

**EVALUATION OF PRODUCT SUPPORT
SOURCES**

by

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ABSTRACT

Companies must weigh the trade-offs of support strategies and choose between the effectiveness of meeting customer expectations and the cost of implementing product support tools and services. These support strategies can be critical to the success of a company and therefore, must provide efficient problem resolution in order to meet the satisfaction of the customer and retailer. This thesis reviews survey data collected from a large agricultural equipment company's retailers on their satisfaction of product support tools and services provided by the company, and how the retailers utilize these product support tools and services when attempting to resolve a product issue. This evaluation of a company's product support strategy leads to the identification of potential solutions to help maximize the efficiency of the problem resolution process, as well as minimize the opportunity costs and financial costs of product support sources.

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CHAPTER 1: PROJECT PLAN

The client for this thesis is the Precision Agriculture Product Support department for Company A, which produces precision agriculture hardware and software products. Precision Agriculture is a division of Company A and was established in 2005 to create products that utilize the global positioning system (GPS) for Company A equipment. Company A Precision Agriculture products are sold throughout the world and Company A Precision Agriculture has locations in Spain and Colorado, USA. The Precision Agriculture Product Support department has over 20 employees in these locations; however the majority of the support for Precision Agriculture products is facilitated from the Colorado location.

The client's purpose for this study is to gain a better understanding of Company A dealerships' satisfaction with the support the Precision Agriculture Product Support department provides to the dealers. This study will allow the Company A Precision Agriculture Product Support department the ability to identify areas of opportunity. The objectives for this thesis are:

- Gather the Company A dealerships' satisfaction of the individual support tools and services.
- Understand what product support tools and services Company A dealers are using when they attempt to resolve a Precision Agriculture product issue.
- Identify improvements to the support avenues to increase dealer satisfaction.

These objectives are important to Company A Precision Agriculture because of the company's history of making quality products and having dealerships provide excellent customer support when product issues arise. If Company A Precision Agriculture is not providing the highest quality of support to Company A dealerships, there is a risk of losing an enormous competitive advantage. By understanding the satisfaction with Company A Precision Agriculture Product Support tools and services, it will allow the Company A Precision Agriculture Product Support department to adjust their support methods to better serve dealers. The result of utilizing new services and tools could be beneficial to both Company A Precision Agriculture and dealers by lowering costs and providing the ability to better support the end user of the products.

The deliverables of this project will be a written thesis and an oral defense of the thesis. The results of this thesis will also be shared with the Company A Precision Agriculture Product Support management to provide information that could be potentially acted upon.

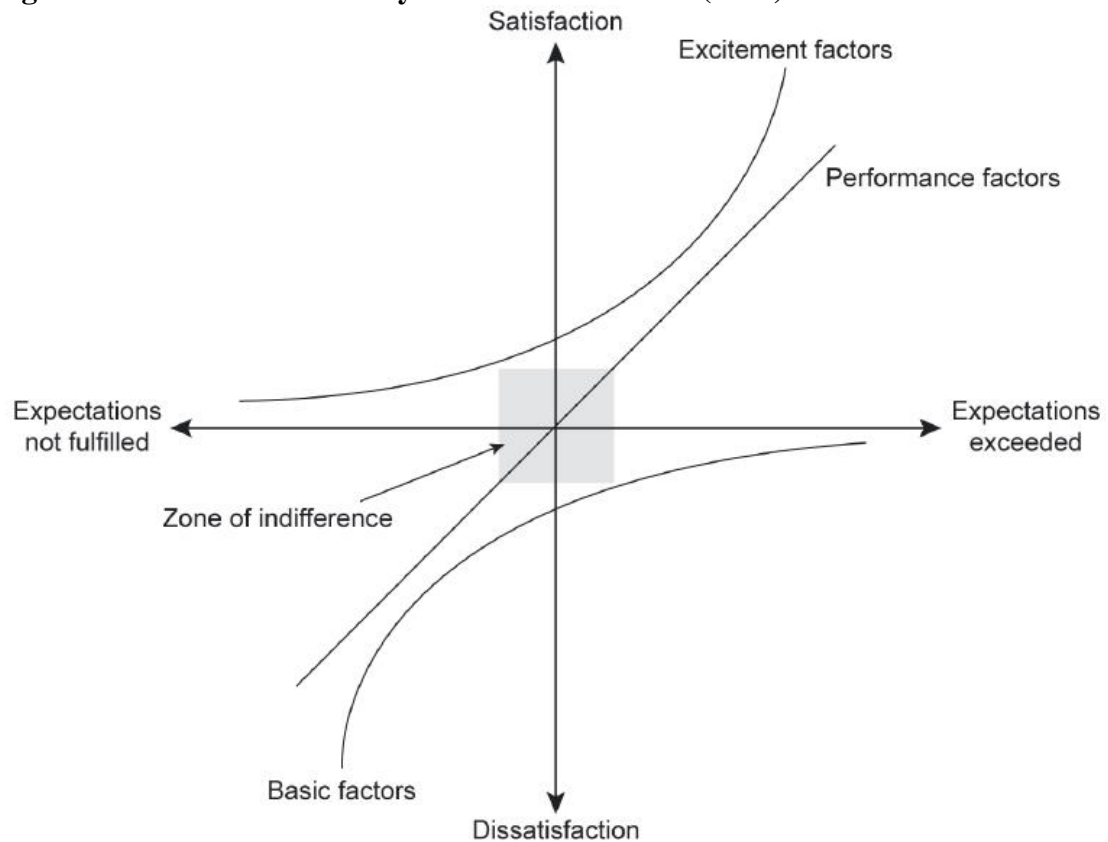
The information required to meet all three objectives of this thesis regarding the support provided by Company A Precision Agriculture will be gathered by surveying Company A dealers on their satisfaction with the support tools and services. This thesis will utilize Company A surveying processes and methods to collect information from Company A dealerships. The survey will ask dealers about their satisfaction with current tools and services provided, along with any new avenues and/or tools the dealers would like Company A Precision Agriculture to provide.

CHAPTER 2: LITERATURE REVIEW

Research on customer satisfaction for a product and/or service has been widely completed for all types of businesses and industries. The dealer satisfaction of the manufacturer who supplies the product and/or service has not been widely researched. However, Staus and Becker completed a study that focused on agricultural machinery dealers in Europe (2012). This study investigated the factors that affect an agricultural machinery dealer's satisfaction with the manufacturers who produce the products the dealer sells and/or services. This study used the Kano (1984) three factor model to explain the different attributes of dealer satisfaction and how these three factors (dissatisfiers/basic, satisfiers/excitement, and performance factors) can be managed to achieve higher results (Staus and Becker 2012).

The dissatisfiers/basic factors are those attributes the dealer expects from the manufacturer and by meeting these factors it does not increase the dealer satisfaction, but if the manufacturer does not meet these factors it can result in dissatisfaction. The satisfiers/excitement factors can lead to an increase of satisfaction, but since these factors are not expected by the dealer, manufacturers that do not meet these factors will not experience a decrease in satisfaction. The performance factors are those attributes the dealer expects from the manufacturer, which can increase or decrease satisfaction (Staus and Becker 2012).

Figure 2.1: Three-factor theory based on Kano et al. (1984)



Source: (Staus and Becker 2012)

The Staus and Becker study focused on the overall satisfaction of manufacturers by gathering dealers' opinions through a survey that focused on eight dimensions of dealer's interaction with the manufacturer. Two of the dimensions of the study, "after-sales methods and service methods" and "support in garage and at service" are closely related to the investigation of Company A dealers' satisfaction with product support tools and services. Staus and Becker concluded the "after-sales methods and service methods" dimension was a dissatisfiers/basic factor, which are attributes the dealer expects from the manufacturers and by not meeting these expectations it can result in dissatisfaction. The results for the "support in garage and at service" dimension were not consistent, therefore

the authors concluded the dimension did not have an influence in the overall satisfaction or the results were inconclusive (Staus and Becker 2012).

The North American Equipment Dealers Association (NAEDA) conducts an annual dealer-manufacturer survey to collect information from dealers about their interaction and satisfaction with their suppliers of agricultural products. This survey allowed dealers from the U.S. and Canada to rate their five most significant equipment line they sell and/or support from a drop down of 62 agriculture manufactures, light industrial/construction and outdoor power equipment. The survey asks dealers to rate manufactures on twelve different dimensions based on a scale from 1 to 7, seven being the highest rating. These dimensions are associated with the main interactions dealers have with the product manufacturers (North American Equipment Dealers Association 2013). The survey includes two dimensions, “product technical support” and “product quality” which are closely related to this thesis.

The 2013 NAEDA survey stated that Company A had a score of 4.15 in the “product technical support” dimension. In the same year the average score in “product technical support” for all manufacturers was 5.22. For the “product quality” dimension, Company A received a score of 4.58, and all manufacturers had an average score of 5.69 (North American Equipment Dealers Association 2013). The NAEDA dealer-manufacturer survey focuses on all products and services provided by Company A and it is not specific to one product line. This thesis will allow us to explore factors specific to Company A Precision Agriculture product support, rather than all of Company A product support.

Product support tools and services provided to dealers are not only critical to the dealers' success, but ultimately the manufacturer's success. In the article by Lele and Karmarkar, the authors state that by identifying customer expectations of support and meeting those expectations, the result can be a successful marketing campaign (1983). "When making purchases, customers often believe they are buying more than the physical item; they also have expectations about the level of postpurchase support the product carries with it" (Lele and Karmarkar 1983, 124).

Lele and Karmarkar (1983) focus on the strategies to support the customer, but many of the same principals can be applied to a manufacturer supporting a dealer. To be successful at product support, the company must first identify customer/dealer expectations and then develop cost-effective product support strategies to meet those expectations. In an effort to develop product support strategies, a company must relate the customer/dealer expectations into measurable attributes or metrics. Once a metric is identified, product support strategies can be implemented to meet customer/dealer expectations (Lele and Karmarkar 1983).

Manufacturers must weigh the trade-offs of support strategies and choose between the effectiveness of meeting customer expectations and the cost of implementing the support strategy. Since every support strategy has an impact on cost, companies need to be aware of diminishing returns from a strategy, "...beyond a certain point, further improvements are increasingly ineffective" (Lele and Karmarkar 1983, 128).

In the article by Hauser and Katz (1998) the thesis is that every metric will affect actions and decisions within a company. Before implementing metrics around the product support strategy, the company must evaluate if the metrics are going to be the "right"

metrics for success. The authors outline seven pitfalls of metrics and seven steps to creating good metrics:

1. Start by listening to the customer
2. Understand the job
3. Understand the interrelationships
4. Understand the linkages
5. Test the correlations and test manager and employee reaction
6. Involve managers and employees
7. Seek new paradigms

The first step to create good metrics is to listen to the customer (Hauser and Katz 1998), which is also a critical step to create a product support strategy.

CHAPTER 3: THEORY

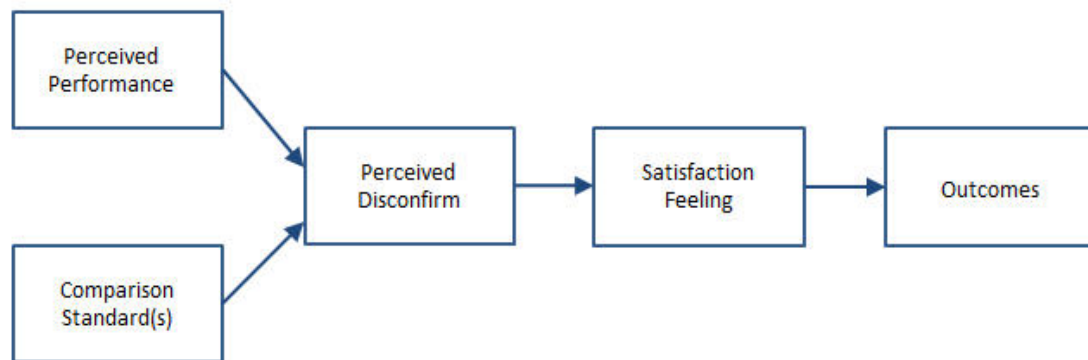
Company A Precision Agriculture is focused on ensuring their products are meeting the customers' expectations by gathering feedback through the Customer Satisfaction Index (CSI) process. This process includes sending a survey to the customer nine months after the product has been purchased. The nine month delay allows for users to have enough time to use the product for several months to allow a full product experience. The CSI survey focuses on product performance, but includes a question asking the customer to rate their sales and support experience with the Company A dealer who sold the product. This CSI process is executed by Company A to receive feedback directly from the customer regarding the product's performance, but it does not capture the feedback directly from the dealer who supports the product after the sale.

The ability for Company A dealers to support the product after the sale has been a major contributing factor in the success that Company A has experienced over the 50 year history of the company. The Company A dealers' involvement is vital to Company A's future success as the dealers are the front line of support for products and services. To assist Company A dealers with providing support to the end users, Company A Precision Agriculture provides tools and services, such as operator's manuals, technical manuals, integrated diagnostic product codes, and support centers to allow the dealers to effectively and efficiently resolve end users' product issues. Even though Company A surveys the end users on their product experiences, Company A does not actively survey dealers regarding the product support tools and services Company A Precision Agriculture provides to them.

To understand Company A dealers' satisfaction with Company A Precision Agriculture Product Support, customer satisfaction conceptual framework can be used to understand how a Company A dealer arrives at the judgment of being satisfied or dissatisfied with the support Company A Precision Agriculture Product Support provides. For the purpose of this study the Company A dealer is the “customer” of the Company A Product Support department, since the dealer is the end user of the Company A Precision Agriculture Product Support tools and services.

The conceptual framework for customer satisfaction that is most applicable to this study is the Traditional Macro Framework, as it provides a high level overview of the different components that contribute to the dealers' satisfaction with the product support provided by Company A Precision Agriculture.

Figure 3.1: Traditional Macro Framework of Customer Satisfaction



Source: (Hom 2000)

The dealers' perceived performance can be attributed to multiple sources that includes his/her previous experience(s) with Company A Precision Agriculture Product Support and/or other dealers that have shared their Company A Precision Agriculture Product Support experience(s) (Figure 3.1). The comparison standard(s) can come from

several sources, including a dealer's interaction with other Company A product lines and/or a dealer's knowledge of a competitor's product support practices. The perceived disconfirmation consist of the current experience the dealer has with Company A Precision Agriculture Product Support, which perceived performance and comparison standard(s) directly affect. The satisfaction feeling accounts for the different satisfaction levels the dealer may have with the different support avenues (i.e. product manuals, technical documents, direct contact with the factory, etc.) that make up the overall Company A Precision Agriculture product support experience. Outcomes, the last component of the Traditional Macro Framework of Customer Satisfaction, are the actions by the dealer as a result of the dealers' satisfaction level. These outcomes can include the dealer sharing his/her experience with other dealers and/or voicing his/her concerns with the Company A Precision Agriculture Product Support department.

CHAPTER 4: METHODS

4.1 Objectives

The objectives of this study are to identify support opportunities by understanding Company A dealerships' satisfaction with the current support Company A Precision Agriculture provides, along with understanding what tools or services dealers use to attempt to resolve Precision Agriculture product issues. In order to receive this feedback directly from employees at Company A dealerships that have utilized Company A Product Support tools and services, a survey (See Appendix B) was sent to dealer employees to understand their perceptions with product support tools available to them when they attempt to resolve an Precision Agriculture product issue. This survey was created and distributed with the assistance of an internal Company A department that focuses on market research, such as this topic of study.

4.2 Data Collection – Survey Question Development

To develop an effective survey that meets the purposes of the thesis, the study's objectives and information on the available support sources were shared with the Company A market research department. With this information the market research department created the questions and structure of the survey. The survey was divided into two sections, one focusing on the progression of what support sources the dealers use to resolve an issue and the second on the overall dealer's perception of Precision Agriculture Product Support sources. The questions in the first section were designed around the dealer focusing on one problem they attempted to the resolved in the past three months. The second section's questions were created to understand the dealer's satisfaction of the

specific support sources, what improvements can be made to the specific support source and the overall Precision Agriculture Product Support strategy.

4.3 Data Collection - Survey

To identify individuals at the Company A dealerships that were good candidates to provide feedback regarding Company A Precision Agriculture Product Support tools and services, a list of dealer employees from North America, Europe, and South America who have been in direct contact with Company A Precision Agriculture through the dealer support center or the call center was gleaned from the case management database. Dealer employees who submitted a dealer support center case in the past twelve months (January 1, 2013 to December 31, 2013) were sent the survey. In addition, those dealership employees who utilized the Company A Precision Agriculture call center in the past six months (July 1, 2013 to December 31, 2013) were also sent the survey. The survey was sent to the dealer employee's email address that was included in the contact information within the dealer support center and call center case. After the duplicate email addresses were removed from the list, the survey was sent to a total of 620 unique email addresses on January 27, 2014 and the survey was available until February 9, 2014.

The email to the dealer included a link to a website that contained the survey, which focused on capturing three items of feedback:

- Identify which support tools or services dealers prefer to use when resolving Precision Agriculture product issues.
- The performance of the individual product support tools and services Company A Precision Agriculture provides.

- Identify areas of opportunity to increase the level of satisfaction with the Precision Agriculture support tools and services to drive faster problem resolution.

