The Role of Digital Technologies of Public Relations Programs in Supporting Agricultural Development: A Survey Study of the Iraqi Ministry of Agriculture

By

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Abstract

Public relations programs have taken the lead in implementing the plans, activities, and tasks of public relations in institutions. They also have an effective role in influencing and winning over the public for the benefit of the institution's goals, as well as drawing the mental image of the institution. The present study explores the identification of public relations use of digital technologies in public relations programs to clarify how the programs contribute to modern digital technologies in the completion of their activities and to reveal the contribution of public relations practitioners in employing modern digital technologies to support agricultural development. The present study mainly aims to identify the role of modern digital technologies of public relations programs in supporting agricultural development. The survey and descriptive method is selected as it is appropriate and optimal in order to address the research problem because it is occurring in the present time. The nature of the use of the survey method in descriptive studies is also a motive to adopt it in the present study. The questionnaire tool is adopted to collect data from the research community of (124) individuals using the inventory method due to the small size of the research population. The present study reached some results, including that the use of the websites of the agricultural institution, with the progress in the agricultural extension programs and the good level in introducing farmers to the harms of agricultural pests are used by public relations divisions. Accordingly, the present study presented conclusions, including that the Facebook site is effective, in addition to that the loss of the budget is Among the elements of implementation of public relations programs with a variation in the levels of programs. There is an increase in the value of agricultural extension programs. In contrast, the lowest level is in rural development programs.

Keywords: Public Relations Programs, Digital Technologies, Agricultural Development.

Introduction

The most important thing facing the world today is the food crisis and how to achieve global food security. Therefore, developed countries have moved towards initiating the process of sustainable agricultural development, under the shadow of digital technologies and technological development in the agricultural and industrial field and all areas of life. Public relations are also concerned with activating the issue of agricultural development, and creating and preparing public relations programs that serve the agricultural development process. Agricultural public relations programs are the beating heart of agricultural work and the

essence of its activities and works. The topic of the present study also examines the role played by digital technologies of public relations programs in supporting agricultural development.

The present study aims to identify how digital technologies are used in public relations programs. It also aims to clarify how public relations programs contribute to the completion of the activities entrusted to them, as well as to reveal the contribution of public relations practitioners in employing modern digital technologies to achieve support for agricultural development.

Research in public relations programs in light of modern digital technologies to support agricultural development in one way or another is of scientific, practical, and societal importance, which pushes for careful study to reach facts and results that can be used in establishing the rules for the solution and setting mechanisms that serve the agricultural process. As a result, it aims to strategize pulling the community out of the conditions of hunger, poverty, and deprivation, based on the trend towards agricultural development work by launching agricultural public relations programs. The two researchers used the survey descriptive method using the questionnaire tool in collecting data. They also used a comprehensive inventory method for the research population of public relations practitioners working in the agricultural establishment. The present study is spatially limited to the site of Ministry of Agriculture in Baghdad and temporally from 1/3/2022 to 30/4/2022.

The methodological framework

The Problem Statement

Developed countries are interested in the policy of agricultural development, as it has an effective role in achieving food security that occupies the mind of the world today. On the part of public relations in agricultural institutions, focus should be placed on this vital issue. It is the responsibility of public relations practitioners to adopt a public relations program in light of modern digital technologies. It can contribute to supporting agricultural development through modern means of information and communication technology. This technology is also characterized by its accuracy, speed, and spread, which makes public relations programs and activities more effective and influential in the institution's audience. As a result, it achieves satisfaction and enhances credibility with the external audience of farmers, as well as The development and upgrading of the job performance of the internal audience of public relations practitioners and employees of the institution. The process of investing digital technologies in public relations programs has clear effects in the process of support for the development of agricultural development. Therefore, the research problem revolves around the main question about the role of digital technologies of public relations programs in Supporting agricultural development. Sub-questions emerge from this question as follows:

1   What are the uses of digital technologies by public relations practitioners in public relations programs?
2   What are the contributions of public relations programs use of digital technologies in achieving their activities?
3   What is the contribution of public relations practitioners in employing modern digital technologies to support agricultural development?

Significance of the Study

The significance of the present study is due to the scarcity of research, studies, references, and sources in addressing the topic of public relations programs and their relationship to agricultural development in light of digital technologies. This topic has become

one of the necessities of the daily life of society and institutions. As for the second trend, it is of economic importance, through the great role played by public relations and its effective programs to contribute to the agricultural development process, which is an important part of economic development through various programs such as awareness, educational, media and development programs, which has the most important role in this vital field that affects the security and sustenance of the citizen. The significance of the present study increases in the following aspects:

Scientific Significance

The scientific significance of the present study is due to its scientific enrichment of the scientific library in general and public relations in particular. It adds a modern feature to the employment of digital technologies in public relations programs and activities in the field of agricultural development. Agriculture is the vital artery in achieving food security for the citizen. The present study also shows the ability and potential of public relations programs through digital technologies to effectively influence the audience of the institution, build good relations through dialogue and understanding, and win their loyalty to the institution in order to achieve its policies in agricultural development.

