Farmers' Perceptions Regarding the use of Digital Marketing Solutions Research Article Farmers' Perceptions Regarding the use of Digital Marketing Solutions

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Abstract

The foremost objective of the study is to explore the perception of the farmers regarding the application of Digital Marketing Solutions by the Bureau of Agriculture Information Khyber Pakhtunkhwa, for the dissemination of information from agriculture experts to the farmers across the province. These Digital solutions are virtual call center, Masking SMS (Agri-Info) and Robo calls. The study was qualitative, cross sectional and inductive. The source of the data has been primary and detail interviews were conducted at convenience from the registered farmers and agriculture officers working at call center and different districts of Khyber Pakhtunkhwa. The population of the study were agriculture officers working as call center agents and those registered farmers who are frequently calling on the virtual helpline (0348-111-70-70), receiving regular SMS that are broadcasted with (Agri Info) masking and Robo calls having different contents related to agriculture. After the implementation of Digital Marketing Solutions (virtual call center, Csms and Robo calls) all the barricades like communication, geographical and lingual have been over-throned as major outcomes. Previously, it was perceived by the farmers that the bureau of agriculture information department is only facilitating large-scale and influential farmers. With the introduction of such digital marketing solutions the perceptions of the farmers changed in a positive manner. As every farmer can call on the helpline number for their queries and complaints. This was the first time in Khyber Pakhtunkhwa that research has been conducted on the mentioned digital marketing solutions. So, the novelty factor of this research has its place in terms of uniqueness and examining different perspectives of digital marketing solutions. Such Marketing Solutions have a brighter scope in terms of empowering farmers. Other Government departments can also utilize such digital solutions to address public issues, concerns, queries and complaints.

Keywords: Digital Solutions. Agriculture Information, ICT, virtual call center, SMS (Agri-Info), Robo call.

Introduction

We are living in a Digital world where the dynamics of marketing changes radically. Digital marketing Plays an integral role in connecting customers with goods and services they want to acquire. The modern world of digital marketing is all about pertinence, engagement and relationship. Digital marketing is a strategic approach to promote goods and services across a range of digital media. Beyond basic connectivity and online marketing, digital marketing also leverages mobile technology, social media, search engines optimization, and a range of other digital channels. Digital marketing enables two-way communication, that helps the brands to interact with the customers on regular intervals. The customers can share their on-ground experiences, so the brands can work on the products and services to meet the customer expectations. Such activities increase customer loyalty. Digital marketing has given upsurge to influencer marketing, where customers are influenced by the views and

experiences shared by others (Nuseir et al., 2023). Digital marketing uniquely utilizes the internet to establish one-to-one connection between sellers and buyers, facilitating personalized interactions and continuous customer support. Digital marketing holds immense significance in developing countries like Pakistan, enabling them to leapfrog traditional barriers and achieve rapid economic development. Although still in its developmental phase, digital marketing in Pakistan is primed for a remarkable takeoff. With all the projections, even the most pessimistic indicating a substantial boom. The growth of digital marketing in Asia is anticipated to be driven by three key factors: affordable computer costs, a growing base of internet users, and a highly competitive market for internet services (Lee et al., 2022). Digital marketing has made it simple for the customers to access necessary information related to goods and services, compare products, and make informed decisions. Digital marketing has raised customer expectations for seamless, efficient, and personalized experiences. Business owners must attract customers to a specific digital doorstep, such as a website or landing page, mobile applications, social media pages etc. where they can access comprehensive information about the products or services and take rational decisions (Almaazmi et al., 2020). The role of Digital marketing has been significant in all the sectors of the economy, not only private sector but Government sectors have also utilized multiple digital tools to facilitate public for the betterment of the society. If we analyze the agriculture sector in Pakistan. It has contributed a lot in Pakistan economy as Pakistan is an agrarian society. The profession of agriculture has been a cornerstone of human civilization from its inception, experiencing a range of developmental stages and diversification in techniques and crops. Contemporary technologies had a profound impact on agriculture, greatly enriching the profession with advanced tools, techniques and precision farming methods (Mandal & Alam, 2020). The agriculture sector is a vital engine of the economy, contributing significantly to a nation's GDP, overall employment and economic well-being. Pakistan's economy relies heavily on the agriculture sector, which generates 22.35 percent of the country's GDP (Bureau of Statistics of Pakistan, July 2022) and Agriculture is a significant sector in Pakistan's economy providing employment opportunities for 37.4 percent of the labor force and serving as a source of income and livelihood for approximately 62 percent of the population both directly and indirectly. (Economic Survey of Pakistan). These statistics unequivocally demonstrate that the agriculture sector is the linchpin of Pakistan's economy, playing a vital role in the country's economic stability and growth. Beyond its direct contribution to the economy, agriculture also supports the industrial sector by providing critical raw materials and labor, thereby playing a vital role in the country's overall economic development. A farmer supervises and directs the activities of agricultural establishments, including farms, greenhouses, nurseries and other production facilities. In order to ensure efficient and productive operations. Farmers engage in various activities, including planting, cultivating and harvesting crops as well as managing livestock, supervising farm workers and performing post-harvest tasks depending on the specific types of farms. Farmers are the key players in the agriculture sector's productivity and the only way to enhance productivity is by adopting modern technology which requires the collective effort of farmers and other stakeholders (Kumar & Sinha, 2021). The agricultural extension services in Pakistan have adopted multiple approaches to share knowledge with farmers, but these efforts have not been successful in achieving the desired goals of improving agricultural productivity and development. Several constraints have hindered the effectiveness of agricultural extension programs in Pakistan, including the lack of incentives for extension staff, inadequate planning and policy support, limited human resources, and a lack of robust communication systems, resulting in a significant gap in knowledge sharing and technology transfer to farmers (Malik & Khan, 2020). To enhance agricultural productivity modern techniques and digital marketing tools can be employed to facilitate access to information, promote knowledge sharing and support farmers in adopting best practices, leading to improved yields and sustainable agriculture. The dissemination of information to rural areas has undergone a significant transformation from relying solely on traditional media like radio and TV to harnessing the power of modern communication tools like the internet and mobile phones. Modern agriculture nowadays is primarily dependent on digital marketing solutions due to geographical spread of farmers, increase in operational cost and limited staff members in the relevant departments. The agriculture information department serves as a crucial bridge connecting the generators of knowledge with the end-users, enabling the transfer of relevant information and technologies to farmers and other stakeholders (Hafeez et al., 2018). As technology advances, all aspects of our society are undergoing transformation, and the agriculture industry with its various stages and processes, is no exception i.e., Crop Cultivation, water management, Fertilizer Application, Fertigation, Pest management, Harvesting, post-Harvest Handling,