The online survey was interactive, which allowed the survey to be tailored to the individual that is responding to the questions. Depending how the survey participant answered a question; the next question would either follow up on the previous answer or move on to the next section of the survey. The first question asked the respondents if they have attempted to resolve a precision agriculture product issue in the past three months. If the respondent answered yes, then they would be asked a series of questions on what support tools or services they used in their attempted to resolve the issue, and if they were successful at resolving the issue with this tool or service, if not, why didn't the tool or service help resolve the issue. This sequence of questions continued until the respondent answered that a specific support tool or service resolved the issue. If the respondent answered they did not attempt to resolve a precision agriculture product issue in the past three months, the survey was complete and the participant was not asked another question. The final series of questions asked the respondents to rate each of the eight individual product support tools and services Company A Precision Agriculture provides and allowed the respondent to select from a prepopulated list of concerns they have with the tools or services. The survey also included free form entry fields which allowed the respondents to enter product support tools or services not listed on the survey and also how to improve the support tools and services beyond the prepopulated list.

4.4 Procedures

Once the survey was closed, the internal Company A group that conducted the survey provided a summary report of the results and the raw survey data in Microsoft® Excel format. The data was organized and graphs were created within Excel to provide a visually representation of the different aspects of the survey. The qualitative data collected through the free form entry fields in the survey were categorized and organized with similar comments to identify trends.

4.4 Survey Limitations

In an effort to minimize the length of the survey and focus on the support sources dealers utilize to resolve Precision Agriculture product issues, demographic questions (i.e. dealer location, dealer job title, years of experience, etc.) were not included in the survey. The lack of demographic data limits the analysis that can be completed to understand if geographic location, job title, or experience impacts what support sources dealers use to resolve product issues. Without this demographic data, it is also difficult to determine how representative this sample is among the population of Company A dealers.

The draft copy of the online survey included a question regarding the dealer's overall satisfaction with Precision Agriculture Product Support. The survey that was sent to dealers had this overall Precision Agriculture Product Support satisfaction question mistakenly removed. Therefore, satisfaction of the individual support sources could not be compared against the dealers' overall satisfaction of Company A Precision Agriculture Product Support.

CHAPTER 5: SURVEY DATA RESULTS

5.1 Survey Results: Introduction

The survey was emailed to 612 Company A dealers on January 27, 2014 and remained available until February 9, 2014. The email invitation (See Appendix B) included a brief introduction to why the survey was being conducted and a link to a website that hosted the survey. Reminder emails were sent on February 3, 2014 and February 6, 2014 to encourage dealers to complete the survey. The survey was started by 202 individuals (33% of the invited dealers), 58 of these dealers did not qualify as a result of the first survey question asking if the participant had an issue with an Precision Agriculture product or service in the past 3 months. Eight-six dealers completed the survey, which resulted in a 14.05% completion rate. The remaining 58 participants who qualified to take the survey failed to complete the survey.

The survey focused on the progression of what sources a Company A dealer would use to resolve an Precision Agriculture product issue. The survey participants were provided a pre-populated list of product support sources for problem resolution and the ability to manually enter other sources if they were not included within the prepopulated list, which included:

- Product Error/Trouble Codes
- Product Manuals
- Company A's Website (General area)
- Company A's Website (Dealer area)
- Application Help

- Precision Agriculture Product Information in Company A's Service Tool:
- Call Center
- Dealer Support Center Solutions
- Dealer Support Center Case
- Trial and Error
- Other Dealer Personnel
- Other Personnel Not At the Dealership
- Company A Other
- The Internet
- Other (Free entry field)
- Company A Field Staff

5.2 Survey Results: Product Issues

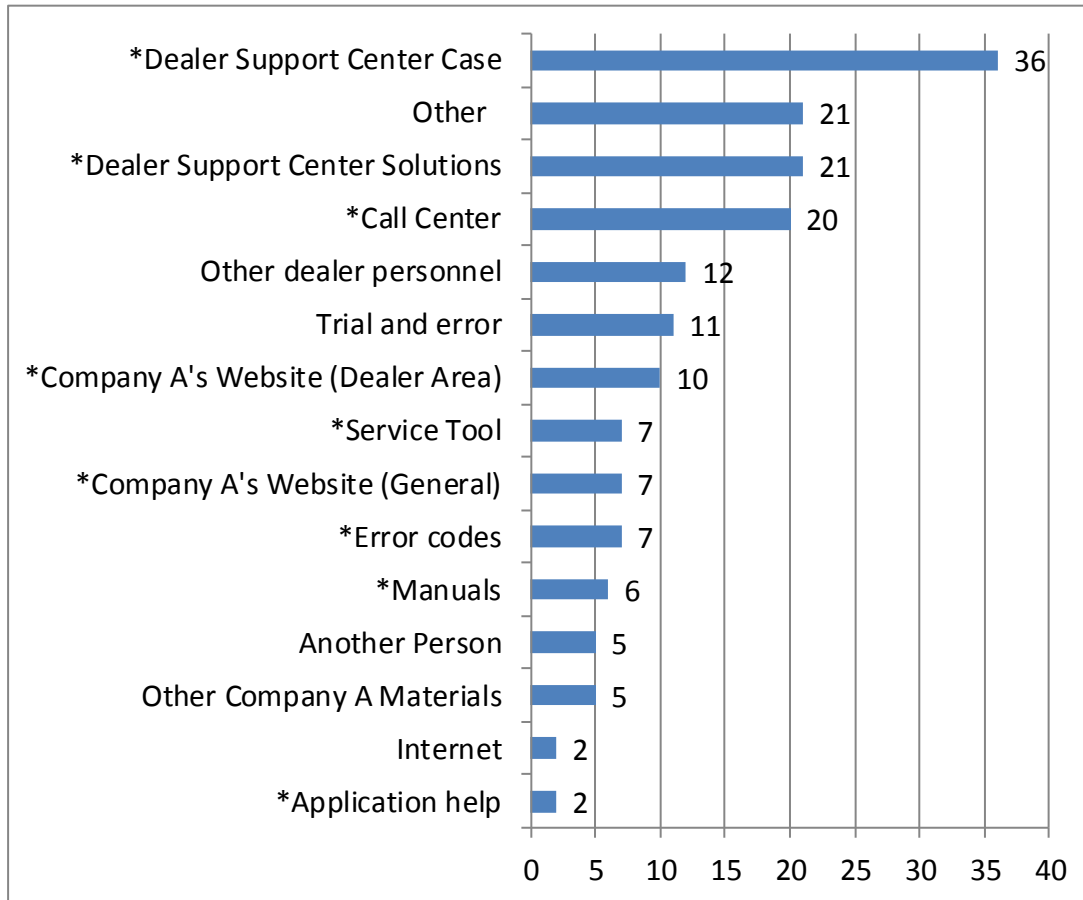
The survey asked the respondents to manually enter in a brief description of an Precision Agriculture product issue they experienced in the past three months, in an effort to have the dealer focus on how they solved this issue for the purpose of the survey. After the survey results were captured, they were manually divided into two categories: hardware issues and software issues. Hardware refers to Precision Agriculture products that have physical hardware, even though all use internal software to complete their intended use. Software refers to those products that do not have physical hardware and are software programs or websites. Out of the 86 issues submitted by the survey participants, 67 were hardware and 19 were software related product issues.

Even though the brief description of the product issue was captured, it did not have any bearing on how the survey was conducted. It is important to note that many of the Precision Agriculture products do not have the same product support information available and some Precision Agriculture products are more complex than others, which may result in an increased level of difficulty when resolving a product issue.

5.3 Survey Results: Sources Overview

From the 86 survey participants, the dealers consulted on average 2.0 sources when attempting to resolve a product issue. The support source with the highest use frequency was a dealer support center case, which is the highest level of support Company A Precision Agriculture provides for hardware issues (Figure 5.1). Since 77.9% of the issues dealers submitted for this survey were hardware related, it is logical that dealer support center was the most used support source.

Figure 5.1: Frequency of Support Sources Consulted



*Precision Agriculture Product Support Source

The survey examined what sources and how many sources dealers used to resolve a Precision Agriculture product issue. Out of the 86 respondents, the number of sources consulted ranged from 1 source to 5 sources to resolve the product issue. The progression of the survey asked the respondents to answer if the support source: resolved the issue, did not resolve the issue, or partially resolved the issue. Participants were only asked what support source they used next if they did not state that the previous support source resolved the issue, submitted a dealer support center case, or concluded there was no solution to their product issue. Table 5.1 summarizes the number of respondents for the number of different support sources utilized and if the

product issues were resolved. It is important to note that 17 dealers (19.7%) concluded there was no solution to their product issue (Table 5.2).

Table 5.1: Issue Resolution by Number of Support Source Utilized

	Respondents	Yes	Yes & No	No
First Support Source Used	86	16	44	26
Second Support Source Used	37	13	17	7
Third Support Source Used	16	8	4	4
Fourth Support Source Used	3	2	1	0
Fifth Support Source Used	1	1	0	0

Table 5.2: Last Support Source Used by Dealers When Product Issue is Resolved

	Number of Dealers
Dealer Support Center case submitted	23
Concluded there was no solution to the issue	17
More trial and error work or crafting a 'work around' fix	8
Talking with someone else at the dealership	7
Call Center	7
Dealer Support Center solution	4
Talking with someone else not at the dealership	3
Other Company A's electronic / internet materials or sites	2
SSC	1
Emailed specialist	1
Company A's Website — Dealer Area	1
Got my Company A's field team involved	1
Time fixed the problem	1
Contacted Precision Ag specialist at Company A	1
Stayed In Contact w/ Territory Specialist	1
Ag Express Electronics	1
Customer would not let me continue	1
Customer pulled out system	1
Talking with the technical product specialist	1
Called support	1
General search of the internet	1
Service Tool	1
Manuals (e.g., e.g., technical manual, owner's manual)	1

There were 10 different support sources that provided a resolution for the product issues dealers submitted through this survey. Out of the 10 different support sources, the 5 resolutions that provided the most problem resolutions accounted for 55.9% of the total sources (Appendix A, Table 1). When the 17 product issues the dealers concluded there was no solution for are removed from the 86 total issues, the five support sources that provided the most problem resolutions accounted for 81.0% of the total resolutions.

All dealers that participated in the survey were asked to provide their satisfaction with the Precision Agriculture support sources (Table 5.3), no matter if they indicate they used the support source to resolve the specific product issue or not. Dealers were asked to

rate the support sources on a scale of 1-5, 1 being very dissatisfied and 5 being very satisfied. A paired t-test was conducted on the source satisfaction data to determine if the data sets differ from each other in a significant way. The p-values of this test indicate the mean differences are not different from 0.

Table 5.3: Support Sources Satisfaction

	Avg. satisfaction	Number of dealers who provided a satisfaction rating*	Percentage of dealers who provided a rating of a 4**	Percentage of dealers who provided a rating of a 5**
Dealer Support Center	3.84	80	24%	35%
Service Tool	3.78	72	38%	19%
Company A's Website	3.68	84	37%	23%
Error Codes	3.64	76	38%	17%
Field Teams	3.61	75	31%	24%
Call Center	3.61	70	27%	22%
Product Manuals	3.54	83	41%	16%
Application Help	3.51	74	35%	14%

A scale of 1-5, 1 being very dissatisfied and 5 being very satisfied

* Dealer selected “I have not used this source enough to comment” were removed

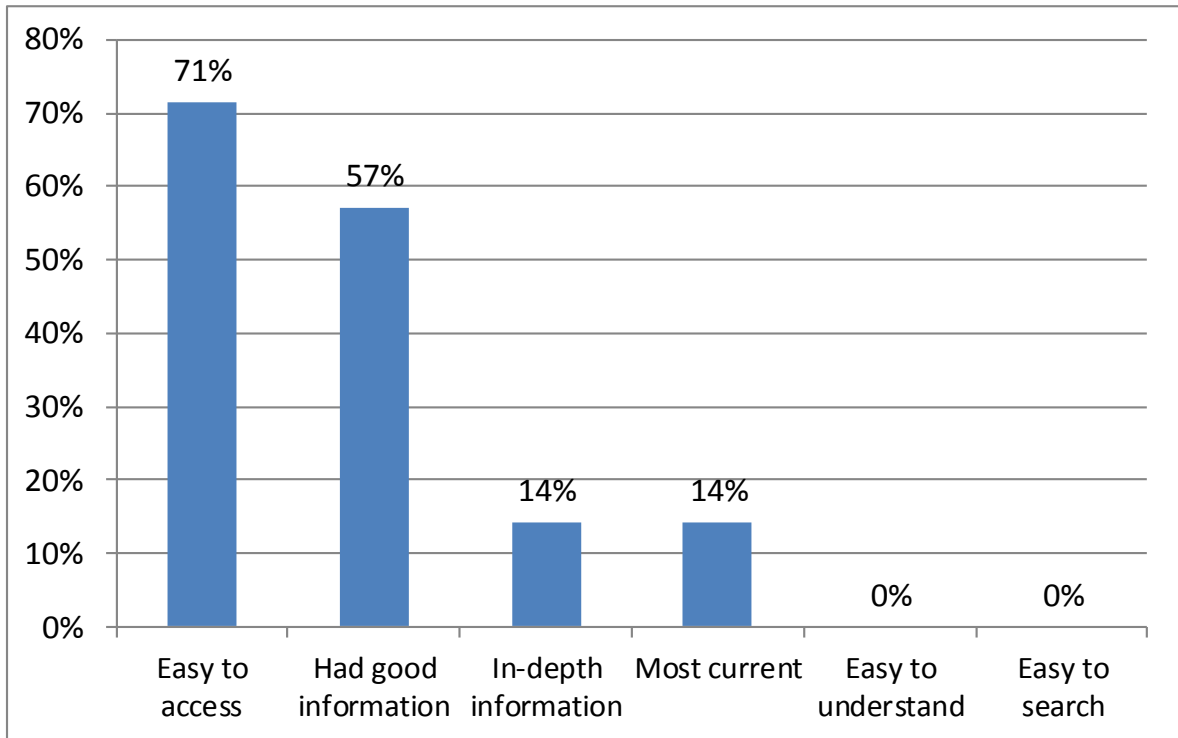
** Percentage calculated from all 86 participants

5.4 Survey Results: Error Codes

In many cases error codes are available directly from the user interface of the product and provide the dealer a code to reference or text describing the issue. Not all Precision Agriculture products include error codes or the same quality of information accompanying the error code. The survey results show error codes were only used as the first support source and used only by 8.1% of the dealers (Appendix A, Table 1). For those dealers that elected to use error codes in an attempt to resolve the product issue, the top two

responses to why error codes were consulted were “Easy to access” and “Had good information in the past” (Figure 5.2).

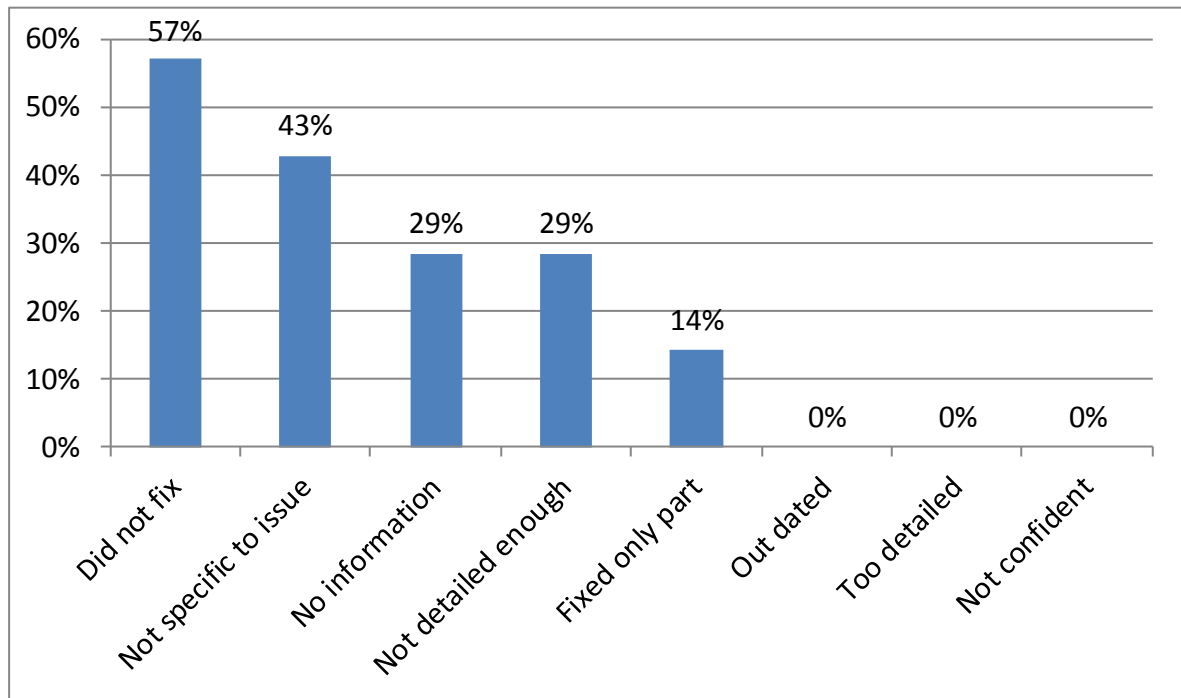
Figure 5.2: Why were Error Codes Consulted?