Practical Significance

This significance stems from helping workers in public relations in agricultural institutions to employ digital technologies in public relations programs and their effects on the external audience of farmers and on the internal audience represented by the employees of the agricultural institution, and to identify the means and methods of communication with the public to achieve the main goal of urging the public to support Local agricultural development. This is technically done through digital technologies, websites, platforms, social media, and multimedia that are used by public relations practitioners. The ability and ability of public relations programs to change trends in public behavior is shown to pay attention to agricultural development.

Societal Significance

The societal importance stems mainly from the deterioration of the Iraqi agricultural situation, with the many challenges facing this vital sector, including water problems, the problem of desertification and the problem of securing the food basket. Therefore, the need for concerted efforts as individuals, society and institutions is required to achieve community awareness towards supporting and developing agricultural development and food security. The public and society should also be informed about the services, activities and policies of the agricultural institution. Communication with the public should be effective through advanced digital technologies and introducing them to the agricultural institution and its news, activities and services provided to the public in order to achieve confidence and credibility and extend lines of cooperation with the public in order to contribute to improving agricultural development to achieve food security.

Objectives of the Study

The objectives are accomplished by answering the research questions by taking systematic and practical research measures. These objectives are as follows:

1   Identifying the uses of digital technologies by public relations practitioners in public relations programs.
2   Clarifying how public relations programs resort to modern digital technologies to accomplish their activities.

3   Exposing the contribution of public relations practitioners in employing digital technologies to support agricultural development.

Methodology

The two researchers adopted the descriptive survey method because it is appropriate and optimal in describing the phenomenon or research problem in the present time. Data is also collected, analyzed, and interpreted, then results are presented and conclusions are drawn to come out with decisions or laws that serve the research process, in addition to the fact that the survey method is one of the methods used in Descriptive studies. The two researchers also used the questionnaire tool to collect data on the uses of digital technologies by public relations practitioners in public relations programs and how they contribute to the completion of business and activities to reveal the contribution of public relations practitioners and their employment of digital technologies in order to support and promote agricultural development.

Population and sample of the study

The population of the present study consists of public relations practitioners from the employees working in the public relations of the Iraqi Ministry of Agriculture in the capital, Baghdad.

Limits of the Study
The Spatial Limits

The site of the Iraqi Ministry of Agriculture in the capital, Baghdad.

The Temporal Limits

The temporal limits extend from the distribution of the questionnaire forms on 3/1/2022 until its collection and completion of its procedures on 4/30/2022.

The theoretical framework

Public Relations Programs

The public relations program is considered as a limited-scope action plan sourced from the general plan, as it is within a specific period of time based on a prepared and drawn budget (Al-Mashakbeh, 2014). The public relations program is defined as a set of activities and campaigns that are directed to achieve a goal for a specific audience or a specific and possible audience. It includes the general public. It is also considered part of the general plan and its backbone. It can be considered planning at a partial level (Nowairi, 2016). The most important feature of public relations programs is achieving its goal that aims at improving the mental image of the institution so that it is stuck in the minds of the public (Al-Tai'e, 2017). The most difficult thing facing public relations practitioners is the obstacles in how to convince the public administration to approve the budget allocated for public relations programs. However, public relations can overcome this crisis and help the administration official to make the best choice through two directions (Lee, et al., 2012):

A   Improving and implementing the central functions of public relations in a way that serves the organization's objectives.
B   Fulfilling the obligations and responsibilities of public relations practitioners, and maintaining communication with the internal public of the institution.

Strategic Planning for Public Relations Programs

Planning is considered one of the most important main functions of public relations. Through it, various activities are implemented to achieve the goals of the institution. Planning

identifies various media messages that are appropriate for the public, then the communication method is determined with the target audience such as bodies, funding agencies, individuals, opinion leaders and all groups concerned with the activities of the institution (Al-Shammari, 2016). Planning for public relations programs includes planning campaigns that serve the work and goals of the organization, which requires public relations practitioners to carry out research procedures that enable them to face problems and analyze the situation, after which the campaign is designed. Public relations should set goals and determine the type, amount, and time frame for change, as well as For documenting the product and adding touches of creativity in solving problems or tactical implementation processes (Erica, 2006). Public relations practitioners and the strategic manager should also pay attention to management, issues, trends, policies, and the structure of the organization. They should also have a strategic vision about future potential problems, which the organization is expected to face over the coming years, how to address them, and the necessary readiness of the organization. There are four skills required for a job Strategic planning for communication in the work of branding programs and activities, which are as follows (Ronald, 2017):

1   Understanding the process of research and strategic planning.
2   Being aware of the methods of making strategic choices.
3   Selecting some options from the list of tactical options.
4   Evaluating the effectiveness of the General Marks Program after the completion of all operations.