transportation of Food/Food products, Packaging, food prevention, Food processing, Food quality management, Food safety, Food storage and Food marketing. Accurate and timely information is essential for the farmers and all stakeholders involved in the various stages of agriculture including planting, growing, harvesting and marketing. By providing timely information, farmers will be able to enhance their productivity in a highly effective and efficient manner (Awan, Ahmed, & Hashim, 2019). Pakistan Telecommunication Authority (PTA) has demonstrated exceptional regulatory oversight, guiding the development of Pakistan's telecommunications industry along a path of robust growth and stability in urban and rural areas. Digital marketing solutions provide a platform for agriculture information department staff members to share knowledge and improved technologies with end-users. Ultimately leading to improved livelihoods and agricultural productivity (Malik & Khan, 2020). Modern communicational gadgets enabled farmers to obtain rationalized, reliable, relevant and appropriate information. ICTs are facilitating farmers to ensure their access to suitable and lucrative markets for their produce. The primary goal of this research was to investigate the effectiveness of different modern communication and digital tools in providing farmers with necessary information.

Farmers require accurate, timely, and cost-effective information to manage field challenges prudently. Digital platforms must bridge the knowledge gap between agriculture experts and farmers, enabling effective and efficient interaction.

Research Questions

1. How the Digital Marketing Solutions optimized by the Bureau of Agriculture Information are perceived by the farmers in addressing their queries related to agriculture?

2. What are the areas of opportunities that needed to be resolved by the Bureau of Agriculture Information Department to facilitate farmers with these digital solutions?

Research Objectives

- To examine the farmer’s perception in the context of the utilization of Digital Marketing Solutions by Bureau of Agriculture Information Khyber Pakhtunkhwa.
- To explore multiple channels to improve these existing digital solutions along with improvisation.

Problem Statement

Numerous studies have been conducted regarding the farmers' perceptions about the utility and effectiveness of ICT tools, providing valuable insights into their needs and preferences. In which internet, mobile phones, websites, TV and radio have been utilized by Bureau of Agriculture Information Department for the Dissemination of information. Despite this fact farmers usually perceived that the department is only assisting large-scale and prominent farmers. The reason behind such perception was limited staff members with the department, geographical spread of the farmers across the province and limited financial resources. In this research the latest digital marketing solutions has been discussed such as virtual call center, Masking SMS (Corporate SMS) and Robo calls. This has been the first time in Khyber Pakhtunkhwa that research has been executed on the mentioned digital marketing solutions. So, the novelty factor of this research has its place in terms of uniqueness and examining different perspectives of digital marketing solutions.

