Indian Journal of Extension Education
Vol. 51, No. 3 & 4, 2015 (49-53)

Application and Performance of Google Forms for Online Data Collection and Analysis: A Case of North Eastern Region of India

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ABSTRACT

Google is a worldwide recognized search engine. It also provides internet related services and products to a wide range of users at greater utility and lesser cost. Google also launched web based applications like Google docs, Google forms, Google drive, Google slides, Google sheets, *etc.*, which has immense potential for increasing productivity of academicians, researchers, students, professionals and policy makers, *etc.* Among the above mentioned web based applications, Google forms is one of the most important tools having great relevance to social science in general and data collection methodology in particular. To study the feasibility and performance of Google forms in KVKs of North Eastern region, *i.e.* Zone-III, three pilot tests were taken to collect data. The online forms were created and online data were collected for various projects and activities of the ATARI Zone-III, Umiam, Meghalaya. The outcomes depicted that in eight North Eastern States, the success of data collection and response rate is more than the traditional and manual way of data collection. All KVKs connected with stable internet connection were able to feed and submit data. The responses increased tremendously when respondents were systematically targeted. Thus, Google forms can significantly make difference to collect online data from respondents who are connected with internet. In order to collect data from respondents who don't have access to the internet (ex. Marginal farmers, tribal and rural populations) researchers can use smartphones or tablet-PCs to collect real time data with greater speed. It will save the paper time and manual efforts of researchers. The non-tampered analysis of survey with fullest authenticity is also possible within few seconds without any manual tabulation and coding. Hence, Google form is a boon for enhancing research productivity of scholars of the National Agricultural Research System.

Key words: Google forms, online data collection, online survey

INTRODUCTION

Primary data collection is a basic research methodology component in social science research. In the discipline of agricultural extension, general data collection is done with the help of the personal interview schedule or questionnaire sent through post *i. e.* printed on paper or via email *i.e.* in soft copy like MS-word format. The World Wide Web (WWW) is increasingly used as a tool and platform for survey research (Van Selm, M. *et. al.,* 2006) and social sciences in agriculture also must adopt these platforms for better results. The response rate of traditional methods of data collection is around 50 per cent (Kerlinger, 1964) which is a key reason to hamper the productivity of researchers. At present, most of the social science researchers are opting for online method data collection as traditional methods are cumbersome and costly.

Lefever S. (2007) predicted that in the near future online data collection methodology will replace the traditional paper - pencil surveys. This online data collection method has great potential to enhance the research productivity of researchers. The findings of Lefever S. *et. al.* (2007) concludes that online surveys can access large and geographically distributed populations and achieve quick returns. They also affirmed that reaching the target population sample remains a problem in an online data collection method. In 2005, Evans and Mathur stated that, online surveys have significant advantages over other formats if conducted properly.In order to improve the effectiveness of evaluation strategy of online and paper surveys, Nulty (2008) in his research work suggested to obtain the highest response rates possible to all surveys and it is possible through the web based targeted online survey.

Sometime the cost of web based online research survey is also comparatively high. This limitation can be avoided by the use of open source / free applications like google forms. The Google forms is free tool can be used for creating events, conducting online polls and information collection through online surveys etc. in a streamlined manner. It can enable the social science researchers to collect data from targeted respondents in a shorter amount of time and at very less cost.To overcome the constraints like shorter budgets and less personnel for extension research, Archer strongly advocated an

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utilization of web based surveys(Archer, 2003).

Therefore, to study the feasibility and performance of Google forms in KVKs of North Eastern region, i.e. Zone-III, three pilot tests were taken to collect data. The online forms were created and online data were collected for various projects and mandated activities of the Zonal ATARI, Zone-III, Umiam, Meghalaya.