Communications and implementation of public relations programs

Communication means the process of exchanging information, ideas, and points of view among individuals. It takes place in an ascending, descending, lateral, or horizontal manner for all departments of the organization (Hussein, 2015). (Wolber Schramm) describes communication as the process of exchanging information and ideas that takes place from one individual to another or a group. Its material is ideas and information. As for its tools, they are words and language." As for media, it is the dissemination of these ideas. Its reliance is mainly on communication. If communication does not occur, there will be no media at all (Ismail, 2003). The essence of activities and public relations programs is the process of completing contact with the public to exchange information and opinions. Hence, communication is the media message or the channel that carries the symbols in the message leads from the sender to the receiver (Hamadi, 2017). Psychologists (Ed Diner and Robert Biswas) acknowledge that the frequent use of mobile phones, text messages and social media is evidence of the desire to communicate. They also acknowledge that the audience Relationships need to be strengthened and documented. This relationship produces a greater degree of well-being that is characterized by mutual interest and understanding as well as verification of the health of the other person. Hence, the Internet and social media platforms contributed to gathering individuals. The mobile phone and social media keep the process of exposure to interactions visible and lingering around the clock or seven days a week. The wide Internet network has been described as the highway for transferring digital information across the world, which indicates that the Internet aims to build a new media network that can be an alternative to traditional media (Campbell, et al., 2016).

Contemporary Public Relations

The concept of public relations is characterized by the establishment and maintenance of natural links between the institution and the public in order to achieve mutual understanding, satisfaction, and trust in an effort to gain public support and public opinion (Diab, 2014). Public relations can be defined as planned efforts to influence public opinion through successful performance relying on two-way communications from the institution to its audience and from

the public to the institution. In fact, the world of public relations has changed radically in recent years due to the development of modern digital technologies of communication and methods of communication and interactions with them. The influence on the practice of public relations is profound and cannot be ignored. The report of the (Arthur W. Page) Association in (2007) entitled (The Authentic Enterprise) indicates that public relations practitioners should adopt four skills for work as follows (Gregory, 2010):

1   Building and managing trust in all its dimensions.
2   Renewing and instilling values in the institution.
3   Building good relations with the audience of the institution.
4   Enabling the institution to use the tools and skills of the new media.

The digital discourse of public relations in modern media is closer to the mental processes that enter into the formation of the instrumental act. Then, they re-create the text and reorganize the entire structure of behavior. Cultural tools can be either material such as computers or psychological such as language, gestures, writing, reading, and memory techniques. Therefore, all tools are psychological or semiotic at the same time in the minds of users receiving text and written messages in order to accommodate the recipient audience of the digital media message sent by the public relations agencies (Thuriow, 2011). Based on the institutions' need for public relations, any institution that carries out its work in implementing a public relations program, or in a media campaign for public relations, or to be in a crisis, it is obvious that communication occurs with the public, then the institution appears through the shape of the building or the banners raised, the office décor, the method of answering phones, the logo or trademark, the annual report, and the website, which will all transmit some facts about the organization to the public. For these reasons, public relations should determine how to communicate and choose good management for communications (Newsom and Hayes, 2008). In the digital age, digital technologies have changed the requirements presented to the public relations practitioner and the methods of carrying out tasks, as well as the nature of the public relations profession, so planning has become more important than before. Effective writing constitutes the essence of marketing in digital technology, so institutions began to use digital communications to reach to the target audience, as it communicates with customers to expand the size of the audience through e-mail, websites, digital newsletters, marketing, blogs, and conference calls. All these tools are available to public relations professionals (aronson, 2007), Contemporary public relations are described as digital, as digital public relations is defined as managed communication between the organization and its audience through the use of Internet applications, including websites, electronic games, and text messaging services that provide information via the Internet and integrate text, graphics, images, and video clips (Ayad, 2010).

Modern technical means
Digital technology
The meaning of technology is multiplied and varied according to the vision of the researchers from the angles of their interest and their own culture. The word technology is of Greek origin. It means a set of accumulated and available knowledge and experiences, and the regular, organizational, and administrative tools and means that a person uses in performing work Or a certain job in the field of their daily life to satisfy material and moral needs, whether at the level of the individual or society (Ahsan, 2018). Technology means applied performance or the science that is concerned with improving performance. It is used to denote the different technical methods for the production of devices equipment, machinery and products (Abu Arja, 2013).

As for digitalization or digitization, it is defined as the process of changing from an analog form to a digital form." Digital is characterized by speed and spread everywhere, and its elements consist of processes, services, work, products, and business models. Today, digital is no longer an option, but rather an imperative for any institution or company. From another angle of digitalization in the field of information technologies, there are five main categories of digital technologies related to information, which are as follows (Gerhard and Kleinemeier, 2017):

A Persons
B things
C Data
D treatment
E The network that is employed in linking all of the above together.