Percentages do not sum to 100% because multiple responses were allowed

Error codes alone did not fully resolve the product issue for any of the dealers, as 57.1% of the dealers stated error codes did not fix the issue and 42.9% stated the issue was only partially resolved (Appendix A, Table 1). The top responses as to why the dealers consulted another source beyond error codes were “Did not fix the issue” and the error codes were “not specific to the issue” (Figure 5.3).

Figure 5.3: Why was an Additional Source Consulted beyond Error Codes?



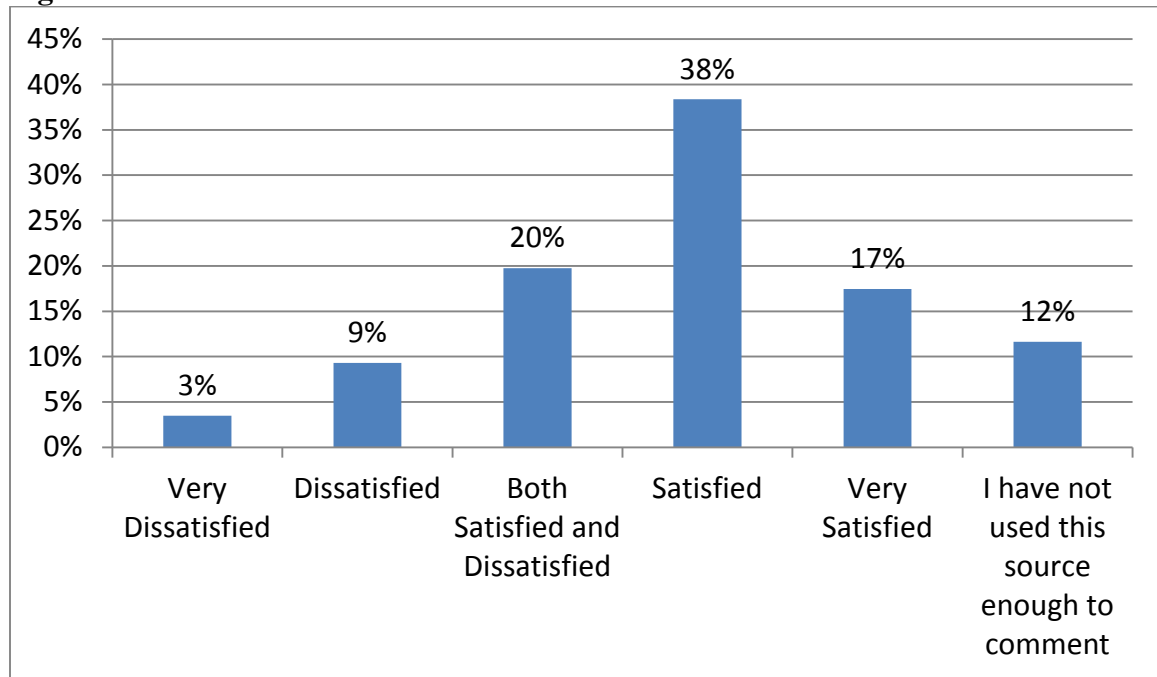
Percentages do not sum to 100% because multiple responses were allowed

All dealers that participated in the survey were provided the opportunity to indicate their satisfaction with error codes (Figure 5.4), no matter if they indicated they used error codes to resolve the specific product issue or not. Forty-eight (55.8%) dealers gave error codes a rating of either satisfied or very satisfied when asked about their satisfaction. The average satisfaction for error codes was 3.64 on a scale of 1-5, 1 being very dissatisfied and 5 being very satisfied (Figure 5.4).

When asked their satisfaction with error codes, 12% of the total participants indicated they had not used this source enough for any issue resolution to comment, this percentage was removed from the average satisfaction calculation. When asked what needs

to be improved for error codes, the number one answer with 29% were error codes do not provide enough detail.

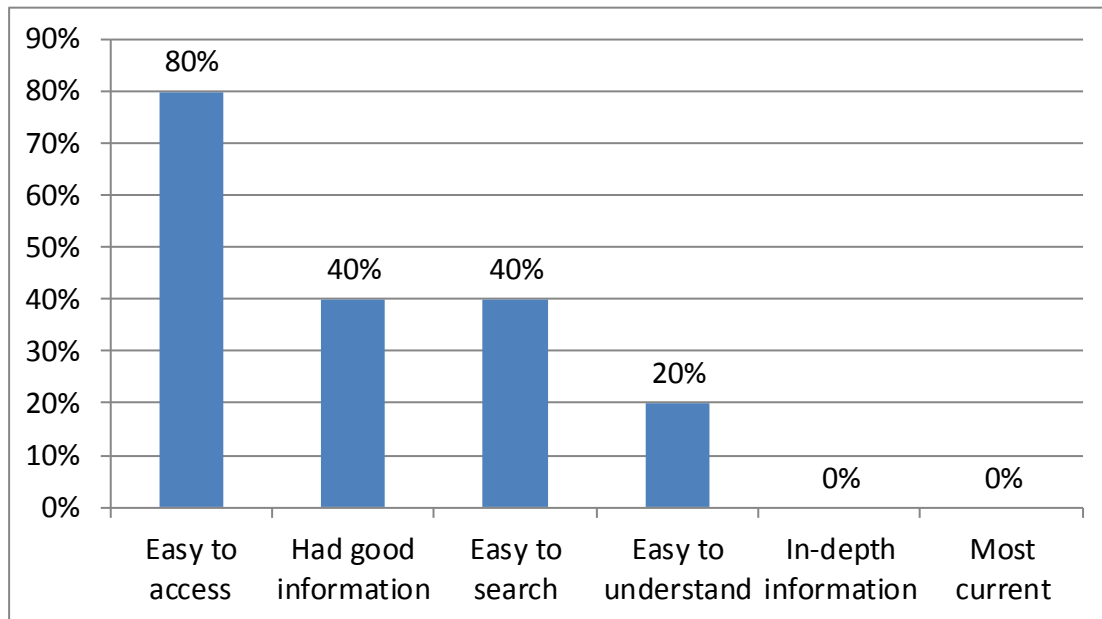
Figure 5.4: Dealer Satisfaction with Error Codes



5.5 Survey Results: Product Manuals

Company A Precision Agriculture offers multiple types of product manuals: operator's manuals, technical manuals, installation manuals, etc. Product manuals can be in paper form or an electronic version available from a variety of sources (e.g., Company A websites, Service Tool). Dealers specified they used product manuals 6.9% of the time to resolve a product issue and they only used them in the first two support sources (Appendix A, Table 1). The overwhelming reason why dealers chose to use product manuals when attempting to resolve an issue was due to "Easy Access" (Figure 5.5).

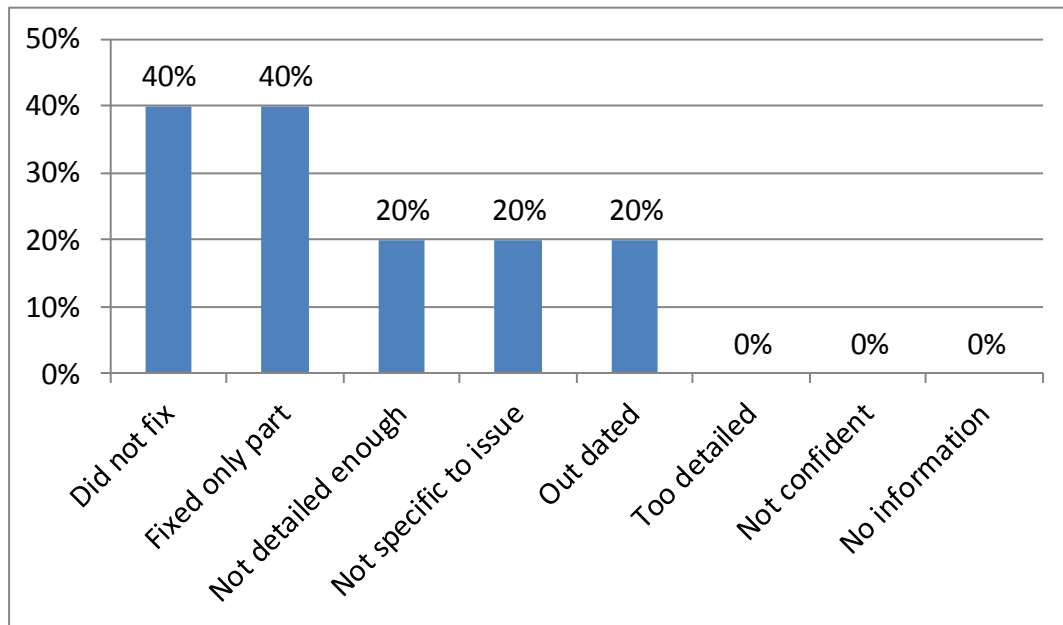
Figure 5.5: Why were Product Manuals Consulted?



Percentages do not sum to 100% because multiple responses were allowed

The survey indicates product manuals did not fully resolve any product issues, as 40% of the dealers stated the problem was not resolved and 60% stated product manuals did not fully resolve the issue (Appendix A, Table 1). When asked why an additional source beyond product manuals were consulted, the top dealers' answers were "Did not fix the issue" and "Fixed only part of the issue" (Figure 5.6).

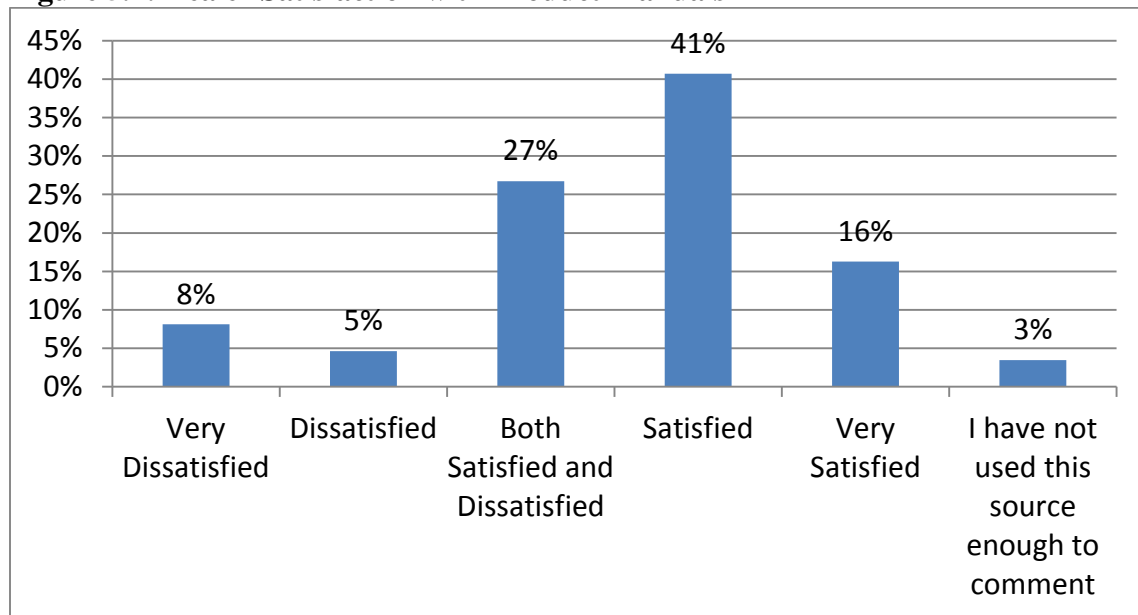
Figure 5.6: Why was an Additional Source Consulted beyond Product Manuals?



Percentages do not sum to 100% because multiple responses were allowed

All dealers that participated in the survey were provided the opportunity to indicate their satisfaction with product manuals (Figure 5.7), no matter if they indicated they used product manuals to resolve the specific product issue or not. Forty-nine (56.9%) dealers stated they were either satisfied or very satisfied with product manuals. The average satisfaction for product manuals was 3.54 on a scale of 1-5, 1 being very dissatisfied and 5 being very satisfied (Table 5.3). When asked their satisfaction with product manuals, 3% of the total participants indicated they had not used this source enough for any issue resolution to comment, this percentage was removed from the average satisfaction calculation. When asked what needs to be improve for product manuals, 21% of the dealers stated product manuals didn't provide enough detail.

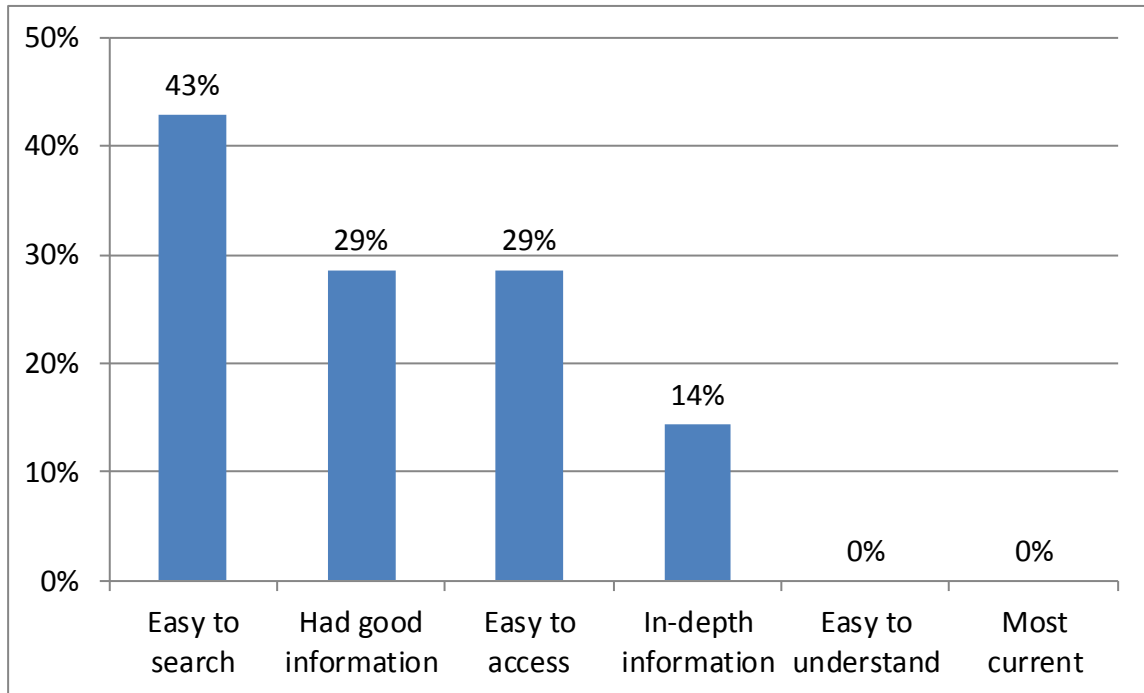
Figure 5.7: Dealer Satisfaction with Product Manuals



5.6 Survey Results: Company A's Website (General Area)

Company A website contains general product information that is available to anyone with internet access. Dealers referenced the general area of Company A's website 8.1% of the time when attempting to resolve a product issue and they only used it within the first two support sources (Appendix A, Table 1). "Easy to search" was the number one reason why dealers consulted the general area of Company A's website (Figure 5.8).

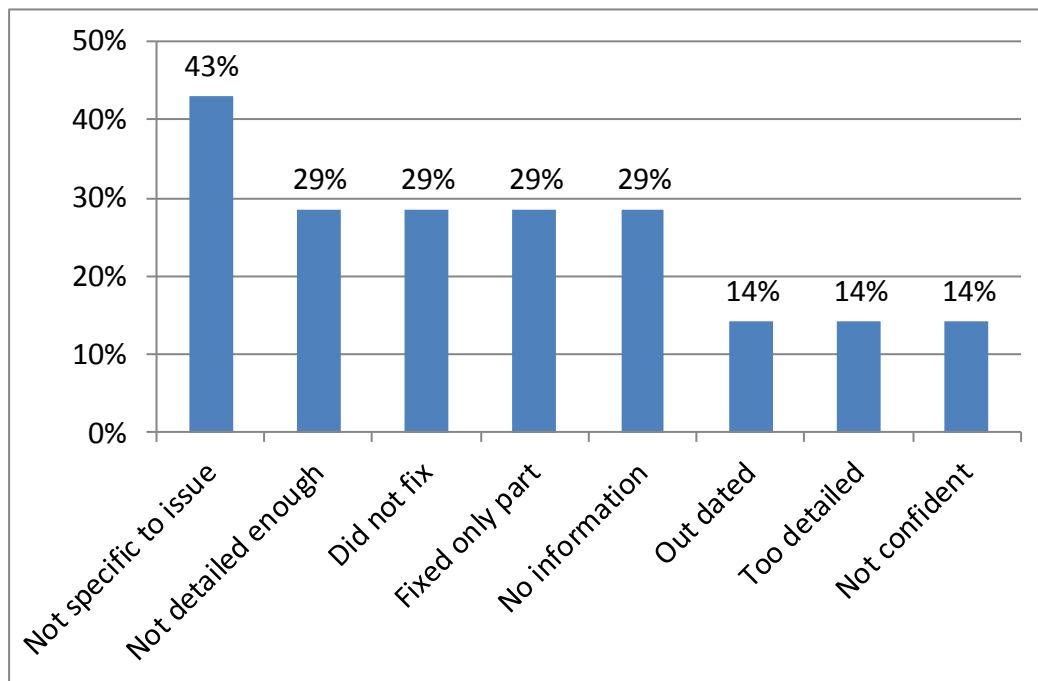
Figure 5.8: Why was Company A’s Website (General Area) Consulted?



