager Tenure	-.003	.002	-1.05	.300	
Constant	1.185	.241	4.92	0.000	
R-squared	0.425				
F-test	6.660				

Table 4.4 presents the results of the independent variables' elasticity of the average technician turnover rate. Elasticities are important estimates because they are unitless and facilitate comparability of the responses of the dependent variable to the same percentage change in the independent variables. The table shows that a percentage change in STACS results in 6.5% change in technician turnover rate in the opposite direction ($p < 0.00$). This implies that technician turnover has an elastic response to STACS. The results also show that the Service Education Credit elasticity of technician turnover was 1.29% ($p < 0.000$). This also implies an elastic response, but in the opposite direction. i.e., turnover response is larger for every unit. The Average Labor Efficiency elasticity of technician turnover was estimated at -0.92% ($p < 0.054$). The table shows that a percentage change in Average Service Manager Tenure results in a .17% change in technician turnover in the opposite direction ($p<.317$). The table shows that a percentage change in Labor Sales per Tech results in a .16% change in technician turnover ($p<.547$).

Table 4.4: Average Technicians Turnover Rates Elasticities with Respect to Independent Variables

	Elasticity	S.E.	t	P>t	Significance
12-month Tech Headcount	0.026	0.098	0.260	0.795	
STACS	-6.468	1.661	-3.900	0.000	***
Service Manager Turnover	0.078	0.055	1.430	0.158	
Average Labor Efficiency	-0.923	0.470	-1.960	0.054	*
Training Credits Ratio	1.294	0.297	4.360	0.000	***
Average Service Manager Tenure	-0.171	0.169	-1.010	0.317	
Labor Sales/Tech	0.166	0.274	0.610	0.547	

CHAPTER V: SUMMARY AND CONCLISIONS

The chapter presents the summary and conclusions of the study. It is organized into three subsections – Summary, Conclusions, and Recommendations. The recommendations subsection is divided into two parts: (i) Management recommendations, and (ii) recommendations for further research.

5.1 Summary

Technician turnover can have adverse effects dealership organizations. By focusing on the factors that influence retention, an increase in technician desire to stay within an organization and not leave can result in savings to dealerships. SmartAg is highly aligned to assist with retention because it affects sales of new equipment. We found that Technician Turnover is directly affected by Smart Tech Assistance Center Score (STACS), Training Credit Ratio Training, and Labor Efficiency. A 1% of improvement in Smart Tech Assistance Center Score (STACS) decreases turnover by 6.47%. A 1% increase in average labor efficiency increases technician retention by .92%. A 1% decrease in Training Credits increases technician retention by 1.29%.

5.2 Conclusions

If one wants to reduce turnover, we have to onboard new technicians and teach them and improve their skills to be able to diagnose and consult with STAC.

A well-trained technician leaving can be devastating to the business in the short term as new technicians are trained. Technicians can leave for many reasons. As leadership teams start to ask questions and understand why technicians are leaving or staying, understanding the organization culture is crucial. Some of those reasons technicians decide to leave could be competing SmartAg dealers, other manufacturing brands, other industries

such as mining or over the road trucking, career changes, to another job changes. It doesn't matter where one is losing technicians from if they are leaving because of situations that could have been prevented. It is crucial to pinpoint where the problems lie and fix the root cause and stop treating the symptoms. As more organizations are focusing on technician retention, understanding first one must fix the problem, then second when hiring new technicians hiring and retaining will be possible. Hiring and maintaining technicians is crucial to long-term success and culture of one's organization.

There is very limited literature available for the agriculture machinery industry specifically. As one seeks further information over the road trucking or school bus industries has more literature. Because these industries are generally pulling from the same candidate pool, one can use their framework and customize it to the agriculture machinery industry. Technicians are no different than other employees in the dealership organization. Understanding your specific technicians is critical to meeting their needs.