Internet and digital transformation

The idea of establishing a decentralized communication network began in the early sixties of the twentieth century. In (1982) APPANET was divided into two parts (Ibrahim, 2019):

A MILNET, which is the network for military domains.
B   NSFNET, which is the network for civil affairs and scientific research.

The Internet is defined as a giant computer network consisting of several smaller networks. Anyone connected to the network can roam in it, get all the information through it, or talk to another person anywhere in the world. The Internet is a collaborative system for forwarding messages and connecting with computer networks. Internet users can display information in one of the following ways (Douglas, et al., 2018):

A Presentation of information on the global network
B Exchanging e-mails
C Participation in electronic discussion forums (newsgroups)
D Sending files from any computer to another via (FTP and HTTP)
E Using each other's computers if they have the appropriate passwords

Computing techniques and information technology have worked to create a protocol in the dense reader network, with the aim of improving remote sensing and being anti-collision and preventing any problems in this regard. For this reason, the protocol was based on the Anti-Collision Mechanism for the Friend-Neighbor Reader (NF RA), with the aim of providing higher throughput in A dense reader network, so this technology revolutionized many digital applications (Suleiman, et al., 2005). Based on the public's confidence and popularity in digital technologies, it was adopted through written communication via the Internet, such as e-mail, instant messages, and chatting by mobile phone such as WhatsApp and social networking sites like Facebook, which led To increase public and media awareness of the linguistic methods and features used in communication, as well as the use of labels such as (conversational speech) or (text speech) to refer to the language transformed into abbreviations and symbols in text messages of the SMS system (Rodney, et al., 2015), but great challenges have emerged. Such challenges have been faced in terms of big data and information management. The flow of data between storage and computing resources necessitates the analysis of large data sets. This leads to redoubling efforts to search for a high level of parallelism for the level of important data by using modern methodologies for emerging applications. Big data applications need to respond

to real-time challenges of the data set, which will provide an interactive connection with low latency and the latest analytical results (Wang, 2018).

Communication technology

Rapid developments in the field of communication technology and digital technologies push towards creating a contemporary environment for a digital communication system. Communication is defined as the processes by which information is transmitted between individuals or institutions with meanings, guidelines and agreed upon methods (Al-Zaidi, 2010). It is one of the pillars on which the Public relations program is based, which does not mean informing the public or conveying news and information only, but it goes beyond the stage of transmitting influential communication that creates a good impression in the hearts of the public, as institutions aspire to improve their mental image before their audience and public opinion through communication and the transfer of useful, effective and influential information to the public (Mahmoud and Al-Khateeb, 2016). In order to bring about technological change, public relations practitioners are required to address change on a large scale in the internal communications programs of the organization first, and pay attention to critical short-term issues facing the work of the organization, as it must be understood and faced by all officials and managers within the organization. It is assumed that change programs create A clear and realistic vision of what can be achieved without relying on many exaggerated expectations (Oliver, 2010). The communication network is the most important asset in communication technology manifolds, as well as computers and data network terminals. There is a functional relationship between the outputs and inputs in the multi-layered (archi) layer that form one or more boxes for use by the upper layer. In this way, the highly complex communication problem can be overcome in Data networks (Hayki and Moher, 2007). Among modern technological communications is the entry of the cellular mobile phone, which is one of the most important innovations in electronic and technological communications. Cellular mobile telephone communications are enabled by some cellular networks and mobile devices connected to each other by radio frequency spectrum. These cellular networks consist of thousands of nodes that help users of mobile devices in achieving huge numbers of tasks (Asif, 2019).

Social media

Social media is one of the social networks on the Internet. The British Encyclopedia defines social media as participatory community sites, whose members participate in social life and social communication to establish close social ties." The American Association for Marketing defines social media as those social networks that are available on the web and they pave the way for individuals and groups to create a personal account for them and share it among other members (Haroun, 2017). Everyone wants to use social media for a variety of reasons, including for the purpose of sending pictures or informing the public about the place of residence or just for chatting. Social media is not limited to communication only with random topics with some individuals, but it can be used as a name for business and marketing, so targeting the audience through social media has become especially important to highlight business and services and win customers for institutions, companies and organizations (Gray and Tox, 2018). In the era of the Internet and social media, the production of newspapers has shrunk and the number of newspaper pages has decreased. Public relations practitioners are responsible for updates in the organization's account. There are two things that appeared when journalism entered the environment of social media. Firstly, the sustainability of journalism as a profession, and secondly, the uncertainty about its future (Bossio, 2007). The process of manufacturing and producing media in the old traditional media institutions began to face a complex environment, and the reason is due to contemporary technological developments such as digitization And the Internet and the emergence of modern communication devices, in

addition to the growing interest of the participatory public in supporting the services provided and the various web platforms, so the social media is increasingly subject to mass communication for communication between individuals and fame in general (Lygmayr and Cinziatto, 2015).