Significance of Study

The research has assisted the Bureau of Agriculture Information Department with the knowledge and feedback to evaluate the existing digital marketing solutions. It has also helped to identify areas that need further improvement and establish data-driven decisions to improve its services in order to better serve the farmers. The research outcomes empowered the Department to optimize its existing resources, identify new opportunities and develop effective strategies to address the challenges faced by farmers, leading to improved service delivery and farmer support. Ultimately, the research has assisted the Bureau of Agriculture Department for formulating future strategies related to agricultural education, dissemination of updated information and the capacity building of both farmers and agriculture staff leading to enhanced skill development and improved service delivery. The study has also provided insights into the farmers' experiences and perceptions of digital marketing solutions,

highlighting the advantages and benefits they have gained from utilizing these digital solutions. The successful implementation of digital solutions in the Agriculture Information Department can serve as a model for other government departments, such as Livestock, Health, Education, WSSP, Excise & Taxation and NADRA to adopt and utilize similar approaches for optimal outreach and impact (Aljumah et al., 2021).

Theoretical Framework

The theoretical context of the research is related to Uses & Gratification theory. Uses & Gratification theory was established by (Katz et al., 1973). It explains how individuals use various channels to fulfill specific needs and how this concept evolves over the period of time to influence businesses, groups and society. Initially, this theory focused on traditional media, but its principles are now being applied to diverse forms of modern media. This theory helps to understand how audiences engage with specific media channels and how to encourage target audiences to adopt emerging channels.

Literature Review

Digitalization is an emerging phenomenon that has given rise to a new paradigm where relevance, interaction and relationship are essential components. Relevance is the foundation upon which effective marketing have immense dependency, enabling the organization to connect with the target audience and generate meaningful interactions with the customers. In this phase knowing the customer is an important factor, as relevance can guide what the customer requires. This is very important phase of the process as knowing the customer psyche, usage patterns and other multiple attributes can play a vital role for the successful customer retention. It is followed by interaction, which is all about connecting with customers, ensuring two-way communication. That increases customer retention, builds trust and loyalty. Followed by feedback that initiates the prospects of improvements and personified the brand through personalized experiences. All the phases have a common factor of engaging the customer at all levels. Such stance will help the executor to ensure quality customer retention and upscaling the business from time to time (Nuseir et al., 2023). Relationship with customers plays a vital role through which marketers reach out customers from the phase of acquisition to retention. To build a strong relationship the organization has to develop trust, communicate consistently, identifying the customer needs, stay connected, offer multiple incentives from time to time, take feedback, hire dedicated customer service teams and address the issues promptly. Through effective relationships the scale of business can be increased by doing up selling and presenting new services and products to the customer. With an active relationship the company can win the trust of the customers. Hence, it can be useful to increase the volume of the business vertical in an effective manner. Digital marketing ensures two-way communication, that facilitates the brands to interact with the customers on regular intervals. The customers can share their on-ground experiences, so the brands can analyze the products and services they are offering to enhance the customer experience. Such activities can increase customer loyalty. Digital marketing has given upsurge to influencer marketing where customers are influenced by the views and experiences shared by others. Digital marketing has made it simple for customers to access necessary information related to goods and services, compare products, and make informed decisions. Digital marketing has raised customer expectations for seamless, efficient and personalized experiences. Businesses must guide customers to a dedicated online space offering a wealth of information about their products or services (Al Kurdi, Alshurideh, & Salloum, 2021). By investing in internet infrastructure and installing signal boosters to enhance TV and radio coverage, the government can significantly improve access to ICT facilities in rural regions. Promoting digital inclusion and bridging the gap in information access is very important in contemporary environment. Extension agents should empower farmers by educating them how to utilize modern ICT tools to access current agricultural information. With a special emphasis on educating young and middle-aged farmers regarding the utilities of information and communication services and encouraging them to leverage ICT tools for agricultural development. The Bureau of agriculture information department has a vital role in generating and broadcasting programs that foster agricultural development, leveraging various ICT technologies to rapidly disseminate current information and knowledge to stakeholders, thereby enhancing agricultural productivity and innovation (Kumar & Sinha, 2021). Modern agriculture nowadays is enormously dependent on Information and Communication Technology. Bureau of agriculture information department is the primary institutional domain that help in the dissemination and exchange of the agricultural information that can be highly beneficial to the farmers and end-

users. The Bureau of Agriculture Department has a significant role of broadcasting the necessary information from the agricultural experts to the farmers in an effective and efficient manner (Hafeez, Shamsuddin, Nazeer, & Saeed, 2021). The Ministry of Agriculture is responsible to execute extension services nation-wide in Pakistan. Agriculture extension services have contributed a crucial role in boosting crop yields, while the private sector has also contributed significantly to agricultural growth by promoting technology transfer at the grassroots level. Both sectors are working together to share knowledge and expertise with farmers. Agricultural extension is a well-established platform for sharing information and data that can benefit farmers. However, in many developing countries, agricultural extension efforts have struggled to effectively reach farmers with modern technologies and innovations (Malik & Khan, 2020). At the same time such digital solutions utilized by the agriculture department has helped the farmers in the best possible manner. The agriculture sector plays a vital role in supporting the industrial sector by supplying raw materials and labor. Farmers manage various agricultural operations including greenhouses, farms, nurseries and are responsible for tasks such as planting, cultivating, harvesting and overseeing livestock and labor. As the backbone of the agriculture sector farmers drive productivity. However, to enhance productivity farmers and other stakeholders must adopt modern technologies and innovative methods with collaboration (Kumar & Sinha, 2021).

