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Comparison of Crop, Fisheries and Livestock Information Displayed on Agriculture Websites

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ABSTRACT

The swift evolution of information technology has doubtlessly profited a number of industries within this country, of which agriculture is one. The existence of new and developing technologies has greatly assisted agriculture, and the term 'modern agriculture' entails the extensive technology used to enhance the quantity and quality of agriculture productivity. One of the most important technologies employed is the Internet, and the main attempt of this paper is to evaluate the information contained on agriculture websites. The data for this study was gained using content analysis on 27 selected agriculture websites maintained by a number of government agencies. The websites were divided into three groups, namely Department of Agriculture, Department of Fisheries and Department of Veterinary Services. The findings conclude that each website has its own unique identity, while displaying information with regards to the expertise of the organization behind the site. Further analyses confirm that information with regards to highly potential crops/fisheries/livestock, available courses and financial information are highly sought after by users. To further improve the websites, issues with regards to a lack of technical agricultural technical information should be addressed.
KEYWORDS: Website evaluation, agriculture information, website development.

INTRODUCTION

Agriculture has long played a role in development. In Malaysia, agriculture generated 12% of the country's national GDP in 2010. Moreover, its contribution to enhancing the community in a socio-economic sense, particularly in terms of offering employment opportunities, is clear: two out of every ten Malaysians are employed by the agriculture sector. Furthermore, Malaysia has a great number of commodity plantations, such as rubber, palm oil and rice. In this new era, the development of agriculture is consistent. Communities, particularly young ones, have started to turn their focus to agriculture as a result of an inclusion of technology, particularly information and communication technology (ICT), in the industry, and such a scenario has been used wisely in profiting the industry (Hassan et al., 2009). As technologies become more integrated with agriculture, they are proven to result in decreasing consumption in terms of time, capital and energy (Barton, 2003). The Internet is one of the main ICT applications that has been adapted in agriculture, particularly for the purposes of information dissemination and sharing (Shaffril et al. 2009). Doubtlessly, the Internet has assisted farmers in many ways, from building up business connections and increasing their income, to acquiring information and knowledge. Among the main Internet applications that has been proven useful and reliable to the agriculture community is websites (Chisita, 2012).Though a number of international studies have confirmed the usefulness of websites in assisting farmers and officers within their country (Chisita, 2012; Davis, 2010; Burke and Sewake, 2008), things are not going the same way in Malaysia as there are fewer number scholars who have placed their interest in studying the content of agriculture websites. Furthermore, according to Shaffril et al. (2009) the level of usage of agriculture websites in Malaysia among farmers is still discouraging. In light of these gaps, this paper aims to evaluate the information displayed on agriculture websites in Malaysia, and it is expected that this will assist concerned parties to generate the best strategies to embolden farmers in using websites as one of their information sources.

THE POWER OF AGRICULTURE WEBSITES

Creating knowledgeable farmers

Referring to a past study conducted by Tripp (2006), information makes its own unique contribution in agriculture, as disseminating information to farmers makes them more knowledgeable, which in turn assists the

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industry to develop well. Websites permit access to information that assists farmers to gain recent and updated data while overcoming their problems (Barton, 2003). Websites have their own strengths in terms of disseminating information, and such information is unrestricted by time and space. Gakuru et al. (2009) confirm that usage of websites in agriculture development is advantageous as it enables farmers to seek information germane to agriculture products and services. By offering such advantages, websites will eventually become seeds of information – for the public generally, and for farmers specifically.

Ease of the communication process

Barton (2003) confirms that websites offer farmers with the capacity to communicate over long distances with their colleagues, concerned parties and universities. Farmers can share their thoughts while gaining different and unique ideas from their local and international colleagues. In addition, via websites, new agriculture information can be disseminated swiftly and accurately to farmers, while researchers from universities can share their research outputs with farmers. In addition, websites are considered to be one of the preferred online services for farmers, based on the fact that website communication consumes less money than telephone costs.