METHODOLOGY

The present study was conducted in the ATARI, Zone-III, Umiam, Meghalaya. This monitors and coordinates the mandated activities of 76 KVKs (*i.e.* Krishi Vigyan Kendras) spread across eight North Eastern States. KVKs send a variety of reports about their research, training, extension and other development activities to this directorate. The ATARI-III compiles data from all the reports like monthly progress report of KVK (MPR), citizen client charter report of KVK (CCC), result framework document report (RFD), quarterly progress report of KVK, half yearly progress report of KVK, skill development report of KVK, Annual Progress report of KVK, monthly performance report of KVK personnel *etc.* which KVKs submit to ATARI-III after regular intervals. To collect and compile data from 76 KVKs is a very cumbersome and critical job. Also ATARI-III researchers undertook various research projects for which they also need to go for data collection. The manual methods took much time to compile, synthesize and report data which consequently resulted in delayed submission of reports.To find out the comparatively easy and convenient mechanism for reporting and compiling data, researchers of ATARI Zone-III made several attempts to envisage the possibility of an online data collection. Several attempts were made by investigators to collect data using the internet. They are given as follows;

CASE-I: In a first attempt, an email based questionnaire was prepared using MS-Word application. It was a questionnaire for a pilot project to explore the feasibility of the concept of 'paperless KVKs'. The questionnaire was emailed to all 74 KVKs of Zone-III in 2012 and respondents was requested to fill up the appropriate responses. Scientific staff of all 74 KVKs was requested to fill the questionnaire and all the responses were collected via email. The researcher did the coding, tabulation and analysis of data manually.

CASE-II: In a second attempt, a web based questionnaire was prepared by using the draft of the first questionnaire with slight modification. The same questions were framed with the help of 'Google Forms' and form was created. The link of the questionnaire form was emailed to all 74 KVKs again to collect the responses. In this case also all scientific staff of 74 KVKs in Zone-III was appealed to participate in the survey and to submit responses. The questionnaire form generated with the help of google forms was streamlined with google sheets. This facilitated online tabulation, entry and analysis of collected data. The objective of this exercise was to compare the results of a web based survey against email based survey using MS-word application.

CASE-III: The third attempt was made by researchers to generate Google forms for collecting data for the pilot project titled 'Risk analysis and perception of mobile phone users in a KVK system of ICAR'. To collect data for this investigation, a web based questionnaire was framed using google forms. The link of generated form was emailed to all KVKs of Zone-III. This time all staff, *i.e.* scientific as well as administrative staff of 74 KVKs was directed to record responses. The data were collected, tabulated and analyzed by Google forms itself.

CASE-IV: In the fourth attempt, data were collected for ATARI Zone-III in-house project titled 'Farmers' perception towards climate changes and their resilient strategies in agriculture' data was collected from eight (8) north eastern districts, one district from each state. A web based questionnaire was prepared by using Google forms and link was emailed to eight concerned KVKs only. All selected eight KVKs were directed to collect data from farmers and feed into google forms. The data were collected, tabulated and analyzed by Google forms itself.

RESULTS AND DISCUSSION

The comparison of various attempts made by investigators to collect online data shows that response rate of respondents was very less in case-I. In spite of 2 reminders in a period of 30 days could attract 34 targeted respondents to submit data. Therefore, the respondents survey rejection tendency is more in case-I in which questionnaires were sent through email by using MS-Word files.

Figure 1: Comparison of various online data collection cases

Description of items	Case-I	Case-II	Case-III	Case-VI
Year of Data collection	2012	2012	2013	2013
Mode of data collection	Through Email using MS-Word files	Through Web based platform using Google forms	Through Web based platform using Google forms	Through Web based platform using Google forms
Category of Targeted respondents'	All Scientific staff of KVK (PCs and SMSs)	All Scientific staff of KVK (PCs and SMSs)	All Scientific and administrative staff of KVK	Farmers of NICRA KVK from the jurisdiction of selected KVKs

Number of KVKs involved in data collection	74 KVKs	74 KVKs	74 KVKs	8 KVKs
Number of valid responses received	34	180	200	400
Reminders sent	2	3	4	5
Time given to submit data	30 Days	30 Days	45 Days	45 Days

(Source: analysis of primary data collected by researchers)

Case-II revealed that around 180 respondents preferred to fill online surveys in a period of 30 days when the questionnaire was created using Google forms (web based platform). 3 reminders were given to respondents to fill questionnaires. This observation shows that more number of reminders are needed to be given to collect data. The respondents prefer to fill responses on web pages than use of MS- word files.