Provincial agriculture information department employ various methods to disseminate knowledge to farmers, aiming to boost agricultural productivity. However, these efforts have fallen short of achieving desired results.

The key reasons for such limited impact include:

- *Lack of incentives for agriculture officers/inspectors.* As agriculture officers and inspectors are the front-line force of the department at ground level. So, the lack of fringe benefits is effecting the efficiency of the staff members.

- *Inadequate agricultural planning and policies.* It is very important to emphasize upon the policies and regulations that need to be implemented for increase in agriculture productivity.

- *Insufficient number of Agriculture staff members.* The number of staff members is not up to the mark, as the geographic dynamics are very challenging. So, there is a dire need to increase the staff members in order to ensure maximum penetration in the field.

- *Ineffective communication systems.* It is very important to ensure the effective communication at all levels within the organization and farmers on regular intervals.

These challenges hinder the effectiveness of agricultural extension services, ultimately affecting agricultural growth (Hashim, Ahmed, & Awan, 2021). However, the productivity of the agriculture sector can be enhanced through the application of modern methods and approaches to information through ICT. Previously, the major digital streams utilized for the propagation of information to farmers were Radio and TV. While currently modern ICT mechanisms like internet and mobile phones are utilized for information dissemination.

According to Aldosari, Muddassir, and Noor (2021) the study aimed to understand how farmers in Khyber Pakhtunkhwa, Pakistan perceive electronic media and how their demographic characteristics relate to their use of radio and TV for information. A random sample of 183 farmers were selected and data was analyzed using descriptive statistics and Chi-square tests. The results showed that most farmers (97.4% and 94.5%) believe that mobile phones and the internet are important sources of agricultural information, with only a small percentage (1.6% and 5.5%) strongly disagreeing. This suggests that farmers in the region value electronic media as a means of accessing agricultural information.

Furthermore, the study found a significant link between the respondents' level of education and their use of information obtained through radio. However, there was no notable connection between the respondents' farming knowledge and their application of information from TV and radio. The findings suggest that extension staff should encourage and support farmers in using electronic media (such as TV, radio, mobile, internet and helplines) to access innovative information on agricultural growth methods (Aldosari, Shunaifi, & Ullah, 2021). Khyber Pakhtunkhwa primarily relies on the agriculture sector, where the rural area population is approximately 80 percent and agriculture is considered their primary source of income. In Pakistan’s GDP, the agriculture sector

has got very significant position as its contribution in GDP is approximately 22 percent, with 40 percent in the employment of the labor force. Nevertheless, 31 percent of the provincial population remains to be food apprehensive with high rate of undernourishment (Agr. Policy, 2015-2025). Sugarcane cultivation is primarily focused in two regions of the province: the Northern belt, comprising Peshawar, Charsadda, Swabi, Mardan, Nowshera, Malakand and Khyber. The Southern belt consists of Bannu, Tank and DI Khan. This crop employs a large workforce in planting, harvesting and post-harvest processing as well as in promoting the crops. The province produces 56 million tons of sugarcane, which supplies to seven sugar mills. (Abbas, Shehbaz & Siqqiqui, 2021). Mandal and Alam (2020) has strongly advocated that the agricultural sector in Khyber Pakhtunkhwa lags in terms of outcomes, despite having access to advanced ICT facilities and infrastructure. Farmers continue to rely on traditional sources like radio, TV and printed materials. They also recognize the potential of modern technologies like mobile phones, internet and advanced radio and TV programs to improve agricultural innovations and productivity. The survey also revealed a widespread positive sentiment among respondents regarding the future of ICT in agricultural extension services, with expectations of enhanced access to information and communication technology once technical obstacles are surmounted. The Department of Agriculture Information uses telecommunications tools to share modern agricultural information from experts to farmers at the grassroots level, aiming to boost productivity.