Electronic press and modern media

New media or electronic media is a group of communication technologies resulting from the intermarriage of the computer with the traditional means of media. It is also the integration of the computer and its networks and multimedia. The new media includes websites, multimedia, the Internet, computer games, and CDs, so the new media is a dynamic interactive media that includes sound, image, and text in one file. The user can interact with the media content and comment on it (Sabti, 2018). The most important thing in the media and electronic journalism today is that they do not work in isolation from each other, as the different media talk to each other as much as they talk to the audience. The relationship between multimedia forms is a dialogue of the relationship between the media and its audience. It is similar to the forms of dialogue media that encourage their audience to enter into interactive dialogue relations to contribute and participate. Technological progress confirms the dialogue relationship between media users and their audiences immediately (Bainbridge, et al., 2015). As for journalism, there is a possibility of anyone producing news by simply having a phone number On a tablet or laptop. News is everywhere through mobile devices. News can also be found on television and computer screens in offices, homes, car radios, bus waiting areas, and airports. It comes from newspapers, websites, news sites, digital information and blogs, as well as social media. And videos on Facebook, e-mail, text messages, and photos. In the digital age, newsrooms produce newspaper websites, blogs, and video clips of their own, and then mix them with content links from other institutions (Anderson, et al., 2016). Electronic journalism also has some features such as instant journalism and digital journalism. The electronic newspaper and electronic journalism is a form of communication with the public through cyberspace. Electronic journalism is defined as a periodic electronic publication that contains current events, whether they are related to public or private topics, as they are read by a computer and are available via the Internet and sometimes they are linked to a printed form (Abdulfattah, 2014).

Agricultural Development
Sustainable Agricultural Development

Agricultural development is linked to the development of the rural community, so rural development and its theoretical directions are related to the emergence and development of rural sociology, which depends on local and governmental efforts (Al-Hafnawi, 2014. Sustainable agriculture means that it is a system of plant and animal production activities in a specific place and continues in the long term. In this regard, the World Commission for Environment and Development defines sustainable agriculture as the development that meets the needs of the present without compromising the ability of future generations to meet their needs (Al-Dulaimi and Abdulrazzaq, 2020). Agriculture has a major role in sparking the shift from traditional farming to modern and extended farming. This is why the development of agricultural technologies works to improve productivity and create surplus agricultural labor. Agricultural development provides partial solutions to stop the problem of hunger, destitution, and food poverty. This problem in itself is very serious in today's world. Before thinking about how to promote agricultural development, there is a necessary need to identify the nature of agriculture in developing country, in addition to the difficulty of understanding and identifying the steps necessary to stimulate agricultural development without that knowledge, as well as how these changes influence on the stakeholders or persons involved in agricultural development (Norton, et al., 2010).

Food security

The importance of food security increases in improving the national security of every country in the world. After the loss of food security, it is one of the biggest determinants of security and stability of countries locally and internationally. Food security is defined as the ability of society to provide the basic nutritional needs of the people, while ensuring the minimum needs (Ibrahim, 2016). In the past, the concept of food security reflected education in the official policies of states, which means different things to different people and changing over time as a sufficient measure of reward. Rather, the quality of green readers means increased crop production and sustainable environmental agriculture over time. In 1974, the World Food Summit was held. At that time, the concept of food security reflected the concerns of the world and expressed the size and stability of food supplies for countries and societies, so the term food security became synonymous and parallel to the food self (Mergos, et al., 2017). It does not mean that food security is just a sufficient amount of food, but that the quality of food provided to the public is also of great importance. Thus, food security means diversified food of high quality for a healthy life, just as the green revolution means increasing crop production, and sustainable environmental agriculture has the ability to provide safe and healthy food at a price that is suitable for society in a sustainable and safe way of production while ensuring that food is easily available. If this system is applied, most of the residents in rural neighborhoods will be able to meet the rest of their needs, such as education, health, housing and food by conducting this system accurately (Hashmi and Shafiullah, 2003).

Agricultural Extension

Agriculture is a science and art. It is the process of manufacturing and producing plant and animal crops that benefit the human being. The French Rural Economic Association defines the term agriculture as the work by which natural powers are used to produce plants and animals to secure human needs (Salih, 2014). Agriculture is defined as tilling the soil with the aim of preparing it for cultivation or gardening (Salama, 2009). The traditional view of agricultural extension is that it carries out the process of transferring agricultural technology and training farmers and guiding them on how to use it. This concept has evolved in the present era until it is understood that agricultural extension facilitates access of farmers, their organizations and market actors to knowledge, improved techniques and information. It also facilitates their interaction with partners in the relevant institutions to help them develop their skills and technical, administrative, and organizational practice (Sigman, et al., 2014). The primary agricultural extension organization structures were from the top to the bottom, and the extension process takes place through agricultural extension officials, farmers share with them to obtain information and experience without paying anything for these services. The American model was organized on the basis of a cooperative system in terms of control and financing between the federal and state and the boycott. This model proved successful, and it is known as technology transfer because it was developed in scientific research stations and universities (sekeram, et al., 2008).

