

Mechanisms to Promote User Satisfaction to Achieve Recognition of the Value of the Meteorological Services

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Abstract

Meteorological services and weather forecasts are used by many people with a wide range of interest everyday. However, due to the high variability and random nature of atmospheric processes, weather forecasts only provide a likelihood of the occurrence of certain conditions. This results in a poor image of the weather forecast. The contributions to the general user satisfaction and their recognition of the value of the services provided are reviewed. Several mechanisms to improve the services provided are discussed, including developing credibility and new products as well as responding to the needs of the user. The role of the media is highlighted in the process of transferring the message from the scientists to the general public. It is vital that there is a two-way communication between the meteorologists and the users and preferably a partnership to devise and develop specific tailored products for routine use in various businesses.

Introduction

Long-term climate data is used together with the current weather conditions to make forecasts of the possible future weather conditions for periods of one day to several weeks ahead. These forecasts have been available to varying degrees throughout the last century. However, during the last few decades, the range of climate forecasts was expanded to include seasonal forecasts with one, three or six month lead times. This type of climatology is at the cutting edge of atmospheric science and advances are being made every year. Sometimes in their eagerness of new discoveries and capabilities, the scientists try to make the forecasts operational before they have been well documented or verified. This has resulted in a rather poor image of long-term climate forecasting throughout the world. Therefore, conscious steps need to be taken to remedy this matter.

To restore the integrity to the scientists there needs to be a growing public awareness of the fact that much of the work is stretching our boundary of knowledge and expertise. The users of the climate and weather information comprise a group of people with wide interests in all walks of life. Usually they want to receive regular and updated information that they can apply for a specific purpose in their own line of business. For the weather information to be useful it must be able to be applied and produce a good result. For the user to be satisfied, the information needs to fulfil their requirements. They should be content or pleased with the service provided by the forecast and it should leave nothing to be desired if they are to be completely satisfied. This needs to be what forecasters aim at and work towards, as all will admit that the users are not completely satisfied at present. This paper will try to address some of the ways of achieving user satisfaction and thereby improving the image of the forecasts.

User Satisfaction

User satisfaction depends on the monetary value of the forecast to the user. If the user can directly apply the information in their routine operations, then it has monetary value to them. The application should be such a way that it can make a impact, to change the turnover or profit. A cost/benefit ratio should be calculated whereby the effect or influence of a

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correct forecast is evaluated, against the situation without any weather information (Von Solms 2002). The effect of a false forecast also needs to be taken into consideration. The forecast can be used during annual planning operations for decisions such as cultivar or crop choice, and seeding rate to get a certain plant population. The seasonal outlook information could also be used for a comprehensive risk analysis. In such an exercise the extremes of the climate information are used as inputs to simulation models to provide the probability of long-term yield levels under certain agronomic operations.

The weather forecast (e.g. daily to 7 days) can be used for predictions of irrigation or frost prevention or for selection of the best time to spray insecticide/herbicides/fungicide. User satisfaction will depend on the confidence which the specific users have in the specific products that they utilize on a regular basis. This confidence will depend on the reliability of the forecast and the ease with which it can be applied to the routine operations. An example of a product that has a high degree of user satisfaction is the monthly service provided by Envirovision in the "Maize Vision" product (Walker et al. 2001).

Maize vision provides an integrated analysis of the current status of the global climate situation and its effect on maize production in RSA. The current SOI is applied locally to a typical maize production system in South Africa via a crop growth simulation model using climate scenarios. These predicted yields are used together with the current trends of economic indicators (e.g. maize price/exchange rate (Rand to US \$) etc.) to allow the producers to make informed/educated decisions regarding the on-farm operations such as planning for the new season and planning for the following month. Mr. Johan van den Berg of Envirovision also provides a personal service to the farmers and speaks at many of the farmer study groups in the maize growing area of RSA during the months (August, September and October) prior to the planting season (e-mail: jvandenber@xsinet.co.za).

Value of Services

An assessment of the value of the service provided by the meteorologists is in the eyes of the user. It would be according to the type of products and the applicability to the business objectives. Another aspect that will be taken into consideration by the user is the significance and worth of the forecast given with respect to their own applications. The value will depend on the frequency, the convenience of its use, and the availability of the forecast. The availability will depend on the means by which it is communicated either through radio, television, print media, telephone or telefax or other means.

The value of the services also depends on the confidence the user has in the supplier of the forecast and whether it is tailored to meet the specific needs of that user. An example of a valuable service provided by the agrometeorologists in South Africa is that of the estimation of the maize crop during the growing season.

The South African Crop Estimates Committee has been in operation for many years to make an assessment of the value of the current maize crop during the season. They have employed various methods over the years to supply a consensus estimate to the producers, millers and national decision makers. At present there is a project running which aims at improving the estimate using advanced stratification modelling and new Landsat imagery. This is an example of a tailor-made produce which has been developed together with the user over many years and evolved into something of very high value to the maize industry in RSA (Monnik, 2002).