These tools include:
- A virtual Call Center that can be managed remotely.
- Sending bulk SMS messages in Urdu to farmers with relevant agricultural information
- Robo Calls in local languages (Urdu, Pashto, Saraiki, etc.) that provide critical information and advice on domains like:
  - Cash crops
  - Weather forecasting
  - Fruits and vegetables
  - Fodder and livestock
  - General information
  - Seasonal advice
  - Productivity enhancement
  - Pest control
  - Government subsidies announcements and deals for farmers

These tools help to disseminate customized and actionable advice to farmers, addressing their specific needs and concerns. These digital solutions are serving farmers to get assistance and updated information from the agriculture call center experts through Mobile Phones related to ongoing issues (Raza, Khan, Shahbaz & Saleem, 2020). The study identified an additional character for the agriculture extension services to educate farmers about the use of modern information and communication technologies (ICTs) in farming. However, many extension specialists may need training and capacity-building programs to familiarize themselves with these evolving technologies. Extension agents must raise awareness among farmers about the benefits of using ICTs. Identify barriers that are preventing farmers from adopting modern information sources. Educate farmers on how to use ICTs as a reliable source of agricultural information. This task is challenging but with careful planning and execution, it is achievable (Awan & Ahmad, 2021).

Research Methodology

This study was executed in Khyber Pakhtunkhwa, a province in Pakistan. It is grounded in the philosophical framework of constructivism, which posits that knowledge is derived from human experiences, perceptions and ideas. The research employed a qualitative approach, using cross-sectional and a source of data has been primary as detailed interviews were conducted randomly to collect the data. The population of the study were agriculture inspectors and officers working as call center agents at call center and in remote locations of the multiple districts and those registered farmers who are calling on the virtual helpline (0348-111-70-70), receiving SMS (Agri Info) masking and Robo calls.

Population of the Study

The population of the study consists of registered farmers and agriculture officers who work as call center agents, both at the department's headquarters and in district-level offices. The Agriculture Information Department registers the farmers either online or through local offices across Khyber Pakhtunkhwa, enabling them to benefit from government initiatives like the Subsidy schemes, discounts etc. Currently, over 600,000 farmers are registered across the province including the newly merged districts. Approximately 100 agriculture officers serve as call center agents, either at the central call center or in remote areas at the districts level (bai, 2021).

Sample and Sample Technique

Clarke and Braun, (2013); Fugard and Potts, (2014); Guest, Bunce and Johnson, (2006) had explored that in qualitative research when detailed interviews were conducted. At point, the interviewer feels data saturation. Normally, sample size of 12 were considered as data saturation point keeping in view the Clarke & Braun observations. Therefore, sample of 13 was believed sufficient for the qualitative Analysis.

Since most agriculture officers work at the district level, a sample of 13 farmers and 13 call center agents (agriculture officers) from the call center were selected. A purposive sampling technique was used to gather detailed information and insights from individuals with diverse expertise in agriculture. Those farmers were approached who had regular interaction with the call center and agriculture department with relevant experience and exposure. This type of sampling is selective and based on judgment, ensuring that the chosen participants can provide valuable, updated and in-depth information.

Sources of Data

The data was collected through primary source, during that course detailed interviews were conducted from the farmers who are registered with the department and all those agriculture officers and inspectors that are working in call center as call center agents. Most of the officers of the department are working at the district level.

Data Collection Tool

To collect the necessary data, it's crucial to choose a suitable research instrument, tool or adapt an existing one. The selection of the instrument depends on the research design and the type of study being conducted. In this case, the study follows a qualitative design and data was gathered using a specially adapted interview guide with open-ended questions. The collection of the data was done through in-depth interviews with registered farmers and agriculture department officers at their convenience. This facilitated us to unfold the necessary information for accomplishing our objectives. As we focused on the understanding the perceptions of farmers and agriculture department officers working as call center agents regarding the utilization of digital solutions by the Bureau of Agriculture Information in Khyber Pakhtunkhwa. Agriculture officers Interviews were conducted at the call center and at district level, labeling them as Group 01 (R1-R13). We also interviewed registered farmers, labeling them as Group 02 (F1-F13).

Themes

In this study, three themes were under discussion. As per details given below:

1. Virtual Call Center (Smart office-0348-111-70-70)
2. Bulk SMS with Masking (Agri Info)
3. Robo Calls

Virtual Call Center

(Savić, Stančin, Jakus, & Tomažič, Virtual Call Center, 2010) signifies the importance of call center that operates virtually, meaning agents are not restricted to a physical location or traditional phone lines stations. They can receive and respond to calls from anywhere, using various devices like cell phones or smart devices regardless of their location. This flexibility allows agents to work remotely and still handle calls as if they were at the call center. Providing greater convenience and mobility for the staff members. The virtual call center has got most of the features that traditional call center contains. This solution empowers businesses to cater their customers'

requirements by routing their calls to the relevant departments. Multiple features of the virtual call center are given below:

