SALES STRATEGY EVALUATION OF A DRONE SPRAYING STARTUP IN THE AGRICULTURAL SECTOR

Dr. S Ramasubramanian, Mr. Avinash Vijayan, Mr. Sakthi Vel S

Associate Professor, Department of Aviation,

Vels Institute of Science, Technology and Advanced Studies, Chennai 600117, Tamil Nadu, India

aeronauticalscience@vistas.ac.in

Assistant Professor,

Department of Aviation,

MH Cockpit Private Limited – 600117, Tamil Nadu, India

avinashvijayan@mhglobal.info

MBA – Aviation & Airport Management

Department of Aviation,

Vels Institute of Science, Technology and Advanced Studies, Chennai 600117, Tamil Nadu, India

S2431vel@gmai.com

Abstract

The implementation of drones into farming has brought new possibilities of increasing efficiency, minimizing the dependency on labor and maximizing precision of crop protection. This research explores the sales approach utilized by a drone spraying startup within the agricultural industry, paying particular attention to farmer awareness, adoption process and factors determining customer acquisition.

The study was based on primary and secondary data, with primary data being collected through interviews with farmers and observations on a field level and secondary data provided by the company itself. Factors examined include awareness, demonstration, perceived value and trust affecting the adoption of drone spraying.

The results show that despite providing numerous benefits in the form of time saving, low chemical utilization and increased safety, the process of adopting the drone spraying was affected mostly by experience-driven factors, rather than financial considerations. Demonstration-driven sales approach turned out to be the most effective one.

This paper concludes with several recommendations, including localized marketing techniques, alternative pricing schemes and increased cooperation with farmer collectives.

Keywords

Drone Spraying, Sales Strategy, Agri-Tech, Farmer Adoption, Precision Agriculture, Technology Adoption

I. Introduction

The agricultural industry is one of the major sectors in India in terms of providing employment, securing food security and ensuring economic stability. However, in spite of advanced technologies and developments in other sectors, there are still various activities in farming that use outdated approaches involving lots of work and inefficiency. For instance, one such practice is pesticide spraying which requires intensive manual labor and time.

Manual spraying of chemicals by using a knapsack or even tractor-based spraying can be ineffective due to its lack of accuracy and excessive use of the chemical substance that may be hazardous to farmers' health.

Drone technology represents an innovative and beneficial tool for modern agriculture as it helps to increase spraying speed, ensure accurate application of chemicals and minimize dependence on labor force. Moreover, drone spraying decreases farmers' contact with hazardous substances.

At present, although the drone spray market is rapidly expanding, the problem of insufficient adoption of this service among farmers still exists.

The aim of this research is to analyze the sales approach of a particular drone spray business and evaluate its effectiveness as well as find out what impacts its adoption rate.

II. Problem Statement

While there are many advantages of using drones for spraying, its use is still low among farmers because most of them still use the conventional method of spraying, either because they are unaware of its benefits or are hesitant to embrace technological innovation.

The founders of drone companies will encounter difficulties when trying to convince their target customers

to purchase their product. Poor sales techniques may prevent them from expanding their customer base. This research seeks to determine the impact of sales strategy on decision-making by farmers.

III. Literature Review

Agriculture technology adoption has been widely researched in terms of efficiency, productivity, and sustainability. One of the best theoretical bases for understanding technology adoption is the innovation adoption theory by Rogers (2003). According to this theory, innovations pass five stages of adoption, namely awareness, interest, evaluation, trial, and adoption. As far as drone spraying service adoption goes, farmers are usually divided into adopter categories, and early adopters play an especially important role in convincing other people to use this technology.

Davis (1989) argues using TAM model that users' perception of usefulness and ease of use have a significant effect on adoption rates. Concerning agricultural sector, farmers tend to adopt the drone spraying services only when they can identify the benefits they offer, namely time-saving, decreased dependence on labor force, and better spray distribution.

According to FAO (2017), drone technology adoption in agriculture contributes to sustainable development due to resource optimization and minimized environmental impact. Zhang and Kovacs (2012) claim that unmanned aerial vehicles are especially useful in agriculture in terms of crop monitoring and spraying efficiency.