Agricultural Techniques

There are various modern technologies in the agricultural field. For the purpose of facilitating the topic, it has been divided into the following headings:

The concept of digital agriculture

Agriculture is increasingly affected by the digital revolution. Digital agriculture refers to the process of employing information and computer technologies with the aim of improving the profitability and sustainability of agriculture. Digital agriculture is also defined as the use of advanced technologies to accurately match agricultural inputs with needs." Computational technologies are available everywhere and provide new possibilities, and this depends on data

intensively and is part of the Fourth Industrial Revolution, which is characterized by the process of merging technologies working to blur the lines between the physical, digital, and biological fields. Digital agriculture applies to all crop systems. It reflects a major shift from general management of farm resources to highly improved management (Glose, et al., 2008).

Technologies of hardware, software, and agricultural machinery

Satellites are an important source for using remote sensing systems to update information on agricultural crop patterns and determine the cultivated area in order to complete the assessment of food production trends. The importance of monitoring irrigated crops increases with the increase in water demand, as it requires remote sensing analysis of multi-season crops and diversification of projects and the collection of multiple images collected at different stages (Thenkabail, et al., 2009). On the other hand, climate change affects agricultural crops and thus food security, so agricultural societies must adapt the agricultural situation to climate change and the rest of the challenges, tools, and techniques based on information and communication technology that aims to enhance Decision-making through reliable, accurate, and timely information. Among the advanced technologies are drones for agricultural use, which can provide valuable data to benefit from in agricultural policies and decision-making (Sylvester, 2017).

Nanotechnology

The word (nano) is derived from the Greek Arabic (nanos) meaning (dwarf) and it is dealt with today in the sense of (billion), as the word (nano) is associated with the unit of the meter, so it is called (nanometer) which means the unit of spatial measurement that is one billionth of a meter. Professor Norio Taniguchi coined the term (nanotechnology). In 1981, the scanning tunneling microscope was developed that can see individual atoms. As an example of the possibility of this microscope, it is assumed that a micrometer is cut into a thousand equal pieces. The length of each piece becomes a nanometer, and then it cannot be observed even with a light microscope. For this, very small parts need a special tool for imaging on the nanometer scale. These small parts include viruses and DNA (Haick, 2013). The American Foresight Institute defines nanotechnology as a set of emerging technologies, in which the structure of matter is controlled on a nanometer scale to produce new Useful materials and devices and unique in their properties (Ramsden, 2009). Nanotechnology refers to technology that is introduced at the nanoscale level and has applications in the real world. The integration of nanotechnology and its technologies provided advanced solutions to many environmental problems, water, energy, and Biotechnology and information technology (Bhushan, 2017).

D. Biotechnology in Agriculture

Biotechnology has great dimensions because it includes biological species and living cell masses, as its derivatives aim to reach useful products. The US Congress defines technology as any technology in which living organisms or parts thereof are used to make new or modified products with the aim of improving plants or animals or photographing micro-organisms for special uses (Hassan, 2007). Tissue culture has emerged as a science that has enormous potential in plant protection, plant production, horticulture and forestry. It also contributes to improving human health and protecting the environment. There are four main approaches to preserving genetic assets in laboratories. It is possible that they lead to developing Tissue bank as follows (Anis and Ahmed, 2016):

1   Preservation by using refrigeration.
2   Working to multiply the planting of buds and their natural growth.
3   A culture of slow growth and cultivation of rooted, renewable and long-term roots.

4 Practical applicability and long-term retention of regenerative potential with minimal chances of genetic instability.

E Organic farming technology

Excessive use of chemical and mineral fertilizers is a source of pollution for the soil, water, and plants. Hence, there is a reason for launching the expansion of organic farming programs using organic fertilizers manufactured through agricultural waste in order to recover nutrients and organic compounds in a way that the plant can benefit from (Shaheen and Al-Sayed, 2016).