Another product used by the farming community is provided by the South Africa weather service as a monthly update of the seasonal forecast for rain and temperature. This forecast provides an outlook for the next 3 months over the whole country. The final product is in the form of a map with probabilities of rainfall relative to the long-term normal rainfall in

the specific areas. This is widely distributed and available on the Website with an update each month (<http://www.weathersa.co.za/nwp/seasonal.html>). This information is highly valuable for the farmer and so the value placed on such forecast is also high due to the relevance to operational decisions (Klopper, 2001).

Recognition of Services

Some of the critical factors that need to be addressed when considering how the weather/climate services are perceived include timelessness, format, accuracy and content. The forecast provider needs to acknowledge that the user has specific needs that may be different from those traditionally addressed by the routine weather forecast. They need to distinguish between different users and different requirements and applications so as to achieve a good service. As far as the timing of the provision supply of the daily weather forecast, in many countries, it is timed so as to be available for the peak news broadcast on radio and TV in the evening. So in the same way, the other types of forecasts need to be tailor-made to be provided at the specific time when the user will be most receptive to the message.

For agricultural purposes, the time appearance of the seasonal forecast for the next three months is a most useful tool in planting the forthcoming season. The farmers are able to use it to make certain decisions pertaining to the lands to be planted, the crop and cultivar to be used, the application of pre-plant fertilizer, and the seeding rate among other specific activities. The supply of a monthly update of this “next three months rainfall forecast” is also useful for decision pertaining to the late plantings, or planning for the harvesting operations, the application of fertilizer topdressings, pesticides and disease control etc. When any new product is developed, it is necessary to assess the optimal time frame needed by the user for that specific product.

The format of the product is also a crucial aspect to obtain recognition of useful services. The products need to be simple and easy to understand. They will be more readily used if they are “user-friendly” and readily available in the users’ environment. For instance, if the farmers use the co-operative for obtaining supplies on regular basis, then the forecast would be made available at the local co-operatives in an attractive format. The forecast should also be written in a language readily understood by the layman and general public or preferably in the local language. This would mean that it is more readily available and can be easily incorporated into everyday use on farm decisions.

The best recognition of services will be if the forecasters make a specific custom-made forecast for a specific industry or community. This type of forecast will have to be developed as a team effort between the user and the meteorologists. This will result in an area specific and commodity specific forecast to meet the needs of the user. It will be a forecast that meets the specific individual requirements of that user and annually will have some additional value over and above the traditional weather forecasts. Some examples of these types are forecast are available at the sites Website

e.g: pigeon racing racing <http://www.weathersa.co.za/fcast/pigeon.htm>

radar http://metsys.weathersa.co.za/general_radar.htm

road running races e.g. <http://www.weathersa.co.za/fcast/comrades.htm>

fire <http://www.weathersa.co.za/fcast/fire.htm>.

The accuracy the forecast provides is critical when the users are trying to utilize it for decisions that affect their livelihoods or businesses. Although everyone acknowledges that the atmospheric processes are random in nature, every effort must be made to provide an accurate and detailed as possible forecast. The forecasters should be willing to be evaluated for success via an independent body for the forecast correctness, or false or miss forecasts. This will enable them to build up a historic record of the success of the forecasts and increase

credibility. It will also help in the forecasters to provide an assessment of the situation following the weather event. It should give details of the forecast provided as well as the severity of the event or consequence of the event (e.g. floods <http://www.weathersa.co.za/stories/Weatherevents.html> etc.

Mechanisms to Promote Recognition of Value of Forecasts

There are several things that the provider of forecasts can do to promote better use and recognition of the services provided. These include some of the usual actions that are used when marketing services to the public. However, some specific aspects can be applied to the meteorologists.

- (a) To develop credibility among the consumers. The consumers are sensitive to the performance of the forecast in the past in relationship to the occurrence particularly of severe weather. Therefore it is vital to develop a good historic track record. This can be done by making public a scientific analysis of the forecast over the last period compared to the actual weather received (Marx 2002). This information needs to be publicized to the general media so that the public can develop some confidence in the forecasts. The forecasters need to provide the media with both success stories and disaster stories that would help to build credibility. When the analysis is done, usually there are 3 categories. There are two types of "hit" when either an event was forecast and it did occur or when an event was not forecast and it did not occur, both constitute a "hit". There is a "miss" when it was forecast and did not occur. Finally, there can be a case when the event was forecast, but it did not occur. The public needs to be fed some post-analysis via the media of each of these situations. Above all the forecasters need to be able to harvest in their analysis and also humble when adding the false alarms and mission. There is then a chance that the public will begin to give recognition where it is due.