In this digital solution, the service provider issues a Master number, that is also considered as Hotline number. It is a virtual number that has no physical sim. But on the other hand, multiple extension numbers are attached and mapped with this Master number in this study (0348-1117070) is a Master number utilized by the Bureau of Agriculture Department. Managing the master number and extension numbers through web portal is an exciting feature of this digital solution. The executor can assign free minutes allocated to master number with extensions. It empowers businesses to share minutes using the pool minutes feature. A call recording facility is also available in order to ensure and monitor the call agents' performance. During that course cloud services are used for data storage (that includes incoming calling numbers details, call recordings for quality purpose, outgoing calls data, missed calls data, incoming calls data that are made during off days or off peak hours). In order to facilitate the customer web portal has been designed with real time monitoring and user-friendly interface. The extensions mapped with Master number are also mobile numbers that can be operated remotely. The call agents can transfer calls to other agents during the calls. Hence, with all these features one mobile number can be the corporate identity of the department for all the related communications. There is an option of IVR for marketing current promotions or any other information related to the caller or target audience. During Covid-19, when all the offices were closed due to pandemic. The call center of the agriculture department was fully operational as all the call agents were working from home and addressing farmers queries and complaints.

Bulk SMS (CSMS)

Bulk SMS, also known as CSMS or corporate SMS is a web-based platform that enables users to send large volumes of messages quickly and efficiently. One of its key features is the ability to broadcast SMS with Masking, allowing users to customize the message's origin. In this study, the Agriculture Information Department utilizes this masking feature, labeling messages as (Agri Info), to enhance the significance and credibility of the SMS content. The Agriculture Information Department sends various types of messages in Urdu to farmers at different times and occasions, providing personalized and relevant advice on agriculture including:

- Crop-specific guidance (cash crops, fruits, vegetables, fodder, and livestock)
- General information
- Seasonal tips
- Crop productivity enhancement
- Pest management
- Weather forecasts
- Government announcements, subsidies and offers for farmers.

To ensure two-way communication call center virtual helpline number (0348-1117070) is also mentioned in every SMS. The executor of the portal has several choices in the web portal i.e., maintaining subscriber list, establishing numerous campaigns, scheduling, quick SMS, creation of sub users, profile management, Complete record of SMS sent to users successfully or failed (Hossain, 2020).

Robo Calls

Robo calls in marketing refer to automated phone calls that use pre-recorded messages or voice messages to communicate with customers or prospects. An automated call has been generated from the system with prerecorded voice message. It is an important digital solution that can be very useful for those target audiences who cannot read or have a low literacy tendency.

As a digital solution, robo calls can be beneficial as per below terms:

1. Deliver personalized messages
2. Increase customer engagement
3. Reduce manual dialing and labor costs
4. Improve response rates
5. Enhance customer experience

In the context of Bureau of Agriculture Department, robo calls can be employed to:
1. Send weather updates and flood alerts
2. Provide crops management advice
3. Offer market prices and trends
4. Share best practices and tips
5. Promote products and services

Robo calls can be integrated with other digital solutions like SMS, email and mobile apps to create a multi-channel marketing strategy. They are particularly useful for reaching a large audience, especially in areas with limited internet connectivity (Ghosh, 2019). But in this research the application of Robo calls has been done creatively by the Bureau of Agriculture Department. Such facility is available in the web-based application of Bulk SMS. Preferably the Robo call duration should not be more than 30 seconds. It is a very handy digital solution for those farmers who are unable to read SMS or having low literacy tendency. So, such solution can be used for illiterate farmers in order to transfer the necessary information related to agriculture.

Conclusion

The implementation of digital marketing solutions such as virtual call center, bulk SMS (corporate SMS) and robo calls have successfully overcome obstacles like geographical barriers, language differences and communication gaps. Before the implementation of such digital solutions farmers were of the perception that the agriculture department is only facilitating large-scale and influential farmers. These tools have transformed farmers' perceptions of digital solutions provided by the Bureau of Agriculture Information Department in Khyber Pakhtunkhwa. By utilizing these tools, farmers can now access vital information on new technologies, weather forecasts, pest management, Government subsidy schemes etc. This enables them to boost agricultural production and stay informed about various government initiatives (bai, 2021). The virtual helpline has shown great promise, with agriculture experts receiving an average of over 3000 calls per month. To further improve the service, the department should consider implementing a callback system for missed calls due to various reasons such as network issues, low balance, calls made during weekends or after office hours. This platform can also be helpful to create a virtual marketplace, enabling farmers to sell their yields via call center agents. Additionally, the Masking SMS (CSMS) tool should be enhanced by sending targeted and timely SMS campaigns to ensure effective communication (Malik & Khan, 2020). Currently, approximately 1 million SMS are sent on monthly basis, but this number should be increased to maximize the impact. To enhance effectiveness, targeted SMS campaigns should be implemented. Additionally, robo calls have untapped potential and should be utilized more extensively. The adoption of digital tools by the Bureau of Agriculture Department in Khyber Pakhtunkhwa has been met with overwhelmingly positive feedback from farmers, who now have easy access to expert advice and information. This has dispelled the previous notion that the department only address influential farmers queries and problems, as all farmers can now easily reach out for guidance by calling the virtual helpline 0348-111-70-70 (bai, 2021). Timely, accurate and relevant agricultural information is crucial for farmers to boost productivity and manage their time effectively. Digital solutions can bridge the literacy gap and ensure that vital information reaches farmers promptly. Additionally, the department should prioritize registering the farmers across the province, as this data will enable the government to easily contact and assist them during various situations like pest attacks, floods or any other natural disasters. Ultimately enhancing their support and facilitation. (Rabbi, Idrees, Ali, Zamin, & Bilal, 2020).