The theory of excellence and its models in public relations
James Grong's Theory of Excellence

The theory of excellence in public relations is an integrated group of several theories that were developed from the seventies to the eighties by James E. Grong in the study that lasted for (15) years under the auspices of the International Association of Research Foundation for Business Communication. The theory was considered after Conducting interviews with the heads of public relations, executives, and employees of (327) institutions, as well as non-profit organizations, associations, companies, and government agencies in the United States of America, the United Kingdom, and Canada. It is also defined as those good, long-term relations with the targeted strategic groups (Nicky, 2005). The theory of excellence is an extension of systems theory. The theory consists of four models of public relations in institutions. In essence, it aims to improve the professionalism of public relations and to describe and find characteristics related to effective public relations, so public relations officials should adopt a campaign of principles in order to raise the level of excellence. Among these principles are the following (Sarhan and Fakhruldin, 2021):

A Public relations participation in strategic management and decision-making.
B Empowering it in the dominant coalition and direct reporting relationship with senior management.
C Public relations should be headed by a manager and not as a technician.
D Ethics and integrity are very important in the public relations profession.
E Excellent public relations should be an administrative function that is separate from other functions, such as marketing, for example.
F The use of the symmetrical system of internal communications based on dialogue.

As for public relations efforts regarding programs and campaigns, Grong Dozier defines it as providing continuous communication efforts to develop the relationship with the target audience without specifying the end point, as it includes campaigns with strategic efforts, but they are restricted to a specific time period, and the campaigns aim to achieve a specific goal and within a framework of a specific time period until its completion. Then, Grong developed a series of principles for the general theory, which included four levels (Karelia, 2014:

A the program.
B Departments.
C Organizational.
D Economic.

In order for the level of the program to be more effective for achieving the goals, the public relations department must be more strategic and distinct from marketing and practice that is identical to two-way communications. The theory of excellence emphasizes the

importance of committed leadership and organizational integrity as basic values and integrated components of any successful organizational efforts for public relations. Building honest and productive bonds with all stakeholders, especially those entering from institutional employees is important, as the mixed practice of similar and asymmetric two-way models should be conducted. Grong reaffirms The importance of continuity and permanence of good behavior of institutions and good relations with the public (Adam, 2004).

Models of Excellence Theory

First; It is necessary to define what a model is. A model is defined as a formal, pictorial, or mathematical structure that explains the relationship between the elements and variables that are studied to contribute to simplifying knowledge, organizing it, explaining practical phenomena, and helping researchers explain and predict. The model is described as close to theory and procedural concept. It has the ability to give the opportunity for the process of understanding and analysis (Zainuldin, 2017). The model is an example of a thing in the sense of taking an image on the example of an image of a thing, but its condition is known from it. It is a representation of a system, process, or service of information technology. It is also a configuration element that is used to help understand or predict future behavior (Al-Janabi, 2015). Grong presented four communication models for public relations, through which it is possible to understand functions of public relations and its communication activities. The models can be perceived in the either-or form. The first is either symmetrical or asymmetrical. As for the second, it is the direction of the flow of communication, either in one direction or in two directions. These models have been used to explain the history of modern public relations and its development over a century, from the primitive state to the current one, and the history that progressed from During which the models are both progressive and linear with this (Browning, 2010). The symmetrical two-way communication model often supports dialogue, and focus should be on Achieving consistency in the relationship between the public and the institution, which is the ideal state for public relations. Dialogue contributes to achieving this state (Theunissen and Rahman, 2010).

The Applied framework

Digital technologies

What are the uses of digital technologies by public relations practitioners in public relations programs?

The results related to this question indicate that the total arithmetic mean is (2.25) and the average level and standard deviation is (0.434). The responses of the researched population ranged between (always to sometimes) on all paragraphs of this question. This indicates a high dispersion in the responses. The mechanisms of public relations communication in the ministry with the public through some communication sites are not at the required level. The results show that the highest value is scored by the paragraph (public relations divisions use websites in the agricultural institution to implement their programs), with an arithmetic mean of (2.59) With a standard deviation of (0.585). The value of the variance coefficient is (22.587). This paragraph ranked first in terms of relative importance, as public relations divisions have been proven to use websites in the agricultural institution to implement their programs. The lowest value is scored by the paragraph (Public Relations divisions use Telegram to enhance their relationship with the public) with an arithmetic mean of (1.9) and a standard deviation of (0.737). The value of the variance coefficient is (38.789). This paragraph ranked fifth in terms of relative importance.

Table (1) *The responses of the surveyed population members to the question: What are the uses of digital technologies by public relations practitioners in public relations programs?*

Response Trend	Relative Importance	Variance Coefficient	Standard Deviation	Arithmetic Mean	Always	Sometimes	Never		Paragraphs	No.
Always	1	22.587	0.585	2.59	79	39	6	**No.**	Public Relations divisions use the websites of the Agricultural Corporation to implement its programmes.	**1**
					63.7	31.5	4.8	**%**		
Always	2	24.98	0.617	2.47	66	50	8	**No.**	Public Relations Divisions use Facebook to communicate with the public.	**2**
					53.2	40.3	6.5	**%**		
Sometimes	4	33.881	0.681	2.01	29	67	28	**No.**	Public Relations Divisions use YouTube to communicate with the public.	**3**
					23.4	54	22.6	**%**		
Sometimes	5	38.789	0.737	1.9	28	56	40	**No.**	Public Relations Divisions use Telegram to enhance relation with the public.	**4**
					22.6	45.2	32.3	**%**		
Sometimes	3	31.404	0.716	2.28	54	51	19	**No.**	Public Relations Divisions use WhatsApp to enhance relation with the public.	**5**

Public relations programs

What are the contributions of employing digital technologies by public relations programs in the implementation of their activities?