Strengthening marketing aspects

Muske et al. (2004), conclude that farmers agree that possessing and surfing websites can double their agro-business profits, as websites synergize their marketing efforts. Having websites in the industry enables farmers to gain information with regards to the places and persons that offer the best prices for their agriculture products. Barton (2003) reflects on the suitability of Internet commerce in the agriculture industry in terms of the fact that it reduces the 'distance' between farmers and potential buyers, widens their networks, diversifies their marketing sources and decreases the time consumed in selling and buying processes. Doubtlessly, the Internet generates plethora of opportunities for farmers to market their products and to stay competitive in the market. Cozart (1998) accentuates the roles of websites as a crucial selling tool which is deemed important for farmers to stay competitive in demanding and challenging markets, and states that, via websites, farmers have the opportunity to consistently promote, disseminate and share information with potential buyers about their agriculture products. In addition, Little (2000) suggests that farmers need websites in order to purchase goods and services, make deals, attend online auctions, accumulate sales and minimize capital expenditure.

Economic efficiency

As most of the capital expended can be reduced via website usage, farmers' profits can be increased. As no mileage is involved, fuel costs can be saved. Via websites, processes for purchasing and selling consume less time and energy, and hence reduce costs of human resources. Communication via websites is proven to be cheaper than using telephones, and communication made via websites can be saved and restored. As so many costs are cut, therefore, farmers have the chance to enjoy more profits from their agriculture products. Furthermore, websites offer opportunities for farmers to seek the persons and places that offer the cheapest prices for seeds, fertilizer and other things for their agriculture operations (Barton, 2003).

THE WEAKNESSES OF AGRICULTURE WEBSITES

Technical problem

Agriculture websites are advantageous in term of providing unlimited flow of information but it can be a number of technical problems. Poor internet connection particularly in the remote areas will obstruct the smoothness of websites surfing and create frustration among the farmers. Moreover, still, in some remote areas, access to internet connection are lacking or unavailable thus limit the usage of agriculture websites among the locals including the farmers.

Technical words and not in line with farmers needs

Too much technical words placed on the agriculture websites will results in lack of understanding and confusion on the information among the farmers particularly the new one. As majority farmers in Malaysia possess low to moderate level of education achievement, agriculture technical and scientific words should be minimized. Then, agriculture information demonstrated in the websites programs sometimes are not in line with the needs of local farmers, and this can be caused by the lacking of information and failure of relevant parties to upload recent and updated agriculture information which then may create frustration among them.

INFORMATION NEEDED BY FARMERS FROM WEBSITES

Ozawa (2003) suggests that agriculture information to be divided into five main groups, namely 1) agriculture input (fertilizer, seeds, pesticides, water, agricultural equipment, etc.); 2) education; 3) agriculture technology; 4) financial and 5) online markets. Meyer (2005) supports this by stating that agriculture information on input (seeds and fertilizer), equipment (tractor), financial, markets, infrastructure and natural sources (water, air and weather) are vital to farmers. In addition, farmers need to be exposed to other information germane to land preparation, weed and pest control, climate, seed-sowing techniques, pesticides and harvest preparation information.

Foust-Prater (2000) confirms that online information with regards to commodity prices, weather, farm machinery and chemical prices are of prime interest to farmers. A study by Tologbonse et al. (2008) and Azarian et al. (2012) confirm that farmers place their interest in agriculture information relating to profits, land management, agriculture credit, livestock handling and marketing. One of the tools that is deep-seated in every aspect of the global community and is highly suited to disseminating such information is ICT, as it has power to enhance and share information and knowledge among farmers. Carter (1999), Meyer and Boon(2003) and Morrow et al. (2002) seem to agree with this, as they view information as one of the most valuable resources in agricultural and rural development programs. The growing demand for agricultural information and products can provide opportunities for producers to sustain and improve their livelihoods through the technology utilized.

MATERIALS AND METHOD

This study employs content analysis; analyses were originally run on 55 agriculture websites that are maintained by selected government agriculture agencies. The websites included are from four main groups, namely the Ministry of Agriculture, Department of Agriculture, Department of Fisheries and Department of Veterinary Services. This paper focuses only on 27 selected websites which involve three main components in agriculture, namely crops (14 websites), fisheries (3 websites) and livestock (10 websites) (Table 1).