To answer the research objectives data was compiled from various SmartAg dealership organizations. This is a representation of SmartAg dealers in North America. Understanding the issue is very important and complex, but what works for one dealership organization may not work for another. By working with leadership at SmartAg as well as a specific organization, plans can be made to address the technician retention problem for one's organization. The practice of analyzing the data is crucial to seeing where the specific gaps within an organization may be at. Of the metrics used, often a dealer was strong in one area and weaker in another. By focusing where, one is weak, organization leadership will be able to make significant improvement to technician moral and increase retention. Service managers need to be at the forefront of these conversations to advocate for the

technicians. By selecting the correct individual for the service manager role, morale and effectiveness can improve in the shop and technicians will know that their manager has their best interests and will do everything they can to create a work environment that they want to be a part of.

The results of the research and analysis suggest that focusing on Smart Tech Assistance Center Score (STACS) Cases scores will increase the retention of technicians. To get a high STACS a technician must complete the case accurately which takes training. Also, they must complete all the given steps in diagnosing equipment before reaching out to STAC. This requires training and a high degree of understanding of equipment and processes. By focusing on training on a dealership level, technicians can have the tools to be the best technicians they can be. By implementing some of the processes and jobs such as Product Specialist or Standard Jobs, technicians can see the support that organizations are committing to them. These positions are tasked with helping technicians be the best technicians they can be which shows the commitment the organization has in them. The investment by dealership top management will pay off as technicians decide not to leave because the switching costs and the support to go to another industry or organization is too great.

The research was focused on existing metrics and processes that are in place today for technician retention. Understand that all organizations are unique, and this problem of retention cannot be fixed overnight and requires constant effort on everyone's part is crucial. What works for one organization may not work for another. By being agile in thinking and implementing multiple strategies, dealership organizations may ensure that all technicians' frustrations are addressed.

5.3 Management Recommendations Incentives to Keep Technicians

One way to increase overall technician retention is by incentivizing older seasoned techs to take newly hired technicians under their wing. By implementing a mentoring program, seasoned technicians can bid or offer to take a new hire and be their mentor for 5 years. This creates the opportunity for the seasoned technician to share information and the new technician to have someone they can ask questions to. This incentive could be structured as such. A technician with 10+ years can be in a pool of mentors. When a new technician is hired the mentor technicians can offer to mentor the new technician. If the new technician lasts 6 months, the mentor receives $250 dollars. As the technician makes it one year and is evaluated, based on their evaluation could receive $500 dollars. As the new technician becomes more efficient and another milestone is hit say 2 years, the technician can receive $1000 dollars based on their contribution to the technician and relationship. This can go on for a set time, until the newly hired technician is trained and is determined to no longer need the formal mentoring. Another incentive that could be implemented is existing technician with 10+ can be mentors and those newly hired technicians that have been through the mentoring program can become mentors a few years early. This would incentive newly hired technicians to opt into the mentor program at the time of being hired.

Standard Jobs: Currently there is a renewed effort by SmartAg for dealer organizations to create standard jobs. Dealers have tools at their disposal that they can use to accomplish this initiative. Expert Services is a way that techs can have jobs and inspections at their fingertips through a computer, phone, or tablet. Through utilizing this tool technicians should be able to complete jobs faster and have less rework. This can improve technician retention because technicians can complete their tasks faster and easier

than before. By signing up and utilizing this service technicians could experience less frustration at work increasing their effectiveness and their desire to stay at the organization.

STAC or product Specialist**:** SmartAg have people at their factories for each product line who focus on answering technical questions from dealers. Dealers know each of these groups as SmartAg Technical Assistance Center (STAC). This group is responsible for answering questions from technicians who are struggling with diagnosing issues, need factory support, or other product technical questions. This group is a huge asset to SmartAg dealers and help dealers keep their customers running. Because of the high volume of calls that come in during the year and especially during the busy harvest season, responses can sometimes be delayed. This can be frustrating for technicians who have exhausted all other paths and need factory support. For dealers to have quicker response times, some have created their own form of STAC. STAC personnel are responsible for taking a first pass at each of the technician's cases and potentially getting to an answer before sending it to STAC. This could ideally speed up the response process from STAC and keep the dealer technicians engaged and working through problems and not waiting for a response. This can help technician efficiency and overall performance of technicians contributing to their success.