Percentages do not sum to 100% because multiple responses were allowed

Dealers stated the general area of Company A’s website did not fully resolve any product issues, but 57.1% of the dealers said it provided a partial fix, while 42.9% stated it did not fix their issue (Appendix A, Table 1). As for why an additional source was needed beyond the general area of Company A’s website, the most popular response was the information was “Not specific to the product issue” with 43% of the dealers selecting this reason (Figure 5.9).

Figure 5.9: Why was an Additional Source Consulted beyond Company A’s Website (General Area)?

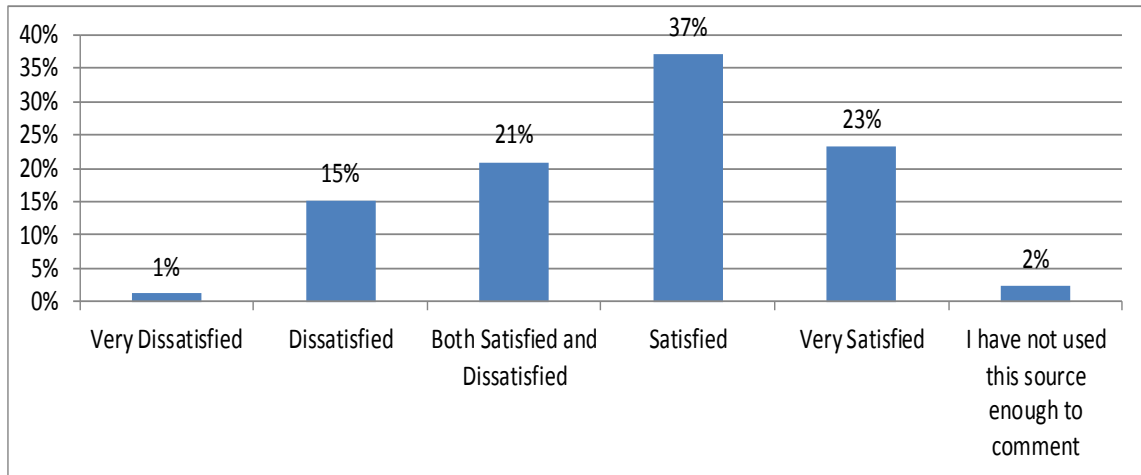


Percentages do not sum to 100% because multiple responses were allowed

All dealers that participated in the survey were provided the opportunity to indicate their satisfaction with (Figure 5.10), no matter if they indicated they used Company A’s website to resolve the specific product issue or not. Dealers were asked about their satisfaction with Company A’s website as a whole, rather than with the specific areas (e.g. general area, dealer area) of the website. Fifty-one (59.3%) dealers selected they were either satisfied or very satisfied with Company A’s website. The average satisfaction was 3.68 on a scale of 1-5, 1 being very dissatisfied and 5 being very satisfied (Table 5.3). When asked their satisfaction with Company A’s website, 2% of the total participants indicated they had not used this source enough for any issue resolution to comment, this percentage was removed from the average satisfaction calculation. When asked what could

be improved with Company A’s website, 23% of the dealers stated it was “too difficult to find an answer”.

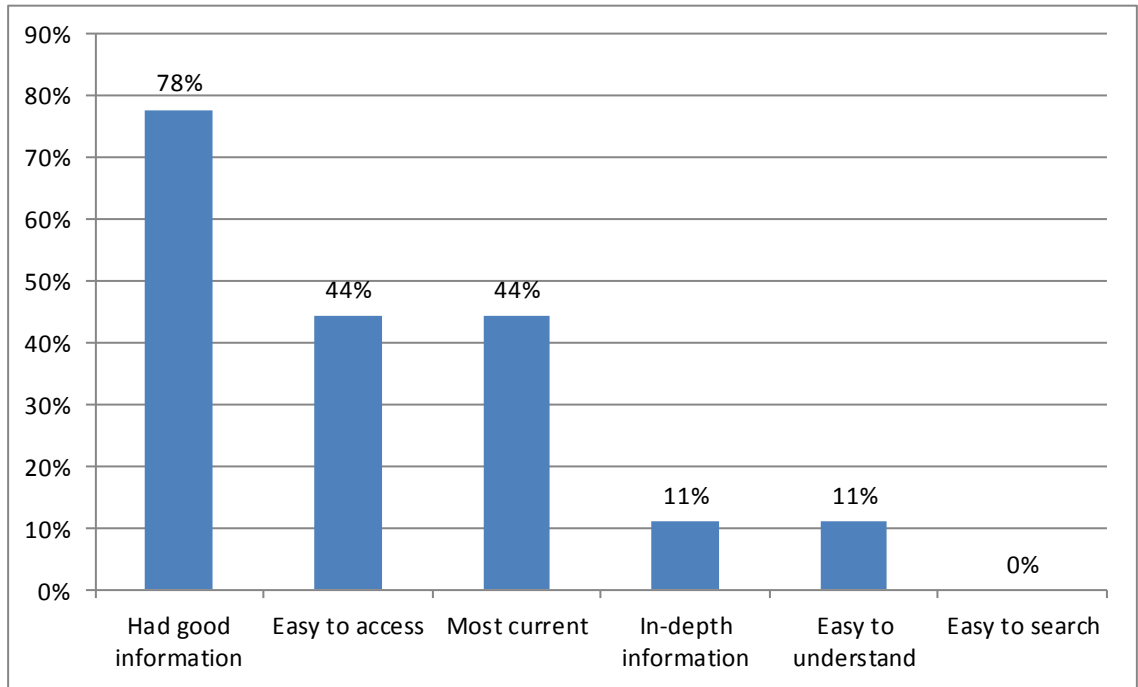
Figure 5.10: Dealer Satisfaction with Company A’s Website



5.7 Survey Results: Company A’s Website (Dealer Area)

The dealer area is a webpage within Company A’s website that is only available to Company A dealers and contains information that is above and beyond what is available in the general area of Company A’s website. The dealer area within Company A’s website was used by 11.6% of the dealers, but it was only used within the first two support sources when attempting to resolve the product issues (Appendix A, Table 1). The number one reason why the dealer area was consulted was “In the past it had good information” (Figure 5.11).

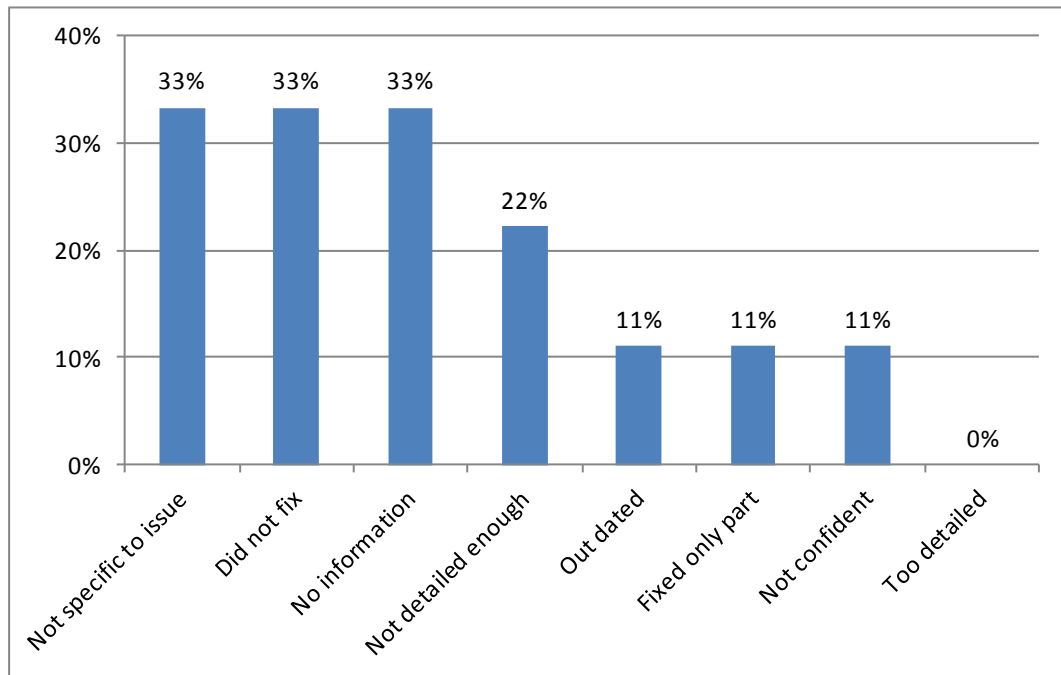
Figure 5.11: Why was Company A's Website (Dealer Area) Consulted?



Percentages do not sum to 100% because multiple responses were allowed

Ten percent of the dealers who used the dealer area of Company A's website were able to resolve the product issue, 70% partially resolved the issue and 20% did not resolve the issue (Appendix A, Table 1). Three responses (not specific to issue, did not fix, no information could be found) tied for the most popular answers as to why an additional source was consulted beyond the dealer area (Figure 5.12).

Figure 5.12: Why was an Additional Source Consulted beyond Company A’s Website (Dealer Area)?



Percentages do not sum to 100% because multiple responses were allowed

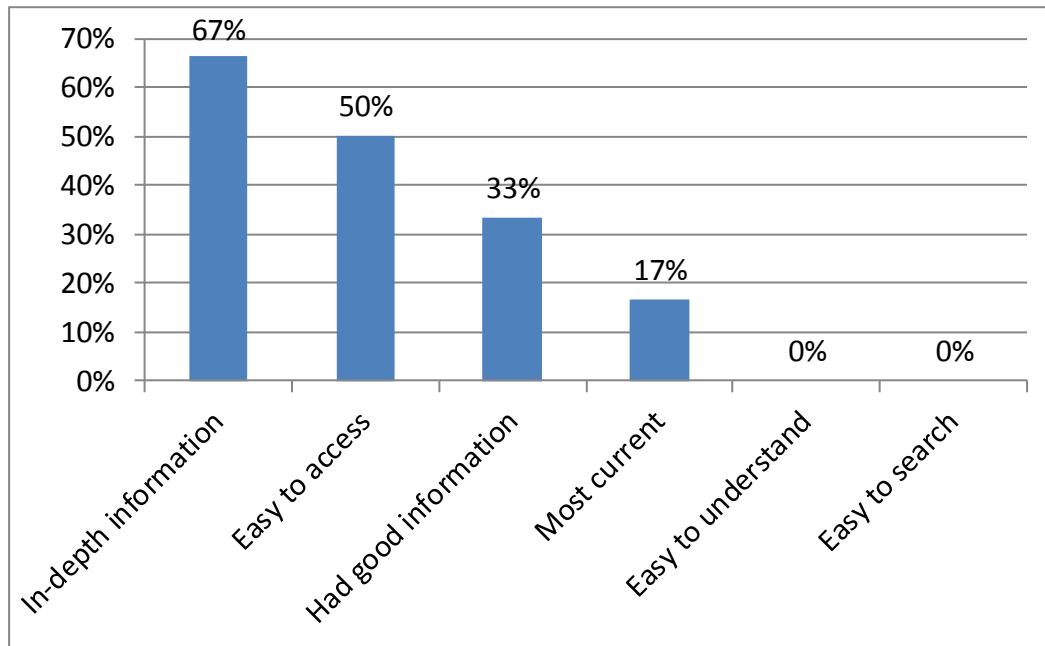
Dealers were asked about their satisfaction with Company A’s website as a whole, rather than with the specific areas (e.g. general area, dealer area) of the site. See section 5.6 for the summary of the dealers’ satisfaction of Company A’s website.

5.8 Survey Results: Precision Agriculture Product Information within Service Tool

Service Tool is a software program that Company A dealers can use to view product manuals and diagnostic steps to resolve product issues. There is product information contained within Service Tool for the majority of the Precision Agriculture products, excluding websites and software programs. Service Tool was used by 8.1% of the dealers within the first two product support sources they consulted when they attempted to resolve a Precision Agriculture product issue (Appendix A, Table 1). The number one

reason why the dealers chose to use Service Tool was for the “in-depth information” it contained (Figure 5.13).

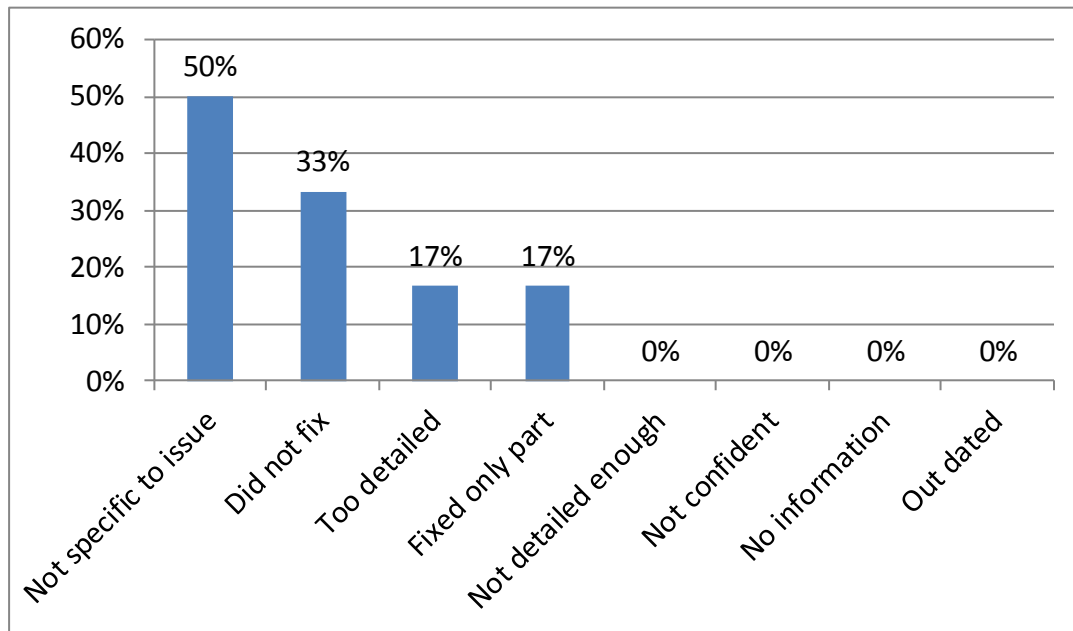
Figure 5.13: Why was Service Tool Consulted?



Percentages do not sum to 100% because multiple responses were allowed

Out of the 7 dealers that used the information with Service Tool, none of them were able to fully resolve their product issue, 83% stated it provided only a partial solution, while 17% stated it did not provide any type of solution to their issue (Appendix A, Table 1). Dealers expressed the number one reason why another support source was consulted after Service Tool was the information was “not specific to issue” (Figure 5.14).

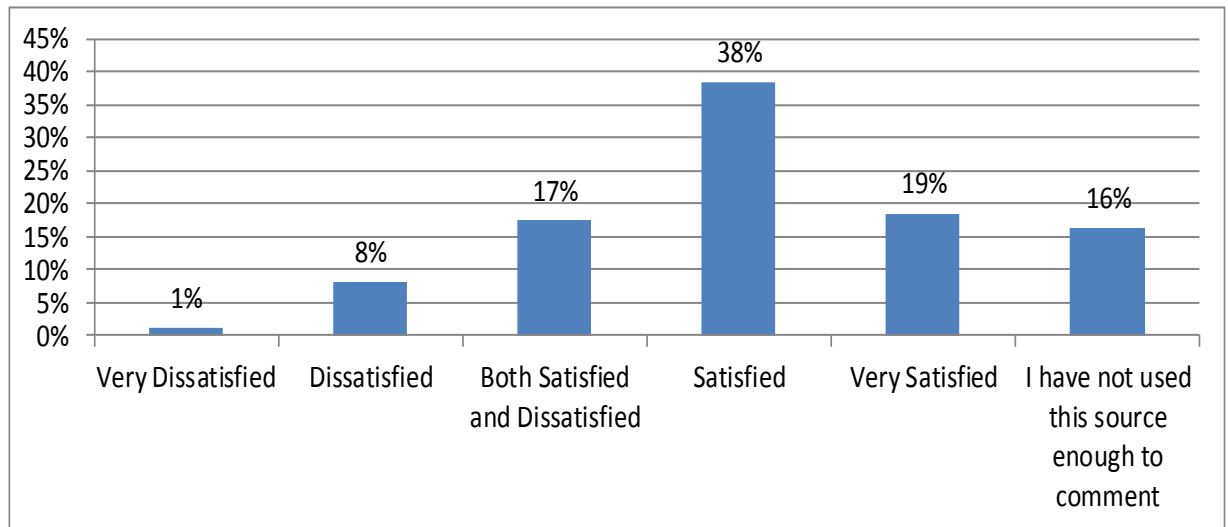
Figure 5.14: Why was an Additional Source Consulted beyond Service Tool?