Table 1. List of websites considered in this study

Crops industry	Fisheries industry	Livestock industry
1- DOA Headquarter	1-DOF Headquarter	1-DVS Headquarter
2- DOA Selangor	2-DOF Perak	2-DVS Kelantan
3- DOA Kedah	3- DOF Sabah	3-DVS Pahang
4- DOA Kelantan		4-DVS Selangor
5- DOA Pahang		5-DVS Melaka
6- DOA Perak		6-DVS Kedah
7- DOA Melaka		7-DVS Perak
8- DOA Terengganu		8-DVS Perlis
9- DOA Johor		9-DVS Pulau Pinang
10- DOA Negeri Sembilan		10-DVS Sabah
11- DOA Pulau Pinang		
12- DOA Sabah		
13- DOA Sarawak		
14- DOA Perlis		

DOA= Department of Agriculture, DOF= Department of Fisheries, DVS=Department of Veterinary Services.

RESULTS AND DISCUSSION

The results of the analyses confirm that each of the websites considered displays agriculture information according to the expertise of the organization behind the site. This, in turn, has resulted in each of the websites having their own unique identity. Moreover, the findings of the study conclude that the agriculture information that gained the most attention is that related to 1) crops/fisheries/livestock that has a great potential to be developed; 2) available courses that offer information to enhance users' agriculture skills and knowledge; and 3) financial aspects such as capital/loans and interest charged to the loaners. Nonetheless, to further improve the agriculture websites, it is suggested that aspects relating to technical information should be added, as the amount of available information in this regard is discouraging. Table 2 demonstrates a comparison of the agriculture information analyzed with regards to crops, fisheries and livestock industries according to the respective departments. As can be seen from the results shown below, only potential crops and provision of training were addressed by all sectors, while information relating to finances, education, harvesting, handling of equipment, pest/disease treatment, and the preparation/suitability of habitats gained a large amount of attention from all sectors. Though previous research has confirmed that information germane to agriculture equipment, genetics and price listsare important to farmers, comparatively, within the scope of this study, such information was found to gain less attention from all sectors. The

data demonstrated are quite worrying, as the main purpose of the websites should be to provide the information that is actually required by farmers. The detailed results can be seen in Table 2.

Table 2.Comparison of agriculture information with regards to crops, fisheries and livestock displayed on agriculture websites. (n=27)

	Information	DOA 14	DOF 3	DVS 10	Websites that do not display such information
1.	Potential crops/fisheries/livestock	14	3	10	-
2.	Financial/capital/loan	14	3	1	1-DVS Kelantan 2- DVS Pahang 3- DVS Selangor 4- DVS Melaka 5- DVS Kedah 6- DVS Perak 7- DVS Perlis 8- DVS Pulau Pinang 9- DVS Sabah
3.	Education (research/publication)	8	1	5	1-DOA Melaka 2-DOA N9 3-DOA Pulau Pinang 4-DOA Sabah 5-DOA Sarawak 6-DOA Perlis 7-DOF Perak 8-DOF Sabah 9-DVS Kelantan 10-DVS Selangor 11-DVS Melaka 12-DVS Kedah 13-DVS Sabah
4.	Handling	9	1	5	1- DOA Selangor 2- DOA Pulau Pinang 3- DOA Sabah 4- DOA Sarawak 5- DOA Perlis 6-DOF Perak 7-DOF Sabah 8-DVS Kelantan 9-DVS Selangor 10-DVS Melaka 11-DVS Kedah 12-DVS Pulau Pinang
5.	Courses	14	3	10	-
6.	Harvesting/handling catches	8	1	8	1-DOA Selangor 2- DOA Melaka 3- DOA Negeri Sembilan 4- DOA Pulau Pinang 5- DOA Sabah 6- DOA Perlis 7-DOF Perak 8-DOF Sabah 9-DVS Kelantan 10-DVS Kedah
7.	Pest/disease treatment	13	0	9	1-DOA Selangor 2-DOF Headquarter 3-DOF Perak 4-DOF Sabah 5-DVS Kelantan
8.	Area preparation / habitat suitability	6	1	7	1-DOA Selangor 2- DOA Melaka 3- DOA Terengganu 4- DOA Negeri Sembilan 5- DOA Pulau Pinang 6- DOA Sabah 7- DOA Sarawak 8- DOA Perlis 9-DOF Perak 10-DOF Sabah 11-DVS Kelantan 12-DVS Pahang 13-DVS Kedah
9.	Food (fertilizer/pellets)	6	1	3	1- DOA Selangor 2- DOA Melaka 3- DOA Terengganu 4- DOA Negeri Sembilan 5- DOA Pulau Pinang 6- DOA Sabah