To ensure a high rate of efficiency when technicians are completing jobs, especially during harvest or other busy times, consider a few changes. To prevent this potential burnout management could implement strategies to decrease the burnout and stress experienced by these technicians during this time. By offering mandatory time off before, during and after this busy time, it could alleviate some of the stress experienced. By offering an overtime plus another small financial return could also entice certain

technicians to stay through the harvest months. If technicians are not motivated by a monetary reward, consider other tactics to relieve the burden. Service Managers should know their technicians best and can be creative in finding the incentive that could work.

Labor Efficiency: By ensuring the right technicians are being assigned with the correct job's dealership organizations can increase over all labor efficiency. Understand what techs are good at what tasks and match the tasks up. Ensure that each technician is performing the tasks that they have a competitive advantage at so that they are as effective as possible. Service manager need to pay attention to the job card time and not allow customers to argue down the price of a repair and pay the full bill. If organizations are seeing low labor efficiency standardized jobs and billing times could increase the overall labor efficiency.

Training Credit Ratio: Ensuring that technicians are being trained especially those that are new hires is crucial to retention. By having the process of training early and often can develop relationships with mentors as well as give new technicians confidence to complete STAC cases as well as quickly and accurately diagnose equipment. Ensuring the training is specific to the skill level of each tech in the class. Different levels of training depending on the skill level is vital to pushing technicians along the retention scale. By grouping technicians of similar skill levels it will allow for open conversation.

By offering a technician longevity bonus this can give technicians the incentive to complete their learning paths. Much like the peer mentoring program, as new technicians are completing their learning paths, gaining knowledge, and learning the trade there could be some sort of retention bonus. This incentive or retention bonus could be over two years vs. five years for the mentoring bonus simply because it's important to reward good

behavior and not simply train technicians to fill a job for a set number of years. If a new technician completed certain milestones such as training, efficiency rates, and other metrics a financial bonus could be considered. This would incentive newly hired technicians to stay motivated and pushing to complete the tasks that are going to make them successful down the road. The bonus could be $250 at six months of service if learning paths are completed. At one year if efficiency ratio exceeds a predetermined number the technician could receive $500 as a bonus. Another milestone could be agreed upon, it is important that good habits are being formed and that the new technician is making lasting progress not just striving for the bonus.

5.4 Recommendations for Further Research

The research was used on metrics that are currently being recorded and reported by dealer organizations to SmartAg. To further the research and utilize the findings presented SmartAg could utilize a survey. In this survey sent to technician emails, questions could be asked to determine how many technicians are currently or thinking about seeking other employment opportunities. Additionally, questions centered around what is important and what pain points are technicians currently facing could be discussed. By gauging this on a broad scale, SmartAg would be equipped to talk with dealership organizations and help alleviate some of the items that are driving technicians to seeking other employment opportunities.

WORKS CITED

Amanor-Boadu, V. 2022. *The Great Resignation: Is It For Real?* Workinig Paper, Manhattan, KS: Department of Agricultural Economics, Kansas State University.

Batista, Ed. 2015. *How Great Coaches Ask, Listen, and Empathize.* February 18. Accessed December 18, 2021. https://hbr.org/2015/02/how-great-coaches-ask-listen-and-empathize.

Behling, Orlando, George Labovitz, and Richard Kosmo. 1968. "The Herzberg Controversy: A Critical Reappraisal." *Academy of Management Journal* 99-108.

Dairy Australia . 2006. *Dairy Australia Retention Strategies.* Accessed December 10, 2021. https://thepeopleindairy.org.au/individual-performance/retention-strategies/.

DataQuest India (DQIndia). 2015. *Why are employees in the information technology sector unhappy?* September 4. Accessed March 7, 2020. https://www.dqindia.com/why-are-employees-in-the-information-technology-sector-unhappy/.

DeVaro, Jed, and Hodaka Morita. 2013. "Internal Promotion and External Recruitment: A Theoretical and Empirical Analysis." *Journal of Labor Economics* 31 (2): 227-269.