The research carried out by Tripicchio et al. (2015) revealed that using drones in agriculture saves labor costs and makes the process more efficient. The research conducted by Balafoutis et al. (2017) further revealed that the use of precision agriculture positively impacts sustainability.

In the case of India, the research conducted by Sharma et al. (2019) indicated that awareness and accessibility are the two key aspects that determine technology adoption among farmers. According to TNAU (2020), both demonstration and peer influence play a crucial role in the decision-making process when adopting new technologies.

Nevertheless, there are few studies that have focused on the impact of sales techniques and strategies employed in selling the drone technology to farmers. In other words, little research has been done on how startups convey their value proposition, build trust, and transform awareness into adoption.

This paper aims at filling this gap in the literature by investigating the sales strategies adopted by a drone spraying startup and identifying the key factors that influence technology adoption among farmers.

IV. Research Methodology

This study employs a descriptive research design to determine the efficiency of sales strategies employed by a drone spraying start-up company.

A. Data Gathering

Primary data was gathered using structured questionnaires administered among farmers, personal observations on farms, and interviews with sales representatives of the drone technology company. This data was gathered to determine how aware and willing farmers were to adopt drone spraying technology.

B. Sample

The research sample comprises rural and semi-urban farmers who may benefit from the use of drones for spraying purposes.

C. Research Instruments

• Percentage analysis

• Comparative analysis

• Basic statistical analysis

D. Variables

• Awareness

• Adoption

• Demonstration effect

• Pricing Perception

E. Sample Design

The research was carried out on farmers residing in rural and semi-urban locations who could use drones for their farming needs.

Sample Size: 150 respondents

Sampling Technique: Convenience sampling

Targeted respondents: Farmers and agricultural land owners

Type of data used: Primary data from questionnaire

Method of data collection: Field survey

Characteristics of Sample:

- Most of the respondents were small and medium sized farmers.
- Both users and non-users of drones were considered for the sample.
- Different farmers having different awareness levels regarding drone services were considered.

This sample was chosen to study the actual adoption behavior of farmers towards drone services.

V. Data Analysis And Results

A. Awareness and Adoption

The findings indicate that farmer awareness is directly related to adoption. Farmers who had been aware of drones or experienced them via demonstrations were more likely to adopt the technology.

It has been noted that just being aware of technology does not necessarily mean that the farmers will adopt it. Farmers like to witness the outcomes firsthand before adopting new technology.

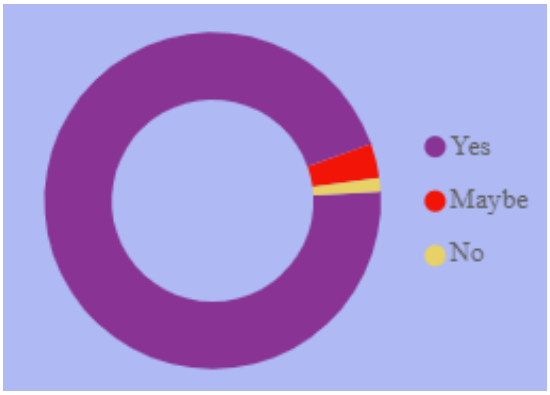

Fig. 1. Awareness Level of Farmers towards Drone Spraying Services

Interpretation:

It can be deduced from the diagram above that the number of farmers with moderate awareness is more than those who have a high awareness of drone spraying technology. This shows that even though the technology has been made known to the farmers, there is a lack of understanding of it.

Awareness alone is not enough to adopt. The farmers need to be exposed to the technology first in order to adopt it.

C. Cost and ROI Perspective

Although the initial costs of drone spraying are considered high for farmers, the eventual benefits like decreased costs and labor make it economically viable. Those that have already used this method found it more cost-efficient.

D. Hypothesis Testing

It has been determined through the analysis that awareness, demonstration, and pricing play a very important role in adoption, with statistical significance ($p < 0.05$). Of these three, demonstration emerged as the most impactful variable.