The case-III is shown that around 200 respondents submitted their responses over the web based platform, *i.e.* Google forms when 4 reminders were sent. Even 45 days were given to submit the data, though there was no significant increase of the number of respondents. In case I, II and III respondents were not targeted. An email containing link of a google form web page was directly sent to the email address of KVK. But the case-IV revealed that a targeted approach to data collection yields better results. In the case-IV, eight KVKs were targeted to collect and feed data on the google form platform. This investigation strategy was more fruitful than last three cases because a sample of 400 farmers was targeted for data collection and the response rate was 100 per cent.

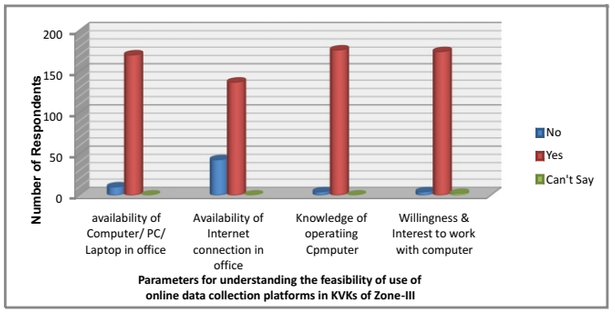
Feasibility of implementation of ICT/online data collection platforms in KVKv of Zone-III:

The primary data collected from respondents revealed that the majority of respondent (80%) is having infrastructure available at their workplace to implement various ICT and web based applications. Around 85 per cent respondents replied that they have knowledge and interest to work with computers. This finding greatly supports not only the implementation of online data collection tools, but also the implementation of a variety of computer-internet based farmer friendly approaches to enhance the productivity of KVKs.

The least rated factor and impediment to implement any computer-internet based ICT tool is poor internet connectivity in KVKs. Almost 65 per cent respondents communicated that they are having internet connectivity and still 35 per cent are struggling to get an internet facility in order to work efficiently. The e-connectivity is relatively poor in the North Eastern region, but in the KVKs of rest of India it is not a hurdle for implementing ICT based solutions for the benefit of the farmer.

Figure 2: Feasibility of implementation of online data collection in KVKs of Zone-III

n=180



(Source: Analysis of primary data collected by researchers)

SWOT analysis of Google forms:

SWOT analysis is a managerial tool given by the Boston Consulting group. It facilitates the easy understanding of possible strengths, Weaknesses, opportunities and threats. SWOT attributes of Google forms as experienced by researchers during this investigation are depicted in the figure given below.