Percentages do not sum to 100% because multiple responses were allowed

All dealers that participated in the survey were provided the opportunity to indicate their satisfaction with Service Tool (Figure 5.15), no matter if they indicated they used Service Tool to resolve the specific product issue or not. Forty-nine (56.9%) dealers in this survey selected they were either satisfied or very satisfied with the Precision Agriculture product information available within Service Tool. The average satisfaction was 3.78 on a scale of 1-5, 1 being very dissatisfied and 5 being very satisfied (Table 5.3). When asked their satisfaction with Service Tool, 16% of the total participants indicated they had not used this source enough for any issue resolution to comment, this percentage was removed from the average satisfaction calculation. When asked what needs to be improved for Precision Agriculture product information within Service Tool, the top dealer response was to improve the ability to find an answer to the product issue.

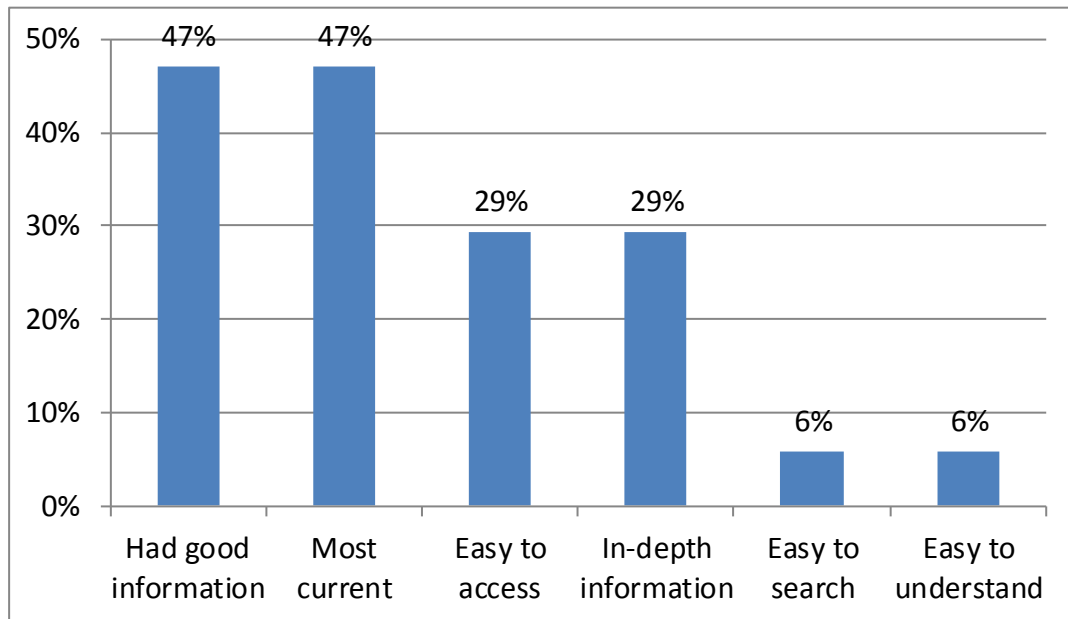
Figure 5.15: Dealer Satisfaction with Precision Agriculture product information within Service Tool



5.9 Survey Results: Company A Call Center

The Company A call center is an precision agriculture technical call center that is available 12 hours a day, 5 days a week. The majority of the support the call center provides is dedicated to tier 1 and tier 2 software support, along with tier 1 hardware support. A total of 20 dealers indicated they used the call center in an attempt to resolve their product issue and these dealers used the call center within the first, second and third support sources (Appendix A, Table 1). Dealers that used the call center stated the top two reasons why they used this support source was in the past it “had good information” and had the “most current” information (Figure 5.16).

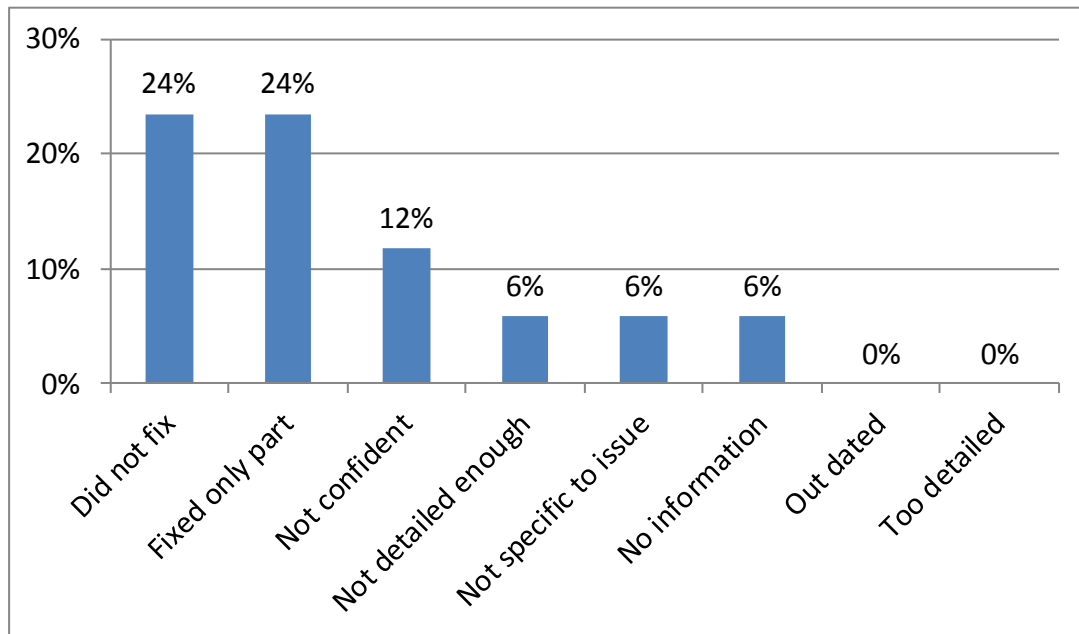
Figure 5.16: Why was the Call Center Consulted?



Percentages do not sum to 100% because multiple responses were allowed

For those dealers that used the call center to resolve their product issue, 35% of the dealers reported their issue was resolved, 41% reported the issue was partially resolved and 24% stated the call center did not resolve their issue (Appendix A, Table 1). The top responses from dealers regarding why an additional source was needed was the call center “did not fix” the issue and the call center “fixed only part” of the issue (Figure 5.17).

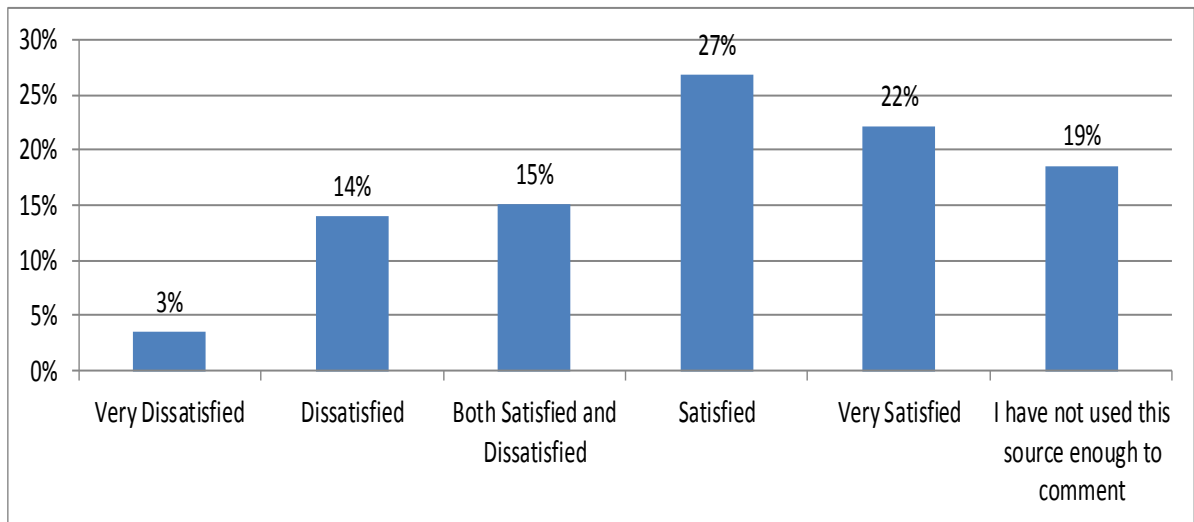
Figure 5.17: Why was an Additional Source Consulted beyond the Call Center?



Percentages do not sum to 100% because multiple responses were allowed

All dealers that participated in the survey were provided the opportunity to indicate their satisfaction with the call center (Figure 5.18), no matter if they indicated they used the call center to resolve the specific product issue or not. Forty-two (48.8%) dealers stated they were either satisfied or very satisfied with the call center. The average satisfaction with the call center was 3.61 on a scale of 1-5, 1 being very dissatisfied and 5 being very satisfied (Table 5.3). When asked their satisfaction with the call center, 19% of the total participants indicated they had not used this source enough for any issue resolution to comment, this percentage was removed from the average satisfaction calculation. The top answer on what needs to be improved for the call center was the support source “does not provide a timely answer”.

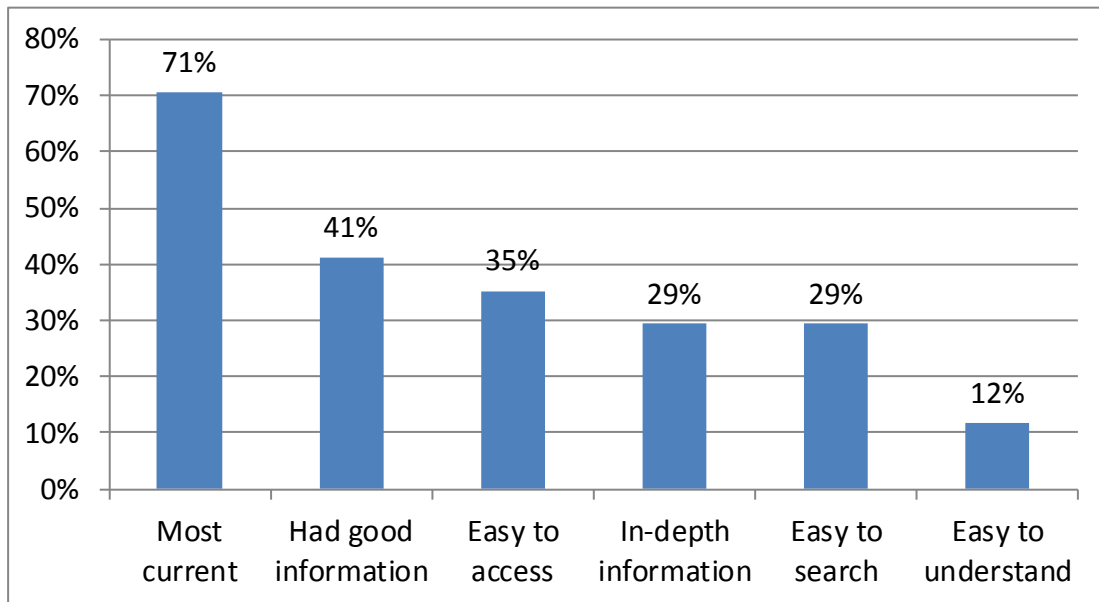
Figure 5.18: Dealer Satisfaction with the Call Center



5.10 Survey Results: Dealer Support Center Solutions

Dealer support center solutions provide problem resolution documents which are created, maintained, and searchable within the dealer support center case management system. These solutions are typically specific to existing Precision Agriculture product issues that dealer support center personnel have resolved for multiple Company A dealers. Dealer support center solutions were used by 21 dealers within the first and second support source in the dealers' attempt to resolve the Precision Agriculture product issue (Appendix A, Table 1). The overwhelming response by dealers to the question of why dealer support center solutions were consulted was the support source contained the "most current" information (Figure 5.19).

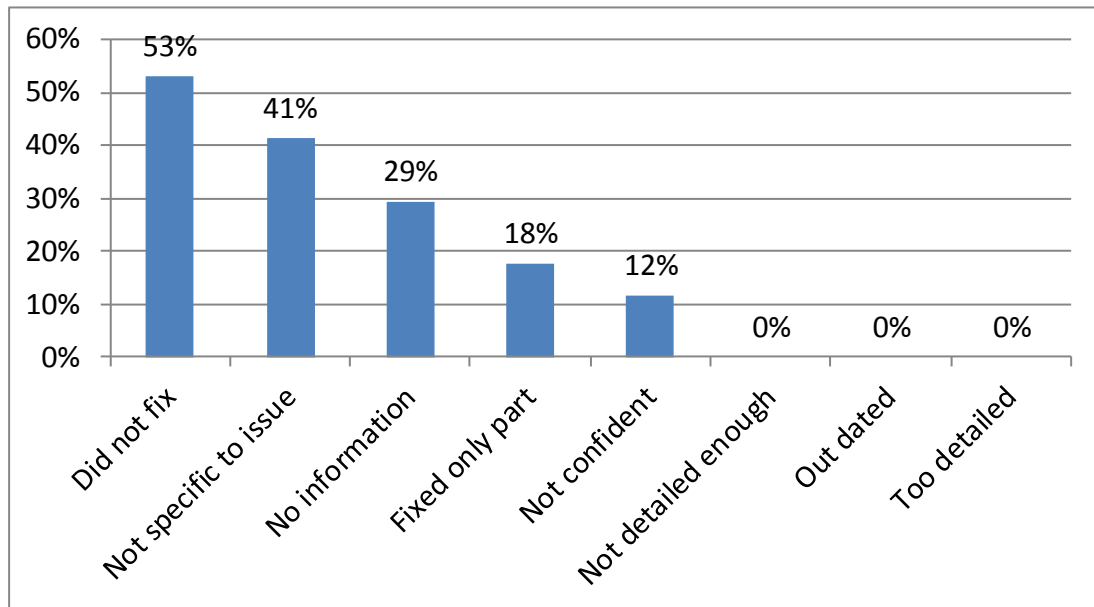
Figure 5.19: Why was Dealer Support Center Solutions Consulted?



Percentages do not sum to 100% because multiple responses were allowed

When using dealer support center solutions in an attempt to resolve an issue, 15% of the dealers stated the issue was resolved, 55% stated it provided a partial fix, and 30% reported it did not resolve the issue (Appendix A, Table 1). The top two responses of why an additional source was consulted were dealer support center solutions “did not fix” the issue and they were “not specific to issue” (Figure 5.20).

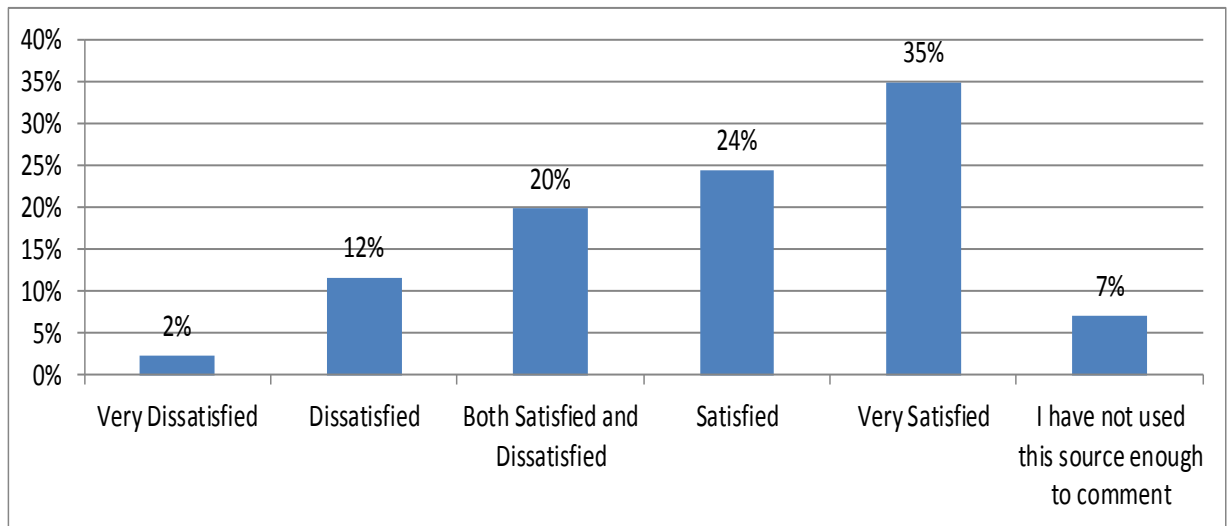
Figure 5.20: Why was an Additional Source Consulted beyond Dealer Support Center Solutions?



Percentages do not sum to 100% because multiple responses were allowed

All dealers that participated in the survey were provided the opportunity to indicate their satisfaction with dealer support center (Figure 5.21), no matter if they indicated they used dealer support center to resolve the specific product issue or not. Dealers were asked about their satisfaction with dealer support center as a whole, rather than the specific areas (e.g. solutions and cases). Fifty-nine percent of the dealers selected their satisfaction with dealer support center was either satisfied or very satisfied. The average satisfaction was 3.84 on a scale of 1-5, 1 being very dissatisfied and 5 being very satisfied (Table 5.3). When asked their satisfaction with dealer support center, 7% of the total participants indicated they had not used this source enough for any issue resolution to comment, this percentage was removed from the average satisfaction calculation. When asked what could be improved with dealer support center, 7% of the dealers stated dealer support center “does not provide a timely answer” when attempting to resolve a product issue.