E. Regression Model

The equation describing the relationship among the variables under consideration is:

$$\text{Adoption} = \beta_0 + \beta_1 (\text{Awareness}) + \beta_2 (\text{Demonstration}) + \beta_3 (\text{Pricing}) + \varepsilon$$

In this case, it is apparent that demonstration plays the most important role, followed by awareness and pricing respectively.

F. Pearson Correlation Analysis

Table I: Correlation Between Sales Representative Explanation And Customer Satisfaction

Variables	Pearson's Correlation(r)	Sig. (2-tailed)	N
Sales Representative Explanation vs Customer Satisfaction	0.212	0.009	150

Hypothesis

Null Hypothesis (H_0): There is no statistically significant relationship between the quality of explanation provided by sales representatives and the level of customer satisfaction among farmers. Any observed association between these variables is assumed to be due to random variation and not indicative of a meaningful relationship.

Alternative Hypothesis (H_1): There is a statistically significant relationship between the quality of explanation provided by sales representatives and the level of customer satisfaction among farmers. This implies that effective communication and clear explanation by sales representatives have a measurable influence on customer satisfaction.

Interpretation

The Pearson correlation coefficient ($r = 0.212$) shows that there is a positive and weak relationship between sales representative explanation and customer satisfaction. The correlation suggests that the better the explanation from sales representatives, the higher the customer satisfaction will be.

The significance value ($p = 0.009$) is smaller than 0.01, which means that the relationship is statistically significant at 1%. With 150 sample data, the findings can be accepted since the significance value is smaller than 0.05.

Even though the relationship is not strong, the finding implies that communication plays an important role in changing customer perceptions, especially in introducing new technology services like drone spraying.

Decision

Since the p-value (0.009) is smaller than 0.01, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1).

Conclusion

It is proved that there is a significant relationship between sales representative explanation and customer satisfaction. Communication and demonstration play a major role in improving customer satisfaction in adopting drone spraying technology service.

VI. Results and Discussion

The research findings show that simply having technological advantages is not enough to facilitate adoption. Farmers rely heavily on trust, observations, and social influences before they adopt a new technology.

It is also clear that demonstration-based selling is an essential process for confidence building. The farmers will be motivated to use the drone-spraying service if they see positive results on farms.

Another important point is that once the value of the product is recognized, then price will become a minor concern.

VII. Recommendations

- Organize group demonstrations in the field
- Switch to flexible and open pricing systems
- Work together with FPOs
- Take advantage of early adopters
- Concentrate on localized communication methods
- Support customers through after-sale services

VIII. Conclusion

Drone technology for spraying can be very beneficial to agriculture and sustainability. But how farmers adopt this technology is mostly dependent on how they are introduced to it.

From the research results, awareness, demonstration, and communication strategies are seen to be more influential in adoption than the cost involved. The farmers need tangible proof before embracing new technology.

By using a demonstration approach when introducing drones to the farmers, startup companies will boost their market share.

IX. References

[1] E. Rogers, *Diffusion of Innovations*, 5th ed. New York: Free Press, 2003.

[2] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly*, vol. 13, no. 3, pp. 319–340, 1989.

[3] FAO, "The future of food and agriculture," Food and Agriculture Organization, 2017.

[4] Directorate General of Civil Aviation (DGCA), "Drone Rules India," 2021.

[5] J. Zhang and Q. Kovacs, "The application of small unmanned aerial systems for precision agriculture," *Precision Agriculture*, 2012.

[6] S. Tripicchio et al., "Drone technologies for agriculture," *Journal of Agricultural Engineering*, 2015.

[7] A. Balafoutis et al., "Precision agriculture technologies positively contributing to sustainable agriculture," *Sustainability*, 2017.

[8] P. Sharma et al., "Adoption of agricultural technologies in India," *Agricultural Economics Research Review*, 2019.

[9] TNAU, "Modern agricultural practices and technologies," Tamil Nadu Agricultural University, 2020.

[10] Industry Reports on Agri-Drone Market in India, 2023