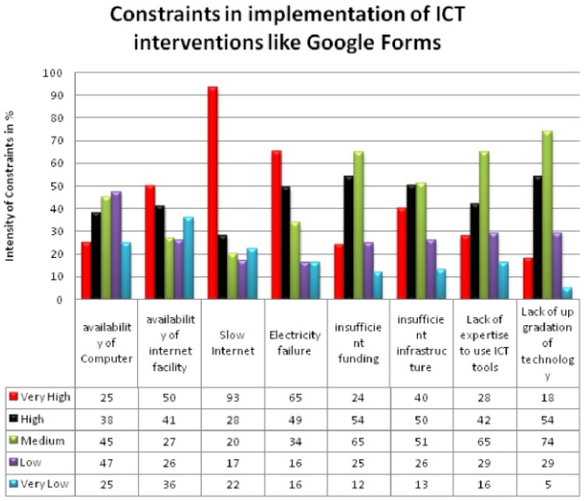
Figure 3: SWOT analysis of Google Forms

Strengths	Weaknesses	Opportunities	Threats
✓ Quick to reach ✓ Scientifically appealing to respondents ✓ Data collection in streamlined manner ✓ Error free, fast and untampered data collection is possible ✓ A great deal of flexibility to form questions ✓ User friendly interface ✓ Any special training is not required to operate google forms ✓ Free to use and execute ✓ Storage of all data on cloud computing is possible so entire data is secure ✓ Social science researchers can reach vast numbers of respondents to obtain a desired sample	✓ Internet connectivity and interface hardware arekey prerequisites ✓ Not suitable for collecting data from respondents who are not connected to e-world Ex. Poor and marginal farmers, tribal folks, etc. ✓ Some respondents don't treat such kind of surveys at par with personal interviews therefor neglection risk is more	✓ The huge potentialof open source –free platform to collect data is available for all scientists. ✓ Public sector organizations can use this tool to generate qualitative and quantitative databases ✓ Link addresses communicate via social networking sites can provide greater sample size ✓ Researchers can use portable internet connected devices like laptops or smartphones or tablet-PCs to collect data from farmers, tribal folks etc. ✓ Best paper saver technology ✓ Tabulation, data entry, coding etc. aren't required which can significantly save productive time of scientists.	✓ Incorrect data entry by respondents may lead to wrong results ✓ Misunderstanding of questions is also a threat to final results. ✓ Low response rate if respondents feel research topic is not relevant to them ✓ Chances of increasing sampling bias ✓

The availability of google forms at free of cost is the greatest plus point and strength for Google forms. It is easy, simple, convenient, speedful yet reliable tool to collect data. Certain studies about online surveys affirmed

that response rate is mostly low for online surveys, but tactful researcher can overcome it by involving larger population as sample. All contextual and shorter surveys are always preferred by respondents. So, with some primary skill of framing questionnaire, any researcher can collect quality data with the help of google forms. Researchers also found threats like incorrect data entry by respondents may lead to wrong results. It may also happen due to misunderstanding of respondents with respect to questions asked. Therefore, researchers must target the authentic and concerned respondents on priority. Scrutiny of entire collected data is also essential in order to remove responses of invalid respondents. During the course of this study, investigators also found some of the constraints in implementation of web based ICT interventions like Google forms in KVKs. Constraints rated by respondents are presented in the figure given below.

Figure 4: Constraints in implementation of Google forms



	availability of Computer	availability of internet facility	Slow Internet	Electricity failure	insufficient funding	insufficient infrastructure	Lack of expertise to use ICT tools	Lack of up gradation of technology
Very High	25	50	93	65	24	40	28	18
High	38	41	28	49	54	50	42	54
Medium	45	27	20	34	65	51	65	74
Low	47	26	17	16	25	26	29	29
Very Low	25	36	22	16	12	13	16	5

(Source: Analysis of primary data collected by researchers)

Slower internet connection, frequent electricity failures and availability of internet facility are the top three most rated very high intense constraints perceived by respondents from KVKs of the north east region of India. High category rated three constraints were insufficient funding, lack of upgradation of technology and insufficient infrastructure. And these factors are also rated by respondents as top three in the medium intense category. Moreover, entire KVKs of the nation are in the process to get high speed internet connectivity, silent power generator sets and all other necessary infrastructure to implement ICT based projects. This is a positive step towards the removal of severe constraints faced by KVKs.

CONCLUSION

The use of 'Google Forms' an online data collection tool is probably the most suitable approach for social scientists. This approach is speedy, accurate and free of cost to use. Minimal costs are involved for use of the internet but in most of the government offices, research institutions and universities internet is freely available for research purpose. Data collected through google forms is always safe as it is stored in cloud storage. The streamlined way of data collection, tabulation and analysis, save the productive time of researchers and automatically facilitates cumbersome job.

The North East region of India is mainly hilly terrain. Most of the pockets are still poorly connected by road. Additionally, during the research duration, many districts were inaccessible due to frequent disturbances. In this situation, data collection from farmers becomes challenging.

Therefore, the experience of the authors of this paper in the North East region showed that google forms is performing well to collect data. KVK interventions are crucial for collecting data from farmers. The 'targeted respondent approach' of data collection found more productive as response rate is almost 100 percent. Even though researchers had limitations like traveling constraints, weather constraints, law and order issues, language constraints, etc. they could collect data from farmers within stipulated time and resources with the help of google forms. The application and research use of google form can also yield better yields if data collected from targeted respondents.

Paper received on : January 22, 2015
Accepted on : February 4,2015

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