Implications

Following steps should be taken by the Bureau of Agriculture Information Khyber Pakhtunkhwa:

Practical Implications

Regular trainings should be conducted for Agriculture officers at call center to enhance their communications skills at call center capacity. They must have a knowledge of all the services provided by the department. The department should work on their communication skills, customer service skills, phone etiquette, time management, conflict resolution etc. If the farmers' calls are missed, the call center agents should call them back to provide in time information. Such steps will bridge the communication gaps between the farmers and the

department. There might be multiple reasons for missed calls but by calling back, the farmers will feel obliged. Sometimes the calls are dropped or disconnected, this issue should be addressed with the service provider. The Department should utilize this vicinity as a virtual market for farmers. This will benefit farmers to trade their produces with good profit margins. With virtual markets, farmers will be able to increase their outreach to multiple buyers and sellers. This will help them in terms of exploring new markets, better price discovery, real time supply chain management, decrease in transaction and transportation costs etc.

Methodological Implications

Upscaling of the existing structure is very important as farmers' expectations and needs are growing gradually. The introduction of modern technology and upgrading of the existing structure will help both parties (department and farmers) in terms of achieving their goals and objectives. Csms message should be simple and precise. Such step will improve the clarity of the messages, it will increase readability and engagement of the farmers. Time management is required when broadcasting Csms and Robo calls. It is very important as farmers are dealing with nature and multiple unforeseen challenges. So, the broadcasting of the messages should be on time and precise to ensure efficiency and effectiveness. Regular callers should be approached by the call center from time to time, by providing them with personalized services, priority services, multiple loyalty and retention schemes. Keeping in view the literacy rate of the farmers Robo calls should be executed frequently at convenient times. Department should avail these digital solutions to register farmers across the province. Robo calls durations should not exceed 30 seconds, as by doing so the audience might lose interest.

Future Study

An attempt was executed to explain the dynamics of the Digital solutions used by Bureau of Agriculture Information Khyber Pakhtunkhwa, but various aspects are still untapped i.e., Quantitative study can also be conducted to acquire the opinion of large sample size from different districts. Moderation and Mediation Analysis is required to find out the relationship between digital marketing variables and perception of the farmers. Mobile Application as new variable that has been launched by the Department of agriculture information, unregistered farmers perceptions regarding the digital marketing solutions and establishment of virtual market for farmers.

Limitations

This study relied on primary data collected through detailed interviews from farmers and agriculture officers. However, managing time and scheduling appointments for these interviews posed a significant challenge. Additionally, the farmers' widespread locations made it difficult to access them for interviews. Due to limited resources, a smaller sample size was used, which was a constraint in conducting the study. The limited sample size was a major hurdle in gathering comprehensive findings.

References

Nuseir, M. T., El Refae, G. A., Aljumah, A., Alshurideh, M., Urabi, S., & Kurdi, B. A. (2023). Digital marketing strategies and the impact on customer experience: A systematic review. *The Effect of Information Technology on Business and Marketing Intelligence Systems*, 21-44.

Alshurideh, M. T., & Al Kurdi, B. H, (2021). Facebook advertising as a marketing tool: Exam-ining the influence on female cosmetic purchasing behaviour. *International Journal of Online Marketing (IJOM), 11*(2), 52–74.

Al Kurdi, B., Alshurideh, M. T., & Salloum, S. A. (2021). The moderation effect of gender on accepting electronic payment technology: A study on United Arab Emirates consumers. *Review of International Business and Strategy, 31*(3), 375–396.

Abbas, S., Khan, G. A., Shahbaz, B., & Siddiqui, M. T. (2021). farmers' perspective on the teaching methods used by public and private sectors extension in the punjab, pakistan. *Pakistan Journal of Agricultural Sciences, 58*(1).

Aldosari, F., Al Shunaifi, M. S., Ullah, M. A., Muddassir, M., & Noor, M. A. (2019). Farmers' perceptions regarding the use of information and communication technology (ICT) in Khyber Pakhtunkhwa, Northern Pakistan. *Journal of the Saudi Society of Agricultural Sciences, 18*(2), 211-217.