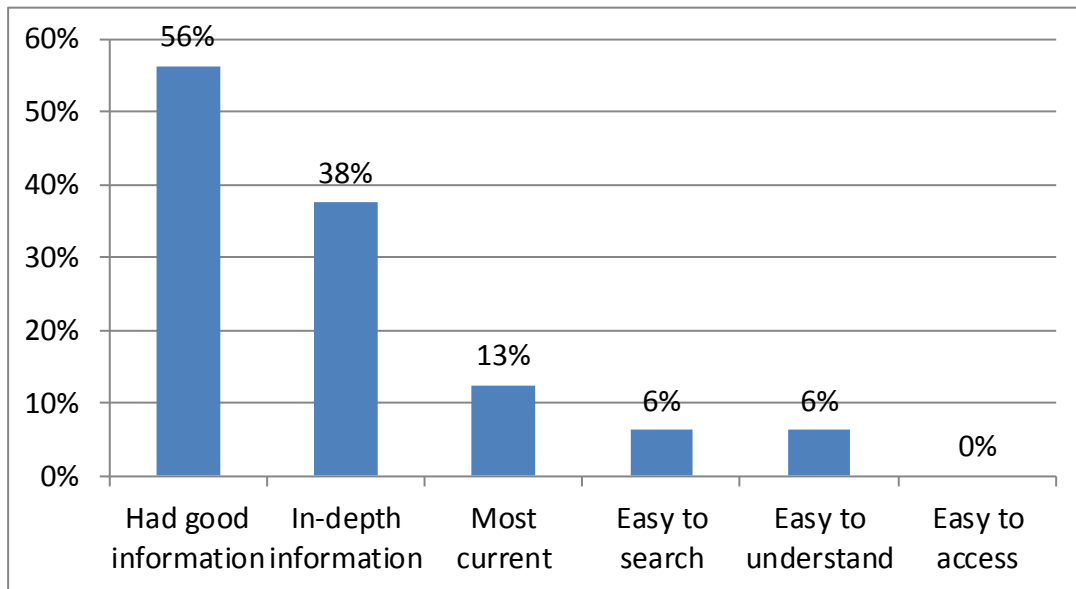
Figure 5.21: Dealer Satisfaction with the Dealer Support Center Cases



5.11 Survey Results: Dealer Support Center Cases

Company A dealers can submit a dealer support center case (i.e. product issue) to a group of Company A Precision Agriculture employees who attempt to identify a resolution to the product issue. Dealer support center is the highest level of support for Precision Agriculture hardware that Company A provides to Company A dealers. Thirty-six dealers submitted a dealer support center case in either the first, second, third, or fourth support source (Appendix A, Table 1). Due to the survey structure, only those dealers who selected they submitted a dealer support center case within the first support source were asked follow up questions of why they submitted a dealer support center case, if the dealer support center case resolved the issue, and why they consulted another source. There were 16 dealers who utilized a dealer support center case as the first support source and they indicated they submitted a dealer support center case because in the past it “had good information” and provided “in-depth information” (Figure 5.22).

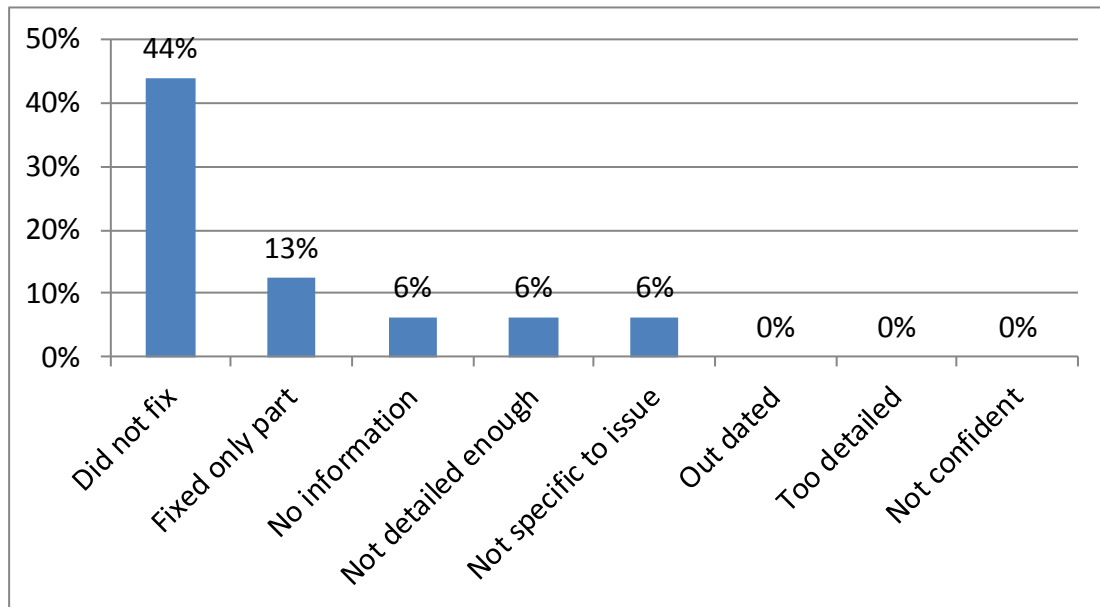
Figure 5.22: Why was Dealer Support Center Case Consulted?



Percentages do not sum to 100% because multiple responses were allowed

Of those 16 dealers that submitted a dealer support center case as their first support source 25% resolved their issues, 44% had a partial fix, and 31% did not resolve the issue (Appendix A, Table 1). The overwhelming response to why another support source was consulted beyond a dealer support center case was it “did not fix” the issue (Figure 5.23).

Figure 5.23: Why was an Additional Source Consulted beyond Dealer Support Center Cases?



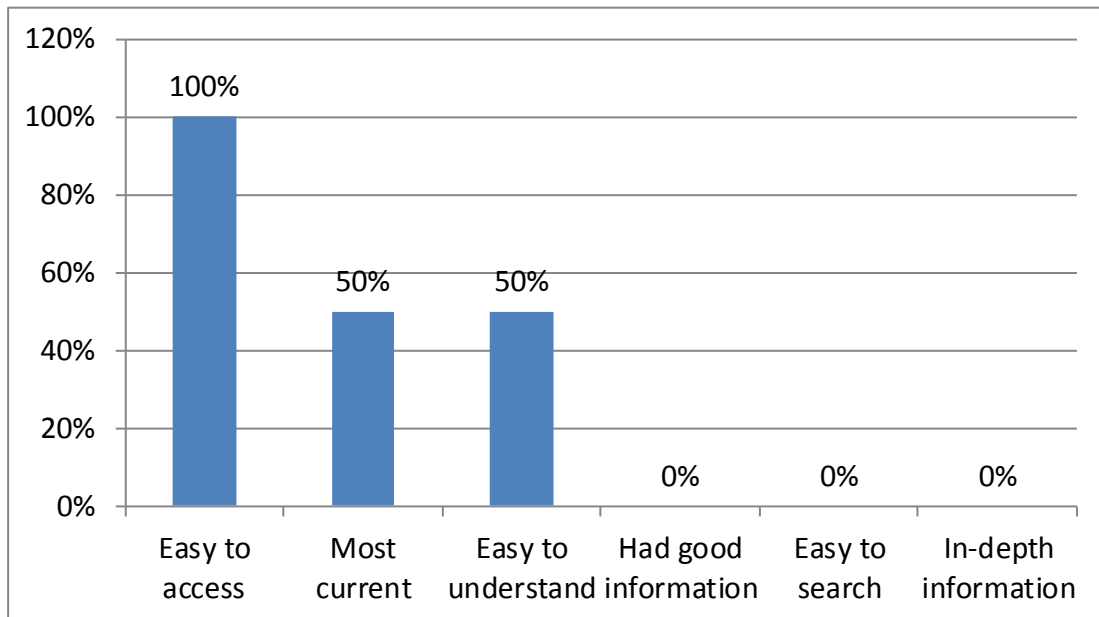
Percentages do not sum to 100% because multiple responses were allowed

Dealers were asked about their satisfaction with dealer support center as a whole, rather than in the specific areas (e.g. solutions and cases) of the dealer support center system. See section 5.10 for the summary of the satisfaction of dealer support center.

5.12 Survey Results: Application Help

Application help is text that is incorporated into a webpage or a software package. This help text provides information on how to use the product, along with general troubleshooting steps. A total of 2 dealers indicated they used application help in an attempt to resolve their product issue and it was only used in the first support source. (Appendix A, Table 1). Both dealers that used application help stated they consulted the support source since it was “easy to access” (Figure 5.24).

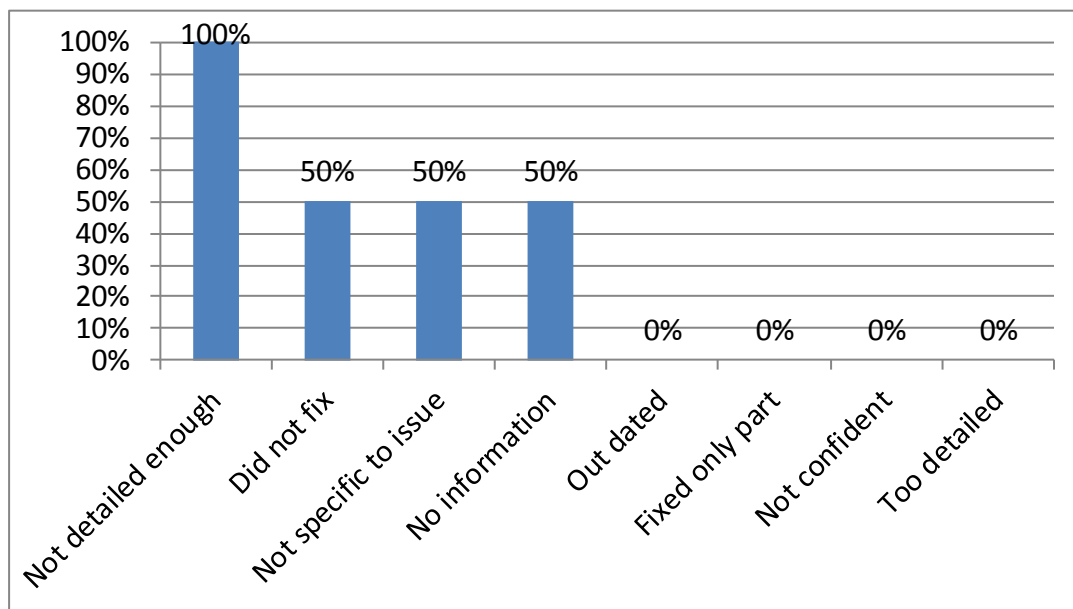
Figure 5.24: Why was Application Help Consulted?



Percentages do not sum to 100% because multiple responses were allowed

For the dealers that used application help, they both reported it did not resolve their product issue (Appendix A, Table 1). The two dealers that used application help indicated the support source was “not detailed enough” (Figure 5.25).

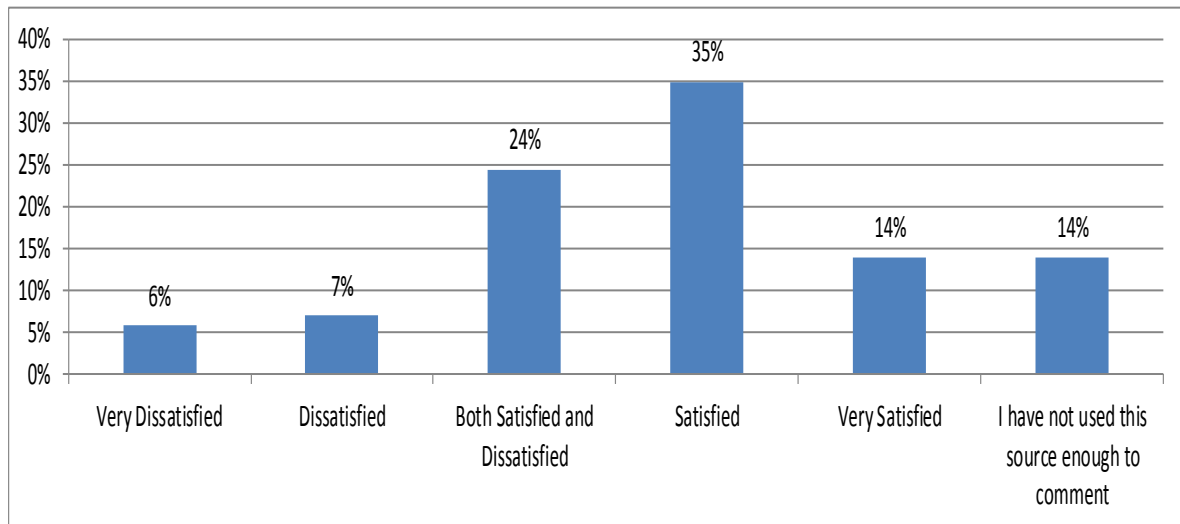
Figure 5.25: Why was an Additional Source Consulted beyond Application Help?



Percentages do not sum to 100% because multiple responses were allowed

All dealers that participated in the survey were provided the opportunity to indicate their satisfaction with application help (Figure 5.26), no matter if they indicated they used application help to resolve the specific product issue or not. Forty-two (48.8%) dealers stated they were either satisfied or very satisfied with the application help. The average satisfaction with the application help was 3.51 on a scale of 1-5, 1 being very dissatisfied and 5 being very satisfied (Table 5.3). When asked their satisfaction with application help, 14% of the total participants indicated they had not used this source enough for any issue resolution to comment, this percentage was removed from the average satisfaction calculation. The top answer to what needs to be improved for application help was the support source “doesn’t provide enough detail” to resolve the issue.

Figure 5.26: Dealer Satisfaction with Application Help



5.13 Survey Results: Non-Precision Agriculture Support Sources

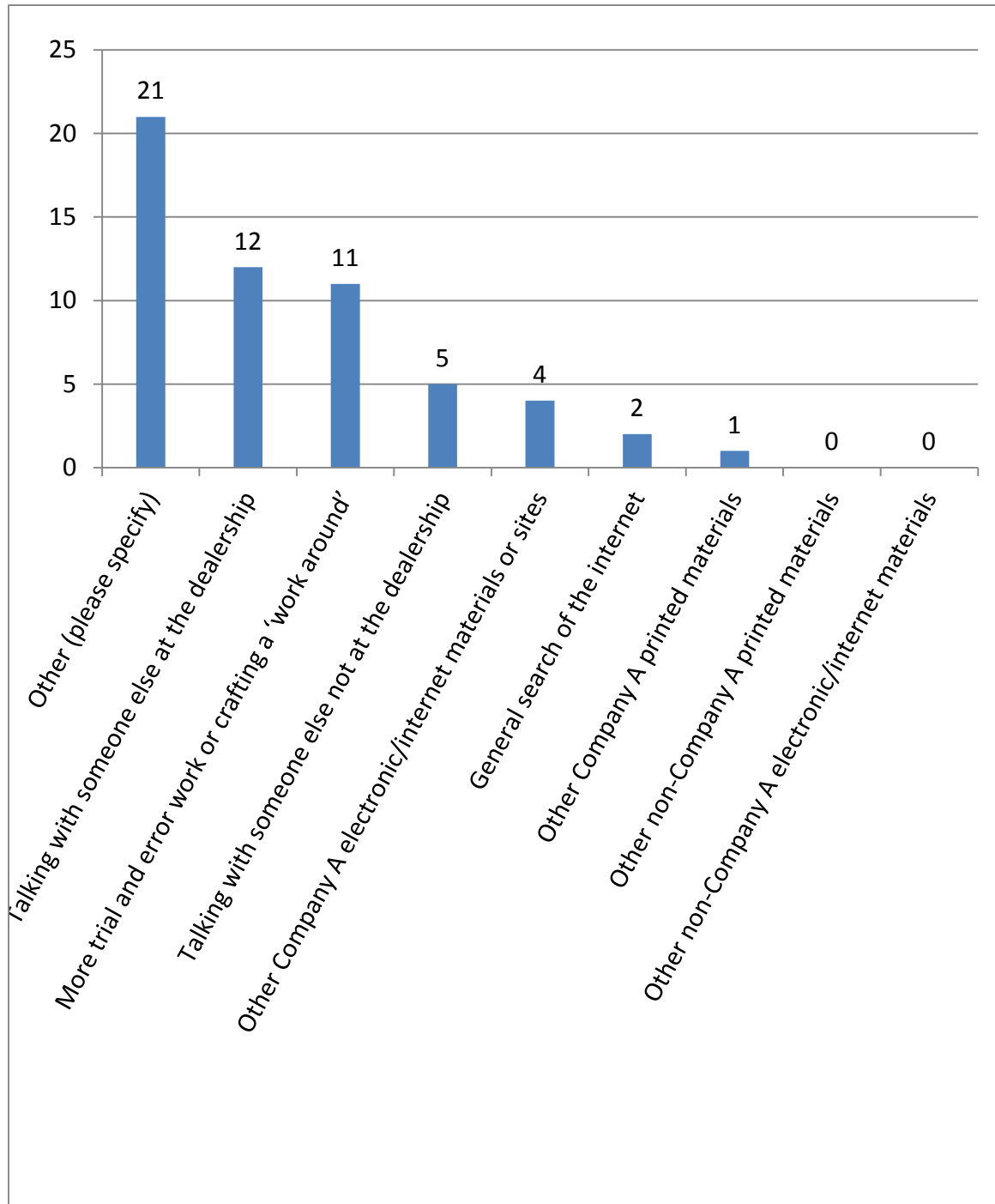
Dealers reach out to other support sources to resolve Precision Agriculture product issue beyond those provided by Company A Precision Agriculture Product Support. These non-Company A Precision Agriculture support sources include:

- Trial and Error: Dealers will try solutions that have worked for similar product issues and will continue to change a variable in the system to solve the issue.
- Other Dealer Personnel: Dealers will consult with co-workers at the dealership that may have had a similar product issue.
- Other Personnel Not At the Dealership: Dealers will consult others outside of the dealership that may have had a similar product issue.
- Other Company A Electronic/Internet Materials: Other Company A product support sources on the internet that are not associated with Company A Precision Agriculture.