The results related to this question reveal that the arithmetic mean is (2.75) and standard deviation is (0.296). The responses of the researched population are (agree) on all paragraphs of this question, as the results show that the highest value is at the paragraph (agricultural extension programs) with an arithmetic mean of (2.89) and a standard deviation of (0.318). The value of the variance coefficient is (11.003). This paragraph ranked first in terms of relative importance, while the lowest value is scored by the paragraph (rural development programs) with an arithmetic mean of (2.56) and a standard deviation of (0.545). The value of the variance coefficient is (21.289). This paragraph ranked fourth in terms of relative importance.

Table (2) *The responses of the respondents to the question: What are the contributions of employing digital technologies by public relations programs in achieving their activities?*

Response Trend	Relative Importance	Variance Coefficient	Standard Deviation	Arithmetic Mean	Agree	Neutral	Disagree		Paragraphs	No.
Agree	1	11.003	0.318	2.89	110	14	---	No.	Guiding Agricultural Programmes	1
					88.7	11.3	---	%		
Agree	2	15.343	0.420	2.77	95	29	---	No.	Agricultural awareness programmes	2
					76.6	23.4	---	%		
Agree	4	21.289	0.545	2.56	73	48	3	No.	Rural development programs	3
					58.9	38.7	2.4	%		
Agree	3	15.343	0.425	2.77	95	29	---	No.	Agricultural Educational Programs	4
					76.6	23.4	---	%		
		10.764	0.296	2.75			**General Mean**			

Agricultural development

3 What is the contribution of employing modern digital technologies by public relations practitioners to support agricultural development?

The results related to this question indicate that the arithmetic mean is (2.72) and standard deviation is (0.316). The responses of the respondents are (agree) on all paragraphs of this question. The results indicate that one of the contributions of public relations in supporting Agricultural development is introducing farmers to the harmful effects of agricultural pests. The results show that the highest value is scored by the paragraph (Introducing farmers to the

mechanism of using agricultural pesticides). The variance coefficient is (18.094). This paragraph ranked first in terms of relative importance. The results indicate the agreement of the respondents on the contributions of public relations in supporting agricultural development in the paragraph of introducing farmers to the mechanism of using agricultural pesticides. The lowest value is scored by the paragraph (Explanation of the mechanism of using chemical fertilizers), with an arithmetic mean of (2.68) and a standard deviation of (0.503). The value of the variance coefficient is (18.769). This paragraph ranked fifth in terms of relative importance.

Table (3) *the responses of the respondents to the question: What is the contribution of employing modern digital technologies by public relations practitioners to support agricultural development?*

Response Trend	Relative Importance	Variance Coefficient	Standard Deviation	Arithmetic Mean	Agree	Neutral	Disagree		Paragraphs	No.
Agree	4	18.094	0.503	2.78	102	17	5	No.	Introducing farmers to the mechanism of using agricultural pesticides	1
					82.3	13.7	4	%		
Agree	1	16.679	0.457	2.74	93	30	1	No.	Familiarizing farmers with the harmful effects of agricultural pests	2
					75	24.2	0.8	%		
Agree	5	18.769	0.503	2.68	86	36	2	No.	Explaining the mechanism of using chemical fertilizers	3
					69.4	29	1.6	%		
Agree	2	17.844	0.48	2.69	87	36	1	No.	Developing modern agricultural approaches	4
					70.2	29	0.8	%		
Agree	3	17.904	0.487	2.72	91	31	2	No.	The use of advanced agricultural technologies such as machines and devices	5
					73.4	25	1.6	%		
		11.618	0.316	2.72				**General Mean**		

Conclusions

1   The process of using the public relations of the websites affiliated with the agricultural institution indicates that it carries out digital technical activities, and that most of these activities are concentrated on the Facebook site.

2   Despite the poor performance in communication between public relations in the agricultural institution and its audience to implement public relations programs and its low level using Telegram and some other sites, there are clear activities in the results from the investment of Facebook.

3   There is a weakness in the balance of tasks for the implementation of public relations programs at a time when agricultural extension programs are at the forefront of the contributions of public relations programs for digital technologies. It is noticed that there are less interesting and effective levels such as development programs.

4   It is evident that there is support and backing by the agricultural institution to inform the external public of farmers about the harmful effects of agricultural pests.

5   It is clear from the results that there is an interest and focus on explaining the mechanism of using chemical fertilizers in supporting agricultural development although the paragraph about supporting agricultural development operations ranked last.

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