An example of a severe rainstorm working was on 20 November 2001 in Bloemfontein, South Africa (Visser & Rossouw, 2002). The radar was used to detect an approaching hailstorm and a warning was issued an hour prior to its arrival in the city on the local FM radio station. A survey was conducted following the event to assess the impact of the radio broadcast warning. Those who heard the warning suffered less damage to their motor vehicles than those who did not hear the warning and were unable to take precaution ally measures. This provides a good success story for severe storm warnings (Visser & Rossouw, 2002).

- (b) A strategy should be put in place to develop new products from the existing weather and climate information for a wider variety of applications. To be able to serve the consumers better, the meteorologists need to develop specific forecasts that will meet the needs of specific users. These type of "tailor-made" forecasts can then meet a niche market. Distinct advantage can be achieved if the meteorologists and users form partnerships to develop original, individual packages to meet the special needs of a particular user group. Firstly, the niche markets need to be identified where the weather has a definite specific effect on production. Then the requirements specified so as to devise an action plan and develop a product to meet the user needs. Just such as exercise was carried out during the annual SADC Agrometeorologists Training session in Zimbabwe during November 2002. Various country groups of agriculturalists and agrometeorologists were able to devise plans for commodity specific forecasts for agriculture production such as timber, maize, sugarcane and goat rearing. These plans will be further developed on return to each country and following more interaction with the wider group of stakeholders.

- (c) Forecasts should be able to respond to the user needs and demands. A good needs assessment should be conducted to ascertain the market requirements for weather and climate forecasts. This can be achieved by a survey which should be followed up by specific face to face consultations with the potential users. One of the areas that needs to be addressed is that of the format of the forecast. For many of the users, the terminology used by the meteorologists is too scientific and not easily comprehended. Sometimes, a simple solution would be devised if the meteorologist and user sit and work out a good mutual language or terminology that both groups can understand. Many of the general public are involved in games of chance and so the probability system is not unknown to them. However, it appears that there is a definite lack of understanding of the scientific terms used in describing probabilities (Mukhala, 2000). If some effort is made to tease out the specific requirements of the user and how they will utilize the specific information, a more user friendly product can be designed to the user specification. Such forecasts can then be distributed to the niche markets via dedicated media sources. This would also allow for some confirmed education and public awareness programme for these specific stakeholders.

If the meteorologists are to respond to the needs of users they also need to meet the time requirements specified by the users. If the meteorologist takes time to understand the process of the users then they can ensure that the flow of weather information is also timeously provided. This is a vital aspect of weather forecasts as the meteorological information is considered a “perishable” item i.e. today’s weather forecast is of no use tomorrow. In the same way the seasonal forecast has a limited time for which it can be applied to give the most effective usefulness.

- (d) The forecast services should not be limited exclusively to the National Meteorological Services (NMS). In countries where there is scientific expertise outside of the NMS, then they should be allowed to issue weather forecasts to the general public. In the interest of the promotion and extension of the science of weather and climate forecasts, other qualified people or organizations such as universities are also allowed to issue forecasts (personal communication B.C. Hewitson). There are many private consultants and climate experts that use scientific methods who can provide a service to the community and to various industries which would not be able to be met by the limited capacity within the NMS. This would also allow the weather forecast to become a commodity in its own right that has value to the consumers.
- (e) The use of the media in communicating the message of the forecast and services is of vital importance in improving the image of the climate predictions and weather forecasts. The main means of communication from the NMS to the general public is via the print and audio media. It is vital that the media is on the side of the meteorological service and that they can understand the vital role they have to communicate the forecast clearly to the general public. The meteorologists have begun to realize this and have initiated some awareness campaigns and training session to meet with the media people and train them in the specifics of weather forecasting. As the weather and climate affects every walk of life it is vital to communicate with the general public in a plain, understandable fashion. The media is a vital link in this chain of message transfer. If the media understand the importance and application of the weather in various situations, they will enable the meteorological services to transfer their message at the right time in a correct fashion. So the NMS need to put some additional effort into good public relations to achieve this.

Conclusion

There is much that can be done to achieve better recognition of the usefulness of the meteorological forecasts and services. There needs to be clear communication via an

educated and interested media core in both electronic and print media sectors. An investigative survey should be conducted to identify specific products that could be developed for use by a wide range of users and stakeholders. The meteorologists need to submit the forecasts services and other products to stringent scientific evaluation and be willing to publicize the findings. New products should be developed by teams from the atmospheric scientists and the user community that will meet the particular requirement of content, timing and presentation. Together, they can dream of making the weather forecast a highly valuable product which is utilized in every walk of life. Then together they can run with vision and serve the general public and specific stakeholders with regular, accurate and clearly understandable weather products.

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