					7- DOA Sarawak 8- DOA Perlis 9-DOF Perak 10-DOF Sabah 11-DVS Kelantan 12-DVS Pahang 13-DVS Melaka 14-DVS Kedah 15-DVS Perak 16-DVS Perlis 17-DVS Pulau Pinang
10.	Agriculture equipment	3	3	2	1- DOA Headquarter 2- DOA Selangor 3- DOA Kedah 4- DOA Kelantan 5- DOA Pahang 6- DOA Melaka 7- DOA Terengganu 8- DOA Johor 9- DOA Negeri Sembilan 10- DOA Sabah 11- DOA Perlis 12-DVS Pahang 13-DVS Selangor 14-DVS Melaka 15-DVS Kedah 16-DVS Perak 17-DVS Perlis 18-DVS Pulau Pinang 19-DVS Sabah
11.	Genetics	0	0	7	1- DOA Headquarter 2- DOA Selangor 3- DOA Kedah 4- DOA Kelantan 5- DOA Pahang 6- DOA Perak 7- DOA Melaka 8- DOA Terengganu 9- DOA Johor 10- DOA Negeri Sembilan 11- DOA Pulau Pinang 12- DOA Sabah 13- DOA Sarawak 14- DOA Perlis 15-DOF Headquarter 16-DOF Perak 17- DOF Sabah 18-DVS Kedah 19-DVS Perak 20-DVS Pulau Pinang
12.	Online markets	11	0	1	1- DOA Melaka 2- DOA Johor 3- DOA Negeri Sembilan 4- DOF Headquarter 5-DOF Perak 6-DOF Sabah 7-DVS Headquarter 8-DVS Kelantan 9-DVS Pahang 10-DVS Selangor 11-DVS Melaka 12-DVS Kedah 13-DVS Perak 14-DVS Perlis 15-DVS Sabah
13.	Price lists/tenders	14	1	6	1-DOF Perak 2-DOF Sabah 3-DVS Kelantan 4-DVS Pahang 5-DVS Selangor 6-DVS Melaka

DOA=Department of Agriculture, DOF=Department of Fisheries, DVS=Department of Veterinary Services

CONCLUSION

Without doubt, agriculture is one of the tools that is assisting Malaysia to achieve its mission to become a developed country by 2020. Crops, fisheries and livestock productivities are all included in this. One of the best ways in which to ensure that each of these sectors flourishes is to keep the flow of information continuous. This

should be the responsibility of concerned parties, who should ensure the dissemination and sharing of essential agriculture information that fits the agriculture community's interests and needs. Undoubtedly, websites are among the best mediums by which to assist the concerned parties to accomplish such a task. Within the scope of this study, the data gained show that agriculture information with regards to 1) crops/fisheries/livestock that has a great potential to be developed; 2) available courses that offer information to enhance users' agriculture skills and knowledge; and 3) financial aspects such as capital/loans and interest rates charged to loaners should be included to a great extent in existing agriculture websites.

To further improve the agriculture websites considered, it is suggested that aspects relating to technical information should be added, as the current amount of available information in this respect is discouraging. Given the strength of websites in terms of disseminating and sharing agriculture information, past studies have proven that websites are able to assist farmers and concerned parties by making farmers more knowledgeable, easing the communication process, and strengthening farmers' marketing and economic efficiency. Hence, improving existing websites is indeed deemed important.

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