Finkelstein, Sydney. 2019. *Why a One-Size-Fits-All Approach to Employee Development Doesn't Work.* March 5. Accessed Feb 10, 2022. https://hbr.org/2019/03/why-a-one-size-fits-all-approach-to-employee-development-doesnt-work?registration=success.

Herzberg, F., and B. Snyderman. 1959. *The Motivation to Work.* New York: John Wiley & Son.

Kinsey, Anne. 2020. *The Advantages of Using Money to Motivate Employees.* July 10. Accessed Feb 16, 2022. https://smallbusiness.chron.com/advantages-using-money-motivate-employees-22056.html.

Klassen, Robert M., and Colin J. K. Anderson. 2009. "How Times Change: Secondary Teachers' Job Satisfaction and Dissatisfaction in 1962 and 2007." *British Educational Research Journal* 745-759.

LABOR, U.S. BUREAU OF. 2020. *Occupational Employment and Wages, Farm Equipment Mechanics and Service Technicians.* May. Accessed Feb 16, 2022. https://www.bls.gov/oes/current/oes493041.htm.

Maertz, Carl P., Rodger Griffeth, Nathanael S. Campbell, and David Allen. 2007. "The Effects of Perceived Organizational Support and Perceived Supervisor Support on Employee Turnover." *Journal of Orginizational Behavior* 7.

McLeod, Dr. Saul. 2020. *Maslow's Hierarchy of Needs.* December 29. Accessed December 28, 2021. https://www.simplypsychology.org/maslow.html.

Nickerson, Charolette. 2021. *Herzberg's Motivation Two-Factor Theory.* Nov 16. Accessed Feb 13, 2022. https://www.simplypsychology.org/herzbergs-two-factor-theory.html.

Rao, S.G.V. 1972. "Theoretical and Empirical Considerations of the Two-Factor Theory of Job Satisfaction." *Indian Journal of Industrial Relations* 311-330.

Robinson, Bryan. 2021. "Businesses Will Lose 70% Of Tech Employees Over Next Year,' Study Shows." *Forbes.* November 2. Accessed November 25, 2021. https://www.forbes.com/sites/bryanrobinson/2021/11/02/businesses-will-lose-70-of-tech-employees-over-next-year-study-shows/?sh=2af635f21bcf.

Schrag, Brian. 2001. "The Moral Significance of Employee Loyalty." *Business Ethics Quarterly* 11 (1): 44-66.

Seppala , Emma, and Marissa King. 2017. *Burnout at Work Isn't Just About Exhaustion. It's Also About Loneliness.* June 29. Accessed Feb 17, 2022. https://hbr.org/2017/06/burnout-at-work-isnt-just-about-exhaustion-its-also-about-loneliness.

STATISTICS, U.S. BUREUA OF LABOR. 2021. *Diesel Service Technicians and Mechanics.* September 8. Accessed Feb 16, 2022. https://www.bls.gov/ooh/installation-maintenance-and-repair/diesel-service-technicians-and-mechanics.htm.

TalentLMS. 2021. "Businesses Will Lose 70% Of Tech Employees over the Next Year."

Taormina, Robert J., and Jennifer H. Gao. 2013. "Maslow and the Motivation Hierarchy: Measuring Satisfaction of the Needs." *The American Journal of Psychology* 126 (2): 155-177.

Value Based Management. n.d. *Two Factor Theory Summary of Herzbergs MNotivation and Hygiene Factors. Abstract.* Accessed Novemeber 15, 2021. https://www.valuebasedmanagement.net/methods_herzberg_two_factor_theory.html.

Verlinden, Neelie. n.d. *11 Top Non-Monetary Incentives to Reward Your Employees.* Accessed Feb 18, 2022. https://www.aihr.com/blog/non-monetary-incentives/.

Webber, Karen L., and Samantha M. Rogers. 2018. "Gender Differences in Faculty Member Job Satisfaction: Equity Forestalled?" *Research in Higher Education* 59: 1105-1132.