- Other Company A Printed Material: Other Company A printed product support sources that are not associated with Precision Agriculture.
- Non-Company A Electronic/Internet Materials: Other product support sources on the internet that are not associated with Company A.
- Non-Company A Printed Materials: Other printed product support sources that are not associated with Company A.
- The Internet: Company A dealers use other support sources available on the internet such as YouTube, message boards, and social media.
- Other (manual entry): Within the survey the respondents were able to enter a support source manually. Examples of support sources that were submitted are: existing dealer support center case, Company A discussion boards, and directly contacting a Company A employee.

When attempting to resolve an Precision Agriculture product issue, dealers consulted these non-Company A Precision Agriculture support sources a total of 56 times, with the most popular source being “Other” which allowed dealers to enter their own support source (Figure 5.27). Many of the “other” support sources that dealers submitted fell into the pre-populated support sources contained within the survey.

Figure 5.27: Frequency Dealers Consulted Non-Precision Agriculture Support Sources



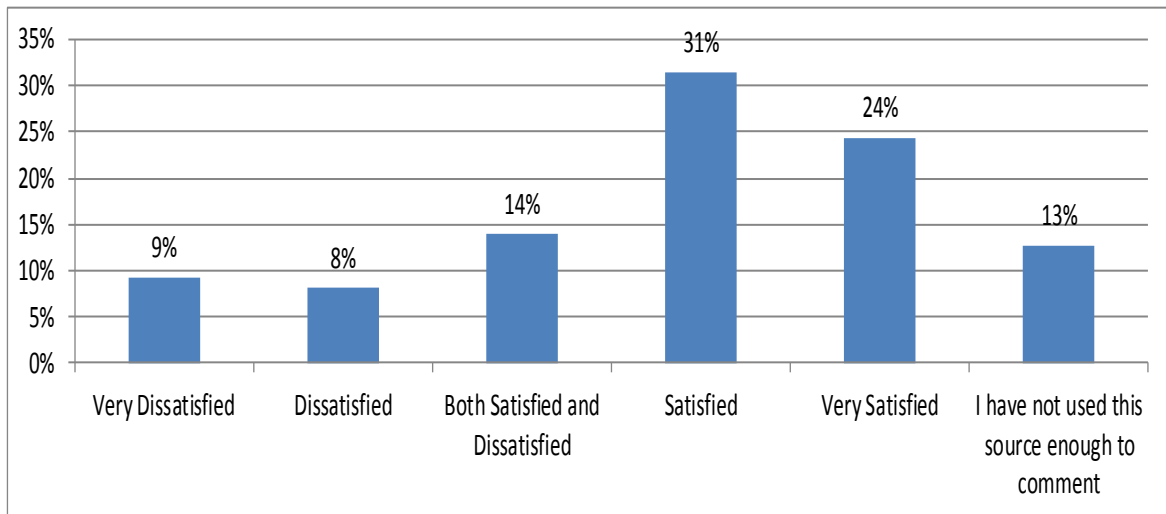
Out of the 56 dealers that selected these non-Precision Agriculture support sources, 50% stated there were able to resolve their issue, 34% were able to partially fix the issue, and 12% were not able to resolve the issue (Appendix A, Table 1).

5.14 Survey Results: Company A Field Staff

Company A has field employees that are assigned to specific geographic regions and are dedicated to supporting the dealers within these regions. Many times these field employees only become involved in helping to resolve product issues when it is a key account or it is a persistent product issue. The survey did not include Company A field staff as an option when attempting to resolve a product issue, as field staff are not considered to be a regular support source. However, out of 18 manually entered support sources, 5 dealers consulted a Company A field employee in an attempt to resolve their Precision Agriculture product issue.

Even though Company A field employees are not primary sources of support, all dealers that participated in the survey were provided the opportunity to indicate their satisfaction with Company A field staff (Figure 5.28), no matter if they indicated they used Company A Field Staff to resolve the specific product issue or not. Forty-eight (55.8%) dealers ranked Company A field teams with either satisfied or very satisfied. The average satisfaction for field staff was 3.61 on a scale of 1-5, 1 being very dissatisfied and 5 being very satisfied (Table 5.3). When asked their satisfaction with Company A field staff, 13% of the total participants indicated they had not used this source enough for any issue resolution to comment, this percentage was removed from the average satisfaction calculation. When asked what needs to be improved for Company A field staff, the number one reason was they do not provide a timely response.

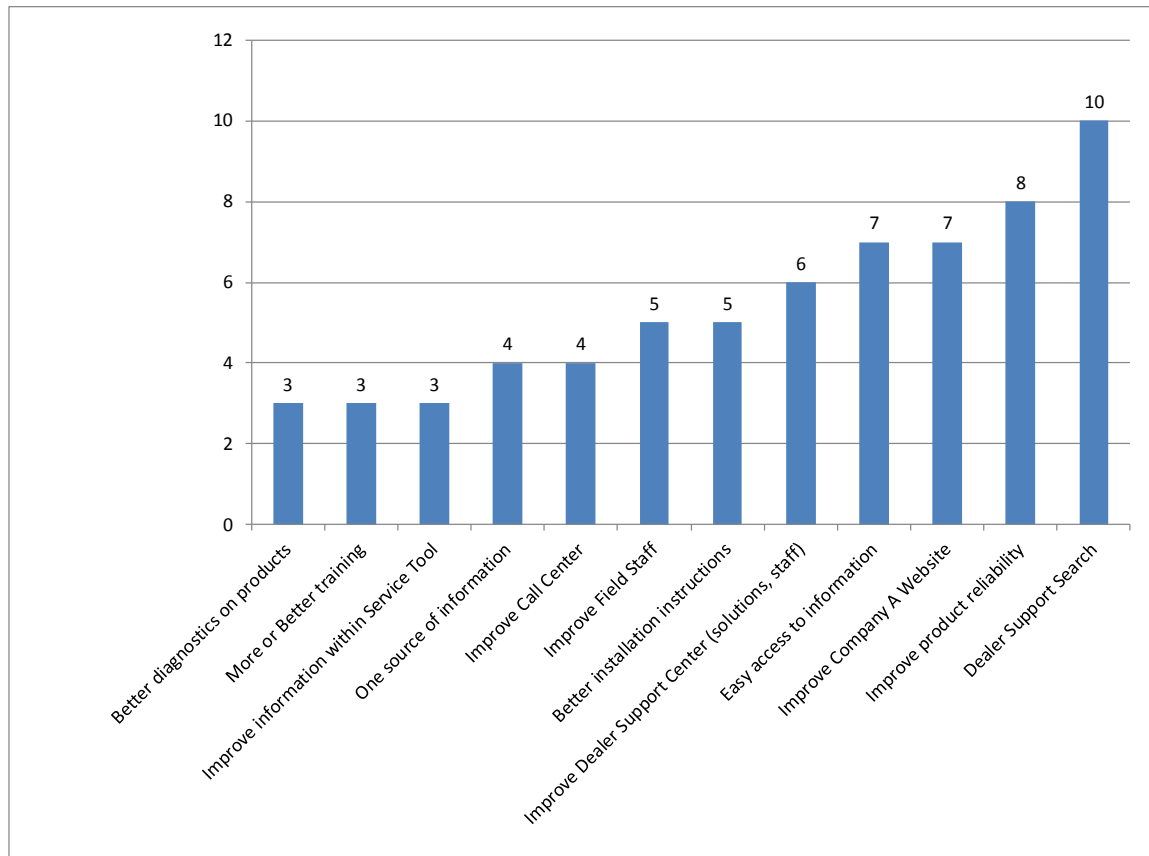
Figure 5.28: Dealer Satisfaction with Company A Field Staff



5.15 Survey Results: Open Ended Questions

The last survey question was open ended and asked the participant, “Please let us know what we can do to make finding solutions to repair and installations easier”. Sixty-three dealers provided an answer to this question; however some responses included multiple areas of improvement. As a result, a total of 76 different responses were identified from the dealers’ answers. These responses were then grouped into 21 different categories based on their topic of improvement (Figure 5.29).

Figure 5.29: Top 12 Responses to “How Can Company A Precision Agriculture Making Finding Solutions Easier?”



CHAPTER 6: CONCLUSION

6.1 Conclusion Overview

For each issue resolution avenue Company A Precision Agriculture provides to the dealers, there is an opportunity and financial costs associated with every support source. The cost for each support source must be compared to the dealers' utilization and the value perceived by the Company A dealers. This evaluation is critical to ensure Company A Precision Agriculture Product Support can maximize the efficiency of the problem resolution process, but at the same time minimize the opportunity and financial costs of the support sources.

The evaluation of the product support sources should begin with the most popular support sources identified by this study: dealer support center (solutions and cases), the call center, Company A's website (general area and dealer area), and non-Company A Precision Agriculture support sources. Even though these are the most popular support sources, a critical factor of understanding if they are key support sources is the value they provide to dealers.

Out of all the support sources within the survey, dealer support center was the number one support source used by dealers, as dealers used dealer support center cases 36 times and dealer support center solutions 21 times. The dealer support center system (solutions and cases) was the last support source used by the most dealers (Table 5.2). This statistic aligns with dealer support center being the highest tiered support source provide by Company A Precision Agriculture. The number of dealers that use dealer support center and when it is used, indicates the dealer support center system (cases and solutions) is the

most vital support tool for Company A dealers when attempting to resolve Precision Agriculture product issues.

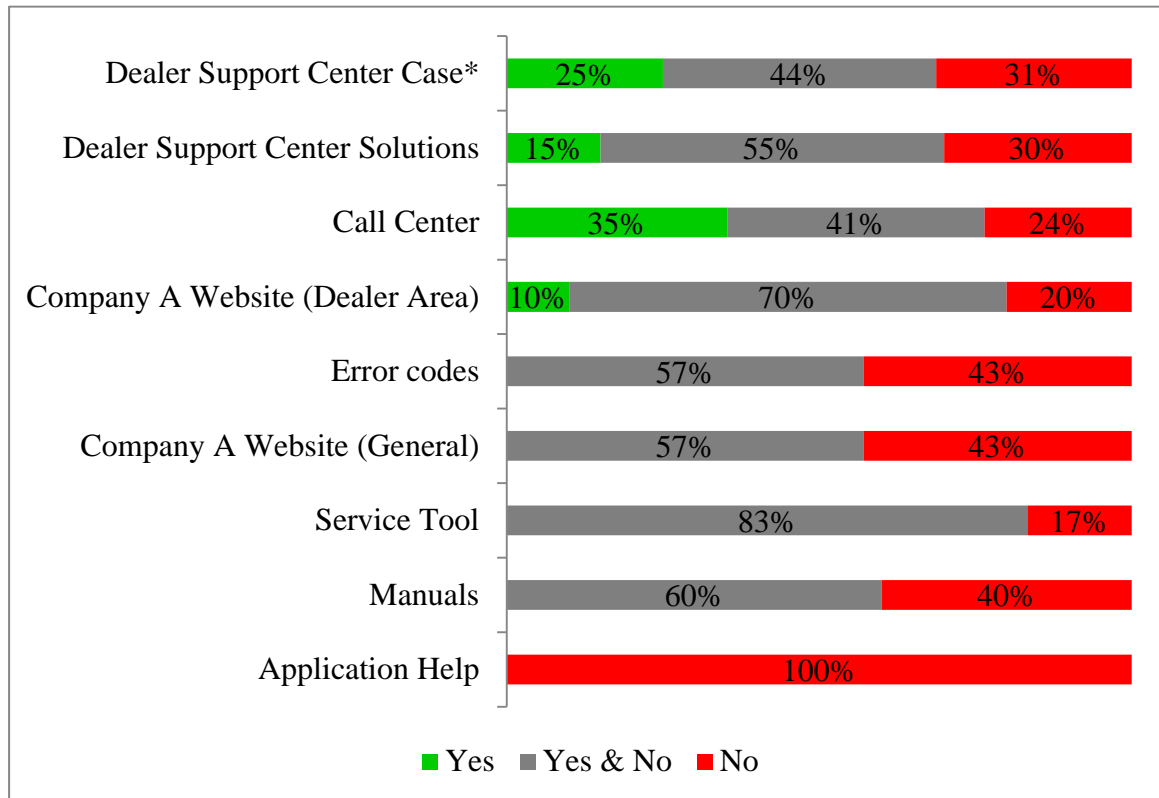
With dealer support center having the highest average satisfaction among the support sources, with 3.84, and the highest “Very Satisfied” rating, with 35%, how can dealer support center be improved to provide maximum efficiency? The number one response from dealers when they were asked how to improve Company A Precision Agriculture Product Support was to improve the dealer support center system search feature, which enables dealers to find solutions that are related to their product issue and other dealer support center cases with the same issue. Improvements to the dealer support center search should include features such as:

- When the user begins to type in their keyword or phrase, the search screen should provide a list of commonly search terms that pertain to the user’s initial text.
- Search results should include like terms, as many components on Company A equipment may have different names depending on the location of the dealer. Including like terms removes the need for the user to know the all the alternative component names.
- Search results should provide spelling suggestions, to reduce the system from providing limited search results due to a misspelled word.

These improvements to the dealer support center search feature would allow dealers to have easy access to support information, which would improve the problem resolution efficiency.

Twenty-one dealers used dealer support center solutions in an attempt to resolve the product issue, however only 15% of the dealers were able to resolve their issue with this support source. In addition, 41% of the dealers who used dealer support center solutions in an attempt to resolve a product issue stated dealer support center solutions were not specific to their issue (Figure 6.1). Along with improving the dealer support center system search functionality which may increase the likelihood of a dealer finding a dealer support center solution that is specific to their product issue, dealer support center solutions should be created for a larger number of product issues. Currently not all product issues result in a dealer support center solution, as it takes more than one customer or dealer to experience the same issue to warrant the time and cost of creating a dealer support center solution. Even though a daily report is currently generated of the previous day's dealer support center cases, Company A Precision Agriculture Product Support relies heavily on communication between individuals to identify if a product issue is determined to be widespread. In an effort to improve dealer support center solutions, the dealer support center system should generate a daily report of the previous day's cases, which should automatically be queried against other cases from a specific time frame to identify product issues faster in order to begin the identification of the issues' root cause and create a dealer support center solution to better inform the dealers.

Figure 6.1: Did the Precision Agriculture Support Source Resolve the Product Issue?



With dealers utilizing the call center 20 times in an attempt to resolve their product issues, the call center can also be considered a key support source for Company A Precision Agriculture. The call center was able to fully resolve 35% of the product issues (Figure 6.1). Even though the call center only provides tier one hardware support, and the majority of the issues dealers referenced in the survey were hardware issues, the ability for the call center to resolve a higher percent of cases is imperative to provide efficient problem resolution for the dealers. This problem resolution percentage is reflected by the call center's average satisfaction rating of 3.61, which is 5th out of 8 support sources. Considering the investment Company A Precision Agriculture Product Support has made into the call center to provide support 12 hours a day 5 days a week, another survey that is focused on how to improve the dealer satisfaction with the call center and why 19% (Figure

5.18) of the participating dealers have not used the call center would be a valuable investment. From this study's data, it is difficult to derive a recommendation for the call center beyond improving employees' knowledge level on the Company A Precision Agriculture products and implementing the proposed daily report to identify product issues earlier for the call center.

Dealer use of Company A's website's general area and dealer area were the fourth most popular support source as dealers consulted the site 17 times. However, only one dealer was able to resolve his/her product issue using Company A's website, which suggests Company A's website is not a key support source for Company A Precision Agriculture. The website was developed to publish specific information dedicated to providing support information for Company A Precision Agriculture products. As the website matured, it became a place to publish information, tools and software updates, but much of the content was published without regard to existing sources provided by Company A. The lack of publishing guidelines resulted in the website containing information that was already available within other support sources or should have been included in a source that was dedicated to this type of information. An example of this duplication are the product manuals published on the website (Service Tool also contains all the manuals for Company A Precision Agriculture Products). This duplication of information costs Company A time and money to ensure both support sources have the current product manuals and it leaves the dealer confused as to which support source to use.

With Company A's website only resolving 1 product issue out of 17 and with it containing information that is available from other sources or information that should be published to another support source, the recommendation is to remove Company A's

website from Precision Agriculture Product Support's portfolio or reduce and limit what information is published on the site.

Even though Service Tool was only used 7 times, it should also be considered as a key support source, as dealers use it to resolve other Company A equipment product issues. Since many of the Precision Agriculture products are installed and integrated on these other Company A products, dealers do not always know if it is an Precision Agriculture product issue or an issue with the host equipment. By delivering support information through Service Tool, it can assist with identifying and resolving issues faster due to Service Tool's ability to diagnose the host equipment and the Precision Agriculture product. Company A Precision Agriculture Product Support should improve the information available within Service Tool to ensure all Precision Agriculture products are represented properly. When developing a new product, Precision Agriculture Product Support should require all products to be compatible with Service Tool, which would allow a dealer to connect the product to Service Tool to receive diagnostic information, which may improve the dealer's problem resolution efficiency.