Aldosaria, F., Al Shunaifia, M. S., Ullah, M. A., Muddassir, M., & Noor, M. A. (2017). Farmer community perceptions: Use of Information and Communication Technology (ICT) by farmers in the province of Khyber Pakhtunkhwa-Northern Pakistan.

Awan, S. H., Ahmed, S., & Hashim, M. Z. (2019). Use of information and communication technology ICT in agriculture to uplift small scale farmers in rural Pakistan. *American Journal of Engineering and Technology Management, 4*(1), 25-33.

Aziz, M. T., & Khan, A. (2021). Utilization of ICTs for Availing Agricultural Information in District Charsadda, Khyber Pakhtunkhwa-Pakistan. *Sarhad Journal of Agriculture, 37*(3), 797-806.

Butt, M. T., Qijie, G., Luqman, M., Zakaria, M., & Hassan, Y. (2017). Mode of ICTs applications in plant production and protection technology in rural Punjab-Pakistan. *Transylvanian Review, 25*(13), 1-12.

Ghosh, M., & Prabu, P. (2019). Empirical analysis of ensemble methods for the classification of robocalls in telecommunications. *International Journal of Electrical and Computer Engineering, 9*(4), 3108-3114.

Hafeez, A., Shamsuddin, A., Nazeer, S., & Saeed, B. (2018). Barriers and challenges for technology transfer in ecosystem of ICT sector of Pakistan. *Journal for Studies in Management and Planning, 4*, 178-188.

Kante, M., Oboko, R., & Chepken, C. (2019). An ICT model for increased adoption of farm input information in developing countries: A case in Sikasso, Mali. *Information processing in agriculture, 6*(1), 26-46.

Kudayeva, F. K., Kaygermazov, A. A., Karmokov, M. M., Kerefov, M. A., Edgulova, E. K., & Bechelova, A. R. (2017, September). Information and communication technologies in solving a free boundaries problems. *In 2017 International Conference" Quality Management, Transport and Information Security, Information Technologies"(IT&QM&IS) (pp. 1-3)*. IEEE.

Khandelwal, C., Singhal, M., Gaurav, G., Dangayach, G. S., & Meena, M. L. (2021). Agriculture supply chain management: a review (2010–2020). *Materials Today: Proceedings, 47*, 3144-3153.

Malik, S., & Khan, A. (2020). Gap analysis of farmers' capacity building by public and private agriculture extension sectors in central plain valley of Khyber Pakhtunkhwa, Pakistan.

Mandal, T. K., & Alam, S. (2020). Measuring the Attitude of the Farmers towards Agriculture as a Profession. Ind. J. Pure App. *Biosci, 8*(5), 47-50.

Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *The public opinion quarterly, 37*(4), 509-523.

Braun, V., & Clarke, V. (2022). Conceptual and design thinking for thematic analysis. *Qualitative psychology, 9*(1), 3.

Rabbi, F., Idrees, M., Ali, S., Zamin, M., & Bilal, H. (2020). Farmers' perceptions and adoption of information and communication technologies (ICTs) in peach (Prunus persica L.) production and marketing. *Sarhad Journal of Agriculture, 36*(3), 882-893.

Raza, M. H., Khan, G. A., Shahbaz, B., & Saleem, M. F. (2020). Effectiveness of information and communication technologies as information source among farmers in pakistan. *Pakistan Journal of Agricultural Sciences, 57*(1).

Silverman, D. (2024). Interpreting qualitative data.

Salam, A., & Khan, M. Z. (2020). Farmers' perception analysis about the use of information and communication technologies (ICT) in agriculture extension services of Khyber Pakhtunkhwa. *Sarhad Journal of Agriculture, 36*(3), 754-760.

Saiz-Rubio, V., & Rovira-Más, F. (2020). From smart farming towards agriculture 5.0: A review on crop data management. *Agronomy, 10*(2), 207.

Hrustek, L. (2020). Sustainability driven by agriculture through digital transformation. *Sustainability, 12*(20), 8596.

Awan, S. H., Ahmad, S., Khan, Y., Safwan, N., Qurashi, S. S., & Hashim, M. Z. (2021). A Combo Smart Model of Blockchain with the Internet of Things (IoT) for the Transformation of Agriculture Sector. *Wireless Personal Communications, 121*(3), 2233-2249.

Khan, N. A., Qijie, G., Sertse, S. F., Nabi, M. N., & Khan, P. (2020). Farmers' use of mobile phone-based farm advisory services in Punjab, Pakistan. *Information Development, 36*(3), 390-402.

Javed, A. (2020). The scope of information and communication technology enabled services in Promoting Pakistan Economy. *Asian Journal of Economics, Finance and Management,* 165-173.