A product support source that is not developed or managed by Company A Precision Agriculture and was used 12 times in the survey was dealers talking with someone else at the dealership. When used, this support source was able to provide a 55% problem resolution rate. In addition, the support source of a dealer speaking with someone else not at the dealership was used 5 times and provided a 50% problem resolution rate. The survey did not ask why dealers turned to others at the dealership or outside of the dealership as a support source, but the assumption can be made other individuals at the dealership and outside of the dealership had knowledge with a similar issue or experience

with the Precision Agriculture product. There were also 11 dealers that attempted to resolve their issue by using trial and error or crafting a work around. These dealers were successful at resolving the issue 63% of the time using this support source. This data highlights what is generally understood, but very rarely acted upon, that often dealership employees have extensive knowledge of Company A Precision Agriculture products. To improve Company A Precision Agriculture Product Support's ability at maximizing the efficiency of the problem resolution process and minimize the financial cost of creating and maintaining support sources, Company A Precision Agriculture Product Support should attempt to leverage the Precision Agriculture product knowledge at Company A dealerships. Company A Precision Agriculture Product Support should promote social media (e.g. Twitter) to increase the likelihood of a dealer consulting others when attempting to resolve product issues. With social media technology already in place, the financial risk is very low for Company A Precision Agriculture to begin encouraging more dealers to utilize this as a support source.

Today, product knowledge at dealerships is shared through conversations between individuals, whether it is face to face, on the phone, or through social media. The ability for Company A Precision Agriculture to facilitate these connections between dealers and others with Precision Agriculture product knowledge could increase the overall Precision Agriculture knowledge among Company A dealerships and reduce the dependency on Company A Precision Agriculture support sources. The success of expanding these informal communication paths among individuals will depend on the effort required by the dealer to find a solution and assist others. The critical success item for these social interactions is the ability to provide a timely solution, as when dealers were asked what can

be improved for the call center and dealer support center the top response for both support sources was the source does not provide a timely answer.

The survey results indicate very few patterns exist regarding what support sources dealers use to resolve an issue. Between the first support source and the second support source dealers used, there were six dealers that utilized dealer support center solutions for the first support source, and then used dealer support center case for the second support sources. This progression is expected, as Company A Precision Agriculture Product Support requires dealers to review existing dealer support center solution before submitting a dealer support center case. This ensures dealers are not consuming valuable and costly dealer support center resources, when the issue can be resolved by an existing dealer support center solution. In addition three dealers progressed from the Company A's website dealer area to the call center, three dealers progressed from error codes to Service Tool, and three dealers progressed from dealer support center case to trial and error. Within the progression from the second support source used to the third support source, there were three dealers that utilized the "other" support source then resorted to concluding there was no solution regarding their product issue.

An alarming statistic from this survey was the number of dealers (19.7% or 17 out of 86) that concluded there was not a solution to their product issue (Table 5.2). With nearly 20% of the issues not being resolved, that results in 20% of the customers having a poor experience with the product and potentially with the supporting Company A dealership. Current Company A Precision Agriculture Product Support processes allows for product issues captured through the call center or the dealer support center system to be escalated to the engineering department to identify the root cause and develop a resolution.

In order for this process to be successful, the product issue must be submitted through the call center or dealer support center, categorized as a concern, and prioritized to receive the proper engineering attention. This process does not capture those issues that are not submitted through the call center or dealer support center, and even if the issue does follow the escalation process, there can be days, weeks or even months before a solution is identified. To decrease the number of dealers that are not submitting the product issues to the call center or dealer support center, but are concluding there is not a solution, dealers should be informed on how the issue resolution process functions at Company A Precision Agriculture. This type of communication would explain the priority of issue resolution by engineering is driven by the impact to the customer and the number of dealers that are reporting the issue.

When it comes to resolving a product issue, if the dealer exhausts all the support sources without resolving the issue, many of them are very clever at providing a work around in order to satisfy their customer's needs. This type of ingenuity can be done when a part is broken or a physical piece needs to be replace, however many of Company A Precision Agriculture products are either all software or depend heavily on software to function properly. Fixing software is extremely difficult, if not impossible for a dealer, so when asked what Precision Agriculture can do to improve product support, 8 out of 65 dealers (second improvement suggestion behind improving the dealer support center search feature) stated product reliability needs to be improved. To reduce those issues in which a dealer concludes there is not a solution; product quality should be a primary focus, along with improving the escalation process to reduce the time when a solution can be identified and communicated back to the dealer. The issue identification can be assisted by

implementing the automated dealer support center and call center case query to identify issues that have been reported by multiple dealers. The second step in providing quick issue resolution is freeing up engineering resources to investigate the root cause and provide a resolution.

In the past, the Company A Precision Agriculture Product Support team has continued to broaden the number of support sources available to dealers in an effort to improve the dealers' efficiency of problem resolution. An example of this expansion is the development of Company A's website. The site was initially created for customers, but as unique product resolutions were developed for product issues, the dealer area was created to communicate directly to dealers. These unique product resolutions were quickly published to Company A's website without regard to how resolutions should be incorporated into existing product support sources. The increase in the number of support sources has increased costs and decreases the dealer's problem resolution efficiency by providing too many sources to use.

Within the survey, 4 dealers indicated their desire for one source of support information and 7 dealers wanted to be able to easily access support information. These dealer suggestions on how to improve Precision Agriculture support highlights the dealers' desire to minimize the number of sources and ensure the support sources' format and structure allows for maximum efficiency.

This thesis focused on the evaluation of support sources, which is only a portion of the total Company A Precision Agriculture support strategy. In an effort to maintain a support strategy that meets the dealer and customer needs, Company A Precision

Agriculture Product Support should establish a metric specific to the quality of support they provide to Company A dealers. According to the Hauser and Katz (1998) article, there are seven steps to creating good metrics. The evaluation of support sources discussed in this study focused on the first two steps (“Start by listening to the customer” and “Understand the job”), however additional research should be dedicated to five other steps to ensure the proper metric can be established to measure the quality of the Company A Precision Agriculture Product Support strategy.

In conclusion Precision Agriculture Product Support should focus on those key support sources (e.g. dealer support center, call center, and Service Tool) to increase their ability to resolve product issues and remove those support sources that do not provide value. The emphasis should be on the depth of the information contained within a support source and not increasing the number of support sources. New support sources, like the functionality to increase the interaction among dealers can be added, but caution must be used to not create a new support source when an existing source can be used. All sources (existing and new) should be critically analyzed to ensure the right information is available in the right format. Above all else, ensure the dealers can easily identify what source to use by eliminating support sources that contain duplicate information and communicate the purpose of each support sources to the dealers. Furthermore, provide effective features within the support sources to allow the dealers to maximize their efficiency of problem resolution and create positive outcomes from their satisfaction of Precision Agriculture Product Support.

6.2 Company A’s Use of this Study

The results of this study have been shared with Product Support leadership from Company A Precision Agriculture. From this communication, I was asked to share my results and conclusions with a project manager that is outlining the future support strategy for the Company A. The majority of my results and conclusions confirmed the future support strategy project's assumptions and validated initial project concepts, which include:

- Dealer support center is a critical support source for dealers
- Dealers want one source to find information
- Company A needs to rely less on communication among Company A employees to identify product issues by implementing technology to automate the identification of reoccurring product issues.

In addition to contributing to the future support strategy, the study has driven more immediate actions to improve the problem resolution efficiency. Company A Precision Agriculture Product Support leadership has made a commitment to improve the diagnostic capabilities of Precision Agriculture products by providing funding to develop a Service Tool test that will provide diagnostic information for the dealer and dealer support center/call center employees.

CHAPTER 7: FUTURE RESEARCH

7.1 Future Research Opportunities

As stated in the Methods section, the survey included limitations around collecting demographic information from the participants and their overall satisfaction of Company A Precision Agriculture Product Support. This information could provide Company A Precision Agriculture great value to ensure they have employed the right support strategy to continue the success of the company. Due to the criticality of the support strategy to the business, I would recommend future survey opportunities include demographics, which would allow Company A Precision Agriculture Product Support to identify problem resolution differences based on these demographics (e.g. geographic location). If problem resolution differences did exist, Company A Precision Agriculture Product Support could modify their support strategy based on these demographics.

In addition, conducting an annual dealer survey of support sources similar to survey utilized by this study would allow Company A Precision Agriculture Product Support to understand if they are improving their support strategy and to identify trends in the collected data. By conducting future surveys on an annual basis, it would prevent the dealers from being over-surveyed, but allow Company A Precision Agriculture Product Support to gain insights to their support strategy.

APPENDIX A

Table 1: When was the Support Source Used and if the Source Resolved the Issue?

	Number of dealers that used support source					Did the source resolve the issue?				
	Support	Support	Support	Support	Support	Yes	Yes & No	No	Null**	
	Total	Avenue #1	Avenue #2	Avenue #3	Avenue #4					Avenue #5
Dealer support case	36	16	18	1	1	0	4	7	5	20
Dealer support solutions	21	11	10	0	0	0	3	11	6	1
*Other (please specify)	21	3	9	6	2	1	9	7	4	1
Call center	20	10	7	3	0	0	6	7	4	3
*Talking with someone at the dealership	12	7	3	2	0	0	6	4	1	1
*Trial and error/ crafting a "work around" fix	11	3	4	3	1	0	5	2	1	3
Company A website (dealer area)	10	9	1	0	0	0	1	7	2	0
Error codes	7	7	0	0	0	0	0	4	3	0
Company A website (general)	7	6	1	0	0	0	0	4	3	0
Service tool	7	2	5	0	0	0	0	5	1	1
Manuals	6	4	2	0	0	0	0	3	2	1
*Talking with someone not at the dealership	5	2	2	1	0	0	2	1	1	1
*Other Company A electronic/internet materials	4	2	2	0	0	0	2	2	0	0
Application Help	2	2	0	0	0	0	0	0	2	0
*General search of the internet	2	1	0	1	0	0	1	1	0	0
*Other Company A printed materials	1	1	0	0	0	0	0	0	1	0
*Non-Company A printed materials	0	0	0	0	0	0	0	0	0	0
*Non-Company A electronic/internet materials	0	0	0	0	0	0	0	0	0	0
Total	172	86	64	17	4	1	39	65	36	32
Company A product sources	116	67	44	4	1	0	14	48	28	26
Non-Company A product sources	56	19	20	13	3	1	25	17	8	6

*Non-Precision Agriculture support sources

**Indicates dealers did not provide a response if the support source resolved the issue. Null responses were removed from the total to calculate the percentage of resolution for each support source.

APPENDIX B

Company A Precision Agriculture Support Source Survey

The purpose of this survey is to understand how we can better support you as you work with the Company A Precision Agriculture products, software, and services. We want to make working with Company A Precision Agriculture Support easier and faster and we want you to feel confident in the solutions we offer.

Please give us your feedback on the support you receive by completing this short survey. This survey should take no more than 10 minutes to complete.

Section 1

Question 1:

Have you had an issue with a Company A Precision Agriculture product or service in the past 3 months?

- Yes (continue to question 2)
- No (survey was complete)

Question 2:

We would now like you to think about the last time you had an issue with a Company A Precision Agriculture product, software, or service that you were not able to solve immediately and needed to take additional steps to solve.

First, please briefly describe the issue that arose. Was it around a specific product or service? Was it an installation issue or something that quit working? We just need a few words to describe the situation. Please be as specific as possible.

(Included a free form text field for the dealer to type their specific issue)

Question 3:

After you attempted to fix the problem, which of the following tools or information sources did you consult FIRST to solve the problem? Please select one response only

- Error(trouble) codes or messages from the product
- Manuals(e.g., technical manual, owner's manual)
- Company A's Website – general area
- Company A's Website – dealer area
- Application Help
- Service Tool
- Company A Precision Agriculture call center
- Dealer Support Center Solutions
- Dealer Support Center Case submitted
- General search of the internet
- Other Company A printed materials
- Other Company A electronic/internet materials or sites
- Other non-Company A printed materials

- Other non-Company A electronic/internet materials or sites
- Talking with someone else at the dealership
- Talking with someone else not at the dealership
- More trial and error work or crafting a “work around” fix
- Other (Please specify) *(Included a free form text field for the dealer to type source used)*

Question 4:

Using a scale of 0 to 100, how confident did you feel that the solution found through this source was correct?

(Included a slider bar that allowed the participant to move the bar from 0 – 100)

Question 5:

Why did you choose this source of information? Please select all that apply.

- This has, in the past, always had good information
- Right at hand, easy to access
- Easy to search
- Has the most in-depth information
- Has the most current information
- Has information that is easy to understand

Question 6:

Did (source selected in Question 3) provide the solution to fix the problem? Please select one response only.

- Yes (continue to section 2)
- Yes and No (Partially helped with the solution) (continue to Question 7)
- No, not at all (continue to Question 7)

Question 7:

What went wrong that you were unable to solve the problem and had to search another source? Please select all that apply

- Was not detailed enough
- Did not address my specific issue
- Was outdated
- Was too detailed to understand
- Did not fix the problem
- Fixed part of the problem, but not the whole problem
- Just didn’t feel right, I did not feel confident in the information
- I couldn’t find any information about my problem

Question 8:

What did you do next? Kept sourcing using one of the following sources:

- Error (trouble) codes or messages from the product
- Manuals (e.g., technical manual, owner’s manual)

- Company A's Website – general area
- Company A's Website – dealer area
- Application Help
- Service Tool
- Company A Precision Agriculture call center
- Dealer support center solutions
- Dealer support center case submitted (*continue to section 2*)
- General search of the internet
- Other Company A printed materials
- Other Company A electronic/internet materials or sites
- Other non-Company A printed materials
- Other non-Company A electronic/internet materials or sites
- Talking with someone else at the dealership
- Talking with someone else not at the dealership
- More trial and error work or crafting a “work around” fix
- Other (Please specify) (*Included a free form text field for the dealer to type source used*)
- Concluded there was no solution (*continue to section 2*)

The survey continued to ask the participant questions 4 – 8 until the participant indicated the source resolved the issue, submitted a dealer support center case, or concluded there was no solution. At that time, the participants would be directed to section 2 of the survey.

Section 2

Question 1:

How frequently do you use Company A Precision Agriculture Product Support materials to help you solve installation and repair issues with Precision Agriculture products, software, and services? Please select one response

Company A Precision Agriculture materials include:

Error (trouble) codes or messages from the product, manual (e.g., technical manual, owner's manual), Company A's website – general area, Company A's website – dealer area, Application Help, Service Tool, Company A Precision Agriculture call center, dealer support center

- Daily
- Couple times a week
- Once a week
- Couple times a month
- Monthly
- Less than once a month

Question 2:

Please think about all of the times you have used the following sources of information over the past 3 months and then rate how satisfied you are with this source of information to solve the installation and service problems you encounter. Please select one response for each item.

	Very Dissatisfied	Dissatisfied	Both Satisfied and Dissatisfied	Satisfied	Very Satisfied	I have not used this source enough to comment
Error (trouble) codes or messages from the product	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Manuals (e.g., technical manuals, owner's manual)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Company A Website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Application Help	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Service Tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Call Center	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dealer Support Center	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Field Teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 3:

For the Precision Agriculture Product Support information sources with which you were not satisfied, please indicate what needs to be improved. This is very important information for Company A as it will help us effectively focus our attention on the areas that most needs to be addressed. Please select all that apply.

	Doesn't provide enough detail	Too difficult to find an answer	Information is wrong or outdated	Information is confusing or difficult to understand	Does not provide a timely answer	I am satisfied with the accessibility and information available
Error (trouble) codes or messages from the product	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Manuals (e.g., technical manuals, owner's manual)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Company A Website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Application Help	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Service Tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Call Center	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dealer Support Center	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Field Teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 4:

Please let us know what we can do to make finding solutions to repair and installations easier.

(Included a free form text field for the dealer to type their specific issue)

This is the end of the survey. We appreciate you taking the time to complete this survey. As we have said, the goal is to ensure that we are supplying you with the information you need, in a format that best meets your needs, to answer the questions you have about Company A Precision Agriculture products and services.

Survey Invitation Email

Company A Precision Agriculture Product Support is continuously looking to improve how we can better serve those who support Precision Agriculture products at Company A dealerships. We would appreciate your feedback regarding your experience with Company A Precision Agriculture Product Support tools and services.

This survey should only take about 5-10 minutes to complete. Please complete the entire survey, once you start, as only the results from completed surveys will be captured.

We assure you that your individual responses and comments will be kept completely confidential and anonymous. This feedback will be used to understand how we can better support you as you work with the Company A Precision Agriculture products.

If this e-mail is being received in a general e-mail account for the dealership, please forward this message to those individuals who support Precision Agriculture products at the dealership. They will each be able to provide their input through the same survey link provided below.

Click [here](#) to start the survey. (This is a link to the survey)

If you are unable to click on the link above, please copy and paste the full URL above into your browser.

We appreciate your participation!

Company A Precision Agriculture Product Support

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